NEATH PORT TALBOT
(RECYCLING) LTD

Material Recovery & Energy Centre
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PERMIT REQUIREMENT 4.1.7

ANNUAL PERFORMANCE REPORT ON WASTE TO ENERGY PLANT

2008

Annual Performance Report for Neath Port Talbot (Recycling) Ltd – BJ5775IF – 2006

This report is required under the Waste Incineration Directive's Article 12(2):- requirements on access to information and public participation. This requires the operator of an incineration or co-incineration plant to produce an annual report to the Regulator on the functioning and monitoring of the plant and to make this available to the public.

Permit Requirement 4.1.7

The Operator shall submit an annual performance report on the functioning and monitoring of the incineration plant in a format agreed with the Environment Agency by the 31st January each year. The report shall, as a minimum requirement, give an account of the running of the process and the emissions into air and water compared with the emission standards in the Waste Incineration Directive, as required by Article 12(2) of the Waste Incineration Directive.

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Name of company	Neath Port Talbot (Recycling) Ltd
Name of Plant	Material Recovery and Energy Centre
Permit Number	BJ5775IF
Address	Crymlyn Burrows, Swansea, SA1 8PZ
Phone	01792 641901
Contact Name	Marc Scourfield
Position	Compliance Manager
Further Information, description of waste types burned and origin	Municipal solid waste (household and commercial wastes) is the key feedstock for this waste management installation from the county boroughs of Neath Port Talbot & Bridgend. One of the waste fractions derived from the MSW is dRDF and is used as a fuel in pellet form to be incinerated and the energy is recovered to produce electricity.

The key purposes of this installation are to recover materials and energy from waste. Municipal solid waste (household and commercial wastes) is the key feedstock for this waste management installation. Waste is delivered to the plant in covered vehicles. These are first weighed before proceeding to the tipping hall. This is in an enclosed building, maintained under slight negative pressure to minimise the release of odours, dust and litter from the building.

Only one delivery vehicle will enter the tipping hall at any one time. The entry door opens, the vehicle enters and the door closes. The vehicle exits through a second exit only door from where it will proceed to a second weighbridge and then leave the site. The vehicles tip onto the floor from where the waste is lifted, using mechanical shovels, into the feed hopper of the waste separation plant.

The processing line comprises a plate feeder and hopper (fed by a loading shovel); a conveyor belt weigher; and a large rotary screen (with its associated conveyors) which sorts waste into a number of sizes. From these areas different waste fractions are further sorted and collected for processing into dRDF, or compost or for recycling elsewhere.

Ferrous metals are removed by magnetic separator and stored in a 'ferrous metals' area. Non-ferrous metals are removed by separator and stored in a 'non-ferrous metals' area. Dense plastics will be separated off and stored for recycling.

Combustion Process

The hearth, a reverse acting grate bar design, ensures continuous mixing of the waste and hence promotes good combustion. As the waste enters the incinerator it passes through a drying zone, a combustion zone and a burnout zone. Combustion air is extracted from within the dRDF store and fed in below the waste through the grate bars and above the waste mass to promote good combustion.

Secondary combustion air is injected above the dRDF where it provides for good mixing and combustion control. The secondary air is drawn in part from re-circulated flue gas in order to reduce the formation of oxides of nitrogen. Ammonium hydroxide is injected into the combustion chamber to react with the oxides of nitrogen, chemically reducing them to nitrogen and water.
Auxiliary low sulphur kerosene burners are fitted for start-up sequencing and to maintain temperatures above 850°C for 2 seconds at 6% oxygen. The oxygen concentration and temperature are controlled to minimise dioxin emissions.

Ash from the grate is transported by the grate to the bottom of the hearth and into a quench pit. It is then transported, by conveyor, to an ash storage area. The bottom ash is stored in a dedicated area for disposal.

Energy Recovery

Hot gases from the waste combustion pass through a series of heat exchangers and super heaters and finally through an economiser. The design of the boilers, following a computerised fluid dynamics assessment, is such that the flue gas temperature is quickly reduced through the critical temperature range to minimise the risk of dioxin reformation.

Steam generating boilers are located at the exit of the flue gas from the main chamber. The steam is fed to a steam turbine which will generate electricity. Water for steam generation is taken from a towns water main and is treated prior to use in the boilers. Residual waste heat is dissipated using air-cooled condensers which are positioned to the east of the main building. Condensed steam is recycled to the boiler system. Boiler blowdown waters will be discharged to foul sewer.

Gas Cleaning

Flue gases pass from the boiler to the gas cleaning equipment. The gas enters a reaction chamber where lime dust and activated carbon are injected to neutralise acid gases and absorb (primarily) dioxins, volatile organic compounds (VOCs) and mercury. Nitrogen oxides (NOx) abatement is achieved by the use of both flue gas recirculation (FGR) and selective non-catalytic reduction (SNCR) using ammonium hydroxide. The SNCR is based on the injection of ammonium hydroxide into the gas stream in the boilers and before the lime and carbon injection and before the gas passes to bag filters.

