



Ferrybridge MFE Ltd – Ferrybridge Multifuel 1

Annual Environment Report 2018

Matt Hardy
25th January 2019

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Permit Number: EPR/SP3239FU/V005

Year: 2018

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.

1. Introduction

Name and address of plant	Ferrybridge Multifuel 1 Kirkhaw Lane Knottingley West Yorkshire WF11 8DX
Description of waste input	Refuse Derived Fuel
Operator contact details if members of the public have any questions	01977 636700 admin@multifuelenergy.com

2. Plant description

The installation is located on land adjacent to the former Ferrybridge 'C' Power Station Site, close to the A1 (M). It lies 1km north-west of the village of Ferrybridge, 2km north-west of Knottingley, 1.9km south-east of Ferry Fryston, and 3 km northeast of Pontefract. Grid reference SE 447335, 424995.

Refuse derived fuel is delivered by road and the facility has a throughput limit of 675,000 tonnes per annum. The installation generates approximately 80MWe of electricity, of which approximately 73MWe is exported.

The installation consists of two combustion lines, waste reception, waste storage, water use, drainage, flue gas and air supply systems, boilers, facilities for the treatment of exhaust gases, on-site facilities for treatment and storage of residues and water recycling, stacks, devices and systems for controlling incineration operations, recording and monitoring conditions.

Moving grate technology is used for burning the waste material, the furnace design ensures that a temperature of at least 850°C for a period of at least two seconds is achieved in the combustion chamber. To ensure that the temperature does not fall below 850°C, auxiliary burners firing a fuel of low sulphur gas oil is automatically triggered by online process monitoring equipment.

Hot gases from the furnace pass into a boiler and the steam raised in the boiler passes through a turbine to generate electricity for export to the National Grid.

There are four components to the flue gas cleaning before combustion gases are released to atmosphere;

- Selective Non-Catalytic Reduction (SNCR), involving the injection of ammonia into the combustion chamber above the flame, provides for the abatement of nitrogen oxides;
- dry lime reagent, injected to neutralise acid gas compounds;
- activated carbon, injected to absorb mercury, dioxins and furans;
- bag filtration to remove fine particulates which are collected in the residues silo.

Cleaned flue gases exiting the abatement system are discharged through the 100m tall stack. Each boiler line has its own flue.

There are no discharges to controlled waters apart from uncontaminated surface water which is discharged to Fryston Beck via two discharge points. All waste waters from on-site processes are reused within the installation during normal operating conditions.

Any potential odours from the storage of waste materials are extracted from the Storage Bunker and Tipping Hall and used as combustion air within the furnace, thereby destroying any potentially odorous compounds.

The FM1 Environmental Management System was accredited to the ISO14001:2015 International Standard in April 2018 by LRQA. Compliance with the standard is closely monitored through an established internal audit programme carried out by 5 trained internal auditors.

3. Summary of Plant Operation

Refuse-derived fuel received	647,085 tonnes
Total waste received	647,085 tonnes
Total plant operational hours	8,279 hours
Total hours of "abnormal operation" (see permit for definition)	11.5 hours
Total quantity of incinerator bottom ash (IBA) produced	128,112 tonnes
Disposal or recovery route for IBA	R5 – Processed for re-use
Did any batches of IBA test as hazardous? If yes, state quantity	none
Total quantity of air pollution control (APC) residues produced	27,070 tonnes
Disposal or recovery route for APC residues	R5 – Processed for re-use D9 – Acid neutralisation followed by non-hazardous landfill
Total electricity generated for export to the National Grid	586,510 MWh

In 2018, plant performance and availability has been very good with 94.5% availability for the 2 boilers and 98.4% availability for the turbine.

Boiler 1 underwent a planned outage from 10th to 23rd September and a further 6 days off line in 2018 to repair a grate cooling hose and a superheater drain leak. Boiler 2 was taken off line for a planned outage from 18th September to 3rd October then underwent an further 3 days off line to repair a furnace wall tube leak.

The turbine was taken off line for 4 days during the September boiler outages for routine inspection of the HP header, turbine availability was excellent throughout 2018, performing well and without any significant losses.

The Incinerator Bottom Ash (IBA) is taken to Ballast Phoenix processing facility in Sheffield where it is reprocessed into graded aggregates and ferrous and non-ferrous metal products for use in the construction and metal industries. Ballast Phoenix are constructing a processing facility at Ferrybridge to receive all of the IBA from both FM1 and also the adjacent FM2 site which commences operation in 2019.

Ferrous metals removed during on site processing of IBA are forwarded to PJP Group in Shafon, South Yorkshire where they are separated into fractions, and recycled.

Air Pollution Control Residue (APCr), removed from the process are mostly sent to Castle Environmental in Ilkeston, Derbyshire where it is used to neutralise spent acid wastes before final disposal at non-hazardous landfill. Castle Environmental also take some of the FM1 APCr to Stoke for reprocessing into construction products.

Another recycled aggregate producer Carbon8 have built an APCr reprocessing facility in Leeds and receive up to 5% of FM1's APCr for reprocessing.

4. Summary of Plant Emissions

4.1 Summary of continuous emissions monitoring results for emissions to air

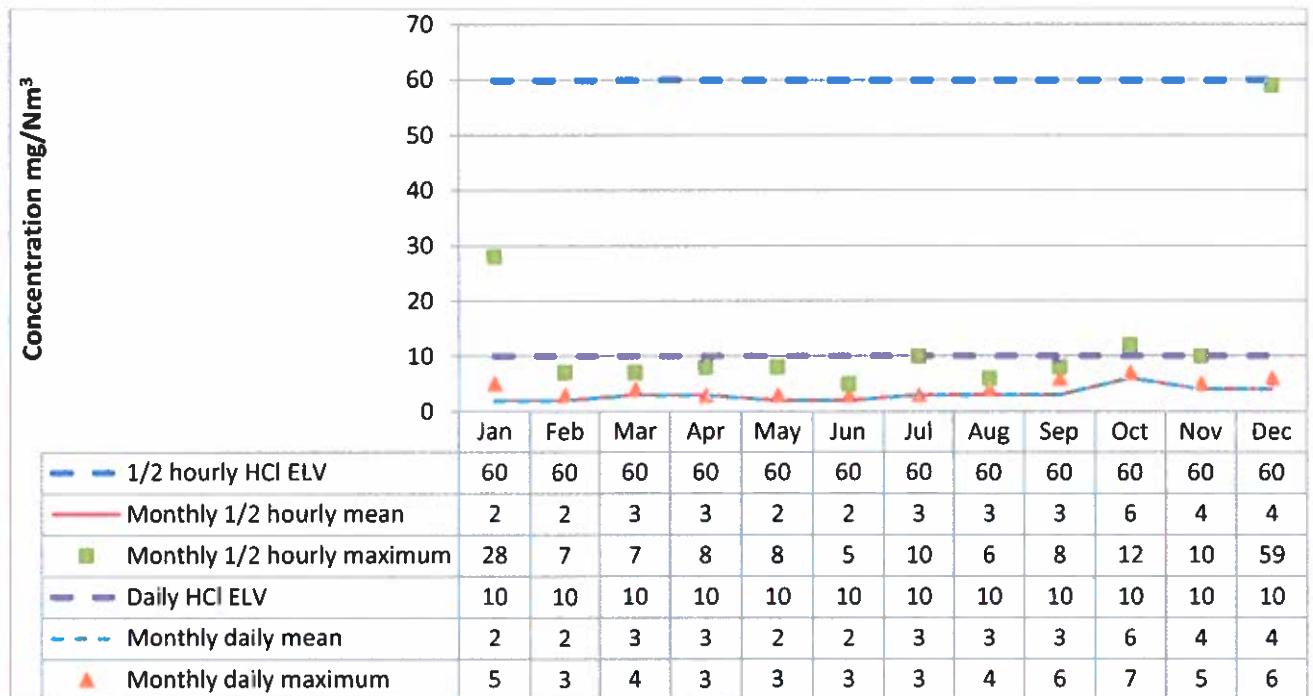
In compliance with the IED and Environmental Permit requirements, the flue gases are continuously monitored using MCERTS accredited monitoring equipment. In addition to the continuous monitoring, the 6 monthly periodic extractive sampling reported in Section 4.2 is undertaken by an approved service supplier. The supplier is accredited by both the United Kingdom Accreditation Service (UKAS) and the Environment Agency's Monitoring Certification Scheme (MCERTS).

