

# Determination of an Application for an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2016

The Permit Number is: EPR/ZP3537AT  
The Applicant / Operator is: Endless Energy Limited  
The Installation is located at: Airedale Road, Keighley, West Yorkshire, BD21 4LW

## 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.

We try to explain our decision as accurately, comprehensively and plainly as possible. Achieving all three objectives is not always easy, and we would welcome any feedback as to how we might improve our decision documents in future. 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 EPR/ZP3537AT/A001. We refer to the application as "the **Application**" in this document in order to be consistent.

The number we haven given to give to the permit is EPR/ZP3537AT. We refer to the permit as "the **Permit**" in this document.

The Application was duly made on 22/10/2018.

The Applicant is Endless Energy Limited. We refer to Endless Energy Limited as "the **Applicant**" in this document. Where we are talking about what would happen after the Permit is granted (if that is our final decision), we call Endless Energy Limited "the **Operator**".

Endless Energy Limited's facility is located at Airedale Road, Keighley, West Yorkshire, BD21 4LW. We refer to this as "the **Installation**" in this document.

## How this document is structured

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## Glossary of acronyms used in this document

(Please note that this glossary is standard for our decision documents and therefore not all these acronyms are necessarily used in this document.)

AAD	Ambient Air Directive (2008/50/EC)
APC	Air Pollution Control
AQS	Air Quality Strategy
BAT	Best Available Technique(s)
BAT-AEL	BAT Associated Emission Level
BAT C	BAT conclusions
BREF	Best Available Techniques (BAT) Reference Documents for Waste Incineration
CEM	Continuous emissions monitor
CFD	Computerised fluid dynamics
CHP	Combined heat and power
COMEAP	Committee on the Medical Effects of Air Pollutants
CROW	Countryside and rights of way Act 2000
CV	Calorific value
CW	Clinical waste
CWI	Clinical waste incinerator
DAA	Directly associated activity – Additional activities necessary to be carried out to allow the principal activity to be carried out
DD	Decision document
EAL	Environmental assessment level
EIAD	Environmental Impact Assessment Directive (85/337/EEC)
ELV	Emission limit value
EMAS	EU Eco Management and Audit Scheme
EMS	Environmental Management System
EPR	Environmental Permitting (England and Wales) Regulations 2016 (SI 2016 No. 1154) as amended
ES	Environmental standard
EWG	European waste catalogue
FSA	Food Standards Agency
GWP	Global Warming Potential
HHRAP	Human Health Risk Assessment Protocol
HPA	Health Protection Agency (now PHE – Public Health England)

HW	Hazardous waste
HWI	Hazardous waste incinerator
IBA	Incinerator Bottom Ash
IED	Industrial Emissions Directive (2010/75/EU)
I-TEF	Toxic Equivalent Factors set out in Annex VI Part 2 of IED
I-TEQ	Toxic Equivalent Quotient calculated using I-TEF
LCV	Lower calorific value – also termed net calorific value
LOI	Loss on Ignition
MBT	Mechanical biological treatment
MSW	Municipal Solid Waste
MWI	Municipal waste incinerator
NO <sub>x</sub>	Oxides of nitrogen (NO plus NO <sub>2</sub> expressed as NO <sub>2</sub> )
OTNOC	Other than normal operating conditions
PAH	Polycyclic aromatic hydrocarbons
PC	Process Contribution
PCB	Polychlorinated biphenyls
PEC	Predicted Environmental Concentration
PHE	Public Health England
POP(s)	Persistent organic pollutant(s)
PPS	Public participation statement
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
SCR	Selective catalytic reduction
SGN	Sector guidance note
SNCR	Selective non-catalytic reduction
SPA(s)	Special Protection Area(s)
SS	Sewage sludge
SSSI(s)	Site(s) of Special Scientific Interest
TDI	Tolerable daily intake

TEF	Toxic Equivalent Factors
TGN	Technical guidance note
TOC	Total Organic Carbon
UHV	Upper heating value –also termed gross calorific value
US EPA	United States Environmental Protection Agency
WFD	Waste Framework Directive (2008/98/EC)
WHO	World Health Organisation
WID	Waste Incineration Directive (2000/76/EC) – now superseded by IED

# 1 Our decision

We have issued the 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.

This Application is to operate an installation which is subject principally to the Industrial Emissions Directive (IED).

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

### 2.1 Receipt of Application

The Application was duly made on 22/10/18. 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.

### 2.2 Consultation on the Application

We carried out consultation on the Application in accordance with the EPR, our statutory PPS and our own internal guidance 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 IED, 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 IED, including telling people where and when they could see a copy of the Application. We also placed an advertisement in the Keighley News on 1<sup>st</sup> November 2018.

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

- City of Bradford Metropolitan District Council
- Health and Safety Executive
- Food Standards Agency
- Public Health England
- Director of Public Health
- Yorkshire Water
- Fire Service
- Civil Aviation Authority
- Leeds Bradford Airport
- National Air Traffic Services
- National Grid

These are bodies whose expertise, democratic accountability and/or local knowledge make it appropriate for us to seek their views directly. Note under our Working Together Agreement with Natural England, we only inform Natural England of the results of our assessment of the impact of the installation on designated Habitats sites.

In addition to our advertising the Application, we undertook a programme of extended public consultation. A public surgery was held on 13<sup>th</sup> November 2018 at The Victoria Hall in Keighley. Written comments were also accepted by the Environment Agency beyond the formal consultation period.

Further details along with a summary of consultation comments and our response to the representations we received can be found in Annex 4.

### 2.3 Requests for Further Information

Although we were able to consider the Application duly made, we did in fact need more information in order to determine it, as shown in the table below. A

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copy of each request and the responses were placed on our public register.

<b>Request</b>	<b>Response date</b>	<b>Summary of information</b>
Response to request for information dated 16/11/18	21/11/18	Dispersion modelling clarifications
Response to 1 <sup>st</sup> schedule 5 notice issued on 20/12/18	18/02/18	Information on air quality and noise assessments
Response to 2 <sup>nd</sup> schedule 5 notice issued on 06/05/19	01/07/19	Wide range of issues
Additional information in follow up to 2 <sup>nd</sup> schedule 5 notice issued on 06/05/19	29/07/19	Information air quality assessment
Response to 3 <sup>rd</sup> schedule 5 notice issued on 24/07/19	07/08/19 02/08/19	Clarification of the Applicant and Updated noise impact assessment
Response to 4 <sup>th</sup> schedule 5 notice issued on 19/09/19	23/10/19 and 11/11/19	Clarification of several issues
Response to 5 <sup>th</sup> schedule 5 notice issued on 15/01/20	25/02/20	Clarification of several issues
Additional information	09/11/20	Clarifications after consultation on draft decision

## 2.4 Consultation on our draft decision

We consulted on our draft decision from 8/06/20 until 12/08/20. Whilst the consultation closed on 12/08/20, we accepted (and considered) any representations received after this date up to permit issue. People who commented on the Application were contacted to inform them of the consultation, a newsletter was distributed and a press release made. A summary of the consultation responses and how we have taken into account all relevant representations is shown in Annex 4, Part B.

The consultation on the draft decision took place during social distancing as specified by the government due to Coronavirus. In recognition of this we took the following steps:

- We extended the consultation beyond our standard 4 week period.
- We circulated a newsletter and made it available on-line
- The newsletter included a section that directed people to sections of the draft decision document on key issues that had been raised during the consultation on the Application and informed people of our view on those key issues.
- We arranged for postal responses to be accepted even though our offices were closed.

### 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 regulated facility is:

- an *installation* and a *waste incineration plant* as described by the IED;
- an *operation* covered by the WFD, 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)(b) – incineration of non-hazardous waste in a waste incineration plant or waste co-incineration plant with a capacity of 3 tonnes or more per hour.

The IED definition of “waste incineration plants” and “waste co-incineration plants” says that it includes:

*“all incineration lines or co-incineration lines, waste reception, storage, on-site pre-treatment facilities, waste, fuel and air supply systems, boilers, facilities for the treatment of waste gases, on-site facilities for treatment or storage of residues*

*and waste water, stacks, devices for controlling incineration or co-incineration operations, recording and monitoring incineration or co-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 may also comprise “directly associated activities”, which at this Installation includes the generation of electricity using a steam turbine and a back up electricity generator for emergencies. These activities comprise one installation, because the incineration plant and the steam turbine are successive steps in an integrated activity.

Therefore there are no directly associated activities.

#### 4.1.2 The Site

The site is located in the town of Keighley next to the A650. The area around the site is a mixture of commercial and residential areas, with the closest residential properties ~ 50 m to the south west. Several schools and nurseries are nearby with the nearest being ~ 400m away. Recreational areas, including a playing field are to the north and as well as the River Aire which is ~180 m away. North Pennine Moors (SAC & SPA) and South Pennine Moors (SAC & SPA) are within 10km of the Installation. There are several Local Wildlife Sites and areas of Ancient Woodland within 2km of the Installation.

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 7 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

The Applicant has described the facility as the Endless Energy Facility. Our view is that for the purposes of IED (in particular Chapter IV) and EPR, the installation is a waste incineration plant because:

Notwithstanding the fact that energy will be recovered from the process; the process is never the less ‘incineration’ because it is considered that its main purpose is the thermal treatment of waste.

Waste will be delivered to the installation in covered vehicles. The waste will be delivered to the tipping hall where it will be tipped into the waste bunker. A grab crane will be used to homogenise the waste and transfer it to a feed hopper that will feed the moving grate furnace where the waste will be burned.

Combustion will be controlled by feeding primary air through the grate and secondary air will be injected above the waste. The furnace will be designed to ensure that the combustion gases are maintained, after the last injection of combustion air, to at least 850 °C for a minimum of two seconds. Combustion air will be drawn from the waste reception area to maintain negative pressure to ensure odour control.

