

DUDLEY ENERGY FROM WASTE PLANT

PERMIT No AP3435SD

WASTE INCINERATION DIRECTIVE

ANNUAL PERFORMANCE REPORT

2018

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Annual performance report for MES Environmental Dudley EfW Plant – Permit No. AP3435SD – Year 2018

Introduction

This report is produced under the Industrial Emissions Directive (chapter 4, Waste Incineration Directive), which 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. In accordance with the requirements of the Directive, the following information is therefore provided:

<i>Name of Company</i>	<i>M E S Environmental</i>
<i>Name of Plant</i>	<i>Dudley EfW Facility</i>
<i>Permit Number</i>	<i>AP3435SD</i>
<i>Address</i>	<i>Lister Road, Dudley DY2 8YT</i>
<i>Phone</i>	<i>01384 457321</i>
<i>Contact name</i>	<i>Mr R Nadin</i>
<i>Position</i>	<i>Plant Manager</i>
<i>Further information, description of waste types burned and origin.</i>	<i>Constructed in 1998 to burn in the region of 105,000 tonnes per annum of local domestic refuse and generate a nominal 7.4MW of electricity for the local community.</i>
<i>(If you would like to make any comment on this report or if you would like any further information or to arrange a visit to the plant please telephone Mr R Nadin on the above number)</i>	

Table 1 – General information

The plant provides a sustainable method of waste disposal and recovery, predominantly for the area within the administrative boundary of Dudley Metropolitan Borough Council, with smaller quantities of waste accepted, where capacity and demand exists, from other local authorities within the general vicinity of the plant.

Household, commercial or industrial wastes, collected by the local authorities, their agents or contractors, comprise almost all of the wastes delivered to the plant at around 99.76% of all deliveries for 2018; this is comparable with 2017 and 2016 (these being around 99.77% and 99.97% respectively).

Waste deliveries from other councils contributed to around 10.99% of the total waste delivered to the plant, waste that historically would have gone to landfill. 0.24% of wastes delivered came from private sector contracts.

Priority will always be given to the delivery of local authority wastes, as required by the terms of contractual arrangements, to ensure that safe, reliable, consistent and sustainable disposal and recovery facilities are available at all times.

This also reduces reliance on and quantities of wastes delivered for disposal to landfill with little or no beneficial outcome. It also contributes significantly to the diversion of biodegradable municipal waste away from landfill consistent with the European Union and Governments objectives under the terms of the EU Landfill Directive.

Non-Technical Plant Description

The installation comprises an energy from waste facility (EfW) processing a maximum of 105,000 tonnes per year of municipal and other specified wastes.

The plant contains two incineration lines with a combined design capacity to process up to 12 tonnes of waste per hour. Each line has separate waste feed systems, furnaces, boilers and flue gas treatment equipment but share a common electricity generation system.

Heat produced during the incineration process is converted to electrical energy by generating steam in high-pressure boilers and expanding the steam through a steam turbine. Air-cooled condensers re-circulate condensate back to the boilers.

By this means the plant, when operating at full load, will typically generate around 7.4 MW of electricity and, after satisfying its own power needs, exports approximately 6.5 MW of electricity to the local electricity network. This assists in contributing to the Government's target of providing 15% of electricity generation from renewable energy sources by the year 2020.

The combined effect of the plant's energy recovery process and the recycling activities of the local authorities in the area results in the recovery of value from around 80% of the municipal wastes produced in the area, either in the form of electricity production, recycling or composting.

This demonstrates that the two processes have a strong environmental synergy and work in common to treat waste as a resource to be put to beneficial use.

As recycling performance and capacity within the primary catchment area increases this provides further opportunity to divert additional materials away from landfill in conjunction neighbouring local authorities, who are more heavily reliant on landfill as their primary disposal route.

During the planned annual outage the site utilised other facilities by diverting wastes to them, reducing the traditional option of diverting to landfill.

In terms of plant operation, the incineration processes have been designed against the background of a detailed assessment of the prevailing environmental conditions at the site location and are based upon the Best Available Technology as detailed both in the original Authorisation application and the application for the Permit issued under the Pollution Prevention and Control (England and Wales) Regulations. These include but are not limited to the following:-

- Well proven process plant developed specifically for incineration of municipal solid wastes,
- Efficient, comprehensive process control and monitoring systems to ensure optimum conditions for complete combustion of the wastes and to minimise emissions from the processes.
- Operations confined within buildings under slight negative pressure in order to contain and minimise emissions such as dust and odour.
- Qualified and experienced operating and maintenance personnel to implement procedures to ensure that the required high standards are maintained. Operating and Maintenance Procedures are established according to an internationally recognised system of quality assurance.
- Multi-stage high efficiency flue gas cleaning systems comprising deNOx Selective Non-Catalytic Reduction (SNCR) for the removal of oxides of

nitrogen, activated carbon and lime semi-dry acid gas scrubbing for controlling acid gas, dioxins/furans and mercury emissions.