The following charts show the performance of the plant against its emission limit values (ELVs) for substances that are continuously monitored.

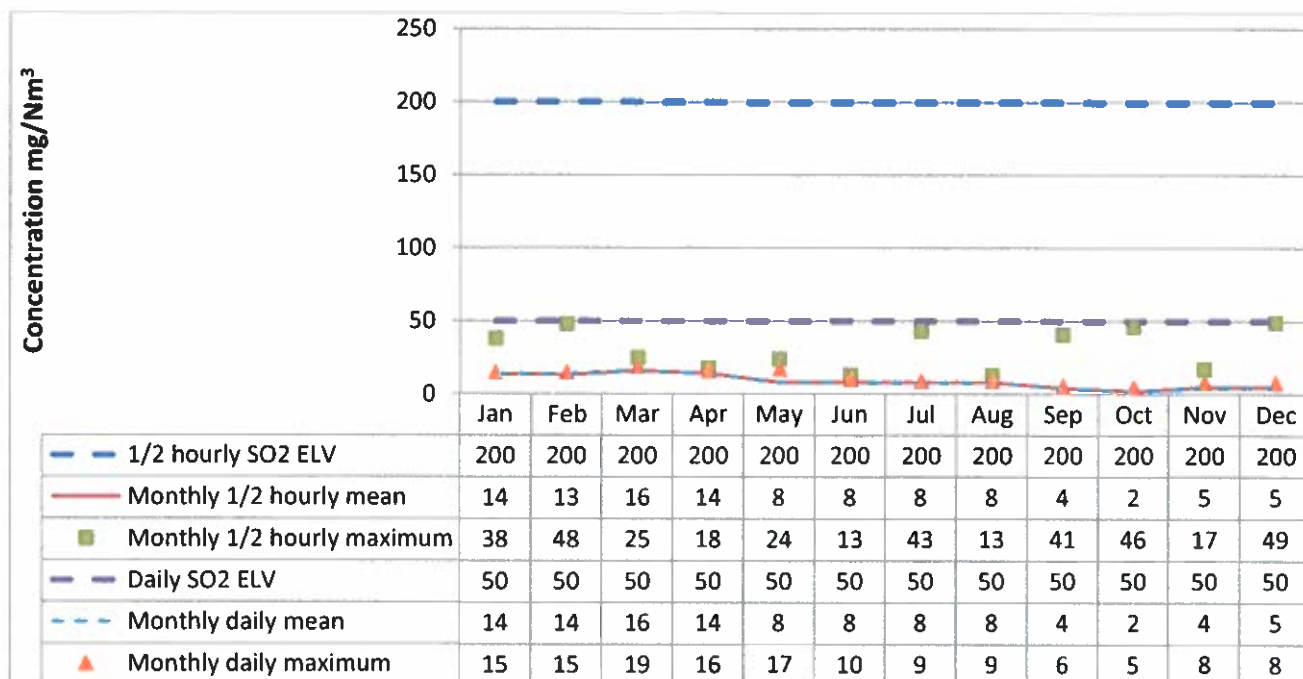


FM1 Monthly
Emissions Summary i

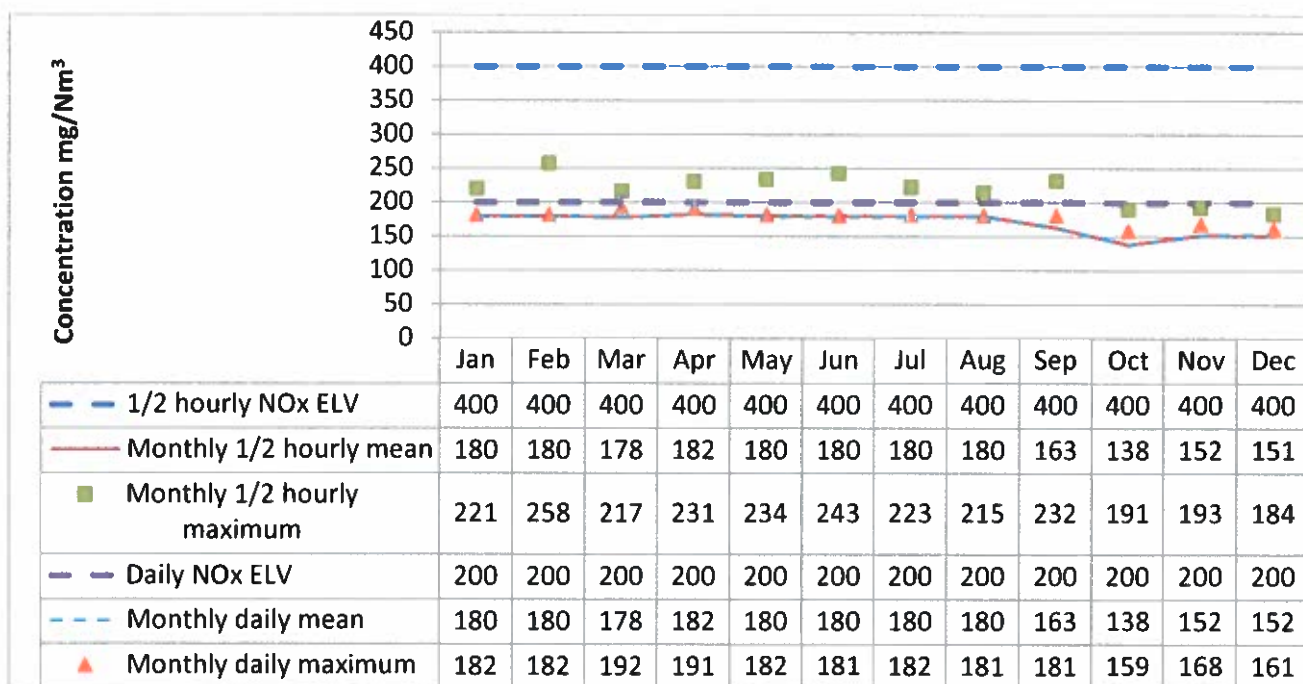
Line A1 - Hydrogen Chloride



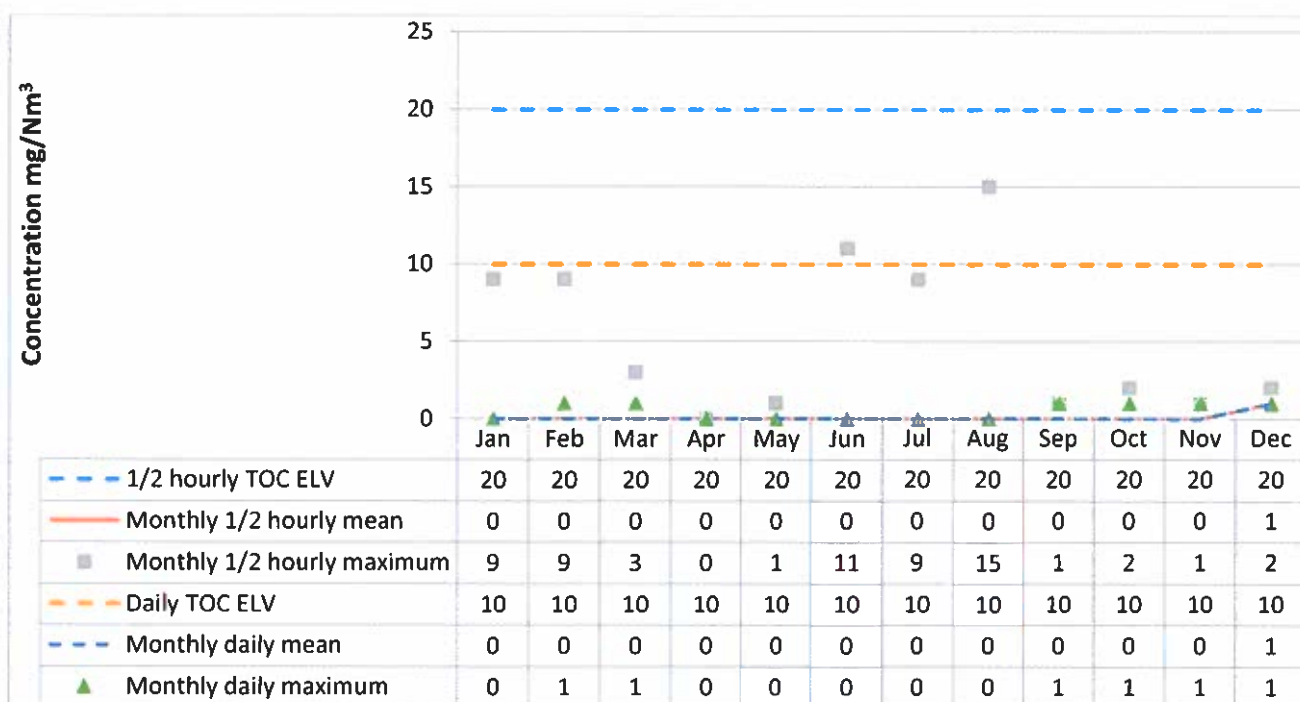
Line A1 – Sulphur Dioxide



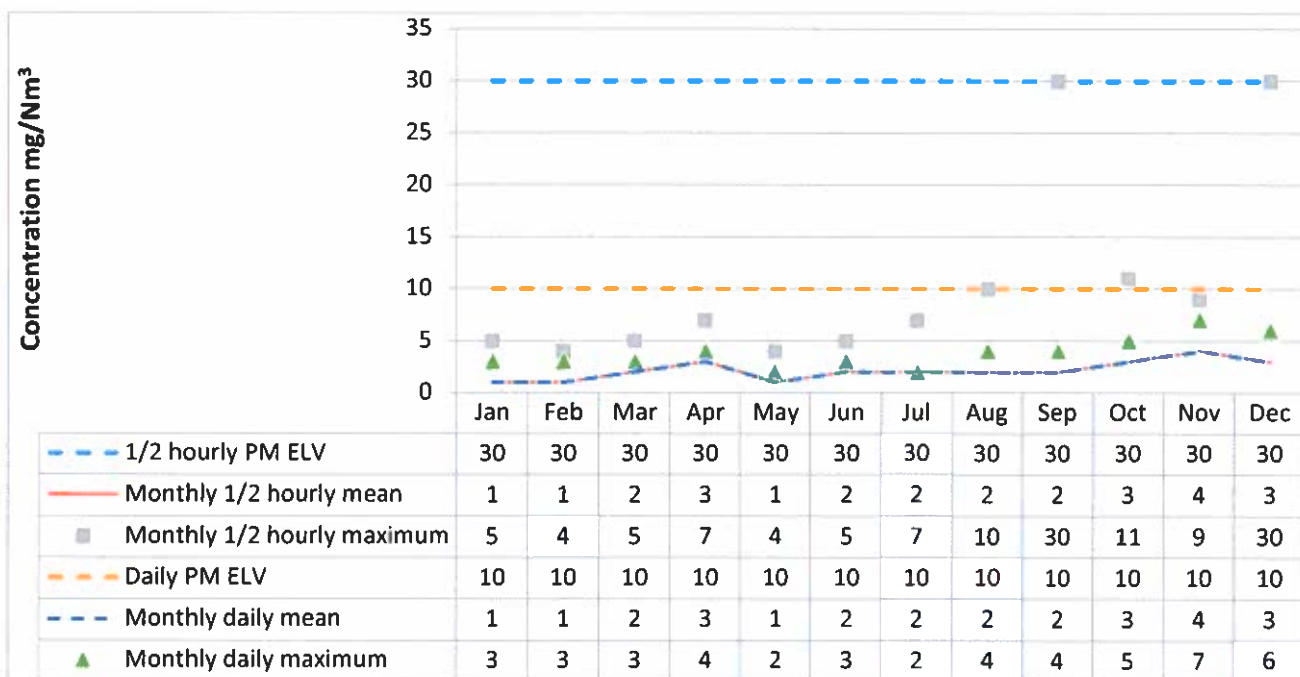
Line A1 – Oxides of Nitrogen



