STOKE ON TRENT ENERGY FROM WASTE PLANT

PERMIT No QP3234SX

WASTE INCINERATION DIRECTIVE

ANNUAL REPORT

2008

CONTENTS

Annual performance report for MES Environmental Stoke –on-Trent EfW Plant– Permit No. QP3234SX – Year 2008

Introduction.

This report is produced under the Waste Incineration Directive's Article 12(2) 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:

Name of Company	*M E S Environmental*
Name of Plant	*Stoke EfW Facility*
Permit Number	*QP3234SX*
Address	*Sideway, Campbell Road, Stoke, ST4 4DX*
Phone	*01782 412131*
Contact name	*Mr. D. Rockey*
Position	*Plant Manager*
Further information, description of waste types burned and origin.	*Constructed in 1997 to burn in the region of 210,000 tonnes per annum of local domestic refuse and generate a nominal 15MW of electricity for the local community.*
(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. D. Rockey on the above number)	

Table 1 – General information

The plant provides a sustainable method of waste disposal and recovery for the whole of the North Staffordshire conurbation, comprising the districts of Stoke-on-Trent, Newcastle under Lyme, Staffordshire Moorlands and the northern area of Stafford.

Household, commercial or industrial wastes, collected by the local authorities, comprise almost all of the wastes delivered to the plant. In 2008 95.61% of all deliveries were from local authorities in the primary catchment area with a further 3.85% from local authorities in the south of the County. Only around 0.5% of wastes were from private sector contracts.

Priority will always be given however 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 210,000 tonnes per year of municipal and other specified wastes.

The plant contains two incineration lines with a combined design capacity to process up to 24 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 14.2 MW of electricity and, after satisfying its own power needs, exports approximately 12 MW of electricity to the local electricity network. This assists in contributing to the Government's target of providing 10% of electricity generation from renewable energy sources by the year 2010.

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.

In 2008 6237 tonnes of wastes were imported from the south of the County which would otherwise have been disposed of at landfill, with no beneficial use.

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 2000. 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.
- 76 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, accredited to IS014001 and a Quality Management System, accredited to IS09001
- 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 QP3234SX) and which contains conditions to ensure that the requirements of the Waste Incineration Directive are incorporated and will be met.

A variation to the permit (reference FP3632XM) was also issued in May 2008 and which amended continuous emission limit monitoring for CO from ½ hourly to 10 minute averages as set out in table 2.2.2 and 2.2.2a of the permit

Periodic emission limit values for particulates and hydrogen chloride were also amended to bring these in line with values for continuous monitoring.

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 12 tonnes per hour.

Although this creates a technical capacity for around 210,000 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 210,000 tonnes of mixed municipal waste and 10,500 tonnes of separately collected fractions.

Separately collected fractions are generally wastes delivered by private sector customers with mixed municipal wastes comprising deliveries from local authorities.

Total deliveries for 2008 are set out in Table 2 below.

Annual waste throughputs

Waste Types	***EWC codes***	***Tonnes burnt***
Mixed municipal wastes	*20.03.01*	Stream 1 83561 Stream 2 77710 Total 161271
Separately collected fractions	*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*	Total 874
Total burnt – all types		162145

Table 2 - Incinerated Wastes 2008

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 with other stoppages tending to be short term shutdowns of individual streams, for one or two days, to deal with smaller scale issues such as tube leaks. Whilst these are relatively small jobs to repair the time taken to complete is extended whilst waiting for boilers to cool down before work can commence and then to bring back up to operating temperatures.

Routine planned maintenance to boiler 2 in 2008 was carried out from the 25th August to the 20th September. Routine maintenance to boiler 1 was carried out from the 6th to 27th September.

The overall level of plant availability, in terms of operating hours, was less than anticipated, mainly as a consequence of the issues referred to above, with boiler 1 and boiler 2 available for 7787 and 7274 hours respectively. This was equivalent individually to 88.65% and 82.81% of potential operating hours or 85.73% overall.

