

Annual Performance Report 2012

Newhaven Energy Recovery Facility

PPC Permit: BV8067IL

1. Introduction.

This report is based on the requirements of Article 12(2) of the Waste Incineration Directive regarding the requirements on access to information and public participation, 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.

Name of Company	Veolia ES Southdowns Ltd.
Name of Plant	Newhaven Energy Recovery Facility
Permit Number	BV8067IL
Address	North Quay Road, Newhaven BN9 0AB
Phone number	01273 511310
Further information	Newhaven ERF (Energy Recovery Facility), Line 1 and 2, built on a new site situated at Newhaven (neighbouring Brighton). The site is located besides a river and approximately 2.0 km north of the south coast. Newhaven ERF provides a long term, sustainable solution for waste disposal in the area as part of an integrated approach to waste management. Municipal waste that is not recycled in East Sussex is incinerated at this ERF minimising disposal of waste to land fill.

The principal objective of the new facility is the provision of an independent ERF with two separate lines burning acceptable mixed municipal waste at an average rate of 14.0 tons per hour, per line with a calorific value of 9.2 MJ/kg for producing 16.5MW electrical power for export.

2. Plant Description

The main purpose of the Facility is to incinerate Mixed Municipal Waste (MMW) as defined by European Waste Catalogue (EWC) Code 20 03 01, however up to 30% of the total throughput can be composed of a range of non-hazardous trade waste of a similar nature. Current energy recovery is wholly in the form of steam and electricity for export to the National Grid, although potential does exist for the provision of community district heating that would also reduce local emissions. The permitted Facility covers the site

and the entire incineration plant including all incineration lines, waste reception and storage, waste-fuel and air supply systems, boilers, facilities for the treatment of exhaust gases, on-site facilities for handling and storage of residues and operations, recording and monitoring conditions.

Waste Reception & Storage:

Waste is delivered into the tipping hall in covered vehicles. The tipping hall is maintained under negative pressure to minimise the escape of odours, dust or litter. The vehicles tip into a waste storage bunker from where the grab cranes transfer waste as required to the feed hopper of the combustion plant.

Combustion Process:

Waste is gravity fed onto the incinerator grate. The grate is continually moving thus promoting continuous mixing of the waste with the combustion air, extracted from the tipping hall and introduced from beneath the grate into the heart of the fire eliminating any odours. Further air is injected just above the fire to promote mixing and complete combustion of the gases.

Fuel gas burners are installed for start-up and to maintain the furnace temperature, if required. However, during normal operation no support fuel is required to maintain the minimum 850°C.

Ash from the grate is discharged into a water filled quench pit from where it is moved by conveyor to the enclosed ash storage bunkers prior to being transported off site. All incinerator bottom ash is sent to a local storage facility for onward transportation by rail to an aggregate production site.

Ferrous metals are removed from the ash by magnets and stored separately prior to being sent to a local Recycling Facility.

Energy Recovery:

Hot gases from the combustion of the waste pass through a heat recovery boiler. The temperature of the gases is reduced from over 850°C to around 150°C. The energy from the hot gases is transferred to the boiler to produce high pressure steam. This steam is fed to the steam turbine driven generator capable of generating around 19.0 MW, which, after supplying the site electrical load is exported to the National Grid.

Gas Cleaning:

Whilst in the boiler combustion chamber a metered amount of ammonia solution is injected into the combustion gases to reduce the formation of oxides of nitrogen. Downstream of the boiler, lime is injected into the gas stream to neutralise acid gases produced in the process. A small quantity of activated carbon is injected to adsorb any residual organic material and heavy metals from the gases.

Prior to release into the air the gases pass through a fabric filter which removes the particulate matter, spent lime and carbon from the gas stream. Once the gases have been cleaned they are discharged into the atmosphere via two flues in the 65 metre high stack.

Water Usage:

The plant uses mains water for steam generation after passing through a water treatment plant. The steam is reused in the boiler after being cooled and condensed using air cooled condensers.

The facility also uses mains water in various ways for water injection into the abatement system reactor tower, internal wash downs, tipping hall floor cleaning, but mostly for human domestic use, cooking, showering and sanitation. Any water that is used within the facility other than for domestic washing and cleaning is captured in dedicated drains and directed into a waste water tank where heavy sediments are removed from the water.

The cleaned water is then re-used within the facility principally for ash quenching, thus limiting the amount of fresh water used and minimising water discharge from the site.

External uncontaminated rainwater runoff from the western side flows directly to a river outfall, whilst all other roof and external surface drains run into the full retention interceptor in accordance with BS EN858 and PPG3, then discharge into the river Ouse.

