

Viridor

Transforming waste™

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

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

**Environmental Monitoring Report
Q2 2022**

1 April – 30 June 2022

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

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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 33.5 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 2022 (1 April – 30 June 2022).

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 1,703 hours

As this quarter had 90 days (91 days x 24 hours = 2184 hours)

Line 1 was in operation 77.9%

Line 2 was in operation for 1,593 hours (72.9%).

This installation generated 59,150MWh of electricity during the period.

Please note the ERFs annual outage ran from 4 May to the 12 June 2022.

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.

See attached PDF Data Sheets as agreed with NRW

Releases to Air from Incinerators – Continuous Monitoring – Air 2							
Parameter	Limit	Reference Period	A1		A2		Test Method
			Max	Avg	Max	Avg	
Oxides of nitrogen	200 mg/m ³	Daily mean					BS EN 15267-3
	400 mg/m ³	½ hourly mean					
Particulate Matter	10 mg/m ³	Daily mean					
	30 mg/m ³	½ hourly mean					
Total Organic Carbon (TOC)	10 mg/m ³	Daily mean					
	20 mg/m ³	½ hourly mean					
Hydrogen chloride	10 mg/m ³	Daily mean					
	60 mg/m ³	½ hourly mean					
Sulphur dioxide	50 mg/m ³	Daily mean					
	200 mg/m ³	½ hourly mean					
Carbon monoxide	50 mg/m ³	Daily mean					
	100 mg/m ³	½ hourly mean*					

* 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

*** Corrective factor determined by NPL during latest QAL 2 (inputted into CDAS on 22 February 2021).

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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	9.26	2.23	29 March 2022 10:50 – 11:50	9.44	2.23	29 March 2022 12:40 – 13:40	EN 14792
Hydrogen fluoride	2 mg/m ³		0.02	0.02	28 March 2022 12:30 – 13:32	0.01	0.01	28 March 2022 13:40 – 14:44	SRM - BS ISO 15713
Hg and its compounds	0.05 mg/m ³		0.0027	0.0011	31 March 2022 10:25 – 13:54	0.0006	0.0005	1 April 2022 07:05 – 10:28	SRM - BS EN 13211 / MID 14385
Cd and Tl and their compounds.	0.05 mg/m ³		0.0006	0.0009	15 June 2022 11:28 – 13:30	0.0005	0.0008	15 June 2022 14:04 – 16:06	SRM – BS EN 14385
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds	0.5 mg/m ³		0.0350	0.0047		0.0147	0.0029		

Dioxins & Furans (I-TEQ)	0.1 ng/m ³	Mean over period minimum 6 hours, maximum 8 hours	0.0150	0.0045	29 March 2022 09:00 – 15:05	0.0036	0.0011	30 March 2022 09:20 – 15:26	SRM - BS EN 1948-1
PCBs (WHO-TEQ Humans / Mammals)	None set ng/m ³		0.0021	0.0003		0.0004	0.0001		SRM - BS EN 1948-1
PCBs (WHO-TEQ Fish)	None set ng/m ³		0.0001	0.0000		0.0001	0.000		SRM - BS EN 1948-1
PCBs (WHO-TEQ Birds)	None set ng/m ³		0.0039	0.0006		0.0040	0.0007		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Humans/Mammals)	None set ng/m ³		0.0133	0.0040		0.0033	0.0010		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Fish)	None set ng/m ³		0.0160	0.0048		0.0038	0.0011		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Birds)	None set ng/m ³		0.0240	0.0072		0.0056	0.0017		EN 1948 1-3
Anthanthrene	None set µg/m ³	Mean over period minimum 6 hours, maximum 8 hours	< 0.001	202.3	29 March 2022 09:00 - 15:05	< 0.001	202.3	30 March 2022 09:20 – 15:26	SRM - BS ISO 11338 - 1
Benzo(a)anthracene	None set µg/m ³		0.00	184.3		0.000	138.5		
Benzo(a)pyrene	None set µg/m ³		< 0.001	202.3		< 0.001	202.3		
Benzo(b)fluoranthene	None set µg/m ³		0.000	175.0		0.000	144.0		
Benzo(b)naphtho(2,1-d)thiophene	None set µg/m ³		< 0.001	202.3		0.000	179.6		
Benzo(c)phenanthrene	None set µg/m ³		0.01	50.8		0.000	60.4		
Benzo(ghi)perylene	None set µg/m ³		< 0.001	202.3		0.000	109.5		
Benzo(k)fluoranthene	None set µg/m ³		< 0.001	202.3		< 0.001	202.3		
Cholanthrene	None set µg/m ³		< 0.001	202.3		< 0.001	202.3		

Chrysene	None set µg/m ³		0.03	31.3		0.02	32.4		
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 µg/m ³		0.03	31.0		0.14	30.2		
Indeno(123-cd)pyrene	None set µg/m ³		< 0.001	202.3		< 0.001	202.3		
Naphthalene	None set µg/m ³		1.23	30.2		0.84	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 13_4_2022 Reported to Viridor 29_4_2022	Received at lab 13_4_2022 Reported to Viridor 29_4_2022		
Total Organic Carbon	3%	2.1%	1.3%		
		Composite			
		Received at lab 13_4_2022 Reported to Viridor 5_5_2022		Received at lab 13_4_2022 Metals reported to Viridor 21_4_2022 D, F + PCBs reported to Viridor 27_4_2022	Received at lab 14_4_2022 Metals reported to Viridor 21_4_2022 D, F + PCBs reported to Viridor 27_4_2022
Antimony (mg/kg)	---	343		1,017	984
Cadmium (mg/kg)	---	46.2		331	387
Thallium (mg/kg)	---	<0.1		1.0	1.1
Mercury (mg/kg)	---	<0.5		8.47	11.2

Lead (mg/kg)	---	629.7	1865	2,151
Chromium (mg/kg)	---	135	50.7	45.8
Copper (mg/kg)	---	1,965.3	627	695
Manganese (mg/kg)	---	1,167	358	325
Nickel (mg/kg)	---	93.2	19.5	16.1
Arsenic (mg/kg)	---	35.1	81.9	92.4
Cobalt (mg/kg)	---	83.5	9.0	5.5
Vanadium (mg/kg)	---	47.0	<10	<10
Zinc (mg/kg)	---	5,065.2	15,406	16,127
Dioxins / Furans (WHO 2005 TEQ) (ng/kg)	---	Dioxins = 4.4051 Furans = 6.11583	Dioxins = 158.259 Furans = 248.335	Dioxins = 169.276 Furans = 272.462
PCB (WHO 2005 TEQ) (ng/kg)	---	0.57013	9.22945	4.33409