Emissions to air will be via a 60 m high stack and will be minimised by cleaning the waste combustion gases as follows:

- Oxides of nitrogen (NOx) will be abated using Selective Non-Catalytic Reduction (SNCR)
- Acid Gases will be abated using a lime abatement system
- Dioxins, mercury and volatiles abated using activated carbon injection
- Particulate matter and metals abated by bag filters

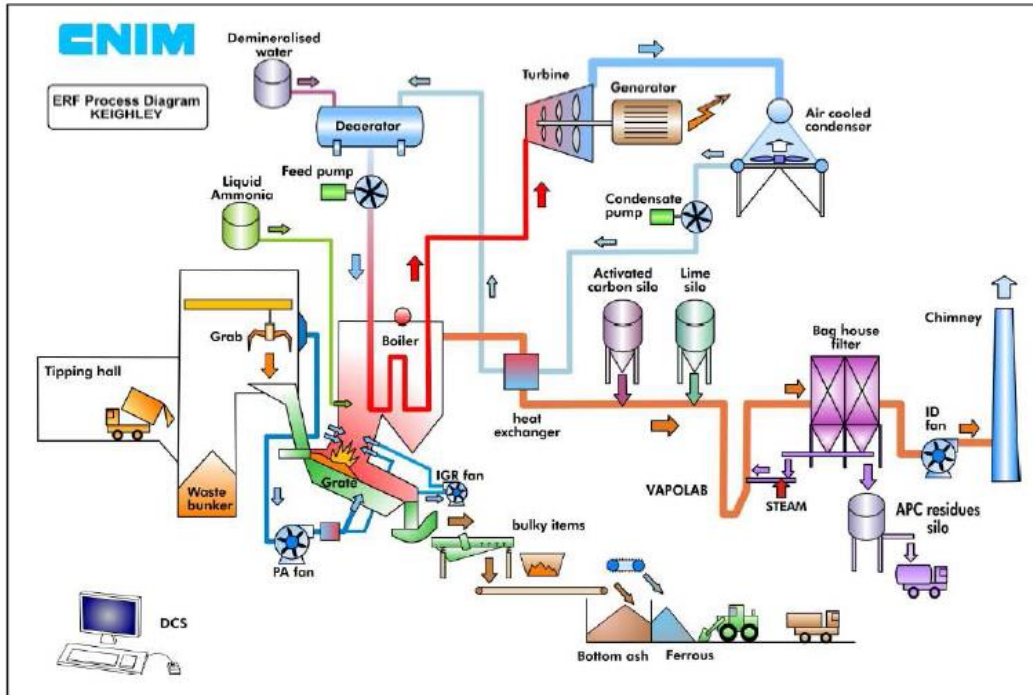
Hot gases from the incineration of waste will be used to generate steam in a boiler. The design of the boilers, will ensure that the flue gas temperature is quickly reduced to minimise the risk of dioxin reformation. The steam generated in the boilers will be fed to a steam turbine which will generate electricity. Water for steam generation will be sourced from the mains to use in the boilers. Steam will be condensed in an air cooled condenser and recycled to the boiler. Process waste water will be re-used for quenching bottom ash.

After quenching in water, bottom ash will be stored in a storage area, before unloading onto vehicles in an enclosed building. Air pollution control (APC) residues will be stored in silos prior to removal from site in sealed tankers. Under normal operation all process water will be re-used. In the case of abnormal operation, such as emptying of the boiler, effluent will be removed from site by tanker.

Surface water run-off from roofs and clean areas of the site will be kept separate to process water. The clean water will be collected in a surface water drainage system and if not re-used on site it will be discharged to the River Aire via an interceptor.

The Installation will generate electricity at a rate of ~ 13.26 MWe with ~ 11.35 MWe available for export to the national grid.

The operator will have an environmental management system and intends to have it certified to ISO 14001.



The key features of the Installation can be summarised in the table below.

Waste throughput, Tonnes/line	148,800 tonnes / year	19.6 tonnes / hour
Waste processed	Commercial and industrial waste and municipal waste	
Number of lines	1	
Furnace technology	Grate	
Auxiliary Fuel	Gas Oil	
Acid gas abatement	Dry	Lime
NOx abatement	SNCR	Ammonia
Reagent consumption	Auxiliary Fuel 60 tonnes / year Ammonia solution: 800 tonnes/year Lime: 1,400 tonnes / year Activated carbon: 38 tonnes / year Process water: 25,000 tonnes / year	
Flue gas recirculation	No	
Dioxin abatement	Activated carbon	
Stack	Grid Reference : 407987 , 441455	
	Height: 60 m	Diameter: 1.47 m
Flue gas	Flow: 39.4 m <sup>3</sup> /s	Velocity: 23.2 m/s
	Temperature 140 °C	
Electricity generated	13.26 MWe	
Electricity exported	11.35 MWe	
Steam conditions	Temperature, 400 °C	Pressure, 60 bar

#### 4.1.4 Key Issues in the Determination

The key issues arising during this determination were assessment of the impact from air emissions, noise emissions and the assessment of BAT; we therefore describe how we determined these issues in most detail in this document.

#### 4.2 The site and its protection

##### 4.2.1 Site setting, layout and history

The site is located in the town of Keighley next to the A650. The area around the site is a mixture of commercial and residential areas, with the closest residential properties ~ 50 m to the south west. Recreational areas, including a playing field are to the north as well as the River Aire which is ~180 m away.

The site is currently disused, comprising of some hard standing, disused buildings and rough vegetation. Part of the site was previously a gasworks.

The site is underlain by a thick fine-grained alluvium aquifer. It is classed as a secondary A type aquifer.

##### 4.2.2 Site design: potentially polluting substances and prevention measures

The Applicant described measures to prevent pollution to ground and groundwater from potentially polluting substances. They are summarised below:

- Waste will be delivered to and stored in a reinforced, waterproof concrete bunker.
- Waste water pit will be of similar construction to the waste bunker.
- Potentially polluting liquids stored in tanks or containers in bunds on impermeable surfacing. All filling and emptying points will be within the bunds.
- The EMS will include procedures for unloading and storage of materials. The will include measures to prevent overfilling.
- Bottom ash will be stored inside the building with an impermeable surface with sealed drainage. It will be transported off-site in covered trucks.
- APC residues will be transferred to a storage silo via a pneumatic conveying system. The storage silo will be in an area of impermeable surfacing and sealed drainage.
- Prompt clean-up will be undertaken if spills occur.

Under Article 22(2) of the IED the Applicant is required to provide a baseline report containing at least the information set out in paragraphs (a) and (b) of the Article before starting operation.

The Applicant has submitted a site condition report which includes a report on the baseline conditions as required by Article 22. We have reviewed that report and consider that it adequately describes the condition of the soil and groundwater prior to the start of operations.

The baseline report is an important reference document in the assessment of contamination that might arise during the operational lifetime of the installation and at cessation of activities at the installation.

#### 4.2.3 Closure and decommissioning

Pre-operational condition PO1 requires the Operator to have an Environmental Management System in place before the Installation is operational, and this will include a site closure plan.

At the definitive cessation of activities, the Operator has to satisfy us that the necessary measures have been taken so that the site ceases to pose a risk to soil or groundwater, taking into accounts both the baseline conditions and the site's current or approved future use. To do this, the Operator will apply to us for surrender of the permit, which we will not grant unless and until we are satisfied that these requirements have been met.

#### 4.3 Operation of the Installation – general issues

##### 4.3.1 Administrative issues

The Applicant is the sole Operator of the Installation.

We are satisfied that the Applicant is the person who will have control over the operation of the Installation after the granting of the Permit; and that the Applicant will be able to operate the Installation so as to comply with the conditions included in the Permit.

##### 4.3.2 Management

The Applicant has stated in the Application that they will implement an Environmental Management System (EMS) that will be certified under ISO14001. A pre-operational condition (PO1) 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 Environment Agency recognises that certification of the EMS cannot take place until the Installation is operational. An improvement condition (IC1) is included requiring the Operator to report progress towards gaining accreditation of its EMS.

We are satisfied that appropriate management systems and management structures will be in place for this Installation, and that sufficient resources are available to the Operator 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 (including the accident risk assessment), 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. An Accident Management Plan will form part of the Environmental Management System and must be in place prior to commissioning as required by a pre-operational condition (PO1).

The Applicant submitted a Fire Prevention Plan. We are satisfied that the plan will minimise the risk of a fire and limit the impact of a fire in the event that one occurred. Pre-operational condition PO8 requires an updated FPP to be submitted for our approval after the detailed design stage of the Installation to account for any changes that may occur.

#### 4.3.5 Off-site conditions

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 documents contained in the Application:



<b>Description</b>	<b>Parts Included</b>	<b>Justification</b>
Application (EPR/ZP3537AT/A001)	Response to question 3a of application form B3	These are parts of the Application that contain key operating techniques
Response to Schedule 5 Notice dated 07/05/19, received on 01/07/19	Schedule 5 notice response document, response to questions: 2, 7, 8, 9 (excluding mention of by-pass), 10, 17, 25, 31, 32, 33, 34, 35, 36, 37, 38, 39 point occurred, 70  Operating techniques document, sections: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 1.7, 3, 4, 5, 6, 7, 8 (excluding fig 8.1), 9, 10, 11  BAT conclusions document, sections: 2.9, 2.12, 2.14, 2.16, 2.17, 2.20 (excluding 2.20.1), 2.24, 2.28, 2.29 (excluding 2.29.1 bullet 3), 2.32, 2.37.  BAT assessment document, sections: 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.11, 7.13	
Response to schedule 5 notice dated 19/09/19 received on 23/10/19	Schedule 5 notice response document, response to questions 2, 8, 9  Fire prevention plan	
Response to schedule 5 notice dated 19/09/19 received on 11/11/19	Schedule 5 notice response document, response to questions 10, 5 and 14	
Response to schedule 5 notice dated 15/01/20 received on 25/02/20	All of the response including revised odour management plan	

The details set out above describe the techniques that will be used for the operation of the Installation that have been assessed by the Environment Agency as BAT; they form part of the Permit through Permit condition 2.3.1 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:

<b>Raw Material or Fuel</b>	<b>Specifications</b>	<b>Justification</b>
Gas Oil	< 0.1% sulphur content	As required by Sulphur Content of Liquid Fuels Regulations.
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Article 45(1) of the IED requires that the Permit must include a list of all types of waste which may be treated using at least the types of waste set out in the European Waste List established by Decision 2005/532/EC, EC, if possible, and containing information on the quantity of each type of waste, where appropriate. The Application contains a list of those wastes coded by the European Waste Catalogue (EWC) number, which the Applicant will accept in the waste streams entering the plant and which the plant is capable of burning in an environmentally acceptable way. We have specified the permitted waste types, descriptions and where appropriate quantities which can be accepted at the installation in Table S2.2.

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) the wastes are all categorised as non-hazardous in the European Waste Catalogue and are capable of being safely burnt at the installation.
- (iii) these wastes are likely to be within the design calorific value (CV) range for the plant;
- (iv) these wastes are unlikely to contain harmful components that cannot be safely processed at the Installation.

The incineration plant will predominately take commercial and industrial waste. The Application also included provision to take waste under the municipal waste codes. A number of the waste types that the Applicant requested appeared to be for recyclable material, such as 15 01 01 - Card. The Applicant stated that they do not wish to take recyclable material out of the supply chain, but that the plant will offer a secondary outlet under specific circumstances such as when recycling facilities are not available or materials are contaminated and not acceptable to the recycling market

Also the Permit restricts separately collected fractions to those which prove to be unsuitable for recovery:

Condition 2.3.4 c (within the permit) states: Waste shall only be accepted if it having been separately collected for recycling, it is subsequently unsuitable for recovery by recycling.

The Applicant stated that plant is expected to incinerate 148,800 tonnes per year operating for 8000 hours per year at a nominal capacity of 18.6 tonnes per hour. The air quality risk assessments in the Application were based on continual operation at a throughput of 19.6 tonnes per hour which is the maximum continuous rating. The actual throughput will vary depending on the calorific value of the waste. We have limited the waste throughput to that stated in the Application of 148,000 tonnes per year and we have also limited the maximum hourly throughput to 19.6 tonnes per hour.