- Final stage flue gas abatement for particulate materials using fabric filtration.
- 47 metre chimney stacks for effective dispersion of the low emission concentrations
- Residues from the combustion process and from the flue gas cleaning system disposed of by approved means, maximising recycling wherever possible.
- Residues transported in appropriate vehicles, suitably enclosed and covered to ensure that no spillage occurs.
- Operation of the installation under an Environmental Management System certified to ISO 14001:2015, a Quality Management System certified to ISO9001:2015 and a health and safety system certified to OHSAS 18001:2007 (to be superseded by ISO45001 accreditation in late 2019). The organisation also maintains the globally recognised RoSPA Gold standard award and has attained this 5 years running.
- Waste water from the process is neutralised and recycled as far as is practicable to minimise the quantities released to sewers.
- Provision of bunds or double skinned vessels for storage of fuel and chemicals to prevent accidental and inappropriate discharge to the public sewers and watercourse.

The Plant is regulated under the terms of a Permit issued by the Environment Agency (reference AP3435SD) which contains conditions to ensure that the requirements of the Waste Incineration Directive are incorporated and will be met.

A variation to the permit (Variation Number CP3136XQ) was issued in 2008, which amended the periodic emission limit values for particulate matter, hydrogen chloride, carbon monoxide, sulphur dioxide and oxides of nitrogen. The values in each case are now the same as the corresponding ½ hourly or 10 minute averages from continuous emissions monitors.

A variation to the permit (Variation Number EPR/AP3435SD/V006) was issued on 10/02/17. The variation added a new accepted EWC code (18 01 04) in order to reflect the changes in the waste industry and wastes available after increased recycling and pre-processing as taken place. The latest additions have been added to enable local NHS trust hospitals to deliver their non-hazardous waste to the site, reducing the carbon footprint, establishing best practise when dealing with waste and reduce the cost of disposal.

Summary of plant operation

The plant is designed to process a heterogeneous mix of municipal type wastes in two identical streams each burning up to 6 tonnes per hour.

Although this creates a technical capacity for around 105,000 tonnes per annum, in reality waste deliveries are typically less than the nominal capacity when taking into consideration periods of planned maintenance and are well within the permit limitations of 105,000 tonnes of mixed municipal waste including a maximum of 5,250 tonnes of separately collected fractions.

Separately collected fractions, if any, are generally wastes delivered by private sector customers with mixed municipal wastes predominantly comprising deliveries from local authorities. Total deliveries for 2018 are set out in Table 2 below.

Annual waste throughputs

Waste Types	EWC codes	Tonnes burnt
<i>Mixed municipal wastes</i>	<i>20.03.01</i>	Stream 1 47613 Stream 2 45890 Total 93503
<i>Separately collected fractions</i>	<i>15.01.06 Packaging 20.01.01 Paper & card 20.01.08 Kitchen waste 20.02.01 Biodegradable 20.03.02 Market waste 20.03.03 Street sweepings</i>	Total 223
<i>Total burnt – all types</i>		93726

Table 2 - Incinerated Wastes 2018

Plant operational hours in the year and reasons for any significant outages

Each boiler is designed to operate continuously throughout the year, although regular routine preventative maintenance programmes are in place to ensure performance efficiency is maintained and to prevent the development of major problems resulting in significant plant outages.

Routine maintenance activities represent the principal reason for significant outages. Other stoppages tend to be short-term shutdowns of individual streams, for one or two days, to deal with smaller scale issues such as tube leaks or minor repair works. These are generally relatively small jobs though the time taken to complete is often extended whilst waiting for boilers to cool down before work can commence and then controlled warming through to bring the system back up to operating temperatures.

Annual scheduled maintenance works for 2018 began on the 27th April.

Boiler 2 was taken offline for routine maintenance for a period of 18 days between the 27th April and the 15th May.

Boiler 1 was taken offline for routine maintenance for a period of 14 days between the 7th May and the 21st May.

A major overhaul of the turbine and generator units was performed between April and June.

Boiler 1 and boiler 2 were available for 8208 and 8054 hours respectively.

This was equivalent individually to 93.70% and 91.94% of potential operating hours or 92.82% overall. This is comparable to previous years and is attributed to higher awareness of preventative and not reactive maintenance and good planning by all concerned during the annual outage period.

