Annual Performance Report 2024

Permit EPR/BK0825IU

Riverside Resource Recovery Facility

Cory

Year:	2024		
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Version Control

Section	Information	Date

Distribution

Copy	Name, Role	No.

This report is required under the Industrial Emissions Directive's Article 55(2) requirements on reporting and public information on waste incineration plants and co-incineration plants, which require the operator to produce an annual report on the functioning and monitoring of the plant and make it available to the public.

Plant Description and Design

The Riverside Resource Recovery Energy from "The Riverside Resource Recovery Energy from Waste facility at Belvedere in the London Borough of Bexley, uses the waste that would otherwise have gone to landfill as feedstock to generate electricity. As one of the largest operations of its kind in the UK, the facility generates c.610,000 MWh of electricity each year from processing up to 850,000 tonnes of waste through its three operating combustion lines. What's more, we use the River Thames as a green highway to move the waste from the city to the facility on our fleet of tugs and barges, removing around 100,000 truck movements a year off our capital's congested roads. By generating electricity from domestic and commercial residual waste, after recycling, we are improving resource efficiency, avoiding London's use on landfill, and achieving greater sustainability as part of London's circular economy.
With the Riverside Resource Recovery facility continuing to be fully operational, the Environment Agency has renewed the facility R1 certification; this means that the facility is classified as a recovery operation.

Summary of Operational Processes and Procedures

The Riverside Energy from Waste facility is a 24/7 operation which is operated from a continuously manned control room. The control room operator shall ensure that the site's operations are performed to the facility design and to the strict requirements of the environmental permit.
The river operations are a key aspect of the process for Riverside, with over 85% of the waste being brought to the plant on barges along the River Thames. From the jetty, the waste containers are removed from the barges and are transported using dock tractors into the site tipping hall.
In the tipping hall the waste is tipped into one of 12 tipping bays. Each bay has a hydraulically operated door designed to minimise noise and odour during tipping. Lights on each tipping bay indicate to the drivers of the vehicles which bay is available to receive waste. The tipping bays open into a waste bunker 30m deep, 61m long and 16m wide. It can hold up to circa. 10,000 tonnes of waste, enough to fuel the plant at full capacity for five days.
The plant runs three combustion lines. The waste cranes feed each combustion line ensuring that the boilers have the required feedstock for 24 hour operation. The waste travels down the feed chutes and onto a horizontal feeder table where hydraulically operated ram feeders push the waste onto the moving grate. The grate is made up of alternate rows of fixed and moving cast steel bars that are arranged on a slope. The forward movement of these bars tumbles the waste slowly down the burning waste bed.
Primary heated combustion air is drawn from above the waste bunker and fed into the waste bed through orificies in each grate bar. This process dries the waste and provides the correct amount of air to allow good combustion of the waste. Secondary swirling air is introduced above the grate. This ensures that the gases given off by the burning waste are thoroughly mixed, resulting in a fully optimised combustion process and lower levels of toxicity in the gases leaving the combustion chamber. Ammonia is injected into the flue gas to reduce the level of Oxides of Nitrogen.
The resulting sub-product, from processing the waste, is known as Incinerator Bottom Ash (IBA) and this falls from the end of the grate into a quench bath. The IBA is collected in an ash bunker and loaded into containers by cranes and hoppers. Any oversized metal is removed and recycled and the remainder is transported on the river (circa 200,000 tonnes per annum) to our partner plant at Tilbury Docks for processing and recycling into aggregate that is primarily used within the construction industry.
The energy from the flue gases is utilised to convert water into steam via the steam drum. The steam is then further super-heated and drives the turbine/generator, producing electricity which is used to power the facility and exported to the National Grid.
Flue gases leave the boiler and pass through a reactor tower where hydrated lime, powdered activated carbon and water are injected into the swirling gas flow. These neutralise acids and capture heavy metals.
Gases from the reactor tower are then drawn into the fabric filter baghouse. The clean gases pass through the filters and the Air Pollution Control residue (APCr) collects on the outer surface of the bags. The APCr is collected in silos.
Flue Gas is drawn through the entire process by Induced Draft Fans. The clean hot gas from the Fabric Filter is passed through a heat exchanger that heats feed water to provide an efficient process. Cooled gas is emitted via an 85 metre stack where it is discharged into atmosphere. Continuous Emissions Monitoring (CEMS) equipment continually records emissions to air.

Summary of Plant Operations and Maintenance during the reporting year

During 2024, a common plant outage was undertaken in April, and a major inspection shutdown on Line 1 in September. The driver for the common outage was to complete a minor turbine inspection, to rectify defects on all systems, and to perform the required inspections under the Pressure Systems Safety Regulations 2000 (PSSR). The major inspection scope of works included Grate Maintenance, condition monitoring of the Boiler, rectification of defects, refractory refurbishment, Boiler cleaning and Fabric filter maintenance.
2024 improvements as follows:
The Boiler improvement 4-year project to replace refractory tiles with Alloy 625 weld overlay on Line 1 was completed. The modification provides benefits in condition monitoring as well as reducing the temperature of the flue gas around the superheater stages, thus reducing corrosion in the long term. Line 1 Fabric bags were fully changed out as part of the maintenance strategy for the Bag House and a pulse cleaning optimisation was implemented. The Ash Expellers and slag chute were upgraded following a study for safety improvements. There were improvements made to the burners control system, and renewed process control stations for Line 1.

Summary of Residue Handling for the reporting year

100% of the Incinerator Bottom Ash was transported via the River Thames to Blue Phoenix Ltd at their premises at Tilbury Docks. □
The Air Pollution Control residue (APCr) was sent to two main destinations throughout 2023: □
1) OCO Ltd in Suffolk where it was treated by Accelerated Carbonation Technology (ACT) to produce a stabilised product that is used as a component of breeze blocks. □
2) Augean at the East Northants Resource Management Facility (ENRMF) is based at Kings Cliffe near Peterborough which operates and is monitored under strict EPR permits to ensure full compliance with all current legislation.

Metal recovered at site was sent to Goldstar Metal Trading in Cambridgeshire.

Operational Data

Plant Size		850,000	tonnes pa	270	MWth	85	MWe
No. of combustion lines	3		No. of Turbines:		1		

Waste types received	Unit	Q1	Q2	Q3	Q4	**Year Total**	%
Household / Local Authority	tonnes	126,158	128,119	130,196	129,491	**513,964**	63.0%
Commercial & Industrial		81,231	72,156	67,458	78,076	**298,921**	36.6%
Hazardous						**-**	-
Clinical						**-**	-
Waste wood (biomass)						**-**	-
Refuse Derived Fuel * - H'hold/LA						**-**	-
Refuse Derived Fuel * - C&I		2,566		91	345	**3,002**	0.4%
Other [Please specify]						**-**	-
Other [Please specify]						**-**	-
Other [Please specify]						**-**	-
Total waste received		**209,955**	**200,275**	**197,745**	**207,912**	**815,886**	
Rejected Waste						**-**	-
Unprocessed waste transferred out		2,022	896	1,831		**4,749**	0.6%
Total waste combusted **		**201,968**	**200,075**	**197,914**	**207,099**	**807,056**	