Bag filters remove particulate matter and other pollutants as the gases pass across the bag fabric. Pulses of compressed air are used to remove the accumulated particulate ("fly-ash") from the bags. The fly-ash falls into a collection hopper and is then conveyed to a sealed container. There is no bag filter bypass at this installation. The cleaned gas then discharges to atmosphere via a free standing twin-flue stack (A1 & A2*) each 1.118m diameter. The average efflux velocity for A1 stack with one stream running in 2006 was 10.6m/s.

* A2 is not commissioned, only A1 is connected to the plant

Summary of plant operation

The Waste to Energy plant has 2 incinerators each with a design capacity of 3t/hr. The design throughput of the plant is 52,000t.

The waste incinerated for energy recovery in 2007 is dRDF (EWC 19 12 10), a total of 9041 t dRDF was incinerated in 2008

The plant ran for 4202 hrs which equates to 175 days, on the assumption that there are 365 days available to run in a year the plant run time was 47.94%

The main reason for the availability being 47.94% is the plant running for 12 day cycles before having to shut down due to a loss in draught. However we have endeavoured to overlap both streams to ensure we are running on one stream and generating electricity to run the plant. The 60 % availability represents the time the plant was burning waste and generating electricity, this does not represent the individual availabilities of each stream

Throughout 2008 the WTE plant was subjected to major breakdowns that impacted the performance of the plant, although the plant incinerated a lesser amount in 2008 in comparison to 2007 the facility was more self sufficient in electricity usage in that the electricity generated was used to run the site and the residual was exported to the grid. Below are examples, although not extensive of maintenance issues and others that have effected the performance this year:

- Lack of fuel – commencement of cemex fuel contract
- Elevator conveyor repairs
- Refractory repairs
- Secondary air manifold repairs
- Grit screw trough repairs
- Ram repairs
- Bag house repairs
- Grate repairs
- Ash drag link repairs

The following residues were produced from the incineration process:

- Bottom Ash = 2376T
- Fly Ash = 535T

The bottom ash was sent to landfill at Pwllfawatkin Landfill site and the Fly ash was diverted from landfill to a treatment facility in Manchester run by Langstar.

Energy 2008

Total Municipal Waste Incinerated	**9041 T**
Electrical Energy Exported	**1939295 kwh**
Electrical Energy Imported	**3518474 kwh**
Electrical Energy Generated and used by the Installation	**3387025 kwh**
Total Electrical Energy Generated by the Installation	**5326320 kwh**

Energy 2007

Total Municipal Waste Incinerated	**10956 T**
Electrical Energy Exported	**1789472 kwh**
Electrical Energy Imported	**2633576 kwh**
Electrical Energy Generated and used by the Installation	**4675508 kwh**
Total Electrical Energy Generated by the Installation	**6464980 kwh**