Further details on plant performance are contained in Appendix 1

Residues produced

There are two main sources of residues arising from the operation of the plant comprising:

- Bottom ash from the combustion process (including metals discharged within the ash)
- Residues from the flue gas treatment system - Air Pollution Control Residue (Fly ash)

Burned out bottom ash residues are discharged from the lower end of each grate into a water filled ash discharger, where it is quenched and then ejected onto a conveyor system. Larger items are screened out and ferrous metals removed by magnetic separation.

Residues from the flue gas treatment process are discharged in an enclosed system into double skinned heavy duty bags prior to removal from site for treatment and disposal.

The residual material represents approximately 10% of the original refuse volume and around 20% of its weight with bottom ash discharged into the residues storage bunker.

The storage capacity for bottom ash residues and separated ferrous metals is sufficient to ensure 4 days storage. Collections for delivery to disposal or treatment sites are made on Mondays to Fridays and are scheduled to ensure sufficient storage capacity is maintained at all times.

Bottom ash is now widely used in the UK and Europe as a substitute for valuable primary aggregate materials in the construction of roads and embankments. Bottom ash from the plant is currently reprocessed to remove additional and trace metals with the final residue being further processed and used as aggregate material.

Table 3 shows the total quantities of the various residues produced in 2018.

Residue	Annual tonnage	Percentage of input waste	Disposal destination.
	t	%	
Bottom ash	15004	16.01	Reprocessing – reuse
Fly ash	3540	3.78	Reprocessing acidic liquid residue neutralisation prior to use on landfill site
Ferrous metals	1435	1.53	Recycling

Table 3 - Residues produced & final destination 2018

Electricity Production

All deliveries to the plant are weighed and, in conjunction with the quantities of electricity produced, details used to determine the calorific values (CV) of wastes delivered. This can vary seasonally and is dependent upon the types of wastes delivered but, typically, are in the order of 8.5 MJ/kg.

In 2018 the average calorific value of wastes delivered over the year was 8.1 MJ/Kg. This is comparable with previous years (2017, 8.1 MJ/Kg and 2016, 8.3 MJ/Kg).

The combustion of municipal waste at the plant not only produced sufficient electrical power to supply the majority of the plant's own power but sufficient also to meet the power demands for around 10,000 households during the year.

This reduces the demand for electricity produced in a conventional fossil fuel power stations and the use of a renewable energy source not only saves the depletion of an irreplaceable natural resource but also reduces the associated CO₂ production and pollution from the mining operation and transportation of the fossil fuel.

The Sector Guidance note IPPC S5.06 contains a guide value of 5 to 8 MWe exported per 100,000 tonnes of waste. Typically, at design performance the plant exports 6.5 MWe from processing around 95,000 tonnes which is equivalent to 6.8MWe per 100,000 tonnes and within the range of guide values.

Extended maintenance on the turbine and generator units (taking place between April and June) led to a decrease in electricity production compared to previous years. This also had an impact on the amount of electricity imported to site. The maintenance was successful and the plant is now operating under normal conditions.

Details of electrical power produced, used and exported from the plant is set out in Table 4 below together with details of smaller quantities of power imported during the times when the plant or part of the plant is shutdown for servicing.

Electrical power production (in MWhrs)			
1 MWh = 10,000 X 100 watt light bulbs powered for 1 hour			
Imported	Production	Site use	Exported
1036	38425	6622	31803

Table 4 - Electrical power production 2018

Plant emissions monitoring

Emissions to air and water are continuously monitored in accordance with legal and regulatory requirements. Emissions to air are either combustion emissions from the stack or fugitive emissions from the storage of materials and chemicals on site.

Stack emissions (Particulates, Hydrogen Chloride, Sulphur Dioxide, Volatile Organic Compounds, Ammonia, Carbon Monoxide and Oxides of Nitrogen) are monitored and recorded continuously on site. Periodic (Bi annual) checks of these are also made by accredited external testing laboratories together with further quarterly or bi-annual checks as may be required by the permit of Dioxins, Mercury, Hydrogen Fluoride, Cadmium / Thallium and other metals.

Fugitive emissions monitoring, for substances having no specific emissions limit value specified in the permit, is part of the general maintenance regime carried out on site.

Table 5 below sets out the frequencies of monitoring for the various substances specified within the permit and in order to comply with the requirements of the Waste Incineration Directive. Further details of associated plant performance are also shown in Table 6 and Appendices 1 and 2.