A higher than anticipated incidence of premature tube failures was however experienced in 2008, particularly in respect of boiler 2. Complete super-heater panels were replaced during the annual routine maintenance period to rectify the problem and availability is expected to improve in 2009.

Works have also been undertaken during 2008 to improve the efficiency of bag house filters. Whilst this has not particularly prejudiced the availability of boilers in terms of time boilers were restricted in terms of operating load prior to the works being undertaken and thus tonnage capacity was reduced during this 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: and
- Residues from the flue gas treatment system (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 26% 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. Although bottom ash from the plant is not currently recycled MESE are currently actively investigating alternatives to landfill in conjunction with its local authority 'partners'

Table 3 shows the total quantities of the various residues produced in 2008.

Residue	Annual tonnage	Percentage of input waste	Disposal destination.
Bottom ash	35755	22.05%	Landfill
Fly ash	5635	3.48%	Reprocessing prior to landfill
Ferrous metals	1453	0.90%	Recycling

Table 3 - Residues produced & final destination

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 of wastes delivered. This can vary seasonally and is dependent upon the types of wastes delivered but, typically, are in the order of 8 to 8.5 Mj/kg.

In 2008 the average calorific value of wastes delivered over the year was 8.11Mj/Kg in comparison with CV's over the last four years of 8.3, 8.45, 8.74 & 8.91mj/kg from 2004 to 2007 respectively. Variations are most likely to be attributable to the

expansion of local authority recycling schemes which are progressively removing greater quantities of material with both high and low or zero CV wastes such as paper, plastic, green and organic kitchen waste, bottles and tins.

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 20,000 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 CO_2 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 the plant exports 12 MWe from processing around 180,000 tonnes which is equivalent to 6.7MWe per 100,000 tonnes and within the range of guide values. In 2008 actual values were 6.01Mwe per 100,000 tonnes. This is expected to increase in 2009 following works to improve the efficiency of bag filter operations with resultant increased operating loads

Details of electrical power produced, used and exported from the plant in 2008 is set out in Table 4 below together with details of small 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
247	95,200	14,229	80971

Table 4 - Electrical power production

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 Carbons, Ammonia, Carbon Monoxide, 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, with further details of associated plant performance shown in Table 6 and Appendices 1 and 2.

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

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. During any water emission to external sewer there is a water sample taken and the sample sent to external laboratory for analysis. In 2008 the cumulative volume of water discharged to sewer was 691m3.

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 Monitor`s (CEM's) Operation

The CEM`s 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 CEM`s failure.

CEM's 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 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.

Periodic testing is undertaken quarterly by independent and appropriately certified testing laboratories with separate annual validation tests also carried out by an alternative certified testing laboratory on behalf of the Environment Agency.

A summary CEM data for all continuously monitored substances is shown at Appendix 2 with a summary of results for substances which are only monitored periodically shown below in Table 6.

Pollutant	ELV	Stream	*Qtr 1*	*Qtr 2*	*Qtr 3*	*Qtr 4*
Cd/Th (mg/m³)	0.05 mg/m3	1	0.0010	0.0069	0.0073	0.0025
		2	0.0169	0.0048	0.0139	0.0126
		Overall Ave	0.0089	0.0059	0.0106	0.0076
Hg (mg/m³)	0.05 mg/m3	1	0.0010	0.0009	0.0100	0.0039
		2	0.0013	0.0059	0.0209	0.0070
		Overall Ave	0.0011	0.0034	0.0154	0.0054
Hf (mg/m³)	2 mg/m3	1	<0.100	<0.100	<0.040	<0.040
		2	<0.100	<0.100	<0.040	<0.050
		Overall Ave	<0.100	<0.100	<0.040	<0.045
Group III Metals (mg/m³)	0.5 mg/m3	1	0.0350	0.1787	0.1616	0.3513
		2	0.2075	0.3021	0.3459	0.2436
		Overall Ave	0.1212	0.2404	0.2537	0.2974
Dioxins (ng/m³)	0.1 ng/m3	1	-	0.0130	-	0.0029
		2	-	0.0654	-	0.0231
		Overall Ave	-	0.0392	-	0.0130

Table 6 Emissions of periodically monitored pollutants

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 an extremely high level. The numbers of occasions where emission limit values have been exceeded are very small and when expressed as a percentage of operating time within limits range from 0 to only 0.01% depending upon the substance measured.