Energy Usage / Export	Unit	Q1	Q2	Q3	Q4	**Year Total**	KWh/te
Power Generated	MWh	155,439	159,267	160,028	166,875	**641,609**	795
Power Exported		139,163	142,588	142,842	149,950	**574,543**	712
Power Used on site		16,565	16,984	17,185	16,947	**67,681**	84
Power Imported		289	304	-	23	**616**	1
Parasitic Load	%	10.6%	10.6%	10.7%	10.2%	10.5%	
Thermal Energy Produced ***	MWh					**-**	-
Thermal Energy Exported ***						**-**	-
R1 value (if applicable)	R1	0.76	0.78	0.79	0.79	0.79	

Waste Disposal & Recovery	Unit	Q1	Q2	Q3	Q4	**Year Total**	% inputs
APC Residues - produced	tonnes	5,180	4,794	4,808	5,302	**20,083**	2.5%
IBA - produced		41,719	42,045	41,093	43,878	**168,735**	20.9%
Metals recycling		173	197	240	243	**854**	0.1%
Other		-	-	-	-	**-**	-
Other		-	-	-	-	**-**	-
Other		-	-	-	-	**-**	-

Raw Material Usage	Unit	Q1	Q2	Q3	Q4	**Year Total**	kg or Ltr /te
Mains Water	ltrs	44,680,000	34,520,000	33,970,000	37,050,000	**150,220,000**	186.13
Other Water	ltrs					**-**	-
Ammonia	ltrs	177,728	208,758	238,942	268,006	**893,434**	1.11
Urea	kgs					**-**	-
Activated Carbon	kgs	86,837	93,556	86,565	89,963	**356,921**	0.44
Lime / hydrated lime	kgs	1,845,640	1,933,860	1,969,870	1,710,120	**7,459,490**	9.24
Fuel oil	ltrs	348,032	309,371	390,094	263,784	**1,311,281**	1.62
Gas	cuf					**-**	
Other						**-**	

Summary	Line/Unit	Q1	Q2	Q3	Q4	**Year Total**	
Availability of waste combustion by line, hrs ****	1	1,943	1,985	1,614	2,111	**7,652**	87.1%
	2	2,071	2,008	2,170	2,205	**8,453**	96.2%
	3	2,057	2,029	2,188	1,964	**8,237**	93.8%
						-	
						-	
Overall Availability, mean avg. of all lines, hrs		**2,024**	**2,007**	**1,990**	**2,093**	8,114	**92.4%**
Hours of turbine operations, hrs	1	2,093	2,033	2,201	2,201	**8,527**	97.1%
Hours of heat / steam export						**-**	n/a
Net Calorific Value of waste	MJ/kg	9.53	9.50	9.66	9.61	9.57	

Abnormal Events	qty.				1		**1**	yes
Abnormal operation	hours				1.5		**1.5**	0.0%
Permit Breaches	qty.		13	7	11		**31**	yes

2024 Annual Reporting Performance Form 1

Permit EPR/BK0825IU Operator: Cory
Facility: Riverside Resource Recovery Facility Form: Performance 1

Reporting Period from: 01 January 2024 to: 31 December 2024

2024 Annual Reporting of Waste Disposal and Recovery

Waste Description	Disposal Route(s)	Disposal Tonnes	Recovery Tonnes	% / tonne of waste incinerated
1) Hazardous Wastes				
APC Residues	R05, D05	10,310.8	9,772.2	2.5%
IBA				-
				-
				-
Total Hazardous Waste		10,310.8	9,772.2	2.5%
2) Non-Hazardous Wastes				
IBA	R04		168,735.0	20.9%
Ferrous Metal	R04		853.5	0.1%
Process Water				-
				-
				-
Total Non-Hazardous Waste		0.0	169,588.5	21.0%
TOTAL WASTE		**10,310.8**	**179,360.7**	23.5%

Operator's comments :

2024 Annual Reporting of Water and Other Raw Material Usage

Raw Material	Usage	Unit	Specific Usage	Unit
Mains Water	150220	m^3	0.19	m^3/te
Total Water	150220	m^3	0.19	m^3/te
Ammonia	893434	ltrs	1.11	ltr/te
Activated Carbon	356921	kg	0.44	kg/te
Hydrated lime	7459490	kg	9.24	kg/te

Operator's comments :

2024 Annual Reporting of other performance indicators

Parameter	Results by Line							
	A1	A2	A3	A4	A5		Turbine 1	Turbine 2
Operating hours for the year, hours	7652	8453	8237				8527	
Number of periods of abnormal operation, qty.		1						
Cumulative hours of abnormal operation for this year, hours		1.5						

Operator's comments :

Signed: _____ Date: _____

2024 Annual Reporting of Energy Usage/Export

Permit EPR/BK0825IU Operator: Cory

Facility: Riverside Resource Recovery Facility Form: Energy 1

Reporting Period from: 01 January 2024 to: 31 December 2024

Energy Source	Energy Usage	Unit	Specific Usage (KWh/tonne incinerated
Electricity Produced	641,609	MWh	795
Electricity Imported	615.9	MWh	1
Electricity Exported	574,543	MWh	712
Gas Oil		tonnes	
Steam/hot water exported	0	GWh	-

Operator's comments :

Signed: _____ Date: _____

Summary of Permit Compliance

Compliance with permit limits for continuously monitored pollutants

The plant met its emission limits as shown in the table below:

Substance	Percentage time compliant during operation[Note 1]	
	Half-hourly limit	Daily limit
Particulates		
Oxides of nitrogen	100.00%	100.00%
Sulphur dioxide	100.00%	100.00%
Carbon monoxide	98.08% 95% of 10-min averages	100.00%
Total organic carbon	99.98%	100.00%
Hydrogen chloride	100.00%	100.00%
Hydrogen fluoride	100.00%	100.00%

Summary of non-compliances under the permit [Note 2]

Date	Summary of non-compliance [Note 3]	Reason	Measures taken to prevent reoccurrence	CCS score if applicable*	
				Impact	Root cause
21 x exceedances	Carbon monoxide - exceedance of 95%tile of 10min averages	Exceedance result of multiple over-pressurisations events in the furnace due to volatile fractions of waste stream	Continue to audit waste to eradicate volatile fractions	CCS4	
10 x exceedances	TOC half-hourly exceedance - (limit 20mg/Nm3)	Exceedance result of multiple over-pressurisations events in the furnace due to volatile fractions of waste stream	Continue to audit waste to eradicate volatile fractions	CCS4	

*If the Environment Agency (EA) has given a Compliance Classification Scheme (CCS) score due to a permit non-compliance it should be entered here (CCS4 = No impact; CCS3 = Minor impact; CCS2 = Significant impact; CCS1 = Major impact). If the EA has not yet assessed a non-compliance which you have notified to them, these columns should be left blank. Enter N/A if no score was given for the root cause.

Summary of any complaints received and actions to taken to resolve them.

Date	Summary of complaint [including Line/Reference]	Reason (including whether substantiated by the operator or the EA)	Measures taken to prevent reoccurrence

Summary of Plant Improvements

Summary of any efficiency improvements that have been completed within the year.

Summary of any permit improvement conditions that have been completed within the year and the resulting environmental benefits.
Imporovement Condition 3: Dioxin monitoring during Line Start-up and Shuitdown periods performed. Dioxin levels found to be low and stable during both start-up and shutdown with no increase risk to the environment.