Pollutants measured	Continuously	Periodically
<i>Particulates</i>	✓	✓
<i>Oxides of Nitrogen</i>	✓	✓
<i>Sulphur Dioxide</i>	✓	✓
<i>Carbon Monoxide</i>	✓	✓
<i>Ammonia</i>	✓	✓
<i>Total Organic Carbon</i>	✓	✓
<i>Hydrogen Chloride</i>	✓	✓
<i>Mercury</i>		✓
<i>Cadmium and Thallium</i>		✓
<i>Group III metals</i>		✓
<i>PCDD and PCDF</i>		✓
<i>Hydrogen Fluoride</i>		✓

Table 5 - Emissions monitoring frequencies

Emissions to water are monitored by equipment built into the on-site effluent treatment plant, which aims to recycle 100% of water from site for reuse on site excluding sewerage. In 2018 the cumulative volume of water discharged to sewer was 4927 M³.

Any emissions which exceed the limits that are imposed upon the operation are reported to the Environment Agency without delay along with plans for the prevention of further occurrences.

Continuous Emissions Monitors (CEMs) Operation

The CEMs equipment operated satisfactorily throughout the year with minor breakdowns on individual sampling streams being responded to by CBISS, the company contracted to service the equipment. At no time was the plant shut down due to CEMs failure.

CEMs equipment continuously measures and records information on emission limits for the substances set out in Table 5 above with 10 minute, ½ hourly and daily average values recorded as required and compared with corresponding emission limit values set out in the permit. Monthly reports are prepared for each substance although these only need to be submitted to the Environment Agency every 6 months.

A summary of CEM data for all continuously monitored substances is shown in Appendix 2 with a summary of results for substances that are only monitored periodically shown below in Table 6. The requirement for Dioxin sampling is for two samples per year.

Note: All data supplied is subject to uncertainty of measurement, which is not included here.

Pollutant	ELV	Stream	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Average
Cd/Tl (mg/m ³)	0.05 mg/m ³	1	0.0016	0.0011	0.0044	0.0041	
		2	0.0026	0.0015	0.0238	0.0077	
		Average	0.0021	0.0013	0.0141	0.0059	0.0059
Hg (mg/m ³)	0.05 mg/m ³	1	0.0017	0.0015	0.0146	0.0018	
		2	0.0024	0.0014	0.0008	0.0018	
		Average	0.0021	0.0015	0.0077	0.0018	0.0033
HF (mg/m ³)	2 mg/m ³	1	0.0700	0.0200	0.0900	0.0100	
		2	0.0900	0.0300	0.0100	0.0100	
		Average	0.0800	0.0250	0.0500	0.0100	0.0413
Group III Metals (mg/m ³)	0.5 mg/m ³	1	0.0363	0.1621	0.1465	0.0545	
		2	0.1296	0.0783	0.0693	0.0938	
		Average	0.0830	0.1202	0.1079	0.0742	0.0963
Dioxins (I-TEQ) (ng/m ³)	0.1 ng/m ³	1	0.0266		0.0259		
		2	0.0257		0.0074		
		Average	0.0262		0.0167		0.0214

Table 6 - Emissions of periodically monitored pollutants 2018

Summary of plant compliance

Description of non-compliances and abnormal operations notified to the Environment Agency.

Set against the total operational hours on each stream plant performance is of a high level. The numbers of occasions where emission limit values have been exceeded are comparatively small and when expressed as a percentage of operating time within limits equates to 1.1% for the whole year.

This is primarily based on the numbers of 10 minute or ½ hourly average readings taken by emissions monitoring instruments and, in reality, although each complete 10 minute or ½ hourly period has been considered in this evaluation the duration during which any limit was exceeded is usually for a much shorter length of time.

The permit also recognises that equipment can malfunction and allows, in certain circumstances, for the plant to remain in service under abnormal operating conditions with increased emission limit values. This allows for short-term continuous emissions monitoring or purification equipment to be rectified.

Although the permit restricts the period of abnormal operating conditions above to a maximum of 4 hours on any one occasion, or no more than 60 hours of abnormal operation on each line per year, boilers are generally shutdown after the first ½ hour of abnormal operation.

Table 7, below shows the percentage of time that the plant was operating within its permitted limits for each continuously monitored parameter, both on individual and combined streams. No figures are included below for NH₃ as, whilst this is continuously measured and monitored, there is no limit specified for emissions within the permit.

It is also important to consider that in addition to the high levels of performance indicated in terms of operating times actual emission levels were also considerably lower than prescribed daily averages. Across all parameters actual emissions were, on average 87% and 62% lower than 10 minute or ½ hourly and daily limits respectively.

