

**Viridor**

**Transforming waste™**

**The Environmental Permitting (England  
and Wales) Regulations 2010**

**Permit: EPR/LP3030XA  
Cardiff Energy Recovery Facility**

**Environmental Monitoring Report  
Q2 2019**

**1 April – 30 June 2019**

Prepared by:  
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## 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  
Environmental Report  
Q2 1 April – 30 June 2019

Report Date: 26 July 2019

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## **1. Introduction**

Cardiff Energy Recovery Facility is located immediately north of Cardiff Docks. The facility has an annual throughput of up to 425,000 tonnes per year of residual municipal and C&I waste and has the capability of exporting approximately 30 MW of electrical power from the process.

In accordance with the requirements of Permit EPR/LP3030XA issued by Natural Resources Wales to Viridor Waste Management Limited (Viridor) on 4 May 2018, Viridor is required to submit an Environmental Monitoring Report on a quarterly basis.

This report summarises the environmental data collected at the site during the Q2 of 2019 (1 April – 30 June 2019).

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 were obtained by running a quarterly continuous emissions report on CDAS software report.

Line 1 was in operation for 95.6% of the quarter and Line 2 was in operation 75.2% of the time.

### 2.3 Schedule Notices Issued

Part A notification reported on	30 April 2019
Date of event	Started 28 April 2019 at 18:09H
Details	Elevated CO (95 <sup>th</sup> ile 10 minute average over ANY 24 hour period) on Line 2. 8 exceedances occurred when allowed 7.2 exceedances.
Part C notification submitted on	7 May 2019
Date of event	4 May 2019
Event	Abnormal operation – lime dosing tripped for 38 Minutes
Part A notification reported on	15 May 2019
Date of event	13 May 2019
Details	Line 1 CO daily average Line 1 VOC ½ hourly average
Part A Notification reported on	16 May 2019
Date of event	Started on 25 April 2019 at 22:00H
Event	Elevated CO (95 <sup>th</sup> ile 10 minute average over ANY 24 hour period) on Line 2. 10 exceedances occurred when allowed 7.2 exceedances.

**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 <sup>3</sup>	Daily mean	225.9	185.2	193.5	170.0	BS EN 15267-3	
	400 mg/m <sup>3</sup>	½ hourly mean	383.2		342.0			
Particulate Matter	10 mg/m <sup>3</sup>	Daily mean	0.6	0.5	0.4	0.3		
	30 mg/m <sup>3</sup>	½ hourly mean	1.0		0.5			
Total Organic Carbon (TOC)	10 mg/m <sup>3</sup>	Daily mean	1.4	0.3	1.2	0.2		
	20 mg/m <sup>3</sup>	½ hourly mean	36.3		6.9			
Hydrogen chloride	10 mg/m <sup>3</sup>	Daily mean	10.4	8.6	11.6	8.1		
	60 mg/m <sup>3</sup>	½ hourly mean	33.9		57.9			
Sulphur dioxide	50 mg/m <sup>3</sup>	Daily mean	41.0	23.6	19.2	11.5		
	200 mg/m <sup>3</sup>	½ hourly mean	152.3		78.3			
Carbon monoxide	50 mg/m <sup>3</sup>	Daily mean	56.3	10.8	39.4	10.0		
	100 mg/m <sup>3</sup>	½ hourly mean*	1574.3		414.7			
Ammonia	No limit set	Daily mean	0.1	0.1	7.9	2.5		

\*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 <sup>3</sup>	Periodic over 30 minutes. Maximum 8 hours	1.04	2.28	09/04/2019 11:30 – 12:30H	6.0	2.28	10/04/2019 09:30 – 10:30H	EN 14792
Hydrogen fluoride	2 mg/m <sup>3</sup>		0.03	0.03	09/04/2019 08:55 – 09:55H	0.05	0.047	10/04/2019 10:32 – 11:32H	SRM - BS ISO 15713
Hg and its compounds	0.05 mg/m <sup>3</sup>		0.001	0.000		0.002	0.001		SRM - BS EN 13211 / MID 14385
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds	0.5 mg/m <sup>3</sup>		0.02	0.004		0.020	0.004		EN 14385
Dioxins & Furans (I-TEQ)	0.1 ng/m <sup>3</sup>	Mean over period minimum 6 hours, maximum 8 hours	0.0257	0.0249	08/04/2019 10:30 – 16:45H	0.0172	0.0221	11/04/2019 08:40 – 14:50H	SRM - BS EN 1948-1
PCBs (WHO-TEQ Humans / Mammals)	None set ng/m <sup>3</sup>		0.00129	0.00018		0.0011	0.0003		SRM - BS EN 1948-1
PCBs (WHO-TEQ Fish)	None set ng/m <sup>3</sup>		0.00013	0.00002		0.0001	0.0000		SRM - BS EN 1948-1
PCBs (WHO-TEQ Birds)	None set ng/m <sup>3</sup>		0.00506	0.00072		0.0035	0.0010		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Humans/Mammals)	None set ng/m <sup>3</sup>		0.0296	0.0288		0.0182	0.0233		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Fish)	None set ng/m <sup>3</sup>		0.0313	0.0304		0.0210	0.0270		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Birds)	None set ng/m <sup>3</sup>		0.0395	0.0384		0.0237	0.0304		EN 1948 1-3