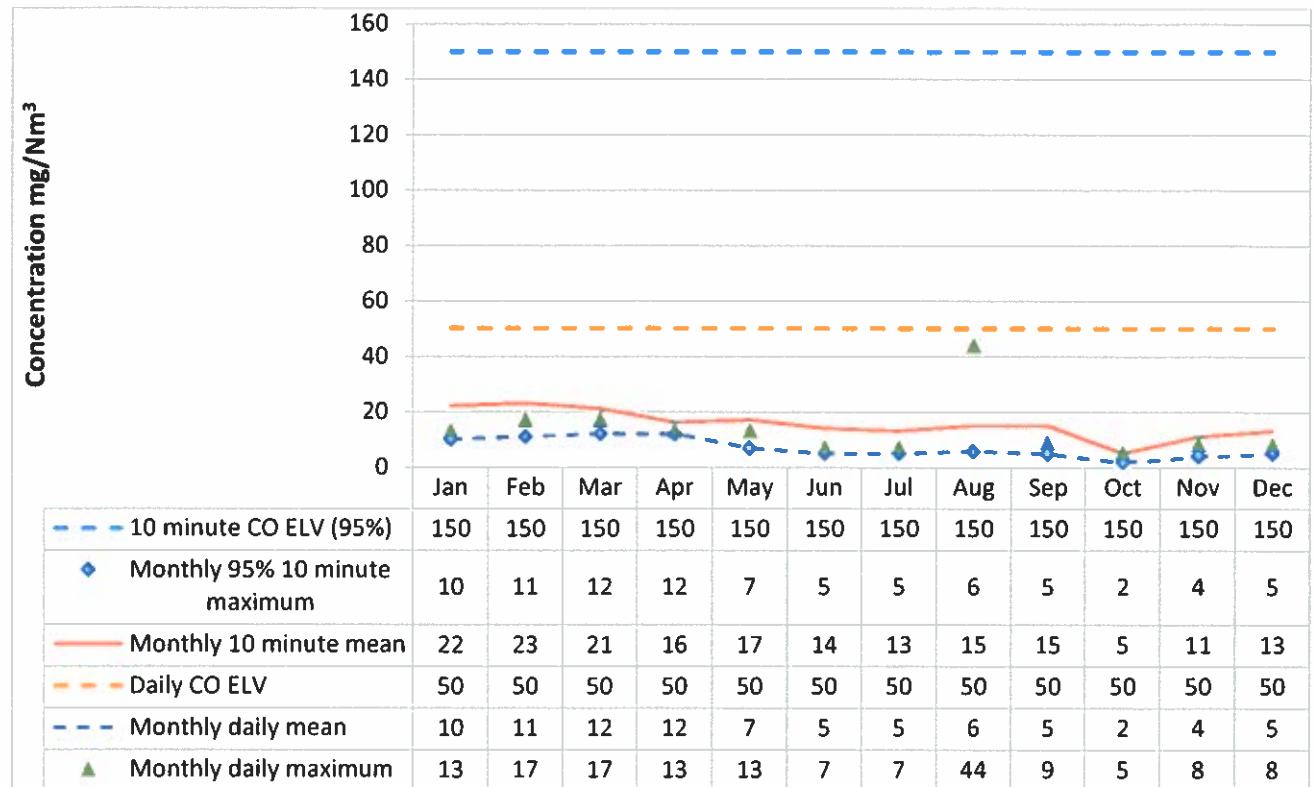
Line A1 – Total Organic Carbon



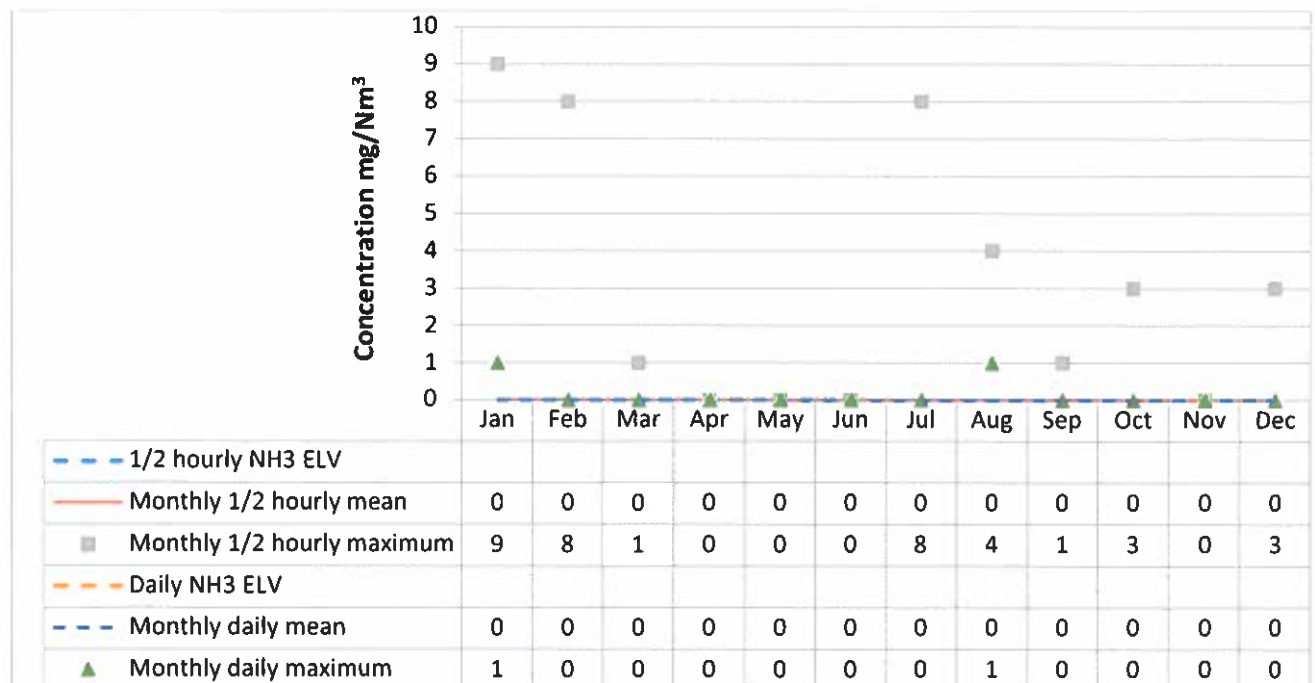
Line A1 – Particulates



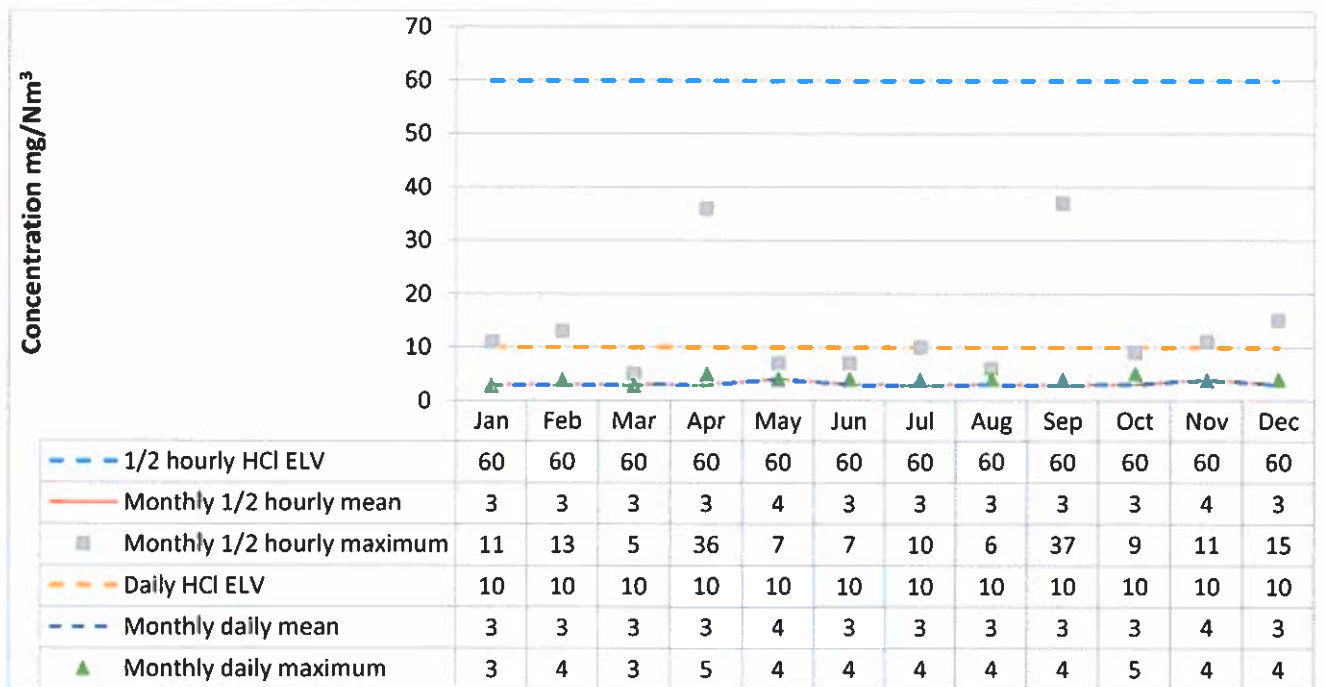
Line A1 – Carbon Monoxide



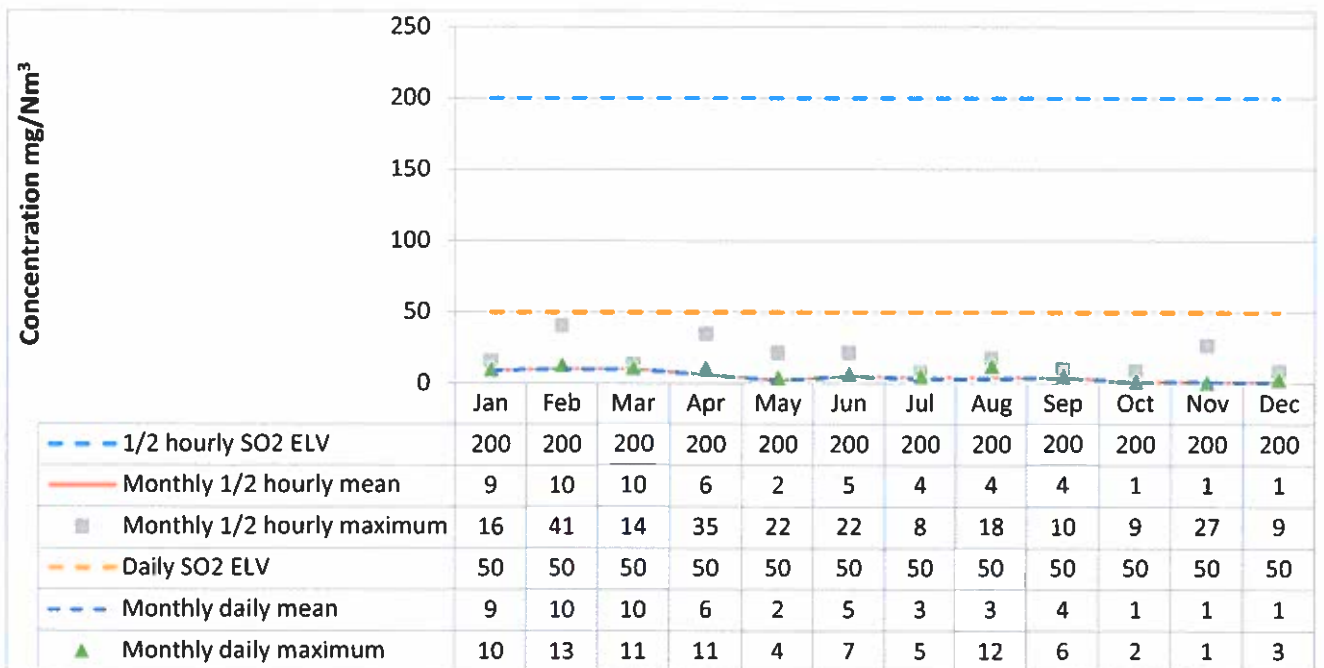
Line A1 – Ammonia



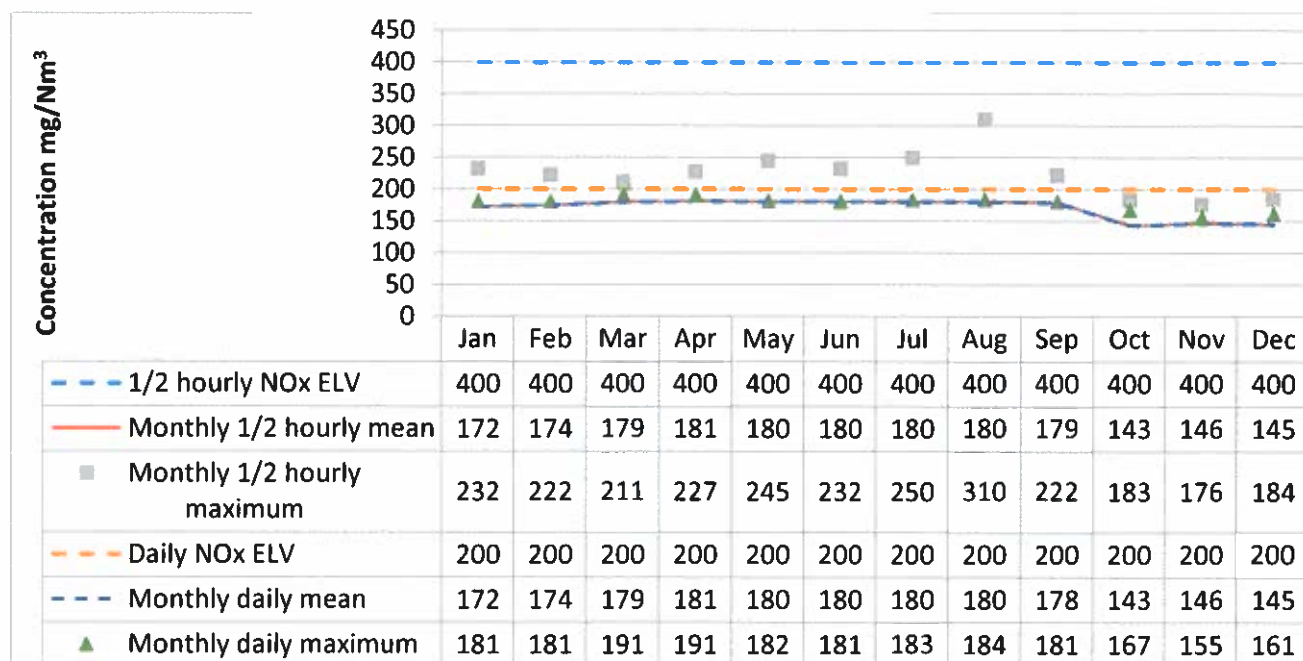
Line A2 – Hydrogen Chloride



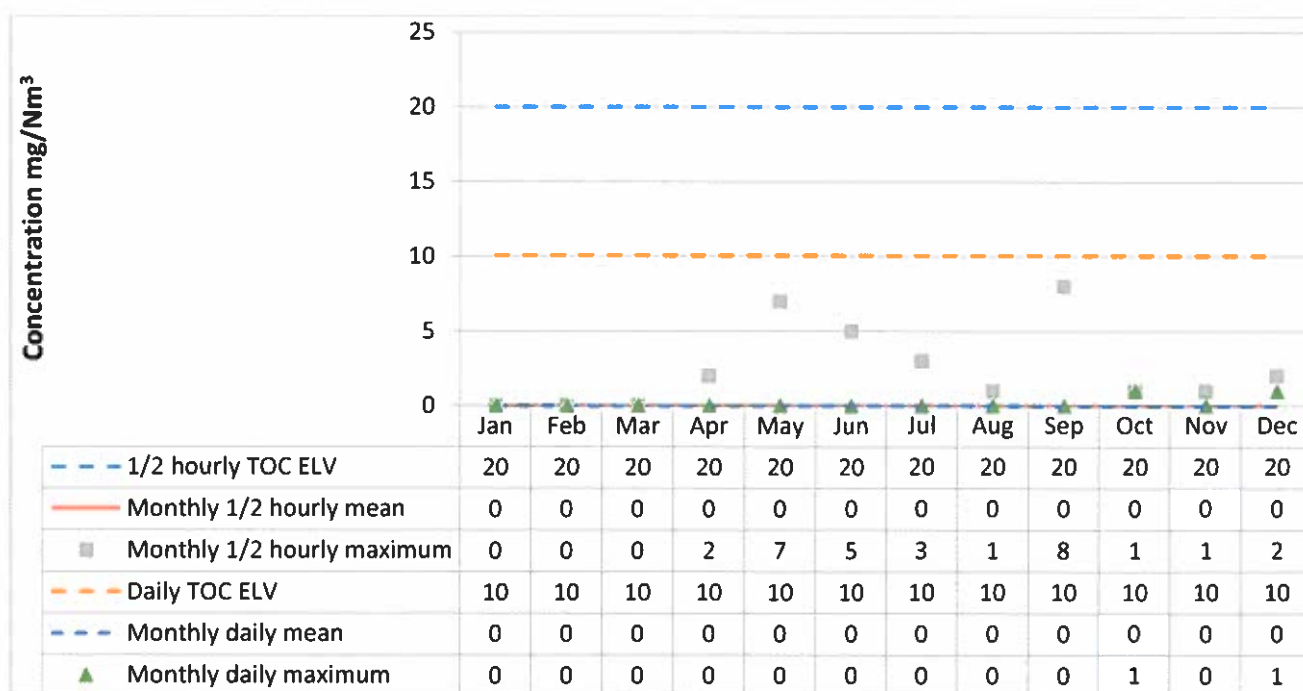
Line A2 – Sulphur Dioxide