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

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.

In 2008 there were only 3 occasions of abnormal operation (see Table 8) comprising 1 on stream 1 and 2 on stream 2.

Table 7 below sets out 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 NH_3 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 over 89% and 70% 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	99.99%	100%	99.99%
Sulphur Dioxide	100%	100%	100%
Oxides of Nitrogen	100%	99.99%	99.99%
Volatile Organic Carbon	100%	100%	100%
Particulates	100%	99.99%	99.99%
Carbon Monoxide	99.99%	99.99%	99.99%

Table 7 - Percentage of plant operating time within limits

A summary of all emissions anomalies for 2008 is given below

Unauthorised releases

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 closed down as soon as is practicable where necessary.

In 2008 there are currently no reported unauthorised releases and all emission anomalies were either as a result of abnormal operations or non reportable events. Periodic test results for particulates in Q4 on stream 2 remain outstanding however as results conflict with values from Continuous emissions monitoring equipment which show levels well below emission limit values. Re-tests have been undertaken in consultation with the Environment Agency and results are currently awaited.

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 and whilst this does not necessarily affect the level of incidence of abnormal operation it significantly reduces the number of operating hours in this situation.

Table 8 identifies the situations in which abnormal operating conditions were applied in 2008.

Date	Time	Substance / Location	Anomaly
17th April	16.20 - 16.30	NOx Boiler 2	O_2 probe failure. Stand by O_2 probe selected and feed chute door closed until O_2 reading stable.
6th May	18.30 – 18.59	Particulates Boiler 2	Problems with bag – house by-pass system. Welding repairs carried out to bag filter inlet duct. 3 new filter bags fitted in cell 3.
28th December	13.30 – 13.59	HCl – Boiler 1	Lime pump trip – changed over to stand-by unit

Table 8 – Abnormal Operations 2008

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, are within the limits prescribed within the Waste Incineration Directive or occur during start up or shut down mode. The numbers of non reportable incidents on each stream during 2008 are summarised below.

Stream 1

Substance	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
CO	0	0	1	0	0	0	0	0	0	0	0	0
HCL	0	0	0	0	0	0	0	0	0	0	0	0
NH_3	0	0	0	0	0	0	0	0	0	0	0	0
NO_x	0	0	0	0	0	0	0	0	0	0	0	0
SO_2	0	0	0	0	0	0	0	0	0	0	0	0
Particulates	0	0	0	0	0	0	0	0	0	0	0	0
VOC	0	0	0	2	0	0	0	0	0	0	0	1
Monthly Total	0	0	1	2	0	0	0	0	0	0	0	1

Table 9 – Non reportable incidents Stream 1 2008

Stream 2

Substance	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
CO	0	0	1	0	0	0	0	0	0	0	0	0
HCL	0	0	0	0	0	0	0	0	0	0	0	0
NH_3	0	0	0	0	0	0	0	0	0	0	0	0
NO_x	0	0	0	0	0	0	0	0	0	0	0	0
SO_2	0	0	0	0	0	0	0	0	0	0	0	0
Particulates	0	0	0	0	0	0	0	0	0	0	0	0
VOC	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Total	0	0	1	0	0	0	0	0	0	0	0	0

Table 10 – Non reportable incidents Stream 2 2008

No enforcement notices were issued by the Environment Agency in respect of any aspect of plant operations in 2008

Although technical performance continued to be delivered at high levels throughout, constant and thorough reviews of management and operating systems are undertaken and subjected to a rigorous process of external audit and validation.