Summary of any changes to the plant or operating techniques which required a variation to the permit and a summary of the resulting environmental impact.

Summary of any other improvements made to the plant or planned to be made and a summary of the resulting environmental benefits.

Details of Public & Stakeholder Liaison

Summary of events held during the reporting year.	
Date	**Description**
22/07/24 - 27/07/24 & 28/10/24 - 01/11/24	SchoolWork Experience event.
27/02/2024 & 01/11/2024	Reading University Environmental Management Students - Presentation & Site Tour
Various	Monthly local Community group site tours
17/06/2024	Harris Garrard Industrial Cadet

List of events planned for next year	
Date	**Description**
13/01/2025	Imperial College London - Environmental Management Students - Presentation & Site Tour
25/04/2025	Reading University Environmental Management Students - Presentation & Site Tour
Various	Monthly local Community group site tours

If you wish to be involved in the public liaison programme, please contact enquiries@corygroup.co.uk

bon dioxide emissions and biogenic content of waste inputs

bon dioxide emissions (all types of plant)

Annual mass of carbon dioxide released	tonnes	899,588
Annual mass of carbon dioxide released per tonne of waste burned	t CO_2 / t waste	1.11
Annual mass of carbon dioxide released per MWh of energy exported	t CO_2 / MWh export	1.57
Description of how annual carbon dioxide mass emission has been calculated. See Note 1	CO2 measured as part of continuous emissions monitoring system (CEMS).	

ous oxide emissions (only plants which use ammonia or urea to abate NOx emissions)

Annual mass emissions of nitrous oxide	tonnes N_2O	1.534
Description of how annual nitrous oxide mass emission has been calculated See Note 2	N2O measured as part of continuous emissions monitoring system (CEMS).	
l annual carbon dioxide + nitrous e emissions. Note 3.	tonnes CO_2e	457

genic CO2 emissions (See Note 4)

Percentage of total carbon dioxide emissions arising from biogenic waste	%	62.0%
No. of measurements undertaken	Number	7
Description of how percentage biogenic carbon dioxide emissions have been measured or calculated. See Note 5	C14 sampling using installed continuous sampling unit.	

genic fraction of waste feedstock (See Note 4)

Yearly average biogenic percentage of the waste by net calorific value (NCV)	%	49.6%
Description of how biogenic percentage (by NCV) has been calculated or estimated. See Note 6	Using the compositional data derived from the waste hand sorting, the corresponding biodegradable factors and the CV data determined from laboratory analysis, the qualifying percentage of electricity generated from renewable sources can be calculated	

Yearly average biogenic percentage of the waste by mass	%	54.3%
If waste sampling undertaken, no. of samples used to ascertain average biogenic percentages above	Number	32
Description of how biogenic percentage (by mass) has been calculated or estimated. See Note 7	Result converted to %mass using "Renewable Energy Association Energy Content of Fuels - Description of Method"	

Comments:

Residue Quality Monitoring Requirements

Summary of monitoring undertaken and compliance
In 2024, the Incinerator Bottom of Ash was tested quarterly for Total Organic Carbon (TOC), Heavy Metals suite, Dioxins/Furans and Dioxin-like PCBs in line with the site permit requirements.
In 2024, The Air Pollution Control residue (APCr) was tested for Heavy Metals suite, Dioxins/Furans and Dioxin-like PCBs in line with the site permit requirements.
In 2024, the facility continued to adopt the the ESA Sampling & Testing Protocol to Assess the Status of Incinerator Bottom Ash, for the hazard assessment of IBA. The IBA remained classified as non-hazardous throughout 2024.

Commentary on any specific events	
Date & Event	**Description**

Residue Quality Monitoring Results			
Parameter (unit)	**Limit***	**Normal Operation**	
		Bottom ash	**APC Residues**
Total Organic Carbon (average %)	<3%	1.21	
No. of Assessments Undertaken	---	4	4
No. of Hazardous Results	---	0	

* The permit will specify a limit of either 5% loss on ignition or 3% total organic carbon. If both are measured anyway, please enter the results here, even where the limit does not apply.

Comments :

Emissions to Water

Summary of monitoring undertaken and compliance
Monthly visual assessment for visible oil or grease at three emission points for uncontaminated roof and surface water. No visible signs of oil or grease seen throughout 2024.

Commentary on any specific events	
Date & Event	**Description**

Emissions to Water / Sewer

Parameter	Monitoring Frequency	Limit	Target	Max.	Average

Emissions to Air (periodically monitored)

Summary of monitoring undertaken, standards used and compliance

Results of emissions to air that are periodically monitored - oxygen reference 11%

Substance	**Ref. Period**	**Emission Limit Value**	**Average**		
			A1	**A2**	**A3**
Hydrogen fluoride	1 hr	1 mg/m^3	0.0221	0.0238	0.0214
Cd and Tl and their compounds	0.5-8hrs	0.02 mg/m^3	0.001	0.0012	0.0048
Hg and its compounds	0.5-8hrs	0.02 mg/m^3	0.0004	0.0004	0.0004
Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds	0.5-8hrs	0.3 mg/m^3	0.0116	0.0255	0.0353
Dioxins & Furans (I-TEQ)	6-8hrs	0.06 ng/m^3	0.0014	0.0019	0.0047
PCBs (WHO-TEQ Humans / Mammals)	6-8hrs	None set ng/m^3	0.0003	0.0002	0.0006
PCBs (WHO-TEQ Fish)	6-8hrs	None set ng/m^3	0.00002	0.00001	0.00003
PCBs (WHO-TEQ Birds)	6-8hrs	None set ng/m^3	0.00079	0.0007	0.0011
Dioxins & Furans (WHO-TEQ Humans / Mammals)	6-8hrs	None set ng/m^3	0.00149	0.002	0.0045
Dioxins & Furans (WHO-TEQ Fish)	6-8hrs	None set ng/m^3	0.00149	0.0021	0.0045
Dioxins & Furans (WHO-TEQ Birds)	6-8hrs	None set ng/m^3	0.00222	0.0032	0.0077
Anthanthrene	6-8hrs	None set $\mu g/m^3$	0.0012	0.0012	0.0012
Benzo(a)anthracene	6-8hrs	None set $\mu g/m^3$	0.0025	0.0014	0.0016
Benzo(a)pyrene	6-8hrs	None set $\mu g/m^3$	0.0019	0.0012	0.0016
Benzo(b)fluoranthene	6-8hrs	None set $\mu g/m^3$	0.0039	0.0012	0.0015
Benzo(b)naptho(2,1-d) thiophene	6-8hrs	None set $\mu g/m^3$	0.0012	0.0012	0.0012
Benzo(c)phenanthrene	6-8hrs	None set $\mu g/m^3$	0.0012	0.0012	0.0012
Benzo(ghi)perylene	6-8hrs	None set $\mu g/m^3$	0.0018	0.0012	0.0021
Benzo(k)fluoranthene	6-8hrs	None set $\mu g/m^3$	0.0017	0.0012	0.0012
Cholanthrene	6-8hrs	None set $\mu g/m^3$	0.0012	0.0012	0.0012
Chrysene	6-8hrs	None set $\mu g/m^3$	0.0039	0.0063	0.0028
Cyclopenta(cd)pyrene	6-8hrs	None set $\mu g/m^3$	0.0012	0.0012	0.0064
Dibenzo(ai)pyrene	6-8hrs	None set $\mu g/m^3$	0.0012	0.0012	0.0012
Dibenzo(ah)anthracene	6-8hrs	None set $\mu g/m^3$	0.0012	0.0012	0.0012
Fluoranthene	6-8hrs	None set $\mu g/m^3$	0.0812	0.0725	0.0626
Indeno(123-cd) pyrene	6-8hrs	None set $\mu g/m^3$	0.0017	0.0012	0.0012
Naphthalene	6-8hrs	None set $\mu g/m^3$	0.3784	0.4218	0.1134

