(29)

STOKE ON TRENT ENERGY FROM WASTE PLANT

PERMIT No QP3234SX

WASTE INCINERATION DIRECTIVE

ANNUAL REPORT

2009

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Annual performance report for MES Environmental Stoke –on-Trent EfW Plant– Permit No. QP3234SX – Year 2009

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 14.2MW 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 the northern area of Stafford and limited quantities from East Staffordshire.

Household, commercial or industrial wastes, collected by the local authorities, comprise almost all of the wastes delivered to the plant. In 2009 89.13% of all deliveries were from local authorities in the primary catchment area with a further 9.73% from local authorities in the south of the County. Only around 1.14% 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 2009 17641 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.

Local authority waste deliveries are comprised entirely of mixed municipal wastes whilst private sector 'deliveries may be a combination of these and / or separately collected fractions.

Total deliveries for 2009 are set out in Table 2 below.

Annual waste throughputs

Waste Types	*EWC codes*	*Tonnes burnt*
Mixed municipal wastes	*20.03.01*	Stream 1 89971 Stream 2 90888 Total 180859
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 480
Total burnt – all types		181339

Table 2 - Incinerated Wastes 2009

Works undertaken during 2008 to improve the efficiency of bag house filters has also enabled boilers to operate at increased loads during 2009 which is a contributory factor in the increased tonnage throughput in 2009 of 181339. This represents an 11.8% increase in comparison with 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 2009 was carried out from the 6th to the 15th September and to boiler 1 from the 13th to the 25th 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 7891 and 7681 hours respectively. This was equivalent individually to 90.08% and 87.68% of potential operating hours or 88.88% overall.

Although a higher than anticipated incidence of premature tube failures was experienced in 2009, particularly in respect of boiler 2, availability and operating hours have increased in comparison with the preceding year where total combined availability was only 85.73%. It is anticipated that this improvement will continue into 2010 with combined availability expected to exceed 90%.

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 27% 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 2009.

Residue	Annual tonnage	Percentage of input waste	Disposal destination.
Bottom ash	40138	22.13%	Landfill
Fly ash	6961	3.84%	Reprocessing prior to landfill
Ferrous metals	2105	1.16%	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 2009 the average calorific value of wastes delivered over the year was 8.37mj/kg in comparison with CV's over the last five years of 8.3, 8.45, 8.74, 8.91 and 8.11

mj/kg from 2004 to 2008 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. At design performance the plant would export 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.

Details of electrical power produced, used and exported from the plant in 2009 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
18	105129	15435	89694

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 2009 the cumulative volume of water discharged to sewer was 3215m3. This reflects a higher than usual discharge level due to problem with breakdowns to pumps in August and September which resulted in discharges of 2583m3. Other than that effluent discharged would have been consistent with previous years at 632m3

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/m^3)	0.05 mg/m3	1	0.0069	0.0035	0.0020	0.0022
		2	0.0051	0.0070	0.0020	0.0094
		Overall Ave	0.0060	0.0053	0.0020	0.0058
Hg (mg/m^3)	0.05 mg/m3	1	0.0060	0.0001	0.0120	0.0099
		2	0.0076	0.0002	0.0140	0.0059
		Overall Ave	0.0068	0.0002	0.0130	0.0079
Hf (mg/m^3)	2 mg/m3	1	<0.03	<0.1	<0.1	<0.05
		2	<0.03	<0.1	<0.1	<0.04
		Overall Ave	<0.03	<0.1	<0.1	<0.05
Group III Metals (mg/m^3)	0.5 mg/m3	1	0.2990	0.1473	0.3850	0.7580
		2	0.1747	0.1541	0.2030	0.7047
		Overall Ave	0.2369	0.1507	0.2940	0.7314
Dioxins (ng/m^3)	0.1 ng/m3	1	-	0.0154	-	0.0128
		2	-	0.0357	-	0.0341
		Overall Ave	-	0.0256	-	0.0235

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 0.03% 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 2009 there were only 4 occasions of abnormal operation (see Table 9) all of which were on stream 1.