The Installation will be designed, constructed and operated using BAT 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 later in this document.

#### 4.3.7 Energy efficiency

##### (i) 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 are normal aspects 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 50(5) of the IED, which requires “*the heat generated during the incineration and co-incineration process is recovered as far as practicable through the generation of heat, steam or power*”. This issue is covered in this section.
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 in section 6 of this Decision Document.
4. The extent to which the Installation meets the requirement of Article 14(5) of the Energy Efficiency Directive which requires new thermal electricity generation installations with a total thermal input exceeding 20 MW to carry out a cost-benefit assessment to “assess the cost and benefits of providing for the operation of the installation as a high-efficiency cogeneration installation”.  
Cogeneration means the simultaneous generation in one process of thermal energy and electrical or mechanical energy and is also known as combined heat and power (CHP)  
High-efficiency co-generation is cogeneration which achieves at least 10% savings in primary energy usage compared to the separate generation of heat and power – see Annex II of the Energy Efficiency Directive for detail on how to calculate this.

(ii) 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:

- An energy efficiency plan will be prepared and reviewed every four years
- Energy consumption will be monitored and reviewed to identify any improvements
- Use of low energy bulbs
- Insulated buildings
- Plant insulated to retain heat in the system
- Low energy equipment will be used
- Equipment maintained to ensure energy efficiency
- Sealed waste feed to prevent air ingress
- On-line boiler cleaning and all heat exchange surfaces kept clean
- Boiler water conditioned using ion exchange method
- Steam from turbine used to pre-heat boiler water and combustion air

The Application states that the specific energy consumption, a measure of total energy consumed per unit of waste processed, will be 116 kWh/tonne. The installation capacity is 148,800 tonnes/ year.

The BREF says that electricity consumption is typically between 60 kWh/t and 190 kWh/t depending on the LCV of the waste.

The LCV in this case is expected to be 9 MJ/kg. The specific energy consumption in the Application is in line with that set out above.

(iii) Generation of energy within the Installation - Compliance with Article 50(5) of the IED

Article 50(5) of the IED requires that *“the heat generated during the incineration and co-incineration process is recovered as far as practicable”*.

Our CHP Ready Guidance - February 2013 considers that BAT for energy efficiency for Energy from Waste (EfW) plant is the use of CHP in circumstances where there are technically and economically viable opportunities for the supply of heat from the outset.

The term CHP in this context represents a plant which also provides a supply of heat from the electrical power generation process to either a district heating network or to an industrial / commercial building or process. However, it is recognised that opportunities for the supply of heat do not always exist from the outset (i.e. when a plant is first consented, constructed and commissioned).

In cases where there are no immediate opportunities for the supply of heat from the outset, the Environment Agency considers that BAT is to build the plant to be CHP Ready (CHP-R) to a degree which is dictated by the likely future opportunities which are technically viable and which may, in time, also become economically viable.

The BREF says that 0.4 – 0.8 MWh of electricity can be generated per tonne of waste. 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/annum of waste (which equates to 0.4 – 0.72 MWh/tonne of waste).

The Installation will generate electricity only and has been specified to maximise electrical output with little or no use of waste heat. The Application shows 13.26 MW of electricity produced for an annual burn of 148,800 tonnes, which represents 9 MW per 100,000 tonnes/yr of waste burned (0.6 MWh/tonne of waste). The Installation is therefore in the middle of the indicative BAT range.

The Applicant provided a calculation of the gross electrical efficiency and compared it to the BAT AEEL of 25-35 specified for new plants in BAT conclusions BAT 20.

The gross electrical efficiency was calculated as 34.6%. This is towards the top of the BAT AEEL range. The BREF notes that plants using high steam conditions can achieve towards the top of the range.

The BREF contains a method for calculating gross energy efficiency for comparison against a BAT range known as BAT AEEL. This is a new assessment that forms part of the BAT conclusions. The method in the BREF allows for internal steam uses to be counted towards the energy calculation. The Applicant included several steam uses in their calculation some of which themselves could contribute to steam production. The BREF does not preclude such steam uses from being counted but after assessing public consultation comments and carrying out a further review we decided that it was sensible to exclude the steam uses that could themselves contribute to steam production and therefore required the Applicant to submit a revised calculation. The revised calculation showed a gross electrical efficiency of 27.4% which is still within the BAT range for new plants. We reviewed again the data in the BREF and performance of plants that we regulate that are of similar size to this Installation. We found that the value proposed by the Applicant was consistent with other plants of similar size. The BREF and our own experience shows that it is larger plants that are able to achieve towards the top of the BAT range. We are satisfied that the Installation will be BAT. In addition PO2 requires a review of all measures to ensure heat recovery is maximised which includes further assessment of CHP but will also need to include electricity optimisation.

In accordance with BAT 2 table S3.3 of the Permit requires the gross electrical efficiency to be measured by carrying out a performance test at full load.

The SGN and Chapter IV of the IED both require that, as well as maximising the primary use of heat to generate electricity; waste heat should be recovered as far as practicable.

The Applicant stated that various opportunities to supply heat have been identified and contacted. However only a single opportunity indicated interest. This opportunity was not financially viable. See section vi below for further details of the cost benefit assessment (CBA).

The location of the Installation largely determines the extent to which waste heat can be utilised, and this is a matter for the planning authority. The Applicant carried out a feasibility study [and provided a CHP-R assessment as part of their application], which showed there was potential to provide district heating to local businesses; suitable opportunities are being explored, though there are no firm commitments at this stage. There is provision within the design of the steam turbine to extract low-grade steam for a district heating scheme. Establishing a district heating network to supply local users would involve significant technical, financial and planning challenges such that this is not seen as a practicable proposition at present.

Our CHP-R guidance also states that opportunities to maximise the potential for heat recovery should be considered at the early planning stage, when sites are being identified for incineration facilities.

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 50(5) are met.

(iv) Choice of Steam Turbine

The Applicant confirmed that the steam conditions will be 400 °C and 60 Bar. We are satisfied that this represents BAT in terms of steam conditions to ensure efficient energy recovery.

(v) Choice of Cooling System

The Applicant has chosen an air cooled cooling system. This was justified on the basis that it will reduce water usage, not require a cooling tower and not result in a water discharge.

(vi) Compliance with Article 14(5) of the Energy Efficiency Directive

The operator has submitted a cost-benefit assessment of opportunities for high efficiency co-generation within 15 km of the installation in which they calculated net present value. If the NPV is positive (i.e. any number more than zero) it means that the investors will make a rate of return that makes the scheme commercially viable. A negative NPV means that the project will not be commercially viable. The Applicant's assessment showed a net present value of -5.6 which demonstrates that operating as a high-efficiency cogeneration installation will not be financially viable. We agree with the applicant's assessment and will not require the installation to operate as a high-efficiency cogeneration installation.

(vii) R1 Calculation

The R1 calculation does not form part of the matters relevant to our determination. It can however be a general indicator that the installation is achieving a high level of energy recovery.

The Applicant has presented an outline R1 calculation in the Application documents. However in order for us to assess R1 the Applicant will need to make a formal R1 application following the guidance on our website. We have not used the outline R1 assessment to assess energy recovery, our assessment of energy recovery is set out in the sections above.

(viii) Permit conditions concerning energy efficiency

Pre-operational condition PO2 requires the Operator to carry out a comprehensive review of the available heat recovery options prior to commissioning, in order to ensure that waste heat from the plant is recovered as far as possible.

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/hot water pass-outs.

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 Environment Agency to monitor energy recovery efficiency at the Installation and take action if at any stage the energy recovery efficiency is less than proposed.

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

#### 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 Environment 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<sub>x</sub>. 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 be tracked separately as part of the energy reporting requirement under condition 4.2.2. Optimising reagent dosage for air abatement systems and minimising the use of auxiliary fuels is further considered in the section on BAT.

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

This 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, air pollution control residues and recovered metals.

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) of <3% in bottom ash. 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.

Incinerator bottom ash (IBA) will normally 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 relating to the content of dangerous substances. Monitoring of incinerator ash will be carried out in accordance with the requirements of Article 53(3) of IED. Classification of IBA for its subsequent use or disposal is controlled by other legislation and so is not duplicated within the permit.

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



In order to ensure that the IBA residues are adequately characterised, pre-operational condition PO3 requires the Operator to provide a written plan for approval detailing the ash sampling protocols. Table S3.4 requires the Operator to carry out an ongoing programme of monitoring.

The Application states that metal fractions will be recovered from the bottom ash by the use of a magnetic separator and sent for recycling. The Application also proposes that, where possible, bottom ash will be transported to a suitable recycling facility, from where it could be re-used in the construction industry as an aggregate.

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 will ensure that this position is maintained.

## **5. Minimising the Installation's environmental impact**

Regulated activities can present different types of risk to the environment, these include odour, noise and vibration; accidents, fugitive emissions to air and water; as well as point source releases to air, discharges to ground or groundwater, global warming potential and generation of waste and other environmental impacts. Consideration may also have to be given to the effect of emissions being subsequently deposited onto land (where there are ecological receptors). All these factors are discussed in this and other sections of this document.

For an installation of this kind, the principal emissions are those to air, although we also consider those to land and water.

The next sections of this document 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 what measures we are requiring to ensure a high level of protection.

### **5.1 Assessment Methodology**

#### **5.1.1 Application of Environment Agency guidance 'risk assessments for your environmental permit'**

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 guidance 'Air emissions risk assessment for your environmental permit

(<https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit>) (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 emissions

The 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 methodology 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.

#### 5.1.2 Use of Air Dispersion Modelling

For incineration applications, we normally require the Applicant to submit a full air dispersion model as part of their application. Air dispersion modelling enables the process contribution to be predicted at any environmental receptor that might be impacted by the plant.

Once short-term and long-term PCs have been calculated in this way, they are compared with Environmental Standards (ES).

Where an Ambient Air Directive (AAD) Limit Value exists, the relevant standard is the AAD Limit Value. Where an AAD Limit Value does not exist, AAD target values, UK Air Quality Strategy (AQS) Objectives or Environmental Assessment Levels (EALs) are used. Our web guide sets out EALs which have been derived to provide a similar level of protection to Human Health and the Environment as the AAD limit values, AAD target and AQS objectives. In a very small number of cases, e.g. for emissions of lead, the AQS objective is more stringent than the AAD value. In such cases, we use the AQS objective for our assessment.

AAD target values, AQS objectives and EALs do not have the same legal status as AAD limit values, and there is no explicit requirement to impose stricter conditions than BAT in order to comply with them. However, they are a standard for harm and any significant contribution to a breach is likely to be unacceptable.

PCs are screened out as **Insignificant** if:

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

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 threshold provides a substantial safety margin to protect health and the environment.