Comments :

Emissions to Air (continuously monitored)

Summary of monitoring undertaken, standards used and compliance
All substances listed below are continuously monitored in line with the requirements of the Environmental permit. Oxides of Nitrogen (ISO 10849), Particulate Matter (BS EN 13284-2), Total Organic Carbon (BS EN 12619), Hydrogen Chloride, Sulphur Dioxide (BS 6069-4.4)

Results of emissions to air that are continuously monitored (maximum and average values for each line) - oxygen reference 11%

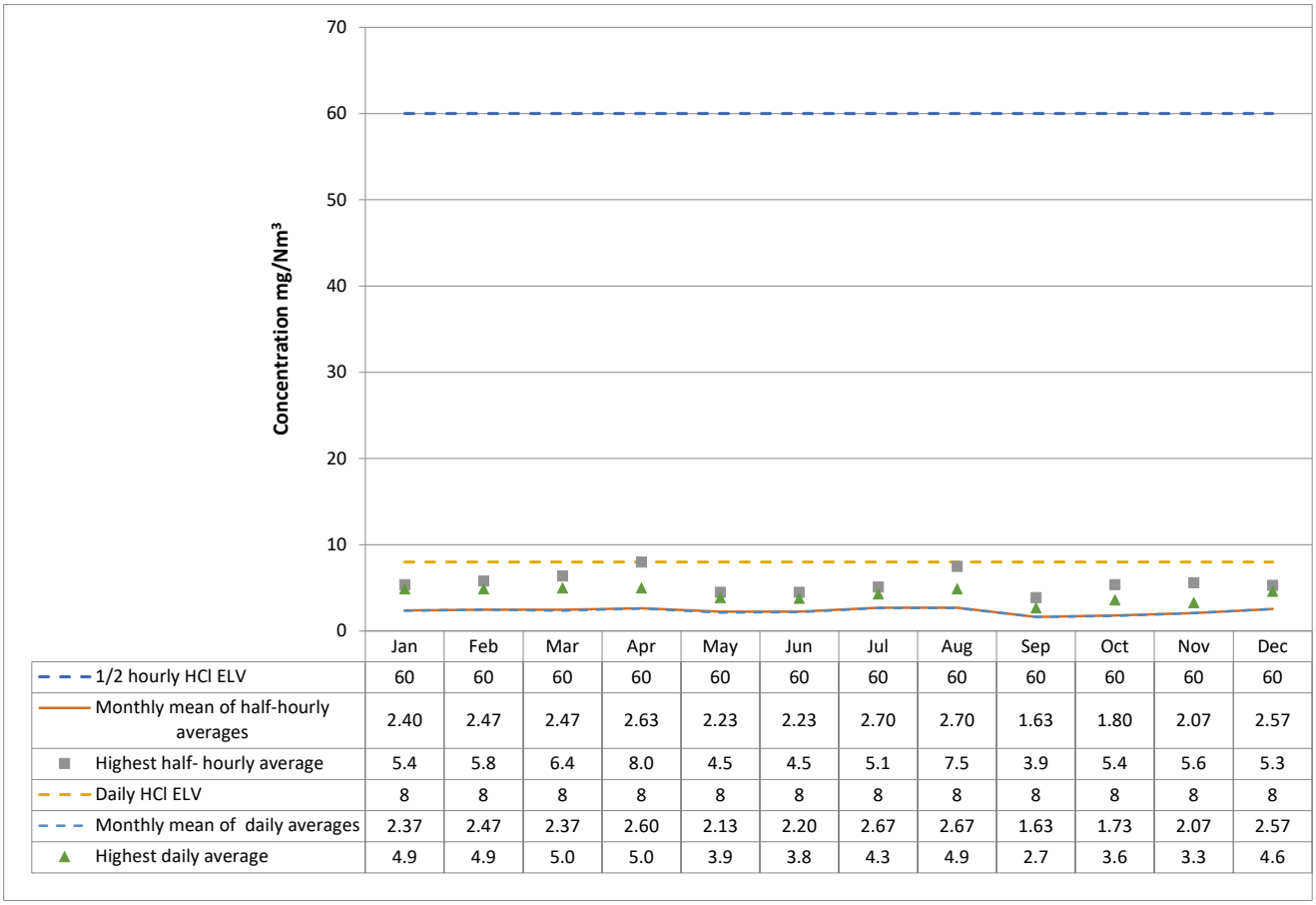
Substance	Reference Period	Emission Limit Value	A1		A2		A3		A4		A5	
			Max.	Avg.	Max.	Avg.	Max.	Avg.	Max.	Avg.	Max.	Avg.
Oxides of nitrogen	Daily mean	180 mg/m^3	161.9	150.7	149.7	148.8	154.1	149.5				
	½ hourly mean	400 mg/m^3	226.6	150.7	226.1	148.8	150.1	149.5				
Particulates	Daily mean	5 mg/m^3										
	½ hourly mean	30 mg/m^3										
Total Organic Carbon	Daily mean	10 mg/m^3	0.4	0.26	1.3	1	1	0.68				
	½ hourly mean	20 mg/m^3	0.4	0.27	1.3	1.1	1.1	0.71				
Hydrogen chloride	Daily mean	8 mg/m^3	3.8	2.6	2	1.3	3.7	2.9				
	½ hourly mean	60 mg/m^3	3.8	2.7	2	1.4	3.7	2.95				
Sulphur dioxide	Daily mean	40 mg/m^3	1.4	0.43	0.8	0.27	2.6	0.72				
	½ hourly mean	200 mg/m^3	1.4	0.48	0.8	0.3	3.1	0.78				
Carbon monoxide	Daily mean	50 mg/m^3	23.7	18.3	26	18.5	24.7	17.7				
	95%ile 10-min avg	150 mg/m^3	1089.7	18.3	1209.5	18.5	1976	17.7				
Ammonia	Daily mean	15 mg/m^3	5.5	2.1	3.7	1.7	2.4	1.9				

Comments :

Following EA guidance and approval in July 2015, RRRL monitor particulate emissions qualitatively as opposed to quantitatively.