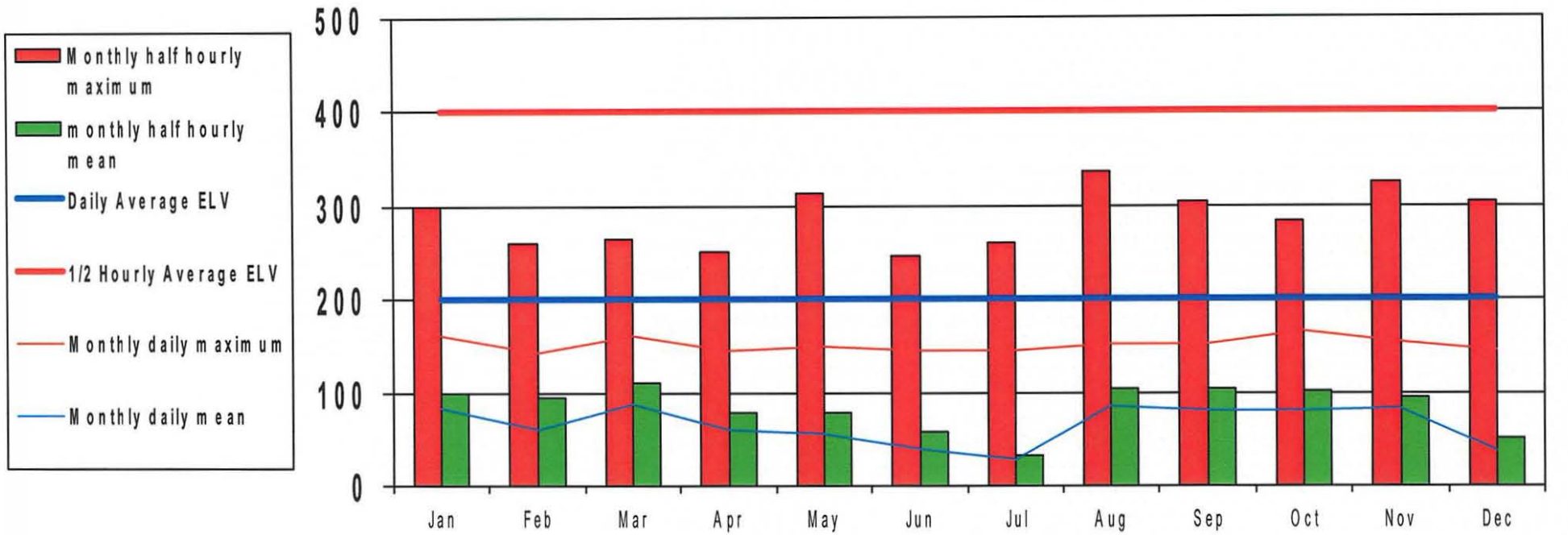
Summary of Plant Monitoring

Pollutant	Continuously	Periodic
Particulate Matter	✓	✓
VOC's as Total Organic Carbon (TOC)	✓	✓
Hydrogen Chloride	✓	✓
Hydrogen Fluoride		✓
Oxides of Nitrogen (NO and NO2 expressed as NO2)	✓	✓
Nitrous Oxide		✓
Ammonia	✓	✓
Sulphur Dioxide	✓	✓
Carbon Monoxide	✓	✓
Cadmium & Thallium and their compounds (total)		✓
Mercury and its compounds		✓
Antimony (Sb) and its compounds		✓
Arsenic (As) and its compounds		✓
Lead (Pb) and its compounds		✓
Chromium (Cr) and its compounds		✓
Cobalt (Co) and its compounds		✓
Manganese (Mn) and its compounds		✓
Nickel (Ni) and its compounds		✓
Vanadium (V) and its compounds		✓
Dioxin like PCBs		✓
Dioxin and Furans		✓
PAH		✓

Permit Reference Number: **BJ5775IF** Operator: **Neath Port Talbot (Recycling) Ltd**

Installation: **Material Recovery and E Material Recovery and Energy Centre** Form No: S3/AIR 1

Reporting of Annual performance of Continuously Monitored Emissions to Air for Oxides of Nitrogen Emissions Point A1 in 2008



	Annual summary		Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Half-Hour average ELV	400	400	400	400	400	400	400	400	400	400	400	400
	Annual 1/2 hour maximum	336.86	Monthly 1/2 hour maximum	299.52	260.58	264.44	250.62	314.43	247.52	260.47	336.86	305.05	282.42	324.33	304.32
HALF-HOURLY AVERAGE	Annual 1/2 hour mean	83.72	Monthly 1/2 hour mean	98.36	94.98	109.74	79.12	79.09	58.33	32.62	103.91	103.29	100.31	94.70	50.18
			Daily average 24 hrs	200	200	200	200	200	200	200	200	200	200	200	200
	Annual daily maximum	165.97	Monthly daily maximum	162.04	142.52	161.32	146.02	150.61	144.15	144.81	152.59	152.14	165.97	153.66	144.73
DAILY AVERAGE	Annual daily mean	87.70	Monthly daily mean	82.91	60.98	87.70	58.85	54.46	38.45	27.19	85.61	81.20	79.96	83.17	37.67

ermit Reference Number: **BJ5775IF** BJ5775IF Operator: **Neath Port Talbot (Recycling) Ltd**

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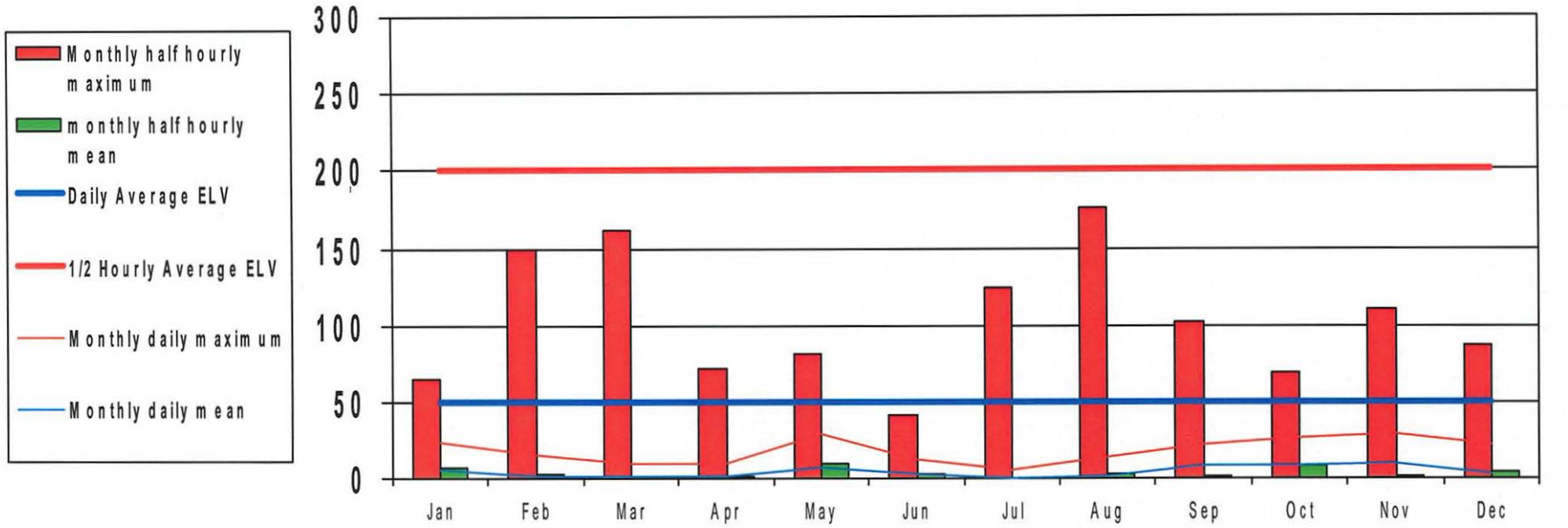
Reporting of Annual performance of Continuously Monitored Emissions to Air for Sulphur Dioxide Emissions Point A1 in 2008



