22nd January 2019

Environment Agency
North Ridings Region
Ridings Area
Bowbridge Close
Bradmarsh Business Park
Templeborough
ROTHERHAM
S60 1BY

Your Ref:
Our ref: GLG/AC
AnnualRepPeriodEndDec2018

FAO MR P BUCHANAN

Dear Mr Buchanan

ANNUAL REPORTING PERIOD ENDING DECEMBER 2018

Please find enclosed completed reports for the period ending 31 December 2018 reported within the Permit requirements BM4082.

Yours sincerely

MR GUY LE GEYT
GENERAL MANAGER

Enc

Cc: Ms G Charters

Veolia ES Sheffield Limited
Sheffield ERF, Bernard Road,
Sheffield, Yorkshire, S4 7YX
Tel: +44 (0)114 273 4399
www.veolia.co.uk

Registered Office:
210 Pentonville Road, London N1 9JY
Registered in England & Wales: 03709317

A group company of
Veolia UK Limited

CONTENTS

Veolia ES Sheffield Limited
Sheffield ERF, Bernard Road,
Sheffield, Yorkshire, S4 7YX
Tel: +44 (0)114 273 4399
www.veolia.co.uk

Registered Office:
210 Pentonville Road, London N1 9JY
Registered in England & Wales: 03709317

A group company of
Veolia UK Limited

SHEFFIELD ENERGY RECOVERY FACILITY

ANNUAL REPORT PERIOD ENDING

DECEMBER 2018

Prepared By
Ann Cheesman
On Behalf of

Guy Le Geyt
General Manager
January 2019

Veolia ES Sheffield Limited
Sheffield ERF, Bernard Road,
Sheffield, Yorkshire, S4 7YX
Tel: +44 (0)11 4273 4399
www.veolia.co.uk

Registered Office:
210 Pentonville Road, London N1 9JY
Registered in England & Wales: 03709317

A group company of
Veolia UK Limited

THE QUEEN'S AWARDS FOR ENTERPRISE: SUSTAINABLE DEVELOPMENT 2014

RESPONSIBLE BUSINESS OF THE YEAR 2016
BUSINESS IN THE COMMUNITY

Permit Reference Number : BM4082

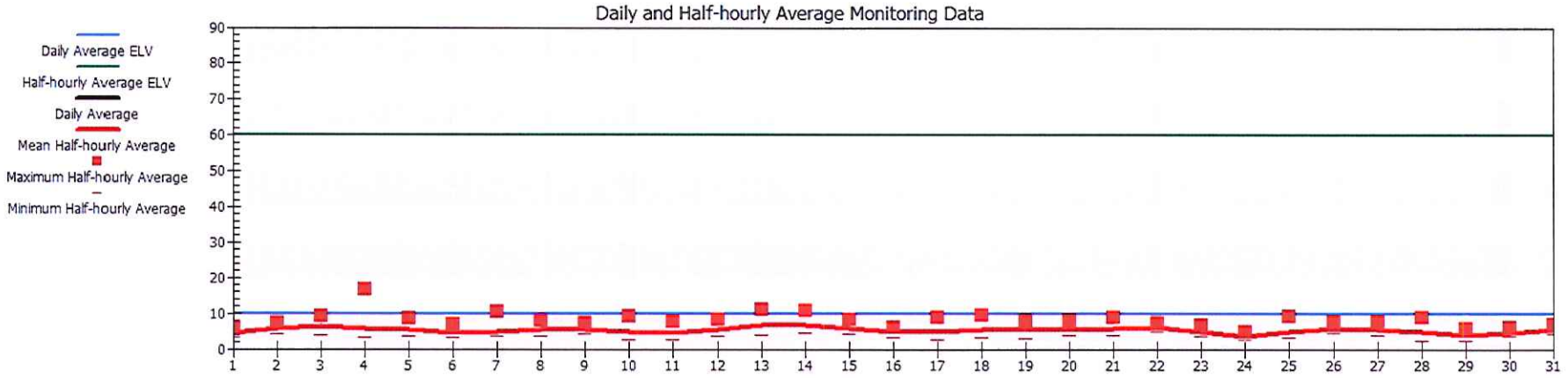
Operator : Veoila ES Sheffield Ltd

Installation: Bernard Road, Sheffield

Form Number: BM4082/PP3332SL/A4

Date of Form: 02/01/2007

Reporting of Continuously Monitored Emissions to Air for HCl mg/Nm3 at Emission Point A1 For the month of December 2018



	Monthly summary		Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Half-hourly average			Half-hourly average ELV	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
	Monthly maximum	16.7	Maximum Half-hourly average	6.1	7.4	9.4	16.7	8.7	6.9	10.4	7.9	7.3	9.3	7.5	8.3	11.2	11.0	8.3	6.2	9.0	9.6	8.1	8.1	9.0	7.4	6.8	4.8	9.2	7.8	7.5	8.9	5.7	6.2	7.0
	Monthly mean	5.3	Mean Half-hourly average	4.4	5.9	6.4	5.8	5.4	4.6	4.9	5.5	5.5	4.9	4.6	5.5	6.6	6.8	5.8	4.7	4.9	5.4	5.5	5.4	5.9	6.1	4.8	3.7	4.9	5.7	5.6	4.9	3.8	4.7	5.6
	Monthly minimum	2.4	Minimum Half-hourly average	3.4	4.3	4.0	3.3	3.5	3.3	3.5	3.7	4.3	2.7	2.6	3.5	3.8	4.6	4.2	3.3	2.8	3.3	3.1	3.9	3.9	4.8	3.5	2.7	3.2	4.4	4.0	2.4	2.4	3.5	4.3
	Total Invalid results	0	No of Invalid results	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sum of exceedances	0	No of exceedances of ELV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daily average			Daily average ELV	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Monthly maximum	6.8	Daily average	4.4	5.9	6.4	5.8	5.4	4.6	4.9	5.5	5.5	4.9	4.6	5.5	6.6	6.8	5.8	4.7	4.9	5.4	5.5	5.4	5.9	6.1	4.8	3.7	4.9	5.7	5.6	4.9	3.8	4.7	5.6
	No of invalid days	0	Value Valid?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Sum of exceedances	0	Value Exceeds ELV?	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Signed.....

Date... 23/01/2019

(Authorised to sign as a representative of the Operator)

Permit Reference Number : BM4082

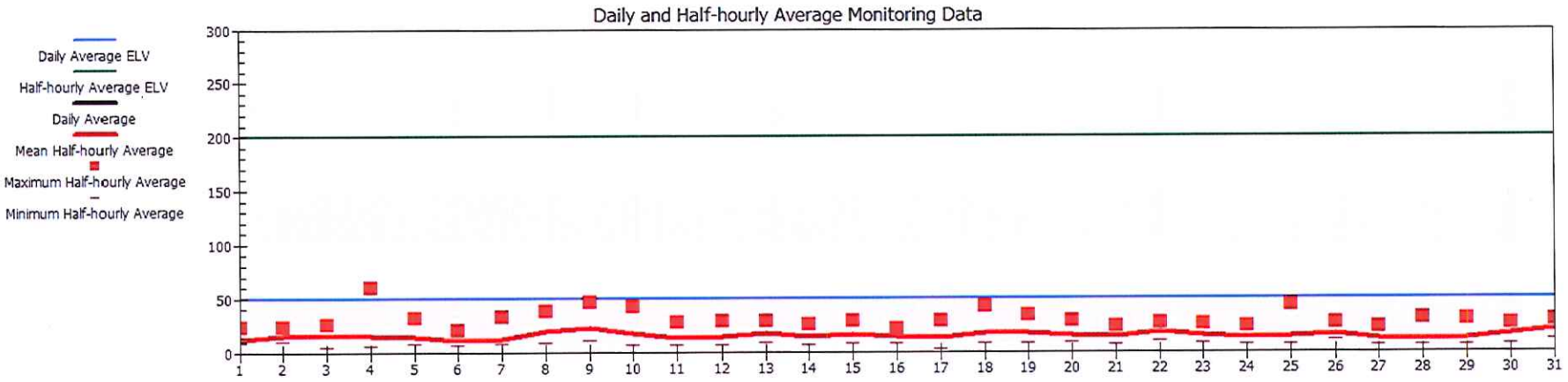
Operator : Veoila ES Sheffield Ltd

Installation: Bernard Road, Sheffield

Form Number: BM4082/PP3332SL/A8

Date of Form: 02/01/2007

Reporting of Continuously Monitored Emissions to Air for SO2 mg/Nm3 at Emission Point A1 For the month of December 2018



