Viridor Transforming waste™

The Environmental Permitting (England and Wales) Regulations 2010

Permit EPR/RP3638CG
Runcorn Energy from Waste Facility

Annual Performance Report 2014

Prepared by:
Viridor
EHS Manager
Runcorn EfW Facility
Picow Farm Road
Weston Point
Runcorn
Cheshire

Version: 1.0
Issue Date: 31/03/2015

Quality Assurance

This report has been prepared with all reasonable skill, care and diligence. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

Report Details	
Report Title:	Runcorn EfW Facility – Annual Performance Report
Report Date:	31st March 2015
Version:	1
Report Generated By	
Name:	Ross Watson
Position:	Technical Projects Officer
Report Approved By	
Name:	Craig Critchley
Position:	EHS Manager

1. Introduction

Runcorn Energy from Waste (EfW) facility is located to the north of the Runcorn site known as Weston Point. The EfW facility has a total capacity of approximately 350MW (thermal input) and is capable of generating up to approximately 86MW of electrical power and 110 tonnes per hour steam. The plant comprises of two parts: Phase 1 and Phase 2. Phase 1 consists of two lines 1 and 2 and has a capacity of 425,000 tonnes per year. Phase 2 consists of two further lines; 3 and 4 and doubles the capacity of the facility.

In accordance with the requirements of Condition 4.2.2 and Schedule 4 of Permit EPR/RP3638CG issued by the Environment Agency to Viridor Waste Management Limited (Viridor) on 29th March 2012, Viridor is required to produce an annual performance report which is to be submitted to the Environment Agency by the 31st March of each year as agreed in writing with the Environment Agency.

This report summarises the environmental and performance data collected at the site during 2014 and fulfils the requirement of Article 12(2) of the Waste Incineration Directive.

The report will cover the following areas of environmental and performance monitoring:

Section 2 – Point Source Emissions to Air
Section 3 – Point Source Emissions to Water
Section 4 – Residue Quality Monitoring Requirements
Section 5 – Performance Parameters
Section 6 – Periods of WID abnormal operation

2. Point Source Emissions to Air

2.1. Introduction

Permit Condition 3.5.1 (a) and Tables S3.1 and S3.1(a) require Viridor to undertake performance monitoring of the point source emissions to air arising at sample points A1 (Line 1), A2 (Line 2), A3 (Line 3), and A4 (Line 4).

The date of first waste burn for each line is as follows:

- Line 1 – 7th March 2014
- Line 2 – 18th March 2014
- Line 3 – 19th December 2014
- Line 4 – N/A

A summary of the point source emissions to air monitoring data at sample point A1 and A2 for the period is included as Table 1. Point source emissions to air monitoring data at sample point A3 is included as Table 2.

Line 4 is still under construction and did not burn waste in 2014.

2.2 Commentary on Data

The recorded concentrations generally remained compliant with the limits set out in Permit Tables S3.1 and S3.1 (a) during the review period which included commissioning activities.

Also included are the quarterly results of the stack spot sampling on Lines 1 and 2. Due to process interruptions spot sampling could not be achieved on Line 3 during this period. Line 4 is still under construction.

Note 1: The unusually high maximum daily averages of Total Organic Carbon (TOC) for Line 1 and Line 2 and carbon monoxide (CO) and oxides of nitrogen (NOx) for Line 2 are the result of being the only valid ½ hourly reading taken within that 24 hour period. This resulted in an apparent high daily average. The CEMS also took readings when the process was down. The Principal Contractor is currently looking to rectify this problem.

Note 2: The maximum daily and ½ hourly average readings for TOC on Line 1 and CO on Lines 1 and 2 were a result of a fault in logic on the Distributed Control System (DCS) as the reading was taken whilst the plant was shut down.