Substance	Stream 1 (% operating time within limits)	Stream 2 (% operating time within limits)	Combined (% operating time within limits)
Hydrogen Chloride	96.49	94.88	95.68
Sulphur Dioxide	99.71	99.40	99.56
Oxides of Nitrogen	100.00	99.99	100.00
Volatile Organic Carbon	99.42	99.40	99.41
Particulates	100.00	99.70	99.85
Carbon Monoxide	99.12	98.51	98.82

Table 7 - Percentage of plant operating time within limits 2018

Unauthorised releases / Schedule 1's

Unauthorised releases relate to circumstances in which permitted emission limit values have been exceeded in situations not considered to comply with the exceptions provided for in abnormal operation.

Levels of unauthorised releases are tightly controlled and prompt remedial action is taken to address the situation with boilers being shut down as soon as is practicable where necessary.

Unauthorised releases are notified to the Environment Agency without delay and confirmed in writing by use of 'Schedule 1' Notices. Schedule 1 notices shall also be sent to the Environment Agency should any accident occur which has caused or has the potential to cause pollution.

In 2018, 18 schedule 1 incidents were reported on stream 1 and 27 on stream 2.

Abnormal Operations

As with any type of plant or machinery, there will inevitably be occasions where problems or breakdowns are experienced.

Abnormal operations are technically unavoidable stoppages, disturbances, or failures of the abatement plant or measurement devices, during which the concentrations into air and the purified water of the regulated substances may exceed normal emission limit values.

As referred to earlier this is recognised within the permit, which provides for the plant to continue to operate within limited circumstances for up to 4 hours to enable restoration of normal operations or failed equipment or its replacement as quickly as possible.

In practice, MES Environmental have adopted a policy to initiate the shut down process after only ½ hour of any abnormal operation unless it is clear that the problem can be resolved well within the 4 hour period. Whilst this does not necessarily affect the level of incidence of abnormal operation, it significantly reduces the number of operating hours in this situation.

During 2018 stream 1 had 0.5 hrs of abnormal periods of operation and for stream 2 this figure was 5.5 hrs

Non reportable incidents

In addition to unauthorised releases and abnormal operations there are also situations where incidents will occur that are not required to be reported to the Environment Agency if these either result in no emission being made to atmosphere or occur during start up or shut down mode.

As a responsible operator, if such situations occur MESE always submit a report to the EA describing what occurred and including supporting evidence.

Enforcement Notices

No enforcement notices were issued by the Environment Agency in respect of any aspect of plant operations during 2018.

Summary of plant improvements

There were a number of significant upgrades and major periodic work carried out in 2018, these include but are not limited to:

- A planned major overhaul of the turbine and the generator started on April 27th and was completed on June 23rd. The generator overhaul was initially scheduled for 26 days, however, this took longer to complete than originally anticipated due to several issues encountered during the stator winding replacement.
- Feed tables, bottom ash dischargers, vibrating tables, rollers and hydraulic rams, rod eyes, hydraulic packs, beams and bars of the grates, side castings, riddling flaps, air dumpers, and waste chute have been cleaned and inspected.
- Boiler 1 has been fitted with a new ash discharger “transition piece”, two new grate bar rows and new ski bars. Boiler 2 has been fitted with a new vibrating table.

Notwithstanding this, the operational and environmental efficiency and effectiveness of the plant infrastructure and systems are constantly monitored to identify potential areas for improvement.

Key performance indicators are considered at regular management meetings to identify trends and variations in performance, not only at an individual plant level but in comparison with sister plants at Wolverhampton and Stoke.

This provides a focus for Managers to consider possible areas for improvement and/or situations where action may be necessary in the future.

Summary of information made available

MES Environmental operate an inclusive policy of involving the public in their Operations by encouraging escorted tours of their facilities by interested groups. Last year numerous schools, colleges and industry or environmental groups visited sites and the same will happen this year.

For information about the facility or to arrange a visit, please contact the Plant Manager Mr. R Nadin on 01384 457321

All information sent to the Environment Agency including the operation permit details are available on the public register, which is accessible on the Environment Agency website.