3. Summary of Plant Operation.

During 2012 the facility processed 224,730 tonnes of waste, of this 199,422 tonnes was municipal waste, the remaining 25,308 tonnes came from commercial premises. Appendix A Lists the amount waste disposed of by European Waste Catalogue Number.

Plant Commissioning details for 2011 are included in the table below.

Operating Hours	Line1 - 7927 Line 2 - 8199	Hours
Waste Incinerated	224,730	Tonnes
Electricity Produced	145,538	MWh
Metals Recovered	4,235	Tonnes
Incinerator Bottom Ash	46,208	Tonnes
APC residues	7,897	Tonnes

The site generated 145,538 MWh of electricity during 2012. After subtracting on site power usage, 127,492 MWh of electricity was exported to the National Grid, equivalent to enough electricity to power approx 25,000 homes.

All Ash residues (known as Incinerator Bottom Ash or IBA) are delivered to a local Recycling Facility.

Ferrous metal removed from the IBA is delivered to a local steel recycler for further processing.

According to the Steel Can Recycling Information Bureau, for every one tonne of steel packaging recycled the following environmental savings are achieved compared to producing steel from raw materials:

- 1.5 tonnes of iron ore
- 0.5 tonnes of coal
- 86% reduced air pollution
- 40% reduced water use
- 76% reduced water pollution
- 62% to 74% reduced energy usage

Fine particulate matter, known as Air Pollution Control residue (APCR), is removed from the flue gases by the fabric filter, collected in a storage silo and then sent in sealed tankers by road to a specialised VES treatment works. At this licensed site, the residue is used to either treat spent acid wastes and then sent for safe disposal at a licensed land fill site, or for safe storage in a secure deep burial facility called Minosus.

4. Summary of Plant Emissions.

All emissions to air from the 65m high twin chimneys are controlled to meet the emission limits included in the PPC Permit. The flue gases released into the atmosphere are continuously monitored using Continuous Emissions Monitoring Equipment (CEMS) for particulate matter, hydrogen chloride, oxides of nitrogen, carbon monoxide, sulphur dioxide, total volatile organic compounds and ammonia. During 2012 the CEMS monitoring equipment was in service and fully operational where the ERF remaining compliant with WID requirements at all times. This equipment is stringently monitored to MCERTS standards with routine calibration checks, conforming to BS EN14181. Additionally, a full range of standby equipment is permanently in service should an unexpected failure occur.

In addition to continuous monitoring, emissions are checked on a quarterly basis, being carried out by independent contractors using approved extractive methods to MCERTS standards. During the first year of operation following commissioning of the plant, extractive sampling was carried out in full compliance with Environmental Permit (BV8067IL) requirements.

Full details of continuously monitored and extractive emission annual averages for 2012 are listed in table 4.1 (in appendix B).

Following completion of commissioning and subsequent operational hand-over to Veolia in February 2012, two discharges to sewer took place in accordance with discharge consent requirements.

One discharge of 16.6m³ took place during the main outage period for planned maintenance requirements

A second discharge of 145m³ took place to allow relining works of the waste water tank by the construction contractor

5. Summary of Plant Compliance

Strict environmental controls and proven operating experience greatly assists in a facility remaining compliant within the conditions of its Pollution Prevention Control (PPC) Permit at all times. This is achieved through constant monitoring of the incineration process during all of the stages, with detailed procedures in place to enable trained staff to carry out their work in an environmentally compliant manner.

During 2012 Newhaven ERF operated at all times within the limits of the WID.

Table 5.2: Plant compliance.

Breach of Permit Conditions	0
Enforcement Notices	0
ERF Complaints Received	20
ERF Substantiated Complaints	2

Any complaints received at the facility are recorded and thoroughly investigated by the Management team with a full report being kept detailing the outcome of the investigation. All complaints are reviewed monthly by the Veolia Senior Management team at Director level

During 2012 there were 20 pollution related complaints from observations outside the plant, however only two were substantiated:

6 complaints were due to noise; 8 were related to odour; 3 to Smoke or Fumes; 2 to Dust & 1 to light pollution.

Of the 2 substantiated complaints; one complaint was due to odour for which additional odour neutralisation equipment has been identified and will be installed in 2013 along with revised system operating procedures; a second complaint was due to smoke/fumes which was identified as a normal plant start-up, where the plant was not operating on waste at the time.

6. Summary of plant improvements.

The Facility was commissioned throughout 2011 to February 2012 to the latest technical and environmental standards. It is not expected that any major improvements will be required in the short term although significant effort is being expended to BAT in optimising the plant performance in order to maximise energy recovery and minimise use of raw materials.