Anthanthrene	None set µg/m <sup>3</sup>	Mean over period minimum 6 hours, maximum 8 hours	<0.0095	0.01904	08/04/2019 10:30 -16:45	<0.0103	0.02064	11/04/2019 08:40 -14:45H	SRM - BS ISO 11338 - 1
Benzo(a)anthracene	None set µg/m <sup>3</sup>		<0.0095	0.01904		<0.0103	0.02064		
Benzo(a)pyrene	None set µg/m <sup>3</sup>		<0.0095	0.01904		<0.0103	0.02064		
Benzo(b)fluoranthene	None set µg/m <sup>3</sup>		<0.0095	0.01904		<0.0103	0.02064		
Benzo(b)naphtho(2,1- d)thiophene	None set µg/m <sup>3</sup>		<0.0095	0.01904		<0.0103	0.02064		
Benzo(c)phenanthrene	None set µg/m <sup>3</sup>		<0.0095	0.01904		<0.0103	0.02064		
Benzo(ghi)perylene	None set µg/m <sup>3</sup>		<0.0095	0.01904		<0.0103	0.02064		
Benzo(k)fluoranthene	None set µg/m <sup>3</sup>		<0.0095	0.01904		<0.0103	0.02064		
Cholanthrene	None set µg/m <sup>3</sup>		<0.0095	0.01904		<0.0103	0.02064		
Chrysene	None set µg/m <sup>3</sup>		<0.0095	0.01904		<0.0103	0.02064		
Cyclopenta(cd)pyrene	None set µg/m <sup>3</sup>		<0.0095	0.01904		<0.0103	0.02064		
Dibenzo(ai)pyrene	None set µg/m <sup>3</sup>		<0.0095	0.01904		0.12	0.02496		
Dibenzo(ah)anthracene	None set µg/m <sup>3</sup>		<0.0095	0.01904		0.03	0.02034		
Fluoranthene	None set µg/m <sup>3</sup>		0.02	0.02014		0.02	0.02016		
Indeno(123-cd)pyrene	None set µg/m <sup>3</sup>		<0.0095	0.01904		0.03	0.02034		
Naphthalene	None set µg/m <sup>3</sup>	0.41	0.06321	0.27	0.03942				

### **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	Composite	Line 1	Line 2
		Received at lab 28 June 2019	Received at lab 14 May 2019		
Total Organic Carbon (report 25/3/2019)	3%	0.9	1.0		
		<b>Composite</b>			
<b>Quarter 2</b>		Received at lab 14 May 2019		Received at lab 18 June 2019	Received at lab 18 June 2019
Antimony (mg/kg)	---	222		876	860
Cadmium (mg/kg)	---	30.3		277	272
Thallium (mg/kg)	---	0.10		0.8	0.8
Mercury (mg/kg)	---	<0.5		7.04	7.13
Lead (mg/kg)	---	907.7		1512	13120
Chromium (mg/kg)	---	152		43.4	44.4
Copper (mg/kg)	---	1816.8		565	550
Manganese (mg/kg)	---	1204		406	391
Nickel (mg/kg)	---	70.3		14.1	15.3

Arsenic (mg/kg)	---	22.8	58.2	60.3
Cobalt (mg/kg)	---	36.7	4.7	4.5
Vanadium (mg/kg)	---	43.1	<10	<10
Zinc (mg/kg)	---	3846.0	17420	13120
Dioxins / Furans (WHO 2005 TEQ) (ng/kg)	---	Dioxins = 4.03215 Furans = 5.46615	Dioxins = 101.643 Furans = 176.735	Dioxins = 118.924 Furans = 188.379
PCB (WHO 2005 TEQ) (ng/kg)	---	1.26488	7.66637	9.3572