Monitoring of Hydrogen Chloride emissions **Whole Installation** *See Notes in Cell Q3*

2024	1/2 Hourly Reference Periods			Daily Reference Periods		
mg/Nm^3	1/2 hourly HCl ELV	Monthly mean of half-hourly averages	Highest half-hourly average	Daily HCl ELV	Monthly mean of daily averages	Highest daily average
Jan	60	2.40	5.4	8	2.37	4.9
Feb	60	2.47	5.8	8	2.47	4.9
Mar	60	2.47	6.4	8	2.37	5.0
Apr	60	2.63	8.0	8	2.60	5.0
May	60	2.23	4.5	8	2.13	3.9
Jun	60	2.23	4.5	8	2.20	3.8
Jul	60	2.70	5.1	8	2.67	4.3
Aug	60	2.70	7.5	8	2.67	4.9
Sep	60	1.63	3.9	8	1.63	2.7
Oct	60	1.80	5.4	8	1.73	3.6
Nov	60	2.07	5.6	8	2.07	3.3
Dec	60	2.57	5.3	8	2.57	4.6

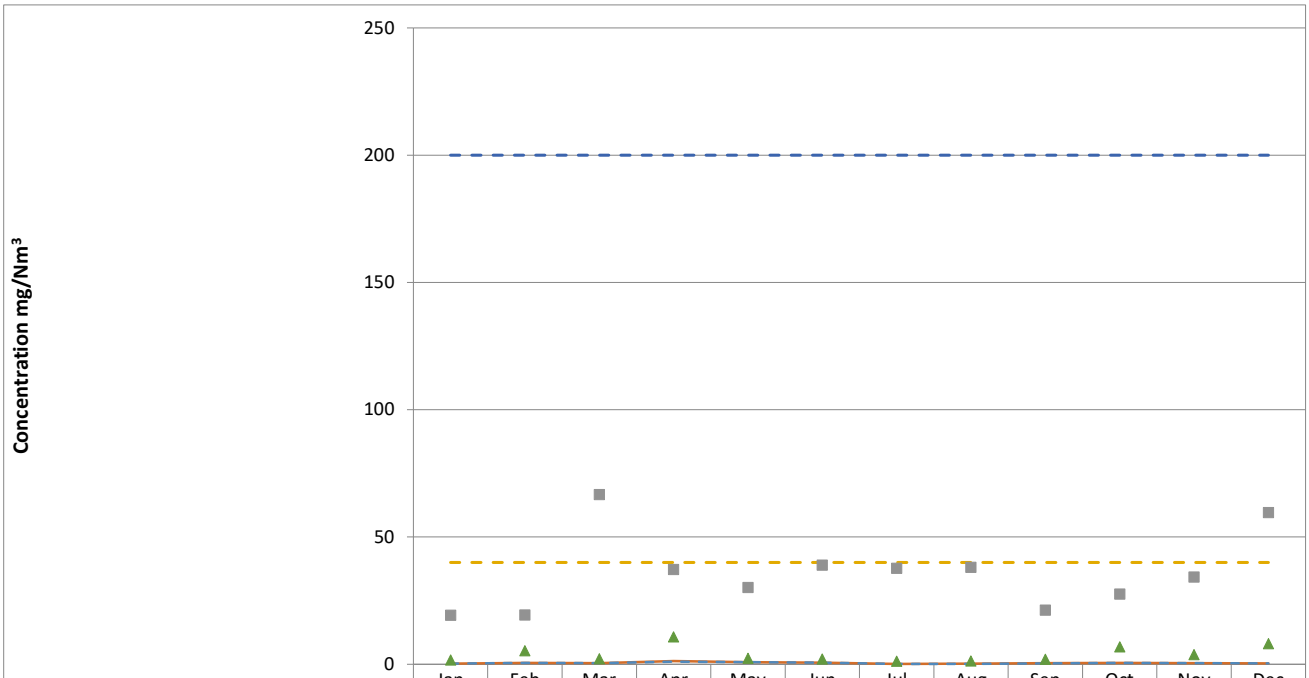


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly HCl ELV	60	60	60	60	60	60	60	60	60	60	60	60
Monthly mean of half-hourly averages	2.40	2.47	2.47	2.63	2.23	2.23	2.70	2.70	1.63	1.80	2.07	2.57
Highest half- hourly average	5.4	5.8	6.4	8.0	4.5	4.5	5.1	7.5	3.9	5.4	5.6	5.3
Daily HCl ELV	8	8	8	8	8	8	8	8	8	8	8	8
Monthly mean of daily averages	2.37	2.47	2.37	2.60	2.13	2.20	2.67	2.67	1.63	1.73	2.07	2.57
Highest daily average	4.9	4.9	5.0	5.0	3.9	3.8	4.3	4.9	2.7	3.6	3.3	4.6

Comments :

Monitoring of Sulphur dioxide emissions **Whole Installation** *See Notes in Cell Q3*

2024	1/2 Hourly Reference Periods			Daily Reference Periods		
mg/Nm^3	1/2 hourly SO2 ELV	Monthly mean of half-hourly averages	Highest half-hourly average	Daily SO2 ELV	Monthly mean of daily averages	Highest daily average
Jan	200	0.27	19.3	40	0.23	1.7
Feb	200	0.57	19.4	40	0.53	5.3
Mar	200	0.43	66.7	40	0.40	2.2
Apr	200	1.27	37.2	40	1.03	10.8
May	200	0.87	30.2	40	0.83	2.4
Jun	200	0.67	39.0	40	0.63	2.1
Jul	200	0.13	37.7	40	0.13	1.2
Aug	200	0.23	38.1	40	0.20	1.3
Sep	200	0.40	21.3	40	0.37	2.0
Oct	200	0.53	27.6	40	0.50	6.8
Nov	200	0.47	34.3	40	0.43	3.8
Dec	200	0.37	59.6	40	0.37	8.1

