Determination of an Application for an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2010

The Permit Number is:	EPR/YP3738XZ
The Applicant / Operator is:	Covanta Energy Limited
The Installation is located at:	Plot 63, Midpoint 18 Industrial Estate Pochin Way, Middlewich, Cheshire.

What this document is about

This is a decision document, which accompanies a permit.

It explains how we have considered the Applicant's Application, and why we have included the specific conditions in the permit we are issuing to the Applicant. It is our record of our decision-making process, to show how we have taken into account all relevant factors in reaching our position. Unless the document explains otherwise, we have accepted the Applicant's proposals.

A lot of technical terms and acronyms are inevitable in a document of this nature: we provide a glossary of acronyms near the front of the document, for ease of reference.

Preliminary information and use of terms

We gave the application the reference number EA/EPR/YP3738XZ/A001. We refer to the application as "the **Application**" in this document in order to be consistent.

The number we give to the permit is EPR/YP3738XZ. We refer to the proposed permit as "the **Permit**" in this document.

The Application was duly made on 23 March 2010.

The Applicant is Covanta Energy Limited. We refer to Covanta Energy Limited as "the **Applicant**" in this document. Where we are talking about what would happen after the Permit is granted we call Covanta Energy Limited "the **Operator**".

Covanta Energy Limited proposed facility is located at Plot 63, Brooks Lane, Midpoint 18 Industrial Estate, Pochin Way, Middlewich, Cheshire. The permit will control the operation of part of an installation. A separate EPR permit covers the treatment of incinerator bottom ash at a neighbouring facility within the Installation boundary. The facility covered by this permit and the ash facility comprise a single installation.

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Glossary of acronyms used in this document

APC	Air Pollution Control
BAT	Best Available Technique(s)
BAT-AEL	BAT Associated Emission Level
BREF	BAT Reference Note
CAFÉ	Clean Air for Europe
CEM	Continuous emissions monitor
CES	Consolidated Environmental Statement
CHP	Combined heat and power
COMEAP	Committee on Medical Effects of Air Pollutants
DAA	Directly Associated Activity
DD	Decision Document
EIAD	Environmental Impact Assessment Directive (85/337/EEC)
ELV	Emission Limit Value
EMS	Environmental Management System
EPR	Environmental Permitting (England and Wales) Regulations 2010 (SI 2010 No. 675)
EQS	Environmental quality standard
ES	Environmental Statement
EWC	European Waste Catalogue
FGT	Flue Gas Treatment
FSA	Food Standards Agency
GWP	Global Warming Potential
HHRAP	Human Health Risk Assessment Protocol
HMIP	Her Majesty's Inspectorate of Pollution
HPA	Health Protection Agency
HRA	Human Rights Act 1998
IBA	Incinerator Bottom Ash
IPPCD	Integrated Pollution Prevention and Control Directive (2008/1/EC)
LCPD	Large Combustion Plant Directive (2001/80/EC)
LCV	Lower Calorific Value (also termed net calorific value)
LfD	Landfill Directive (1999/31/EC)
LOI	Loss on Ignition
MWI	Municipal Waste Incinerator
NAQMAU	National Air Quality Modelling and Assessment Unit

OPRA	Operator Performance Risk Appraisal
PAHs	Polycyclic aromatic hydrocarbons
PCB	Polychlorinated biphenyls
PCT	Primary Care Trust
PPS	Public Participation Statement
PR	Public register
PXDD	Poly-halogenated di-benzo-p-dioxins
PXB	Poly-halogenated biphenyls
PXDF	Poly-halogenated di-benzo furans
RDF	Refuse Derived Fuel
RGS	Regulatory Guidance Series
SAC	Special Area of Conservation
SED	Solvent Emissions Directive (1999/13/EC)
SCR	Selective Catalytic Reduction
SGN	Sector Guidance Note
SHPI(s)	Site(s) of High Public Interest
SNCR	Selective Non-catalytic Reduction
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SWMA	Specified Waste Management Activity
WFD	Waste Framework Directive (2008/98/EC)
WID	Waste Incineration Directive (2000/76/EC)

1 Our decision

We have decided to grant an Environmental Permit to the Applicant. This will allow it to operate the Installation, subject to the conditions in the Permit.

We consider that, in reaching that decision, we have taken into account all relevant considerations and legal requirements and that the permit will ensure that a high level of protection is provided for the environment and human health.

The Permit contains many conditions taken from our standard Environmental Permit template including the relevant Annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the permit, we have considered the Application and accepted the details are sufficient and satisfactory to make the standard condition appropriate. This document does, however, provide an explanation of our use of "tailor-made" or installation-specific conditions, or where our Permit template provides two or more options.

2 How we reached our decision

The Application was duly made on 23 March 2010. This means we considered it was in the correct form and contained sufficient information for us to begin our determination but not that it necessarily contained all the information we would need to complete that determination: see below.

The Applicant made no claim for commercial confidentiality. We have not received any information in relation to the Application that appears to be confidential in relation to any party.

We carried out consultation on the Application in accordance with the EPR, our statutory PPS and our own RGS Note 6 for Determinations involving Sites of High Public Interest. We consider that this process satisfies, and frequently goes beyond the requirements of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, which are directly incorporated into the IPPCD, which applies to the Installation and the Application. We have also taken into account our obligations under the Local Democracy, Economic Development and Construction Act 2009 (particularly Section 23). This requires us, where we consider it appropriate, to take such steps as we consider appropriate to secure the involvement of representatives of interested persons in the exercise of our functions, by providing them with information, consulting them or involving them in any other way. In this case, our consultation already satisfies the Act's requirements.

We advertised the Application by a notice placed on our website, which contained all the information required by the IPPCD, including informing people where and when

they could see a copy of the Application. We also placed an advertisement in the Mid Cheshire Guardian Series on 14 April 2010.

We placed a paper copy of the Application and all other documents relevant to our determination (see below) on our Public Register at Appleton House, Birchwood, Warrington. A copy was also sent to Cheshire East Council for its own Public Register. Anyone wishing to see these documents could do so and arrange for copies to be made.

We sent copies of the Application to the following bodies, including those with whom we have "Working Together Agreements":

- Health and Safety Executive
- Development Management – Cheshire East Council
- Environmental Health – Cheshire East Council
- Director of Public Health – Central and Eastern Cheshire Primary Care Trust
- United Utilities (Warrington)
- Food Standards Agency

These are bodies whose expertise, democratic accountability and/or local knowledge make it appropriate for us to seek their views directly.

In addition to our advertising the Application, we undertook a programme of extended public consultation. A public surgery to explain the permit application determination process, what aspects of that process the public can influence and how was held at Middlewich Community Church, Brooks Lane, Middlewich CW10 0JG on 14 June 2010. We also accepted written comments in respect of the application well beyond the formal consultation period of 13 May 2010. Further details along with a summary of consultation comments and our response to the representations we received can be found in Annex 4. We have taken all relevant representations into consideration in reaching our determination.

Although we were able to consider the Application duly made, we did in fact need more information in order to determine it, and issued a notice of request for further information 29 September 2010. A copy of the information notice was placed on our public register and sent to Cheshire East Council for inclusion on its register, as was the response when received.

In addition to our information notice, we received additional information during the determination from the Applicant by e-mail. These are detailed within the Status Log of the Permit. We made a copy of this information available to the public in the same way as the response to our information notice.

Having carefully considered the Application and all other relevant information, we put our draft decision before the public and other interested parties in the form of a draft Permit, together with a draft decision document. We carried out a public consultation between 16th March 2012 and 20th April 2012. We also arranged a drop-in event for the public in Middlewich Community Church on 4th April 2012.

We notified all Cheshire East and Chester West and Chester Councilors about the event, together with local Town and Parish Councilors and local MP's offices. We also contacted CHAIN to make them aware of the consultation event as we are aware they have a considerable following in Middlewich and surrounding areas. In addition we also spoke with Middlewich Town Council who agreed to put up posters. In addition, press releases were sent to the local media and we spoke with journalists who we were aware were interested in this development. We understand that the Middlewich Guardian subsequently covered the consultation on the 28 March and 3 April. The Crewe Chronicle also published details on the 28 March.

We have considered all relevant representations which we received in response to this final consultation and have amended this explanatory document as appropriate to explain how this has been done. Further details along with a summary of consultation comments and our response to these representations can be found in Annex 4 B.

3 The legal framework

The Permit is granted under Regulation 13 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the Installation is:

- an installation for the purposes of the IPPCD;
- a *waste incineration installation* under the WID;
- an *operation* covered by the WFD, because it processes waste; and
- subject to aspects of other relevant legislation which also have to be addressed.

We address some of the major legal requirements directly where relevant in the body of this document. Other requirements are covered in a section towards the end of this document.

We consider that the Permit will ensure that the operation of the Installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

4 The Installation

4.1 Description of the installation and related issues

4.1.1 The permitted activities

The Installation is subject to the EPR because it carries out an activity listed in Part 1 of Schedule 1 to the EPR:

- Section 5.1 Part A(1)(c) – incineration of non-hazardous waste in an incineration plant with a capacity of 1 tonne or more per hour.

The definition of a WID "incineration plant" includes:

> *"the site and the entire incineration plant including all incineration lines, waste reception, storage, on-site pre-treatment facilities, waste-fuel and air-supply systems, boiler, facilities for the treatment of exhaust gases, on-site facilities for treatment or storage of residues and waste water, stack, devices and systems for controlling incineration operations, recording and monitoring incineration conditions."*

Many activities which would normally be categorised as "directly associated activities" for EPR purposes (see below), such as air pollution control plant, and the ash storage bunker, are therefore included in the listed activity description.

An installation also comprises any unlisted "directly associated activities", which at this Installation includes the removal of recyclables from some of the incoming waste streams as well as the generation of electricity using a steam turbine. This material recycling facility is not considered SWMA (see section 4.3.1 for reasons). These are all parts of the same installation, because they are successive steps in an integrated activity.

Together, these listed and unlisted activities make up the part of the Installation covered by this Permit. A separate EPR permit issued to Ballast Phoenix covers the ash treatment facility at a neighbouring site which is also included within the Installation boundary. The facility covered by this permit and the ash treatment facility comprise a single installation.

4.1.2 The site

The proposed Installation is to be located at Plot 63, Brooks Lane, Midpoint 18, Middlewich, Cheshire. The proposed location is within the Midpoint Industrial Estate at Middlewich and is bordered to the south and west by a railway line and to the North and east by Sanderson's Brook. The nearest sensitive receptor is at Cledford Hall about 500 metres to the south east of the site. The following habitats are located within the relevant distance to the site:

- SAC – none within 10km
- SPA – none within 10km
- Ramsar sites – Midland Meres and Mosses – Phase 1 (8 km away at nearest point)

- SSSI – Sandbach Flashes (2.0 km from site at nearest point)
- Ancient Monuments – Kinderton Hall (1.5km from site), Brine pumps at Brooks Lane (560 metres from site), King Street Roman Fort (1.7km from site)
- Local Wildlife sites – Cledford Lane Beds (borders site to South East , separated by railway line)
- Ancient Woodlands – none within 2km
- National Nature Reserve – none within 2km
- Local Nature Reserve – none within 2km
- World Heritage Sites – none within 2 km
- Areas of Outstanding Natural Beauty – none within 2km
- National Parks – none within 2km

Some protected species such as bats, newts and otters are known to use the site during part of their life cycle. Where necessary a new habitat has been created nearby. See section on Habitats for further details.

The Applicant submitted a plan which we consider is satisfactory, showing the site of the Installation and its extent. A plan is included in Schedule 2 to the Permit, and the Operator is required to carry on the permitted activities within the site boundary.

Further information on the site is addressed below at 4.3.

4.1.3 What the Installation does

This is an installation for the incineration of household, commercial and industrial municipal waste. The energy produced by the incineration of the waste is converted into high pressure steam which in turn drives turbines that produce electricity. The facility has been designed to incinerate about 370,000 tonnes of waste annually at a rate of 50 tonnes per hour (2 lines with a capacity of 25 tonnes per hour each) and produce 44MW of electricity with 37MW of that electricity being exported. At this point the Operator is assessing the feasibility of also supplying energy in the form of low pressure steam to the nearby British Salt factory.

Waste will be delivered to site by road within covered lorries. Waste that has not been subject to segregation will be subjected to pre-treatment to remove recyclable materials such as glass, plastic and metals on arrival on site, with any residual waste being incinerated. Waste prior to incineration will be stored in a storage pit within the reception hall building. Delivery lorries will enter the building and tip the waste into the storage pit, residual waste from the process to remove recyclables will be transferred to the waste storage pit by conveyor.

Grabs will be used to rotate and mix the waste within the storage pit to ensure that aerobic conditions are maintained within the waste pile to minimise odour potential.
Grabs will also be used to transfer the waste into the waste charging hoppers associated with each of the two lines. The waste will be charged steadily on to the moving grate of the combustion unit from the hoppers.

Each incineration line will have auxiliary burners fuelled by low sulphur gas oil to ensure that the temperature of the waste gases is maintained at 850^{o}C or above for a

minimum of 2 seconds. Each incineration line will have interlocks such that if the temperature requirements are not met then waste feed will stop until the temperature is returned to at least 850^{o}C.

Two main waste streams will be produced as a result of the waste incineration process. These are :

(i) Air Pollution Control residue – APC (incorporating fly ash)

APC residue is a mixture of ash, ammonium salts, lime, calcium salts, carbon and small amounts of metals and dioxins (and similar compounds) which have been removed from the hot gases leaving the incinerator. Fly ash is finer particles of ash that pass though the boiler system and are carried over in the flue gas stream to the reaction chamber where the pollutants in the gas stream are removed. This waste is collected within a bag filter and will be removed off-site as a hazardous waste for specialist treatment prior to recovery or disposal.

(ii) Incinerator Bottom ash (incorporating boiler ash) - IBA

IBA is the solid mass material that is discharged from the end of the combustion grate and includes some finer siftings that transmit through the grate as the main ash mass is conveyed along the grate whereas Boiler Ash comprises larger particles of ash that are carried over in the flue stream gas to the first stage of the boiler where they disengage from the gas stream and are collected. It also includes scale residues that deposit on the external surfaces of the boiler tubes, which have to be periodically removed to maintain efficient heat transfer from the flue gas stream to the pressurised water within the boiler.

IBA will be quenched with water and stored in a pit within the ash storage hall before being removed off-site by covered lorry for treatment in the neighbouring ash treatment facility operated by Ballast Phoenix. The neighbouring ash treatment facility and the plant covered by this Application are considered to be part of a single installation for the purposes of the IPPCD. The ash treatment facility will be operated by a different company under the authorisation of a separate EPR permit EPR/PP3333FV (the consultation on the draft decision for both the waste incinerator site and ash treatment facility at Middlewich were run in parallel).

The emissions to air from the site will be minimised by

(i) Lime injection into post boiler gas stream to reduce emissions of acid gases such as hydrogen chloride and sulphur dioxide,
(ii) ammonia injection into secondary combustion chamber to reduce emissions of oxides of nitrogen; and
(iii) activated carbon injection into post boiler gas stream to reduce emissions of metals and dioxins.

There are no emissions to surface water or groundwater directly from the process. Surface water from non-process areas of site will be drained via an interceptor into Sanderson's Brook.

There will be occasional discharges of process water to sewer from the site e.g. boiler blowdown and excess water from ash quenching system (see section 6.5.4 for more details of discharge to sewer).

4.1.4 Key Issues in the Determination

The key issues arising during this determination were:

- definition of the installation
- operator competence
- proximity of protected species
- impact of emissions from site on local agricultural land

and we therefore describe how we determined these issues in more detail in this document.

4.2 The site and its protection

4.2.1 Site setting, layout and history

The site is bordered to the west by the Crewe railway line and to the east by Sanderson's Brook. The land to the south of the site is rural comprising agricultural land. To the north, north west and east there are further industrial units with the ash processing facility associated with the site located south east of the incinerator site. The site is broadly level with a gentle west-east slope towards Sanderson's Brook.

The site will comprise a number of buildings and an 80 metre stack for release of treated gaseous emissions from the process to air.

Historical maps show the presence of sand pits and ponds on the site which were filled in during the 1980s, according to map evidence. The land although part of the Brooks Lane Industrial Estate area has remained undeveloped. Therefore, in planning terms, the land is regarded as a greenfield site that is designated for industrial development.

4.2.2 Proposed site design: potentially polluting substances and prevention measures

The site will be built on hardstanding with drainage systems for collection of uncontaminated surface water which will be discharged via an interceptor into a local water course – Sanderson's Brook. All received waste handling and processing will occur within a series of buildings. All waste produced (incinerator bottom ash, air pollution control residue (APC) etc, will also be handled within either buildings or enclosed transfer and storage systems as in the case of APC. All tanks (e.g. diesel oil) will be bunded to give at least 110% containment (or 25% of the total capacity of the tanks within the bund where more than one tank in a bund). All process aqueous waste, although limited, will be discharged to the local sewer.

The site will also contain an impervious bunded area or an underground tank with a capacity of approximately 1,000m^3 to contain any firewater that may be generated in the event of a fire at the site. There is a commitment within the Application that the

Local Authority Fire Officer will be involved in agreeing the scope of the firewater containment system on site.

We are therefore satisfied that there is sufficient containment measures planned for the site to ensure that the local environment will be sufficiently protected from any unplanned events that may occur on site.

4.2.3 Closure and decommissioning

As the EPR Application has been submitted prior to construction of the facility there is no closure and decommissioning plan included within the Application. We accept that in order to be able to develop such a plan the site will need to be constructed. Therefore, we have set pre-operational condition PO6 to require the Operator to develop an Environment Management System (EMS) in line with the requirements of our H5 guidance and 'How to Comply' documents. Such an EMS will need to contain a detailed closure and decommissioning plan.

In the event that the decision is taken to close the site then the Operator will have to apply to us to surrender the Permit. Within an application to surrender the Permit the Operator will need to satisfy us that the necessary measures have been taken, both to avoid any pollution risk resulting from the operation of the Installation, and to return the site to a satisfactory state, having regard to the state of the site before the Installation was put into operation. We will not grant a surrender of the Permit unless and until we are satisfied that these requirements have been complied with.

4.3 Operation of the Installation – general issues

4.3.1 Administrative issues

This is a multi-operator installation comprising:

- An energy from waste incineration plant
- An IBA Processing Plant

Covanta Energy Limited are the operators of the waste to energy plant whereas Ballast Phoenix are the operators for the incinerator bottom ash (IBA) processing facility adjacent to the site. Both sites are regarded as one installation as the Ballast Phoenix site is being developed to treat the IBA resulting from operations at the Middlewich Incinerator.

The incineration of waste is not a specified waste management activity. The Agency has considered whether any of the other activities taking place at the Installation are Specified Waste Management Activity (SWMA) and is satisfied that none of the proposed operations at the installation are classified as SWMA.

Consideration was given in particular to whether the activities of the materials recovery facility (MRF) which removes glass, plastic and metals from some of the waste streams received prior to incineration should be regarded as a SWMA. We have decided that the primary purpose of this MRF is to remove recyclables from certain waste streams prior to incineration. During this process any inappropriate or low calorific waste will also be removed in order to maximise the efficiency of the

incineration process. Therefore as the activity is taking place at an installation and is not the primary purpose of that installation the MRF should not be regarded as a SWMA.

The ash treatment operated by Ballast Phoenix is also not regarded as a SWMA as *", on-site facilities for treatment or storage of residues"* is included in the definition of incineration plant under the WID and the Ballast Phoenix part of the Installation will only treat the IBA generated Covanta site.

We are satisfied that the Applicant's submitted OPRA profile is accurate.

The OPRA score will be used as the basis for subsistence and other charging, in accordance with our OPRA Scheme.

4.3.2 Management

4.3.2.1 Management system

The Applicant has stated in the Application that they will implement an Environmental Management System that will, as the site becomes operational, be certified under ISO14001. A pre-operational condition (PO6 is included requiring the Operator to provide a summary of the EMS prior to commissioning of the plant and to make available for inspection all EMS documentation. The Agency recognises that certification of the EMS cannot take place until the Installation is operational.

4.3.2.2 Technical competence

Following reported breaches of dioxin emissions at (four of the 42) Covanta operated incinerators in the USA, a Schedule 5 notice (issued September 2010) asked for details of these and their relevance to the proposed incinerator. The Applicant provided details of US plants and their relevance to Middlewich proposed facility. It also provided details of a European operation (Trezzo, Italy) which is subject to WID and has similar design features as the proposed facility. (for more details, see annex-4 (2) (c)(v)) Results provided showed that the plant achieved dioxin emissions which were well below the WID limit in 2007, 2008 and 2009. We are satisfied that the Operator will have sufficiently robust recruitment and training procedures in place to ensure that the personnel operating the site will have the appropriate level of technical competence.

4.3.2.3 Financial competence

The Operator has stated on the application form that Covanta Energy Limited have not been subject to any Insolvency or Bankruptcy proceedings. In addition checks on Experian indicate that Covanta Energy Limited are "a below average financial risk". Therefore we are satisfied that the company has sufficient financial resource to comply with the conditions of the Permit.

4.3.2.4 Relevant convictions

A search was carried out via the Agency's National Enforcement Database in respect of the enforcement history of Covanta Energy Limited. No relevant convictions were identified.

Therefore, having considered the information above and that submitted in the Application, we are satisfied that appropriate management systems and management structures will be in place for this Installation and that sufficient financial, technical and personnel resources are available to Covanta Energy Limited to ensure compliance with all the Permit conditions.

4.3.3 Site security

Having considered the information submitted in the Application, we are satisfied that appropriate infrastructure and procedures will be in place to ensure that the site remains secure.

4.3.4 Accident management

The Applicant has not submitted an Accident Management Plan. However, having considered the other information submitted in the Application, we are satisfied that appropriate measures will be in place to ensure that accidents that may cause pollution are prevented but that, if they should occur, their consequences are minimised. Pre-operational condition (PO6) requiring the submission of an Environmental Management System which will incorporate an Accident Management Plan has been included in the Permit.

4.3.5 Off-site conditions

From our assessment of the installation's environmental impact, we do not consider that any off-site conditions are necessary.

4.3.6 Operating techniques

We have specified that the Applicant must operate the Installation in accordance with the following descriptions contained in the Application:

Description	Parts Included	Justification
The Application	Section 3.2 excluding 3.2.3, 3.2.4, 3.2.10, 3.2.28 and 3.2.31. Section 3.9 Section 3.10 Section 3.11	Section 3.2 describes the operating techniques to enable the Operator to conform with the requirements of the Waste Incineration Directive. The excluded parts do not refer directly to operating techniques – referring instead to local waste plans, Renewable Obligations Certificates and the neighbouring ash waste facility
Response to Schedule 5 Notice dated 19/11/10	Section 7.4	Additional details on how dioxin emissions from the facility will be minimised.
Other Information	E-mail on surface water discharge – location and abatement	Commitment that surface water will only be discharged to Sanderson's Brook via an interceptor.

	E-mail on definition of end of 'start-up' and start of 'shutdown' received from the Applicant on 18 November 2010.	Defines start up and shutdown i.e. periods where limits do not apply.

The details set out above describe the techniques that will be used for the operation of the Installation that have been assessed by the Agency as BAT; they form part of the Permit through Permit condition 2.3 and Table S1.2 in the Permit Schedules.