6. Summary of plant improvements:

During the course of 2008 improvements have been made to improve the efficiency gas cleaning through improved bag filter capability together with changes to the urea dosing system. Both of these were as a result of more rigourous emission controls and increasing use of consumables as a consequence of the requirements of the Waste Incineration Directive. (WID)

The surface area of existing bag filters was insufficient to efficiently accommodate increased levels of lime consumption necessary for tighter control of acidic gases. As a consequence the plant was operating at reduced load until infrastructure improvements were made. This is reflected in part in the lower than anticipated tonnage throughput and electricity outputs in the earlier part of the year.

It should be noted however that this did not in any way prejudice the capability of the plant in terms of control of emissions as is indicated earlier in this report and as summarised in Table 7 and Appendix 2

The number of bag filters have now been increased from 660 to1120 increasing the surface area available by around 34%. (The replacement bag filters are smaller individually than those they have replaced). Works were completed during the major outage in September and plant performance and output has improved significantly.

Operating loads have increased from around 30 tph of steam up to around 36tph with proportionate increases in waste tonnage capacity and improvements in energy production.

Increased levels of urea consumption required to comply with the tighter controls imposed by WID in the control of NOx have also influenced changes to the existing dosing systems. Notwithstanding the fact that NOx levels were controlled effectively

using the old system, again as indicated by elsewhere in this report, the new system provides greater capacity and flexibility in the control and level of dosing rates.

In addition to this, of course, 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 or variations in performance, not only at an individual plant level but in comparison with sister plants at Dudley and Wolverhampton.

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

7. Summary of information made available:

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

For information about the facility or to arrange a visit, please contact either the Plant or Operations Manager Mr D Rockey or Mr. J Buckham on 01782 412131

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:

Mr. P Wright
Senior Policy Manager
MES Environmental
Crown Street
Wolverhampton
WV1 1QB

Appendices

Appendix 1 Performance Reports 2008

Permit Reference Number: QP3234SX **Operator : MES Environmental Limited**
Installation; Hanford Waste Services Limited Form Number : Agency Form / QP3234SX / DR1

Reporting of Waste Disposal and Recovery for the year ……2008……

Waste Description	Disposal Route	Tonnes	Recovery Tonnes
1) Hazardous Wastes			
Named haz. Waste (Specify each separately)	Reprocess Fly ash (APC)	5635	0
Other hazardous wastes			
Total hazardous waste		5635	0
2) Non-Hazardous Wastes			
Named non-haz. Waste (Specify each separately)	Landfill IBA	35755	0
Other non-hazardous wastes	Recycling (Fe)	1453	1453
Total non-hazardous waste		37208	1453
TOTAL WASTE	-	42843	1453

Trends in Waste Disposal and Recovery Year	Parameter		
	Named Waste	Total Waste	Waste per unit output
2007			
	APC	5943	0.074T/MWh
		5943	0.074T/MWh
	IBA	41756	0.523T/MWh
	Fe	557	0.007T/MWh
		42313	0.530T/MWh
		48256	0.604T/MWh

Operator's comments : Waste per unit output above expressed in terms of nett exported energy of 79855 MWh in 2007.

If expressed in terms of gross energy production of 94473MWh figures are adjusted to 0.063, 0.442 & 0.006T/MWh for APCR, IBA and recycled tins respectively. (0.511T/MWh overall)

Signed …… Date……..

(authorised to sign as representative of Operator)

Permit Reference Number: QP3234SX **Operator : MES Environmental Limited**

Installation; Hanford Waste Services Limited Form Number : Agency Form / QP3234SX / WU1

Reporting of Water Usage for the year ……2008……

Water Source	Usage (m^3)	Specific Usage (m^3/t)
Mains water	21848	0.135m3/t
Site borehole		
River abstraction		
Canal abstraction	41860	0.258m3/t
TOTAL WATER USAGE	63708	0.393m3/t

Trends in Water Usage Year	Parameter		
	Named Water source	Total Water usage	Water per unit output
2007	Mains supply	22366	0.280m3/MWh
	Canal	44590	0.558 m3/MWh
		66956	0.838m3/MWh

Operator's comments : Water per unit output above expressed in terms of nett exported energy of 79855 MWh in 2007.