2.3 Schedule Notices Issued

21.03.2014 – Schedule Notification Part A for Air Pollution Control residues spillage
(Part B notification submitted on 11 April 2014)

Table 1: Emissions to Air from A1 and A2

Releases to Air from Incinerators							
Parameter	**Reference period**	**Monitoring frequency**	**Limit**	**A1**		**A2**	
				Max	**Avg**	**Max**	**Avg**
Particulates	½ hr average	Continuous	30 mg/m^3	5.3	0.18	1.11	0.09
	Daily average	Continuous	10 mg/m^3	1.52	0.14	0.93	0.09
TOCs (as C)	½ hr average	Continuous	20 mg/m^3	6.32	0.16	31.43	0.10
	Daily average	Continuous	10 mg/m^3	59.64	0.14	242.7	0.08
Hydrogen chloride	½ hr average	Continuous	60 mg/m^3	34.9	2.59	33.07	2.01
	Daily average	Continuous	10 mg/m^3	8.9	2.52	6.1	1.93
Hydrogen fluoride	1 hour period	Spot	2 mg/m^3	<0.1	<0.07	<0.1	<0.1
Carbon monoxide	½ hr average	Continuous	100 mg/m^3	1355	7.75	719	17
	Daily average	Continuous	50 mg/m^3	1355	9	719	16.5
Sulphur dioxide	½ hr average	Continuous	200 mg/m^3	99	5.55	80.3	4.72
	Daily average	Continuous	50 mg/m^3	28.55	3.69	23.22	4.74
Oxides of nitrogen	½ hr average	Continuous	400 mg/m^3	268.04	138.2	257.8	132.82
	½ hr average	Spot, Quarterly	400 mg/m^3		N/A	N/A	N/A
	Daily average	Continuous	200 mg/m^3	193.7	138.0	207.4	132.86
Cd + Tl	½ – 8 hour	Spot	0.05 mg/m^3	0.001	0.001	0.001	0.001
Hg	½ – 8 hour	Spot	0.05 mg/m^3	0.009	0.0047	0.005	0.005
Sb+As+Pb+ Cr+Co+Cu+ Mn+Ni+V	½ – 8 hour	Spot	0.5 mg/m^3	0.039	0.0345	0.044	0.044
Ammonia	Daily average (units: mg/m^3)	Continuous	--	7.29	0.45	16.6	0.35
Nitrous oxide (N_2O)	Daily average (units: mg/m^3)	Continuous	--	10.86	5.5	22.41	5.04
Dioxins and Furans (I-TEQ)	½ – 8 hour	Spot	0.1 ng/m^3	0.020	0.0145	0.042	0.042
Dioxin like PCB's (WHO –TEQ Humans/ Mammals)	½ – 8 hour	Spot	None Set	0.0021	0.00205	0.0032	0.0032
Dioxin like PCB's (WHO –TEQ Fish)	½ – 8 hour	Spot	None Set	0.0001	0.0001	0.0002	0.0002

Dioxin like PCB's (WHO –TEQ Birds	½ – 8 hour	Spot	None Set	0.0056	0.0048	0.0097	0.0097
Dioxin / Furans (WHO –TEQ Humans/ Mammals)	½ – 8 hour	Spot	None Set	0.022	0.02	0.046	0.046
Dioxin / Furans (WHO –TEQ Fish)	½ – 8 hour	Spot	None Set	0.021	0.0155	0.044	0.044
Dioxins / Furans (WHO –TEQ Birds	½ – 8 hour	Spot	None Set	0.033	0.0215	0.075	0.075
Specific PAH's	½ – 8 hour	Spot	None Set	0.29	0.145	<0.0002	<0.0002

Table 2: Emissions to Air from A3 and A4

Releases to Air from Incinerators							
Parameter	**Reference period**	**Monitoring frequency**	**Limit**	**A3**		**A4**	
				Max	**Avg**	**Max**	**Avg**
Particulates	½ hr average	Continuous	30 mg/m^3	0.05	0.05		
	Daily average	Continuous	10 mg/m^3	0.12	0.12		
TOCs (as C)	½ hr average	Continuous	20 mg/m^3	0	0		
	Daily average	Continuous	10 mg/m^3	0	0		
Hydrogen chloride	½ hr average	Continuous	60 mg/m^3	0	0		
	Daily average	Continuous	10 mg/m^3	0	0		
Hydrogen fluoride	1 hour period	Spot	2 mg/m^3	-	-		
Carbon monoxide	½ hr average	Continuous	100 mg/m^3	122	27		
	Daily average	Continuous	50 mg/m^3	29	27		
Sulphur dioxide	½ hr average	Continuous	200 mg/m^3	2	2		
	Daily average	Continuous	50 mg/m^3	1.9	1.9		
Oxides of nitrogen	½ hr average	Continuous	400 mg/m^3	172.1	172.1		
	½ hr average	Spot, Quarterly	400 mg/m^3	N/A	N/A	N/A	N/A
	Daily average	Continuous	200 mg/m^3	168.1	168.1		
Cd + Tl	½ – 8 hour	Spot	0.05 mg/m^3	-	-		
Hg	½ – 8 hour	Spot	0.05 mg/m^3	-	-		
Sb+As+Pb+ Cr+Co+Cu+ Mn+Ni+V	½ – 8 hour	Spot	0.5 mg/m^3	-	-		