	Monthly summary		Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
			Half-hourly average ELV	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Half-hourly average	Monthly maximum	60	Maximum Half-hourly average	24	23	26	60	32	20	33	38	47	43	28	29	29	25	29	22	29	42	34	28	24	27	26	24	44	26	22	30	30	25	29
	Monthly mean	15	Mean Half-hourly average	12	16	15	15	14	11	12	19	23	18	14	14	17	14	16	14	13	17	17	15	15	18	15	14	15	16	12	11	12	16	20
	Monthly minimum	3	Minimum Half-hourly average	9	10	5	6	8	7	8	9	11	7	7	6	9	7	8	8	3	8	8	9	7	10	8	7	7	11	6	5	6	7	11
	Total Invalid results	0	No of Invalid results	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sum of exceedances	0	No of exceedances of ELV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Daily average ELV	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Daily average	Monthly maximum	23	Daily average	12	16	15	15	14	11	12	19	23	18	14	14	17	14	16	14	13	17	17	15	15	18	15	14	15	16	12	11	12	16	20
	No of invalid days	0	Value Valid?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Sum of exceedances	0	Value Exceeds ELV?	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Signed.....

(Authorised to sign as a representative of the Operator)

Date....23/01/2019

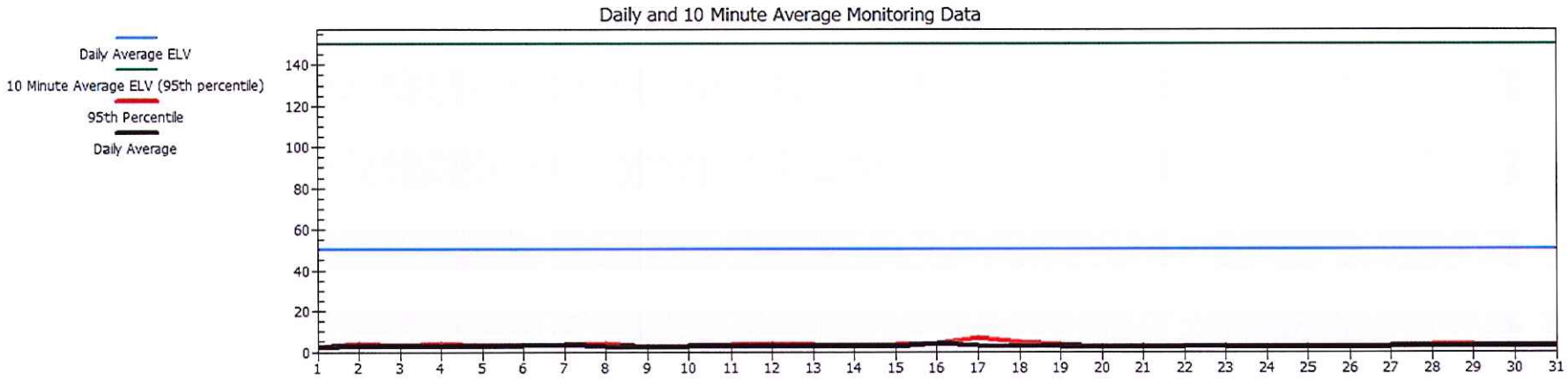
Permit Reference Number : BM4082

Operator : Veoila ES Sheffield Ltd

Installation: Bernard Road, Sheffield

Form Number:

Reporting of Continuously Monitored Emissions to Air for CO mg/Nm3 at Emission Point A1 For the month of December 2018



	Monthly summary		Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
10 Minute average			10 Minute average ELV (95th Percentile)	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
	Monthly Maximum	150	Maximum 10 Minute average	3	47	5	25	4	43	150	11	3	10	4	63	5	3	5	52	12	10	17	10	9	3	9	3	7	5	4	8	7	7	9
	Monthly 95th Percentile	7	95th Percentile	3	4	3	4	3	3	4	4	2	3	4	4	4	3	4	4	7	5	4	3	3	3	3	2	3	2	3	4	3	3	3
	Monthly minimum	1	Minimum 10 Minute average	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2
	Total Invalid results	0	No of Invalid results	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Number of results above 150mg/m³	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sum of Exceedances of 95th percentile ELV	0	95th Percentile Exceeds ELV	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Daily average			Daily average ELV	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	Monthly maximum	4	Daily average	2	3	2	3	2	3	4	3	2	2	3	3	3	2	3	4	3	3	2	2	2	2	2	2	2	2	2	3	3	2	2
	No of invalid days	0	Value Valid?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Sum of exceedances	0	Value Exceeds ELV?	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Signed.....

(Authorised to sign as a representative of the Operator)

Date.. 23/01/2019

Permit Reference Number : BM4082

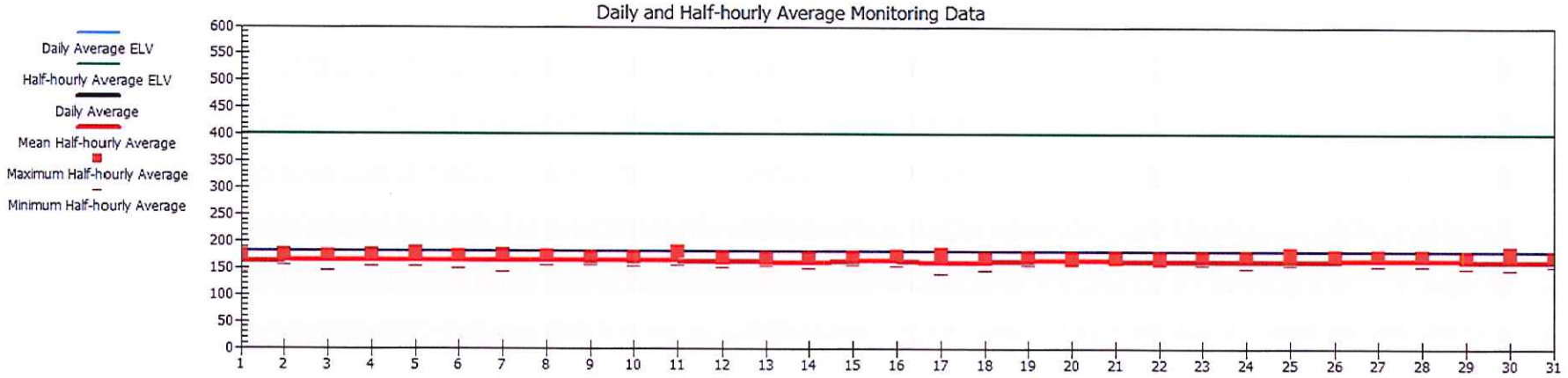
Operator : Veoila ES Sheffield Ltd

Installation: Bernard Road, Sheffield

Form Number: BM4082/PP3332SL/A9

Date of Form: 02/01/2007

Reporting of Continuously Monitored Emissions to Air for NOx mg/m3 at Emission Point A1 For the month of December 2018