Where an emission is screened out in this way, we would normally consider that the Applicant's proposals for the prevention and control of the emission to be BAT. That is because if the impact of the emission is already insignificant, it follows that any further reduction in this emission will also be insignificant.

**However, where an emission cannot be screened out as insignificant, it does not mean it will necessarily be significant.**

For those pollutants which do not screen out as insignificant, we determine whether exceedences of the relevant ES are likely. This is done through detailed audit and review of the Applicant's air dispersion modelling taking background concentrations and modelling uncertainties into account. Where an exceedance of an AAD limit value is identified, we may require the Applicant to go beyond what would normally be considered BAT for the Installation or we may refuse the application if the applicant is unable to provide suitable proposals. Whether or not exceedences are considered likely, the application is subject to the requirement to operate in accordance with BAT.

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 Assessment of Impact on Air Quality

The Applicant's assessment of the impact of air quality is set out in their Air Quality Impact Assessment document. The assessment comprises:

- Dispersion modelling of emissions to air from the operation of the incinerator.
- A study of the impact of emissions on nearby sensitive habitat / conservation sites.

This section of the decision document deals primarily with the dispersion modelling of emissions to air from the incinerator chimney and its impact on local air quality. The impact on conservation sites is considered in section 5.4.

The Applicant has assessed the Installation's potential emissions to air against the relevant air quality standards, and the potential impact upon local conservation and habitat sites and human health. These assessments predict the potential effects on local air quality from the Installation's stack emissions using the ADMS 5.2 dispersion model, which is a commonly used computer model for regulatory dispersion modelling. The model used 5 years of meteorological data collected from the weather station at Bingley between 2012 and 2016. The Applicant stated that this is the closest weather station to the Installation, being 6 km away. The impact of the terrain surrounding the site upon plume dispersion was considered in the dispersion modelling.

The air impact assessments, and the dispersion modelling upon which they were based, employed the following assumptions.

- First, they assumed that the ELVs in the Permit would be the maximum permitted by Article 46(2) and Annex VI of the IED. These substances are:
  - Oxides of nitrogen (NO<sub>x</sub>), expressed as NO<sub>2</sub> – short term
  - Total dust
  - Carbon monoxide (CO)
  - Sulphur dioxide (SO<sub>2</sub>) – short term
  - Hydrogen chloride (HCl)
  - Hydrogen fluoride (HF)
  - Metals (Cadmium, Thallium, Mercury)
  - Metals (Antimony, Arsenic, Lead, Chromium, Cobalt, Copper, Manganese, Nickel and Vanadium)
  - Chromium VI was assumed to be 20% of total chromium.
  - Polychlorinated dibenzo-para-dioxins and polychlorinated dibenzo furans (referred to as dioxins and furans) were each assumed to be emitted at 11% of the ELV.
  - Gaseous and vaporous organic substances, expressed as Total Organic Carbon (TOC)
- They based long term emissions of oxides of nitrogen and sulphur dioxide on achievable emissions that are lower than the IED chapter IV limits.

These lower emissions were 150 mg/m<sup>3</sup> for NO<sub>x</sub> and 18 mg/m<sup>3</sup> for Sulphur dioxide.

- They assumed that the Installation operates continuously at the relevant long-term or short-term ELVs, i.e. the maximum permitted emission rate.
- The model also considered emissions of pollutants not covered by Annex VI of IED, specifically ammonia (NH<sub>3</sub>), polycyclic aromatic hydrocarbons (PAH) and Polychlorinated biphenyls (PCBs). Emission rates used in the modelling have been drawn from data in the Waste Incineration BREF and data from emissions from another plant and are considered further in section 5.2.2.

We are in agreement with this approach. The assumptions underpinning the model have been checked and are reasonably precautionary. The levels used in the modelling are in some cases higher than the emission limits that have been set in the Permit. The limits in the Permit reflect the BAT AELs that are specified in the 2019 incineration BREF. The modelling therefore reflects a worse case than the actual operating plant. The Applicant confirmed that they will be able to meet the BAT AELs. Meeting the oxides of nitrogen BAT AEL (120 mg/m<sup>3</sup>) results in a slightly higher ammonia emission that was originally modelled (8.5 mg/m<sup>3</sup> instead of 5 mg/m<sup>3</sup>). The Applicant therefore updated the assessment of ammonia impacts with the higher emission and also updated the assessment of impacts at habitat sites with the revised emission data for oxides of nitrogen and ammonia.

The Applicant has carried out a review of different sources of the local background air quality. This data is summarised in the Application and has been used by the Applicant to establish the background (or existing) air quality against which to measure the potential impact of the incinerator.

As well as calculating the peak ground level concentration, the Applicant has modelled the concentration of key pollutants at a number of specified locations within the surrounding area.

The way in which the Applicant used dispersion models, its selection of input data, use of background data and the assumptions it made have been reviewed by the Environment Agency's modelling specialists to establish the robustness of the Applicant's air impact assessment. The output from the model has then been used to inform further assessment of health impacts and impact on habitats and conservation sites.

Our review of the Applicant's assessment leads us to agree with the Applicant's conclusions. We have also audited the air quality and human health impact assessment and similarly agree that the conclusions drawn in the reports were acceptable.

The Applicant's modelling predictions are summarised in the following sections.

## 5.2.1 Assessment of Air Dispersion Modelling Outputs

The Applicant's modelling predictions are summarised in the tables below.

The Applicant's modelling predicted peak ground level exposure to pollutants in ambient air and at discreet receptors. The tables below show peak ground level exposure to pollutants in ambient air.

Whilst we have used the Applicant's modelling predictions in the table below, we have made our own simple verification calculation of the percentage process contribution and predicted environmental concentration. These are the numbers shown in the tables below and so may be very slightly different to those shown in the Application due to rounding corrections. Any such minor discrepancies do not materially impact on our conclusions.

Pollutant	EQS / EAL		Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	$\mu\text{g}/\text{m}^3$			$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	% of EAL	$\mu\text{g}/\text{m}^3$
NO <sub>2</sub>	40	1	29	2.18	5.45	31.2	78.0
	200	2	58	21	10.5	79	39.5
PM <sub>10</sub>	40	1	17	0.27	0.68	17.3	43.2
	50	3	34	0.7	1.40	34.7	69.4
PM <sub>2.5</sub>	25	1	17	0.27	1.08	17.27	69.1
SO <sub>2</sub>	266	4	87	43	16.2	130	48.9
	350	5	34	30	8.57	64	18.3
	125	6	14	1.93	1.5	15.93	12.7
HCl	750	7	2.01	27	3.6	29.0	3.87
HF	16	8	2.16	0.021	0.13	2.181	13.63
	160	7	4.92	1.83	1.14375	6.75	4.2
CO	10000	9	519	27.0	0.27	546	5.5
	30000	10	519	69	0.23	588	2.0
TOC	5	1	0.71	0.21	4.20	0.920	18.40
	195	7	1.42	4.57	2.34	5.99	3.07
PAH	0.00025	1	0.00014	0.000021	8.40	0.000161	64.4
NH <sub>3</sub>	180	1	1.16	0.17	0.09	1.33	0.74
	2500	10	2.32	15.6	0.62	17.92	0.72
PCBs	0.2	1		0.000105	0.05	0.00011	0.05
	6	10		0.0023	0.04	0.00230	0.0

Pollutant	EQS / EAL		Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	$\mu\text{g}/\text{m}^3$			$\mu\text{g}/\text{m}^3$	% of EAL	$\mu\text{g}/\text{m}^3$	% of EAL
Dioxins			5.50E-08	2.08E-09		5.71E-08	

TOC as Benzene  
PAH as benzo[a]pyrene

- 1 Annual Mean
- 2 99.79th %ile of 1-hour means
- 3 90.41st %ile of 24-hour means
- 4 99.9th ile of 15-min means
- 5 99.73rd %ile of 1-hour means
- 6 99.18th %ile of 24-hour means
- 7 1-hour average
- 8 Monthly average
- 9 Maximum daily running 8-hour mean
- 10 1-hour maximum

Pollutant	EQS / EAL		Back-ground	Process Contribution		Predicted Environmental Concentration	
	$\mu\text{g}/\text{m}^3$			$\mu\text{g}/\text{m}^3$	% of EAL	$\mu\text{g}/\text{m}^3$	% of EAL
Cd	0.005	1	0.00012	0.001	20.0	0.00112	22.4
Tl				0.001		0.001	
Hg	0.25	1	0.0021	0.001	0.40	0.00310	1.24
	7.5	2	0.0042	0.023	0.31	0.02720	0.363
Sb	5	1	0.00084	0.01	0.20	0.01084	0.22
	150	2	0.0017	0.23	0.15	0.23170	0.154
Pb	0.25	1	0.0062	0.01	4.00	0.01620	6.48
Co			0.00016	0.01		0.01016	
Cu	10	1	0.043	0.01	0.10	0.053	0.530
	200	2	0.086	0.23	0.12	0.31600	0.158
Mn	0.15	1	0.011	0.01	6.67	0.021	14.00
	1500	2	0.023	0.23	0.02	0.25300	0.0169
V	5	1	0.0012	0.01	0.20	0.0112	0.22
	1	3	0.0023	0.23	23.00	0.23230	23.23
As	0.003	1	0.00073	0.01	333.33	0.01073	357.7
Cr (II)(III)	5	1	0.0045	0.01	0.20	0.01450	0.290
	150	2	0.00902	0.23	0.15	0.23902	0.1593
Cr (VI)	0.0002	1	0.00090	0.0021	1050.00	0.00300	1500.0
Ni	0.02	1	0.0014	0.0100	50.00	0.01140	57.0

- 1 Annual Mean
- 2 1-hr Maximum
- 3 24-hr Maximum

(i) Screening out emissions which are insignificant

From the tables above the following emissions can be screened out as insignificant in that the process contribution is < 1% of the long term ES and <10% of the short term ES. These are:

- PM10, PM2.5, HCl, HF, CO, NH<sub>3</sub>, Hg, Sb, Cr (II) & (III), Cu, Mn, V and PCBs

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

(ii) Emissions unlikely to give rise to significant pollution

Also from the tables above the following emissions (which were not screened out as insignificant) have been assessed as being unlikely to give rise to significant pollution in that the predicted environmental concentration is less than 100% (taking expected modelling uncertainties into account) of both the long term and short term ES.

- TOC, SO<sub>2</sub>, NO<sub>2</sub>, Cd, Pb, Ni, PAH, PM2.5, Mn and V

For these emissions, we have carefully scrutinised the Applicant's proposals to ensure that they are applying the Best Available Techniques to prevent and minimise emissions of these substances. This is reported in section 6 of this document.

(iii) Emissions requiring further assessment

Finally from the tables above the following emissions require further assessment.

- As and Cr (VI)

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.

