

Viridor

Transforming waste™

The Environmental Permitting (England
and Wales) Regulations 2010

Permit: EPR/LP3030XA
Cardiff Energy Recovery Facility

Environmental Monitoring Report
4th Quarter 2016: 1st October – 31st December 2016

Prepared by:
EHS Manager
Viridor Waste Management
Trident Park ERF
Glass Avenue
Cardiff
CF24 5EN

Version: 1.0
Issue Date: 19/01/2017



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:	Cardiff Energy Recovery Facility – 4 th Quarter 2016 Environmental Report
Report Date:	19/01/2017
Version:	1

Report Generated By

Name:	Fiona Bussell
Position:	EHS Manager

Report Approved By

Name:	Stewart Davies
Position:	Lead SHEQS Business Partner (ERF, Capital Projects and LFE)

1. Introduction

Cardiff Energy Recovery Facility is located immediately north of Cardiff Docks. The facility has an annual throughput of 350,000 tonnes per year of residual municipal and C&I waste and has the capability of exporting approximately 30MW of electrical power from the process.

In accordance with the requirements of Condition 4.2.3, Schedule 4 and table S4.1 of Permit EPR/LP3030XA issued by Natural Resources Wales to Viridor Waste Management Limited (Viridor) on 4th November 2010, Viridor is required to submit a summary of the environmental monitoring works undertaken at the site on a quarterly basis. Such reports will form the basis of the annual environmental review report, which is to be submitted to Natural Resources Wales by the 30th April as agreed in writing with Natural Resources Wales of each year in accordance with Condition 4.2.2 of the Permit.

Viridor took over the operation of the Plant on 31st January 2015; therefore 2016 is the second year of operations at the Facility.

This report summarises the environmental data collected at the site during the fourth quarter calendar period of 2016, between 1st October and 31st December.

The report will cover the following areas of environmental monitoring:

- Section 2 – Point Source Emissions to Air
- Section 3 – Point Source Emissions to Water
- Section 4 – Residue Quality Monitoring Requirements

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 and A2 on a continuous and periodic basis.

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

The measurement frequency for periodic point source emissions to air monitoring data at sample point A1 and A2 is on a bi-annual basis, after 12 months of operation.

2.2 Commentary on Data

The concentrations recorded under normal operation during the review period remained compliant with the limits set out in the Permit.

Line 1 was in operation for 84.2% of the quarter and Line 2 for 78.4%.

2.3 Schedule Notices Issued

No Permit limit exceedances were recorded during the review period for emissions to air.

Table 1: Emissions to Air from A1 and A2 (CEMS)

Releases to Air from Incinerators – Continuous Monitoring – Air 2								
Parameter	Limit	Reference Period	A1		A2		Test Method	Uncertainty**
			Max	Avg	Max	Avg		
Oxides of nitrogen	200 mg/m ³	Daily mean	186	170	194	184	BS EN 15267-3	
	400 mg/m ³	½ hourly mean	307		321			
Particulate Matter	10 mg/m ³	Daily mean	1	1	0	0		
	30 mg/m ³	½ hourly mean	12		1			
Total Organic Carbon (TOC)	10 mg/m ³	Daily mean	1	0	1	0		
	20 mg/m ³	½ hourly mean	8		3			
Hydrogen chloride	10 mg/m ³	Daily mean	9	8	9	8		
	60 mg/m ³	½ hourly mean	21		25			
Sulphur dioxide	50 mg/m ³	Daily mean	33	12	18	5		
	200 mg/m ³	½ hourly mean	89		53			
Carbon monoxide	50 mg/m ³	Daily mean	16	6	8	5		
	100 mg/m ³	½ hourly mean*						
Ammonia	No limit set	Daily mean	2	0	3	2		

*Note. ½ hourly monitoring for CO is no longer required in the latest version of the permit

**Note. CEMS data figures are adjusted for the method uncertainty

Table 2: Emissions to Air from A1 and A2 Periodic

Substance / Parameter	Emission Limit Value	Reference Period	A1 Result	Uncertainty	Sample Date / Time	A2 Result	Uncertainty	Sample Date / Time	Test Method
Nitrous oxide	None set mg/m ³	Periodic over 30 minutes. Maximum 8 hours	18.3	1.6	25/11/2016 00:00 – 01:00	17.3	1.7	24/11/2016 00:00 – 01:00	TGN M22
Hydrogen fluoride	2 mg/m ³		0.040	0.003	01/09/2016 11:50 – 12:50	<0.018	0.001	23/11/2016 09:11 – 10:11	ISO 15713
Cd and Th and their compounds	0.05 mg/m ³		0.00094	0.00017	02/09/2016 08:14 – 08:44; 08:50 – 09:20	0.00068	0.00012	30/08/2016 13:47 – 14:17; 14:20 – 14:50	EN 14385
Hg and its compounds	0.05 mg/m ³		0.0030	0.0004		0.00052	0.00008		MID 14385
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds	0.5 mg/m ³		0.063	0.011		0.42	0.07		EN 14385
Dioxins & Furans (I-TEQ)	0.1 ng/m ³	Mean over period minimum 6 hours, maximum 8 hours	0.0030	0.0007	01/09/2016 08:10 – 11:10; 11:15 – 14:15	0.024	0.005	23/11/2016 07:33 – 10:33; 10:37 – 13:37	EN 1948 1-3
PCBs (WHO-TEQ Humans / Mammals)	None set ng/m ³		0.00034	0.00008		0.00068	0.00015		EN 1948 1-3
PCBs (WHO-TEQ Fish)	None set ng/m ³		0.000016	0.000004		0.000038	0.000009		EN 1948 1-3
PCBs (WHO-TEQ Birds)	None set ng/m ³		0.0012	0.0003		0.0032	0.00072		EN 1948 1-3
Dioxins/Furans (WHO-TEQ Humans/Mammals)	None set ng/m ³		0.0021	0.0005		0.023	0.005		EN 1948 1-3
Dioxins/Furans (WHO-TEQ Fish)	None set ng/m ³		0.0022	0.0005		0.023	0.005		EN 1948 1-3
Dioxins/Furans (WHO-TEQ Birds)	None set ng/m ³		0.0035	0.0008		0.032	0.007		EN 1948 1-3