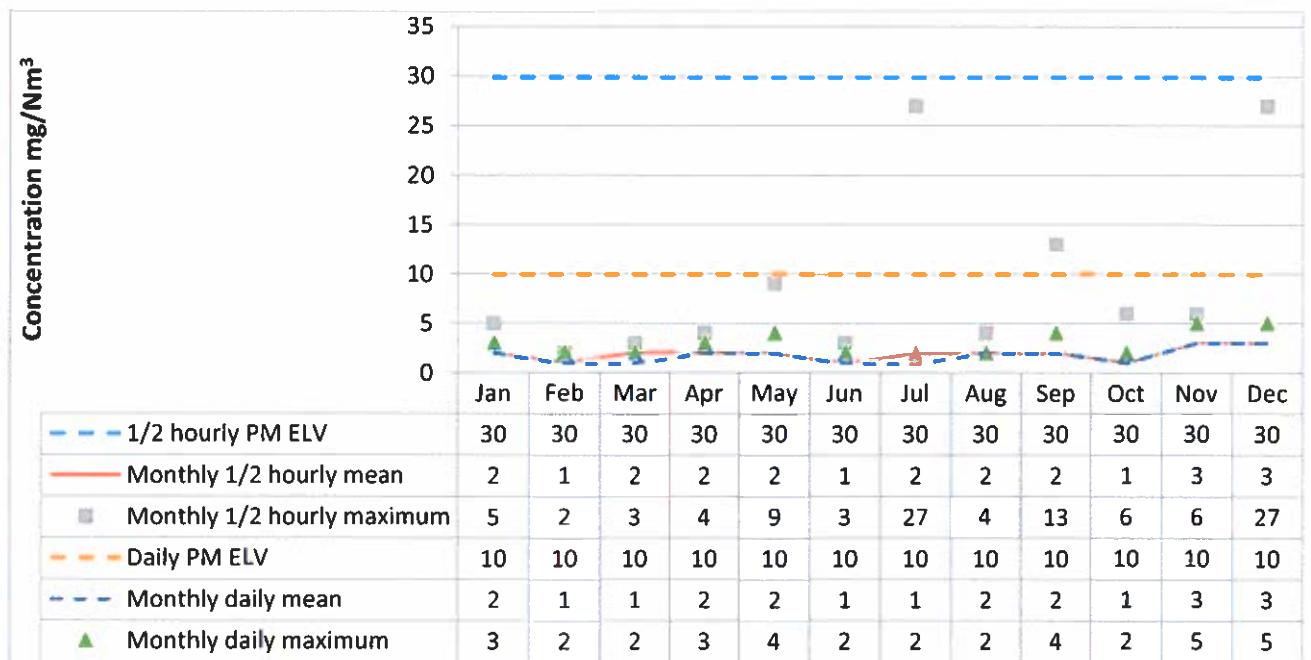
Line A2 – Oxides of Nitrogen



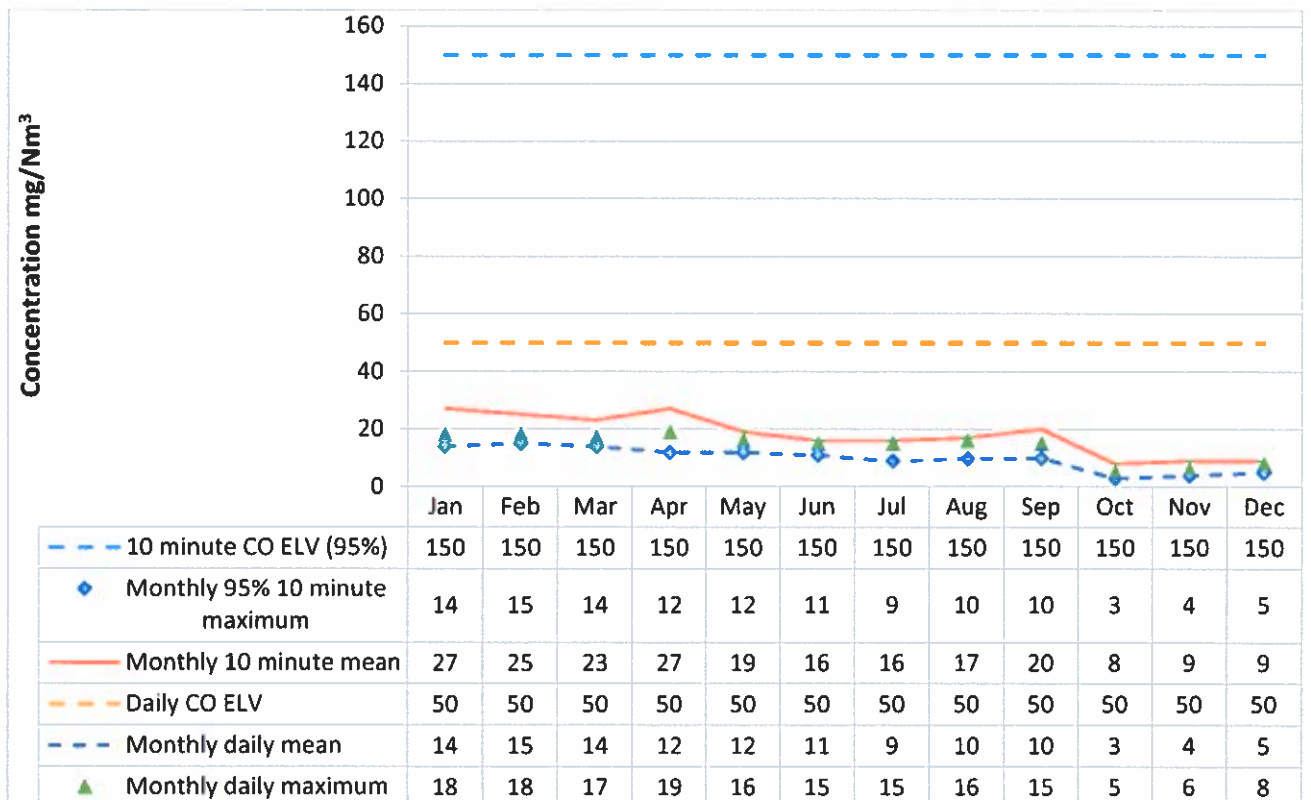
Line A2 – Total Organic Carbon



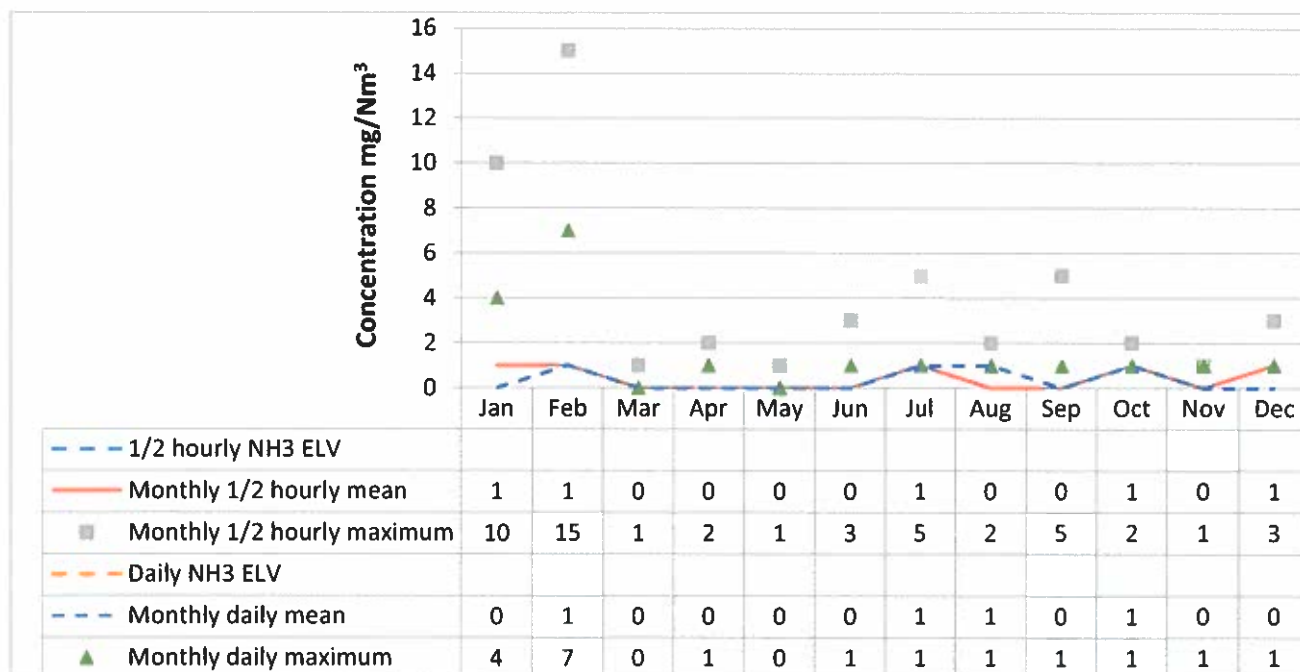
Line A2 – Particulates



Line A2 – Carbon Monoxide



Line A2 – Ammonia



4.2 Summary of periodic monitoring results for emissions to air

The table below shows the results of periodically monitored substances.

Line A1

Substance	Emission limit value	Results	