	Monthly summary		Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Half-hourly average			Half-hourly average ELV	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
	Monthly maximum	182	Maximum Half-hourly average	173	175	172	175	179	172	174	173	170	171	182	169	168	167	171	172	176	169	171	169	171	169	170	170	177	173	172	172	171	178	170
	Monthly mean	163	Mean Half-hourly average	163	165	164	164	164	164	163	165	164	164	164	162	162	160	164	164	159	162	163	164	164	163	163	162	163	164	163	164	163	162	163
	Monthly minimum	139	Minimum Half-hourly average	143	156	146	153	153	149	142	155	155	153	156	151	154	150	155	154	139	144	156	156	157	156	155	150	155	159	153	154	149	148	154
	Total Invalid results	0	No of Invalid results	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sum of exceedances	0	No of exceedances of ELV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daily average			Daily average ELV	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
	Monthly maximum	165	Daily average	163	165	164	164	164	164	163	165	164	164	164	162	162	160	164	164	159	162	163	164	164	163	163	162	163	164	163	164	163	162	163
	No of invalid days	0	Value Valid?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Sum of exceedances	0	Value Exceeds ELV?	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Signed..... Date.. 23/01/2019

(Authorised to sign as a representative of the Operator)

Permit Reference Number : BM4082

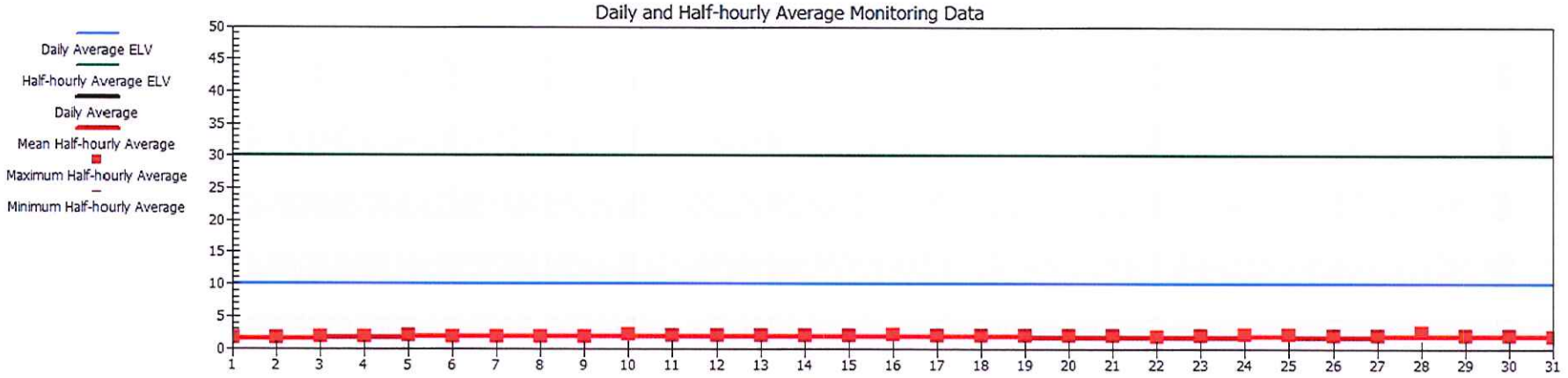
Operator : Veoila ES Sheffield Ltd

Installation: Bernard Road, Sheffield

Form Number: BM4082/PP3332SL/A3

Date of Form: 02/01/2007

Reporting of Continuously Monitored Emissions to Air for Particulate Matter mg/Nm3 at Emission Point A1 For the month of December 2018



	Monthly summary		Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Half-hourly average			Half-hourly average ELV	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
	Monthly maximum	2.4	Maximum Half-hourly average	1.7	1.6	1.8	1.9	2.0	1.9	1.9	1.9	1.8	2.1	2.0	2.0	1.9	2.1	2.1	2.1	2.1	2.0	1.9	2.0	1.9	1.8	1.9	2.2	2.2	1.9	2.0	2.4	2.0	2.1	1.9
	Monthly mean	1.8	Mean Half-hourly average	1.6	1.5	1.7	1.7	1.8	1.7	1.8	1.8	1.7	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.8	1.8	1.7	1.8	1.6	1.7	1.9	1.9	1.7	1.8	1.9	1.8	1.8	1.7
	Monthly minimum	1.5	Minimum Half-hourly average	1.5	1.5	1.5	1.6	1.7	1.6	1.7	1.7	1.7	1.7	1.6	1.7	1.7	1.8	1.8	1.8	1.8	1.6	1.6	1.5	1.6	1.6	1.6	1.8	1.7	1.6	1.7	1.7	1.7	1.6	1.7
	Total Invalid results	0	No of Invalid results	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sum of exceedances	0	No of exceedances of ELV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daily average			Daily average ELV	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Monthly maximum	1.9	Daily average	1.6	1.5	1.7	1.7	1.8	1.7	1.8	1.8	1.7	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.8	1.8	1.7	1.8	1.6	1.7	1.9	1.9	1.7	1.8	1.9	1.8	1.8	1.7
	No of invalid days	0	Value Valid?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Sum of exceedances	0	Value Exceeds ELV?	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Signed..... Date... 23/01/2019

(Authorised to sign as a representative of the Operator)

Permit Reference Number : BM4082

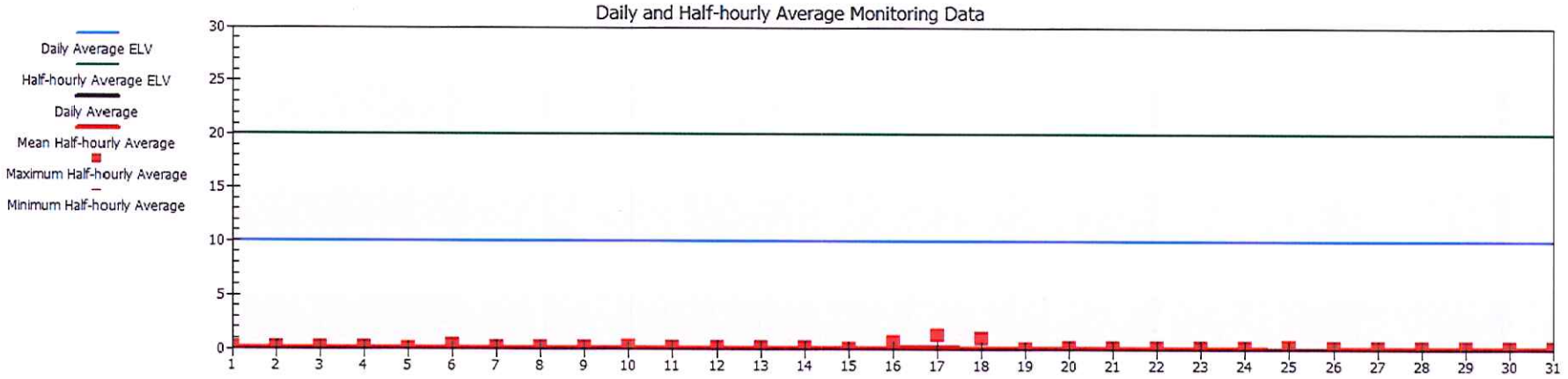
Operator : Veoila ES Sheffield Ltd

Installation: Bernard Road, Sheffield

Form Number: BM4082/PP3332SL/A5

Date of Form: 02/01/2007

Reporting of Continuously Monitored Emissions to Air for TOC mg/Nm3 at Emission Point A1 For the month of December 2018



	Monthly summary		Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Half-hourly average			Half-hourly average ELV	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
	Monthly maximum	1.3	Maximum Half-hourly average	0.1	0.1	0.2	0.1	0.1	0.4	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.7	1.3	1.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1
	Monthly mean	0.1	Mean Half-hourly average	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1
	Monthly minimum	0.0	Minimum Half-hourly average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Invalid results	0	No of Invalid results	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sum of exceedances	0	No of exceedances of ELV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daily average			Daily average ELV	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Monthly maximum	0.3	Daily average	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1
	No of invalid days	0	Value Valid?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Sum of exceedances	0	Value Exceeds ELV?	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Signed.....