We have also carefully considered whether additional measures are required above what would normally be considered BAT in order to prevent significant pollution. Consideration of additional measures to address the pollution risk from these substances is set out in section 5.2.4. The impacts from As and Cr(VI) are considered in more detail below in section 5.2.3.

## 5.2.2 Consideration of key pollutants

(i) Nitrogen dioxide (NO<sub>2</sub>)

The impact on air quality from NO<sub>2</sub> emissions has been assessed against the ES of 40 µg/m<sup>3</sup> as a long term annual average and a short term hourly average of 200 µg/m<sup>3</sup>. The model assumes a 70% NO<sub>x</sub> to NO<sub>2</sub> conversion for



the long term and 35% for the short term assessment in line with Environment Agency guidance on the use of air dispersion modelling.

The above tables show that the peak long term PC is greater than 1% of the ES and therefore cannot be screened out as insignificant. Even so, from the table above, the emission is not expected to result in the ES being exceeded. The peak short term PC is marginally above the level that would screen out as insignificant (>10% of the ES). However it is not expected to result in the ES being exceeded.

In addition the impacts at the most impacted receptor are lower at 2.8% of the long term ES and 8.8% of the short term ES.

(ii) Particulate matter PM<sub>10</sub> and PM<sub>2.5</sub>

The impact on air quality from particulate emissions has been assessed against the ES for PM<sub>10</sub> (particles of 10 microns and smaller) and PM<sub>2.5</sub> (particles of 2.5 microns and smaller). For PM<sub>10</sub>, the ES are a long term annual average of 40 µg/m<sup>3</sup> and a short term daily average of 50 µg/m<sup>3</sup>. For PM<sub>2.5</sub> the ES of 25 µg/m<sup>3</sup> as a long-term annual average to be achieved by 2010 as a Target Value and by 2015 as a Limit Value has been used.

The Applicant's predicted impact of the Installation against these ESs is shown in the tables above. The assessment assumes that **all** particulate emissions are present as PM<sub>10</sub> for the PM<sub>10</sub> assessment and that **all** particulate emissions are present as PM<sub>2.5</sub> for the PM<sub>2.5</sub> assessment.

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

- It assumes that the plant emits particulates continuously at the IED Annex VI limit for total dust, whereas actual emissions from similar plant are normally lower.
- It assumes all particulates emitted are below either 10 microns (PM<sub>10</sub>) or 2.5 microns (PM<sub>2.5</sub>), 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<sub>10</sub> is below 1% of the long term ES and below 10% of the short term ES and so can be screened out as insignificant. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of particulates to be BAT for the Installation.

The above assessment shows that the predicted process contribution for emissions of PM<sub>2.5</sub> is slightly above 1% ES and so cannot be screened out as insignificant. However, the Applicant's assessment was based on an

emission at the IED Annex VI limit of 10 mg/m<sup>3</sup>. The limit we have set in the Permit is the BAT AEL of 5 mg/m<sup>3</sup> and so the impact of PM<sub>2.5</sub> can be screened out as insignificant. This is still the case when assessing against the ES of 20 µg/m<sup>3</sup> which is applicable from 2020.

There is currently no emission limit prescribed nor any continuous emissions monitor for particulate matter specifically in the PM<sub>10</sub> or PM<sub>2.5</sub> fraction. Whilst the Environment Agency is confident that current monitoring techniques will capture the fine particle fraction (PM<sub>2.5</sub>) for inclusion in the measurement of total particulate matter, an improvement condition (IC2) has been included that will require a full analysis of particle size distribution in the flue gas, and hence determine the ratio of fine to coarse particles. In the light of current knowledge and available data however the Environment Agency is satisfied that the health of the public would not be put at risk by such emissions, as explained in section 5.3.3.

(iii) Acid gases, SO<sub>2</sub>, HCl and HF

From the tables above, emissions of HCl and HF can be screened out as insignificant in that the process contribution is <10% of the short term ES. There is no long term ES for HCl. HF has 2 assessment criteria – a 1-hr ES and a monthly EAL – the process contribution is <1% of the monthly EAL and so the emission screens out as insignificant if the monthly ES is interpreted as representing a long term ES.

There is no long term ES for SO<sub>2</sub> for the protection of human health. Protection of ecological receptors from SO<sub>2</sub> for which there is a long term ES is considered in section 5.4.

Emissions of SO<sub>2</sub> can also be screened out as insignificant in that the short term process contribution is also <10% of each of the three short term ES values. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation.

Whilst SO<sub>2</sub> emissions cannot be screened out as insignificant, the Applicant's modelling shows that the installation is unlikely to result in a breach of the ES. The Applicant is required to prevent, minimise and control SO<sub>2</sub> emissions using BAT, this is considered further in Section 6. We are satisfied that SO<sub>2</sub> emissions will not result in significant pollution.

(iv) Emissions to Air of CO, VOCs, PAHs, PCBs, Dioxins and NH<sub>3</sub>

The above tables show that for CO emissions, the peak long term PC is less than 1% of the ES and the peak short term PC is less than 10% of the ES and so can be screened out as insignificant. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation.

The above tables show that for emissions of VOCs (TOC), the peak long term PC is greater than 1% of the ES and therefore cannot be screened out as insignificant. Even so, from the table above, the emission is not expected to result in the ES being exceeded.

The Applicant based their assessment of VOCs on benzene which has an ES of 5 µg/m<sup>3</sup>. However they used an ES of 3.25 µg/m<sup>3</sup> in their assessment. The ES for 1,3-butadiene is lower at 2.25 µg/m<sup>3</sup> which is the lowest ES of organic species likely to be present in VOC (other than PAH, PCBs, dioxins and furans). Even if compared to this ES the impacts would not be exceeded even when making the worst case assumption that all of the VOC emission is 1,3-butadiene.

The above tables show that for PCB emissions, the peak long term PC is less than 1% of the ES and the peak short term PC is less than 10% of the ES for PCBs and so can be screened out as insignificant. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation.

The above tables show that for PAH PCB emissions, the peak long term PC is greater than 1% of the ES and therefore cannot be screened out as insignificant. Even so, from the table above, the emission is not expected to result in the ES being exceeded.

The Applicant used the ES for benzo[a]pyrene (BaP) for their assessment of the impact of PAH. We agree that the use of the BaP ES is sufficiently precautionary.

There is no ES for dioxins and furans as the principal exposure route for these substances is by ingestion and the risk to human health is through the accumulation of these substances in the body over an extended period of time. This issue is considered in more detail in section 5.3

From the tables above all the other emissions can be screened out as insignificant in that the process contribution is < 1% of the long term ES and <10% of the short term ES.

The ammonia emission is based on a release concentration of 8.5 mg/m<sup>3</sup>. This is lower than the benchmark of 10 mg/m<sup>3</sup> in the current BREF. We are satisfied that this level of emission is consistent with the operation of a well controlled SNCR NO<sub>x</sub> abatement system.

Whilst all emissions cannot be screened out as insignificant, the Applicant's modelling shows that the installation is unlikely to result in a breach of the ES. The Applicant is required to prevent, minimise and control PAH and VOC emissions using BAT, this is considered further in Section 6. We are satisfied that PAH and VOC emissions will not result in significant pollution.

(V) Summary

For the above emissions to air, for those emissions that do not screen out, we have carefully scrutinised the Applicant's proposals to ensure that they are applying the BAT to prevent and minimise emissions of these substances. This is reported in section 6 of this document. Therefore we consider the Applicant's proposals for preventing and minimising emissions to be BAT for the Installation. Dioxins and furans are considered further in section 5.3.2.

### 5.2.3 Assessment of Emission of Metals

The Applicant has assessed the impact of metal emissions to air, as previously described.

Annex VI of IED sets three limits for metal emissions:

- An emission limit value of 0.05 mg/m<sup>3</sup> for mercury and its compounds (formerly WID group 1 metals).
- An aggregate emission limit value of 0.05 mg/m<sup>3</sup> for cadmium and thallium and their compounds (formerly WID group 2 metals).
- An aggregate emission limit of 0.5 mg/m<sup>3</sup> for antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel and vanadium and their compounds (formerly WID group 3 metals).

In addition the UK is a Party to the Heavy Metals Protocol within the framework of the UN-ECE Convention on long-range trans-boundary air pollution. Compliance with the IED Annex VI emission limits for metals along with the Application of BAT also ensures that these requirements are met.

In section 5.2.1 above, the following emissions of metals were screened out as insignificant:

- Hg, Sb, Cr (II) & (III) and Cu.

Also in section 5.2.1, the following emissions of metals whilst not screened out as insignificant were assessed as being unlikely to give rise to significant pollution:

- Cd, Pb and Ni, Mn and V

This left emissions of As and Cr (VI) requiring further assessment. For all other metals, the Applicant has concluded that exceedences of the ES are not likely to occur.

Where Annex VI of the IED sets an aggregate limit, the Applicant's assessment assumes that each metal is emitted individually at the relevant aggregate emission limit value. This is a something which can never actually occur in practice as it would inevitably result in a breach of the said limit, and so represents a very much worst case scenario.

For metals As and Cr (VI) the Applicant Used representative emissions data from other municipal waste incinerators using our guidance note. Please refer to "Guidance to Applicants on Impact Assessment for Group 3 Metals Stack

Releases – version 4” (<https://www.gov.uk/government/publications/waste-incinerators-guidance-on-impact-assessment-for-group-3-metals-stack>).

Measurement of Chromium (VI) at the levels anticipated at the stack emission points is expected to be difficult, with the likely levels being below the level of detection by the most advanced methods.

Data for Cr (VI) was based on total Cr emissions measurements and the proportion of total Cr to Cr (VI) in APC residues.

Based on the above, the following emissions of metals were screened out as insignificant:

- Cr (VI)

The following whilst not screened out as insignificant was assessed as being unlikely to give rise to significant pollution:

- As

Improvement condition IC6 has been set for the Applicant to confirm this assessment with monitoring data from the Installation.

#### 5.2.4 Consideration of Local Factors

##### (i) Impact on Air Quality Management Areas (AQMAs)

The City of Bradford metropolitan District council has declared 4 Air Quality Management Areas (AQMAs), for NO<sub>2</sub>, located at:

- Area of the junction of Manchester Road and Mayo Avenue, Bradford
- Area of the junction of Manningham Lane and Queens Road, Bradford
- An area encompassing a number of properties on Thornton Road Bradford, in the vicinity of its junction with Princess Way
- Area of the junction of Shipley Airedale Road and Church Bank on the inner ring road in Bradford

The closest AQMA is ~ 10 km from the Installation. The NO<sub>2</sub> impacts at this distance will be well below the 1% insignificance threshold. The Applicant’s modelling shows that the NO<sub>2</sub> PC will be <1% beyond ~1.5 km from the Installation. The contribution at the AQMAs from the Installation will be negligible.

##### (ii) Local weather conditions

During the consultation on the Applicant we received a lot of responses expressing concern over local weather conditions including temperature inversions in the Aire valley and whether this would trap emissions leading to increased impacts.