If expressed in terms of gross energy production of 94473MWh figures are adjusted to 0.24 and 0.47m3/MWh for mains and canal water supply respectively (0.71m3/MWh overall)

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

Permit Reference Number: QP3234SX **Operator : MES Environmental Limited**

Installation; Hanford Waste Services Limited Form Number : Agency Form / QP3234SX / EU1

Reporting of Energy Usage for the year ……2008……

Energy Source	Energy Usage Quantity	Primary Energy (MWh)	CO_2 Produced (tonnes)
Electricity	MWh	14476	6225
Natural Gas	tonnes	N/A	
Gas Oil	tonnes	331.30	1217
Recovered Fuel Oil	tonnes	N/A	
TOTAL	-		
			7442

Trends in Energy Usage Year	Parameter		
	Primary Energy usage	CO_2 Produced (tonnes)	CO_2 per unit output
2007			
	15232	6550	0.082 t/MWh
	208.49	766	0.010 t/MWh
		7316	0.092t/MWh

Operator's comments : CO_2 per unit output above expressed in terms of nett exported energy of 79855 MWh in 2007.

If expressed in terms of gross energy production of 94473MWh figures are adjusted to 0.069 and 0.008T/MWh for electricity and gas oil consumption respectively. (0.077T/MWh overall)

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

Permit Reference Number: QP3234SX **Operator : MES Environmental Limited**

Installation; Hanford Waste Services Limited Form Number : Agency Form / QP3234SX / PP1

Reporting of Performance Indicators for the period …01/01/2008..… to …31/12/2008…….

Annual Production/Treatment	
Total municipal waste incinerated (excluding separately collected fractions)	161271 tonnes
Total other wastes Incinerated	874 tonnes
Electrical energy generated and exported	80971 MWhrs
Electrical energy generated and used on installation	14229 MWhrs

Environmental Performance Indicators

Parameter	Quarterly Average	Units
Electrical energy imported to site	**1.52**	kWhrs/ tonne of waste incinerated (dry basis)
Fuel oil consumption	**2.04**	kg/ tonne of waste incinerated (dry basis)
Mass of bottom ash produced	**220.51**	kg/ tonne of waste incinerated (dry basis)

Trends in Environmental Performance Year	Parameter	
2007	Electrical energy imported to site	**3.70** Kwhrs / tonne waste incinerated
	Fuel oil consumption	**1.25** kg / tonne waste incinerated
	Mass of bottom ash produced	**251.47** kg / tonne of waste incinerated

Parameter	Quarterly	Units
Mass of APC residues produced	**34.75**	kg/ tonne of waste incinerated (dry basis)
Mass of other solid residues produced	**8.96**	kg/ tonne of waste incinerated (dry basis)
Urea consumption	**0.82**	kg/ tonne of waste incinerated (dry basis)
Activated carbon consumption	**0.04**	kg/ tonne of waste incinerated (dry basis)
Lime consumption	**14.80**	kg/ tonne of waste incinerated (dry basis)
Water consumption	**0.393**	m^3/ tonne of waste incinerated (dry basis)

Trends in Environmental Performance		
2007	Mass of APC residues produced	**35.79** kg / tonne of waste incinerated
	Mass of other solid residues produced	**3.35 kg** / tonne of waste incinerated
	Urea consumption	**0.98 kg** / tonne of waste incinerated
	Activated carbon consumption	**0.03 kg** / tonne of waste incinerated
	Lime consumption	**13.38 kg** / tonne of waste incinerated
	Water consumption	**0.403 m3** / tonne of waste incinerated

Operator's comments :

Signed …… **Date……..**

(authorised to sign as representative of Operator)

APPENDIX 2

Continuously Monitored Emissions to Air (mg/m3*) from Emission Point A1 – 2008

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	66	Monthly ½ Hrly Max	47	15	16	10	20	15	36	33	21	18	15	66
	Annual ½ Hrly Mean	4	Monthly ½ Hrly Mean	3	2	3	2	2	3	3	4	5	5	5	6
Daily Ave ELV 10	Annual Daily Max	9	Monthly Daily Max	6	4	5	4	6	3	6	7	9	7	6	9
	Annual Daily Mean	4	Monthly Daily Mean	3	2	3	2	2	3	3	4	5	5	5	6