7. Summary of information made available.

- A general process description can be found on the company website at <http://www.veoliaenvironmentalservices.co.uk/southdowns/Facilities/Energy-Recovery-Facility>
- This site also contains details of average emissions for the full year.
- Community liaison group meetings are planned tri-annually in 2013 and are expected to continue on a similar basis for the foreseeable future.
- As part of their regulatory responsibility the Environment Agency inspector visits the Facility on a regular basis.
- The Operating Permit is available on the Public Register from the Environment Agency's office at:

The Environment Agency
Solent and South Downs Area Office,
Guildbourne House, Chatsworth Road,
Worthing, Sussex, BN11 1LD

Useful web addresses:

<http://www.veoliaenvironmentalservices.co.uk>
www.environment-agency.gov.uk

Registered Office: Veolia Environmental Services (UK) Plc,
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Appendix A

List of waste disposed of during 2012 at the Newhaven Energy Recovery Facility

Table 2.1.2 Waste Types			
Waste type	Limitations	EWC Codes	Maximum annual throughput
Mixed Municipal Waste (MMW)	Excluding separately collected fractions unless recycling/reuse options cannot practicably be exploited.	20 03 01	Up to 242,000 tonnes of all waste types received
Waste from markets	Only if recycling/reuse options cannot practicably be exploited	20 03 02	All wastes other than MMW to constitute no more than 30% of total
Wastes from waste and water treatment	Arising as mechanical treatment (shredding) of bulky solid non-hazardous municipal waste	19 12 12	All wastes other than MMW to constitute no more than 30% of total
Street Cleaning residues	Only if recycling/reuse options cannot practicably be exploited.	20 03 03	All wastes other than MMW to constitute no more than 30% of total
Bulky waste (includes civic amenity waste from household waste recycling sites)	Only if recycling/reuse options cannot practicably be exploited	20 03 07	All wastes other than MMW to constitute no more than 30% of total
Paper and cardboard	Only if recycling/reuse options cannot practicably be exploited.	19 12 01	All wastes other than MMW to constitute no more than 30% of total
Textiles	Only if recycling/reuse options cannot practicably be exploited.	19 12 08	All wastes other than MMW to constitute no more than 30% of total
Combustible waste (Refuse derived fuel)	Only if recycling/reuse options cannot practicably be exploited.	19 12 10	All wastes other than MMW to constitute no more than 30% of total
Confidential waste paper and cardboard	Only if recycling/reuse options cannot practicably be exploited.	20 01 01	All wastes other than MMW to constitute no more than 30% of total
Confidential waste plastics	Only if recycling/reuse options cannot practicably be exploited.	20 01 39	All wastes other than MMW to constitute no more than 30% of total
Biodegradable waste / International catering waste	Only if recycling/reuse options cannot practicably be exploited	20 01 08	All wastes other than MMW to constitute no more than 30% of total

from the kitchen and canteens of ferries landing in the UK			
Clothes / shoes	Only if recycling/reuse options cannot practicably be exploited	20 01 10	All wastes other than MMW to constitute no more than 30% of total
Textiles	Only if recycling/reuse options cannot practicably be exploited	20 01 11	All wastes other than MMW to constitute no more than 30% of total
Offensive waste other fractions not otherwise specified (comprising only of separately collected fractions of municipal clinical waste (not arising from healthcare and/or related research i.e. not including waste from natal care, diagnosis, treatment or prevention of disease) which is subject to special requirements in order to prevent infection).	Only if recycling/reuse options cannot practicably be exploited	20 01 99 <small>note 2</small>	All wastes other than MMW to constitute no more than 30% of total

Note 1 Equivalent to 210,000 te/annum at 7500 hours normal operation

Note 2 In addition, the following wastes are specifically excluded from waste treatment activities:

(i) : Any waste containing waste medicines and chemicals, waste contaminated with cytotoxic and cytostatic medicines, anatomical waste (identifiable human or animal tissue arising from healthcare), or Dental amalgam;

(ii) : Sharps boxes containing any of the excluded wastes from (i) and (iii) or Sharps that are contaminated with pharmaceuticals in any quantity (including syringes that are fully discharged, partially discharged or undischarged).

(iii) : Biohazard waste : Any waste known or likely to contain ACDP Hazard Group 4 biological agents; Any waste from a containment level 3 laboratory: and All Microbiological cultures from any source, and, any potentially infected waste from pathology departments and other clinical or research laboratories (Unless autoclaved before leaving the site of production).