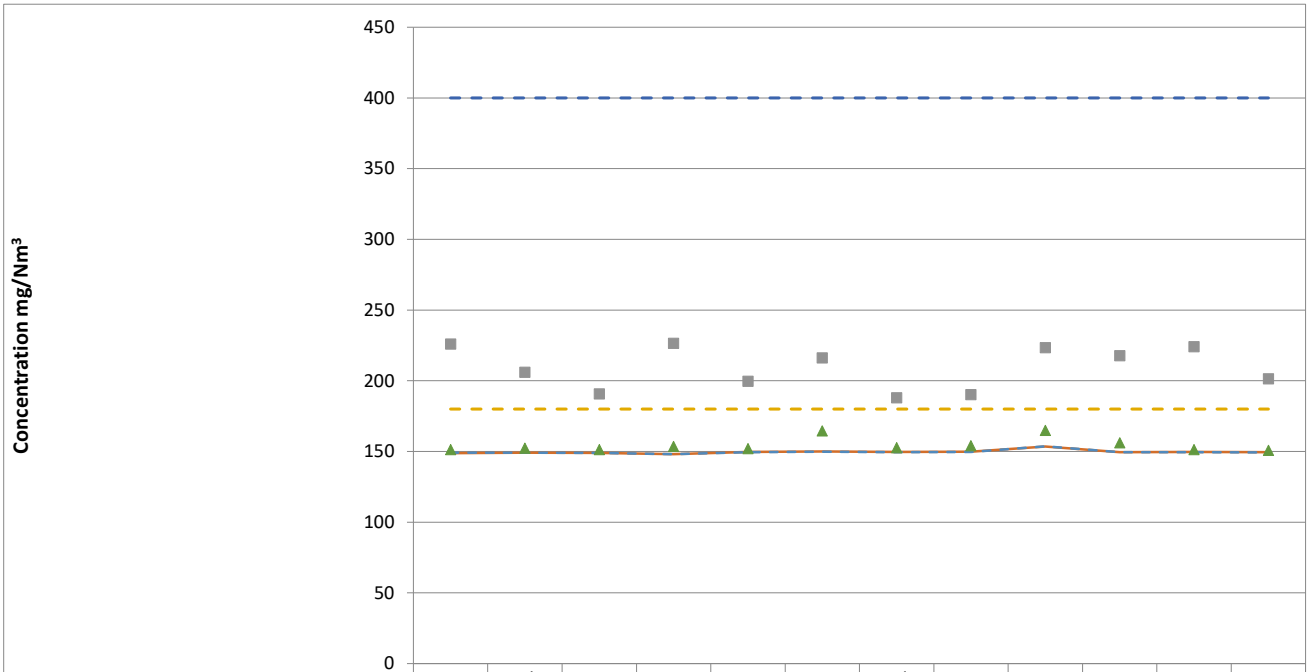


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly SO2 ELV	200	200	200	200	200	200	200	200	200	200	200	200
Monthly mean of half-hourly averages	0.27	0.57	0.43	1.27	0.87	0.67	0.13	0.23	0.40	0.53	0.47	0.37
Highest half- hourly average	19.3	19.4	66.7	37.2	30.2	39.0	37.7	38.1	21.3	27.6	34.3	59.6
Daily SO2 ELV	40	40	40	40	40	40	40	40	40	40	40	40
Monthly mean of daily averages	0.23	0.53	0.40	1.03	0.83	0.63	0.13	0.20	0.37	0.50	0.43	0.37
Highest daily average	1.7	5.3	2.2	10.8	2.4	2.1	1.2	1.3	2.0	6.8	3.8	8.1

Comments :

Monitoring of Oxides of Nitrogen emissions **Whole Installation** *See Notes in Cell Q3*

2024	1/2 Hourly Reference Periods			Daily Reference Periods		
mg/Nm^3	1/2 hourly NOx ELV	Monthly mean of half-hourly averages	Highest half-hourly average	Daily NOx ELV	Monthly mean of daily averages	Highest daily average
Jan	400	148.87	226.1	180	149.07	151.30
Feb	400	149.07	206.1	180	149.07	152.50
Mar	400	148.97	190.7	180	148.90	151.30
Apr	400	148.10	226.6	180	148.10	153.60
May	400	149.60	199.7	180	149.53	152.10
Jun	400	149.93	216.3	180	149.90	164.70
Jul	400	149.63	188.0	180	149.53	152.70
Aug	400	149.77	190.3	180	149.73	154.10
Sep	400	153.50	223.4	180	153.63	164.90
Oct	400	149.57	217.7	180	149.53	156.20
Nov	400	149.67	224.1	180	149.50	151.40
Dec	400	149.47	201.5	180	149.40	150.90

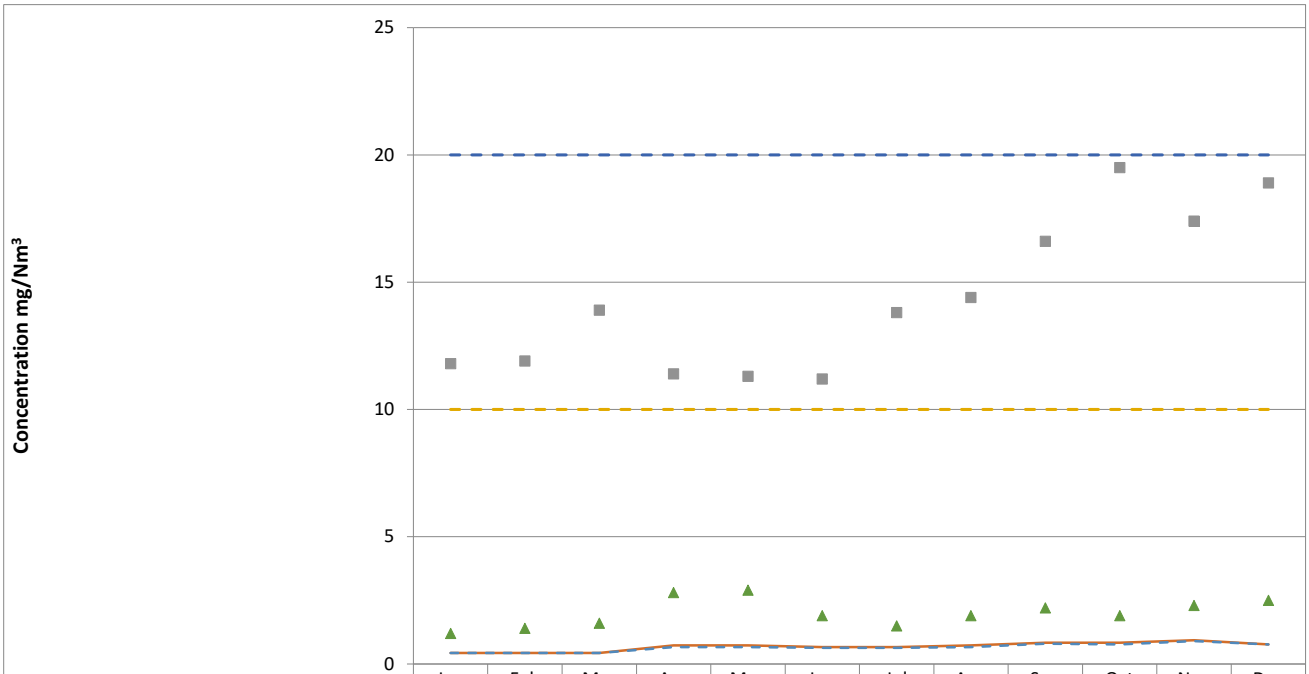


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly NOx ELV	400	400	400	400	400	400	400	400	400	400	400	400
Monthly mean of half-hourly averages	148.87	149.07	148.97	148.10	149.60	149.93	149.63	149.77	153.50	149.57	149.67	149.47
Highest half- hourly average	226.1	206.1	190.7	226.6	199.7	216.3	188.0	190.3	223.4	217.7	224.1	201.5
Daily NOx ELV	180	180	180	180	180	180	180	180	180	180	180	180
Monthly mean of daily averages	149.07	149.07	148.90	148.10	149.53	149.90	149.53	149.73	153.63	149.53	149.50	149.40
Highest daily average	151.30	152.50	151.30	153.60	152.10	164.70	152.70	154.10	164.90	156.20	151.40	150.90

Comments :

Monitoring of Total organic carbon emissions **Whole Installation** *See Notes in Cell Q3*

2024	1/2 Hourly Reference Periods			Daily Reference Periods		
mg/Nm^3	1/2 hourly TOC ELV	Monthly mean of half-hourly averages	Highest half-hourly average	Daily TOC ELV	Monthly mean of daily averages	Highest daily average
Jan	20	0.43	11.8	10	0.43	1.2
Feb	20	0.43	11.9	10	0.43	1.4
Mar	20	0.43	13.9	10	0.43	1.6
Apr	20	0.73	11.4	10	0.67	2.8
May	20	0.73	11.3	10	0.67	2.9
Jun	20	0.67	11.2	10	0.63	1.9
Jul	20	0.67	13.8	10	0.63	1.5
Aug	20	0.73	14.4	10	0.67	1.9
Sep	20	0.83	16.6	10	0.80	2.2
Oct	20	0.83	19.5	10	0.77	1.9
Nov	20	0.93	17.4	10	0.90	2.3
Dec	20	0.77	18.9	10	0.77	2.5