		18, 19/01/2018 and 06/03/2018	24 and 25/07/2018
Mercury and its compounds	0.05 mg/m ³	0.0009 mg/m ³	0.001 mg/m ³
Cadmium & thallium and their compounds (total)	0.05 mg/m ³	<0.0005 mg/m ³	0.003 mg/m ³
Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m ³	0.009 mg/m ³	0.35 mg/m ³
Dioxins and furans (I-TEQ)	0.1 ng/m ³	0.0039 ng/m ³	0.0037 ng/m ³
Hydrogen Fluoride	2 mg/m ³	<0.04 mg/m ³	<0.04 mg/m ³

Line A2

Substance	Emission limit value	Results	
		16 and 17/01/2018	23, 26 and 27/07/2018
Mercury and its compounds	0.05 mg/m ³	0.01 mg/m ³	0.002 mg/m ³
Cadmium & thallium and their compounds (total)	0.05 mg/m ³	<0.0006 mg/m ³	0.001 mg/m ³
Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m ³	0.01 mg/m ³	0.032 mg/m ³
Dioxins and furans (I-TEQ)	0.1 ng/m ³	0.0037 ng/m ³	0.0044 ng/m ³
Hydrogen Fluoride	2 mg/m ³	<0.06 mg/m ³	<0.06 mg/m ³

4.3 Summary of monitoring results for emissions to water

The plant is designed to have zero effluent discharge and only clean surface water is discharged to Fryston Beck.

Waste water is designed to be utilised in the plant via the bottom ash expellers. During periods of boiler maintenance, excess waste water is transported off site by road tanker for disposal at the Knostrop Water Treatment Facility in Leeds operated by FCC Environment.