	Annual summary		Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Half-Hour average ELV	200	200	200	200	200	200	200	200	200	200	200	200
HALF-HOURLY AVERAGE	Annual 1/2 hour maximum	175.76	Monthly 1/2 hour maximum	65.4	149.17	161.33	71.43	82.02	41.23	124.71	175.76	102.75	69.63	110	87.21
	Annual 1/2 hour mean	3.78	Monthly 1/2 hour mean	6.63	2.96	1.85	1.73	9.48	3.02	0.61	2.60	1.69	8.72	1.93	4.18
			Daily average 24 hrs	50	50	50	50	50	50	50	50	50	50	50	50
DAILY AVERAGE	Annual daily maximum	29.04	Monthly daily maximum	23.29	15.44	10.23	10.33	29.04	12.78	5.44	13.26	22.74	26.57	28.56	21.46
	Annual daily mean	9.1468	Monthly daily mean	5.81	1.73	1.59	1.12	6.90	2.16	0.45	2.03	7.80	8.02	9.15	3.26

ermit Reference Number: **BJ5775IF** **BJ5775IF** Operator: **Neath Port Talbot (Recycling) Ltd**

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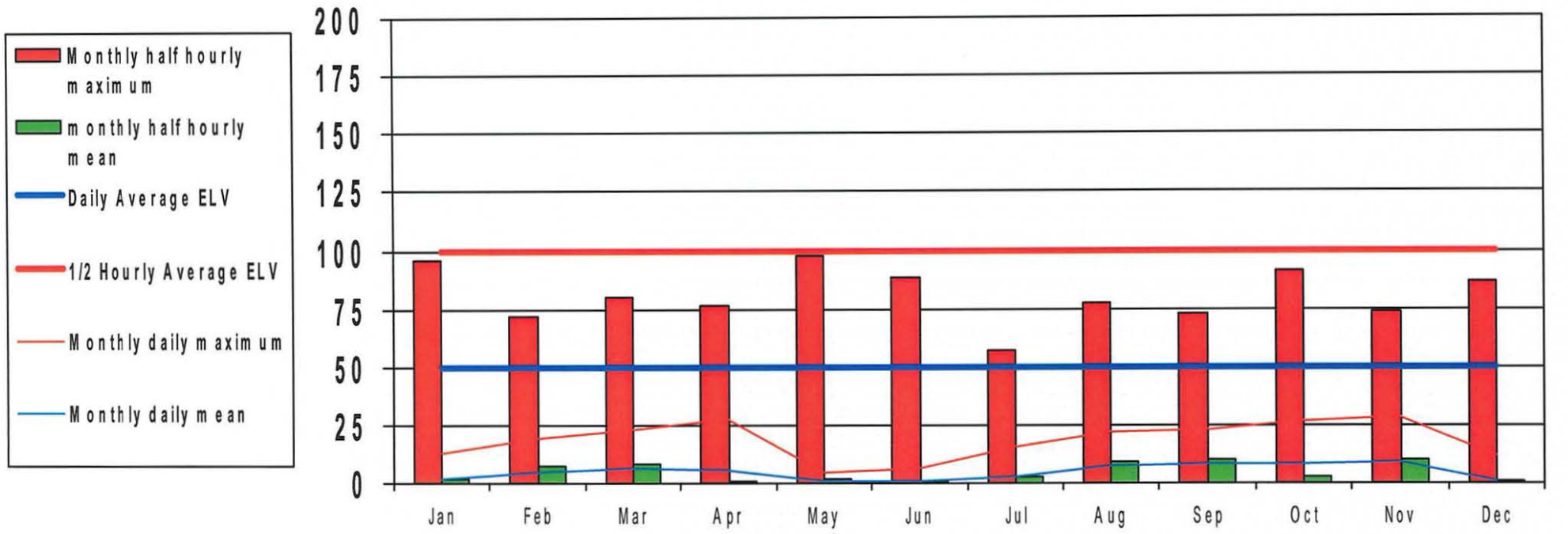
Reporting of Annual performance of Continuously Monitored Emissions to Air for Carbon Monoxide Emissions Point A1 in 2008