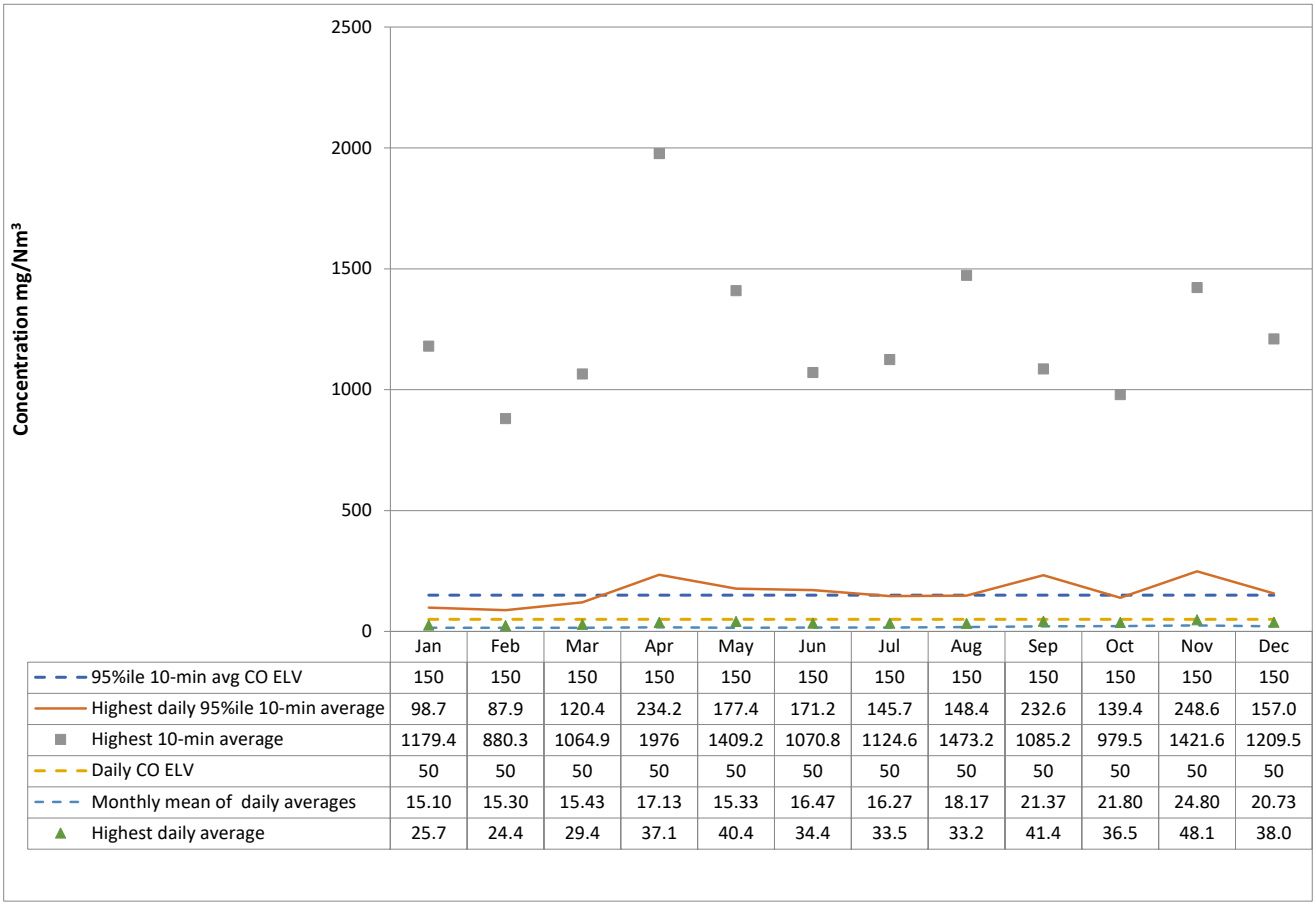
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly TOC ELV	20	20	20	20	20	20	20	20	20	20	20	20
Monthly mean of half-hourly averages	0.43	0.43	0.43	0.73	0.73	0.67	0.67	0.73	0.83	0.83	0.93	0.77
Highest half- hourly average	11.8	11.9	13.9	11.4	11.3	11.2	13.8	14.4	16.6	19.5	17.4	18.9
Daily TOC ELV	10	10	10	10	10	10	10	10	10	10	10	10
Monthly mean of daily averages	0.43	0.43	0.43	0.67	0.67	0.63	0.63	0.67	0.80	0.77	0.90	0.77
Highest daily average	1.2	1.4	1.6	2.8	2.9	1.9	1.5	1.9	2.2	1.9	2.3	2.5

Comments :

Monitoring of Carbon Monoxide (10-minute avg) **Whole Installation** *See Notes in Cell S3*

Please complete this tab for your plant if you have 10-minute average CO ELVs; otherwise, leave it blank and complete the CO 0.5 hourly tab

2024	10-minute Reference Periods				Daily Reference Periods		
mg/Nm^3	95%ile 10-min avg CO ELV	Highest daily 95%ile 10-min average	Monthly mean of 10-min averages	Highest 10-min average	Daily CO ELV	Monthly mean of daily averages	Highest daily average
Jan	150	98.7	15.07	1179.4	50	15.10	25.7
Feb	150	87.9	15.37	880.3	50	15.30	24.4
Mar	150	120.4	15.33	1064.9	50	15.43	29.4
Apr	150	234.2	17.10	1976	50	17.13	37.1
May	150	177.4	15.43	1409.2	50	15.33	40.4
Jun	150	171.2	16.53	1070.8	50	16.47	34.4
Jul	150	145.7	16.30	1124.6	50	16.27	33.5
Aug	150	148.4	18.23	1473.2	50	18.17	33.2
Sep	150	232.6	21.40	1085.2	50	21.37	41.4
Oct	150	139.4	21.80	979.5	50	21.80	36.5
Nov	150	248.6	25.07	1421.6	50	24.80	48.1
Dec	150	157.0	20.73	1209.5	50	20.73	38.0