We have also specified the following limits and controls on the use of raw materials and fuels:

Raw Material or Fuel	Specifications	Justification
Gas Oil	< 0.1% sulphur content	As required by Sulphur Content of Liquid Fuels Regulations.

Article 4(4) of the WID requires that the Permit must list explicitly the categories of waste which may be treated. The Application contains a list of those wastes that the Applicant proposes to incinerate within the facility. The original list submitted as part of the application accepted as duly made on 23 March 2010 included a number of waste streams that we do not consider suitable for waste incineration e.g. metals, inerts and glass. Therefore, the Schedule 5 notice issued on 29 September 2010 required the Applicant to review and revise the list of wastes that they proposed to incinerate at the facility. The revised list was submitted to the Agency as part of their response to this Schedule 5 notice on 19 November 2010. We have specified the permitted waste types, descriptions and where appropriate quantities which can be accepted at the installation in Table S2.2. The list of wastes are coded by the European Waste Catalogue (EWC) number and is a list of wastes that the Applicant believes may appear in the waste streams entering the plant and which, in our opinion, the plant is capable of burning in an environmentally acceptable way.

We are satisfied that the Applicant can accept the wastes contained in Table S2.2 of the Permit because: -

(i) these wastes are categorised as municipal waste in the European Waste Catalogue or are non-hazardous wastes similar in character to municipal waste;

(ii) these wastes are likely to be in the design calorific value (CV) range for the plant;

(iii) these wastes are unlikely to contain harmful components that cannot be safely processed at the Installation

We have limited the waste that can be received at the Installation to residual waste, i.e. that which is not separately collected or otherwise recovered, recycled or composted, unless the separately collected fractions are contaminated to such an extent that re-use / recycling becomes technically or economically unfeasible and the material would otherwise be destined for landfill (see condition 2.3.3 (c)).

We have limited the capacity of the Installation to 370,000 tonnes per annum. This is based on the installation operating 7,796 hours per year, 6,832 hours with both incineration lines operational (at 25 tonnes / hour each) with only 1 incineration line operational for the remaining 964 hours (based on an operational capacity of 89%). We have further restricted the operation of the plant by excluding the throughput of the following waste types within the EWC listed in the table.

- Liquid or sludge wastes (apart from liquid wastes forming an unavoidable component of mixed loads of commercial/industrial or other wastes) - as grate incineration is not a suitable technique for combustion of liquids, and if containerised a homogenous waste stream would be difficult to achieve.
- Plastics, metals and paper / cardboard (apart from where recycling options are unfeasible due to contamination or other reason, and would be otherwise destined for landfill).
- Bio-degradable wastes (apart from where anaerobic digestion treatment options are not available).

The installation will be designed, constructed and operated using BAT for the installation for the incineration of the permitted wastes. We are satisfied that the operating and abatement techniques are BAT for incinerating these types of waste. Our assessment of BAT is set out in the rest of this document.

4.3.7 Energy efficiency

4.3.7.1 Consideration of energy efficiency

We have considered the issue of energy efficiency in the following ways:

1. The use of energy within, and generated by the Installation, which is a normal aspect of all EPR permit determinations. This issue is dealt with in this section.

2. The extent to which the Installation meets the requirements of Article 6(6) of the WID, which requires that heat "*shall be recovered as far as practicable*". This issue is covered in this section. It is important to understand, however, that the potential for using waste heat is largely determined by decisions taken by other bodies, such as planning decisions on the location of the Installation.

3. The combustion efficiency and energy utilisation of different design options for the Installation are relevant considerations in the determination of BAT for the Installation, including the Global Warming Potential of the different options. This aspect is covered in the BAT assessment which we explain in section 6 of this Decision Document.

4.3.7.2 Use of energy within the Installation

Having considered the information submitted in the Application, we are satisfied that appropriate measures will be in place to ensure that energy is used efficiently within the Installation.

The Application details a number of measures that will be implemented at the Installation in order to increase its energy efficiency, including:

- *the use of economisers and superheaters within the boiler system*
- *potential for supplying low pressure steam to the nearby British Salt site for evaporation, with condensate being returned to the boiler system on the Middlewich incinerator site.*
- *Minimising the specific energy consumption of the site.*

Data from the BREF for Municipal Waste Incinerators shows that the range of specific energy consumptions is as in the table below.

MSWI plant size range (t/yr)	**Process energy demand (kWh/t waste input)**
Up to 150,000	300 – 700
150,000 – 250,000	150 – 500
More than 250,000	60 – 200

The BREF says that it is BAT to reduce the average installation electrical demand to generally below 150 kWh/tonne of waste with an LCV of 10.4 MJ/kg. The specific energy consumption of the incinerator is estimated to be 140 kWh/t and is, therefore, in line with the above.

There are no site-specific considerations that require the imposition of standards beyond indicative BAT, and so the Agency accepts that the Applicant's proposals represent BAT for this Installation.

4.3.7.3 Generation of energy within the installation -Compliance with Article 6(6) of the WID

Article 6(6) of the WID requires that heat "*shall be recovered as far as practicable*". The Government's guidance on the WID (WID EPR Guidance, March 2010) lists the following hierarchy of heat recovery options, with (e) as the least preferred option and the optimum being a combination of the other four options:

a) use of waste heat from boiler water cooling system

b) use of a boiler for steam generation or electricity generation

c) use of exhaust steam for process heating or CHP schemes

d) internal heat exchange for primary air heating and/or flue gas reheating

e) no heat recovery.

The Application proposes the use of a boiler for steam generation to produce 44 MW of electrical output, 37 MW of which would be exported to the National Grid. The Applicant is also in negotiations with British Salt to supply low pressure steam to their facility – see next section for details.

The BREF says that where a plant generates electricity only, it is BAT to recover 0.4 – 0.65 MWh/ tonne of waste (based on LCV of 10.4 MJ/kg). This plant will generate electricity at the rate of 0.88 MWh/tonne of waste and is hence above the BREF range.

Our technical guidance note, SGN EPR S5.01, states that where electricity only is generated, 5-9 MW of electricity should be recoverable per 100,000 tonnes of waste burned. The Application shows 44 MW of electricity will be produced by burning 370,000 tonnes of waste per year. This represents 11.9 MW per 100,000 tonnes of waste burned. The Installation is therefore predicted to produce more electricity per 100,000 tonnes of waste incinerated than that stated within our technical guidance. This indicates that the Middlewich Incinerator is designed such that it maximises energy recovery.

The SGN and the WID both require that, as well as maximising the primary use of heat to generate electricity, waste heat should be recovered as far as practicable, i.e. by identifying and utilising opportunities for Combined Heat and Power (CHP) and district heating. The Application states that the Applicant is in discussions with British Salt to assess the feasibility of supplying low pressure steam to that site for evaporation process. If this was deemed technically and economically feasible then Middlewich Incinerator would supply on average 27.2 tonne/hour of steam to the British Salt site. This would reduce slightly the amount of electricity exported to the National Grid, however, even if steam was to be supplied the electricity recovered from the incinerated waste would continue to be at the top end of the indicative BAT range. However, although the electricity production would be reduced the fact that energy in the form of steam will also be exported will increase the plant's overall efficiency in converting the waste into usable energy.

We consider that, within the constraints of the location of the Installation explained above, the Installation will recover heat as far as practicable, and therefore that the requirements of Article 6(6) are met.

4.3.7.4 Permit conditions concerning energy efficiency

Conditions 1.2.2 and 1.2.3 have also been included in the Permit, which require the Operator to review the options available for heat recovery on an ongoing basis, and to provide and maintain the proposed steam and / or hot water pass-outs.

To ensure that any potential for steam utilisation is realised as soon as possible, pre-operational condition PO5 is also included within the Permit to require the Operator to identify potential steam users and to assess the feasibility of supplying steam to these potential users. The Application states that the Operator has started discussions with British Salt investigating the possibility that steam from the Covanta site could be supplied for salt evaporation processes.

The Operator is required to report energy usage and energy generated under condition 4.2 and Schedule 4. The following parameters are required to be reported: total electrical energy generated; electrical energy exported; total energy usage and energy exported as heat (if any). Together with the total MSW burned per year, this will enable the Agency to monitor energy efficiency at the Installation and take action if at any stage the energy efficiency is not considered acceptable.

4.3.8 Efficient use of raw materials

Having considered the information submitted in the Application, we are satisfied that the appropriate measures will be in place to ensure the efficient use of raw materials and water.

The Operator is required to report with respect to raw material usage under condition 4.2. and Schedule 4, including consumption of lime, activated carbon and ammonia used per tonne of waste burned. This will enable the Agency to assess whether there have been any changes in the efficiency of the air pollution control plant, and the operation of the SNCR to abate NO_x. These are the most significant raw materials that will be used at the Installation, other than the waste feed itself (addressed elsewhere). The efficiency of the use of auxiliary fuel will also be reported in line with the requirements of condition 4.2 and Schedule 4.

Considering each of the key raw materials in turn:

- *reagent for SNCR* – the Applicant states that ammonia solution will be used as the reagent for the reduction of NOx emissions. The reason given for this within the Application is that ammonia is more efficient than urea as it is more reactive.
- *acid gas reagent* – the Applicant states that quick lime will be used for acid gas abatement. It is argued that lime is more efficient and that the resultant salts will be more easily captured by the bag filter system than would be the case if sodium bicarbonate was used. We accept this argument that the use will minimise re-agent use due to higher efficiency.
- *auxiliary fuels* – the Applicant states that low sulphur gas oil will be used as a secondary fuel. They consider natural gas as an alternative, however, there is no natural gas supply to the site and the cost of supplying natural gas to the site becomes prohibitive. The low sulphur content of the gas oil will limit sulphur dioxide emissions as much as possible. We accept that low sulphur gas oil is an acceptable auxiliary fuel for Middlewich Incinerator and is in line with that used on similar sites.
- *process water* – very little process water will be used on the Middlewich incinerator site. The water for the boiler will be taken from the towns supply and will be re-circulated as much as possible within the boiler system. The facility uses air cooling and therefore water use is minimised as far as possible. If steam was to be supplied to the neighbouring British Salt site then this would be returned as condensate to the Middlewich Incinerator boiler system – so again minimising the amount of additional water required to be imported on to the site.

The Permit requires within Improvement Condition IC1 that the amount of each raw material used for pollutant control is optimised during the commissioning stage in order to ensure that the minimum amount of raw material is consumed whilst still obtaining an acceptable level of protection for the environment.

4.4 Avoidance, recovery or disposal with minimal environmental impact of wastes produced by the activities

This IPPCD requirement addresses wastes produced at the Installation and does not apply to the waste being treated there. The principal waste streams the Installation will produce are bottom ash and air pollution control residues.

The first objective is to avoid producing waste at all. Waste production will be avoided by achieving a high degree of burnout of the ash in the furnace, which results in a material that is both reduced in volume and in chemical reactivity. Condition 3.1.3

and associated Table S3.4 specify limits for Total Organic Carbon (TOC) in bottom ash of <3%. Compliance with this limit will demonstrate that good combustion control and waste burnout is being achieved in the furnaces and waste generation is being avoided where practicable.

Most incinerator bottom ash (IBA) is likely to be classified as non-hazardous waste. However, IBA is classified on the European List of Wastes as a "mirror entry", which means IBA is a hazardous waste if it possesses a hazardous property.

Air pollution control (APC) residues from flue gas treatment are hazardous waste and therefore must be sent for disposal to a landfill site licensed to accept hazardous waste, or to an appropriately permitted facility for treatment. The amount of APC residues is minimised through optimising the performance of the air emissions abatement plant and the use of raw materials.

In order to ensure that the IBA and APC residues are adequately characterised and sent to appropriate disposal or recovery facilities, pre-operational condition, PO3, requires the Operator to provide a written plan for approval detailing the ash sampling protocols to be employed at the site. Condition 3.1.3 and Table S3.4 requires the Operator to carry out an ongoing programme of monitoring.

The Application states that the IBA will be transferred by truck to a dedicated ash process area adjacent to the waste incinerator site which will be run by a third party and will be subject to a separate permit. The ash treatment facility will stabilise the IBA and process it into IBA aggregate for use in the construction industry. The ash treatment facility will treat the IBA produced at the Middlewich Incinerator site and is, therefore, considered to be an inherent part of the Middlewich Incinerator installation.

Having considered the information submitted in the Application, we are satisfied that the waste hierarchy referred to in Article 4 of the WFD will be applied to the generation of waste and that any waste generated will be treated in accordance with this Article.

We are satisfied that waste from the Installation that cannot be recovered will be disposed of using a method that minimises any impact on the environment. Standard condition 1.4.1 of the Permit will ensure that this position is maintained.

5 Minimising the Installation's environmental impact

This section of the document explains how we have approached the critical issue of assessing the likely impact of the Installation on human health and the environment, and what measures we are requiring to ensure a high level of protection. For an installation of this kind, the principal emissions are those to air, although we also consider those to land and water.

5.1 Assessment Methodology

5.1.1 Application of Environment Agency H1 Guidance

A methodology for risk assessment of point source emissions to air, which we use to assess the risk of applications we receive for permits, is set out in our Horizontal Guidance Note H1 and has the following steps:

- Describe emissions and receptors
- Calculate process contributions
- Screen out insignificant emissions that do not warrant further investigation
- Decide if detailed air modelling is needed
- Assess emissions against relevant standards
- Summarise the effects of your emissions

The H1 methodology uses a concept of "process contribution (PC)", which is the estimated concentration of emitted substances after dispersion into the receiving environmental media at the point where the magnitude of the concentration is greatest. The guidance provides a simple method of calculating PC primarily for screening purposes and for estimating process contributions where environmental consequences are relatively low. It is based on using dispersion factors. These factors assume worst case dispersion conditions with no allowance made for thermal or momentum plume rise and so the process contributions calculated are likely to be an overestimate of the actual maximum concentrations. More accurate calculation of process contributions can be achieved by mathematical dispersion models, which take into account relevant parameters of the release and surrounding conditions, including local meteorology – these techniques are expensive but normally lead to a lower prediction of PC. The Applicant has the choice to use either method.

Screen Out Insignificant Emissions

Once short-term and long-term PCs have been calculated (either by dispersion factors or modelling), they are compared with Environmental Quality Standards (EQS) referred to as "benchmarks" in the H1 Guidance.

Where an EU EQS exists, the relevant standard is the EU EQS. Where an EU EQS does not exist, our guidance sets out a National EQS (also referred to as Environmental Assessment Level - EAL) which has been derived to provide a similar level of protection to Human Health and the Environment as the EU EQS levels.

PCs are considered **Insignificant** if:

- the **long-term** process contribution is less than **1%** of the relevant EQS; and
- the **short-term** process contribution is less than **10%** of the relevant EQS.

The **long term** 1% process contribution insignificance threshold is based on the judgements that:

- It is unlikely that an emission at this level will make a significant contribution to air quality;
- The threshold provides a substantial safety margin to protect health and the environment.

The **short term** 10% process contribution insignificance threshold is based on the judgements that:

- spatial and temporal conditions mean that short term process contributions are transient and limited in comparison with long term process contributions;
- the proposed threshold provides a substantial safety margin to protect health and the environment.

Decide Whether Detailed Modelling is Needed

Where an emission cannot be screened out as insignificant as a PC through applying the first stage of our H1 Guidance, it does not mean it will necessarily be significant.

In these circumstances, the H1 Guidance justifies the need for detailed modelling of emissions, long-term, short-term or both, taking into account the state of the environment before the Installation operates, where:

- local receptors may be sensitive to emissions;
- released substances fall under an Air Quality Management Plan;
- the long term Predicted Environmental Concentration (PEC) exceeds 70% of the appropriate long term standard, (where the PEC is equal to the sum of the background concentration in the absence of the Installation and the process contribution);
- the short term Process Contribution exceeds 20% of the headroom, (where the headroom is the appropriate short term standard minus twice the long term background concentration).

5.1.2 Applying the Guidance to the Application

We review the Applicant's detailed impact assessment to confirm whether or not we agree with the Applicant's conclusions with respect to H1 screening against the above criteria.

For those pollutants where the $PEC_{long\ term}$ exceeds 70% of an EQS or the $PC_{short\ term}$ exceeds 20% of the headroom between an EQS and the background concentration, we determine whether exceedences of EQS are likely. This is done through detailed audit and review of the Applicant's impact assessment taking headroom and modelling uncertainties into account. Where an exceedence of an EQS is identified, we may require the Applicant to go beyond what would normally be considered BAT for the Installation or refuse the application. Whether or not exceedences are considered likely, the application is subject to the requirement to operate in accordance with BAT.

National EQSs do not have the same legal status as EU EQSs, and there is no explicit requirement to impose stricter conditions than BAT in order to comply with a national EQS. However, national EQSs are a standard for harm and any significant contribution to a breach is likely to be unacceptable.

This is not the end of the risk assessment, because we also take into account local factors (for example, particularly sensitive receptors nearby such as a SSSIs, SACs or SPAs). These additional factors may also lead us to include more stringent conditions than BAT.

If, as a result of reviewing of the risk assessment and taking account of any additional techniques that could be applied to limit emissions, we consider that emissions **would** cause significant pollution, we would refuse the Application.

5.2 Air Quality Assessment

5.2.1 Assessment of Air Dispersion Modelling Outputs

The Applicant assessed the Installation's potential emissions to air against the relevant air quality standards, and potential impact upon local habitat sites and human health. These assessments predicted the potential effects on local air quality from the Installation's stack emissions using the ADMS 4 dispersion models. The models used 5 years of meteorological data collected from Manchester International Airport. The terrain module data was not applied to the model, we agree that this is appropriate due to the uniformity of the ground in the vicinity of the site. The concentrations reported in the assessments were the maximum ground level concentrations predicted by the dispersion modelling packages over the 5 years of meteorological data.

The air impact assessments, and the dispersion modelling upon which they were based, employ conservative assumptions in that they assumed that the Installation operates continuously at the short-term and long-term WID emission limit values, i.e. the maximum permitted emissions under the WID. The emission limit values set on the Permit are in line with the requirements of the WID.

The results of the model are summarised in the tables below:

a) Long-term impact of emissions to air

Pollutant	EQS	Background	Max PC	PC as % of EQS	PEC	PEC as % EQS
Oxides of Nitrogen	40	21.2	0.2	0.5	21.3	53.5
Sulphur dioxide	50	8.8	0.05	0.1	8.85	17.7
Particulate	40	19.6	0.01	0.025	19.61	49.0
Hydrogen chloride	20	Not measured	0.01	0.05		

All the above concentration figures are in $\mu g/m^3$
PC = Process contribution (i.e. the concentration within the environment as a result of the direct emissions from the process)
PEC = Predicted Environmental Concentration = PC + background

b) Short-term impact of emissions to air

Pollutant	EQS /EAL	Background	Max PC	PC as % of EQS/EAL	Predicted headroom	PC as % of Headroom
Oxides of Nitrogen	200	21.2	8.7	4.4	157.6	5.5
Sulphur dioxide	350	8.8	44.3	12.6	332.4	13.3
Particulate	50	19.6	0.7	1.4	10.8	6.5

Hydrogen Chloride	750	Not measured	13.1	1.7	
Hydrogen fluoride	160	Not measured	0.8	0.5	
Carbon monoxide	10,000	Not measured	9.6	0.096	

All the above concentration figures are in $\mu g/m^3$

For the assessment of short term impacts the PEC is determined by adding twice the long term background concentration to the short tem process contribution.

From the tables above the following emissions can be screened out as insignificant in that the process contribution is < 1% of the long term EQS/EAL and <10% of the short term EQS/EAL.

- Oxides of nitrogen – short-term and long-term
- Sulphur dioxide – long-term only
- Particulate – long term and short-term
- Hydrogen chloride – long term and short term
- Carbon monoxide (CO) – short term (due to the instability of CO (easily converting to CO_2) there is no long term AQS for CO.

Also from the table above none of the emission not screened out as insignificant (i.e impact of emissions on short-term sulphur dioxide only) is considered to have the potential to give rise to significant pollution in that the short term Process Contribution is less than 20% of the headroom.. For this emission, we have carefully scrutinised the Applicant's proposals to ensure that they are applying the Best Available Techniques to prevent and minimise emissions of this substance. This is reported in section 6 of this document.

As part of the response to Schedule 5 Notice issued on 29 September 2010, the Applicant provided predicted process contributions for heavy metals (note that As, Ni and Cr are considered later). The reported results were as below.

Parameter	**PC (ng/m^3)**	**EAL (ng/m^3)**	**PC as % EAL**
Antimony	4.2	5000	0.08
Lead	4.2	250	1.7
Cobalt	4.2	NA	NA
Copper	4.2	10000	0.04
Manganese	4.2	150	2.8
Vanadium	4.2	5000	0.08
Mercury	0.45	250	0.2
Cadmium and Thallium	0.45	5	9.0

From the table above, lead, manganese and cadmium/Thallium do not screen out as insignificant. The Applicant argued that the dispersion modelling was based on worst case scenario and that the actual emissions will be about 7% of the input value. In the case of Cd and Tl, they also assumed that each metal will be emitted at WID ELV.

Therefore we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation.

We have reviewed the way in which the Applicant used dispersion models, its selection of input data, and the assumptions it made and have satisfied ourselves that the modelling presented a reasonably reliable picture. We agreed with the Applicant's conclusion, that the predicted concentrations of all pollutants considered were well within the relevant air quality objectives and environmental assessment levels.

c) Assessment of emissions of PM_{10} and $PM_{2.5}$

The impact on air quality from particulate emissions has been assessed against EQS for PM_{10} (particles of 10 microns and smaller) and $PM_{2.5}$ (particles of 2.5 microns and smaller). For PM_{10}, the EU EQS are a long term annual average of 40 $\mu g/m^3$ and a short term daily average of 50 $\mu g/m^3$. For $PM_{2.5}$ the EU EQS of 25 $\mu g/m^3$ as a long-term annual average to be achieved by 2010 as a Target Value and by 2015 as a Limit Value.

The Applicant's predicted impact of the Installation against these EQS is shown in the table below – all concentrations are shown as $\mu g/m^3$. The assessment assumes that **all** particulate emissions are present as PM_{10} for the PM_{10} assessment and as $PM_{2.5}$ for the $PM_{2.5}$ assessment.

Pollutant	EQS / EAL	Background	PC	PC as % of EQS / EAL
PM_{10} long-term	40	19.6	0.01	0.03
short-term	50	19.6	0.7	1.4
$PM_{2.5}$ long-term CAFE	25	19.6	0.01	0.04

The above assessment is considered to represent a worst case assessment in that: -

(i) It assumes that the plant emits particulates continuously at the WID limit, whereas actual emissions from similar plant are normally in the range 1 to 5 mg/m^3 (less than 50% of the daily average emission limit value expressed within the WID and on the Permit)

(ii) It assumes all particulates emitted are below either 10 microns (PM_{10}) or 2.5 microns ($PM_{2.5}$), when some are expected to be larger.

We have reviewed the Applicant's particulate matter impact assessment and are satisfied in the robustness of the Applicant's conclusions.

The above assessment shows that the predicted process contribution for emissions of PM_{10} is below 1% of the long term EQS and below 10% of the short term EQS and so can be considered insignificant.