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 90% and 73% 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%	100%	100%
Volatile Organic Carbon	99.99%	100%	99.99%
Particulates	99.98%	99.97%	99.98%
Carbon Monoxide	100%	100%	100%

Table 7 - Percentage of plant operating time within limits

A summary of all emissions anomalies for 2009 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 2009 there were only 3 incidents of unauthorised releases as set out in Table 8 below. All of these related to results of extractive testing for particulates in the first quarter of the year. Results were in conflict with continuous emissions monitoring results and investigations identified extractive test methods as being open to possible contamination which may have influenced results.

Continuous emissions monitors for particulates for the corresponding periods did not indicate any elevated levels but extractive testing results were nevertheless reported as unauthorised releases in accordance with the requirements of the Permit.

Results of re-tests carried out in June 2009 using a test method recommended by the Environment Agency were well below emission limit values and consistent with results from continuous emission monitors

Date	Stream	Substance	Anomaly
Jan 2009	Boiler 2	Particulates	This was for the results of a re test of extractive testing results for Q4 in 2008 and gave results of 33 mg/m3 against an ELV of 30mg/m3. Doubts expressed regarding the validity of test results – see comments above
Mar 2009	Boiler1	Particulates	Both of these were following extractive testing of particulates on boilers 1 and 2 on 5 and 6 March respectively. Although similar doubts regarding validity and test methods were experienced subsequent inspections during tube leaks identified holes in ducts after filtration on both streams and which were repaired.
Mar 2009	Boiler 2	Particulates	

Table 8 – Unauthorised Releases 2009

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 9 identifies the situations in which abnormal operating conditions were applied in 2009.

Date	Time	Substance / Location	Anomaly
4 January 2009	10.00 – 10.29	HCl Boiler 1	Water supply to lime preparation system fractured leading to brief shortage and blockage of the lime supply to the scrubber.
6th January 2009	13.00 – 13.29	HCl Boiler 1	Poor lime quality. Preparation failed to slake and settled in the preparation tank. Both boilers shutdown pending investigation Poor quality of lime was found to be a small 'pocket' and on site preparation was returned to normal and waste reintroduced to both boilers at 18.00.
24th April 2009	07.00 – 07.29	Particulates Boiler 1	Bag house by pass valve failed to close correctly following plant restart after under fire air fan repair. Plant taken off waste for investigation. Valves stroked and re-seated and particulates levels returned to normal.
16th July 2009	08.00 – 08.29	VOC Boiler 1	During set up for water calibration on CEM's equipment a maintenance spray was used as a cleaning agent. Vapours from this were detected by the monitoring equipment.

Table 9 – Abnormal Operations 2009

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. There was only 1 non reportable incident in 2009. This was again on boiler 1 and related to high reading for VOC's. This occurred whilst running boiler 2 off for repairs during which fuel oil pumps developed a leak and which was detected by the VOC analysers for boiler 1.

No enforcement notices were issued by the Environment Agency in respect of any aspect of plant operations in 2009

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:

Other than works carried out during the major outage in September and ongoing routine maintenance work no specific plant improvements have been carried out during 2009.

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 Dudley.

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 is 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. S Thompson
Environment Manager
MES Environmental
Crown Street
Wolverhampton
WV1 1QB

Appendices

Appendix 1 Performance Reports 2009

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 .....2009.....