(Authorised to sign as a representative of ~~the Operator~~)

Date..... 23/01/2019

Permit Reference Number : BM4082/QP3936US
Operator : Veolia ES Sheffield Ltd
Installation: Sheffield Energy Recovery Facility
Form Number: BM4082/QP3036US / Ash1 / Form Dated 1st November 2007

6 monthly reporting of Quarterly Ash Composition for the period from July to December 2018

Bottom Ash	Loss on Ignition (LOI) = Jul-Sept 2.04 % Oct-Dec 2.54 %

Ash Composition (Metals, Dioxins, etc.)	Cd mg/kg	TI 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
Botttom Ash Qtr 3	12.7	0.09	0.43	675	113	1918	800	97.5	7.10	43.6	25.2	1916	3.15	3.20	6.57	3.21
APC Residues Qtr 3	348	1.30	7.80	1630	83.2	667	401	39.2	46.0	14.3	17.5	12220	131	124	301	141
Bottom Ash Qtr 4	8.52	0.08	0.42	370	107	1816	814	105.3	7.37	34.3	37.6	1555	1.72	1.68	3.33	1.70
APC Residues Qtr 4	278	1.20	7.00	1598	106	692	525	92.4	64.4	17.0	31.3	12850	72.5	69.3	169	76.8

Reporting of Ash Solubility for the period from: **Not Required** **to**

Ash solubility (Metals)	Cd mg/l	TI mg/l	Hg mg/l	Pb mg/l	Cr mg/l	Cu mg/l	Mn mg/l	Ni mg/l	As mg/l	Co mg/l	V mg/l	Zn mg/l
Bottom Ash Qtr ...												
APC Residues Qtr ...												
Bottom Ash Qtr ...												
APC Residues Qtr ...												

Signed ..... Date... 23/01/2018 .....
(authorised to sign as representative of Operator)

Permit Number: EPR/BM4082IY

Operator: Veolia ES Sheffield Limited

Facility: Sheffield Energy Recovery Plant

Form Number: BM4082IY / S2 / 02/03/12

Reporting of emissions to sewer for the period from 01/07/2018 to 31/12/2018

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result [1]	Test Method [2]	Sample Date and Times [3]	Uncertainty [4]
S1	pH	6 minimum 10.5 maximum	Continuous	8.63	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	30	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**16 m³**	ISO 17052	10.07.2018	
S1	pH	6 minimum 10.5 maximum	Continuous	7.7	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	23.18	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**10 m³**	ISO 17052	11.07.2018	
S1	pH	6 minimum 10.5 maximum	Continuous	7.9	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	38.6	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**65 m³**	ISO 17052	19.07.2018	

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result [1]	Test Method [2]	Sample Date and Times [3]	Uncertainty [4]
S1	pH	6 minimum 10.5 maximum	Continuous	7.2	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	25.6	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**30 m³**	ISO 17052	20.07.2018	
S1	pH	6 minimum 10.5 maximum	Continuous	6.83	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	23.18	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**10 m³**	ISO 17052	21.07.2018	
S1	pH	6 minimum 10.5 maximum	Continuous	8.39	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	24.87	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**8 m³**	ISO 17052	23.07.2018	
S1	pH	6 minimum 10.5 maximum	Continuous	6.7	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	26.6	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**90 m³**	ISO 17052	01.08.2018	

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result [1]	Test Method [2]	Sample Date and Times [3]	Uncertainty [4]
S1	pH	6 minimum 10.5 maximum	Continuous	6.93	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	22.7	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**75 m³**	ISO 17052	02.08.2017	
S1	pH	6 minimum 10.5 maximum	Continuous	6.87	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	31.3	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**22 m³**	ISO 17052	03.08.2018	
S1	pH	6 minimum 10.5 maximum	Continuous	7.2	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	27.8	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**18 m³**	ISO 17052	04.08.2017	
S1	pH	6 minimum 10.5 maximum	Continuous	7.28	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	27.1	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**3 m³**	ISO 17052	06.08.2018	

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result [1]	Test Method [2]	Sample Date and Times [3]	Uncertainty [4]
S1	pH	6 minimum 10.5 maximum	Continuous	8.5	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	30.88	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**8 m³**	ISO 17052	10.08.2018	
S1	pH	6 minimum 10.5 maximum	Continuous	8.65	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	37.7	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**20 m³**	ISO 17052	13.08.2018	
S1	pH	6 minimum 10.5 maximum	Continuous	8.47	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	38.36	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**5 m³**	ISO 17052	14.08.2018	
S1	pH	6 minimum 10.5 maximum	Continuous	7.65	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	20.48	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**1 m³**	ISO 17052	18.08.2018	

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result [1]	Test Method [2]	Sample Date and Times [3]	Uncertainty [4]
S1	pH	6 minimum 10.5 maximum	Continuous	8.35	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	29.31	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**25 m³**	ISO 17052	22.08.2018	
S1	pH	6 minimum 10.5 maximum	Continuous	8.52	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	29.25	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**25 m³**	ISO 17052	23.08.2018	
S1	pH	6 minimum 10.5 maximum	Continuous	7.45	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	15.95	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**20 m³**	ISO 17052	24.08.2018	
S1	pH	6 minimum 10.5 maximum	Continuous	8.12	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	24.86	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**18 m³**	ISO 17052	25.08.2018	

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result [1]	Test Method [2]	Sample Date and Times [3]	Uncertainty [4]
S1	pH	6 minimum 10.5 maximum	Continuous	7.89	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	24.28	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**17 m³**	ISO 17052	26.08.2018	
S1	pH	6 minimum 10.5 maximum	Continuous	7.99	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	25.18	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**5 m³**	ISO 17052	27.08.2018	
S1	pH	6 minimum 10.5 maximum	Continuous	7.48	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	20.35	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**8 m³**	ISO 17052	28.08.2018	
S1	pH	6 minimum 10.5 maximum	Continuous	8.21	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	21.6	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**11m³**	ISO 17052	03.10.2018	

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result [1]	Test Method [2]	Sample Date and Times [3]	Uncertainty [4]
S1	pH	6 minimum 10.5 maximum	Continuous	8.7	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	28.26	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**38m³**	ISO 17052	05.10.2018	
S1	pH	6 minimum 10.5 maximum	Continuous	7.2	BS 6068-2.50		
S1	Temperature	43.3 (°C)	Continuous	9.0	ISO 17052		
S1	Flow	0.007m³/s	Continuous	**9m³**	ISO 17052	02.11.2018	

The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.
Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Environment Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, for example gas chromatography.
For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by the result is given.
The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed .....