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	171	Monthly ½ Hrly Max	73	106	171	92	114	41	67	39	71	97	82	101
	Annual ½ Hrly Mean	12	Monthly ½ Hrly Mean	16	15	21	18	15	14	6	5	9	10	10	8
Daily Ave ELV 50	Annual Daily Max	33	Monthly Daily Max	21	21	26	33	27	17	24	9	17	15	15	12
	Annual Daily Mean	12	Monthly Daily Mean	16	15	21	18	15	14	7	5	9	10	10	8

NOx	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	265	Monthly ½ Hrly Max	202	235	265	213	186	187	178	194	202	246	216	237
	Annual ½ Hrly Mean	153	Monthly ½ Hrly Mean	154	156	156	158	157	158	156	155	141	147	148	144
Daily Ave ELV 200	Annual Daily Max	162	Monthly Daily Max	159	160	159	162	159	159	159	159	158	157	158	156
	Annual Daily Mean	153	Monthly Daily Mean	154	156	156	158	157	158	156	156	140	147	149	144

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	74	Monthly ½ Hrly Max	3	11	2	74	16	6	15	16	3	2	3	39
	Annual ½ Hrly Mean	1	Monthly ½ Hrly Mean	1	1	1	1	1	1	2	1	2	1	1	1
Daily Ave ELV 10	Annual Daily Max	4	Monthly Daily Max	1	2	1	3	4	2	3	3	2	2	2	2
	Annual Daily Mean	1	Monthly Daily Mean	1	1	1	1	1	1	2	2	2	1	1	1

NH_3	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av	Annual ½ Hrly Max	75	Monthly ½ Hrly Max	15	9	13	14	14	11	13	15	16	25	32	75
No ELV	Annual ½ Hrly Mean	5	Monthly ½ Hrly Mean	2	2	2	3	2	2	2	2	3	9	13	16
Daily Ave	Annual Daily Max	25	Monthly Daily Max	5	3	4	5	3	4	4	4	5	14	17	25
No ELV	Annual Daily Mean	5	Monthly Daily Mean	2	2	2	3	2	2	2	2	3	9	12	16

Particulates	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av	Annual ½ Hrly Max	20	Monthly ½ Hrly Max	2	1	2	8	4	2	16	20	19	9	3	5
ELV 30	Annual ½ Hrly Mean	1	Monthly ½ Hrly Mean	0	0	0	1	1	0	1	1	1	1	0	0
Daily Ave	Annual Daily Max	4	Monthly Daily Max	1	0	1	3	3	1	2	3	2	4	1	1
ELV 10	Annual Daily Mean	0	Monthly Daily Mean	0	0	0	1	1	0	0	1	1	1	0	0

CO **	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av	Annual ½ Hrly Max	105	Monthly ½ Hrly Max	83	71	105	56	-	-	-	-	-	-	-	-
ELV 100	Annual ½ Hrly Mean	9	Monthly ½ Hrly Mean	9	9	11	8	-	-	-	-	-	-	-	-
10 Min Av	Annual 10 min Max	109	Monthly 10 min max	-	-	-	-	35	53	48	102	109	45	90	14
ELV 150	Annual 10 min Mean	9	Monthly 10 min mean	-	-	-	-	10	11	7	6	16	8	9	9
Daily Ave	Annual Daily Max	29	Monthly Daily Max	14	12	15	10	14	15	11	12	29	12	17	10
ELV 50	Annual Daily Mean	9	Monthly Daily Mean	9	9	11	8	10	11	6	5	13	8	9	9

* Figures reported to the nearest whole number.