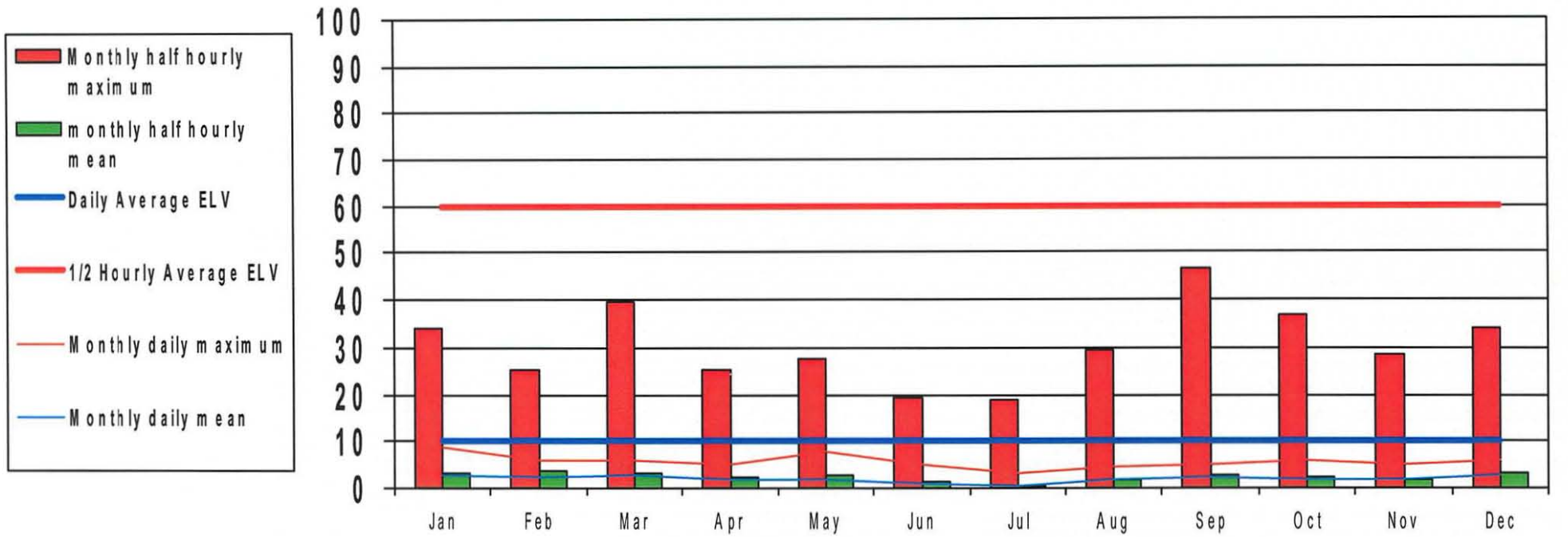


	Annual summary		Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Half-Hour average ELV	100	100	100	100	100	100	100	100	100	100	100	100
HALF-HOURLY AVERAGE	Annual 1/2 hour maximun	97.83	Monthly 1/2 hour maximum	95.69	71.87	79.97	76.19	97.83	88.27	57.29	76.98	73.23	91.42	73.43	86.54
	Annual 1/2 hour mean	4.89	Monthly 1/2 hour mean	1.99	7.65	8.24	1.35	1.60	1.05	3.07	9.18	10.28	2.39	10.56	1.31
			Daily average 24 hrs	50	50	50	50	50	50	50	50	50	50	50	50
DAILY AVERAGE	Annual daily maximum	28.56	Monthly daily maximum	12.90	19.33	23.17	27.42	4.86	6.38	15.86	21.76	22.74	26.57	28.56	11.66
	Annual daily mean	9.147	Monthly daily mean	1.42	4.99	6.81	5.86	0.73	0.66	2.49	7.75	8.36	8.02	9.15	1.01

ermit Reference Number: BJ5775IF BJ5775IF Operator: Neath Port Talbot (Recycling) Ltd

Installation: Material Recovery and E Material Recovery and Energy Centre Form No: S3/AIR 1

Reporting of Annual performance of Continuously Monitored Emissions to Air for Hydrogen Chlorides Emissions Point A1 in 2008