Waste Description	Disposal Route	Tonnes	Recovery Tonnes
1) Hazardous Wastes			
Named haz. Waste (Specify each separately)	Reprocess Fly ash (APC)	6961	0
Other hazardous wastes			
Total hazardous waste		6961	0
2) Non-Hazardous Wastes			
Named non-haz. Waste (Specify each separately)	Landfill IBA	40138	0
Other non-hazardous wastes	Recycling (Fe)	2105	2105
Total non-hazardous waste		42243	2105
TOTAL WASTE	-	49204	2105

Trends in Waste Disposal and Recovery Year	Parameter		
	Named Waste	Total Waste	Waste per unit output
2008			
	APC	5635	0.069T/MWh
		5635	0.069T/MWh
	IBA	35755	0.442T/MWh
	Fe	1453	0.018T/MWh
		37208	0.460T/MWh
		42843	0.529T/MWh

Operator's comments : Waste per unit output above expressed in terms of nett exported energy of 80971 MWh in 2008.

If expressed in terms of gross energy production of 95200MWh figures are adjusted to 0.059, 0.376 & 0.015T/MWh for APCR, IBA and recycled tins respectively. (0.450T/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 .....2009.....

Water Source	Usage (m^3)	Specific Usage (m^3/t)
Mains water	**22520**	**0.124m3/t**
Site borehole		
River abstraction		
Canal abstraction	**46205**	**0.255m3/t**
TOTAL WATER USAGE	**68725**	**0.379m3/t**

Trends in Water Usage Year	Parameter		
	Named Water source	**Total Water usage**	**Water per unit output**
2008	**Mains supply**	**21848**	**0.270m3/MWh**
	Canal	**41860**	**0.517 m3/MWh**
		63708	**0.787m3/MWh**

Operator's comments : Water per unit output above expressed in terms of nett exported energy of 80971 MWh in 2008.

If expressed in terms of gross energy production of 95200MWh figures are adjusted to 0.23 and 0.44m3/MWh for mains and canal water supply respectively (0.67m3/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 .....2009.....

Energy Source	Energy Usage Quantity	Primary Energy (MWh)	CO_2 Produced (tonnes)
Electricity	MWh	15453	6645
Natural Gas	tonnes	N/A	
Gas Oil	tonnes	250.44	920
Recovered Fuel Oil	tonnes	N/A	
TOTAL	-		7565

Trends in Energy Usage Year	Parameter		
	Primary Energy usage	CO_2 Produced (tonnes)	CO_2 per unit output
2008			
	14476	6225	0.077 t/MWh
	331.30	1217	0.015 t/MWh
		7442	0.092t/MWh

Operator's comments : CO_2 per unit output above expressed in terms of nett exported energy of 80971 MWh in 2008.

If expressed in terms of gross energy production of 95200MWh figures are adjusted to 0.065 and 0.013T/MWh for electricity and gas oil consumption respectively. (0.078T/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 ...01/01/2009..... to ...31/12/2009.....

Annual Production/Treatment	
Total municipal waste incinerated (excluding separately collected fractions)	180859 tonnes
Total other wastes Incinerated	480 tonnes
Electrical energy generated and exported	89694 MWhrs
Electrical energy generated and used on installation	15435 MWhrs

Environmental Performance Indicators

Parameter	Quarterly Average	Units
Electrical energy imported to site	**0.10**	kWhrs/ tonne of waste incinerated (dry basis)
Fuel oil consumption	**1.38**	kg/ tonne of waste incinerated (dry basis)
Mass of bottom ash produced	**221.34**	kg/ tonne of waste incinerated (dry basis)

Trends in Environmental Performance Year	Parameter	
2008	Electrical energy imported to site	**1.52** Kwhrs / tonne waste incinerated
	Fuel oil consumption	**2.04** kg / tonne waste incinerated
	Mass of bottom ash produced	**220.51** kg / tonne of waste incinerated

Mass of APC residues produced	**38.39**	kg/ tonne of waste incinerated (dry basis)
Mass of other solid residues produced	**11.61**	kg/ tonne of waste incinerated (dry basis)
Urea consumption	**0.92**	kg/ tonne of waste incinerated (dry basis)
Activated carbon consumption	**0.04**	kg/ tonne of waste incinerated (dry basis)
Lime consumption	**15.73**	kg/ tonne of waste incinerated (dry basis)
Water consumption	**0.379**	m^3/ tonne of waste incinerated (dry basis)