Extra copies of this report are available by request from either the above referenced persons or by writing to:

David Lavender
Environmental Manager & QA Manager
MES Environmental
Crown Street
Wolverhampton
WV1 1QB

Appendices

Appendix 1 Performance Reports 2018

Permit Reference Number: AP3435SD

Operator: MES Environmental Limited

Installation; Dudley Waste Services Limited

Form Number: Agency Form / R1

Reporting of Waste Disposal and Recovery for the year 2018

Wates description	Disposal route	Tonnes	Recovery tonnes
2018			
1) Hazardous Wastes			
Named haz. Waste (Specify each separately)	Reprocess Fly ash (APC)	3540	0
Other hazardous wastes			
Total hazardous waste			0
2) Non-Hazardous Wastes			
Named non-haz. Waste (Specify each separately)	Reprocess IBA	15004	0
Other non-hazardous wastes	Recycling (Fe)	1435	1435
Total non-hazardous waste		16439	
TOTAL WASTE	-	19979	

Wates description	Disposal route	Tonnes	Recovery tonnes
2017			
1) Hazardous Wastes			
Named haz. Waste (Specify each separately)	Reprocess Fly ash (APC)	3311	0
Other hazardous wastes			
Total hazardous waste			0
2) Non-Hazardous Wastes			
Named non-haz. Waste (Specify each separately)	Reprocess IBA	15334	0
Other non-hazardous wastes	Recycling (Fe)	1558	1558
Total non-hazardous waste		16892	
TOTAL WASTE	-	20203	

Signed Date.....
 (Authorised to sign as representative of Operator)

Installation; Dudley Waste Services Limited

Form Number: Agency Form / AP3435SD / WU1

Reporting of Water Usage for the year2018

2018 - Water source	Usage (m ³)	Usage (m ³ /t)
Mains water	48863	0.52
Site borehole		
River abstraction		
Canal abstraction		
TOTAL WATER USAGE	48863	0.52

2017 - Water source	Usage (m ³)	Usage (m ³ /t)
Mains water	40337	0.42
Site borehole		
River abstraction		
Canal abstraction		
TOTAL WATER USAGE	40337	0.42

Signed Date.....
 (Authorised to sign as representative of Operator)

Installation; Dudley Waste Services Limited

Form Number: Agency Form / AP3435SD / E1

Reporting of Energy Usage for the year 2018

2018 - Source		Calculated	CO ₂ Produced (tonnes)
Electricity	MWh	7658	3292.9
Natural Gas	tonnes	N/A	
Gas Oil	tonnes	60.15	221.0
Recovered Fuel Oil	tonnes	N/A	
TOTAL	-		3513.9

2017 - Source		Calculated	CO ₂ Produced (tonnes)
Electricity	MWh	7649	3289.1
Natural Gas	tonnes	N/A	
Gas Oil	tonnes	47	172.7
Recovered Fuel Oil	tonnes	N/A	
TOTAL	-		3461.7

Signed Date.....
 (authorised to sign as representative of Operator)

Installation; Dudley Waste Services Limited

Form Number: Agency Form / AP3435SD / PI1

Reporting of Performance Indicators for the period 01/01/2018 to 31/12/2018

Annual Production/Treatment	
Total municipal waste incinerated (excluding separately collected fractions)	93,503 tonnes
Total other wastes Incinerated	223 tonnes
Electrical energy generated and exported	31803 MWh
Electrical energy generated and used on installation	6622 MWh

Signed Date.....
(authorised to sign as representative of Operator)

Environmental Performance Indicators

2018

Parameter	Average	Units
Electrical energy imported to site	11.06*	kWhrs/ tonne of waste incinerated (dry basis)
Fuel oil consumption	0.77	L / tonne of waste incinerated (dry basis)
Mass of bottom ash produced	160	kg/ tonne of waste incinerated (dry basis)
Mass of APC residues produced	37.77	kg/ tonne of waste incinerated (dry basis)
Mass of other solid residues produced	15.31	kg/ tonne of waste incinerated (dry basis)
Urea consumption	1.68	kg/ tonne of waste incinerated (dry basis)
Activated carbon consumption	0.08	kg/ tonne of waste incinerated (dry basis)
Lime consumption	10.22	kg/ tonne of waste incinerated (dry basis)
Water consumption	0.52	m ³ / tonne of waste incinerated (dry basis)

2017

Parameter	Average	Units
Electrical energy imported to site	1.33	kWhrs/ tonne of waste incinerated (dry basis)
Fuel oil consumption	0.60	L / tonne of waste incinerated (dry basis)
Mass of bottom ash produced	161	kg/ tonne of waste incinerated (dry basis)
Mass of APC residues produced	34.86	kg/ tonne of waste incinerated (dry basis)
Mass of other solid residues produced	16.40	kg/ tonne of waste incinerated (dry basis)
Urea consumption	1.67	kg/ tonne of waste incinerated (dry basis)
Activated carbon consumption	0.07	kg/ tonne of waste incinerated (dry basis)
Lime consumption	9.68	kg/ tonne of waste incinerated (dry basis)
Water consumption	0.42	m ³ / tonne of waste incinerated (dry basis)

Operator's comments: *Extended maintenance on the turbine and generator units (taking place between April and June) led to a decrease in electricity production compared to previous years. This also had an impact on the amount of electricity imported to site.