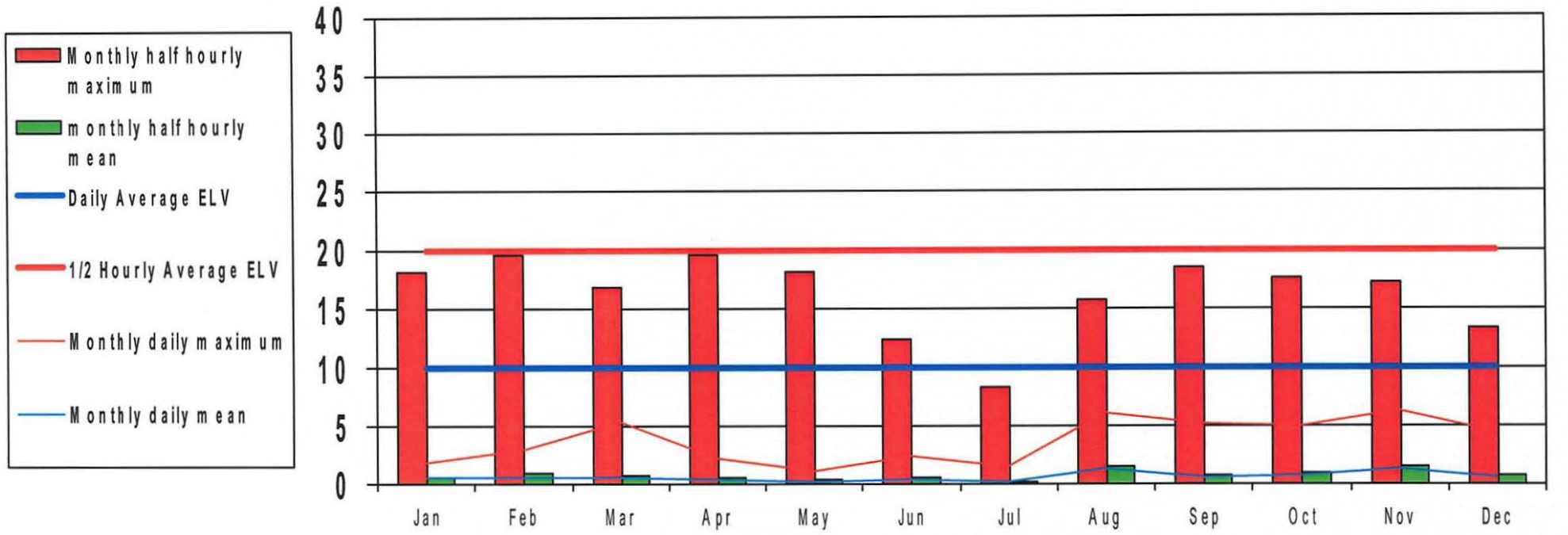


	Annual summary		Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Half-Hour average ELV	60	60	60	60	60	60	60	60	60	60	60	60
HALF-HOURLY AVERAGE	Annual 1/2 hour maximum	46.7	Monthly 1/2 hour maximum	34.22	25.48	39.74	25.35	27.52	19.31	18.88	29.62	46.72	36.83	28.59	34.22
	Annual 1/2 hour mean	2.44	Monthly 1/2 hour mean	3.22	3.60	3.32	2.18	2.77	1.50	0.68	1.90	2.75	2.20	1.91	3.22
			Daily average 24 hrs	10	10	10	10	10	10	10	10	10	10	10	10
DAILY AVERAGE	Annual daily maximum	8.66	Monthly daily maximum	8.66	6.03	6.06	5.02	7.74	5.01	3.35	4.80	5.18	6.16	4.90	6.03
	Annual daily mean	2.85	Monthly daily mean	2.85	2.29	2.55	1.62	1.99	1.07	0.60	1.62	2.24	1.77	1.71	2.85

ermit Reference Number: BJ5775IF BJ5775IF Operator: Neath Port Talbot (Recycling) Ltd

Installation: Material Recovery and E Material Recovery and Energy Centre Form No: S3/AIR 1

Reporting of Annual performance of Continuously Monitored Emissions to Air for VOC Emissions Point A1 in 2008