Ammonia	Daily average (units: mg/m^3)	Continuous	--	0.28	0.28		
Nitrous oxide (N_2O)	Daily average (units: mg/m^3)	Continuous	--	10.58	10.58		
Dioxins and Furans (I-TEQ)	½ – 8 hour	Spot	0.1 ng/m^3	-	-		
Dioxin like PCB's (WHO –TEQ Humans/ Mammals)	½ – 8 hour	Spot	None Set	-	-		
Dioxin like PCB's (WHO –TEQ Fish)	½ – 8 hour	Spot	None Set	-	-		
Dioxin like PCB's (WHO –TEQ Birds	½ – 8 hour	Spot	None Set	-	-		
Dioxin / Furans (WHO –TEQ Humans/ Mammals)	½ – 8 hour	Spot	None Set	-	-		
Dioxin / Furans (WHO –TEQ Fish)	½ – 8 hour	Spot	None Set	-	-		
Dioxins / Furans (WHO –TEQ Birds	½ – 8 hour	Spot	None Set	-	-		
Specific PAH's	½ – 8 hour	Spot	None Set	-	-		

3. Point Source Emissions to Water

3.1. Introduction

Permit Condition 3.5.1 (a) and Table S3.2 requires Viridor to undertake minimum weekly spot performance monitoring of the point source emissions to water arising at sample point W1 at the Salt Union outfall.

A summary of the point source emissions to water monitoring data for the period is included in Table 2.

3.2 Commentary on Data

Recorded concentrations remained compliant during the review period with the following exceptions.

Note 1: High suspended solids analysis of 332 mg/l on 9 April 2014 at sample point W1. Schedule notification submitted. See 3.3 below.

Note 2: High temperature reading taken of 32.5^{o}C on 23 May 2014 at sample point W1. EA informed but no further action required as review of surface water monitoring arrangements to taken place to establish improved sampling regime.

3.3 Schedule Notices Issued

22 April 2014 – Schedule Notification Part A for High Suspended Solids at W1 (Part B submitted 11 June 2014)

Table 3: Emissions to Water from W1

Releases to Water via Outfall W1				
Parameter	**Monitoring frequency**	**Limit (L) Target (T)**	**Maximum**	**Average**
Suspended solids	Weekly, Spot (when flow present)	150 mg/l (L) 100 mg/l (T)	332	27.6
pH	Weekly, Spot (when flow present)	4 – 11 (L) 5 – 9 (T)	9.3	7.8
Temperature	Weekly, Spot (when flow present)	30 ^{o}C (L) 24 ^{o}C (T)	32.5	20.9
Available chlorine	Weekly, Spot (when flow present)	20 mg/l (L) 5 mg/l (T)	0.09	0.02
Oil and grease	Weekly, Spot (when flow present)	None visible	None visible	None visible

4. Residue Quality Monitoring Requirements

4.1. Introduction

Permit Condition 3.5.1 (d) and Table S3.5 require Viridor to undertake residue quality monitoring at minimum monthly intervals for both bottom ash and APC residues.

4.2 Commentary on Data

Incinerator Bottom Ash

Figures shown are an average of the analysis during the review period for Phase 1 which has followed the criteria laid out in the ESA protocol.

Air Pollution Control Residues

Figures shown are an average of the analyses for 2014.

Viridor note IBA and APCr was not sampled from Phase 2 during the period as minimal amount was produced as Line 3 was not in full operation.

