

Viridor

Transforming waste™

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

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

**Environmental Monitoring Report
Q2 2021**

1 April – 30 June 2021

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 2021

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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 2021 (1 April – 30 June 2021).

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 1,964 hours (89.9%) of the quarter and
Line 2 was in operation for 1,627 hours (74.5%) of the quarter.
(Percentages calculated when AMJ = 91 days = max 2,184 hours).

Please note the ERFs annual outage ran from 10 June to 12 July 2021 inclusive.

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) taken from A1- Cbiss reports.

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	180.66	171.06	188.78	181.99	BS EN 15267-3	
	400 mg/m ³	½ hourly mean	279.82		395.19			
Particulate Matter	10 mg/m ³	Daily mean	0.59	0.51	0.43	0.37		
	30 mg/m ³	½ hourly mean	0.89		1.12			
Total Organic Carbon (TOC)	10 mg/m ³	Daily mean	0.08	0.00	0.09	0.00		
	20 mg/m ³	½ hourly mean	4.44		5.59			
Hydrogen chloride	10 mg/m ³	Daily mean	9.49	8.53	9.33	8.24		
	60 mg/m ³	½ hourly mean	34.35		17.37			
Sulphur dioxide	50 mg/m ³	Daily mean	30.87	18.83	24.46	12.64		
	200 mg/m ³	½ hourly mean	82.22		94.16			
Carbon monoxide	50 mg/m ³	Daily mean	8.53	0.00	8.38	0.48		
	100 mg/m ³	½ hourly mean*						
Ammonia	No limit set	Daily mean	3.18	1.88	10.48	2.89		

* 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

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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	9.54	1.77	26 April 2021 11:30 – 12:30	21.3	0.76	26 April 2021 12:50 – 13:50	EN 14792
Hydrogen fluoride	2 mg/m ³		0.11	0.023	27 April 2021 13:50 – 15:50	0.02	0.012	28 April 2021 13:45 – 15:45	SRM - BS ISO 15713
Hg and its compounds	0.05 mg/m ³		0.0011	0.0004	27 April 2021	0.0029	0.0005	28 April 2021	SRM - BS EN 13211 / MID 14385
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds	0.5 mg/m ³		0.008	0.002	13:50 – 15:55	0.017	0.003	13:50 – 16:00	EN 14385
Dioxins & Furans (I-TEQ)	0.1 ng/m ³	Mean over period minimum 6 hours, maximum 8 hours	0.0376	0.0114	27 April 2021 07:25 – 13:35	0.0135	0.0041	28 April 2021 07:25 – 13:35	SRM - BS EN 1948-1
PCBs (WHO-TEQ Humans / Mammals)	None set ng/m ³		0.00202	0.00031		0.00103	0.00015		SRM - BS EN 1948-1
PCBs (WHO-TEQ Fish)	None set ng/m ³		0.00011	0.00002		0.00005	0.00005		SRM - BS EN 1948-1
PCBs (WHO-TEQ Birds)	None set ng/m ³		0.00534	0.00081		0.00222	0.00034		SRM - BS EN 1948-1

Dioxins/Furans (WHO-TEQ Humans/Mammals)	None set ng/m ³		0.0348	0.0105		0.0125	0.0038		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Fish)	None set ng/m ³		0.0389	0.0118		0.0142	0.0043		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Birds)	None set ng/m ³		0.0688	0.0208		0.0064	0.0064		EN 1948 1-3
Anthanthrene	None set µg/m ³	Mean over period minimum 6 hours, maximum 8 hours	< 0.001	202.3	27 April 2021 07:55 - 13:35	< 0.001	202.3	28 April 2021 07:25 - 13:25	SRM - BS ISO 11338 - 1
Benzo(a)anthracene	None set µg/m ³		< 0.001	202.3		0.05	30.4		
Benzo(a)pyrene	None set µg/m ³		< 0.001	202.3		0.00	92.0		
Benzo(b)fluoranthene	None set µg/m ³		< 0.001	202.3		0.01	49.8		
Benzo(b)naphtho(2,1-d)thiophene	None set µg/m ³		< 0.001	202.3		< 0.001	202.3		
Benzo(c)phenanthrene	None set µg/m ³		< 0.001	202.3		< 0.001	202.3		
Benzo(ghi)perylene	None set µg/m ³		0.00	361.3		0.01	48.6		
Benzo(k)fluoranthene	None set µg/m ³		< 0.001	202.3		0.000	138.5		
Cholanthrene	None set µg/m ³		< 0.001	202.3		< 0.001	202.3		
Chrysene	None set µg/m ³		< 0.001	202.3		< 0.001	202.3		
Cyclopenta(cd)pyrene	None set µg/m ³		< 0.001	202.3		< 0.001	202.3		
Dibenzo(ai)pyrene	None set µg/m ³		< 0.001	202.3		< 0.001	202.3		
Dibenzo(ah)anthracene	None set µg/m ³		< 0.001	202.3		< 0.001	202.3		

Fluoranthene	None set $\mu\text{g}/\text{m}^3$	0.01	33.8	1.41	30.2		
Indeno(123-cd)pyrene	None set $\mu\text{g}/\text{m}^3$	< 0.001	202.3	0.000	169.4		
Naphthalene	None set $\mu\text{g}/\text{m}^3$	0.15	30.2	0.11	30.2		

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
		Received at lab 19_4_2021 Reported to Viridor 26_4_2021	Received at lab 19_4_2021 Reported to Viridor 26_4_2021		
Total Organic Carbon	3%	0.8%	1.1%		
		Composite			
		Received at lab 28_4_2021 Reported to Viridor 17_5_2021	Received at lab 19_4_2021 Metals reported to Viridor 26_4_2021 D, F + PCBs reported to Viridor 28_4_2021	Received at lab 19_4_2021 Metals reported to Viridor 26_4_2021 D, F + PCBs reported to Viridor 28_4_2021	
Antimony (mg/kg)	---	208	842	880	
Cadmium (mg/kg)	---	18.5	313	351	
Thallium (mg/kg)	---	<0.1	1.0	1.1	
Mercury (mg/kg)	---	<0.5	4.84	4.35	

Lead (mg/kg)	---	502.4	1709	2069
Chromium (mg/kg)	---	122	25.6	31.0
Copper (mg/kg)	---	1853.6	578	594
Manganese (mg/kg)	---	1026	327	341
Nickel (mg/kg)	---	112	11.4	19.0
Arsenic (mg/kg)	---	23.6	69.7	81.0
Cobalt (mg/kg)	---	79.6	3.9	4.3
Vanadium (mg/kg)	---	49.6	<10.0	<10
Zinc (mg/kg)	---	2912.5	12611	13061
Dioxins / Furans (WHO 2005 TEQ) (ng/kg)	---	Dioxins = 2.1287 Furans = 3.95027	Dioxins = 200.205 Furans = 304.644	Dioxins = 164.749 Furans = 256.668
PCB (WHO 2005 TEQ) (ng/kg)	---	0.22923	16.9647	10.8308