5. Summary of Permit Compliance

5.1 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	
	Half-hourly limit	Daily limit
Particulates	100 %	100 %
Oxides of nitrogen	100 %	100 %
Sulphur dioxide	100 %	100 %
Carbon monoxide	100 % 95% of 10-min averages	100 %
Total organic carbon	100 %	100 %
Hydrogen chloride	100 %	100 %
Hydrogen fluoride	100 %	100 %

5.2 Summary of any notifications or non-compliances under the permit

Date	Summary of notification or non-compliance	Reason	Measures taken to prevent reoccurrence
	None		

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

Date of complaint	Summary of complaint	Reason for complaint including whether substantiated by the operator or the EA	If substantiated, measures to prevent reoccurrence
23/04/2018	Local resident reported car coated in dust on driveway	Not substantiated, dust emissions were low during the period, complainant agreed another source was more likely	
25/06/2018	Local resident reported a TCP like odour	Not substantiated, plant was in normal operation and wind direction was away from complainant	

Several external complaints were received during 2018 regarding vehicles attending the FM1 site passing through a weight restricted area and also causing traffic issues on the A162 slip lane. All complaints were investigated and where attributable to a vehicle attending FM1, the driver's behaviour was reported to the supplier or haulier for action.

6. Summary of plant improvements

Summary of any permit improvement conditions that have been completed within the year and the resulting environmental benefits.
None
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.
None
Summary of any other improvements made to the plant or planned to be made and a summary of the resulting environmental benefits.
None

7. Use of Rejected Heat

Every practicable opportunity to use the heat rejected at the steam condensers for beneficial local use is investigated. The necessary works were conducted in 2016 to install pipework to allow heat offtake from the steam turbine. This is in line with a number of potential heat "customers" becoming available both in the short and long term, and discussions with Wakefield Metropolitan District Council.

The site is currently not able to further explore heat offtake agreements due to being tied to a capacity market contract.

APPENDIX 1 – Ferrybridge Multifuel Energy Annual Returns

In accordance with Condition 4.2.2 of EPR/SP3239FU/V005.

Form: Performance 1;

- 2018 Annual Reporting of Waste Disposal and Recovery (01/01/2018 to 31/12/2018)
- 2018 Annual Reporting of Water and Other Raw Material Usage (01/01/2018 to 31/12/2018)
- 2018 Annual Reporting of other performance indicators (01/01/2018 to 31/12/2018)

Form: Energy 1;

- 2018 Annual Reporting of Energy Usage/Export (01/01/2018 to 31/12/2018)

Permit Number : EPR/SP3239FU

Facility : Ferrybridge Multifuel Facility

Operator : Ferrybridge MFE Limited

Form Number : Performance 1 / 30/11/2012

2018 Annual Reporting of Waste Disposal and Recovery (01/01/2018 to 31/12/2018)

Waste Description	Disposal Route	Tonnes	Recovery Tonnes	Tonnes / tonne of waste incinerated
1) Hazardous Wastes				
APC Residues	D9 / R5	27,069.66	4,506.12	0.0418
Spent FGT Filter Bags	D14	3.4		0.0000053
WEEE	R4	0.3	0.3	0.0000005
Oil Contaminated Wastes	R13	1.96	1.96	0.0000003
Spent Aerosol Cans	R13	0.1	0.1	0.0000001
Waste Oil	R9	2.26	2.26	0.0000035
Total Hazardous Waste		27,077.68	4,510.74	0.0419
2) Non-Hazardous Wastes				
IBA	R5	128,112.23	128,112.23	0.198
Ferrous Metal	R4	3,048.14	3,048.14	0.0047
Process Water	D8	836.3		0.0013
Wood	R3	6.58	6.58	0.00001
Dry Mixed Recyclables	R13	2.72	2.72	0.000004
General Waste	R13	15.2	15.2	0.000023
Rubble	R13	56.54	56.54	0.00009
Total Non-Hazardous Waste		132,077.71	131,241.41	0.204
TOTAL WASTE		159,155.39	135,752.15	0.246

Operator's comments: R3 – Recycling/reclamation of organic substances, R4 – Metals recovered, R5 – Processed for re use, R9 – Oil re-refining or other reuses of oil, R13 - Temporary storage of wastes pending any of the operations numbered R1 to R12, D8 - Biological treatment not specified, D9 – Acid neutralisation followed by non-hazardous landfill, D14 - Repackaging prior to submission to any of the operations numbered D1 to D13.

Signed Date 25/1/19
 (authorised to sign as representative of Ferrybridge MFE Limited)

2018 Annual Reporting of Water and Other Raw Material Usage (01/01/2018 to 31/12/2018)

Raw Material	Usage	Unit	Specific Usage	Unit
Mains water	70,506	m ³	0.109	m ³ /t
Total water usage	175,795	m ³	0.272	m ³ /t
Ammonia	613.91	Tonnes	0.949	kg/t
Activated carbon	225.67	Tonnes	0.349	kg/t
Lime/hydrated lime or sodium bicarbonate	10,858	Tonnes	16.783	kg/t

Operator's comments :

Fuel burn (01/01/2018 to 31/12/2018) = 646,959 tonnes

NB: Fuel burn = tonnes delivered in period + (tonnes in bunker at start of period – tonnes in bunker at end of period)
 Fuel burn submitted in quarterly and annual returns prior to 01/10/2018 was measured using bunker waste crane load cells.

Signed Date.....
 (authorised to sign as representative of Ferrybridge MFE Limited)

2018 Annual Reporting of other performance indicators (01/01/2018 to 31/12/2018)

Parameter	Result	
Operating hours for the year	8,279 hours	
	Line A1	Line A2
Number of periods of abnormal operation	5 periods	18 periods
Cumulative hours of abnormal operation for this calendar year	2.5 hours	9.0 hours

Operator's comments :

WID abnormal periods (01/01/2018 to 31/12/2018):

A1 21st Feb, 1 period (0.5 hours) (CEMs communication issue)
 A1 23rd Mar, 2 periods (1.0 hours) (CEMs communication issue)
 A1 23rd September, 1 period (0.5 hours) (Dust Filtration Bag Failure)
 A1 15th December, 1 period (0.5 hours) (Data Handling System Issue)

 A2 15th Jan, 3 periods (1.5 hours) (CEMs communication issue)
 A2 17th Jan, 3 periods (1.5 hours) (CEMs communication issue)
 A2 21st Feb, 1 period (0.5 hours) (CEMs communication issue)
 A2 18th Mar, 1 periods (0.5 hours) (CEMs communication issue)
 A2 10th June, 1 period (0.5 hours) (CDAS reporting software issue)
 A2 22nd October, 6 periods (3.0 hours) (CEMs issue, low data)
 A2 11th December, 2 periods (1.0 hours) (CEMs issue, low data)
 A2 15th December, 1 period (0.5 hours) (Data Handling System Issue)

The 2017 operating hours were 8,050 hours

Signed Date 25/11/19
 (authorised to sign as representative of Ferrybridge MFE Limited)

Permit Number : EPR/SP3239FU

Operator : Ferrybridge MFE Limited

Facility : Ferrybridge Multifuel Facility

Form Number :Energy 1 / 30/11/2012

2018 Annual Reporting of Energy Usage/Export (01/01/2018 to 31/12/2018)

Energy Source	Energy Usage	Unit	Contained Energy (MWh)
Electricity Produced	648,766	MWh	
Electricity Imported	620,303	MWh	
Electricity Exported	586,510	MWh	
Gas Oil	467.42	tonnes	
Steam/hot water Exported	0	MWh	

Operator's comments :

Signed Date.....
(authorised to sign as representative of Ferrybridge MFE Limited)