Particulates smaller than 2.5 microns

The Operator will be required to monitor particulate emissions using the method set out in Table S3.1 of Schedule 3 of the Permit. This method requires that the filter efficiency must be at least 99.5 % on a test aerosol with a mean particle diameter of 0.3 µm, at the maximum flow rate anticipated. This means that particulate monitoring data effectively captures everything above 0.3 microns and much of what is smaller. It is not expected that even smaller particles will contribute significantly to the mass release rate / concentration of particulates because of their very small mass, even if

present. This means that emissions monitoring data can be relied upon to measure the true mass emission rate of particulates.

.d) Treatment of New EPAQS Guidelines on Arsenic, Nickel and Chromium (VI)

In April 2010, the Environment Agency published revised Environmental Assessment Levels (EALs) for arsenic, nickel and hexavalent chromium Cr(VI) in our H1 Guidance (H1 Environmental Risks Assessment) The revised EALs are substantially lower than the former EALs:

- Arsenic – 3 ng/m^3
- Nickel – 20 ng/m^3
- Cr (VI) – 0.2 ng/m^3

The EALs refer to that portion of the metal emissions contained only within the PM_{10} fraction of particulates in ambient air.

The 2009 report of the Expert Panel on Air Quality Standards (EPAQS) – Guidelines for Metal and Metalloids in Ambient Air for the Protection of Human Health, proposes new ambient air quality guidelines for arsenic, nickel, beryllium and chromium (VI).

Arsenic, nickel and chromium are three of the nine Group 3 metals whose emissions are subject to a mandatory minimum emission limit by the WID. WID sets an aggregate limit of 0.5 mg/m^3 for all nine Group 3 metals. Emissions of beryllium are not subject to an emission limit in WID.

The EPAQS guidelines refer only to that portion of the metal emissions contained within PM_{10} in ambient air The new guidelines are 3ng/m^3 for arsenic, 20 ng/m^3 for nickel and 0.2 ng/m^3 for chromium (VI).

The WID limit for Group III metals of 0.5 mg/m^3 covers gaseous and vapour forms of the metals and their compounds as well as that present in particulate matter. WID has a separate emission limit value for emissions to air of total particulate material. The EPAQS guideline also refers to Chromium (VI) only whereas the Group III WID limit includes all chromium. The EPAQS report estimates that 20% of environmental chromium is present as chromium (VI).

As part of the response to the Schedule 5 notice issued on 29 September 2010, the Applicant carried out air dispersion modelling of the impact of metal emissions from the proposed incinerator on local air quality and human health. The input data for this air dispersion modelling work was based on the typical metal emissions from waste incinerators as reported in our guidance – Interim guidance to Applicants on Metals Impact assessment for Waste Incineration plant. The Applicant compared the modelled process contributions from the proposed incinerator based on continuous release at the maximum emission rate for each metal quoted in our interim guidance.

The table below shows the Applicant's assessment against the current Environmental Assessment Levels alongside the same data compared with the EPAQS long term guidelines.

Pollutant	Release concentration (mg/m^3)		Process contribution – PC (ng/m^3)		PC as % of EPAQS guideline	
	Max	Mean	Max	Mean	Max	Mean
Arsenic	0.003	0.0016	0.027	0.014	0.9	0.47
Nickel	0.136	0.0196	1.23	0.177	6.2	0.89
Chromium VI*	0.033	0.0076	0.002	0.00046	1.0	0.23

* For the purpose of calculating PC the Applicant has assumed that Chromium VI is present at a mean of 0.7% of the total chromium emissions – this is in line with our interim guidance on metals impact assessment for waste incineration plant. The release concentrations quoted in the table are for total chromium.

The EPAQS report stating the new guidelines for arsenic, nickel and chromium (VI emissions, also sets out information on background levels of these pollutants. This installation is located in a rural area and the background levels proposed in the EPAQS report are as follows: -

Arsenic 0.1 to 0.4 ng/m^3
Nickel 0.3 to 1.5 ng/m^3
Chromium VI 0.04 to 0.14 ng/m^3

Consequently, based on the assessment carried out by the Applicant, in line with the maximum release concentrations stated in our interim guidance then the peak process contribution would be 0.9%, 6.2% and 1.0% of the relevant EPAQS guideline for arsenic, nickel and chromium (VI) respectively as shown in the above table. However, as these are long term guidelines then a more realistic comparison is to compare with the mean emissions. Based on mean emissions the process contribution of arsenic, nickel and chromium VI can be regarded as insignificant.

The Predicted Environmental Concentration (PEC) have been assessed using background concentrations set out in the EPAQS Report and shown in the table below

Pollutants	**PC as % of EPAQS guideline**		**PEC as % of EPAQS guideline**	
	PC	**%**	**PEC**	**%**
Arsenic	0.027	0.9	0.127 – 0.427	4.2 – 14.2
Nickel	1.23	6.2	1.53 – 2.73	7.6 – 13.6
Chromium (VI)	0.002	1.0	0.042 – 0.142	21.0 – 71.0

This assessment shows that a breach of the air quality guidelines for arsenic, nickel and chromium (VI) is unlikely.

It should also be noted that these assessments are still based on total metal emissions, not just those present in particulate matter on which these air quality guidelines are based. The installation has been assessed as meeting BAT for control of emissions to air.

Therefore taking all these factors into account, it is considered appropriate to set an improvement condition requiring more detailed assessment against the proposed air quality guidelines based on actual measurements of emissions. This is included as IC4. A period of one year's data has been specified to take account of any natural variation in the waste composition. The Improvement Condition seeks to verify whether the actual releases are as expected within these limits, in which case no further action is required.

Based on the assessment of operating plant data, actual Arsenic, Nickel and Chromium emissions from the installation is expected to demonstrate that the proposed EPAQS air quality guidelines can be achieved for Chromium (VI) as well as for Arsenic and Nickel. However, in the event that the assessment were to indicate a risk of the air quality guidelines being exceeded, the Agency could specify a specific emission limit value for Arsenic, Nickel or Chromium as appropriate or seek beyond BAT improvements to the abatement technology employed.

5.3 Human health risk assessment

5.3.1 Our role in preventing harm to human health

The Environment Agency has a statutory role to protect the environment and human health from all processes and activities it regulates. We assessed the effects on human health for this application in the following ways:

i) Applying Statutory Controls

The plant will be regulated under EPR. These regulations include the requirements of relevant EU Directives, notably, the waste incineration directive (WID), the Waste Framework Directive (WFD), Integrated Pollution Prevention and Control Directive (IPPCD) and Air Quality Directive (AQD)

The main conditions in an Energy from Waste (EfW) permit are based on the requirements of the IPPCD. Further specific conditions have been introduced to ensure compliance with the requirements of the WID. The aim of WID is to prevent or to limit as far as practicable negative effects on the environment, in particular pollution by emissions into air, soil, surface water and groundwater, and the resulting risks to human health, from the incineration and co-incineration of waste. WID achieves this aim by "setting stringent operational conditions, technical requirements and emission limit values". The requirements of the IPPCD include the use of BAT, which may in some circumstances dictate tighter emission limits and controls than the WID. The assessment of BAT for this installation is detailed in section 6 of this document.

ii) Environmental Impact Assessment

Industrial activities can give rise to odour, noise and vibration, accidents, fugitive emissions to air and water, releases to air (including the impact on Photochemical Ozone Creation Potential (POCP)), discharges to ground or groundwater, global warming potential and generation of waste. For an installation of this kind, the principal environmental effects are through emissions to air, although we also consider all of the other impacts listed. Section 5.1 and 5.2 above explain how we have approached the critical issue of assessing the likely impact of the emissions to air from the Installation on human health and the environment and any measures we are requiring to ensure a high level of protection.

iii) Expert Scientific Opinion

We take account of the views of national and international expert bodies. Following is a summary of some of the publications which we have considered (in no particular order).

An independent review of evidence on the health effects of municipal waste incinerators was published by **DEFRA** in 2004. It concluded that there was no convincing link between the emissions from MSW incinerators and adverse effects on public health in terms of cancer, respiratory disease or birth defects. On air quality effects, the report concluded "Waste incinerators contribute to local air pollution. This contribution, however, is usually a small proportion of existing background levels which is not detectable through environmental monitoring (for example, by comparing upwind and downwind levels of airborne pollutants or substances deposited to land). In some cases, waste incinerator facilities may make a more detectable contribution to air pollution. Because current MSW incinerators are located predominantly in urban areas, effects on air quality are likely to be so small as to be undetectable in practice."

A Position Statement issued by the **HPA** in 2009 states that "The Health Protection Agency has reviewed research undertaken to examine the suggested links between emissions from municipal waste incinerators and effects on health. While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable".

Policy Advice from Government also points out that the minimal risk from modern incinerators. Paragraph 22 (Chapter 5) of WS2007 says that "research carried out to date has revealed no credible evidence of adverse health outcomes for those living near incinerators." It points out that "the relevant health effects, mainly cancers, have long incubation times. But the research that is available shows an absence of symptoms relating to exposures twenty or more years ago when emissions from incinerators were much greater than is now the case." **Paragraph 30 of PPS10** explains that "modern, appropriately located, well run and well regulated waste management facilities should pose little risk to public health."

The **Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment (CoC) issued** a statement in 2000 which said that "any potential risk of cancer due to residency (for periods in excess of 10 years) near to municipal solid waste incinerators was exceedingly low and probably not measurable by the most modern epidemiological techniques." In 2009, CoC considered six further relevant epidemiological papers that had been published since the 2000 statement, and concluded that "there is no need to change the advice given in the previous statement in 2000 but that the situation should be kept under review".

Republic of Ireland Health Research Board report stated that "It is hard to separate the influences of other sources of pollutants, and other causes of cancer and, as a result, the evidence for a link between cancer and proximity to an incinerator is not conclusive".

The **Food Safety Authority of Ireland (FSAI) (2003)** investigated possible implications on health associated with food contamination from waste incineration and

concluded: “In relation to the possible impact of introduction of waste incineration in Ireland, as part of a national waste management strategy, on this currently largely satisfactory situation, the FSAI considers that such incineration facilities, if properly managed, will not contribute to dioxin levels in the food supply to any significant extent. The risks to health and sustainable development presented by the continued dependency on landfill as a method of waste disposal far outweigh any possible effects on food safety and quality.”

Health Protection Scotland (2009) considered scientific studies on health effects associated with the incineration of waste particularly those published after the Defra review discussed earlier. The main conclusions of this report were: “(a) For waste incineration as a whole topic, the body of evidence for an association with (non-occupational) adverse health effects is both inconsistent and inconclusive. However, more recent work suggests, more strongly, that there may have been an association between emissions (particularly dioxins) in the past from industrial, clinical and municipal waste incinerators and some forms of cancer, before more stringent regulatory requirements were implemented. (b) For individual waste streams, the evidence for an association with (non-occupational) adverse health effects is inconclusive. (c) The magnitude of any past health effects on residential populations living near incinerators that did occur is likely to have been small. (d) Levels of airborne emissions from individual incinerators should be lower now than in the past, due to stricter legislative controls and improved technology. Hence, any risk to the health of a local population living near an incinerator, associated with its emissions, should also now be lower.”

The **US National Research Council Committee on Health Effects of Waste Incineration (NRC) (NRC 2000)** reviewed evidence as part of a wide ranging report. The Committee view of the published evidence was summarised in a key conclusion: “Few epidemiological studies have attempted to assess whether adverse health effects have actually occurred near individual incinerators, and most of them have been unable to detect any effects. The studies of which the committee is aware that did report finding health effects had shortcomings and failed to provide convincing evidence. That result is not surprising given the small populations typically available for study and the fact that such effects, if any, might occur only infrequently or take many years to appear. Also, factors such as emissions from other pollution sources and variations in human activity patterns often decrease the likelihood of determining a relationship between small contributions of pollutants from incinerators and observed health effects. Lack of evidence of such relationships might mean that adverse health effects did not occur, but it could mean that such relationships might not be detectable using available methods and sources.”

The **British Society for Ecological Medicine (BSEM) published a report in 2005** on the health effects associated with incineration and concluded that “Large studies have shown higher rates of adult and childhood cancer and also birth defects around municipal waste incinerators: the results are consistent with the associations being causal. A number of smaller epidemiological studies support this interpretation and suggest that the range of illnesses produced by incinerators may be much wider. Incinerator emissions are a major source of fine particulates, of toxic metals and of more than 200 organic chemicals, including known carcinogens, mutagens, and hormone disrupters. Emissions also contain other unidentified compounds whose

potential for harm is as yet unknown, as was once the case with dioxins. Abatement equipment in modern incinerators merely transfers the toxic load, notably that of dioxins and heavy metals, from airborne emissions to the fly ash. This fly ash is light, readily windborne and mostly of low particle size. It represents a considerable and poorly understood health hazard."

The BSEM report was reviewed by the HPA and they concluded that "Having considered the BSEM report the HPA maintains its position that contemporary and effectively managed and regulated waste incineration processes contribute little to the concentrations of monitored pollutants in ambient air and that the emissions from such plants have little effect on health." The BSEM report was also commented on by the consultants who drafted the Defra 2004 report referred to above. They said that "It fails to consider the significance of incineration as a source of the substances of concern. It does not consider the possible significance of the dose of pollutants that could result from incinerators. It does not fairly consider the adverse effects that could be associated with alternatives to incineration. It relies on inaccurate and outdated material. In view of these shortcomings, the report's conclusions with regard to the health effects of incineration are not reliable."

A **Greenpeace** review on incineration and human health concluded that a broad range of health effects have been associated with living near to incinerators as well as with working at these installations. Such effects include cancer (among both children and adults), adverse impacts on the respiratory system, heart disease, immune system effects, increased allergies and congenital abnormalities. Some studies, particularly those on cancer, relate to old rather than modern incinerators. However, modern incinerators operating in the last few years have also been associated with adverse health effects."

The Health Protection Scotland report referred to above says that "the authors of the Greenpeace review do not explain the basis for their conclusion that there is an association between incineration and adverse effects in terms of criteria used to assess the strength of evidence. The weighting factors used to derive the assessment are not detailed. The objectivity of the conclusion cannot therefore be easily tested."
From this published body of scientific opinion, we take the view stated by the HPA that "While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable". We therefore ensure that permits contain conditions which require the installation to be well-run and regulate the installation to ensure compliance with such permit conditions.

iv) Health Risk Models

Comparing the results of air dispersion modelling as part of the H1 Environmental Impact assessment against European and national air quality standards effectively makes a health risk assessment for those pollutants for which a standard has been derived. These air quality standards have been developed primarily in order to protect human health via known intake mechanisms, such as inhalation and ingestion. Some pollutants, such as dioxins and furans, have human health impacts at lower

ingestion levels than lend themselves to setting an air quality standard to control against. For these pollutants, a different human health risk model is required which better reflects the level of dioxin intake.

Dioxin Intake Models: Two models are available to predict the dioxin intake for comparison with the Tolerable Daily Intake (TDI) recommended by the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment, known as COT. These are HHRAP and the HMIP model.

HHRAP has been developed by the US EPA to calculate the human body intake of a range of carcinogenic pollutants and to determine the mathematic quantitative risk in probabilistic terms. In the UK, in common with other European Countries, we consider a threshold dose below which the likelihood of an adverse effect is regarded as being very low or effectively zero. The HMIP model uses a similar approach to the HHRAP model, but does not attempt to predict probabilistic risk. Either model can however be used to make comparisons with the TDI.

The TDI is the amount of a substance that can be ingested daily over a lifetime without appreciable health risk. It is expressed in relation to bodyweight in order to allow for different body size, such as for children of different ages. In the UK, the COT has set a TDI for dioxins and furans of 2 picograms I-TEQ/Kg-body weight/day (N.B. a picogram is a million millionths (10^{-12}) of a gram).

In addition to an assessment of risk from dioxins and furans, the HHRAP model enables a risk assessment from human intake of a range of heavy metals. The HMIP report does not consider metals. In principle, the respective EQS for these metals are protective of human health. It is not therefore necessary to model the human body intake.

COMEAP developed a methodology applicable to the results of time series epidemiological studies which allows calculation of the public health impact of exposure to the classical air pollutants (NO_2, SO_2 and particulates) in terms of the numbers of “deaths brought forward” and the “number of hospital admissions for respiratory disease brought forward or additional”. COMEAP has issued a statement expressing some reservations about the applicability of applying its methodology to small affected areas. Those concerns generally relate to the fact that the exposure-response coefficients used in the COMEAP report derive from studies of whole urban populations where the air pollution climate may differ from that around a new industrial installation. COMEAP identified a number of factors and assumptions that would contribute to the uncertainty of the estimates. These were summarised in the Defra review as below:

- Assumption that the spatial distribution of the air pollutants considered is the same in the area under study as in those areas, usually cities or large towns, in which the studies which generated the coefficients were undertaken.
- Assumption that the temporal pattern of pollutant concentrations in the area under study is similar to that in the areas in which the studies which generated the coefficients were undertaken (i.e. urban areas).
- It should be recognised that a difference in the pattern of socio-economic conditions between the areas to be studied and the reference areas could lead to inaccuracy in the predicted level of effects.

- In the same way, a difference in the pattern of personal exposures between the areas to be studied and the reference areas will affect the accuracy of the predictions of effects.

The use of the COMEAP methodology is not generally recommended for modelling the human health impacts of individual installations. However it may have limited applicability where emissions of NO_x, SO_2 and particulates cannot be screened out as insignificant in an H1 Environmental Impact assessment, there are high ambient background levels of these pollutants and we are advised that its use was appropriate by our public health consultees.

Our recommended approach is therefore the use of the H1 assessment methodology comparison for most pollutants (including metals) and dioxin intake models using either the HHRA or HMIP models as described above for dioxins and furans. Where an alternative approach is adopted for dioxins, we check the predictions ourselves using the HMIP methodology.

v) Consultations

As part of our normal procedures for the determination of a permit application, we would consult PCT, FSA and in some cases HPA (often the PCT response would incorporate HPA advice). We also consult the local communities who may raise health related issues. All issues raised by these consultations are considered in determining the application as described in Annex 4 of this document.

5.3.2 Assessment of Intake of Dioxins and Furans

For dioxins and furans, the principal exposure route is through ingestion, usually through the food chain, and the main risk to health is through accumulation in the body over a period of time.

The human health risk assessment calculates the dose of dioxins and furans that would be received by local receptors if all their food and water were locally sourced from the locality where the deposition of dioxins and furans is predicted to be the highest. This is then assessed against the Tolerable Daily Intake (TDI) levels established by the COT of 2 picograms I-TEQ / kg bodyweight/ day.

The results of the applicant's assessment of dioxin intake are detailed in the table below. (worst – case results for each category are shown). The results showed that the predicted daily intake of dioxins at all receptors, resulting from emissions from the proposed facility, were below the TDI levels. This remains the case even when the current average daily intake of dioxins for adults in the UK are added to the worst case scenarios. It should be noted that these predictions are very conservative as the assessment presumes that all of the food and drink consumed by an individual is sourced at the point of greatest impact from the site.

Receptor	Calculated intake of dioxins (pg/kg bw/day)	% of Tolerable Daily Intake (TDI)
Adult non-farmer	0.08	4.0
Child non-farmer	0.24	12.0
Adult farmer	0.57	28.5

Child farmer	0.91	45.5

Calculated maximum daily intake of dioxins by local receptors resulting from the operation of the proposed facility (I-TEQ/ kg-BW/day)

The FSA has reported that recent dietary studies have shown that estimated total dietary intakes of dioxins and dioxin-like PCBs from all sources by all age groups fell by around 50% between 1997 and 2001, and are expected to continue to fall. In 2001, the average daily intake by adults in the UK from diet was 0.9 pg WHO-TEQ/kg bodyweight.

In 2010, FSA studied the levels of chlorinated, brominated and mixed (chlorinated-brominated) dioxins and dioxin-like PCBs in fish, shellfish, meat and eggs consumed in UK. It asked COT to consider the results and to advise on whether the measured levels of these PXDDs, PXDFs and PXBs indicated a health concern ('X' means a halogen). COT issued a statement in December 2010 and concluded that " The major contribution to the total dioxin toxic activity in the foods measured came from chlorinated compounds. Brominated compounds made a much smaller contribution, and mixed halogenated compounds contributed even less (1% or less of TDI). Measured levels of PXDDs, PXDFs and dioxin-like PXBs do not indicate a health concern". COT recognised the lack of quantified TEFs for these compounds but said that "even if the TEFs for PXDDs, PXDFs and dioxin-like PXBs were up to four fold higher than assumed, their contribution to the total TEQ in the diet would still be small. Thus, further research on PXDDs, PXDFs and dioxin-like PXBs is not considered a priority."

In the light of this statement, we assess the impact of chlorinated compounds as representing the impact of all chlorinated, brominated and mixed dioxins / furans and dioxin like PCBs.

5.3.3 Nanoparticles

Nano-particles are considered to refer to those particulates less than 0.1µm in diameter ($PM_{0.1}$). Questions are often raised about the effect of nano-particles on human health, in particular on children's health, because of their high surface to volume ratio, making them more reactive, and their very small size, giving them the potential to penetrate cell walls of living organisms. The small size also means there will be a larger number of small particles for a given mass concentration. However the HPA statement (referenced below) says that due to the small effects of incinerators on local concentration of particles, it is highly unlikely that there will be detectable effects of any particular incinerator on local infant mortality.

The HPA addresses the issue of the health effects of particulates in their September 2009 statement 'The Impact on Health of Emissions to Air from Municipal Incinerators'. It refers to the coefficients linking PM_{10} and $PM_{2.5}$ with effects on health derived by the Committee on the Medical Effects of Air Pollutants (COMEAP) and goes on to say that if these coefficients are applied to small increases in concentrations produced, locally, by incinerators, the estimated effects on health are likely to be small. The HPA notes that the coefficients that allow the use of number concentrations in impact calculations have not yet been defined because the national

experts have not judged that the evidence is sufficient to do so. This is an area being kept under review by COMEAP.

In December 2010, COMEAP published a report on The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom. It says that "a policy which aims to reduce the annual average concentration of $PM_{2.5}$ by 1 $\mu g/m^3$ would result in an increase in life expectancy of 20 days for people born in 2008." However, "The Committee stresses the need for careful interpretation of these metrics to avoid incorrect inferences being drawn – they are valid representations of population aggregate or average effects, but they can be misleading when interpreted as reflecting the experience of individuals."

The HPA also point out that in 2007 incinerators contributed 0.02% to ambient ground level PM_{10} levels compared with 18% for road traffic and 22% for industry in general. The HPA note that in a sample collected in a day at a typical urban area the proportion of $PM_{0.1}$ is around 5-10% of PM_{10}. It goes on to say that PM_{10} includes and exceeds $PM_{2.5}$ which in turn includes and exceeds $PM_{0.1}$.

This is consistent with the assessment of this application which shows emissions of PM_{10} to air to be insignificant.

We take the view, based on the foregoing evidence, that techniques which control the release of particulates to levels which will not cause harm to human health will also control the release of fine particulate matter to a level which will not cause harm to human health.

5.3.4 Assessment of Health Effects from the Installation

We have assessed the health effects from the operation of this installation in relation to the above (sections 5.3.1 to 5.3.3). We have applied the relevant requirements of the national and European legislation in imposing the permit conditions. We are satisfied that compliance with these conditions will ensure protection of the environment and human health.

Taking into account all of the expert opinion available, we agree with the conclusion reached by the HPA that "While it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable."