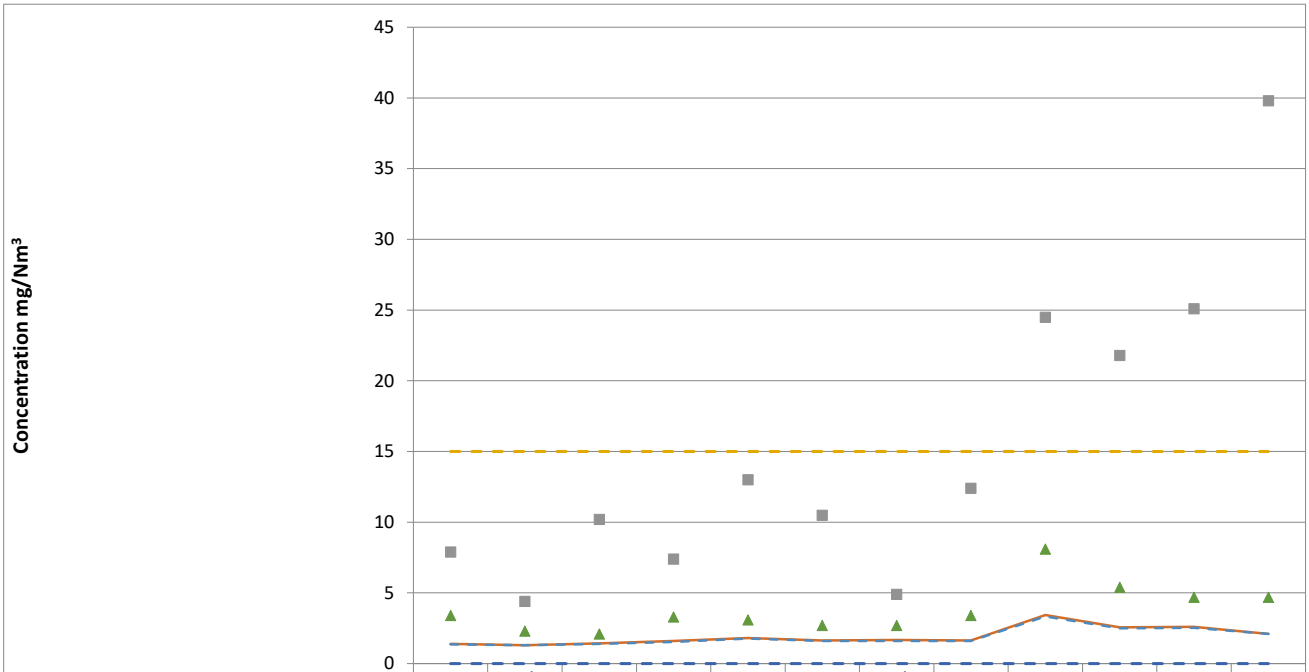
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
95%ile 10-min avg CO ELV	150	150	150	150	150	150	150	150	150	150	150	150
Highest daily 95%ile 10-min average	98.7	87.9	120.4	234.2	177.4	171.2	145.7	148.4	232.6	139.4	248.6	157.0
Highest 10-min average	1179.4	880.3	1064.9	1976	1409.2	1070.8	1124.6	1473.2	1085.2	979.5	1421.6	1209.5
Daily CO ELV	50	50	50	50	50	50	50	50	50	50	50	50
Monthly mean of daily averages	15.10	15.30	15.43	17.13	15.33	16.47	16.27	18.17	21.37	21.80	24.80	20.73
Highest daily average	25.7	24.4	29.4	37.1	40.4	34.4	33.5	33.2	41.4	36.5	48.1	38.0

Comments :

Environment Agency explanatory note: The 10-minute average ELV is based on the “95th percentile”. In this case this means that 95% of the 10 minute averages in the relevant 24-hour period (i.e. 137) must be below 150 mg/Nm3, and 5% (i.e. 7) are allowed to be any value above 150 mg/Nm3. Whilst we expect operators to minimise CO emissions at all times, it is perfectly acceptable for the value of the maximum 10-minute average to be above 150 mg/Nm3, provided the 95th percentile ELV has been met for that period.

Monitoring of Ammnonia emissions **Whole Installation** *See Notes in Cell Q3*

2024	1/2 Hourly Reference Periods			Daily Reference Periods		
mg/Nm^3	1/2 hourly NH3 ELV	Monthly mean of half-hourly averages	Highest half-hourly average	Daily NH3 ELV	Monthly mean of daily averages	Highest daily average
Jan	None	1.40	7.9	15	1.37	3.4
Feb	None	1.30	4.4	15	1.30	2.3
Mar	None	1.43	10.2	15	1.40	2.1
Apr	None	1.60	7.4	15	1.53	3.3
May	None	1.80	13	15	1.77	3.1
Jun	None	1.63	10.5	15	1.60	2.7
Jul	None	1.67	4.9	15	1.60	2.7
Aug	None	1.63	12.4	15	1.60	3.4
Sep	None	3.43	24.5	15	3.33	8.1
Oct	None	2.57	21.8	15	2.50	5.4
Nov	None	2.60	25.1	15	2.53	4.7
Dec	None	2.10	39.8	15	2.10	4.7



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1/2 hourly NH3 ELV	0	0	0	0	0	0	0	0	0	0	0	0
Monthly mean of half-hourly averages	1.40	1.30	1.43	1.60	1.80	1.63	1.67	1.63	3.43	2.57	2.60	2.10
Highest half- hourly average	7.9	4.4	10.2	7.4	13	10.5	4.9	12.4	24.5	21.8	25.1	39.8
Daily NH3 ELV	15	15	15	15	15	15	15	15	15	15	15	15
Monthly mean of daily averages	1.37	1.30	1.40	1.53	1.77	1.60	1.60	1.60	3.33	2.50	2.53	2.10
Highest daily average	3.4	2.3	2.1	3.3	3.1	2.7	2.7	3.4	8.1	5.4	4.7	4.7

Comments :

An indicated ELV value of zero in the table above means that no ammonia limit is/was set in the permit.

Log of changes to template (Environment Agency use only)

Date	Description of change	New version number and date
16/01/2024	Air (periodic) tab: corrected default O2 reference from 6 to 11%	Version 23.5a (for incinerators) - 16/01/2024
23/09/2024	Air (periodic) tab: corrected symbol for Thallium to Tl	
23/09/2024	Air (periodic) tab: removed last year's references to different emission limit values applying from 03/12/23 and updated all relevant ELVs	
23/09/2024	Tabs for continuously monitored pollutants (HCl, SO2 etc.): changed terminology in table headings to improve clarity	
23/09/2024	Tabs for continuously monitored pollutants (HCl, SO2 etc.): removed last year's references to different emission limit values applying from 03/12/23 and updated all relevant ELVs	
23/09/2024	Perf 1 tab: updated formula for water usage to report m3 rather than litres and corrected error with formula copying operator name	
23/09/2024	Operational Summary tab: table added on start-ups and shut-downs	
23/09/2024	Operational Summary tab: table added on dioxins and mercury protocols	
23/09/2024	Operational Summary tab: table added on AST, QAL 2 and calibration functions	
23/09/2024	CO2 N2O tab: various changes made to notes to reflect the fact that most plants should now have calibrated CEMS and flow meters + some have C14 samplers and more up to date industry data	Version 24a (for incinerators) - 23/09/24
08/11/2024	CO2 N2O tab: Changed the N2O CO2 equivalence factor from 298 to 265 in line with recently updated government greenhouse gas figures: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2024	
08/11/2024	CO2 N2O tab: Added an additional requirement for municipal EfW plants to state the yearly average biogenic percentage of the waste by mass, and reference to a document which sets out a methodology for calculating NCV of waste from the results of C14 sampling.	
08/11/2024	Permit Compliance tab: Two additional columns added + explanatory notes to the table entitled "Summary of non-compliances under the permit" to allow CCS scores to be stated where relevant.	
08/11/2024	Residue Quality tab: Note added explaining application of TOC and LOI limits and asking operators to report both metrics where measured.	Version 24.1a (for incinerators) - 08/11/24
27/11/2024	Operational Summary tab: Tables on mercury & dioxins protocols and ASTs removed (covered instead by new tables added to updated Air 9 periodic monitoring form)	Version 24.2a (for incinerators) - 27/11/24