We carried out checks during our audit of the Applicant's dispersion modelling that included:

- Using our own weather data from Bingley, on site numerical weather prediction data and modelled weather data (MM5)
- Considering Defra background maps alongside local data
- Using high resolution terrain data
- Testing sensitivity to surface roughness
- Using multiple dispersion models including the Calpuff model

As a result of our audit we were satisfied that the Applicant's predictions represented a reasonable worst case and could be used for permit determination. We are still satisfied that there will not be a significant impact on air quality or health when taking into account local weather conditions and the location in the valley.

### **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 industrial emissions directive (IED), the waste framework directive (WFD), and ambient air directive (AAD).

The main conditions in an EfW permit are based on the requirements of the IED. Specific conditions have been introduced to specifically ensure compliance with the requirements of Chapter IV. The aim of the IED is to prevent or, where that is not practicable, to reduce emissions to air, water and land and prevent the generation of waste, in order to achieve a high level of protection of the environment taken as a whole. IED achieves this aim by setting operational conditions, technical requirements and emission limit values to meet the requirements set out in Articles 11 and 18 of the IED. These requirements may in some circumstances dictate tighter emission limits and controls than those set out in the BAT conclusions or Chapter IV of IED on waste incineration and co-incineration plants. 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. The gathering of evidence is a continuing process. Although gathering evidence is not our role we keep the available evidence under review. The 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."

The European Integrated Pollution Prevention and Control Bureau stated in the Reference Document on the Best Available Techniques for Waste Incineration August 2006 "European health impact assessment studies, on the basis of current evidence and modern emission performance, suggest that the local impacts of incinerator emissions to air are either negligible or not detectable."

**HPA** (now **PHE**) in 2009 stated 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".

In 2012 the UK Small Area Health Statistics Unit (SAHSU) at Imperial College was commissioned by Public Health England (PHE) to carry out a study to extend the evidence base and to provide further information to the public about any potential reproductive and infant health risks from municipal waste incineration (MWIs).

A number of papers have been published by SAHSU since 2012 which show no effect on birth outcomes. One paper in the study looked at exposure to emissions from MWIs in the UK and concluded that exposure was low. Subsequent papers found no increased risk of a range of birth outcomes (including stillbirth and infant mortality) in relation to exposure to PM10 emissions and proximity to MWIs, and no association with MWIs opening on changes in risks of infant mortality or sex ratio.

The final part of the study, published on 21/06/19, found no evidence of increased risk of congenital anomalies from exposure to MWI chimney emissions, but a small potential increase in risk of congenital anomalies for children born within ten kilometres of MWIs. The paper does not demonstrate a causal effect, and it acknowledges that the observed results may well be down to not fully adjusting the study for factors such as other sources of pollution around MWIs or deprivation.

PHE have stated that 'While the conclusions of the study state that a causal effect cannot be excluded, the study does not demonstrate a causal association and makes clear that the results may well reflect incomplete control for confounding i.e. insufficiently accounting for other factors that can cause congenital anomalies, including other sources of local pollution. This possible explanation is supported by the fact no increased risk of congenital anomalies was observed as a result of exposure to emissions from an incinerator.'

Following this study, PHE have further stated that 'PHE's position remains that modern, well run and regulated municipal waste incinerators are not a significant risk to public health, and as such our advice to you [i.e. the Environment Agency] on incinerators is unchanged.'

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 produced 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 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, furans and dioxin like PCBs, 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.

Models are available to predict the dioxin, furan and dioxin like PCBs 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 include the HHRAP 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 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, furans and dioxin like PCB's of 2 picograms I-TEQ/Kg-body weight/day (N.B. a picogram is a million millionths (10<sup>-12</sup>) of a gram).

In addition to an assessment of risk from dioxins, furans and dioxin like PCB's, the HHRAP model enables a risk assessment from human intake of a range of heavy metals. In principle, the respective ES for these metals are protective of human health. It is not therefore necessary to model the human body intake.

COMEAP developed a methodology based on the results of time series epidemiological studies which allows calculation of the public health impact of exposure to the classical air pollutants (NO<sub>2</sub>, SO<sub>2</sub> 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<sub>x</sub>, SO<sub>2</sub> and particulates cannot be screened out as insignificant in the 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 methodology set out in our guidance for comparison for most pollutants (including metals) and dioxin intake model using the HHRAP model as described above for dioxins, furans and dioxin like PCBs. Where an alternative approach is adopted for dioxins, we check the predictions ourselves.

## **v) Consultations**

As part of our normal procedures for the determination of a permit application, we consult with Local Authorities, Local Authority Directors of Public Health, FSA and PHE. 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, Furans and Dioxin like PCBs**

For dioxins, furans and dioxin like PCBs, 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 their food and water were sourced from the locality where the deposition of dioxins, furans and dioxin like PCBs 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, furans and dioxin like PCBs at all receptors, resulting from emissions from the proposed facility, were significantly below the recommended TDI levels. The results show that the intake at most impacted receptor (child at Clay Hall Farm) is **0.74%** of the TDI.

Receptor	adult	child
Airedale Cricket Club	1.52x10 <sup>-3</sup>	3.91x10 <sup>-3</sup>
Clay Hall Farm	1.02x10 <sup>-2</sup>	1.47x10 <sup>-2</sup>

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

Based on a paper by the European Food Safety Authority (EFSA) the COT have recently revised their advice on dioxin/dioxin like PCBs. This has resulted in a change from a tolerable daily intake (TDI) of 2pg I-TEQ/Kg-body weight to a tolerable **weekly** intake (TWI) of 2pg I-TEQ/Kg-body weight. We have checked the Applicant’s assessment taking the revised tolerable intake into account and we are satisfied that the conclusions of the assessment are not affected and that impacts will not be significant.

The FSA has reported that 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. A report in 2012 showed that Dioxin and PCB levels in food have fallen slightly since 2001. In 2001, the average daily intake by adults in the UK from diet was 0.9 pg WHO-TEQ/kg bodyweight. The additional daily intake predicted by the modelling as shown in the table above is substantially below this figure.

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 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  $\mu\text{m}$ , at the maximum flow rate anticipated. The filter efficiency for larger particles will be at least as high as this. This means that particulate monitoring data effectively captures everything above 0.3  $\mu\text{m}$  and much of what is smaller. It is not expected that particles smaller than 0.3  $\mu\text{m}$  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.

Nano-particles are considered to refer to those particulates less than 0.1  $\mu\text{m}$  in diameter ( $\text{PM}_{0.1}$ ). 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 (now PHE) 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  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  with effects on health derived by 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. PHE note 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  $\text{PM}_{2.5}$  by 1  $\mu\text{g}/\text{m}^3$  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.”

PHE also point out that in 2007 incinerators contributed 0.02% to ambient ground level PM<sub>10</sub> levels compared with 18% for road traffic and 22% for industry in general. PHE noted that in a sample collected in a day at a typical urban area the proportion of PM<sub>0.1</sub> is around 5-10% of PM<sub>10</sub>. It goes on to say that PM<sub>10</sub> includes and exceeds PM<sub>2.5</sub> which in turn includes and exceeds PM<sub>0.1</sub>. The National Atmospheric Emissions Inventory (NAEI) figures show that in 2016 municipal waste incineration contributed 0.03% to ambient ground level PM<sub>10</sub> levels and 0.05% to ambient ground level PM<sub>2.5</sub> levels. The 2016 data also shows that road traffic contributed to 5.35% of PM<sub>10</sub> and 4.96% of PM<sub>2.5</sub> and that domestic wood burning contributed 22.4% to PM<sub>10</sub> and 34.3% of PM<sub>2.5</sub> levels.

This is consistent with the assessment of this application which shows emissions of PM<sub>10</sub> to air to be insignificant.

In 2016 a paper by Jones and Harrison concluded that ‘ultrafine particles (<100nm) in flue gases from incinerators are broadly similar to those in urban air and that after dispersion with ambient air ultrafine particle concentrations are typically indistinguishable from those that would occur in the absence of the incinerator.

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 PHE 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 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 of pollutants have either screened out as insignificant; or where they have not been screened out as insignificant, the assessment still shows that the predicted environmental concentrations are within air quality standards or environmental action levels.

The Environment Agency has reviewed the methodology employed by the Applicant to carry out the health impact assessment. We are satisfied with the Applicant's conclusions that there will not be a significant impact on health.

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 relevant 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.

PHE and the Local Authority Director of Public Health were consulted on the Application. PHE did not have any significant concerns regarding the risk to the health of humans from the installation. The local authority director of public health and Food Standards Agency was also consulted during the permit determination process and no concerns were received. Details of the consultation on this Application can be found in Annex 4.

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.

Based on a paper by the European Food Safety Authority (EFSA) the COT have recently revised their advice on dioxin/dioxin like PCBs. This has resulted in a change from a tolerable daily intake (TDI) of 2pg I-TEQ/Kg-body weight to a tolerable weekly intake (TWI) of 2pg I-TEQ/Kg-body weight. We have checked the Applicant's assessment taking the revised tolerable intake into account and we are satisfied that the conclusions of the assessment are not affected and that impacts will not be significant.

#### **5.4 Impact on Habitats sites, SSSIs, non-statutory conservation sites etc.**

##### **5.4.1 Sites Considered**

The following Habitats (i.e. Special Areas of Conservation, Special Protection Areas and Ramsar) sites are located within 10 km of the Installation:

- South Pennine Moors (SAC and SPA)

There are no Sites of Special Scientific Interest within 2 km of the proposed Installation.



The following non-statutory local wildlife and conservation sites are located within 2 km of the Installation:

- St Ive's Estate
- How Beck Wood Riddlesden
- Marley Bog
- Transfield Wood
- Ewe Hills
- Harden Moor and Deepcliffe Wood
- Stockbridge Nature Reserve
- Beechcliffe Ings
- Beechcliffe Ox-bow
- Elam Wood
- Leeds-Liverpool Canal (part Leeds)
- Park Wood
- Hollin Plantation

#### 5.4.2 Habitats Assessment

The Applicant's Habitats assessment was reviewed by the Environment Agency's technical specialists for modelling, air quality, conservation and ecology technical services, who agreed with the assessment's conclusions, that there would be no likely significant effect on the interest feature(s) of the protected site(s).