Date 23/01/2018
(Authorised to sign as representative of Veolia ES Sheffield Limited)

Operator comments:

Permit Reference Number : BM4082/PP3332SL
Installation: Sheffield Energy Recovery Facility
November 2007

Operator : Veolia ES Sheffield Ltd
Form Number: BM4082/QP39367US / A1 / Form Dated 1st

Bi-annual Reporting of Emissions to Air for the period July 2018 to December 2018

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
A1	Particulate Matter	30 mg/m^3 over minimum 1 hour period	3.73	EN 13284-1:2002 & MID	23/8/2018.	UKAS No 2499	9
A1	VOC as Total Organic Carbon (TOC)	20 mg/m^3 over minimum 1 hour period	0.36	EN 12619:2013	23/8/2018	UKAS No 2499	3
A1	Hydrogen chloride	60 mg/m^3 over minimum 1 hour period	12.54	BSEN 1911:2010	23/8/2018	UKAS No 2499	14
A1	Hydrogen fluoride	2 mg/m^3 over minimum 1 hour period	0.05	BSISO 15713:2006 & MID	21/8/2018	UKAS No 2499	15
A1	Carbon monoxide	100 mg/m^3 (average of ½-hour averages) over minimum 4 hour period	4.14	EA TGN M22	23/8/2018	UKAS No 2499	4
A1	Sulphur dioxide	200 mg/m^3 (average of ½-hour averages) over minimum 4 hour period	14.19	EA TGN M22	23/8/2018	UKAS No 2499	3
A1	Oxides of nitrogen (NO and NO_2 expressed as NO_2)	400 mg/m^3 (average of ½-hour averages) over minimum 4 hour period	210.71	EA TGN M22	23/8/2018	UKAS No 2499	4
A1	Ammonia (NH_3)	No limit applies – report 95%ile of half hour averages over reporting period	Jul 0.32 Aug 0.05 Sep -0.64 Oct -0.73 Nov - 0.01 Dec –0.76	CEMs data			
A1	Ammonia (NH_3)	No limit applies – report max daily average over reporting period	0.07	CEMs data			
A1	Nitrous oxide (N_2O)	No limit applies – report periodic result for reporting period	6.40	EA TGN M22	23/8/2018	UKAS No 2499	9
A1	Cadmium & thallium and their compounds (total)	0.05 mg/m^3 over minimum 30 minute, maximum 8 hour period	0.0012	BSEN 14385:2004 & MID	24/8/2018	UKAS No 2499	9
A1	Mercury and its compounds	0.05 mg/m^3 over minimum 30 minute, maximum 8 hour period	0.00094	BSEN 14385:2004 & MID	24/8/2018	UKAS No 2499	14

Emission Point	Substance / Parameter	Emission Limit Value	Result [1]	Test Method [2]	Sample Date and Times [3]	Accreditation/ Certification [4]	Uncertainty [5]
A1	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m³ over minimum 30 minute, maximum 8 hour period	0.024	BSEN 14385:2004 & MID	24/8/2018	UKAS No 2499	5
A1	Dioxins / furans (I-TEQ)[6]	0.1 ng/m³ over minimum 6 hour, maximum 8 hour period	0.0049	BSEN 1948-1:2006 & MID	21/8/2018	UKAS No 2499	19
			0.0045				
A1	Dioxin-like PCBs (WHO-TEQ Humans / Mammals)[6]	No limit applies- ng/m³	0.00078	BSEN 1948-4:2010	21/8/2018	UKAS No 2499	20
			0.000032				
A1	Dioxin-like PCBs (WHO-TEQ Fish)[6]	No limit applies- ng/m³	0.000046	BSEN 1948-4:2010	21/8/2018	UKAS No 2499	17
			0.0000064				
A1	Dioxin-like PCBs (WHO-TEQ Birds)[6]	No limit applies- ng/m³	0.0042	BSEN 1948-4:2010	21/8/2018	UKAS No 2499	15
			0.0027				
A1	Dioxins / furans (WHO-TEQ Humans / Mammals) [6]	No limit applies- ng/m³	0.0051	BSEN 1948-1:2006 & MID	21/8/2018	UKAS No 2499	19
			0.0047				
A1	Dioxins / furans (WHO-TEQ Fish) [6]	No limit applies- ng/m³	0.0048	BSEN 1948-1:2006 & MID	21/8/2018	UKAS No 2499	21
			0.0044				
A1	Dioxins / furans (WHO-TEQ Birds) [6]	No limit applies- ng/m³	0.0079	BSEN 1948-1:2006 & MID		UKAS No 2499	25
			0.0075				
A1	Poly-cyclic aromatic hydrocarbons (PAHs) Total	No limit applies- ug/m³	0.58	ISO 11338:2003	22/8/2018	UKAS No 2499	
A1	Anthanthrene	No limit applies- ug/m³	0.015*	ISO 11338:2003	22/8/2018	UKAS No 2499	
A1	Benzo{a}anthracene	No limit applies- ug/m³	0.015	ISO 11338:2003	22/8/2018	UKAS No 2499	
A1	Benzo[b]fluoranthene	No limit applies- ug/m³	0.015*	ISO 11338:2003	22/8/2018	UKAS No 2499	
A1	Benzo[k]fluoranthene	No limit applies- ug/m³	0.015*	ISO 11338:2003	22/8/2018	UKAS No 2499	
A1	Benzo[b]naph(2,1-d}thiophene	No limit applies- ug/m³	0.015*	ISO 11338:2003	22/8/2018	UKAS No 2499	
A1	Benzo[c]phenanthrene	No limit applies- ug/m³	0.015*	ISO 11338:2003	22/8/2018	UKAS No 2499	
A1	Benzo[ghi]perylene	No limit applies- ug/m³	0.015*	ISO 11338:2003	22/8/2018	UKAS No 2499	
A1	Benzo[a]pyrene	No limit applies- ug/m³	0.015*	ISO 11338:2003	22/8/2018	UKAS No 2499	
A1	Cholanthrene	No limit applies- ug/m³	0.015*	ISO 11338:2003	22/8/2018	UKAS No 2499	
A1	Chrysene	No limit applies- ug/m³	0.015*	ISO 11338:2003	22/8/2018	UKAS No 2499	
A1	Cyclopenta(c,d)pyrene	No limit applies- ug/m³	0.015*	ISO 11338:2003	22/8/2018	UKAS No 2499	
A1	Dibenzo[ah]anthracene	No limit applies- ug/m³	0.015*	ISO 11338:2003	22/8/2018	UKAS No 2499	
A1	Dibenzo[a,i]pyrene	No limit applies- ug/m³	0.015*	ISO 11338:2003	22/8/2018	UKAS No 2499	
A1	Fluoranthene	No limit applies- ug/m³	0.030	ISO 11338:2003	22/8/2018	UKAS No 2499	
A1	Indo[1,2,3-cd]pyrene	No limit applies- ug/m³	0.015*	ISO 11338:2003	22/8/2018	UKAS No 2499	
A1	Naphthalene	No limit applies- ug/m³	0.34	ISO 11338:2003	22/8/2018	UKAS No 2499	

A5(A) Boiler 1	Oxides of nitrogen (NO and NO_2 expressed as NO_2) Reported Annually	80 mg/m^3 max 1 hourly average over minimum 4 hour sampling period	64.26	ISO 17025:2005	20/11/2018	UKAS No 2499	
A5(B) Boiler 2			72.09		20/11/2018		
A5(C) Boiler 5			75.60		20/11/2018		
A6(A) Boiler 3			60.78		19/11/2018		
A6(B) Boiler 4			59.32		19/11/2018		

Note: :* are non-detects (below limit of detection)

Notes

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.

[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, e.g. gas chromatography.

[3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by the result is given.

[4] The accreditation status of the equipment and/or the monitoring organisation, as appropriate, for the methods used for both sampling and analysis.

[5] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

[6] The result 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.