In carrying out air dispersion modelling as part of the H1 Environmental Impact assessment and comparing the predicted environmental concentrations with European and national air quality standards, the Applicant has effectively made a health risk assessment for many pollutants. These air quality standards have been developed primarily in order to protect human health.

The Applicant's assessment of the impact from oxides of nitrogen, sulphur dioxide, particulate, hydrogen chloride, hydrogen fluoride, carbon monoxide, particulate PM_{10}, particulate $PM_{2.5}$, arsenic, total chromium, chromium (VI), antimony, lead, manganese, cobalt, copper, nickel and vanadium have all indicated that the Process

Contribution from the Installation screen out as insignificant; where the impact of emissions of sulphur dioxide (short-term). the assessment still shows that the predicted environmental concentrations are well within air quality standards or environmental action levels. For all long-term the process contribution of the average emissions rather than the maximum have been assessed.

The Environment Agency has reviewed the methodology employed by the Applicant to carry out the health impact assessment.

We have expressed a number of minor concerns with the way in which the modelling work has been done. We are satisfied, however that dioxin and furan emissions are not likely to contribute significantly to any exceedences of the TDI.

Overall, taking into account the conservative nature of the impact assessment (i.e. that it is based upon an individual exposed for a life-time to the effects of the highest predicted airborne concentrations and consuming mostly locally grown food), it was concluded that the operation of the proposed facility will not pose a significant carcinogenic or non-carcinogenic risk to human health.

The Health Protection Agency and Central and Eastern Cheshire Primary Care Trust were consulted on the Application and concluded that they had no significant concerns regarding the risk to the health of humans from the installation. The Food Standards Agency was also consulted during the permit determination process and it concluded that it is unlikely that there will be any unacceptable effects on the human food chain as a result of the operations at the Installation. Details of the responses provided by the PCT and FSA to the consultation on this Application can be found in Annex 2.

The Environment Agency is therefore satisfied that the Applicant's conclusions presented above are soundly based and we conclude that the potential emissions of pollutants including dioxins, furans and metals from the proposed facility are unlikely to have an impact upon human health.

5.3.5 Impact on Habitats sites, SSSIs, non-statutory conservation sites etc.

5.3.5.1 SAC, SPA and Ramsar.

There are no SAC or SPA within the relevant screening distance from the site. There is one Ramsar site (Midland Meres and Mosses) that is within the relevant distance (8km away at its nearest point).

Acidification potential due to releases of SO_2, NOx, HCl, HF and nitrification potential as a result of NOx and ammonia emissions have been considered. Air dispersion modelling indicates that the annual average (expressed as a maximum ground level concentration) for each pollutant is insignificant compared with relevant Air Quality Standards. Maximum ground level concentrations are closer into the site (within 1km). Therefore, as the Habitat is 8km away from the site process contribution to acidification and nutrification will be negligible (if any) and make no discernible difference to acidification and nitrification at the site.

5.3.5.2 SSSI

There is one SSSI at the edge of the relevant distance (2km) from the site. This is Sandbach Flashes which is 2.0km away at its nearest point.

Modelling carried out by the Operator and verified by the Environment Agency has demonstrated that beyond 800m south of the site NO_2 levels due to NOx releases from the waste incinerator fall below 1% of the relevant AQS and can therefore be regarded as insignificant. Modelling has demonstrated that beyond 200m south of the site SO_2 levels due to SOx releases from the waste incinerator fall below 1% of the relevant AQS and can therefore be regarded as insignificant.

As Sandbach Flashes are at least 2km south of the site then the impact of the site on this SSSI can be regarded as insignificant and we can conclude that the operation of the site will result in no damage to the Sandbach Flashes SSSI.

5.3.5.3 Assessment of non-statutory sites

There are no Ancient Woodlands, National Nature Reserves, Local Nature Reserves, World Heritage Sites, Areas of Outstanding Natural Beauty or National Parks within the relevant distance (2km) of the site.
However, there are three Ancient Monuments, namely:

- Kinderton Hall (1.5km from site);
- Brine pumps at Brooks Lane (560 metres from site); and
- King Street Roman Fort (1.7km from site)

There is also one Local Wildlife Site within the relevant distance – Cledford Lane Beds (bordering site to South East, separated by a railway line).

As modelling and assessment has demonstrated that the predicted ground level environmental concentrations of pollutants in the area even at a maximum will not compromise any Air Quality Objectives then we are satisfied that the operation of the Waste Incinerator will not compromise the integrity of the above sites.

5.3.5.4 Assessment of protected species.

Some protected species such as bats, newts and otters are known to use the site during part of their life cycle. The following protected species are known to be present within 500 metres of the proposed Waste Incinerator site. These species include :

- Bats,
- Badgers
- Otters
- Protected amphibians

The Applicant has demonstrated that the Air Quality Standards will not be compromised within 500 metres of the site and most notably not in the area to the East of the site which is where the protected species will be primarily located as the areas to the north, west and south of the site are part of the industrial estate and associated infrastructure.

The Applicant has also demonstrated that the surrounding Habitat in which the protected species are present is predominantly Improved Grassland that is not sensitive to nutrification or acidification. Therefore, the Habitat in which the protected species live will not be compromised by the operations of the Waste Incinerator.

There are also several ponds in the vicinity of the site in which protected amphibians are known to live. The owners of the industrial estate are currently planning a local alternative Habitat for these species.

The Applicant also considered the potential impact of noise and light from the site during the operational phase on the protected species. They conclude that procedural controls and abatement at the site will mean that the protected species will not be adversely affected by noise and light from the site. Based on the evidence given within the Environmental Impact Assessment and that within the response to the first Schedule 5 notice issued in November 2010 we are able to agree with this assessment.

As part of the determination of the planning appeal, the Secretary of State directed the applicant to *"…. undertake an assessment of the likely significant effects of CHP connections from the proposed EfW plant to all buildings on Midpoint 18 Phases 1, 2 and 3 (whether existing, permitted or indicative) in terms of their effects on the habitats of protected species, and especially on European protected species, together with appropriate mitigation measures…."*.

The Applicant has submitted a Consolidated Environmental Statement which includes the above assessment and shows that the overall impact will not be significant. It needs to be remembered that the installation of CHP infrastructure is not part of the permit application. However, the permit requires the Applicant to explore this possibility and submit a report to us for consideration prior to the Installation becoming operational. We will consider this report and any proposed provision of CHP along with any impacts of providing it if the development was to go ahead. We would not require the provision of CHP unless we were satisfied the environmental impacts were acceptable. In the meantime, we are satisfied that the operation of the Installation will not cause disturbance to any protected species.

5.3.6 Impact of abnormal operations

WID (Article 6(3)(c)) requires that waste shall cease to be fed to the installation whenever any of the continuous emission monitors show that an emission limit value (ELV) is exceeded due to disturbances or failures of the purification devices. Not withstanding this, WID (Article 13(3)) allows for the continued feeding of waste under abnormal operating conditions – this is a recognition that the emissions during transient states (e.g. start-up, shut-down) are higher than during steady-state operation, and the overall environmental impact of continued operation with a limited exceedance of an ELV may be less than that of a partial shut-down and re-start. WID Article 13 sets criteria for determining what is an abnormal operation and sets some limits regarding duration and extent of the abnormal operation which aim to ensure that the overall environmental impact is so minimised.

Abnormal operations are limited to no more than a period of 4 hours continuous operation and no more than 60 hour aggregated operation in any calendar year (<1% of total operating hours). As such, abnormal operating conditions are not expected to have any significant long term environmental impact unless the background conditions were already close to, or exceeding, an EQS. For the most part therefore consideration of abnormal operations is limited to consideration of its impact on short term EQSs.

WID abnormal operations are defined as any technically unavoidable stoppages, disturbances, or failures of the abatement plant or the measurement devices, during which the concentrations in the discharges into air may exceed the normal emission limit values.

For incineration plant, WID sets backstop limits for particulates, CO and TOC which must continue to be met. The CO and TOC limits are the same as for normal operation, and are intended to ensure that good combustion conditions are maintained. The backstop limit for particulates is 150 mg/m^3 as a half hourly average, which is five times the limit in normal operation.

In making an assessment of abnormal operations the following worst case scenario has been assumed:

- For oxides of nitrogen the abatement proposed is SNCR. SNCR has an efficiency rate of 40 – 60%. Assuming the system will always operate at the maximum efficiency and that operational emissions are at the short-term WID limit of 400mg/m^3. Therefore, unabated emissions for short-term release could be expected to reach (400/0.4) = 1,000mg/m^3.
- For sulphur dioxide, hydrogen chloride and hydrogen fluoride the abatement proposed is lime injection. Lime injection is considered to have an efficiency rate of up to 50%. Therefore assuming the system will need to operate at maximum efficiency to achieve the WID limits, if the system fails the short-term sulphur dioxide, hydrogen chloride and hydrogen fluoride emissions will increase to 400mg/m^3, 120mg/m^3 and 4mg/m^3 respectively.
- For particulate the abatement proposed is bag filters. Bag filters are considered to have an efficiency rate of up to 99%. The WID states that even during periods of abnormal operation the maximum limit for particulate emissions is 150mg/m^3.
- For dioxin emissions the abatement proposed is carbon injection. Carbon injection is considered to have an efficiency rate of up to 99%. Therefore assuming the system will need to operate at maximum efficiency to achieve the WID limits, if the system fails the short-term dioxin emissions will increase to 10ng/m^3.

This is a worst case scenario in that WID abnormal conditions include a number of different equipment failures not all of which will necessarily result in an adverse impact on the environment (e.g. a failure of a monitoring instrument does not necessarily mean that the incinerator or abatement plant is malfunctioning). This analysis assumes that any failure of any equipment results in all the negative impacts set out above occurring simultaneously.

The result on the short-term environmental impact stated in the Application and verified by the Environment Agency is summarised in the table below. There is no measured background for hydrogen fluoride, hydrogen chloride and dioxin therefore the calculations based on predicted headroom has not been done for these pollutants.

Pollutant	Short term EQS / EAL	Background Conc	Process Contribution (PC)	PC as % of EQS / EAL	Predicted Headroom (EQS – 2 x background)	PC as % of headroom
Oxides of nitrogen	200	21.2	21.8	10.9	157.6	13.8
Sulphur dioxide	350	8.8	88.3	22.6	332.4	26.7
Particulate	50	19.6	3.5	7.0	10.8	32.4
Hydrogen chloride	750	N/M	26.2	3.4		
Hydrogen fluoride	160	N/M	1.6	1.0		
Dioxins	none	N/M	0.0007			

N/M = not measured

Note 1 All the above concentration figures are in $\mu g/m^3$

Note 2 For the assessment of short term impacts the PEC is determined by adding twice the long term background concentration to the short tem process contribution.

From the table above the emissions of the following substances can still be considered insignificant, in that the PC is still <10% of the short-term EQS/EAL.

- Particulate
- Hydrogen fluoride

For oxides of nitrogen the PC is slightly higher than 10% of the AQS, however, PC is less than 20% of the headroom and can therefore be considered not significant.

For Sulphur dioxide and Particulate the PC is greater than 20% of the headroom. For those pollutants whose PC is greater than 20% of the headroom, the applicant has determined that exceedences of an EQS are not likely. We have checked these predictions in our detailed audit and agree with the applicant's conclusions.

We have not assessed the impact of abnormal operations against long term EQSs for the reasons set out above. Except that if dioxin emissions were at 10 ng/m^3 for the maximum period of abnormal operation, this would result in a 70% increase in the TDI reported in section 5.3.3. In these circumstances the TDI for an adult farmer (worst case scenario for adults) would be (0.57 * 1.7) =0.969pg (TEQ/ kg-BW/day), which will still not pose a risk to human health based on the World Health Organisation guidelines on acceptable TDI for an adult.

5.3.7 Other Emissions

The only other emissions to the environment directly from the process are

(i) the periodic release (approx 2 times annually) of boiler drain down water with up to $150m^3$ being discharged over a period of 8 – 12 hours each time.

(ii) Surface water run-off (excluding roof run-off) from the non-process areas of site, will be discharged via an interceptor in to Sanderson's Brook.

We are satisfied that both these discharges will not have a significant impact on the receiving environment.

6. Application of Best Available Techniques

6.1 Scope of consideration

In this section, we explain how we have determined which are the Best Available Techniques for this Installation.

- The first issue we address is the fundamental choice of incineration technology. There are a number of alternatives, and the Applicant has explained why it has chosen one particular kind for this Installation.

- We then consider control measures for the emissions which were not screened out as insignificant above. The only emission that did not screen out as having an insignificant process contribution to Air Quality Standards was the impact of sulphur dioxide emissions on short-term AQS.

- We also have to consider the combustion efficiency and energy utilisation of different design options for the Installation, which are relevant considerations in the determination of BAT for the Installation, including the Global Warming Potential of the different options.

- Finally, Persistent Organic pollutants (POPs) must be considered, as we explain below.

6.1.1 The choice of furnace

The prime function of the furnace is to achieve maximum combustion of the waste. The WID requires that the plant (furnace in this context) should be designed to deliver its requirements. The main requirements of the WID in relation to the choice of a furnace are compliance with air emission limits for CO and TOC and achieving a low TOC/LOI level in the bottom ash.

The Waste Incineration BREF elaborates the furnace selection criteria as:

- the use of a furnace (including secondary combustion chamber) dimensions that are large enough to provide for an effective combination of gas residence time and temperature such that combustion reactions may approach completion and result in low and stable CO and TOC emissions to air and low TOC in residues.
- use of a combination of furnace design, operation and waste throughput rate that provides sufficient agitation and residence time of the waste in the furnace at sufficiently high temperatures.
- use of furnace design that, as far as possible, physically retain the waste within the combustion chamber to allow its complete combustion.

The BREF also provides a comparison of combustion and thermal treatment technologies and factors affecting their applicability and operational suitability (Tables 4.7 to 4.9) used in EU and for all types of wastes. There is some information on the comparative costs.

The table below has been extracted from the BREF tables. This table is also in line with the Guidance Note "The Incineration of Waste (EPR 5.01)). However, it should not be taken as an exhaustive list nor that all technologies listed have found equal application across Europe.

Comparison of thermal treatment technologies

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Moving grate (air-cooled)	Low to medium heat values (LCV 5 – 16.5 GJ/t) Municipal and other heterogeneous solid wastes Can accept a proportion of sewage sludge and/or medical waste with municipal waste Applied at most modern MSW installations	1 to 50 t/h with most projects 5 to 30 t/h. Most industrial applications not below 2.5 or 3 t/h.	Widely proven at large scales Robust Low maintenance cost Long operational history Can take heterogeneous wastes without special preparation	generally not suited to powders, liquids or materials that melt through the grate	TOC 0.5 % to 3 %	High capacity reduces specific cost per tonne of waste
Moving grate (liquid Cooled)	Same as air-cooled grates except: LCV 10 – 20 GJ/t	Same as air-cooled grates	As air-cooled grates but: higher heat value waste treatable better Combustion control possible	As air-cooled grates but: risk of grate damaging leaks and higher complexity	TOC 0.5 % to 3 %	Slightly higher capital cost than air-cooled
Technique	**Key waste characteristics and suitability**	**Throughput per line**	**Advantages**	**Disadvantages / Limitations of use**	**Bottom Ash Quality**	**Cost**
Rotary Kiln	Can accept liquids and pastes solid feeds more limited than grate (owing to refractory	<10 t/h	Very well proven with broad range of wastes and good burn out even of HW	Throughputs lower than grates	TOC <3 %	Higher specific cost due to reduced capacity

	damage) often applied to hazardous Wastes					
Fluid bed - bubbling	Only finely divided consistent wastes. Limited use for raw MSW often applied to sludges	1 to 10 t/h	Good mixing Fly ashes of good leaching quality	Careful operation required to avoid clogging bed. Higher fly ash quantities.	TOC <3 %	FGT cost may be lower. Costs of waste preparation
Fluid bed - circulating	Only finely divided consistent wastes. Limited use for raw MSW, often applied to sludges / RDF	1 to 20 t/h most used above 10 t/h	Greater fuel flexibility than BFB Fly ashes of good leaching quality	Cyclone required to conserve bed material Higher fly ash quantities	TOC <3 %	FGT cost may be lower. Costs of preparation.
Oscillating furnace	MSW / heterogeneous wastes	1 – 10 t/h	Robust Low maintenance Long history Low NOX level Low LOI of bottom ash	-higher thermal loss than with grate furnace - LCV under 15 G/t	TOC 0.5 – 3 %	Similar to other technologies
Pulsed hearth	Only higher CV waste (LCV >20 GJ/t) mainly used for clinical wastes	<7 t/h	can deal with liquids and powders	bed agitation may be lower	Dependent on waste type	Higher specific cost due to reduced capacity
Stepped and static hearths	Only higher CV waste (LCV >20 GJ/t) Mainly used for clinical wastes	No information	Can deal with liquids and powders	Bed agitation may be lower	Dependent on waste type	Higher specific cost due to reduced capacity

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Spreader - stoker combustor	- RDF and other particle feeds poultry manure wood wastes	No information	- simple grate construction less sensitive to particle size than FB	only for well defined mono-streams	No information	No information

Gasific-ation - fixed bed	- mixed plastic wastes ~ other similar consistent streams ~ gasification less widely used/proven than incineration	1 to 20 t/h	-low leaching residue ~ good burnout if oxygen blown ~ syngas available -Reduced oxidation of recyclable metals	- limited waste feed - not full combustion - high skill level ~ tar in raw gas - less widely proven	-Low leaching bottom ash ~ good burnout with oxygen	High operation/ maintenance costs
Gasific-ation - entrained flow	- mixed plastic wastes - other similar consistent streams ~ not suited to untreated MSW ~ gasification less widely used/proven than incineration	To 10 t/h	- low leaching slag ~ reduced oxidation of recyclable metals	- limited waste feed ~ not full combustion ~ high skill level ~ less widely proven	low leaching slag	High operation/ maintenance costs pretreatment costs high
Gasific-ation - fluid bed	- mixed plastic wastes ~ shredded MSW ~ shredder residues ~ sludges ~ metal rich wastes ~ other similar consistent streams ~ less widely used/proven than incineration	5 – 20 t/h	- temperatures e.g. for Al recovery ~ separation of noncombustibles -can be combined with ash melting - reduced oxidation of recyclable metals	-limited waste size (<30cm) - tar in raw gas - higher UHV raw gas - less widely proven	If Combined with ash melting chamber ash is vitrified	Lower than other gasifiers

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Pyrolysis	~ pretreated MSW ~ high metal inert streams ~ shredder residues/plastics ~ pyrolysis is less widely	~ 5 t/h (short drum) 5 – 10 t/h (medium drum)	~ no oxidation of metals ~ no combustion energy for metals/inert in reactor acid neutralisation	- limited wastes ~ process control and engineering critical ~ high skill req. ~ not widely proven	- dependent on process temperature ~ residue produced requires further processing	High pretreatment, operation and capital costs

	used/proven than incineration		possible syngas available	need market for syngas	sometimes combustion	

Overall, any of the furnace technologies listed above would be considered as BAT provided the Applicant has justified it in terms of:

- nature/physical state of the waste and its variability
- proposed plant throughput which may affect the number of incineration lines
- preference and experience of chosen technology including plant availability
- nature and quantity/quality of residues produced.
- emissions to air – usually NOx as the furnace choice could have an effect on the amount of unabated NOx produced
- energy consumption – whole plant, waste preparation, effect on GWP
- Need, if any, for further processing of residues to comply with TOC
- Costs

The Applicant has proposed to use a furnace technology comprising an air cooled moving grate combustion unit with a separate secondary combustion chamber, which are identified in the tables above as being considered BAT in the BREF or TGN for municipal waste feed.

Within their BAT assessment the Applicant considered a range of potential technologies including gasification and pyrolysis. The Applicant also considered wither the incineration process should be a grate incinerator, fluidised bed or rotary kiln.

Boiler Design

In accordance with our Technical Guidance Note, S5.01, the Applicant has confirmed that the boiler design will include the following features to minimise the potential for reformation of dioxins within the de-novo synthesis range:

- ensuring that the steam/metal heat transfer surface temperature is a minimum where the exhaust gases are within the de-novo synthesis range;
- design of the boilers using CFD to ensure no pockets of stagnant or low velocity gas;
- boiler passes are progressively decreased in volume so that the gas velocity increases through the boiler; and
- Design of boiler surfaces to prevent boundary layers of slow moving gas.

We have considered the assessments made by the Applicant and agree that the furnace technology chosen represents BAT. We believe that, based on the information gathered by the BREF process, the chosen technology will achieve the requirements of the WID for the air emission of TOC/CO and the TOC on bottom ash.

6.2 BAT and emissions control

The prime function of flue gas treatment is to reduce the concentration of pollutants in the exhaust gas to a level at which they will cause no significant environmental harm. The techniques which are described as BAT individually are targeted to remove

specific pollutants, but the BREF notes that there is benefit from considering the FGT system as a whole unit. Individual units often interact, providing a primary abatement for some pollutants and an additional effect on others.

The BREF lists the general factors requiring consideration when selecting flue-gas treatment systems as:

- type of waste, its composition and variation
- type of combustion process, and its size
- flue-gas flow and temperature
- flue-gas content, size and rate of fluctuations in composition
- target emission limit values
- restrictions on discharge of aqueous effluents
- plume visibility requirements
- land and space availability
- availability and cost of outlets for residues accumulated/recovered
- compatibility with any existing process components (existing plants)
- availability and cost of water and other reagents
- energy supply possibilities (e.g. supply of heat from condensing scrubbers)
- reduction of emissions by primary methods
- release of noise.

Taking these factors into account the Technical Guidance Note and the BREF point to a range of technologies being BAT subject to circumstances of the Installation.