Pollutant	ES / ES ( $\mu\text{g}/\text{m}^3$ )	Back-ground ( $\mu\text{g}/\text{m}^3$ )	Process Contribution (PC) ( $\mu\text{g}/\text{m}^3$ )	PC as % of ES	Predicted Environmental Concentration (PEC) ( $\mu\text{g}/\text{m}^3$ )	PEC as % ES
Direct Impacts <sup>2</sup>						
NO <sub>x</sub> Annual	30	-	0.12	0.096	-	-
NO <sub>x</sub> Daily Mean	75	-	1.16	1.54	-	-
SO <sub>2</sub>	20 (1)	-	0.0144	0.072	-	-
Ammonia	1 (1)	-	0.004	0.40	-	-
HF Weekly Mean	0.5	-	<0.005	<1%	-	-
HF Daily Mean	5	-	0.0095	0.19	-	-
Deposition Impacts <sup>2</sup>						
N Deposition (kg N/ha/yr)	5	21.84 to 25.34	0.045	0.90	-	-
Acidification (keq/ha/yr)	0.569	1.82 to 2.34	0.0056	0.99		

(1) The lichen and bryophyte sensitivity standards for ammonia has been assigned for this assessment as the presence of these features has been recorded in the site

Management Plan for at least one of the sections of the site. For SO<sub>2</sub>, the Applicant used a critical level of 20. Even if a precautionary value of 10 was used the PC would still screen out as insignificant.

(2) Direct impact units are µg/m<sup>3</sup> and deposition impact units are kg N/ha/yr or keq/ha/yr.

### **Impacts alone**

We were satisfied that all impacts would not cause an adverse impact alone because the process contributions, except for acidification were screened out as insignificant.

For acidification dispersion modelling showed the PC below 1%. However our assessment of the modelling showed that the PC could be slightly higher than the 1% insignificant screening threshold. We conservatively made our assessment based on a PC of up to 1.5%. The background acidification level at the area to the north east is between 1.81 keq/ha/yr and 2.34 keq/ha/yr which is between 318% and 411% of the critical load.

Habitat H7130 Blanket Bog is present in the units of the habitat site to the north east of the proposed installation. The APIS website describes it as being in unfavourable recovering condition.

We are satisfied that there will be no adverse effect alone because:

- The maximum process contribution is small at 1.5% of the critical load
- The process contribution is <0.5% when compared to existing background levels.
- The background is between 318% and 411% of the critical load. The habitat is in a recovering condition even with the critical load being exceeded. We are satisfied that such a small increase from the proposed installation will not have an adverse effect alone and will not change the recovering status of the habitat.

### **In-combination impacts**

We considered whether the proposed Installation could act in combination with other plans, proposals or permissions (PPPs). The main PPPs that could act in combination would be other PPPs that could emit similar combustion emissions to the proposed installation. We also checked for intensive farms that could give rise to ammonia emissions. Existing operating plants will already be included in the consideration of background pollution levels. So the in combination assessment concentrated on PPPs that are not yet operating.

We checked for permit applications that we have in progress and permitted sites that have not yet started to operate. We did not find any sites that have the potential to act in combination.

We consulted the following authorities to check if they have any PPPs that could act in combination:

- Bradford City Council
- Kirklees Council
- Harrogate Borough Council
- Craven District Council
- Leeds City Council
- Burnley Borough Council
- Calderdale Council
- Pendle Borough Council

Information that was provided is summarised below:

- Lists of sites regulated by the authorities. Any emissions from these sites are already included in the current background levels and have therefore already been taken into account. No further assessment of in combination effects was required.
- Development plans and habitat risk assessments. These showed plans that authorities have for additional housing and other developments in towns around the local area. The assessments identified that the developments could result in increased background levels mainly from traffic increases.

Although it is possible that background levels will increase due to these PPPs we are satisfied that in combination effects with the proposed installation will not lead to an adverse effect as explained below.

The acidification process contribution is 1.5% of the critical load. The Current level of acidification (background) is between 318% and 411% of the critical load. Acidification is dominated by existing background levels, with the process contribution from the installation being <0.5% of the existing background levels. Any further small increase in background levels from other PPPs will not affect the overall conclusion that the contribution from the proposed installation is negligible and so in combination effects will not cause an adverse effect.

The highest process contribution for nutrient enrichment was in the area to the north east of the proposed installation at 0.53% of the critical load. The Current level of nitrogen deposition (background) is between 437% and 506% of the critical load. Nitrogen deposition is dominated by current background levels with the process contribution from the installation being ~ 0.1% of the existing background levels. Any further small increase in background levels from other PPPs will not affect the overall conclusion that the contribution

from the proposed installation is negligible and so in combination effects will not cause an adverse effect.

Dispersion modelling showed that the process contribution for NO<sub>x</sub>, SO<sub>2</sub>, NH<sub>3</sub> and HF were less than 1% of annual critical levels and <10% of short term critical levels. They are therefore at the point that we consider them to be insignificant.

As identified above an increase in road traffic could give rise to increased emissions, mainly of NO<sub>x</sub>. However a small increase in background levels will not affect the conclusion that emissions from the proposed Installation are negligible and any in combination effects will not have an adverse effect

We consulted with Natural England on our assessment. Natural England agreed with our conclusion of no adverse effect.

#### 5.4.3 Assessment of other conservation sites

Conservation sites are protected in law by legislation. The Habitats Directive provides the highest level of protection for SACs and SPAs, domestic legislation provides a lower but important level of protection for SSSIs. Finally the Environment Act provides more generalised protection for flora and fauna rather than for specifically named conservation designations. It is under the Environment Act that we assess other sites (such as local wildlife sites) which prevents us from permitting something that will result in significant pollution; and which offers levels of protection proportionate with other European and national legislation. However it should not be assumed that because levels of protection are less stringent for these other sites that they are not of considerable importance. Local sites link and support EU and national nature conservation sites together and hence help to maintain the UK's biodiversity resilience.

For SACs SPAs, Ramsars and SSSIs we consider the contribution PC and the background levels in making an assessment of impact. In assessing these other sites under the Environment Act we look at the impact from the Installation alone in order to determine whether it would cause significant pollution. This is a proportionate approach, in line with the levels of protection offered by the conservation legislation to protect these other sites (which are generally more numerous than Natura 2000 or SSSIs) whilst ensuring that we do not restrict development.

Critical levels and loads are set to protect the most vulnerable habitat types. Thresholds change in accordance with the levels of protection afforded by the legislation. Therefore the thresholds for SAC SPA and SSSI features are more stringent than those for other nature conservation sites.

Therefore we would generally conclude that the Installation is not causing significant pollution at these other sites if the PC is less than the relevant critical level or critical load, provided that the Applicant is using BAT to control emissions.

We are satisfied that the PCs will be below the critical levels or loads. We are therefore satisfied that the Installation will not cause significant pollution at the sites. The Applicant is required to prevent, minimise and control emissions using BAT, this is considered further in Section 6.

#### 5.4.4 Assessment of other habitats and Species

As part of our assessment we check on protected sites, habitats and species which have the potential to be impacted by the activity being proposed. This is done using our own internal screening tools to generate a list of sites and species. We also had a large number of consultation responses expressing concern over impacts on nearby sites and species.

According to our records, section 41 NERC BAP habitats which are not overlain by LWS site designations are either further away from the Installation than the LWS designations themselves and are similar in nature to the LWSs, or could only be affected by water emissions. Therefore as there is no significant pollution at the designated LWSs and the only emission to water is clean surface water run-off, we are confident that there will be no significant pollution at these other habitats or on protected species.

### **5.5 Impact of abnormal operations**

Article 50(4)(c) of IED requires that waste incineration and co-incineration plants shall operate an automatic system to prevent waste feed 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. Notwithstanding this, Article 46(6) allows for the continued incineration and co-incineration of waste under such conditions provided that this period does not (in any circumstances) exceed 4 hours uninterrupted continuous operation or the cumulative period of operation does not exceed 60 hours in a calendar year. This is a recognition that the emissions during transient states (e.g. start-up and 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.

For incineration plant, IED sets backstop limits for particulates, CO and TOC which must continue to be met at all times. 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<sup>3</sup> (as a half hourly average) which is five times the limit in normal operation.

Article 45(1)(f) requires that the permit shall specify the maximum permissible period of any technically unavoidable stoppages, disturbances, or failures of the purification devices or the measurement devices, during which the concentrations in the discharges into the air may exceed the prescribed emission limit values.

These 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. This is less than 1% of total operating hours and so 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 ES. For the most part therefore consideration of abnormal operations is limited to consideration of its impact on short term ESs.

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

- Dioxin emissions of 100 times those of normal operation
- NO<sub>x</sub> emissions of 550 mg/m<sup>3</sup>
- Particulate emissions of 150 mg/m<sup>3</sup>
- Metal emissions increased at the same proportion as particulate emissions.
- SO<sub>2</sub> emissions of 400 mg/m<sup>3</sup>
- HCl emissions of 600 mg/m<sup>3</sup>
- HF emissions of 8 mg/m<sup>3</sup>

This is a worst case scenario in that these 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 Applicant's short-term environmental impact is summarised in the table below.

Pollutant	EQS / EAL		Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	µg/m <sup>3</sup>			µg/m <sup>3</sup>	% of EAL	µg/m <sup>3</sup>	% of EAL
NO <sub>2</sub>	200	2	58	29.04	14.5	87.04	43.5
PM <sub>10</sub>	50	3	34	0.59	1.18	34.59	69.2
SO <sub>2</sub>	266	4	87	60	22.6	147	55.3
	350	5	34	42	12.00	76	21.7

	125		14	30	24.00	44	35.2
HCl	750	6	2.02	274	36.53	276.0	36.80
HF	160	6	4.92	3.66	2.2875	8.58	5.4
Hg	7.5	1	0.0042	0.343	4.57	0.34720	4.629
Sb	150	1	0.0017	0.381	0.25	0.38270	0.255
Cu	200	1	0.0856	0.381	0.19	0.46660	0.233
Mn	1500	1	0.00132	0.381	0.38	0.38232	0.0255
V	1	1	0.0023	0.107	0.38	0.10930	10.9300
PCBs	6	1		0.23	3.83	0.23000	3.8333
Cr (II)(III)	150	1	0.009	0.381	0.25	0.39000	0.2600

- 1 1-hr Maximum
- 2 99.79<sup>th</sup> %ile of 1-hour means
- 3 90.41<sup>st</sup> %ile of 24-hour means
- 4 99.9<sup>th</sup> ile of 15-min means
- 5 99.73<sup>rd</sup> %ile of 1-hour means
- 6 1-hour average

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 ES: all metals and PCBs

Also from the table above all other emissions (which were not screened out as insignificant) have been assessed as being unlikely to give rise to significant pollution in that the predicted environmental concentration is less than 100% of short term ES.

We are therefore satisfied that it is not necessary to further constrain the conditions and duration of the periods of abnormal operation beyond those permitted under Chapter IV of the IED.

We have not assessed the impact of abnormal operations against long term ESs for the reasons set out above. Except that if dioxin emissions were at 10 ng/m<sup>3</sup> for the maximum period of abnormal operation, this would result in an increase of approximately 70% in the TDI reported in section 5.3.3. In these circumstances the TDI would be 0.0247 pg(I-TEQ/ kg-BW/day), which is 1.24 % of the COT TDI. At this level, emissions of dioxins will still not pose a risk to human health. As stated in section 5.3 the recent change to TWI does not change the conclusion of no significant impact.