Signed

Date.....

APPENDIX 2

Continuously Monitored Emissions to Air (mg/m³*) from Emission Point A1 – 2018

HCI	Annual Summary		Monthly Summary		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	½ Hourly Av ELV 60	Annual ½ Hrly Max	703	Monthly ½ Hrly Max	76	93	136	53	55	187	76	237	28	53	703	52
Annual ½ Hrly Mean		6	Monthly ½ Hrly Mean	5	6	5	7	8	8	8	8	6	3	6	5	
Daily Ave ELV 10	Annual Daily Max	33	Monthly Daily Max	9	8	8	8	11	10	9	11	8	8	33	7	
	Annual Daily Mean	6	Monthly Daily Mean	5	6	5	7	8	8	8	8	6	3	6	5	

SO ₂	Annual Summary		Monthly Summary		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	½ Hourly Av ELV 200	Annual ½ Hrly Max	373	Monthly ½ Hrly Max	72	78	101	97	126	148	99	148	82	92	373	58
Annual ½ Hrly Mean		13	Monthly ½ Hrly Mean	9	11	12	13	24	17	15	14	12	10	12	10	
Daily Ave ELV 50	Annual Daily Max	31	Monthly Daily Max	14	17	27	19	31	22	24	21	18	15	38	16	
	Annual Daily Mean	13	Monthly Daily Mean	9	11	12	12	23	17	15	14	12	10	12	10	

NO _x	Annual Summary		Monthly Summary		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	½ Hourly Av ELV 400	Annual ½ Hrly Max	666	Monthly ½ Hrly Max	298	333	309	324	666	338	345	291	260	328	260	320
Annual ½ Hrly Mean		180	Monthly ½ Hrly Mean	180	180	180	180	179	181	180	180	180	180	180	179	
Daily Ave ELV 200	Annual Daily Max	194	Monthly Daily Max	184	184	185	185	194	185	187	182	183	185	181	184	
	Annual Daily Mean	180	Monthly Daily Mean	180	180	180	180	182	181	180	180	180	180	180	179	

VOC	Annual Summary		Monthly Summary		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	½ Hourly Av ELV 20	Annual ½ Hrly Max	32	Monthly ½ Hrly Max	10	22	4	4	7	6	4	3	5	32	3	5
Annual ½ Hrly Mean		1	Monthly ½ Hrly Mean	1	1	1	1	1	1	1	1	1	0	0	0	
Daily Ave ELV 10	Annual Daily Max	2	Monthly Daily Max	1	2	1	1	1	1	1	1	1	1	1	1	
	Annual Daily Mean	1	Monthly Daily Mean	1	1	1	1	1	1	1	1	1	0	0	0	

NH₃	Annual Summary		Monthly Summary												
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
½ Hourly Av No ELV	Annual ½ Hrly Max	206	Monthly ½ Hrly Max	100	12	14	75	206	37	111	46	55	47	10	24
	Annual ½ Hrly Mean	3	Monthly ½ Hrly Mean	4	3	2	2	6	4	3	3	2	3	2	1
Daily Ave No ELV	Annual Daily Max	12	Monthly Daily Max	8	9	3	5	12	5	7	5	5	5	5	2
	Annual Daily Mean	3	Monthly Daily Mean	4	3	2	2	5	3	1	3	2	3	2	1

Particulates	Annual Summary		Monthly Summary												
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
½ Hourly Av ELV 30	Annual ½ Hrly Max	253	Monthly ½ Hrly Max	4	2	3	9	253	20	3	3	3	3	2	7
	Annual ½ Hrly Mean	2	Monthly ½ Hrly Mean	2	2	2	2	5	2	2	2	2	2	2	2
Daily Ave ELV 10	Annual Daily Max	13	Monthly Daily Max	2	2	2	2	13	2	2	2	2	2	2	4
	Annual Daily Mean	2	Monthly Daily Mean	2	2	1	1	3	2	2	2	2	2	2	2

CO	Annual Summary		Monthly Summary												
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
10 min Av ELV 150	Annual 10 min Max	420	Monthly 10 min Max	28	25	40	161	241	85	420	37	245	64	34	24
	Annual 10 min Mean	10	Monthly 10 min Mean	7	7	8	10	15	9	12	11	11	9	9	8
Daily Ave ELV 50	Annual Daily Max	60	Monthly Daily Max	21	20	20	37	26	18	50	34	60	45	20	53
	Annual Daily Mean	9	Monthly Daily Mean	6	7	8	9	11	8	12	11	11	9	9	8

* Figures reported to the nearest whole number.