6.2.1 Particulate Matter

Particulate matter Technique	Advantages	Disadvantages	Optimisation	Defined as BAT in BREF or TGN for:
Fabric filters (BF)	Reliable abatement of particulate matter to below 5mg/m^3	Max temp 250°C	Multiple compartments Bag burst detectors	Most plants
Wet scrubbing	May reduce acid gases simultaneously.	Not BAT on its own. Liquid effluent produced	Require reheat to prevent visible plume and dew point problems.	Where scrubbing required for other pollutants
Ceramic filters	High temperature applications Smaller plant.	May "blind" more than fabric filters		Small plant. High temperature gas cleaning required.
Electrostatic precipitators	Low pressure gradient. Use with BF may reduce the energy consumption of the induced draft fan.	Not BAT on their own.		When used with other particulate abatement plant

6.2.2 Oxides of Nitrogen

Oxides of Nitrogen : Primary Measures				
Technique	Advantages	Disadvantages	Optimisation	Defined as BAT in BREF or TGN for:
Low NOx burners	Reduces NOx at source		Start-up, supplementary firing.	Where auxiliary burners required.
Starved air systems	Reduce CO simultaneously.			Pyrolysis, Gasification systems.
Optimise primary and secondary air injection				All plant.
Flue Gas Recycling (FGR)	Reduces the consumption of reagents used for secondary NOx control. May increase overall energy recovery	Some applications experience corrosion problems.		All plant unless impractical in design (needs to be demonstrated)

Oxides of Nitrogen : Secondary Measures (BAT is to apply Primary Measures first)				
Technique	Advantages	Disadvantages	Optimisation	Defined as BAT in BREF or TGN for:
Selective catalytic reduction (SCR)	NOx emissions < 70mg/ m^3 Reduces CO, VOC, dioxins	Expensive. Re-heat required – reduces plant efficiency		All plant
Selective non-catalytic reduction (SNCR)	NOx emissions typically 150 - 180mg/m^3	Relies on an optimum temperature around 900 °C, and sufficient retention time for reduction May lead to Ammonia slip	Port injection location	All plant unless lower NOx release required for local environmental protection.
Reagent Type: Ammonia	Likely to be BAT	More difficult to handle Narrower temperature window		All plant
Reagent Type: Urea	Likely to be BAT Lower nitrous oxide formation			All plant

6.2.3 Acid Gases, SO_x, HCl and HF

Acid gases and halogens : Primary Measures				
Technique	Advantages	Disadvantages	Optimisation	Defined as BAT in

				BREF or TGN for:
Low sulphur fuel, (< 0.2%S)	Reduces SOx at source		Start-up, supplementary firing.	Where auxiliary fuel required.
Management of problem waste streams	Disperses sources of acid gases (e.g. PVC) through feed.	Requires closer control of waste management		All plant with heterogeneous waste feed

Acid gases and halogens : Secondary Measures (BAT is to apply Primary Measures first)				
Technique	Advantages	Disadvantages	Optimisation	Defined as BAT in BREF or TGN for:
Wet	High reaction rates Low solid residues production Reagent delivery may be optimised by concentration and flow rate	Large effluent disposal and water consumption if not fully treated for re-cycle Effluent treatment plant required May result in wet plume Energy required for effluent treatment and plume reheat		Plants with high acid gas and metal components in exhaust gas - HWIs
Dry	Low water use Reagent consumption may be reduced by recycling in plant Lower energy use Higher reliability	Higher solid residue production Reagent consumption controlled only by input rate		All plant
Semi-dry	Medium reaction rates Reagent delivery may be varied by concentration and input rate	Higher solid waste residues Energy required for plume reheat		
Reagent Type: Sodium Hydroxide	Highest removal rates Low solid waste production	Corrosive material ETP sludge for disposal		HWIs

Acid gases and halogens : Secondary Measures (BAT is to apply Primary Measures first)				
Technique	Advantages	Disadvantages	Optimisation	Defined as BAT in BREF or TGN for:
Reagent Type: Lime	Very good removal rates Low leaching solid residue Temperature of reaction well suited to use with bag filters	Corrosive material May give greater residue volume if no in-plant recycle	Wide range of uses	MWIs, CWIs
Reagent Type: Sodium Bicarbonate	Good removal rates Easiest to handle Dry recycle systems proven	Efficient temperature range may be at upper end for use with bag filters Leachable solid residues Bicarbonate more expensive	Not proven at large plant	CWIs

5.2.4 Carbon dioxide

Carbon dioxide				
Technique	Advantages	Disadvantages	Optimisation	Defined as BAT in BREF or TGN for:
Maximise net energy recovery	All measures will reduce the impact of CO_2 emissions.			All plants
Use low Carbon support fuels			Natural Gas. Low Sulphur GasOil	Both are BAT.

6.2.5 Carbon monoxide

Carbon monoxide and volatile organic compounds (VOCs)				
Technique	Advantages	Disadvantages	Optimisation	Defined as BAT in BREF or TGN for:
Optimise combustion control	All measures will increase oxidation of these species.		Covered in section on furnace selection	All plants

6.2.6 Dioxins and furans (and Other POPs)

Dioxins and furans Technique	Advantages	Disadvantages	Optimisation	Defined as BAT in BREF or TGN for:
Optimise combustion control	All measures will increase oxidation of these species.		Covered in section on furnace selection	All plants
Avoid *de novo* synthesis			Covered in boiler design	All plant
Effective Particulate matter removal			Covered in section on particulate matter	All plant
Activated Carbon injection	Can be combined with acid gas absorber or fed separately.	Combined feed rate usually controlled by acid gas content.		All plant. Separate feed normally BAT unless feed is constant and acid gas control also controls dioxin release.

6.2.7 Metals

Metals Technique	Advantages	Disadvantages	Optimisation	Defined as BAT in BREF or TGN for:
Effective Particulate matter removal			Covered in section on particulate matter	All plant
Activated Carbon injection for mercury recovery	Can be combined with acid gas absorber or fed separately.	Combined feed rate usually controlled by acid gas content.		All plant. Separate feed normally BAT unless feed is constant and acid gas control also controls dioxin release.

The Applicant has proposed to use a FGT system comprising SNCR using 25% ammonium hydroxide as the reagent for NOx abatement, dosing with dry lime for acid gas abatement, activated carbon injection to facilitate the removal of metals and dioxins, and bag filters for the removal of particulate and adsorbed pollutant. All of which are identified in the tables above as being considered BAT in the BREF or TGN for this type of waste feed.

We have considered the individual elements of the FGT system and agree that they are BAT. We have considered the FGT system as a whole and agree that it is BAT for reducing the concentration of pollutants in the exhaust gas to a level at which they will

cause no significant environmental harm. We believe that, based on the information gathered by the BREF process, the chosen combination of technologies will achieve the requirements of the WID for the air emission of particulates, NOx, SO_2, HCl, metals and dioxins/furans.

As mentioned previously all pollutants with the exception of SO2 short-term impact may be considered insignificant. We consider that the FGT system may be considered BAT so far as the pollutants screened out as insignificant are concerned. SO_2 produced by the incineration process is dependant on the sulphur content of the waste incinerated, in order to minimise its impact on the environment the gas is removed by the use of lime. We accept that the use of lime within the FGT can be considered BAT for the removal of SO2. Improvement condition IC1 within the Permit will ensure that the lime dosage is optimised to be able to minimise the SO_2 emissions despite fluctuations in the SO_2 content of the untreated flue gas.

6.3 BAT and global warming potential

This section summarises the assessment of greenhouse gas impacts which has been made in the determination of this Permit. Emissions of carbon dioxide (CO_2) and other greenhouse gases differ from those of other pollutants in that, except at gross levels, they have no localised environmental impact. Their impact is at a global level and in terms of climate change. Nonetheless, CO_2 is clearly a pollutant for IPPCD purposes.

The emissions cannot be characterised as insignificant. The Installation is not subject to the Greenhouse Gas Emissions Trading Scheme Regulations 2003; therefore it is a requirement of IPPCD to investigate how emissions of CO_2 (and nitrous oxide N_2O, which is also a greenhouse gas emitted from the installation) might be prevented or minimised.

GWP has therefore been a factor in the Applicant's BAT assessment. There are a number of areas in which a difference can be made to the GWP of the Installation. These relate to the choice of abatement system for NO_x. Nitrous oxide N_2O is approximately 310 times more potent as a greenhouse gas than CO_2. The Applicant's Bat options appraisal compared SCR and SNCR methods of secondary NO_x abatement. The Incinerator Sector Guidance Note indicates that N_2O emissions have the potential to be higher for SNCR than SCR. However SCR is associated with higher energy requirements and therefore higher emissions of CO_2 than SNCR systems. In summary: the following factors influence the GWP of the facility:-

On the debit side

- CO_2 emissions from the burning of the waste;
- CO_2 emissions from burning auxiliary or supplementary fuels;
- CO_2 emissions associated with electrical energy drawn from the public supply:
- CO_2 from the de-NOx process.
- N_2O from the de-NOx process.

On the credit side

- CO_2 saved from the export of electricity to the public supply by displacement of burning of virgin fuels;

- CO_2 saved from the use of waste heat by displacement of burning of virgin fuels.

The assessment shows that the GWP of the plant is dominated by the emissions of carbon dioxide that are released as a result of waste combustion. This is constant for all options considered in the BAT assessment.

The differences in the GWP of the options in the BAT appraisal arise from small differences in energy recovery and in the amount of N_2O emitted. Whilst these will be much smaller than the emissions of CO_2 from the facility in terms of quantity, these could still be significant as N_2O is known to be approximately 310 times more potent as a greenhouse gas than carbon dioxide. Improvement condition IC1 is included to ensure the abatement systems including those for NO_x are optimised.

The Applicant has considered that the nitrous oxide release from both the use of SNCR and SCR will be below 5mg/m^3 and comparable. Therefore, they have not considered the GWP of nitrous oxide further. We have placed a requirement on the Permit to monitor the concentration of nitrous oxide released in Table S3.1 as quarterly spot monitoring for nitrous oxide so that the Operator are able to demonstrate that the nitrous oxide release remains within the levels assessed within the Permit determination process.

Taking all these factors into account, the Operator's assessment shows their preferred option is best in terms of GWP.

The Environment Agency agrees with this assessment and that the chosen option is BAT for the installation.

It should be noted that CO_2 is an inevitable product of the combustion of waste. The amount of CO_2 emitted will be essentially determined by the quantity and characteristics of waste being incinerated, which are already subject to conditions in the Permit. It is therefore inappropriate to set an emission limit value for CO_2, which could do more than recognise what is going to be emitted. The gas is not therefore targeted as a key pollutant under the IPPC Directive or under the Waste Incineration Directive, e.g. it is not included in Annex III to the IPPCD, which lists the main polluting substances that are to be considered when setting emission limit values (ELVs) in Permits.

We have therefore considered setting equivalent parameters or technical measures for CO_2. However, provided energy is recovered efficiently (see section 4.3.7 above), there are no additional equivalent technical measures (beyond those relating to the quantity and characteristics of the waste) that can be imposed that do not run counter to the primary purpose of the plant, which is the destruction of waste. Controls in the form of restrictions on the volume and type of waste that can be accepted at the Installation and permit conditions relating to energy efficiency effectively apply equivalent technical measures to limit CO_2 emissions.

6.4 BAT and POPs

International action on Persistent Organic pollutants (POPs) is required under the UN's Stockholm Convention, which entered into force in 2004. The EU implemented the Convention through the POPs Regulation (850/2004), which is directly applicable in UK law. The Environment Agency is required by national POPs Regulations (SI 2007 No 3106) to give effect to Article 6(3) of the EC POPs Regulation when determining applications for environmental Permits.

However, it needs to be borne in mind that this application is for a particular type of installation, namely a waste incinerator. The Stockholm Convention distinguishes between intentionally-produced and unintentionally-produced POPs. Intentionally-produced POPs are those used deliberately (mainly in the past) in agriculture (primarily as pesticides) and industry. Those intentionally-produced POPs are not relevant where waste incineration is concerned. This is logical, not least because high-temperature incineration is one of the prescribed methods for destroying POPs.

The unintentionally-produced POPs addressed by the Convention are:

- dioxins and furans;
- HCB (hexachlorobenzene)
- PCBs (polychlorobiphenyls); and
- PeCB (pentachlorobenzene)

The UK's national implementation plan for the Stockholm Convention, published in 2007, makes explicit that the relevant controls for unintentionally-produced POPs, such as might be produced by waste incineration, are delivered through a combination of IPPC and WID requirements. That would, as required by the IPPC Directive, include an examination of BAT, including potential alternative techniques, with a view to preventing or minimising harmful emissions. These have been applied as explained in this document, which explicitly addresses alternative techniques and BAT for the minimisation of emissions of dioxins.

Our legal obligation, under regulation 4(b) of the POPs Regulations, is, when considering an application for an environmental permit, to comply with article 6(3) of the POPs Regulation:

> "Member States shall, when considering proposals to construct new facilities or significantly to modify existing facilities using processes that release chemicals listed in Annex III, without prejudice to Council Directive 1996/61/EC, give priority consideration to alternative processes, techniques or practices that have similar usefulness but which avoid the formation and release of substances listed in Annex III."

The 1998 Protocol to the Convention recommended that unintentionally produced should be controlled by imposing emission limits (e.g 0.1 ng/m^3 for MWIs) and using BAT for incineration. UN Economic Commission for Europe (Executive Body for the Convention) (ECE-EB) produced BAT guidance for the parties to the Convention in 2009. This document considers various control techniques and concludes that primary measures involving management of feed material by reducing halogenated substances are not technically effective. This is not surprising because halogenated

wastes still need to be disposed of and because POPs can be generated from relatively low concentrations of halogens. In summary, the successful control techniques for waste incinerators listed in the ECE-EB BAT are:

- maintaining furnace temperature of 850^{o}C and a combustion gas residence time of at least 2 seconds
- rapid cooling of flue gases to avoid the *de novo* reformation temperature range of 250-450^{o}C
- use of bag filters and the injection of activated carbon or coke to adsorb residual POPs components.

Using the methods listed above, the UN-ECE BAT document concludes that incinerators can achieve an emission concentration of 0.1 ng TEQ/m^3.

We believe that the Permit ensures that the formation and release of POPs will be prevented or minimised. As we explain above, high-temperature incineration is one of the prescribed methods for destroying POPs. Permit conditions are based on the use of BAT and WID and incorporate all the above requirements of the UN-ECE BAT guidance and deliver the requirements of the Stockholm Convention in relation to unintentionally produced POPs.

The release of **dioxins and furans** to air is required by the WID to be assessed against the I-TEQ (International Toxic Equivalence) limit of 0.1 ng/m^3. Further development of the understanding of the harm caused by dioxins has resulted in the World Health Organisation (WHO) producing updated factors to calculate the WHO-TEQ value. Certain **PCBs** have structures which make them behave like dioxins (dioxin-like PCBs), and these also have toxic equivalence factors defined by WHO to make them capable of being considered together with dioxins. The UK's independent health advisory committee, the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT) has adopted WHO-TEQ values for both dioxins and dioxin-like PCBs in their review of Tolerable Daily Intake (TDI) criteria. The Government is of the opinion that, in addition to the requirements of the WID, the WHO-TEQ values for both dioxins and dioxin-like PCBs should be specified for monitoring and reporting purposes, to enable evaluation of exposure to dioxins and dioxin-like PCBs to be made using the revised TDI recommended by COT. The release of dioxin-like PCBs and PAHs is expected to be low where measures have been taken to control dioxin releases. EPR requires monitoring of a range of PAHs and dioxin-like PCBs in waste incineration Permits at the same frequency as dioxins are monitored. We have included a requirement to monitor and report against these WHO-TEQ values for dioxins and dioxin-like PCBs and the range of PAHs identified by Defra in the Environmental Permitting Guidance on the WID. We are confident that the measures taken to control the release of dioxins will also control the releases of dioxin-like PCBs and PAHs. Section 5 of this document details the assessment of emissions to air, which includes dioxins and concludes that there will be no adverse effect on human health from either normal or abnormal operation.

Hexachlorobenzene (HCB)) is released into the atmosphere as an accidental product from the combustion of coal, waste incineration and certain metal processes. It has also been used as a fungicide, especially for seed treatment although this use

has been banned in the UK since 1975. Natural fires and volcanoes may serve as natural sources. Releases of HCB are addressed by the European Environment Agency (EEA), which advises that:

> "*due to comparatively low levels in emissions from most (combustion) processes special measures for HCB control are usually not proposed. HCB emissions can be controlled generally like other chlorinated organic compounds in emissions, for instance dioxins/furans and PCBs: regulation of time of combustion, combustion temperature, temperature in cleaning devices, sorbents application for waste gases cleaning etc*."reference: http://www.eea.europa.eu/publications/EMEPCORINAIR4/sources_of_HCB.pdf

Pentachlorobenzene (PeCB) is another of the POPs list to be considered under incineration. PeCB has been used as a fungicide or flame retardant, there is no data available however on production, recent or past, outside the UN-ECE region. PeCBs can be emitted from the same sources as for PCDD/F: waste incineration, thermal metallurgic processes and combustion plants providing energy. As discussed above, the control techniques described in the UN-ECE BAT guidance and included in the permit, are effective in controlling the emissions of all relevant POPs including PeCB.

We have assessed the control techniques proposed for dioxins by the Applicant and have concluded that they are appropriate for dioxin control. We are confident that these controls are in line with the UN-ECE BAT guidance and will minimise the release of HCB, PCB and PeCB.

We are therefore satisfied that the substantive requirements of the Convention and the POPs Regulation have been addressed and complied with.

6.5 Setting ELVs and other Permit conditions

6.5.1 Translating BAT into Permit conditions

As we have explained above, establishing the BAT for the Installation is not the end of the exercise, as local factors and national and European EQSs must also be considered, to see whether different requirements are indicated. This section explains how we have determined the conditions included in the Permit.

6.5.1.1 Local factors

We have considered the following information – local air quality, local Habitats, local watercourses and sensitive receptors to potential noise and odour in our consideration of what can be considered BAT for the site. We are satisfied that the potential impacts of the site on the locality will be minimised as far as possible as a result of the conditions set within the Permit.

*6.*5.1.2 National and European EQSs

We have assessed Air Quality impact in the area compared to European Air Quality Standards as well as recent Air Quality guidelines from the Governments Expert Panel on Air Quality Standards (EPAQS) on nickel, arsenic and chromium. We are

satisfied that the conditions on the Permit are sufficient to ensure that these standards and guidelines are not compromised within the locality of the site.

6.5.1.3 Commissioning

The permit requires through pre-operational condition PO1 and improvement condition IC1 that during the plant commissioning period the Operator gathers sufficient process data to demonstrate that the plant is able to comply with the requirements of their Environmental Permit , BAT and the WID.

We are satisfied that the use of BAT at the waste incineration site will be sufficiently protective of air quality, human health, noise and odour levels in the area local to the site.

6.5.2 Emissions to air

Combustion gases from the waste incineration process will be emitted to air via a 80m stack containing 2 separate, but identical, flues (one for each incineration line). We are satisfied that the emission limits set on the Permit in line with the WID are sufficient to ensure that Air Quality Standards in the local area are not compromised as a result of the operation of this plant.

6.5.3 Emissions to water

All uncontaminated surface water from the installation will be passed through an interceptor prior to discharge to Sanderson's Brook at release point W1. We are satisfied that this water will not compromise the water quality within Sanderson's Brook and have set a requirement for daily visual checks for oil and weekly tests for oil and suspended solids on the surface water stream before discharge to ensure that the interceptor continues to work effectively (see Tale S3.2 of the permit).

6.5.4 Emissions to sewer

The facility will use approximately 75,000m^3 of mains water per year. No additional surface or ground water abstraction is required.

The facility is designed with a waste water pit to store used process water from a variety of sources such as boiler drains, ash discharge overflow and rainwater runoff from potentially contaminated areas. This water is then reused within the process for bottom ash quenching. Under unusual conditions, for example, during boiler cleaning there may be a need for overflow of this water and it will be discharged to public sewer under a trade effluent consent or pumped out for final disposal by tanker. Any discharge would be controlled by the trade effluent consent. Releases are infrequent and capable of being treated by the sewage treatment works which in turn has limits set to protect the environment.

6.5.5 Fugitive emissions

Based upon the information in the application we are satisfied that appropriate measures will be in place to prevent and / or minimise fugitive emissions.

The WID specifies that plants must be able to demonstrate that the plant is designed in such a way as to prevent the unauthorised and accidental release of polluting substances into soil, surface water and groundwater. In addition storage requirements for contaminated water of Article 8(7) must be arranged. These matters are reviewed in Annex 1 of this document and the Agency concludes that Article 8(7) is satisfied.

6.5.6 Odour

Based upon the information in the application we are satisfied that the appropriate measures will be place to prevent or where that is not practicable to minimise odour and prevent pollution from odour.

Waste accepted at the installation will be delivered in covered vehicles or within containers and bulk storage of waste will only occur in the installation's waste bunker. A roller shutter door will be used to close the entrance to the tipping hall outside of the waste delivery periods and combustion air will be drawn from above the waste storage bunker in order to prevent odours and airborne particulates from leaving the facility building.

6.5.7 Noise and vibration

Based upon the information in the application we are satisfied that the appropriate measures are in place to prevent or where that is not practical minimise noise and vibration and to prevent pollution from noise and vibration.

The application contained a noise impact assessment which identified local noise-sensitive receptors, potential sources of noise at the proposed plant and noise attenuation measures. Measurements were taken of the prevailing ambient noise levels to produce a baseline noise survey and an assessment was carried out in accordance with BS4142 to compare the predicted plant rating noise levels with the established background levels. The assessment concluded that during daytime and night time periods the operation of the plant at the predicted noise levels would be unlikely to cause complaints at any of the assessment locations as the change in noise impact at the sensitive receptors was assessed as being below marginal significance in line with BS4142. The Operator has not included a 5dBA correction factor for tonal noises within their noise modelling assessment. The Operator justified this approach as part of their response to the Schedule 5 notice that was issued on 17 January 2011. We agree with this approach and the justification as tonal content is unlikely from this source at the nearest residential receptor is at a distance of over 500m away across a railway line.

To confirm the above conclusion that noise levels will be controlled and kept at acceptable levels, pre-operational condition PO4 has been set in the permit requiring the operator to propose a programme of monitoring at the installation and in the surrounding environment to establish noise levels during plant commissioning and operation. Improvement Programme IC1 ensures that the Operator puts the agreed plan in response to pre-operational condition PO4 into practice.

6.6 Monitoring

6.6.1 Monitoring during normal operations

We have decided that monitoring should be carried out for the parameters listed in tables S3.1 to S3.4 in Schedule 3 using the methods and to the frequencies specified in those tables. These monitoring requirements have been imposed in order to demonstrate compliance with emission limit values.

For emissions to air, the methods for continuous and periodic monitoring are in accordance with the Agency's Guidance M2 for monitoring of stack emissions to air.

Monitoring of N_2O and ammonia have been set as a requirement of the permit to demonstrate the optimum environmental performance of the NO_x abatement process.

Based on the information in the Application and the requirements set in the conditions of the permit we are satisfied that the Operator's techniques, personnel and equipment will have either MCERTS certification or MCERTS accreditation as appropriate.

6.6.2 Monitoring under abnormal operations arising from the failure of the installed CEMs

The Operator will provide back-up CEMS working in parallel to the operating CEMS. There will be one set of back-up CEMS shared between emission points A1 and A2. These can be switched into full operation immediately for either flue as required in the event that there is any failure in the regular monitoring equipment. The back-up CEMS measure the same parameters as the operating CEMS. In the unlikely event that the back-up CEMS also fails, or both sets of operational CEMS fail at the same time Condition 2.3.10 of the permit requires that the burning of waste shall cease for one or both flues as necessary.

6.6.3 Other Monitoring Requirements

Other monitoring requirements have been set by the Agency in Condition 3.5.1 and Schedule 3 of the permit. These monitoring requirements have been imposed in order to enable correction of measured concentration of substances to the appropriate reference conditions; to gather information about the performance of the SNCR system; to deliver the EPR requirement that dioxin-like PCBs and PAHs should be monitored and to deliver the requirements of WID for monitoring of residues and temperature in the combustion chamber.

In addition improvement condition IC2 requires an exercise be carried out to determine the size distribution of the particles emitted from the stacks to identify the fractions in the PM_{10}, $PM_{2.5}$ and $PM_{1.0}$ ranges. This reflects the latest scientific research which indicates that very fine particles have the most potential to adversely affect health. This is a standard improvement condition being imposed on all incinerators in order to gather information on the contribution of waste incineration generally to emissions of very fine particles.

6.6.4 Continuous emissions monitoring for dioxins and mercury

The WID specifies manual extractive sampling for mercury and dioxin monitoring. However, Article 11(13) of the WID requires that "The Commission, acting in accordance with the procedure laid down in Article 17, shall decide, as soon as appropriate measurement techniques are available within the Community, the date from which continuous measurements of the air emission limit values for heavy metals, dioxins and furans shall be carried out in accordance with Annex III". No such decision has yet been made by the Commission.

