Viridor Transforming waste™

The Environmental Permitting (England and Wales) Regulations 2010

Permit: EPR/LP3030XA
Cardiff Energy Recovery Facility

Environmental Monitoring Report
Q4 2023

1 October – 31 December 2023

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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 21 December 2022, 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 Q4 of 2023 (1 October – 31 December 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.

Availability of waste combustion Line 1 was 2,141 hours

As this quarter had 92 days (92 days x 24 hours = 2208 hours)
Line 1 was in operation 96.9%

Availability of waste combustion Line 2 was 2,137 hours (96.7%).

This installation generated 80,642 MWh of electricity during the period.

2.3 Schedule Notices Issued

No Schedule 5 notifications were submitted to NRW during this period

Table 1: Emissions to Air from A1 and A2 (CEMS) taken from ENVEA (new name for 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 Reported to Viridor on 13 November 2023.

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	0.13	0.89	27 Sept 2023 09:00 – 10:00	0.14	0.89	25 Sept 2023 09:00 – 10:00	EN 14792
Hydrogen fluoride	2 mg/m^3		0.04	0.023	23 Aug 2023 07:55 – 09:55	0.09	0.04	22 Aug 2023 09:00 – 11:00	SRM - BS ISO 15713
Hg and its compounds	0.05 mg/m^3		0.0146	0.0022	25 Aug 2023 06:20 – 09:55	0.0122	0.0023	21 Aug 2023 11:45 – 15:12	SRM - BS EN 13211 / MID 14385
Cd and Tl and their compounds.	0.05 mg/m^3		0.0004	0.0007	24 Aug 2023 09:10 – 11:15	0.0004	0.0008	21 Aug 2023 09:31 – 11:35	SRM – BS EN 14385
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds	0.5 mg/m^3		0.055	0.006		0.021	0.003		

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	0.0605	0.0093	23 Aug 2023 07:40 – 13:50 24 Aug 2023 08:10 – 14:16	0.0795	0.0122	22 Aug 2023 08:45 – 14:55	SRM - BS EN 1948-1
PCBs (WHO-TEQ Humans / Mammals)	None set ng/m^3		0.0006	0.00003		0.0015	0.0001		SRM - BS EN 1948-1
PCBs (WHO-TEQ Fish)	None set ng/m^3		0.0000	0.000002		0.0001	0.000004		SRM - BS EN 1948-1
PCBs (WHO-TEQ Birds)	None set ng/m^3		0.0014	0.0001		0.0032	0.0002		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Humans/Mammals)	None set ng/m^3		0.0555	0.0085		0.0707	0.0108		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Fish)	None set ng/m^3		0.0648	0.0099		0.0846	0.0129		SRM - BS EN 1948-1
Dioxins/Furans (WHO-TEQ Birds)	None set ng/m^3		0.1310	0.0200		0.1520	0.0233		EN 1948 1-3
Anthanthrene	None set µg/m^3	Mean over period minimum 6 hours, maximum 8 hours	< 0.001	201.5	23 Aug 2023 07:40 – 13:50	< 0.0011	201.5	22 Aug 2023 08:45 – 14:55	SRM - BS ISO 11338 - 1
Benzo(a)anthracene	None set µg/m^3		0.00	199.6		< 0.0011	201.5		
Benzo(a)pyrene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.5		
Benzo(b)fluoranthene	None set µg/m^3		0.00	174.2		< 0.0011	201.5		
Benzo(b)naptho(2,1-d)thiophene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.5		
Benzo(c)phenanthrene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.5		

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		0.00	46.3		< 0.0011	201.5		
Benzo(k)fluoranthene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.5		
Cholanthrene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.5		
Chrysene	None set µg/m^3		0.00	69.7		< 0.0011	201.5		
Cyclopenta(cd)pyrene	None set µg/m^3		0.00	73.5		< 0.0011	201.5		
Dibenzo(ai)pyrene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.5		
Dibenzo(ah)anthracene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.5		
Fluoranthene	None set µg/m^3		0.03	26.0		0.01	35.5		
Indeno(123-cd)pyrene	None set µg/m^3		< 0.001	201.5		< 0.0011	201.5		
Naphthalene	None set µg/m^3		0.07	25.0		0.10	25.1		

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_10_2023 Reported to Viridor 19_10_2023	Received at lab 13_10_2023 Reported to Viridor 19_10_2023		
Total Organic Carbon	3%	1.0%	0.6%		
		Composite			
		Received at lab 9_10_2023 Reported to Viridor 23_10_2023		Received at lab 09_10_2023 Metals reported to Viridor 13_10_2023 D, F + PCBs reported to Viridor 18_10_2023	Received at lab 09_10_2023 Metals reported to Viridor 13_10_2023 D, F + PCBs reported to Viridor 18_10_2023
Antimony (mg/kg)	---	766		920	799
Cadmium (mg/kg)	---	63		272	193
Thallium (mg/kg)	---	0.11		1.1	0.7
Mercury (mg/kg)	---	<0.5		3.13	4.62

Lead (mg/kg)	---	851.1	1745	1195
Chromium (mg/kg)	---	179	45.9	38
Copper (mg/kg)	---	1521	693	439
Manganese (mg/kg)	---	1526	426	400
Nickel (mg/kg)	---	130.8	20.2	11
Arsenic (mg/kg)	---	66.1	71.9	84.6
Cobalt (mg/kg)	---	95.9	7.5	4.5
Vanadium (mg/kg)	---	29.9	<10	<10
Zinc (mg/kg)	---	8057	13265	9772
Dioxins / Furans (WHO 2005 TEQ) (ng/kg)	---	Dioxins = 5.563 Furans = 7.1901	Dioxins = 2326.6 Furans = 2310.37	Dioxins = 326.816 Furans = 405.749
PCB (WHO 2005 TEQ) (ng/kg)	---	0.62071	204.269	35.64