Trends in Environmental Performance		
2008	Mass of APC residues produced	**34.75** kg / tonne of waste incinerated
	Mass of other solid residues produced	**8.96 kg** / tonne of waste incinerated
	Urea consumption	**0.82 kg** / tonne of waste incinerated
	Activated carbon consumption	**0.04 kg** / tonne of waste incinerated
	Lime consumption	**14.80 kg** / tonne of waste incinerated
	Water consumption	**0.393 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 – 2009

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	70	Monthly ½ Hrly Max	70	24	22	35	18	34	17	17	15	21	20	43
	Annual ½ Hrly Mean	5	Monthly ½ Hrly Mean	6	5	5	6	6	6	6	5	4	5	6	5
Daily Ave ELV 10	Annual Daily Max	8	Monthly Daily Max	8	7	8	7	7	8	8	7	7	8	7	7
	Annual Daily Mean	5	Monthly Daily Mean	6	5	5	6	6	6	6	5	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	82	Monthly ½ Hrly Max	40	63	76	82	45	50	26	23	40	71	80	71
	Annual ½ Hrly Mean	7	Monthly ½ Hrly Mean	7	7	8	9	6	6	5	4	5	7	10	7
Daily Ave ELV 50	Annual Daily Max	17	Monthly Daily Max	13	10	14	13	9	9	7	6	10	11	17	12
	Annual Daily Mean	7	Monthly Daily Mean	7	7	8	9	6	6	5	4	5	7	11	7

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	332	Monthly ½ Hrly Max	285	244	332	262	286	170	206	205	169	251	239	282
	Annual ½ Hrly Mean	134	Monthly ½ Hrly Mean	146	130	143	141	140	143	142	128	113	136	122	121
Daily Ave ELV 200	Annual Daily Max	177	Monthly Daily Max	177	160	154	152	160	151	155	148	156	156	143	146
	Annual Daily Mean	135	Monthly Daily Mean	146	130	143	142	141	143	142	133	115	136	123	121

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	5	3	16	10	13	12	32	8	4	3	3	5
	Annual ½ Hrly Mean	1	Monthly ½ Hrly Mean	1	1	1	1	1	1	1	1	1	1	1	1
Daily Ave ELV 10	Annual Daily Max	2	Monthly Daily Max	2	2	2	1	2	1	2	2	1	2	2	2
	Annual Daily Mean	1	Monthly Daily Mean	1	1	1	1	1	1	1	1	1	1	1	1

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	169	Monthly ½ Hrly Max	42	73	33	51	71	28	29	169	34	65	137	110
	Annual ½ Hrly Mean	8	Monthly ½ Hrly Mean	12	4	7	10	9	7	10	13	5	5	11	9
Daily Ave No ELV	Annual Daily Max	20	Monthly Daily Max	18	11	14	12	15	14	16	20	10	17	16	17
	Annual Daily Mean	8	Monthly Daily Mean	12	4	7	10	9	7	10	7	4	5	11	9

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	37	Monthly ½ Hrly Max	14	6	8	37	19	10	4	5	2	10	19	25
	Annual ½ Hrly Mean	1	Monthly ½ Hrly Mean	1	1	1	4	4	0	1	1	0	2	2	1
Daily Ave ELV 10	Annual Daily Max	8	Monthly Daily Max	2	3	2	5	8	2	2	1	1	6	7	3
	Annual Daily Mean	1	Monthly Daily Mean	1	1	1	4	4	0	1	1	0	2	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	87	Monthly 10 min max	24	27	33	15	48	17	8	87	53	13	59	46
	Annual 10 min Mean	6	Monthly 10 min mean	8	8	7	6	6	5	4	5	4	4	8	7
Daily Ave ELV 50	Annual Daily Max	14	Monthly Daily Max	10	10	9	7	9	7	6	5	10	5	14	10
	Annual Daily Mean	6	Monthly Daily Mean	8	8	7	6	6	5	4	3	4	4	7	7

* Figures reported to the nearest whole number.