The Environment Agency has reviewed the applicability of continuous sampling and monitoring techniques to the installation.

Recent advances in mercury monitoring techniques have allowed standards to be developed for continuous mercury monitoring, including both vapour-phase and particulate mercury. There is a standard which can apply to CEMs which measure mercury (EN 15267-3) and standards to certify CEMs for mercury, which are EN 15267-1 and EN 15267-3. Furthermore, there is an MCERTS-certified CEM which has been used in trials in the UK and which has been verified on-site using many parallel reference tests as specified using the steps outlined in EN 14181.

In the case of dioxins, equipment is available for taking a sample for an extended period (several weeks), but the sample must then be analysed in the conventional way. However, the continuous sampling systems do not meet the requirements of BS EN 1948 which is the standard for dioxin analysis. BS EN 1948 requires traversing the sampler across the duct and collecting parts of the sample at various points across the duct to ensure that all of the gas phase is sampled proportionately, in case there are variations in gas flow rate or composition resulting in a non-homogeneous gas flow. This requirement is particularly important where suspended solids are present in the gas, and dioxins are often associated with suspended solid particles. Continuous samplers are currently designed for operation at one or two fixed sampling points within the duct, and traverses are not carried out automatically. Using such samplers, more information could be obtained about the variation with time of the dioxin measurement, but the measured results could be systematically higher or lower than those obtained by the approved standard method which is the reference technique required to demonstrate compliance with the limit specified in the WID. The lack of a primary reference method (e.g. involving a reference gas of known concentration of dioxin) prohibits any one approach being considered more accurate than another. Because compliance with the WID's requirements is an essential element of EPR regulation, we have set emission limits for dioxins in the permit based on the use of BS EN 1948 and the manual sampling method remains the only acceptable way to monitor dioxins for the purpose of regulation.

For either continuous monitoring of mercury or continuous sampling of dioxins to be used for regulatory purposes, an emission limit value would need to be devised which is applicable to continuous monitoring. Such limits for mercury and dioxins have not been set by the European Commission. Use of a manual sample train is the only technique which fulfils the requirements of the WID. At the present time, it is considered that in view of the predicted low levels of mercury and dioxin emission it is

not justifiable to require the Operator to install additionally continuous monitoring or sampling devices for these substances.

In accordance with it's legal requirement to do so the Environment Agency is always reviewing the development of new methods and standards and their performance in industrial applications. In particular the Environment Agency considers continuous sampling systems for dioxins to have promise as a potential means of improving process control and obtaining more accurate mass emission estimates

We have specified the reporting requirements in Schedule 4 of the Permit either to meet the reporting requirements set out in the WID, or to ensure data is reported to enable timely review by the Agency to ensure compliance with permit conditions and to monitor the efficiency of material use and energy recovery at the installation.

7 Other legal requirements

In this section we explain how we have addressed other relevant legal requirements, to the extent that we have not addressed them elsewhere in this document.

7.1 The EPR 2010 and related Directives

The EPR delivers the requirements of a number of European and national laws.

7.1.1 Schedules 1 and 7 to the EPR 2010 – **IPPC Directive**

We address the requirements of the IPPCD in the body of this document above.

There is one requirement not addressed above, which is that contained in Article 9(2) IPPCD. Article 9(2) of the IPPC Directive requires that "In the case of a new installation or a substantial change where Article 4 of Directive 85/337/EC applies, any relevant information obtained or conclusion arrived at pursuant to articles 5, 6 and 7 of that Directive shall be taken into account for the purposes of granting an environmental permit.

- Article 5 of EIA Directive relates to the obligation on developers to supply the information set out in Annex IV of the Directive when making an application for development consent.
- Article 6(1) requires Member States to ensure that the authorities likely to be concerned by a development by reason of their specific environmental responsibilities are consulted on the Environmental Statement and the request for development consent.
- Article 6(2)-6(6) makes provision for public consultation on applications for development consent.
- Article 7 relates to projects with trans-boundary effects and consequential obligations to consult with affected Member States.

The grant or refusal of development consent is a matter for the relevant local planning authority. The Environment Agency's obligation is therefore to take into consideration any relevant information obtained or conclusion arrived at by the local planning authorities pursuant to those EIA Directive articles.

The Environment Agency's obligation is therefore to take into consideration any relevant information obtained or conclusion arrived at by the local planning authorities pursuant to those EIA Directive articles.

In determining the Application we have considered the following documents: -

- The Environmental Statement submitted with the planning application (which also formed part of the Environmental Permit Application). We also considered the additional information supplied by the Applicant to the planning inquiry (consolidated environmental statements of October 2010 and July 2011) during the post consultation period.
- The decision of the Cheshire East planning authority to refuse planning permission on 29 April 2010.
- The response of the Environment Agency to the local planning authority in its role as consultee to the planning process.

We have reviewed in particular the reasons given for the refusal of planning permission and specifically whether this conclusion is based on information given in the Environmental Statement.

From our consideration of all the documents above, the Agency considers that no additional or different conditions are necessary.

The Environment Agency has also carried out its own consultation on the Environmental Permitting Application which includes the Environmental Statement submitted to the local planning authority. The results of our consultation are described in Annex 4 of this decision document.

7.1.2 Schedule 9 to the EPR 2010 – **Waste Framework Directive**

As the Installation involves the treatment of waste, it is carrying out a *waste operation* for the purposes of the EPR 2010, and the requirements of Schedule 9 therefore apply. This means that we must exercise our functions so as to ensure implementation of certain articles of the WFD.

We must exercise our relevant functions for the purposes of ensuring that the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste and that any waste generated is treated in accordance with Article 4 of the Waste Framework Directive. (See also section 4.4)

The conditions of the permit ensure that waste generation from the facility is minimised. Where the production of waste cannot be prevented it will be recovered wherever possible or otherwise disposed of in a manner that minimises its impact on the environment. This is in accordance with Article 4.

We must also exercise our relevant functions for the purposes of implementing Article 13 of the Waste Framework Directive; ensuring that the requirements in the second paragraph of Article 23(1) of the Waste Framework Directive are met; and ensuring

compliance with Articles 18(2)(b), 18(2)(c), 23(3), 23(4) and 35(1) of the Waste Framework Directive.

Article 13 relates to the protection of human health and the environment. These objectives are addressed elsewhere in this document.

Article 23(1) requires the permit to specify:

(a) the types and quantities of waste that may be treated;
(b) for each type of operation permitted, the technical and any other requirements relevant to the site concerned;
(c) the safety and precautionary measures to be taken;
(d) the method to be used for each type of operation;
(e) such monitoring and control operations as may be necessary;
(f) such closure and after-care provisions as may be necessary.

These are all covered by permit conditions.

The permit does not allow the mixing of hazardous waste so Article 18(2) is not relevant.

We consider that the intended method of waste treatment is acceptable from the point of view of environmental protection so Article 23(3) does not apply.
Energy efficiency is dealt with elsewhere in this document but we consider the conditions of the permit ensure that the recovery of energy take place with a high level of energy efficiency in accordance with Article 23(4).

Article 35(1) relates to record keeping and its requirements are delivered through permit conditions.

7.1.3 Schedule 13 to the EPR 2010 – **Waste Incineration Directive**

We address the WID in detail in Annex 1 to this document.

7.1.4 Schedule 22 to the EPR 2010 – **Groundwater, Water Framework and Groundwater Daughter Directives**

To the extent that it authorises the discharge of pollutants to groundwater (a "groundwater activity" under the EPR 2010), the Permit is subject to the requirements of Schedule 22, which delivers the requirements of EU Directives relating to pollution of groundwater. The Permit will require the taking of all necessary measures to prevent the input of any hazardous substances to groundwater, and to limit the input of non-hazardous pollutants into groundwater so as to ensure such pollutants do not cause pollution, and satisfies the requirements of Schedule 22.

No releases to groundwater from installation are permitted. The Permit also requires material storage areas to be designed and maintained to a high standard to prevent accidental releases.

7.1.5 Directive 2003/35/EC – **The Public Participation Directive**

Regulation 59 of the Environmental Permitting Regulations 2007 requires the Agency to prepare and publish a statement of its policies for complying with its public participation duties.

The Agency has published such a document and this Application is being consulted upon in line with our public participation statement, as well as with the Agency's Regulatory Guidance Note RGS6 on Sites of High Public Interest, which addresses specifically extended consultation arrangements for determinations where public interest is particularly high. This satisfies the requirements of the Public Participation Directive.

Our decision in this case has been reached following a programme of extended public consultation, on the original application. The way in which this has been done is set out in Section 2**.**. A summary of the responses received to our consultations and our consideration of them is set out in Annex 4B.

7.2 National primary legislation

7.2.1 **Environment Act 1995**

7.2.1.1 Section 4 (Pursuit of Sustainable Development)

We are required to contribute towards achieving sustainable development, as considered appropriate by Ministers and set out in guidance issued to us. The Secretary of State for Environment, Food and Rural Affairs has issued *The Environment Agency's Objectives and Contribution to Sustainable Development: Statutory Guidance (December 2002)*. This document:

> "*provides guidance to the Agency on such matters as the formulation of approaches that the Agency should take to its work, decisions about priorities for the Agency and the allocation of resources. It is not directly applicable to individual regulatory decisions of the Agency*".

In respect of regulation of industrial pollution through the EPR, the Guidance refers in particular to the objective of setting permit conditions "*in a consistent and proportionate fashion based on Best Available Techniques and taking into account all relevant matters…*". The Agency considers that it has pursued the objectives set out in the Government's guidance, where relevant, and that there are no additional conditions that should be included in this Permit to take account of the Section 4 duty.

7.2.1.2 Section 7 (Pursuit of Conservation Objectives)

We considered whether we should impose any additional or different requirements in terms of our duty to have regard to the various conservation objectives set out in Section 7, but concluded that we should not.

We have considered the impact of the installation on local wildlife sites within 2km which are not designated as either European Sites or SSSIs. We are satisfied that no additional conditions are required.

7.2.1.3 Section 81 (National Air Quality Strategy)

We have had regard to the National Air Quality Strategy and consider that our decision complies with the Strategy, and that no additional or different conditions are appropriate for this Permit.

7.2.2 **Human Rights Act 1998**

We have considered potential interference with rights addressed by the European Convention on Human Rights in reaching our decision and consider that our decision is compatible with our duties under the Human Rights Act 1998. In particular, we have considered the right to life (Article 2), the right to a fair trial (Article 6), the right to respect for private and family life (Article 8) and the right to protection of property (Article 1, First Protocol). We do not believe that Convention rights are engaged in relation to this determination.

7.2.3 **Countryside and Rights of Way Act 2000 (CROW 2000)**

Section 85 of this Act imposes a duty on Agency to have regard to the purpose of conserving and enhancing the natural beauty of the area of outstanding natural beauty (AONB). There is no AONB which could be affected by the Installation.

7.2.4 **Wildlife and Countryside Act 1981**

Under section 28G of the Wildlife and Countryside Act 1981 the Agency has a duty to take reasonable steps to further the conservation and enhancement of the flora, fauna or geological or physiographical features by reason of which a site is of special scientific interest. Under section 28I the Agency has a duty to consult Natural England/Countryside Council for Wales in relation to any permit that is likely to damage SSSIs.

We assessed the Application and concluded that the Installation will not damage the special features of any SSSI. This was recorded on a CROW Appendix 4 form which was sent to Natural England for information on 06 December 2010.

The CROW assessment is summarised in greater detail in section 5.3.5 of this document. A copy of the full Appendix 4 Assessment can be found on the public register.

7.2.5 **Natural Environment and Rural Communities Act 2006**

Section 40 of this Act requires us to have regard, so far as is consistent with the proper exercise of our functions, to the purpose of conserving biodiversity. We have done so and consider that no different or additional conditions in the Permit are required.

7.3 National secondary legislation

7.3.1 The Conservation of Natural Habitats and Species Regulations 2010

We have assessed the Application in accordance with guidance agreed jointly with Natural England and concluded that there will be no likely significant effect on any European Site. There are no SAC or SPA within the relevant distance of the site. We have assessed potential impact on the Midland Meres Ramsar site which is 8km away from the site at its nearest point. A copy of our assessment was shared with Natural England. We have also considered the protected species that are known to spend at least part of their life cycle in the vicinity of the site.

The habitat assessment is summarised in greater detail in section 5.3.5 of this document. A copy of the full Appendix 11 Assessment can be found on the public register.

7.3.2 Water Framework Directive Regulations 2003

Consideration has been given to whether any additional requirements should be imposed in terms of the Agency's duty under regulation 3 to secure the requirements of the Water Framework Directive through (inter alia) EP permits, but it is felt that existing conditions are sufficient in this regard and no other appropriate requirements have been identified.

7.3.3 The Persistent Organic Pollutants Regulations 2007

We have explained our approach to these Regulations, which give effect to the Stockholm Convention on POPs and the EU's POPs Regulation, above.

7.4 Other relevant legal requirements

7.4.1 Duty to Involve

S23 of the Local Democracy, Economic Development and Construction Act 2009 require us where we consider it appropriate to take such steps as we consider appropriate to secure the involvement of interested persons in the exercise of our functions by providing hem with information, consulting them or involving them in any other way. S24 requires us to have regard to any Secretary of State guidance as to how we should do that.

The way in which the Environment Agency has consulted with the public and other interested parties is set out in section 2 of this document. The way in which we have taken account of the representations we have received is set out in Annex 4. Our public consultation duties are also set out in the EP Regulations, and our statutory Public Participation Statement, which implement the requirements of the Public Participation Directive. In addition to meeting our consultation responsibilities, we have also taken account of our guidance in Environment Agency Guidance Note RGS6 and the Environment Agency's Building Trust with Communities toolkit.

ANNEX 1 : APPLICATION OF THE WASTE INCINERATION DIRECTIVE

WID Article	Requirement	Delivered by
4(3)	measurement techniques for emissions into the air comply with Annex III	See below on compliance with Article 11
4(4)	compliance with any applicable requirement of directives on:Urban Waste Water Treatment, the IPPC, Air Quality Framework, Dangerous Substances, Landfill.	Landfill Directive is not relevant to this installation. Relevant requirements of all other direcives are delivered via EPR.
4(4)(a)	list explicitly the categories of waste that may be treated; using the European Waste Catalogue ("EWC") including information on the quantity of waste where appropriate.	Condition 2.3.3 and Table S2.2 in Schedule 2 of the Permit
4(4)(b)	Permit shall include the total waste incinerating capacity of the plant	Condition 2.3.3 and Table S2.2 in Schedule 2
4(4)(c)	specify the sampling and measurement procedures used to satisfy the obligations imposed for periodic measurements of each air and water pollutant.	Conditions 3.5.1 and Tables S3.1, S3.1(a), S3.2, S3.3 and S3.4. also compliance with Articles 10 and 11
5(1)	Take all necessary precautions concerning delivery and reception of wastes, to prevent or minimise pollution.	- EPR require prevent or minimise pollution. -Volume 2 of the Application defines how this will be carried out. - conditions 2.3.1, 2.3.3, 3.2, 3.3 and 3.4
5(2)	determine the mass of each category of wastes, if possible according to the EWC, prior to accepting the waste.	Volume 2 of the application describes procedures for the reception and monitoring of incoming waste

WID Article	Requirement	Delivered by
6(1)	(a). Slag and bottom ash to have Total Organic Carbon (TOC) is < 3% or loss on ignition (LOI) is < 5%. (b) flue gas to be raised to a temperature of 850ºC for two seconds, as measured at representative point of the combustion chamber. (c) At least one auxiliary burner which must not be fed with fuels which can cause higher emissions than those resulting from the burning of gas oil liquefied gas or natural gas	(a) Conditions 3.5.1 and Table S3.4 (b) - Pre-operational condition PO1. The application specifies measurement point (c) Condition 2.3.7
6(2)	Relates to co-incineration plants	Not relevant
6(3)	automatic waste feed prevention: (a) at start up until the specified temperature has been reached or if this temperature is not maintained (b) when the CEMs show that ELVs are exceeded due to disturbances or failure of abatement.	Condition 2.3.6
6(4)	Different conditions than those in 6(1) may be authorised	No such conditions have been allowed
6(5)	emissions to air do not give rise to significant ground level pollution, in particular, through exhaust of gases through a stack	Emissions and their ground-level impacts are discussed in the body of this document,
6(6)	any heat generated from the process shall be recovered as far as practicable.	(a) The plant will generate electricity (b)Operator to review the available heat recovery options prior to commissioning (Condition PO5) and then every 2 years (Condition 1.2. 3)
6(7)	Relates to the feeding of infectious clinical waste into the furnace	No infectious clinical waste will be burnt
6(8)	management of the Installation to be in the hands of a natural person who is competent to manage it	Conditions 1.1.1 to 1.1.3 and 2.3.1 of the Permit fulfil this requirement
7(1)	incineration plants to comply with the ELVs in Annex V.	Conditions 3.1.1 and 3.1.2 and Tables S3.1 and S3.1a

WID Article	Requirement	Delivered by
7(2)	Relates to co-incineration	Not relevant
7(3)	measured ELVs to be standardised in accordance with Article 11.	Schedule 6 details this standardisation requirement
7(4)	Relates to co-incineration	Not relevant
8(1) – 8(6)	All relate to conditions for water discharges from the cleaning of exhaust gases	There are no such discharges as condition 3.1.1 prohibits this.
8(7)	(a) prevention of unauthorised and accidental release of any polluting substances into soil, surface water or groundwater. (b) storage capacity for contaminated rainwater run-off from the site or for contaminated water from spillage or fire-fighting	The application explains the measures to be in place for achieving the directive requirements
9	(a) residues to be minimised in their amount and harmfulness, and recycled where appropriate (b) prevent dispersal of dry residues and dust during transport and storage (c) test residues for their physical and chemical characteristics and polluting potential including heavy metal content (soluble fraction)	(a)condition 3.5. (b) conditions 2.3.1 and 3.2.1 (c) . Condition 3.5.1
10(1) and 10(2)	measurement equipment shall be installed and techniques used to monitor the incineration process, and that the measurement requirements shall be laid down in Permits	condition 3.5.1, and tables s3.1 and s3.1(a), emissions to air, and table s3.3, process monitoring requirements
10(3)	Installation and functioning of CEMs for emissions to air and water to be subjected to regular control, testing and calibration	condition 3.5.3, and tables s3.1, s3.1(a), and s4.4
10(4)	Sampling points to be specified in Permits	tables s3.1 and s3.1(a), and s3.3
10(5)	periodic measurements to air and water to comply with Annex III, points 1 and 2	tables s3.1 and s3.1(a), and s3.3 specify the standards to be used. Condition PO2 requires a report from the operator

WID Article	Requirement	Delivered by
11(2)	Continuous measurement of NO_x, CO, total dust, TOC, HCl, and SO_2 and periodic measurement of HF, heavy metals, dioxins and furans plus the measurement of combustion chamber temperature and concentration of O_2, pressure, temperature and water content of the exhaust gases	condition 3.5.1 and tables s3.1, s3.1(a) and s3.3.
11(3)	verify the residence time and minimum temperature as well as oxygen content of exhaust gases	Improvement condition IC 6 in table s1.3.
11(4)	Periodic rather than Continuous measurement of HF if HCl is abated and limit values not exceeded	Condition 3.1.2 and table s3.1
11(6)	Conditional option of periodic measurement for HCl, HF and SO_2 instead of CEMs	Option not applied except for HF as per Article 11(4) above
11(7)	reduction in the monitoring frequency for heavy metals, dioxins and furans under certain conditions, provided the criteria in article 17 of WID are available	Not applied as no such criteria available
11(8)	sets out reference conditions for standardisation of measurements	Schedule 6 sets the same reference conditions
11(9)	recording and reporting requirements	Section 4 and Schedules 4 and 5
11(10)	Sets out criteria for compliance with ELVs in Annex V	conditions 3.1.2 and tables s3.1, s3.1(a) and s3.3
11(11)	Specifies when ELVs apply, how averages are calculated (including the use of Annex III) and how many values can be discarded	table S3.1, condition 3.5.5
11(12)	Average values for HCl, SO_2 and HF to be determined as per Articles 10(2), 10(4) and Annex III	See Articles 10(2), 10(4) and 11(11) above
11(14) to 11(16)	addresses the monitoring of waste water from the cleaning of exhaust gases	There are no such releases from the Installation.
11(17)	Competent authorities to be informed if ELVs are exceeded	Condition 4.3.1
12(2)	An annual report on plant operation and monitoring for all plants burning more than 2 tonne/hour waste.	Condition 4.2.2

WID Article	Requirement	Delivered by
13(1)	specify maximum period of unavoidable stoppages, disturbances or failures of purification or CEMs, during which air or water ELVs may be exceeded	Conditions 2.3.6 to 2.3.9
13(2)	cease the feed of waste in the event of a breakdown	condition 2.3.10
13(3)	Limits the maximum period under 13(1) above to 4 hours uninterrupted duration in any one instance, and with a maximum cumulative limit of 60 hours per year	condition 2.3.10.
13(4)	Limits on dust (150 mg/m3), CO and TOC not to be exceeded	Condition 2.3.6 and Table s3.1(a)