** CO ELV amended to 10 min average by variation to permit issued in May 2008

Continuously Monitored Emissions to Air (mg/m3*) from Emission Point A2 – 2008

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	45	Monthly ½ Hrly Max	45	27	21	16	23	31	23	18	30	26	15	25
	Annual ½ Hrly Mean	5	Monthly ½ Hrly Mean	5	4	6	4	4	3	5	5	5	5	5	5
Daily Ave ELV 10	Annual Daily Max	9	Monthly Daily Max	9	7	9	6	7	7	9	7	6	8	7	7
	Annual Daily Mean	4	Monthly Daily Mean	5	4	5	3	4	3	5	4	4	5	5	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	139	Monthly ½ Hrly Max	75	139	136	98	114	102	102	66	64	84	89	61
	Annual ½ Hrly Mean	15	Monthly ½ Hrly Mean	10	17	23	20	19	16	12	10	12	12	15	11
Daily Ave ELV 50	Annual Daily Max	35	Monthly Daily Max	16	35	34	27	30	29	27	19	16	22	19	19
	Annual Daily Mean	15	Monthly Daily Mean	10	17	21	20	19	16	12	10	12	12	15	11

NOx	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	569	Monthly ½ Hrly Max	267	270	218	569	211	211	206	280	235	269	218	225
	Annual ½ Hrly Mean	153	Monthly ½ Hrly Mean	158	160	156	152	156	156	155	161	131	153	152	141
Daily Ave ELV 200	Annual Daily Max	177	Monthly Daily Max	166	174	158	158	158	160	158	177	146	173	160	155
	Annual Daily Mean	153	Monthly Daily Mean	157	160	156	152	156	156	155	160	133	153	152	141

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	17	Monthly ½ Hrly Max	14	7	17	10	12	15	6	7	12	7	3	7
	Annual ½ Hrly Mean	1	Monthly ½ Hrly Mean	1	1	1	1	1	1	1	1	0	0	0	0
Daily Ave ELV 10	Annual Daily Max	2	Monthly Daily Max	2	1	1	1	1	1	1	1	1	0	0	1
	Annual Daily Mean	1	Monthly Daily Mean	1	1	1	1	1	1	1	1	0	0	0	0

NH_3	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	86	Monthly ½ Hrly Max	14	5	10	8	12	15	18	86	52	29	36	20
	Annual ½ Hrly Mean	2	Monthly ½ Hrly Mean	1	2	2	2	3	3	1	1	8	4	1	1
Daily Ave No ELV	Annual Daily Max	15	Monthly Daily Max	1	2	4	4	4	4	3	8	15	10	8	3
	Annual Daily Mean	2	Monthly Daily Mean	1	2	2	2	3	3	1	1	7	4	1	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	31	Monthly ½ Hrly Max	7	11	27	10	31	4	7	7	19	16	4	25
	Annual ½ Hrly Mean	2	Monthly ½ Hrly Mean	1	1	2	1	4	1	1	1	7	3	0	0
Daily Ave ELV 10	Annual Daily Max	10	Monthly Daily Max	3	2	8	3	8	1	3	3	10	7	1	1
	Annual Daily Mean	2	Monthly Daily Mean	1	1	2	1	2	1	1	1	7	3	0	0

CO**	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av ELV 100	Annual ½ Hrly Max	162	Monthly ½ Hrly Max	55	61	162	82	-	-	-	-	-	-	-	-
	Annual ½ Hrly Mean	10	Monthly ½ Hrly Mean	7	10	13	11	-	-	-	-	-	-	-	-
10 Min Av ELV 150	Annual 10 min Max	55	Monthly 10 min max	-	-	-	-	47	33	55	26	34	8	14	12
	Annual 10 min Mean	6	Monthly 10 min mean	-	-	-	-	10	9	4	4	7	5	6	6
Daily Ave ELV 50	Annual Daily Max	16	Monthly Daily Max	11	15	16	15	10	13	13	8	11	7	8	7
	Annual Daily Mean	7	Monthly Daily Mean	7	9	11	11	9	9	4	4	6	5	6	6

* Figures reported to the nearest whole number.

** CO ELV amended to 10 min average by variation to permit issued in May 2008