Viridor Transforming waste™

The Environmental Permitting (England and Wales) Regulations 2010

Permit: EPR/LP3030XA
Cardiff Energy Recovery Facility

Environmental Monitoring Report
Q2 2023

1 April – 30 June 2023

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 2023
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Report Generated By

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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 2023 (1 April – 30 June 2023).

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 1,700.5 hours
As this quarter had 90 days (91 days x 24 hours = 2184 hours)
Line 1 was in operation 77.8%

Line 2 was in operation for 1,721.5 hours (78.8%).

This installation generated 57,385MWh of electricity during the period.

Please note the ERFs annual outage ran from 5 June 2023 into July 2023.

2.3 Schedule Notices Issued

Schedule 5 Parts A and B was submitted to NRW on 17 May 2023 upon receiving the 6-monthly emissions monitoring report from Socotec Ltd.

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**	**Uncertainty****
			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).

*

Table 2: Emissions to Air from A1 and A2 Periodic

Substance / Parameter	Emission Limit Value	Reference Period	A1 Result	Uncer-tainty	Sample Date / Time	A2 Result	Uncer-tainty	Sample Date / Time	Test Method
Nitrous oxide	None set mg/m^3	Periodic over 30 minutes. Maximum 8 hours	5.1	2.5	23 Feb 2023 10:30 – 11:30	1.02	2.07	23 Feb 2023 13:00 – 14:00	EN 14792
Hydrogen fluoride	2 mg/m^3		0.014	0.0046	27 Feb 2023 09:02 – 11:02	0.009	0.0048	27 Feb 2023 11:15 – 13:15	SRM - BS ISO 15713
Hg and its compounds	0.05 mg/m^3		0.0116	0.0014	23 Feb 2023 08:51 – 12:24	0.0031	0.0007	23 Feb 2023 12:45 – 16:14	SRM - BS EN 13211 / MID 14385
Cd and Tl and their compounds.	0.05 mg/m^3		0.0005	0.0007	21 Feb 2023 14:50 – 16:54	0.0005	0.0008	22 Feb 2023 08:55 – 11:00	SRM – BS EN 14385
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds	0.5 mg/m^3		0.0232	0.0034		0.048	0.006		

Substance / Parameter	Emission Limit Value	Reference Period	A1 Result	Uncer-tainty	Sample Date / Time	A2 Result	Uncer-tainty	Sample Date / Time	Test Method
Dioxins & Furans (I-TEQ)	0.1 ng/m^3	Mean over period minimum 6 hours, maximum 8 hours	0.0218	0.0033	Dioxins * 19 April 2023 10:35 – 16:45 20 April 2023 09:10 – 15:15 PCBs 21 Feb 2023 08:25 – 14:40	0.0042	0.0006	20 Feb 2023 09:33 – 15:42	SRM - BS EN 1948-1
PCBs (WHO-TEQ Humans / Mammals)	None set ng/m^3		0.0075	0.0004		0.0004	0.0000		SRM - BS EN 1948-1
PCBs (WHO-TEQ Fish)	None set ng/m^3		0.0004	0.0000		0.0000	0.0000		SRM - BS EN 1948-1
PCBs (WHO-TEQ Birds)	None set ng/m^3		0.0125	0.0006		0.0014	0.0001		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Humans/Mammals)	None set ng/m^3		0.0210	0.0032		0.0040	0.0006		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Fish)	None set ng/m^3		0.0219	0.0033		0.0045	0.0007		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Birds)	None set ng/m^3		0.0462	0.0070		0.0079	0.0012		EN 1948 1-3
Anthanthrene	None set µg/m^3	Mean over period minimum 6 hours, maximum 8 hours	< 0.001	201.5	21 Feb 2023 08:25 – 14:40	< 0.0011	201.6	20 Feb 2023 09:34 – 15:42	SRM - BS ISO 11338 - 1
Benzo(a)anthracene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.6		
Benzo(a)pyrene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.6		
Benzo(b)fluoranthene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.6		
Benzo(b)naptho(2,1-d)thiophene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.6		
Benzo(c)phenanthrene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.6		

Substance / Parameter	Emission Limit Value	Reference Period	A1 Result	Uncer-tainty	Sample Date / Time	A2 Result	Uncer-tainty	Sample Date / Time	Test Method
Benzo(ghi)perylene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.6		
Benzo(k)fluoranthene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.6		
Cholanthrene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.6		
Chrysene	None set µg/m^3		0.00	147.0		< 0.0011	201.6		
Cyclopenta(cd)pyrene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.6		
Dibenzo(ai)pyrene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.6		
Dibenzo(ah)anthracene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.6		
Fluoranthene	None set µg/m^3		0.01	30.9		0.01	34.8		
Indeno(123-cd)pyrene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.6		
Naphthalene	None set µg/m^3		0.24	24.7		0.12	25.1		

* Dioxin retest undertaken as original dioxin test on 21 Feb 2023 from 08:25 to 14:40h deemed to be “approach to limit”.
Result 0.1133ng/m3 +/- 0.0173 ng/m3 = 0.096 ng/m3

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 12_4_2023 Reported to Viridor 17_4_2023	Received at lab 12_4_2023 Reported to Viridor 17_4_2023		
Total Organic Carbon	3%	1.0%	1.1%		
		Composite			
		Received at lab 20_4_2023 Reported to Viridor 4_5_2023		Received at lab 12_4_2023 Metals reported to Viridor 18_4_2023 D, F + PCBs reported to Viridor 20_4_2023	Received at lab 12_4_2023 Metals reported to Viridor 18_4_2023 D, F + PCBs reported to Viridor 20_4_2023
Antimony (mg/kg)	---	340		951	730
Cadmium (mg/kg)	---	27.2		264	226
Thallium (mg/kg)	---	<0.1		0.8	0.8
Mercury (mg/kg)	---	<0.5		5.07	5.37

Lead (mg/kg)	---	385.2	1598	1355
Chromium (mg/kg)	---	150	51.8	41.4
Copper (mg/kg)	---	2089.2	5771	541
Manganese (mg/kg)	---	1294	405	359
Nickel (mg/kg)	---	101.4	20.0	17.0
Arsenic (mg/kg)	---	33.8	70.2	64.1
Cobalt (mg/kg)	---	118	5.5	4.4
Vanadium (mg/kg)	---	42.4	<10	<10
Zinc (mg/kg)	---	3301.6	12,590	11,100
Dioxins / Furans (WHO 2005 TEQ) (ng/kg)	---	Dioxins = 3.37688 Furans = 1.44183	Dioxins = 121.237 Furans = 279.753	Dioxins = 90.1046 Furans = 157.468
PCB (WHO 2005 TEQ) (ng/kg)	---	0.28235	7.36965	4.5514