Signed: ..... Date: 23/01/2019

(authorised to sign as representative of Operator)

Permit Reference Number : BM4082/QP3936US Operator : Veoila ES Sheffield Ltd Installation: Sheffield Energy Recovery Facility Form Number: BM4082/QP3936US / R1 / Form Dated 1st November 2007

Reporting of Waste Disposal and Recovery for the year 2018

Waste Description	EWC Code	Disposal Tonnes	Recovery Tonnes
Incinerator bottom ash (IBA)	190112		41467.38
Air pollution control residues (APC)	190107	4665.38	
Ferrous metal	190102		5240.62
TOTAL WASTE		4665.38	46708.00

Trends in Waste Disposal and Recovery				
Year		Parameter		
		IBA	APC	Ferrous
2007	Recovery			6,232
	Disposal	45160.00	5,013	
2008	Recovery			6,059
	Disposal	40600.00	3,624	
2009	Recovery			7337.65
	Disposal	47628.31	5084.14	
2010	Recovery	42589.78		6772.84
	Disposal		4366.34	
2011	Recovery	41099.10		6390.78
	Disposal		4732.41	
2012	Recovery	42761.72		6096.72
	Disposal		4946.42	
2013	Recovery	40618.68		5984.16
	Disposal		4650.1	
2014	Recovery	38496.70		6072.7
	Disposal		4632.10	
2015	Recovery	44481.48		6017.43
	Disposal		4904.62	
2016	Recovery	43854.24		6017.68
	Disposal		5034.48	
2017	Recovery	41362.70		6065.89
	Disposal		4818.31	

Operator's comments :

Signed ..... Date 23/01/2019

(authorised to sign as representative of Operator)

Permit Reference Number: BM4082/QP3936US
Operator: Veolia ES Sheffield Ltd
Installation: Sheffield Energy Recovery Facility
Form Number: BM4082/QP3036US / PI1b / Form Dated 1st November 2007

Reporting Environmental Performance Indicators for the year 2018

Month	Mass of pollutant released per tonne of waste burnt in EfW Plant (g/tonne)				
	CO	NOx(as NO2)	SO2	Particulates	HCL
January	17.00	915.00	130.00	9.00	30.00
February	20.00	1068.00	169.00	10.00	37.00
March	18.00	906.00	145.00	9.00	25.00
April	14.00	862.00	111.00	8.00	30.00
May	14.00	867.00	103.00	10.00	35.00
June	17.00	759.00	64.00	12.00	30.00
July	2.00	81.00	6.00	1.00	4.00
August	21.00	849.00	72.00	8.00	36.00
September	15.00	822.00	68.00	7.00	34.00
October	15.00	841.00	68.00	21.00	30.00
November	14.00	832.00	77.00	32.00	25.00
December	14.00	892.00	82.00	10.00	29.00

Operator's comments :

Signed .....
(authorised to sign as representative of Operator)

Date 23/01/2019

Permit Reference Number : BM4082/QP3936US

Operator : Veolia ES Sheffield Ltd

Installation: Sheffield Energy Recovery Facility

Form Number: BM4082/QP3936US / E1 / Form Dated 1st November 2007

Reporting of Energy Usage by the Installation for the year 2018

Energy Source	Energy Usage Generated for use within the Installation	Primary Energy imported*	CO_2 Produced from energy used (tonnes)
Electricity	15926.1 MWh	318.20MWh	
Natural Gas	0	159.76MWh	
Fuel Oil (litres)	0	0	
TOTAL	15926.1 MWh	467.96 MWh	

Trends in Energy Usage and CO2 emissions		
Year	Parameter	
	Energy usage by Installation	CO_2 produced from energy used by the Installation
2007	23041 MWh	
2008	22128 MWh	
2009	17526 Mwh	
2010	16735 MWh	
2011	17219 MWh	
2012	16972 MWh	
2013	17514 MWh	
2014	17266 MWh	
2015	17747 MWh	
2016	17029 MWh	
2017	16959 MWh	
2018	16394 MWh	

* If applicable for Installation, conversion factor for delivered electricity to primary energy = 2.6

Operator's comments :

Signed .....

(authorised to sign as representative of Operator)

Date 23/01/2019

Permit Reference Number: BM4082/QP3936US
Installation: Sheffield Energy Recovery Facility

Operator: Veolia ES Sheffield Ltd
Form Number: BM4082/QP3036US / PI1a / Form Dated 1st November 2007

Reporting of Installation Performance Indicators for the year 2018

Annual Production/Treatment		
Total Municipal Waste incinerated excluding Trade/Commercial/Industrial Waste	188495.00	tonnes
Total Trade/Commercial/Industrial Waste incinerated	46571.00	tonnes
Electrical energy exported to Grid	109316.90	MWh
Thermal energy produced by EfW Plant for use via the DHS	112124.02	MWh
EfW Plant availability over year (including maintenance)	95.19	% of year
Average annual lower calorific value of the waste incinerated during the year	8,944	Kj/kg

Performance Indicators

Performance parameter	Total for year	Units	Quarterly trends in performance parameters per tonne of waste incinerated			
			1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Electrical energy generated within Installation	125389.20	MWh(e)	0.476	0.543	0.573	0.540
Thermal energy exported to the DHS	112124.02	MWh(th)	0.766	0.319	0.222	0.546
Fuel Oil consumption	0	litres	-	-	-	-
Natural gas consumption for EFW Plant	159.76	MWh	0.001	0.001	0.001	0.001
Mass of Bottom Ash produced	41467.38	tonnes	163.59	188.53	179.98	173.64
Mass of APC residues produced	4665.38	tonnes	20.35	18.57	21.45	19.41
Urea consumption	267.18	tonnes	1.28	1.05	1.06	1.15
Activated carbon consumption	31.96	tonnes	0.11	0.13	0.13	0.17
Lime consumption	1658.12	tonnes	7.51	7.13	7.12	6.49
Potable Water consumption for the EfW Plant	151558.90	m3	0.78	0.65	0.66	0.50

Operator's comments :

Signed .....
(authorised to sign as representative of Operator)

Date... 23/01/2019

Annual Performance Report 2018

Sheffield Energy Recovery Facility

Permit No. BM4082IY

1. Introduction.

This report fulfils the requirements of the Industrial Emissions Directive regarding the:

Veolia ES Sheffield Limited
Sheffield Energy Recovery Facility
Bernard Road,
Sheffield
S4 7YX

Further copies of this report are available the address above.

The Sheffield Energy Recovery Facility (ERF) is operated by Veolia ES Sheffield Ltd under an Environmental Permit issued and regulated by the Environment Agency.

In August 2001, Veolia Environmental Services (formally Onyx) were awarded a 35 year integrated waste management contract by Sheffield City Council. As part of this contract, Veolia Environmental Services were required to replace the old Energy Recovery Facility constructed in the 1970s with a new modern Energy Recovery Facility. The new facility had to continue electricity & heat generation, improve performance and meet the stricter European Environmental Regulations that came into force in December 2005. Construction for the new facility began in August 2003. In December 2005 the old Energy Recovery Facility was decommissioned and the new facility commenced hot commissioning. Commissioning was completed in April 2006.

The Facility recovers heat from the incineration of the waste, producing steam which is used to generate up to 19MW of electricity to the National Grid and up to $60MW_{(t)}$ to the Community District Energy network.

2. Plant Description

The main purpose of the Facility is to incinerate Municipal Solid Waste (MSW), recovering energy in the form of steam for export to the Community District Energy network and electricity for export to the National Grid. The permitted Facility covers the site and the entire facility including incineration, waste reception and storage, waste-fuel and air supply systems, boilers, facilities for the treatment of exhaust gases, on-site facilities for handling and storage of residues and operations, recording and monitoring conditions.

Waste Reception & Storage:
Waste is delivered into the tipping hall in covered vehicles. The tipping hall is maintained under negative pressure to minimise the escape of odours, dust or litter. The vehicles tip into a waste storage bunker from where the grab cranes transfers waste as required to the feed hopper of the combustion plant.

Combustion Process:
Waste is gravity fed onto the incinerator grate. The grate is continually moving thus promoting continuous mixing of the waste with the combustion air, extracted from the tipping hall and introduced from beneath the grate into the heart of the fire eliminating any odours. Further air is injected just above the fire to promote mixing and complete combustion of the gases.
Fuel gas burners are installed for start-up and to maintain the furnace temperature, if required. However, during normal operation no support fuel is required to maintain the minimum 850°C.