Continuously Monitored Emissions to Air (mg/m³*) from Emission Point A2 – 2018

HCl	Annual Summary		Monthly Summary		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	½ Hourly Av ELV 60	Annual ½ Hrly Max	713	Monthly ½ Hrly Max	75	68	76	60	99	66	61	145	90	175	713	130
	Annual ½ Hrly Mean	7	Monthly ½ Hrly Mean	6	7	7	7	8	6	7	8	6	3	8	5	
Daily Ave ELV 10	Annual Daily Max	36	Monthly Daily Max	8	9	9	10	10	10	9	10	8	8	36	8	
	Annual Daily Mean	7	Monthly Daily Mean	6	7	7	7	8	6	7	8	6	3	8	5	

SO₂	Annual Summary		Monthly Summary		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	½ Hourly Av ELV 200	Annual ½ Hrly Max	218	Monthly ½ Hrly Max	90	95	110	111	138	153	87	205	72	75	218	53
	Annual ½ Hrly Mean	15	Monthly ½ Hrly Mean	14	15	16	16	28	18	19	16	12	9	11	10	
Daily Ave ELV 50	Annual Daily Max	44	Monthly Daily Max	18	19	27	24	44	26	23	25	18	13	29	18	
	Annual Daily Mean	15	Monthly Daily Mean	14	15	16	16	26	19	19	16	12	9	11	10	

NO_x	Annual Summary		Monthly Summary		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	½ Hourly Av ELV 400	Annual ½ Hrly Max	452	Monthly ½ Hrly Max	323	234	358	452	347	370	322	343	217	353	305	198
	Annual ½ Hrly Mean	180	Monthly ½ Hrly Mean	181	180	180	180	181	180	180	181	180	180	180	179	
Daily Ave ELV 200	Annual Daily Max	190	Monthly Daily Max	185	181	183	185	184	185	184	190	181	188	182	180	
	Annual Daily Mean	180	Monthly Daily Mean	181	180	180	180	180	180	180	181	180	180	180	179	

VOC	Annual Summary		Monthly Summary		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	½ Hourly Av ELV 20	Annual ½ Hrly Max	63	Monthly ½ Hrly Max	1	23	1	6	3	5	63	18	9	5	7	7
	Annual ½ Hrly Mean	0.1	Monthly ½ Hrly Mean	0	1	0	0	0	0	0	0	0	0	0	0	
Daily Ave ELV 10	Annual Daily Max	2	Monthly Daily Max	1	2	0	1	1	1	1	0	2	1	1	1	
	Annual Daily Mean	0.1	Monthly Daily Mean	0	1	0	0	0	0	0	0	0	0	0	0	

NH₃	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	½ Hourly Av No ELV	Annual ½ Hrly Max	221	Monthly ½ Hrly Max	68	32	86	154	102	43	221	41	25	17	34
Annual ½ Hrly Mean		3	Monthly ½ Hrly Mean	3	2	3	3	11	4	2	2	2	2	3	2
Daily Ave No ELV	Annual Daily Max	15	Monthly Daily Max	8	5	5	13	15	8	9	3	4	3	6	3
	Annual Daily Mean	3	Monthly Daily Mean	3	2	2	3	11	3	2	2	2	2	3	2

Particulates	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	½ Hourly Av ELV 30	Annual ½ Hrly Max	89	Monthly ½ Hrly Max	89	3	2	3	27	12	4	5	3	33	2
Annual ½ Hrly Mean		1	Monthly ½ Hrly Mean	1	1	1	1	3	1	1	1	1	2	1	1
Daily Ave ELV 10	Annual Daily Max	8	Monthly Daily Max	3	1	1	1	8	2	2	1	2	2	1	1
	Annual Daily Mean	1	Monthly Daily Mean	1	1	1	0	1	1	1	1	1	1	1	1

CO	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	10 min Av ELV 150	Annual 10 min Max	629	Monthly 10 min Max	95	50	485	471	331	93	629	5	66	70	32
Annual 10 min Mean		14	Monthly 10 min Mean	13	12	16	15	40	17	18	11	11	9	10	9
Daily Ave ELV 50	Annual Daily Max	133	Monthly Daily Max	29	37	87	133	57	35	53	11	25	22	19	40
	Annual Daily Mean	14	Monthly Daily Mean	13	12	14	15	32	17	16	10	66	10	10	9

* Figures reported to the nearest whole number.