Anthanthrene	None set µg/m ³	Mean over period minimum 6 hours, maximum 8 hours	<0.013	0.003	31/08/2016 08:37 – 11:37; 11:38 – 14:38	<0.012	0.003	31/08/2016 08:03 – 11:03; 11:05 – 14:05	ISO 11338
Benzo(a)anthracene	None set µg/m ³		<0.013	0.003		<0.012	0.003		
Benzo(a)pyrene	None set µg/m ³		<0.013	0.003		<0.012	0.003		
Benzo(b)fluoranthene	None set µg/m ³		<0.013	0.003		<0.012	0.003		
Benzo(b)naphtho(2,1- d)thiophene	None set µg/m ³		<0.013	0.003		<0.012	0.003		
Benzo(c)phenanthrene	None set µg/m ³		<0.013	0.003		<0.012	0.003		
Benzo(ghi)perylene	None set µg/m ³		<0.013	0.003		<0.012	0.003		
Benzo(k)fluoranthene	None set µg/m ³		<0.013	0.003		<0.012	0.003		
Cholanthrene	None set µg/m ³		<0.013	0.003		<0.012	0.003		
Chrysene	None set µg/m ³		<0.013	0.003		<0.012	0.003		
Cyclopenta(cd)pyrene	None set µg/m ³		<0.013	0.003		<0.012	0.003		
Dibenzo(ai)pyrene	None set µg/m ³		<0.013	0.003		<0.012	0.003		
Dibenzo(ah)anthracene	None set µg/m ³		<0.013	0.003		<0.012	0.003		
Fluoranthene	None set µg/m ³		0.039	0.009		<0.012	0.003		
Indeno(123-cd)pyrene	None set µg/m ³		<0.013	0.003		<0.012	0.003		
Naphthalene	None set µg/m ³	3.2	0.74	2.1	0.48				

3. Point Source Emissions to Water

3.1. Introduction

Permit Condition 3.5.1(a) and Table S3.2 requires Viridor to ensure sample point W1 is free of oil, grease and visible solids.

3.2 Commentary on Data

During the quarter monitoring point W1 has remained free of oil and grease.

3.3 Schedule Notices Issued

No Permit limit exceedances were recorded during the review period for emissions to water.

4. Residue Quality Monitoring Requirements

4.1. Introduction

Permit Condition 3.5.1(c) and Table S3.5 require Viridor to undertake residue quality monitoring at quarterly intervals following the first year of operation. This applies for both bottom ash and air pollution control residues.

4.2 Commentary on Data

Incinerator Bottom Ash

Figures shown in Table 3 detail the quarterly analysis undertaken in line with the criteria laid out in the ESA protocol.

Air Pollution Control Residues

Figures shown in Table 3 detail the analysis undertaken during the quarter.

Table 3: Residue Quality

Residue quality					
Parameter	Limit	Normal Operation			
		Bottom ash		APC Residues	
		Line 1	Line 2	Line 1	Line 2
		Quarter 4	Quarter 4		
Total Organic Carbon	3%	1.4	1.0		
		Composite			
Quarter		Quarter 4		Quarter 4	Quarter 4
Antimony (mg/kg)	---	132		931	916
Cadmium (mg/kg)	---	10.7		279	281
Thallium (mg/kg)	---	<0.1		1.0	1.0
Mercury (mg/kg)	---	<0.5		6.91	6.15
Lead (mg/kg)	---	417		1855	1874
Chromium (mg/kg)	---	137		31.1	30.1
Copper (mg/kg)	---	1656.3		536	527
Manganese (mg/kg)	---	916		317	314
Nickel (mg/kg)	---	71.4		9.0	9.0
Arsenic (mg/kg)	---	15.1		51.9	52.4
Cobalt (mg/kg)	---	28.7		4.0	3.9
Vanadium (mg/kg)	---	45.7		<10	<10

Zinc (mg/kg)	---	2657.7	13420	13560
Dioxins / Furans (WHO 2005 TEQ) (ng/kg)	---	2.285	278.06	246.136
PCB (WHO 2005 TEQ) (ng/kg)	---	0.424	7.84	11.766