Ash from the grate is discharged into a water filled quench pit from where it is moved by conveyor to the enclosed ash storage bunkers prior to being transported off site. All incinerator bottom ash is sent to a local Recycling Facility.

Ferrous metals are removed from the ash by a magnet and stored separately and sent to a local Recycling Facility.

Energy Recovery:
Hot gases from the combustion of waste pass through a steam boiler. The temperature of the gases is reduced from over 850°C to around 140°C. The gases heat up the water in the boiler and produce steam at 45barG. This steam is fed to a steam turbine driven generator capable of generating up to $21MW_{(e)}$, this supplies electricity to the National Grid after first satisfying the site parasitic load. Steam is also fed into the District Energy System using heat exchangers; this can be up to $60MW_{(t)}$ of energy.

Gas Cleaning:
Urea solution is injected into the combustion gas path to reduce the formation of oxides of nitrogen. Downstream of the boiler hydrated lime is injected to neutralise acid gases. Powdered activated carbon is injected to adsorb dioxins, furans and dioxin like PCBs and heavy metals.
Prior to release into the air the gases pass through a fabric filter which removes the particulate matter, spent lime and carbon from the gas stream. Once the gases have been cleaned they are discharged into the atmosphere via two flues in the 76 metre high stack.

Water Usage:
The plant uses mains water for steam generation. After electricity generation in the turbine the steam is cooled and condensed back to water for reuse in the boiler.

The facility also uses mains water in various ways for internal wash downs, tipping bay floor cleaning, but mostly for human domestic use, cooking, showering and sanitation. Any water that is used within the Facility for washing and cleaning is captured in dedicated drains and directed into an interceptor pit where heavy sediments are removed from the water.

The cleaned water is then re-used within the Facility principally for ash quenching, thus limiting the amount of fresh water used and minimising water discharge from the site. External uncontaminated rainwater runoff is allowed to enter the sewer network unchecked along with normal domestic waste water.

3. Summary of plant operations.

This facility consists of one incineration line capable of processing approximately 28 tonnes of refuse per hour, allowing for a nominal refuse throughput of 245,000 tonnes per year assuming 95.19 % availability. This is dependent on two factors: actual operating hours and calorific value of the waste being burnt. The average calorific value of general municipal waste is 9200Kj/Kg.

During 2018 the facility processed 234328.21 tonnes of waste, of this 80.19% was municipal waste, the remaining 19.81% came from commercial premises. Appendix A Lists the amount waste disposed of by European Waste Catalogue Number.

Plant Operational details for 2018 are included in the table below.

Operating Hours	8331	Hours
Waste Incinerated	234328.21	Tonnes
Electricity Produced	125389.20	MWh
Energy exported to Community District Energy network	112124.02	MWh
Metals Recovered	5240.62	Tonnes
Incinerator Bottom Ash	41467.38	Tonnes
APC residues	4665.38	Tonnes

The availability for 2018 was 95.19%.

Planned Outage Maintenance ran for 16 days.

The site generated 125389.20 MWh of electricity during 2018. After subtracting on site usage, 109316.90 MWh of electricity was exported to the National Grid. This is enough to provide approximately 25,000 homes in Sheffield with electricity for 1 year. This displaces up to 49,000 tonnes of coal a year that would have been needed to produce an equivalent amount of electricity in a conventional coal fired power station.

(BERR Electricity Consumption Statistics: Sheffield average domestic electricity consumption for 2006 was 3,851 kWh)

The District Energy Network now supplies low carbon energy to 143 buildings in Sheffield including 5 hotels, leisure facilities, 2 Universities and several Local Government Buildings. There were three additional buildings connected to the network during 2018, with one building disconnected and one building reconnected. There was 101,958 MWh of thermal energy was sold to the

users of the system; conventional oil fired boilers would use approximately 14.5 million litres of oil to generate an equivalent amount of thermal energy. All Ash residues (known as Incinerator Bottom Ash or IBA) are delivered to a local Recycling Facility.

Ferrous metal removed from the IBA is collected by a local steel manufacturer for recycling.

According to the Steel Can Recycling Information Bureau, every tonne of steel packaging recycled compared to producing steel from raw materials makes the following environmental savings:

1.5 tonnes of iron ore.
0.5 tonnes of coal.
86% reduced air pollution
40% reduced water use
76% reduced water pollution
62% to 74% reduced energy usage

If all the recycled steel from the Sheffield ERF was used to build The London Eye a new London Eye could be built every 14 weeks.

Fine particulate matter, known as Air Pollution Control (APC) residue, removed from the flue gases by the fabric filter is collected and sent to a specialised treatment works where it is used to treat spent acid wastes prior to disposal at a licensed land fill site.

4. Summary of Plant Emissions.

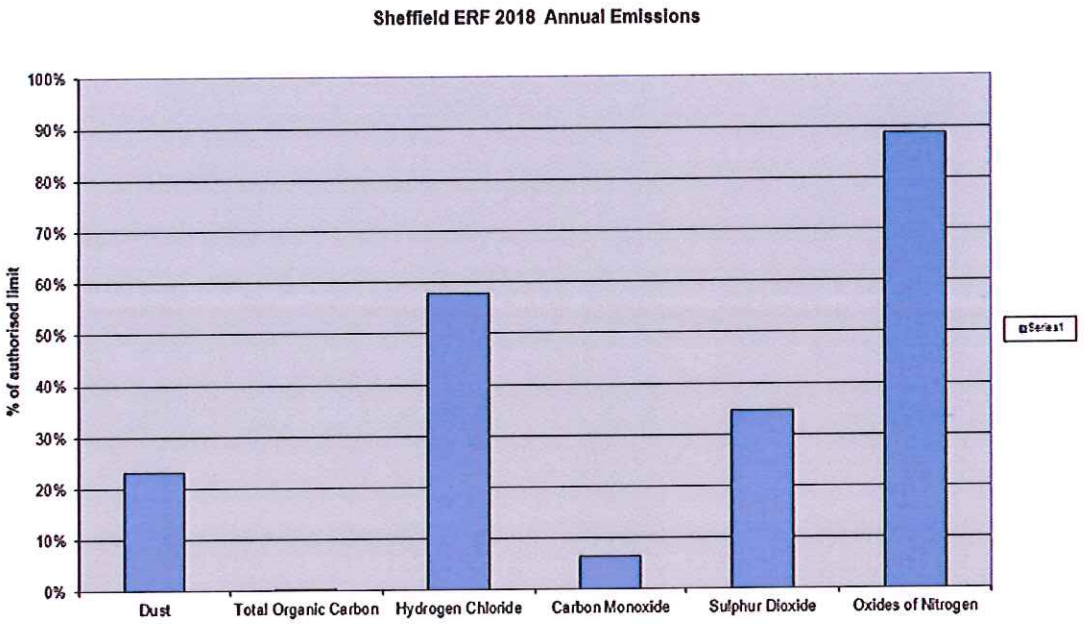
All emissions to air from the 76m high chimney are controlled to meet the emission limits included in the EPR Permit. The flue gases released into the atmosphere are continuously monitored for Particulate Matter, Hydrogen Chloride, Oxides of Nitrogen, Carbon Monoxide, Sulphur Dioxide, Total Volatile Organic Compounds and Ammonia. The monitoring equipment was in service during 2018 for whole of the plant operating time. This equipment is stringently monitored with routine calibration checks and is standardised to BS EN14181. Additionally, a full range of standby equipment is permanently in service should an unexpected failure occur.