Continuously Monitored Emissions to Air (mg/m3*) from Emission Point A2 – 2009

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	53	Monthly ½ Hrly Max	43	13	22	26	19	17	27	22	53	19	14	18
	Annual ½ Hrly Mean	5	Monthly ½ Hrly Mean	6	5	6	6	5	6	5	6	5	5	5	5
Daily Ave ELV 10	Annual Daily Max	9	Monthly Daily Max	9	7	7	8	7	8	7	8	8	7	7	7
	Annual Daily Mean	5	Monthly Daily Mean	6	5	6	6	5	6	4	5	5	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	117	Monthly ½ Hrly Max	81	62	80	56	54	69	60	45	108	117	91	76
	Annual ½ Hrly Mean	9	Monthly ½ Hrly Mean	8	12	12	9	9	11	7	10	7	7	9	8
Daily Ave ELV 50	Annual Daily Max	19	Monthly Daily Max	16	17	19	15	13	14	15	15	17	13	13	14
	Annual Daily Mean	9	Monthly Daily Mean	8	12	12	9	9	11	7	10	8	7	9	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	275	Monthly ½ Hrly Max	210	232	275	223	195	169	231	167	189	208	192	193
	Annual ½ Hrly Mean	120	Monthly ½ Hrly Mean	137	138	128	123	99	121	128	101	114	125	109	111
Daily Ave ELV 200	Annual Daily Max	179	Monthly Daily Max	179	178	167	161	127	141	167	115	165	155	146	142
	Annual Daily Mean	120	Monthly Daily Mean	137	137	128	123	102	122	127	101	120	125	108	112

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	16	Monthly ½ Hrly Max	2	5	12	6	9	16	15	13	12	13	13	10
	Annual ½ Hrly Mean	1	Monthly ½ Hrly Mean	0	1	1	1	1	1	1	1	1	1	1	1
Daily Ave ELV 10	Annual Daily Max	2	Monthly Daily Max	1	1	1	1	1	2	1	1	1	1	1	1
	Annual Daily Mean	1	Monthly Daily Mean	0	1	1	1	1	1	1	1	1	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	29	Monthly ½ Hrly Max	13	15	13	10	17	14	23	18	27	5	29	18
No ELV	Annual ½ Hrly Mean	1	Monthly ½ Hrly Mean	1	1	2	1	1	0	1	2	3	0	1	1
Daily Ave	Annual Daily Max	11	Monthly Daily Max	2	3	4	4	2	2	2	3	11	1	1	5
No ELV	Annual Daily Mean	1	Monthly Daily Mean	1	1	1	1	1	0	1	2	2	0	1	1

Particulates	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av	Annual ½ Hrly Max	17	Monthly ½ Hrly Max	5	6	9	2	6	13	7	7	5	5	17	9
ELV 30	Annual ½ Hrly Mean	1	Monthly ½ Hrly Mear	0	1	1	1	1	1	0	1	1	2	2	1
Daily Ave	Annual Daily Max	8	Monthly Daily Max	1	2	4	1	2	1	1	2	1	3	8	4
ELV 10	Annual Daily Mean	1	Monthly Daily Mean	0	1	1	1	1	1	0	1	1	2	2	1

CO	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
10 Min Av	Annual 10 min Max	102	Monthly 10 min max	8	9	68	10	28	102	50	51	15	14	43	23
ELV 150	Annual 10 min Mean	5	Monthly 10 min mean	5	5	4	3	4	7	4	5	4	4	6	5
Daily Ave	Annual Daily Max	19	Monthly Daily Max	6	6	5	5	8	19	7	8	6	6	9	7
ELV 50	Annual Daily Mean	5	Monthly Daily Mean	5	5	4	3	4	7	4	4	4	4	6	5

* Figures reported to the nearest whole number.