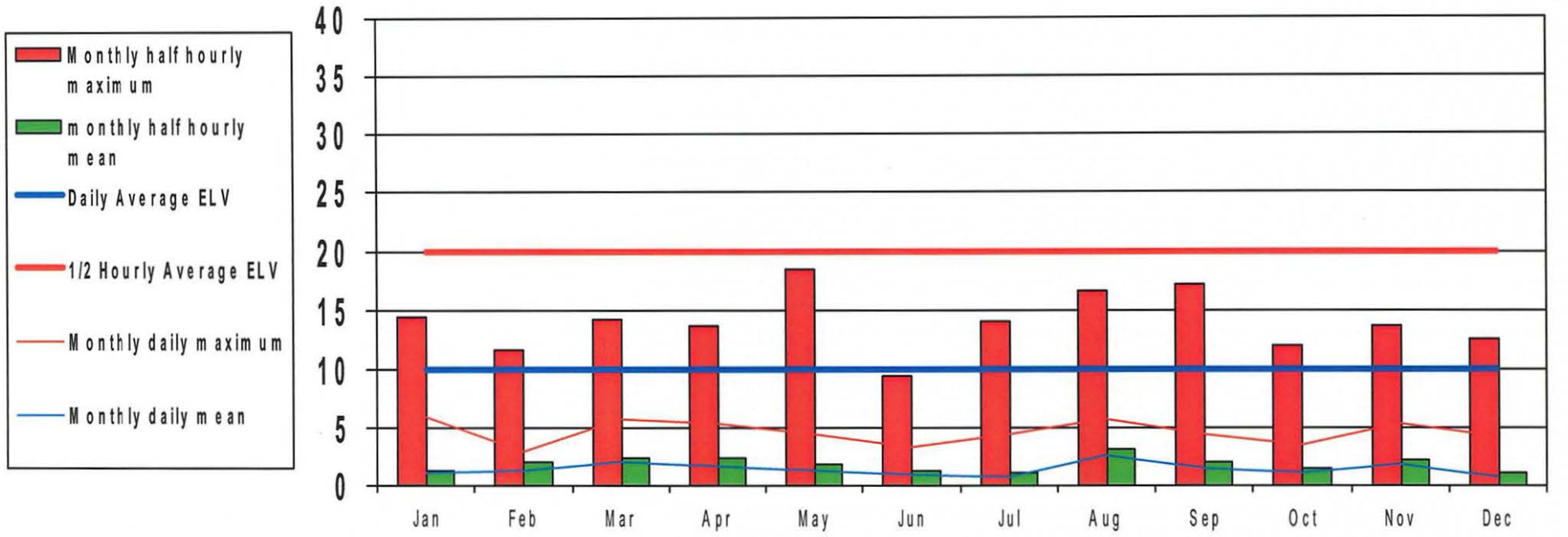


	Annual summary		Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Half-Hour average ELV	20	20	20	20	20	20	20	20	20	20	20	20
HALF-HOURLY AVERAGE	Annual 1/2 hour maximum	19.60	Monthly 1/2 hour maximum	18.01	19.60	16.85	19.57	18.08	12.41	8.26	15.75	18.44	17.51	17.09	13.31
	Annual 1/2 hour mean	0.76	Monthly 1/2 hour mean	0.62	0.84	0.75	0.55	0.38	0.48	0.15	1.44	0.72	0.86	1.55	0.78
			Daily average 24 hrs	10	10	10	10	10	10	10	10	10	10	10	10
DAILY AVERAGE	Annual daily maximum	6.311	Monthly daily maximum	1.87	2.94	5.32	2.21	1.03	2.41	1.47	6.09	5.09	4.98	6.31	4.40
	Annual daily mean	1.353	Monthly daily mean	0.52	0.59	0.55	0.36	0.21	0.33	0.14	1.23	0.58	0.71	1.35	0.61

Permit Reference Number: **BJ5775IF** Operator: **Neath Port Talbot (Recycling) Ltd**

Installation: **Material Recovery and E Material Recovery and Energy Centre** Form No: S3/AIR 1

Reporting of Annual performance of Continuously Monitored Emissions to Air for Ammonia Emissions Point A1 in 2008