ANNEX 2: Pre-Operational Conditions

Reference	Pre-operational measures	Justification
PO1	Prior to the commencement of commissioning; the Operator shall provide a written commissioning plan, including timelines for completion, for approval by the Environment Agency. The commissioning plan shall include the expected emissions to the environment during the different stages of commissioning, the expected durations of commissioning activities and the actions to be taken to protect the environment and report to the Environment Agency in the event that actual emissions exceed expected emissions. Commissioning shall be carried out in accordance with the commissioning plan as approved	To ensure that the data gathered and the testing carried out during the commissioning period is appropriate to (i) demonstrate the capability of the facility in respect of all permit conditions and (ii) ensure that the dosing of abatement materials (ammonia, lime, carbon etc) is optimised to minimise Air Pollution Control residue whilst ensuring compliance with the WID.
PO2	At least 4 months prior to start of operation at the site, the Operator shall submit a written report to the Agency of the details of the computational fluid dynamic (CFD) modelling. The report shall demonstrate whether the design combustion conditions comply with the residence time and temperature requirements as defined by the Waste Incineration Directive. The report shall also justify the position of all temperature probes that are to be used to demonstrate compliance with the WID, as well as demonstrating the reliability and accuracy of the temperature probes. The report shall also contain a proposed procedure to demonstrate that WID conditions are complied with in line with Article 11(3) of that Directive. Operations at the site shall not start until the report is approved in writing by the Agency.	To ensure that the facility has been designed in such a way as to maximise its capability to conform with the WID requirements in respect of residence time and temperature of the combustion gases.
PO3	At least 3 months prior to start	To ensure that appropriate sampling

	of operations at the site, the Operator shall submit a written plan to the Agency for approval detailing the ash sampling protocol to be used for APC residues and bottom ash, in conformance to Agency Guidance. The plan shall be implemented in accordance with the Agency's written approval	procedures are in place to gain a representative sample of the incinerator bottom ash (IBA) and Air Pollution Control (APC) residue produced to ensure (i) compliance with the WID requirements (in the case of IBA) and (ii) adequate characterisation of waste to identify appropriate re-use/ re-cycle /disposal options.
PO4	At least 2 months prior to start of operations at the site, the Operator shall provide the Agency with a written report for approval describing the detailed programme of noise monitoring that will be carried out at the site at the commissioning stage and when the plant is fully operational. The report shall include confirmation of locations, time, frequency and methods of noise monitoring. The monitoring programme shall be carried out in accordance with the Agency's written approval.	From information supplied within the application we expect that the facility will not cause an additional noise impact at the nearest sensitive receptors. This pre-operational condition is to ensure that appropriate plans are in place to monitor the actual noise impact of the site at the closest local receptors and verify the predictions within the application. This will ensure that any impact can be identified and rectified at the earliest opportunity
PO5	At least 2 months prior to start of operations at the site, the Operator shall submit a report to the Agency detailing an investigation into identifying potential users of steam within sufficient proximity of the site for the use of that steam to be potentially viable. Where such users are identified the Operator shall assess the feasibility of supplying the potential user with steam by operating the combustion unit at the site as a Combined Heat and Power plant. Where applicable, the report shall include a time-tabled plan to implement such changes including the development of the operating techniques and training of relevant personnel. The report shall also include a commitment for regular structured investigations of potential steam users in the vicinity of the site in line with condition 1.3.3 of this Permit.	The Operator has indicated within the application that they are in negotiations with a local site (British Salt) regarding supply of steam. This pre-operational condition requires the Operator to continue these discussions and assess in detail the feasibility and also identify and assess any other opportunities for supply of steam in the area. Supplying steam as well as electricity will enable the facility to maximise its efficiency in converting the burning of waste into usable energy.
PO6	At least 1 month prior to start of	One of the key tools for ensuring an

	operations at the site the Operator shall submit a copy of the site Environment Management System (EMS) to the Agency and make available for inspection all documents and procedures which form part of the EMS. The EMS shall be developed in line with the requirements set out in Section 1 of 'How to comply with your environmental permit – Getting the basics right'; and Horizontal Guidance Note H6 'Environmental Management Systems' The documents and procedures set out in the EMS shall form the written management system referenced in condition 1.1.1 (a) of the permit. .	on-going high degree of protection for the environment is to ensure that the Operator has an appropriate Environment Management System in place. This is to confirm that the Operator has developed such a system prior to start-up. The effectiveness of this system and adherence to it will be assessed by the Environment Agency as part of the on-going regulation of the site

ANNEX 3: Improvement Conditions

Reference	Improvement measure	Completion date
IC1	The Operator shall submit a post-commissioning report to the Agency which shall include as a minimum: - the end date for commissioning and the start of plant operations - a review of performance of the facility against the conditions of this permit. - details of optimization of emission abatement systems including reagent dosing rates. - Assessment of noise impact of the site in line with the proposal agreed as a result of pre-operational condition PO4 within Table S1.4 of this Permit and proposed improvements to reduce noise levels to that assessed within the application, where necessary. - Details of procedures developed during commissioning for achieving and demonstrating satisfactory process control. The report should clearly demonstrate how the commissioning plan agreed in response to PO1 has been implemented during the commissioning period. Where differences are identified between the plant performance and that presented within the EPR permit application the Operator shall (i) review the Environmental Impact assessment submitted as part of the application where appropriate, and (ii) propose a time-tabled plan for upgrades to optimise plant performance. Any submitted plan shall be implemented in line with written agreement form the Agency...	Within 3 months of end of commissioning period
IC2	The operator shall submit a written proposal to the Environment Agency to carry out tests to determine the size distribution of the particulate matter in the exhaust gas emissions to air from emission point A1, identifying the fractions within the PM_{10}, $PM_{2.5}$ and $PM_{1.0}$ ranges. The proposal shall include a timetable for approval by the Environment Agency to carry out such tests and produce a report on the results. On receipt of written agreement by the Environment Agency to the proposal and the timetable, the operator shall carry out the tests and submit to the Environment Agency a report on the results.	Within 6 months of the completion of commissioning.

C3	The operator shall review the potential for alternative re-use, recycle or disposal routes for the bottom ash and APC residue generated at the site in accordance with the waste hierarchy referred to in Article 4 of the WFD. The review should consider how the environmental impact can be minimised. Where feasible alternatives are identified then the Operator shall propose a timetabled plan to implement the identified alternatives. A written report shall be submitted to the Agency. The improvements identified shall be put in place as agreed in writing by the Agency.	Within 9 months of start of operations at the site
IC4	The Operator shall carry out an assessment of the impact of emissions to air of all the component metals subject to emission limit values, i.e. Cd, Tl, Hg, Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V. Emissions monitoring data obtained during the first year of operation shall be used to compare the actual emissions with those used in the original impact assessment. An assessment shall be made of the impact of each metal against the relevant EQS/EAL through the use of air dispersion modelling. A report on the assessment shall be made to the Environment Agency	Within 15 months of start of operations at the site.
IC5	The Operator shall submit a written report to the Environment Agency on the implementation of its Environmental Management System and the progress made in the accreditation of the system by an external body or if appropriate submit a schedule by which the EMS will be subject to accreditation.	Within 12 months of start of operations at the site.
IC6	The Operator shall carry out checks to verify the residence time, minimum temperature and oxygen content of the exhaust gases in the furnace whilst operating under the anticipated most unfavourable operating conditions. The results shall be submitted in writing to the Environment Agency.	Within 4 months of the completion of commissioning
IC7	The Operator shall submit a written summary report to the Agency to confirm by the results of calibration and verification testing that the performance of Continuous Emission Monitors for parameters as specified in Table S3.1 and Table S3.1(a) complies with the requirements of BS EN 14181, specifically the requirements of QAL1, QAL2 and QAL3.	Initial calibration report to be submitted to the Agency within 3 months of completion of commissioning. Full summary evidence compliance report to be submitted within 18 months of commissioning.

ANNEX 4: Consultation Reponses

A) Advertising and Consultation on the Application

The Application has been advertised and consulted upon in accordance with the Agency's Public Participation Statement. The way in which this has been carried out along with the results of our consultation and how we have taken consultation responses into account in reaching our decision is summarised in this Annex. Copies of all consultation responses have been placed on the Agency and Local Authority public registers.

The Application was advertised on the Agency website from 14 April 2010 to13 May 2010 and in the Mid Cheshire Guardian Series on 14 April 2010. Copies of the Application were placed in the Agency Public Register at Appleton House, Birchwood and the Cheshire East Public Register at Sandbach. Additionally copies of the Application were placed at Middlewich Library, Lewin Street, Middlewich CW10 9AS and Middlewich Town Council, Victoria Buildings, Lewin Street, Middlewich, CW10 9AT.

The following other (Non-)Governmental Organisations were consulted: -

- Health and Safety Executive
- Food Standards Agency
- Central and Eastern Cheshire Primary Care Trust
- Cheshire East Council – Planning Department
- Cheshire East Council – Environmental Health
- United Utilities (Warrington office)

1) Consultation Responses and direct input from other (Non-)Governmental Organisations

Response Received from Cheshire & Merseyside Health Protection Unit and Chester Microbiology Laboratory on behalf of Eastern Cheshire Primary Care Trust.	
Brief summary of comments:	Summary of action taken / how this has been covered
1. Typically a well managed waste incinerator presents little risk to local residents 2. Main potential issues are emissions from the stack and noise – however, if these comply with all relevant regulation this should not cause any obvious cause for concern.	During the determination of this application we have assessed the potential impact of air emissions and noise on the local environment and concluded that these emissions will not impact significantly on the local environment. We have set legally binding emission limits and reporting requirements

Response Received from Cheshire East Council – Environmental Health	
Brief summary of comments	Summary of action taken / how this has been covered
All necessary areas appear to have been considered within the application	No comment / action required

Response Received from United Utilities	
Brief summary of comments:	Summary of action taken / how this has been covered
1. No objection to the application 2. Discharge consent will be needed 3. No issue with the quantity or quality of effluent described within the application or the perceived impact on the operation of the WwTW and the receiving environment.	No comment / action required

Response Received from Cheshire West and Chester Council	
Several comments linked into planning considerations such as adherence to Waste Local Plan and potential over-capacity.	
Brief summary of comments.	Summary of action taken / how this has been covered
Insufficient information on impact on air quality around the A54 through Sproston	As described in section 5.2.1 above, the process contribution of the plant for NOx is insignificant in that this contribution is < 1% of the long term EQS/EAL or <10% of the short term EQS/EAL. Air Quality surrounding road networks which may be impacted by traffic to and from the site is outside our remit as set out by the Environmental Permitting Regulations. Such matters would have been considered as part of the determination of the planning permission application.

Response Received from Sandbach Town Council – Planning Committee	
Brief summary of comments:	Summary of action taken / how this has been covered
1. No confidence that the plant can be operated without high health and pollution risk to the adjoining areas. 2. Vague statements in application including words such as “unlikely” and “not expected” builds mistrust. 3. The impact of additional traffic movements on air quality should be	During the determination of the Permit our assessments have led us to conclude that we are satisfied that there will be no significant adverse effect on human health or the environment as a result of this facility operating within the conditions set in the Permit. Failure to conform to the

considered as part of an Environmental permission.	conditions of the Permit will result in enforcement action being taken against the Operator.

Response Received from Bradwall Parish Council	
Brief summary of comments:	Summary of action taken / how this has been covered
1. Impact of increased traffic on area 2. Deposition of pollutants on local farm land 3. Emissions of sulphur dioxide and particulate have been assessed exceeding H1 guidance thresholds. 4. Concern on toxicity of emissions to air as incinerating commercial and industrial waste as well as municipal waste	1. Increase in traffic within the area is not within the scope of the Environmental Permitting Regulations which is concerned with emissions from the installation. Impact of increase in traffic on the local environment would be assessed as part of the planning application. 2. The Operator submitted information in respect of deposition of dioxins on local farms and its potential impact on human health. This concluded that there would not be a significant impact on the health of individuals living in the area even if it is assumed that all the food they consume is produced locally. We have audited this work and conclude that we are able to agree with the Operator's assessment. 3. H1 guidance thresholds are an indication of whether the impact of the emissions need to be assessed more thoroughly in the context of the local environment. More thorough assessment by the Operator and audited by ourselves indicate that the emissions from the site will not cause any of the relevant Air Quality Standards and Objectives to be exceeded in the area. 4. All of the assessments carried out have been based on emissions at the emission limit values on a continuous basis. The assessments have concluded that we are satisfied that there will be no adverse impact on the environment or human health as a result of the operation of this facility. Regardless of the nature of the waste being incinerated the emission limits will remain the same and therefore the environmental impact will also not change.

2) Consultation Responses from Members of the Public and Community Organisations

The consultation responses received were wide ranging and a number of the issues raised were outside the Agency's remit in reaching its permitting decisions. Specifically questions were raised which fall within the jurisdiction of the planning system, both on the development of planning policy and the grant of planning permission.

Guidance on the interaction between planning and pollution control is given in PPS23. It says that the planning and pollution control systems are separate but complementary. We are only able to take into account those issues, which fall within the scope of the Environmental Permitting Regulations. The way in which we have done that is set out below.

a) Representations from Local MP, Councillors and Parish / Town Councils

Representation was received from Councillor L.W. Gilbert (representing Congleton Rural Ward) who raised the following issues.

(i) Planning for the site has already been refused.

(ii) Health concerns as four incinerators proposed in a small area, two of which (Runcorn and Ince Marshes) have already been granted planning.

(i) We are aware that the planning permission has been refused by Cheshire East and Cheshire Borough Council. The decision to refuse the planning permission is to be reviewed by the Secretary of State as a result of an appeal launched by the Operator. The Planning and Environmental Permitting processes are separate but complementary, with each assessing the proposed development within the respective relevant legislative framework. Therefore, the refusal of the planning permission application does not necessarily in itself result in the application for an Environmental Permit being refused.

(ii) The waste incinerators at Runcorn and Ince Marshes are 29.4km west north west and 26.7km north west of the proposed Middlewich incinerator respectively. Air dispersion modelling for waste incinerators based on WID limits indicates that the increase in ambient concentrations of pollutant becomes undetectable at a distance of more than 2km away from a given site. Therefore, as the Runcorn and Ince Marshes waste incinerator sites are well in excess of 20km away from the site, we can be confident that there will be no cumulative impact on air quality and human health between the Middlewich incinerator and those at Runcorn and Ince Marshes. There is also a waste incinerator development considered for Northwich which is over 7km north north west of the Middlewich site. This potential development would also not be expected to have a cumulative impact on air quality or human health in conjunction with the Middlewich incinerator due to the distance between the two sites.

b) Representations from Community and Other Organisations

Representations were received from Cheshire Anti-Incinerator Network (CHAIN) who raised the following issue:

- Planning has been refused, therefore, the application for an Environmental Permit should also be rejected. A summary of the reasons for refusing the planning application was appended to the letter. The reasons for refusal of the planning application stated within the summary were:
- Site is not allocated on the waste local plan
- Need not established (overcapacity)
- Unsustainable as waste would need to be imported
- Visual impact outweighs any potential benefits
- Inadequate provision for export of energy from the site

See our response to a(i) above.

- Concern on accumulative health impacts of the number of relatively large waste incinerators that are planned for the area – two of which have already been granted planning permission and a fourth is under consideration. This one refused.

See our response to a(ii) above

c) Representations from Individual Members of the Public

A total of 44 responses were received from individual members of the public. These raised many of the same issues as previously addressed. Only those issues additional to those already considered and relevant to the Environmental Permit determination process are listed below:

(iii) There is no evidence that the facility will be able to recover energy (referred to in 18 responses)

The application shows that the plant will generate 44MW electricity of which 37MW will be exported to the National Grid. The Operator has applied for planning for connections for the export of energy to the National Grid and is in on-going discussions with British Salt in respect of supplying steam to that site for the evaporation of brine.

We are therefore satisfied that, should the site be developed, there will be appropriate infrastructure and opportunity in place to recover energy effectively based on the opportunities available based on the location of the site.

Also refer to Section 4.3.7.2 of this document.

(iv) Planning application for the site already rejected (referred to in 16 responses)

Refer to response to a) (i) above.

(v) Technical capability of Covanta as an Operator (referred to in 14 responses)

A search was carried out via the Agency's National Enforcement Database in respect of the enforcement history of Covanta Energy Limited. No relevant convictions were identified.

Covanta operate over 40 waste incinerators within the US. Four of these incinerators have breached their respective dioxin limits within the period 2006 – 2010 – one incinerator breached the limit on two occasions. Only one of the incinerators (accounting for one breach) uses a similar technology to that being proposed for the Middlewich incinerator. We contacted the relevant departments of the US Environmental Protection Agency to understand the causes of these breaches and how Covanta had responded to them. General feedback was that Covanta had investigated, identified root causes and put corrective actions in place to avoid re-occurrence. The environmental standards that waste incinerators are expected to achieve in the US are not as stringent as those stated by the Waste Incineration Directive for such facilities in Europe. As a result the design of waste incinerators in Europe and the US tend to differ.

Covanta operate the Trezzo waste incineration facility in Italy which is designed and operated to the standards required by the European Waste Incineration Directive (WID). The requirements set out within the WID are designed to protect the environment and human health and any waste incinerators within Europe are required to operate within the requirements of the WID. We have no knowledge of any breaches of the WID requirements at the Covanta Trezzo waste incinerators.

The application for an Environmental Permit for Middlewich Incinerator submitted by Covanta Limited sets out the processes and procedures that will be used for the design and operation of the waste incinerator at Middlewich. We are satisfied that these processes and procedures are sufficient to ensure that the requirements of the WID are achieved on a routine basis at the Middlewich site.

Based on the processes and procedures stated within the permit application and the on-going operation of the Trezzo waste incinerator we are therefore satisfied that Covanta Limited will have the required expertise available to them to operate the Middlewich Energy to Waste plant in line with the requirements of all relevant EU legislation.

(vi) Build up of toxins in soil impacting local farming (referred to in 5 responses)

Assessment carried out by the Operator and audited by the Environment Agency demonstrate that even where individuals eat only food produced from soils where the deposition from the plant is at its highest it will not have a significant impact on their health as a result of ingesting food grown in this area. In reality the diet of individuals comprises of a variety of foods from different areas and therefore the risk is even less than that has been assessed. Our audit concluded that we are able to agree with the Operator's conclusions.

See also Section 5.3.2 of this document

(vii) Health impacts – cancer / asthma (referred to in 5 responses)

As part of this determination we have consulted with the Eastern Cheshire Primary Care Trust and the advice from them is that an incinerator run within the limits set

within the Permit presents little risk to local residents. Both the impact of air pollutants and ingestion of pollutants through the food chain have been assessed and we are satisfied that there will be no significant impact on human health as a result of the operations of this incinerator.

See also Section 5.3 of this document

(viii) Accumulative impact of all 4 waste incinerators planned for the area. (referred to in 4 responses)

Refer to response to (a) (ii) above.

(ix) Presence of protected species (referred to in 3 responses)

Covanta has identified a number of protected species within 500 metres of the proposed sites including badgers, bats, otters, birds and amphibians as detailed within their Environmental Statement and in the response to the Schedule 5 notice issued on 29 September 2010. Modelling assessments have indicated that the increase to airbourne pollutants within this area is small and the concentration remain significantly below air quality standards that are set to protect the environment, wildlife and human health. Therefore no adverse impact to the protected species or their habitat is expected from the emissions from the site.
Noise from the site may also impact on species. Noise modelling has indicated that there is a below marginal significance change in the overall noise within the locality as a result of the operation of the proposed waste incinerator. Sudden noises are known to have the potential to startle some species especially birds. The nature and design of the facility is such that sudden noise will be minimal and if they do occur will be within attenuated buildings.

Other potential impacts e.g. physical disturbance due to new buildings, on the protected species assessed within the Environmental Statement are not relevant for consideration under the Environmental Permitting Regulations 2010, but have been considered within the determination of the planning application.

In addition Covanta has applied for planning permission to create a nearby alternative habitat (3 ponds) as a mitigation strategy for the protection of amphibian species that frequent some of the ponds in the immediate vicinity of the proposed site. This planning application is currently the subject of an appeal alongside the decision on the planning permission for the main Covanta Energy from Waste facility. Covanta has also applied to Natural England for a European protected species mitigation licence.

We are therefore satisfied that should the development go ahead that the appropriate processes will be put in place to ensure that there is sufficient mitigation measures to ensure that the populations of protected species in the area are not adversely impacted.

(x) Noise impact (referred to in 3 responses)

We have checked the noise impact assessment submitted by the Operator in response to the Schedule 5 notice issued on 17 January 2011. Following a thorough audit of this work we are able to agree with the Operator's assessment that we would not expect noise nuisance as a result of this development. In addition we have included pre-operational condition PO4 and improvement condition IC1 within the Permit to ensure that the noise impact of the facility as built is the same or less than that on which our decision is based.

See also Section 5.5.7 of this document.

(xi) Production of hazardous ash needing landfill (referred to in 3 responses)

Most Incinerator Bottom Ash (IBA) is likely to be non-hazardous waste. IBA is classified on the List of Wastes as a 'mirror entry'. This means that IBA must be assessed, and if found to possess any one of the fourteen hazardous properties (which include eco-toxicity) it would then be classified as a hazardous waste. A pre-operational condition (PO3) has been included in the permit requiring the operator to propose an ash sampling protocol. Permit conditions require that, where waste disposal is necessary, this is undertaken in a manner which minimised its impact on the environment and, where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.

An adjacent facility to process the IBA produced by the incinerator is being separately permitted. This facility will process about 100,000 tonnes of IBA and produce about 90,000 tonnes of Incinerator Bottom Ash Aggregate

Air pollution control residues may be classified as hazardous waste, however, this does not preclude this waste stream from re-use.

IC3 within the permit requires the operator to investigate the feasibility of re-use or recycle of both bottom ash and air pollution control residues. This will ensure that where an opportunity arises to re-use or recycle these waste streams that is both technically and economically feasible then this is done.

(xii) Use of gas oil as supplementary fuel (referred to in 2 responses)

The use of gas oil as supplementary fuel is accepted as Best Available Technique for this Installation in the absence of natural gas supply being available to the site. The emission limit values set on the Permit are applicable during normal operation whether or not supplementary fuel is being fired at the time. The impact of continuous emissions at their respective emission limit values on the local environment has been assessed as part of this application and we are satisfied that there will be no adverse impact on air quality or human health as a result.
Gas oil at the site will be stored within a bund that has the capacity to hold at least 110% of the capacity of the tank, therefore, in the event of a failure of the tank the gas oil will be contained within the bund. Valves associated with loading the tank will be positioned within the bund and transfer of gas oil from the tank to the supplementary burners within the waste incinerator will be within a dedicated pipework system. We are satisfied that in the event of an accident these measures will ensure that any accidental spillage of oil that may occur will be contained on the site.

Concern has also been expressed that in the absence of sufficient waste to fill the incinerator capacity that gas oil or natural gas would be substituted as a fuel so depleting even further natural resources. This permit is for the incineration of non-hazardous municipal, commercial and industrial waste. The use of gas oil is only for start up, shut down or maintaining of the specified temperature. On the basis

of economics alone the Operator would wish to maximise the amount of waste burnt and only use oil where absolutely necessary.

(xiii) Bottom ash to be stored uncovered (referred to in 2 responses)

The bottom ash within this part of the Installation will be stored within a pit within a designated building. Movements of bottom ash in and out of this building will be by covered lorries. We are satisfied that sufficient processes and infrastructure are in place to minimise fugitive emissions of bottom ash from the waste incinerator site.

(xiv) Contamination of local water sources by contaminated surface water (referred to in 2 responses)

All processing, waste, fuel and ash storage at the site is carried out within designated buildings or enclosed bulk storage vessels. There are no emissions to surface water or groundwater directly from the process. Surface water from non-process areas of site will be drained via an interceptor into Sanderson's Brook.

There will be occasional discharges of process water to sewer from the site e.g. boiler blowdown and excess water from ash quenching system (see section 5.5.4 above for more details of discharge to sewer). In addition the entire site will be constructed on hard standing which will be subject to appropriate checks and maintenance. This will ensure that the groundwater under the site is protected from contamination.

We are therefore satisfied that the procedures on site are appropriate for avoiding significant contamination of surface water.

(xv) Global warming impact of Carbon dioxide emissions (referred to in 1 response)

The global warming potential of the Installation has been considered as part of our assessment. Please refer to Section 6.3 of this document.

(xvi) No carbon capture planned (referred to in 1 response)

The production of energy from waste is in itself a way of minimising global carbon dioxide emissions. It achieves this primarily by replacing the need to burn fossil fuels for the production of energy. In addition carbon capture is not currently an available technology for waste incineration. A number of trials will take place in the next few years at coal fired power stations to prove the viability of this technology. It is expected that the first applications of this technology once developed will be in power stations where its potential benefits are the greatest.

Therefore as this technology is currently experimental it therefore can not be considered to be 'available' as is required to be BAT,

d) <u>Representations Made at The Drop-In Event</u>

The drop-in event was attended by about 50 persons, who were a mixture of local residents and business community potentially impacted by the proposed facility. Many of the issues raised were the same as those considered above.