Bi-annual check monitoring of these emissions is carried out by approved contractors using independent extractive reference methods. Emissions of metals, dioxins and other substances are also monitored as detailed overleaf.

Parameter	Limit mg/m³	Average emission result for 2018	
Continuous Emission Monitoring Results			
Particulate	10	2.318	mg/Nm³
Total organic carbon	10	0.029	mg/Nm³
Hydrogen Chloride	10	5.786	mg/Nm³
Ammonia	No limit	0.083	mg/Nm³
Carbon monoxide	50	3.237	mg/Nm³
Nitrogen oxides	180	159.739	mg/Nm³
Sulphur dioxide	50	17.299	mg/Nm³
Extractive Sampling Results			
Hydrogen Fluoride	2	0.105	mg/Nm³
Nitrous oxide	No limit	3.8	mg/Nm³
Cadmium & thallium	0.05	0.0012	mg/Nm³
Mercury	0.05	0.00107	mg/Nm³
other metals	0.5	0.0395	mg/Nm³
Dioxins/Furans (I-TEQ)	0.1ng/Nm³	0.0045	ng/Nm³
upper and lower levels		0.0040	ng/Nm³
Dioxin-like PCBs (WHO-TEQ Humans/mammals)	no limit	0.0007	ng/Nm³
upper and lower levels		0.0003	ng/Nm³
Dioxin-like PCBs (WHO-TEQ Fish)	no limit	0.0000	ng/Nm³
upper and lower levels		0.0000	ng/Nm³
Dioxin-like PCBs (WHO-TEQ Birds)	no limit	0.0042	ng/Nm³
upper and lower levels		0.0027	ng/Nm³
Dioxins/Furans (WHO-TEQ Humans/Mammals)	no limit	0.0047	ng/Nm³
upper and lower levels		0.0042	ng/Nm³
Dioxins/Furans (WHO-TEQ Fish)	no limit	0.0045	ng/Nm³
upper and lower levels		0.0040	ng/Nm³
Dioxins/Furans (WHO-TEQ Birds)	no limit	0.0082	ng/Nm³
upper and lower levels		0.0077	ng/Nm³
Poly-cyclic aromatic hydrocarbons (PAHs) Total	no limit	1.8450	ug/Nm³
Anthanthracene	no limit	0.0490	ug/Nm³
Benzo(a)anthracene	no limit	0.0145	ug/Nm³
Benzo(b)fluoranthene	no limit	0.0420	ug/Nm³
Benzo(k)fluoranthene	no limit	0.0420	ug/Nm³
Benzo(b)naph(2,1-d)thiophene	no limit	0.0145	ug/Nm³
Benzo(c)phenanthrene	no limit	0.0145	ug/Nm³
Benzo(ghi)perylene	no limit	0.3675	ug/Nm³
Benzo(a)pyrene	no limit	0.0145	ug/Nm³
Cholanthrene	no limit	0.0145	ug/Nm³
Chrysene	no limit	0.0145	ug/Nm³
Cyclopenta(c,d)pyrene	no limit	0.0145	ug/Nm³
Dibenzo(ah)anthracene	no limit	0.0145	ug/Nm³
Dibenzo(a,i)pyrene	no limit	0.1625	ug/Nm³
Fluoranthene	no limit	0.4850	ug/Nm³
Indo(1,2,3-cd)pyrene	no limit	0.0625	ug/Nm³
Naphthalene	no limit	0.5150	ug/Nm³

The following bar chart shows the average annual emissions from the Sheffield ERF.

5. Summary of Plant Compliance



Strict environmental controls and proven operating experience ensures that the Facility is compliant with all conditions of its Pollution Prevention Control (PPC) Permit at all times. This is achieved through constant monitoring of the incineration process during all of the stages, with detailed procedures in place to enable trained staff to carry out their work in an environmentally compliant manner. The plant operates within an Environmental Management System compliant with both ISO 9001; ISO 14001 and OHSAS 18001 and is independently and externally audited.

During 2018 the Sheffield ERF operated within the Permitted Emission Limit Values (ELV) for 99.96% of the operational time.

Table of plant compliances

Breach of Permit Conditions	4
Enforcement Actions	0
General Complaints	1

Summaries of half hourly and daily average emission data for continuously monitored emissions are supplied to the Environment Agency on a monthly basis. Other reports as required by the EPR Permit are also forwarded 6 monthly. All are available from the public register.

6. Summary of plant improvements.

The Facility was commissioned in 2006 to the latest technical and environmental standards, it is not expected that any major improvements will be required in the short term although significant effort is being expended in optimising the plant performance in order to maximise energy recovery and minimise use of raw materials.

7. Summary of information made available.

A general process description can be found on the company website at www.veolia.co.uk/sheffield/what-happens-your-waste. This site also contains details of average emissions for the full year. A community liaison group meeting is held annually.

As part of their regulatory responsibility the Environment Agency inspector visits the Facility on a regular basis. The Operating Permit is available from the Public Register at the Environment Agency's office:

The Environment Agency
Bowbridge Close
Bradmarsh Business Park,
Templeborough,
Rotherham
S60 1BY

Useful web addresses:

www.veolia.com
www.environment-agency.gov.uk

Registered Office: Veolia ES Sheffield Limited
210 Pentonville Road
London
N1 9JY

Compiled on behalf of the Operator by:

Guy Le-Geyt
General Manager

January 2019

Appendix A

List of waste disposed of during 2018 at The Sheffield Energy Recovery Facility

Description	European Waste Catalogue Number	Annual Tonnage
Waste from food preparation - animal tissue waste	020202	0
Waste from food preparation – materials unsuitable for consumption/processing	020203	0
Healthcare waste – wastes where collection and disposal is not subject to special requirements in order to prevent infection	180104	966.16
Waste from waste and water treatment – other wastes from mechanical treatment of wastes other than those mentioned in 191211	191212	37486.54
Waste packaging – adsorbents, filters and protective clothing not contaminated by dangerous substances.	150203	0
Waste packaging – paper and cardboard packaging	150101	
Waste packaging – mixed packaging	150106	0
Waste packaging – textile packaging[1]	150109	0
Municipal Wastes – paper and cardboard	200101	35.74
Municipal Wastes – biodegradable kitchen waste	200108	0
Municipal Wastes – clothes	200110	0
Municipal Wastes – textiles	200111	0
Municipal Wastes – wood	200138	0
Municipal Wastes – plastics	200139	0
Garden and Park waste – biodegradable waste	200201	22.10
Other municipal waste – mixed municipal waste	200301	196554.67
Other municipal waste – waste from markets	200302	0
Other municipal waste – street cleaning residues	200303	0

Annual Fugitive Emissions Review 2018

Sheffield Energy Recovery Facility

Permit No. BM4082IY

The Sheffield Energy Recovery Facility became fully operational in April 2006. The facility is designed, maintained and operated in such a way that during normal operation fugitive emissions do not occur.

During 2018 there were 0 fugitive emission incidents.

23/01/2018.

Guy Le-Geyt
General Manager

Annual Report of the Environmental Management System

Improvement Targets for the Sheffield Energy Recovery Facility

Permit No. BM4082IY

Year 2018

IMPROVEMENT TARGETS

1. Installation of Electric Charging Points for vehicles.

23/01/2019

Guy Le-Geyt
General Manager

Annual Ash Report 2018

Sheffield Energy Recovery Facility

Permit No. BM4082IY

The quantity of ash generated excluding ferrous metals for 2018 was 41467.38 tonnes. This equates to 17.64% of the mass of refuse received at the facility.

The incinerator bottom ash is transported by a contractor to the following site:

tonnes were reprocessed as aggregate:

Ballast Phoenix
Beeley Wood
Claywheels Lane
Sheffield
S6 1NF

23/01/2019.

Guy Le-Geyt
General Manager