Appendix B

Table 4.1: 2012 quarterly extractive analysis results & CEMS confidence adjusted averages for Newhaven ERF

Substance / Parameter	Emission Limit Value	Results A1	Results A2
Continuous Emission Monitoring Results with confidence adjusted			
Particulate Matter	10 mg/m ³ daily average	1.4 mg/m ³	1.28 mg/m ³
VOC as Total Organic Carbon (TOC)	10 mg/m ³ daily average	0.21 mg/m ³	0.16 mg/m ³
Hydrogen chloride	10 mg/m ³ daily average	6.9 mg/m ³	7.5 mg/m ³
Carbon monoxide	50 mg/m ³ daily average	11.1 mg/m ³	11.4 mg/m ³
Sulphur dioxide	50 mg/m ³ daily average	1.3 mg/m ³	0.2 mg/m ³
Ammonia	No limits	1.08 mg/m ³	0.92 mg/m ³
Oxides of nitrogen (NO and NO ₂ expressed as NO ₂)	200 mg/m ³ daily average	175 mg/m ³	176 mg/m ³
Extractive Sampling Results			
Nitrous oxide (N ₂ O)	No limit applies	2.97 mg/m ³	2.79 mg/m ³
Hydrogen fluoride	1 mg/m ³ over minimum 1 hour period	0.13 mg/m ³	0.165 mg/m ³
Cadmium & thallium and their compounds (total)	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.0015 mg/m ³	0.00009 mg/m ³
Mercury and its compounds	0.05 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.0044 mg/m ³	0.0026 mg/m ³
Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m ³ over minimum 30 minute, maximum 8 hour period	0.062 mg/m ³	0.14 mg/m ³

Dioxins / furans (I-TEQ) ⁶	0.1 ng/m ³ over minimum 6 hour, maximum 8 hour period	0.0062 to 0.0066 ng/m ³	0.0020 to 0.0024 ng/m ³
Dioxin-like PCBs (WHO-TEQ Humans / Mammals) ⁶	No limit applies	0.0030 to 0.0059 ng/m ³	0.0016 to 0.0029 ng/m ³
Dioxin-like PCBs (WHO-TEQ Fish) ⁶	No limit applies	0.0052 to 0.0055 ng/m ³	0.0017 to 0.0018 ng/m ³
Dioxin-like PCBs (WHO-TEQ Birds) ⁶	No limit applies	0.0096to-0.0116 ng/m ³	0.0024 to 0.0045 ng/m ³
Dioxins / furans (WHO-TEQ Humans / Mammals) ⁶	No limit applies	0.0011 to 0.0020 ng/m ³	0.0014 to 0.0024 ng/m ³
Dioxins / furans (WHO-TEQ Fish) ⁶	No limit applies	0.0010 to 0.0011 ng/m ³	0.0044 to 0.0054 ng/m ³
Dioxins / furans (WHO-TEQ Birds) ⁶	No limit applies	0.0020to-0.0041 ng/m ³	0.0008to-0.0027ng/m ³
Poly-cyclic aromatic hydrocarbons (PAHs) Total	No limit applies	0.61 ug/m ³	0.5167 ug/m ³
Anthanthrene	No limit applies	0.0016 ug/m ³	0.0078 ug/m ³
Benzo{a}anthracene	No limit applies	0.0016 ug/m ³	0.0218 ug/m ³
Benzo[b]fluoranthene	No limit applies	0.0016 ug/m ³	0.0078 ug/m ³
Benzo[k]fluoranthene	No limit applies	0.0016 ug/m ³	0.0078 ug/m ³
Benzo[b]naph(2,1-d)thiophene	No limit applies	0.0016 ug/m ³	0.0078 ug/m ³
Benzo[c]phenanthrene	No limit applies	0.0016 ug/m ³	0.0078 ug/m ³
Benzo[ghi]perylene	No limit applies	0.031 ug/m ³	0.0078 ug/m ³
Benzo[a]pyrene	No limit applies	0.0016 ug/m ³	0.0078 ug/m ³
Cholanthrene	No limit applies	0.0016 ug/m ³	0.0078 ug/m ³
Chrysene	No limit applies	0.0016 ug/m ³	0.0078 ug/m ³

Cyclopenta(c,d)pyrene	No limit applies	0.0016 ug/m ³	0.0078 ug/m ³
Dibenzo[ah]anthracene	No limit applies	0.0016 ug/m ³	0.0078 ug/m ³
Dibenzo[a,i]pyrene	No limit applies	0.0016 ug/m ³	0.0078 ug/m ³
Fluoranthene	No limit applies	0.054 ug/m ³	0.0226 ug/m ³
Indo[1,2,3-cd]pyrene	No limit applies	0.0016 ug/m ³	0.0078 ug/m ³
Naphthalene	No limit applies	0.33 ug/m ³	0.25 ug/m ³