3) Matters which are outside the Agency's Permitting Remit

Location of the installation:
Proximity of brine fault line (referred to in 4 responses)
Not part of Cheshire East Local Waste Plan (referred to in 15 responses)

Decisions over land use and whether they are in line with relevant local plans are matters for the planning system. The location of the installation is a relevant consideration for Environmental Permitting, but only in so far as its potential to have an adverse environmental impact on communities or sensitive environmental receptors. The environmental impact is assessed as part of the determination process and has been reported upon in the main body of this document. The location of the installation can have an impact on the ability to recover waste heat for use in nearby residential, commercial or industrial premises and we comment on this in our consultation response to the local planning authority.

Visual impact : (referred to in 15 responses)
Visual impact of the development is a matter for the planning system.

Vehicle access to the installation and traffic movements:
These are relevant considerations for the grant of planning permission, but do not form part of the Environmental Permit decision making process.

Additional pollution as a result of traffic movements associated with the site : (referred to in 7 responses)
Although predominantly a matter for the planning system, the impact of increased traffic on the background concentrations of pollutants has been given consideration during the determination of the application for an Environmental Permit. The additional pollution as a result of traffic has been demonstrated to only marginally add to the background concentrations and even taking this in to consideration we are satisfied that there is no risk to Air Quality Objectives being breached within the locality of the site.

Flood Risk: (referred to in 3 responses)
The Environment Agency provides advice and guidance to the local planning authority on flood risk in our consultation response to the local planning authority. Our advice on these matters is normally accepted by both Applicant and Planning Authority. When making permitting decisions, flood risk is still a relevant consideration, but only in so far as it is taken into account in the accident management plan and that appropriate measures are in place to prevent pollution in the event of a credible flooding incident.

The Use of Alternate Technologies:
It is argued that Incineration is not an environmentally sustainable technology and therefore almost by definition cannot be considered to be the Best Available Technique (BAT). The Environment Agency is aware that a number of proposals are coming forward for other ways of dealing with waste streams such as pyrolysis and mechanical / biological treatment. At this time however, mass burn incineration at this

scale can still be considered BAT, subject to the appropriate assessments being made. Anaerobic digestion is most suitable for high moisture content biodegradable wastes such as food and agricultural wastes, and can be applied where there is separate collection of these waste streams. Anaerobic digestion is not however appropriate for mixed municipal waste.

It is important to draw a distinction between Sustainability Appraisal and Best Practicable Environmental Option (BPEO) and BAT. In Planning Policy Statement 10 (PPS10) (Planning for Sustainable Waste Management) Sustainability Appraisal forms part of the decision making process which should be applied so as to shape planning strategies that support the Government's planning objectives for waste management. Thus Sustainability Appraisal is an important part of plan formation and planning decisions are made by reference to planning policies. BAT assessment is a technical appraisal that the proposed technique is the best available for the protection of the environment as a whole.

Incinerator Capacity and its effect on Waste Recovery and Recycling Activities: (referred to in 2 responses)

It is argued that as the quantity of residual waste reduces over the lifetime of the installation, the need to maximise efficiency by maintaining the incinerator at full capacity will suppress waste recovery and recycling initiatives, which are higher up the waste hierarchy. The capacity of the incinerator is a matter for the Applicant and is designed to meet the waste disposal needs of the local authority. The proposed facility forms part of an integrated waste management strategy; any material arriving at the facility will be residual waste arising following upstream waste segregation, recovery and recycling initiatives. The shape and content of this strategy is a matter for the local authority. The incinerator is one element in that strategy, and the Environment Agency's role is to ensure that it can be operated without giving rise to significant pollution or harm to human health. In any event Permit conditions will prohibit the burning of any separately collected or recovered waste streams.

Import of Waste:
Overcapacity for waste incineration in area not in line with proximity principle. (referred to in 22 responses)
It is argued that overcapacity of residual waste incinerator capacity within the area will result in the import of waste from outside the area or sub-region, which is not in line with the proximity principle of disposing of waste as close to source as possible. The appropriateness of the capacity and number of waste incinerators in a given area is considered within the planning system. The Environment Agency's role is to ensure that it can be operated without giving rise to significant pollution or harm to human health in the event that planning permission is granted.

B) Advertising and Consultation on the Draft Decision

This section reports on the outcome of the public consultation on our draft decision carried out between 16th March, 2012 and 20th April, 2012 and the public drop-in event held on 4th April 2012 at Middlewich Community Church.

In some cases the issues raised in the consultation were the same as those raised previously and already reported in section A of this Annex. Where this is the case, the Environment Agency response has not been repeated and reference should be made to section A for an explanation of the particular concerns or issues.

Also some of the consultation responses received were on matters which are outside the scope of the Environment Agency's powers under the Environmental Permitting Regulations. Our position on these matters is as described previously.

General Comments

Comment:

Concerns were raised by members of the public that changes to the original Environmental Statement (ES) made available to the planning enquiry had not been formally submitted to the Environment Agency and that this would have an effect on the Agency's draft permit and draft decision document.

Our Response

EPR permitting and planning are two complementary but distinct processes controlled by different Regulations. Pollution control is concerned with preventing pollution through the use of measures to prohibit or limit the release of substances to the environment from different sources to the lowest practicable level. It also ensures that releases to air and water meet standards that guard against impacts to the environment and human health. The planning system controls the development and use of land in the public interest. It plays an important role in determining the location of development which may give rise to pollution, either directly or from traffic generated, and in ensuring that other developments are, as far as possible, not affected by major existing, or potential sources of pollution. The planning system focuses on whether the development itself is an acceptable use of the land, and the impacts of those uses, rather than the control of processes or emissions themselves. It is therefore not unusual for the scope of planning applications to be different to the scope of applications for an Environmental Permit. To operate the proposed facility Covanta would need both Planning Permission and an Environmental Permit for all the aspects of the proposal they intend to build.

Although Environmental Statements are usually submitted as part of the permit application, this application must be made on the form provided by the regulator; and include the information specified on the form. If we need further information, we obtain this through the issue of Schedule 5 notices. The main elements that this application must cover are:

- Proposed activities within the installation
- The nature and quantities of emissions from the activity to air, land and water together with an assessment of the effect of these on the environment
- Proposed technology and other techniques for the preventing and reducing emissions
- Measures for the monitoring of emissions
- Materials and energy used in or generated by the activity

Following the original ES which formed part of the permit application, the applicant submitted three separate pieces of supplementary information to the planning authority which were then consolidated into the original ES (CES). This CES was issued in October 2010. Independent of this, we issued a Schedule 5 Notice for further information in September 2010 and we received a response in November 2010. The main issues covered in the three supplements related to:

- topics of socio-economics, landscape and ecology, transportation, matters relating to archaeology and environmental protection
- the grid connection, CHP pipeline and proposed ecological receptor site for the great crested newts (GCN).
- a set of sensitivity tests relating to different operating scenarios for the Development and the climate change impact of the transport of residual waste to the Development

Further information was required by Planning Inspector under Regulation 19. This related to an assessment of the likely significant effects upon the habitats of protected species of CHP connections from the proposed EfW facility together with appropriate mitigation measures. It was inserted into the CES for ease of reference and issued in July 2011.

Following the receipt of public comments we have looked closely at the changes to the original ES. Although there were substantial additions, almost all of these related to planning and not the permit application. There was considerable additional information on proposed grid connection and CHP link in terms of traffic and transport, construction noise, landscape and visual, archaeology and cultural heritage but this was not part of permit application. Following is a summary of the relevant information and how we took it into consideration in our decision making.

- Planning refusal (paras 1.1.12 – 1.1.13 of CES): As discussed on page 63 of the DD, we satisfied ourselves that the reason for refusal were not related to environmental impact.
- Stack height (para 4.2.9) : Specifies the stack height which is the same as used in our determination (see page 12 of DD).
- Plant throughput (para 5.4). Specified the anticipated plant throughput. The permit (see table S2.2 of the permit) specifies this same throughput.
- NOx impact at Sproston (para 9.7.58). Anticipated NOx emissions are insignificant as discussed on page 78 of DD.
- Greenhouse Gas Emissions (paras 9.7.84 to 9.7.88). This is discussed on pp53-54 of DD.
- Noise (paras 10.1.5 – 10.1.7). Up to date information was received from the applicant in January 2011. Our assessment is discussed on page 59 of DD. The permit also requires the operator to submit a noise monitoring programme (see pre-operational condition PO4 of the permit) for approval and implementation before the plant start.
- Habitats (para 15.5.67 and 15.5.68). This is considered in detail on pages 38-40 of the DD.
- Dioxins (paras 16.3.27 – 16.3.31). Data in these paras is the same as submitted under EPR application (see section 5.3.2 above).

We looked at the changes to CES (issued July 2011) before issuing our draft permit and decision document. On page 40 of our DD we say that the installation of CHP infrastructure is not part of the permit application. Should Covanta wish to install such connections, they would need to apply to us to vary any permit we may issue to allow that to happen. Any such application would be determined on its merits and would need to demonstrate that such connections are not going to cause harm to the environment or human health. Within the remit of the Environmental Permitting regime we would consider the impact on habitats and protected species from that particular element of the proposal again at that time.

We are satisfied that the changes made to the original ES did not contain any different information than that made available to us through the EPR application process which would make us take a different decision

Comment

Comments were received that the publicity announcing the drop-in session organised by the Environment Agency was inadequate. It was also said that there were difficulties in obtaining the draft documents.

Our Response

We do not agree that the publicity surrounding the engagement event was inadequate. Due to the level of local concern about this proposal we have been keen to speak to local people, valuing the opportunity to hear about any local factors that could be important in our decision making. Our intention was to reach as many people as possible so we also notified all Cheshire East and Chester West and Chester Councilors about the event, together with local Town and Parish Councilors and local MP's offices. We also contacted CHAIN to make them aware of the consultation event as we are aware they have a considerable following in Middlewich and surrounding areas. In addition we also spoke with Middlewich Town Council who agreed to put up posters advertising the session at the main library and the Town Hall.

In addition, press releases were sent to the local media and we spoke with journalists who we were aware were interested in this development. We understand that the Middlewich Guardian subsequently covered the consultation on the 28 March and 3 April. The Crewe Chronicle also published details on the 28 March. Our belief was that we could raise awareness better by having articles published in the local newspapers rather than a formal advert in the notices section. However, following comments, we recognize that some people consider more value may have been added if we had also included a formal advert in one of those papers. In future we will consider, where there is a high level of public interest, using formal adverts to draw attention to the consultation periods in addition to using press releases. We did make a genuine attempt to notify people and we consider this was effective as evidenced by people attending the drop-in event and making comments on the draft permit and draft decision document.

As regards the availability of draft documents, we disagree that the documents were only available in Council and Environment Agency Offices. As is apparent from the valued and detailed responses we received at the drop in session from members of the community surrounding this development, copies of the documents were obtained from our website. Had we received feedback from members of the public either attending the event or at other times that they had difficulty obtaining a copy then steps could have been taken to make copies available. We will consider making more copies of our draft decisions available at future events we may hold.

Planning Related Comments

A number of comments were received that obviously related to planning matters.

Our Response

Some of the questions were the same as the reasons given for planning refusal. These were: site selection, need for the facility, requirement to import waste, effect on landscape and lack of grid connection. Since the planning refusal is subject to appeal, we expect these issues will be considered by SoS. Other issues raised were: increase in traffic, effect on house prices, pollution from heavy lorries, new housing development, permission for new retail outlets, and light pollution. We do not consider these are matters for EPR which is concerned with regulating emissions from the installation so that they do not cause harm to human health or the environment. They may be relevant considerations for planning.

a) Response Received from Cheshire East Council

Brief summary of comments.	Summary of action taken / how this has been covered
Cheshire East Council Environmental Health team consider that the permit appears to consider all aspects of the potential noise, odour and air quality impacts that should be covered by the Environmental Permit.	Noted. No action required
As part of proceedings for the Public Inquiry into the planning application for the Energy from Waste facility, a draft set of planning conditions was prepared which all parties recommended should be applied to any permission granted. We would draw your attention to these in	We have looked at the draft planning conditions and are satisfied that there are no contradictions between these and the proposed conditions in the EPR permit.

drafting any conditions on the Environmental Permit, a copy of which is attached. It is essential to ensure that there are no inconsistencies or contradictions between the restrictions imposed on the Environmental Permit and any planning conditions imposed on a grant of planning permission	
The Secretary of State has yet to issue a decision on the appeal, and should this be approved, they will impose a set of planning conditions that they consider acceptable. As such we feel it may be premature to consult on the draft Permit and decision document at this stage in the proceeding when the terms of any planning permission are unknown. Depending on the nature of the Secretary of State's decision, and any potential planning conditions imposed; there is a potential for significant sections of the draft Permit to require amendments to reflect the approved scheme. We would request that consideration is given to halting the draft Permit consultation process at this stage until such time as a decision is made on the planning application	As discussed above under general comments, the planning and pollution control systems are separate but complementary. The scope of planning and permit applications can be different. Planning authorities should work on the assumption that the relevant pollution control regime will be properly applied and enforced. They should act to complement but not seek to duplicate it. An EPR permit can be issued for an EfW facility without a planning consent – the same way a planning consent can be issued without a permit Based on previous experience, SoS planning appeal decisions do not impose conditions that are in the remit of EPR permitting. Those making the planning decision will be aware of our proposed EPR permit conditions. In any case, provisions exist in EPR which allow a permit to be varied at any time.
It is our understanding that the application to Environment Agency for the Environmental Permit does not include for the pipes to export steam which forms a part of the scheme and we therefore assume a further application for a Permit would be necessary for the pipework. Again we would request that consideration is given to halting the consultation process on the draft Permit until sufficient consideration is given to all environmental impacts of the whole scheme in its entirety.	The Council is correct in its understanding that the EPR permit application did not include any proposal to export steam. Our legal obligation is to determine the application as submitted. There is no justification for stopping the permitting process. Should Covanta wish to install such connections, they would need to apply to us to vary any permit we may issue to allow that to happen.
We would like written confirmation that the Environment Agency	This is discussed in detail under the general comments above

have fully considered all additional information submitted to the Public Inquiry. This includes the additional information provided in July 2011 to satisfy the April 2011 Regulation 19 request.	

b) Response from Cheshire East ward Councillor for Middlewich

Comments were received from the Councillor for Middlewich. These raised the issues of: lack of publicity for the drop-in event, concern that the Environment Agency decision was not based on information made available to the planning inquiry and effect of new developments on the local infrastructure and environment.

Our Response

Please see our response to general comments above.

c) Response Received from CHAIN

Issues Raised.	Summary of action taken / how this has been covered
Apparent anomaly between Covanta's current submission to the EA and the Project Brief circulated to the people of Middlewich and discussed at the recent Public Inquiry	CHAIN is right that the scope of the permit application does not include CHP. Note that the EPR scope of EfW facility has remained essentially unchanged since the application was made to us in March 2010 and was subject to public consultation. We note that the July version of Consolidated ES (at para 1.2.11) states that the following are not part of the planning application even though they are included in the CES. - connection to national grid - export of CHP - new receptor site for great Crested Newts As we said before, should Covanta wish to install CHP, they would need to apply to us to vary any permit we may issue to allow that to happen. Any such application would need to demonstrate within the remit of EPR that such connections are not going to cause harm to the environment or human health.

Proof that Covanta is not a fit and proper operator of Waste to Energy Plants	The issue of operator competence was raised during the public consultation of Covanta permit application in mid 2010. Our investigation of this is summarised in section 4.3.2.2 in this document. The same issue has also been raised in the planning inquiry. Whilst we can understand CHAIN's concerns, we do not believe that lack of UK operational experience, breach of limits at some plants or labour disputes make the operator "not fit and proper". We are satisfied that the type of technology and emission control techniques proposed by Covanta (which they will have to deliver) will enable them to operate the plant within the prescribed limits. Compliance with permit conditions is a legal obligation and we have adequate powers to enforce such compliance
Changes which have taken place since Covanta applied for a Permit	CHAIN's concern here is the increase of HGV and other traffic due to approved developments such as two large retail outlets, and 2000 homes development. As we stated earlier, it is the planning system which controls the development and use of land and the location of development which may give rise to traffic issues.
Effect of very small particles ($PM_{2.5}$ and below) emitted via both the Waste Incinerator chimney and HGVs	CHAIN voiced their concern about the health effects of fine particles ($PM_{2.5}$ and below). It is generally agreed that fine particles can affect human health. However, EfW plants are very small emitters of these particles compared with other sources like traffic and domestic heating. We discuss these issues in section 5.2.1 (c) and 5.3.3. There are 77 national monitoring stations which measure ambient concentrations of these particles. In 2010, EfW plants contributed less than 0.05% of the national emission of $PM_{2.5s}$. EPR can control emissions from installations.
Bottom ash from waste incinerators and its potential effect on protected species	This is discussed in the DD which accompanies the permit for IBA processing
CHAIN also pointed out three other issues, namely, inadequate	We have responded to these in general comments at the start on Annex 4 B

publicity of the drop-in event, availability of EA documents and the request for postponement of the drop-in event	above. We consider the arrangements were effective and that postponement was not justified.

d) Responses Received from Individual Members of the Public

Several comments were raised which related to issues that are matters for the local planning authority. Many others related to matters that we discuss under 'General Comments' at the beginning of Annex 4 B...	
Brief summary of comments.	Summary of action taken / how this has been covered
1. Concerns were raised about the health implications of waste particles in the atmosphere	Health risk assessment is discussed in section 5.3 above. Fine particles are discussed in our response to CHAIN above
2. One member of the public raised the issues of (a) quoted bag filter efficiency, (b) Covanta's record of US plants	(a) Bag filter efficiency of 99.98% comes from some recent publications from researchers in Italy and US. It needs to be remembered that plants that rely on lime abatement (as Covanta plant here) have a layer of sorbent on the filter cloth for acid gas absortion. (b). This is discussed in our response to CHAIN above and in section 4.3.2.2
3. DD section 4.1.3 says that the pre-treatment plant will remove plastics but CES paras 4.5.1-4.5.12 do not confirm this.	Our statement is based on the information supplied to us in the permit application (application section 3.2.12). Para 4.2.6 of CES also says the same.
4. It is claimed that firewater containment capacity at 1000m^3 may not be adequate	Section 4.2.2 above states that there is a commitment within the Application that the Local Authority Fire Officer will be involved in agreeing the scope of the firewater containment system on site.
5. Concern that, with reduction in waste arisings, enough waste streams will not be available for EfW plants and the operator might fail.	Defra's waste policy review of 2011 says (para 214-Renewable Energy from Waste) "Our horizon scanning work up to 2020, and beyond to 2030 and 2050 indicates that even with the expected improvements in prevention, re-use and recycling, sufficient residual waste feedstock will be available through diversion from landfill to support significant growth in this area, without conflicting with the drive to move waste further up the hierarchy".
6. Not sharing EA comment that "We are satisfied that the Operator	This is delivered through the legally binding General Management condition 1.1 of the permit

will have sufficiently robust recruitment and training procedures in place to ensure that the personnel operating the site will have the appropriate level of technical competence."	
7. EA should have a strong monitoring regime that restrictions on waste streams are enforced	We enforce all permit conditions vigorously and in accordance with our published approach to Enforcement and Prosecution.
8. HPA Study would not have been initiated if they were happy with current knowledge.	The HPA have stated that "It is important to stress that our current position on the potential health effects of well run and regulated modern Municipal Waste Incinerators remains valid... This view is based on detailed assessments of the effects of air pollutants on health and on the fact that modern and well managed municipal waste incinerators make only a very small contribution to local concentrations of air pollutants"
9. Operator's US record and whether he will be able to have "a well run modern incinerator" and not cause future health problems.	We discuss health risk assessment in section 5.3 above. For Operator's US record, see main body of this document, Annex 4A, our response to CHAIN and item 6 above.
10. The Operator will need to import waste which will cause traffic and smell nuisance	Please see the last item in Annex 4 A above.
11. The permit should control light pollution, noise and odour	Please see permit conditions 3.3 and 3.4 and sections 6.5.6 and 6.5.7 above in relation to odour and noise. Light pollution is likely to be subject to planning conditions as evidenced by the draft planning conditions referred to in the response from Cheshire East Council
12. Stack hazard to low flying air craft	Stack height and location are matters for the planning authority in this context.
13. No information has been provided on HGV movements	Section 8 of the Consolidated Environmental Statement provides details of HGV movements. This is subject to planning approval
14. One correspondent had the following concerns: - site selection and EA role in it -Need for waste imports - Increase in traffic movements	We explain above (under our response to general comments) different but complementary roles of the planning and permitting regulations. The first three concerns are matters for the planning

	authority. In fact the selection of site and the capacity of the plants were amongst the reasons given by planners for refusing the planning which is now subject to appeal.
- Presence of visible haze in Middlewich	Existing background pollution levels are taken into account in assessing the air quality impact of the proposed plant. (see section 5.2 above). Proposed plant will use air cooled condensers which should have no visible plume
-Use of IBA in road construction	IBA can only be used in road construction if it meets the Specification for Highway Works [MCHW Volume 1] and the Design Manual for Roads and Bridges [HD 35/04] issued by the Highways Agency, Welsh Assembly, Scottish Executive and the Department of the Environment for Northern Ireland
15. One member of the public who wanted to remain anonymous raised the following issues. - EA not considering the grid or CHP connections as part of permit determination - EA should delay issue of permit until HPA study is complete - Provides a detailed summary of Covanta submissions to the planning inquiry	- Grid and CHP connections are being considered under the planning inquiry. They do not form part of the permit application. - HPA's views on their new study are discussed under item 8 above. They remain satisfied with their current position. - Issues that are relevant to planning will be considered by the planning authority.
-Concerns about flood risk and the plant location	- We discuss flood risk (Annex 4A) in this DD. Please also note that PPS25 states that the aims of the planning policy on development and flood risk are "to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding and to direct development away from areas of highest risk"
- Release of dioxins and their effect on farming	- Dioxin releases are discussed in section 5.3.2 above.
16.Issues raised as: - Increase in traffic especially of HGV	- Traffic is for the planning authority to consider.

- Development will depress house prices - Recycling and composting will leave hardly any waste for burning	- This is outside the scope of EPR as if it happened it would not be caused by emissions from the installation - Future availability of waste for EfW is discussed in item 5 above
17. Following issues were raised: - Environmental impact assessment has been done as an EfW plant and not as an incineration plant - Air quality assessment does not take account of existing poor air quality - Source of waste and hence the emissions is not known -Allowing monitoring devices to be out of service for 4 hours will allow the operator to burn 'non-compliant' wastes	- The plant will be permitted as an incineration plant which will recover energy in the form of electricity. The Operator did not apply for CHP pipework connections. Should Covanta wish to install such connections, they would need to apply to us to vary any permit we may issue to allow that to happen. Any such application within the remit of EPR would need to demonstrate that such connections are not going to cause harm to the environment or human health. - Our assessment takes account of existing background levels of pollutants - The permit specifies the list of wastes that the operator can burn. Same emission limits for all permitted waste types. - The effect of such operations is detailed in section 5.3.6 above
18. One response raised the concern that there is a large gas storage about a mile from the incinerator and a simultaneous leak in the gas holder and a crack in the incinerator could lead to explosion.	Chances of this happening are extremely remote. Firstly, natural gas is lighter than air and any leaked gas would rise upwards and not to the incinerator. Secondly, incinerator furnaces are under a negative pressure and a crack will not push flames outwards. More importantly, gas storage is subject to control under the Control of Major Accident Hazards Regulations which are implemented jointly by HSE and Environment Agency. These controls are designed to limit the consequences to people and the environment of any major accident.