Table 4: Residue Quality Monitoring

Residue quality									
Parameter	Limit	Normal Operation				Before use of a new disposal or recycling route			
		Bottom ash (Note [2])		APC Residues (Note [2])		Bottom ash		APC Residues	
		Incinerator		Incinerator		Incinerator		Incinerator	
		Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2
Loss on ignition (%)	<5	3.3				2.7			
Antimony	---	159		232		0.11		0.31	
Cadmium	---	20.5		174		<0.01		0.06	
Thallium	---	<1		5		<0.01		<0.01	
Mercury	---	<0.5		112		<0.01		<0.01	
Lead	---	949		1290		<0.2		1.9	
Chromium	---	321		689		2.5		<0.01	
Copper	---	1141		1940		0.15		2.2	
Manganese	---	233		169		1.9		0.15	
Nickel	---	117		65		0.02		0.07	
Arsenic	---	15.2		63		0.02		<0.01	
Cobalt	---	72		75		<0.01		<0.01	

Vanadium	---	96		147		<0.01		<0.01	
Zinc	---	1343		2854		0.24		4.2	
pH	---	11.1				11.42		12.2	
Chloride	---					12424		151150	
Fluoride	---					21		4.4	
Dioxins/ Furans ITEQ (ng/kg)	---	41.2		1013					
PCB-81 (ng/kg)	---	6.97		339					
PCB-77m (ng/kg)	---	18.5		795					
PCB-123 (ng/kg)	---	2.22		90					
PCB-118 (ng/kg)	---	39.2		298					
PCB-114 (ng/kg)	---	5.23		177					
PCB-105 (ng/kg)	---	20.03		321					
PCB-126 (ng/kg)	---	20.17		745					
PCB-167 (ng/kg)	---	6.83		130					
PCB-156 (ng/kg)	---	15.17		313					
PCB-157 (ng/kg)	---	10.4		265					
PCB-169 (ng/kg)	---	14.33		365					
PCB-189 (ng/kg)	---	23.17		309					
PCB (WHO-TEQ) Humans (ng/kg)	---	2.75		47.0					
PCB (WHO-TEQ) Birds (ng/kg)	---	3.66		67.2					
PCB (WHO-TEQ) Fish (ng/kg)	---	0.37		2.14					
Total soluble fraction (%)	---					15.2			
Metals only soluble fraction (%)	---					1.8			

5. Performance Parameters

5.1. Introduction

Condition 4.2.2 and Table S4.3 of the Permit require Viridor set out the reporting criteria for performance parameters.

5.2 Commentary on Data

The recorded performance data is set out in Table 4

5.3 Annual mass emissions of monitored pollutants

Condition 4.2.2(c) of the permit requires mass emissions of monitored pollutants to be reported on an annual basis. The recorded data is set out in Appendix 1 and is taken from the sites 2014 Pollution Inventory report. Viridor notes that the plant only started operating in 2014 and is still under commissioning therefore these values are not indicative of a full year's normal operations.

Table 4: Performance Parameters

Performance parameters		
Parameter	**Units**	**2014**
Refuse derived fuel incinerated (a)	tonnes	156,237
Digestate incinerated (b)	tonnes	132
Biomass incinerated (c)	tonnes	0
Commercial waste incinerated (d)	tonnes	0
Total waste incinerated (a+b+c+d)	tonnes	156,369
Total electrical energy generated	KWh	28,547,000
Total electricity exported	KWh	1,163,877
Electrical energy used on installation	KWh / tonne of waste incinerated KWh total used	99.98 15,632,340
Total steam exported	tonnes	0
Fuel gas consumption	Kg / tonne of waste incinerated Kg total used	19.96 3,121,536
Mass of Bottom Ash produced	Kg / tonne of waste incinerated Kg total used	127.71 19,500,596
Mass of APC residues produced	Kg / tonne of waste incinerated Kg total used	24.5 3,830,996
Mass of Other solid residues produced	Kg / tonne of waste incinerated	0
Ammonia consumption	Kg / tonne of waste incinerated Kg total used	1.56 244,540
Activated Carbon consumption	Kg / tonne of waste incinerated Kg total used	0.47 74220
Lime consumption	Kg / tonne of waste incinerated Kg total used	15.5 2,418,690
Dee Water consumption	Kg / tonne of waste incinerated Kg total used	715 111,859,000
High Grade Water consumption	Kg / tonne of waste incinerated Kg total used	24.8 3,878,000

6. Periods of WID abnormal operation

Table S4.3 of the Permit requires detail of periods of WID abnormal operation to be reported on a quarterly basis.

During the 2014 calendar year, the plant had zero periods of WID abnormal operation.

Appendices

Appendix 1 - Annual Mass Emissions