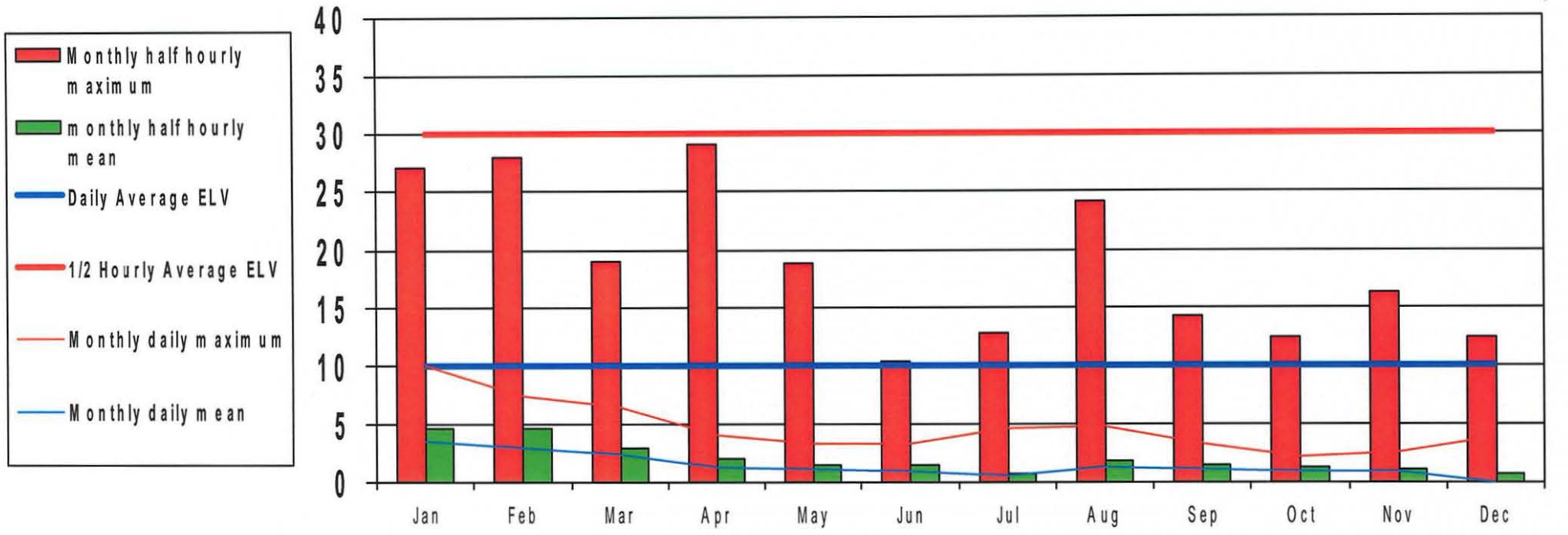


	Annual summary		Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Half-Hour average ELV	20	20	20	20	20	20	20	20	20	20	20	20
HALF-HOURLY AVERAGE	Annual 1/2 hour maximum	18.48	Monthly 1/2 hour maximum	14.3	11.69	14.18	13.7	18.48	9.39	13.95	16.59	17.13	12.06	13.6	12.61
	Annual 1/2 hour mean	1.83	Monthly 1/2 hour mean	1.35	1.98	2.39	2.35	1.80	1.26	1.08	3.14	1.99	1.42	2.15	1.04
			Daily average 24 hrs	10	10	10	10	10	10	10	10	10	10	10	10
DAILY AVERAGE	Annual daily maximum	5.87	Monthly daily maximum	5.87	3.03	5.63	5.43	4.38	3.23	4.35	5.74	4.39	3.53	5.32	4.23
	Annual daily mean	2.6	Monthly daily mean	1.02	1.23	1.97	1.67	1.30	0.83	0.79	2.60	1.48	1.14	1.88	0.76

Permit Reference Number: **BJ5775IF** Operator: **Neath Port Talbot (Recycling) Ltd**

Installation: **Material Recovery and E Material Recovery and Energy Centre** Form No: S3/AIR 1

Reporting of Annual performance of Continuously Monitored Emissions to Air for Particulates Emissions Point A1 in 2008



	Annual summary		Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Half-Hour average ELV	30	30	30	30	30	30	30	30	30	30	30	30
HALF-HOURLY AVERAGE	Annual 1/2 hour maximum	29.13	Monthly 1/2 hour maximum	27.07	27.98	18.91	29.13	18.72	10.26	12.69	24.21	14.27	12.4	16.29	12.39
	Annual 1/2 hour mean	2.01	Monthly 1/2 hour mean	4.60	4.52	2.93	1.95	1.56	1.42	0.72	1.82	1.54	1.22	1.11	0.75
			Daily average 24 hrs	10	10	10	10	10	10	10	10	10	10	10	10
DAILY AVERAGE	Annual daily maximum	9.8727	Monthly daily maximum	9.87	7.36	6.52	3.97	3.33	3.30	4.70	4.88	3.32	2.30	2.56	3.78
	Annual daily mean	3.5623	Monthly daily mean	3.56	2.86	2.32	1.36	1.09	0.88	0.59	1.29	1.18	0.98	0.97	0.00

Pollutant	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Particulate Matter	Mg/m^3		8.43		0.45
VOC's as Total Organic Carbon (TOC)	Mg/m^3		11.59		2.54
Hydrogen Chloride	Mg/m^3	10	5.85	<5	5.06
Oxides of Nitrogen (NO and NO2 expressed as NO2)	Mg/m^3		104.16		151.68
Ammonia	Mg/m^3		2.78		2.5
Sulphur Dioxide	Mg/m^3		12.15		17.34
Carbon Monoxide	Mg/m^3		11.44		<0.41
HF	Mg/m^3		0.13	<0.5	<0.4
Mercury	Mg/m^3	<0.01	0.002	<0.005	<0.0013
Nitrous Oxide	Mg/m^3		0.02	3	<0.028
Cadmium & Thallium	Mg/m^3	<0.01	0.006	<0.005	<0.0037
TOTAL Heavy Metals	Mg/m^3	0.23	0.111	0.05	0.063
Dioxins/furans	ng/m^3		0.05		0.095
PCB's	ng/m^3		1.62		2.2
PAH	ug/m^3		<3.013		9.99

Summary of plant compliance

Pollutant	Percentage CEMS compliance with permit conditions
Particulate Matter	**100%**
VOC's as Total Organic Carbon (TOC)	**100%**
Hydrogen Chloride	**100%**
Oxides of Nitrogen (NO and NO2 expressed as NO2)	**100%**
Nitrous Oxide	**100%**
Ammonia	**100%**
Sulphur Dioxide	**100%**
Carbon Monoxide	**100%**

Summary of plant improvements

- An AST has since been conducted in December 2008
- The bag house socks have been replaced
- A Re-line of both combustors

Summary of information made available:

This information is made available on the public register locate at the Environment Agency Office at Llandarcy. Currently the company does not have a website due to the current procurement process for Neath Port Talbot County Borough Councils waste contract.

Hard copies of this report will be made available on request to the Environment Agency or by contacting members of the local liaison committee meeting.

The plant performance is reported at the quarterly liaison committee meetings with representation from the local community. Any issues relating to the plant are discussed in the meeting, however issues have been reported to members of the committee via letter in between meetings with a view of maintaining an open and transparent communication channel.