## **5.6 Impact of emissions during OTNOC**

IED article 14 (3) states that BAT conclusions shall be the reference for setting the permit conditions. Article 14 (3) states that the competent authority

shall set emission limit values that, under normal operating conditions, do not exceed the emission levels associated with the best available techniques as laid down in the decisions on BAT conclusions. These limits are set in Table S3.1. In addition, the IED also sets maximum limits for certain emissions that should not be exceeded and would still apply outside normal operating conditions. These limits are set in Tale S3.1(b) and are normally higher than the BAT AELs

The IED and BAT conclusions therefore make provision for plants to have short term fluctuations where BAT AELs could be exceeded but the IED limits are not other than under abnormal operation. These periods are called 'Other than normal operation.' (OTNOC). Although the BAT AELs can be exceeded during OTNOC setting BAT AELs as emission limits is controlling emissions because plants will need to ensure that the plant is capable of meeting the BAT AELs during normal operation which will apply for most of the time the plant is operational.

Although BAT AELs do not apply during periods of OTNOC the IED annex VI emission limits do still apply.

Periods of OTNOC will be of short duration and limited in nature. The Applicant used the IED annex VI half hour average limits to assess short term impacts, therefore no further specific assessment of the impacts during OTNOC was required.

Pre-operational condition PO1 requires the Operator to have an EMS and that the EMS will include an OTNOC management plan in line with BAT conclusions 1 and 18. The Operator will be required to identify potential OTNOC scenarios and any required monitoring in their management plan and will require our approval of scenarios before they can be classed as OTNOC. We may impose further monitoring and limits, through table S3.1(b) of the Permit, once we have approved the OTNOC scenarios.

## **6. Application of Best Available Techniques**

### **6.1 Scope of Consideration**

In this section, we explain how we have determined whether the Applicant's proposals 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 in particular control measures for the emissions which were not screened out as insignificant in the previous section on minimising the installation's environmental impact.



- 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, the prevention and minimisation of Persistent Organic Pollutants (POPs) must be considered, as we explain below.

Chapter IV of the IED specifies a set of maximum emission limit values. Although these limits are designed to be stringent, and to provide a high level of environmental protection, they do not necessarily reflect what can be achieved by new plant. Article 14(3) of the IED says that BAT Conclusions shall be the reference for setting the permit conditions, so it may be possible and desirable to achieve emissions below the limits referenced in Chapter IV. The BAT conclusions were published in December 2019.

Even if the Chapter IV limits are appropriate, operational controls complement the emission limits and should generally result in emissions below the maximum allowed; whilst the limits themselves provide headroom to allow for unavoidable process fluctuations. Actual emissions are therefore almost certain to be below emission limits in practice, because any Operator who sought to operate its installation continually at the maximum permitted level would almost inevitably breach those limits regularly, simply by virtue of normal fluctuations in plant performance, resulting in enforcement action (including potentially prosecution) being taken. Assessments based on, say, Chapter IV limits are therefore “worst-case” scenarios.

Should the Installation, once in operation, emit at rates significantly below the limits included in the Permit, we will consider tightening ELVs appropriately. We are, however, satisfied that emissions at the permitted limits would ensure a high level of protection for human health and the environment in any event.

#### 6.1.1 Consideration of Furnace Type

The prime function of the furnace is to achieve maximum combustion of the waste. Chapter IV of the IED requires that the plant (furnace in this context) should be designed to deliver its requirements. The main requirements of Chapter IV 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 BREF states that Municipal Waste can be incinerated in traveling grates, rotary kilns and fluidised bed technology. Fluidised bed technology requires MSW to be of a certain particle size range, which usually requires some degree of pre-treatment even when the waste is collected separately. The BREF describes other process such as gasification and pyrolysis. The BREF notes that some of the processes have encountered technical and economic problems when scaled up to commercial, industrial sizes. Some are used on a commercial basis in Japan and are being tested in demonstration plants in Europe but still only have a small share of overall capacity.

Section 4.3 of the BREF provides a comparison of combustion and thermal treatment technologies, used in Europe and factors affecting their applicability and operational suitability for various waste types. There is also 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.

Overall, any of the furnace technologies listed below 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 NO<sub>x</sub> as the furnace choice could have an effect on the amount of unabated NO<sub>x</sub> produced
- energy consumption – whole plant, waste preparation, effect on GWP
- Need, if any, for further processing of residues to comply with TOC
- Costs

**Summary comparison of thermal treatment technologies (reproduced from the Waste Incineration BREF)**

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Moving grate (air-cooled)	<ul style="list-style-type: none"> <li>• Low to medium heat values (LCV 5 – 16.5 GJ/t)</li> <li>• Municipal and other heterogeneous solid wastes</li> <li>• Can accept a proportion of sewage sludge and/or medical waste with municipal waste</li> <li>• Applied at most modern MSW installations</li> </ul>	<ul style="list-style-type: none"> <li>• 1 to 50 t/h with most projects 5 to 30 t/h.</li> <li>• Most industrial applications not below 2.5 or 3 t/h.</li> </ul>	<ul style="list-style-type: none"> <li>• Widely proven at large scales.</li> <li>• Robust</li> <li>• Low maintenance cost</li> <li>• Long operational history</li> <li>• Can take heterogeneous wastes without special preparation</li> </ul>	<ul style="list-style-type: none"> <li>• Generally not suited to powders, liquids or materials that melt through the grate</li> </ul>	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: <ul style="list-style-type: none"> <li>• higher heat value waste is treatable</li> <li>• Better combustion control possible.</li> </ul>	As air-cooled grates but: <ul style="list-style-type: none"> <li>• risk of grate damage/leaks</li> <li>• higher complexity</li> </ul>	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	<p>Can accept liquids and pastes as well as gases</p> <p>Solid feeds more limited than grate (due to refractory damage)</p> <p>often applied to hazardous Wastes</p>	<16 t/h	<ul style="list-style-type: none"> <li>• Very well proven</li> <li>• Broad range of wastes</li> <li>• Good burn out even of HW</li> </ul>	Throughputs lower than grates	TOC <3 %	Higher specific cost due to reduced capacity
Fluid bed - bubbling	<ul style="list-style-type: none"> <li>• Wide range of CV (5-25 MJ/kg)</li> <li>• Only finely divided consistent wastes.</li> <li>• Limited use for raw MSW</li> <li>• Often applied to sludges co fired with RDF, shredded MSW, sludges, poultry manure</li> </ul>	Up to 25 t/h	<ul style="list-style-type: none"> <li>• Good mixing</li> <li>• Fly ashes of good leaching quality</li> </ul>	<ul style="list-style-type: none"> <li>• Careful operation required to avoid clogging bed.</li> <li>• Higher fly ash quantities.</li> </ul>	TOC <1%	<p>FGT cost may be lower.</p> <p>Costs of waste preparation</p>
Fluid bed - circulating	<ul style="list-style-type: none"> <li>• Wide range of CV (6-25 MJ/kg)</li> <li>• Only finely divided consistent wastes.</li> <li>• Limited use for raw MSW</li> <li>• Often applied to sludges co-fired with RDF, coal, wood waste</li> </ul>	Up to 70 t/h	<ul style="list-style-type: none"> <li>• Good mixing</li> <li>• High steam parameters up to 500°C</li> <li>• Greater fuel flexibility than BFB</li> <li>• Fly ashes of good leaching quality</li> </ul>	<ul style="list-style-type: none"> <li>• Cyclone required to conserve bed material</li> <li>• Higher fly ash quantities</li> </ul>	TOC <1%	<ul style="list-style-type: none"> <li>• FGT cost may be lower.</li> <li>• Costs of waste preparation</li> </ul>

<b>Technique</b>	<b>Key waste characteristics and suitability</b>	<b>Throughput per line</b>	<b>Advantages</b>	<b>Disadvantages / Limitations of use</b>	<b>Bottom Ash Quality</b>	<b>Cost</b>
Spreader - stoker combustor	<ul style="list-style-type: none"> <li>• RDF and other particle feeds</li> <li>• Poultry manure</li> <li>• Wood wastes</li> </ul>	No information	<ul style="list-style-type: none"> <li>• Simple grate construction</li> <li>• Less sensitive to particle size than FB</li> </ul>	Only for well defined mono-streams	No information	No information
Gasification - fixed bed	<ul style="list-style-type: none"> <li>• Mixed plastic wastes</li> <li>• Other similar consistent streams</li> <li>• Gasification less widely used/proven than incineration</li> </ul>	Up to 20 t/h	<ul style="list-style-type: none"> <li>• Low leaching residue</li> <li>• Good burnout if oxygen blown</li> <li>• Syngas available</li> <li>• Reduced oxidation of recyclable metals</li> </ul>	<ul style="list-style-type: none"> <li>• Limited waste feed</li> <li>• Not full combustion</li> <li>• High skill level</li> <li>• Tar in raw gas</li> <li>• Less widely proven</li> </ul>	<ul style="list-style-type: none"> <li>• Low leaching bottom ash</li> <li>• Good burnout with oxygen</li> </ul>	High operating/maintenance costs
Gasification - entrained flow	<ul style="list-style-type: none"> <li>• Mixed plastic wastes</li> <li>• Other similar consistent streams</li> <li>• Not suited to untreated MSW</li> <li>• Gasification less widely used/proven than incineration</li> </ul>	Up to 10 t/h	<ul style="list-style-type: none"> <li>• Low leaching slag</li> <li>• Reduced oxidation of recyclable metals</li> </ul>	<ul style="list-style-type: none"> <li>• Limited waste feed</li> <li>• Not full combustion</li> <li>• High skill level</li> <li>• Less widely proven</li> </ul>	low leaching slag	<ul style="list-style-type: none"> <li>• High operation/maintenance costs</li> <li>• High pre-treatment costs</li> </ul>
Gasification - fluidised bed	<ul style="list-style-type: none"> <li>• Mixed plastic wastes</li> <li>• Shredded MSW</li> <li>• Shredder residues</li> <li>• Sludges</li> <li>• Metal rich wastes</li> <li>• Other similar consistent streams</li> <li>• Gasification less widely used/proven than incineration</li> </ul>	5 – 20 t/h	<ul style="list-style-type: none"> <li>• Can use low reactor temperatures e.g. for Al recovery</li> <li>• Separation of main non combustibles</li> <li>• Can be combined with ash melting</li> <li>• Reduced oxidation of recyclable metals</li> </ul>	<ul style="list-style-type: none"> <li>• Limited waste size (&lt;30cm)</li> <li>• Tar in raw gas</li> <li>• Higher UHV raw gas</li> <li>• Less widely proven</li> </ul>	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	<ul style="list-style-type: none"> <li>• Pre-treated MSW</li> <li>• High metal inert streams</li> <li>• Shredder residues/plastics</li> <li>• Pyrolysis is less widely used/proven than incineration</li> </ul>	~ 5 t/h (short drum) 5 – 10 t/h (medium drum)	<ul style="list-style-type: none"> <li>• No oxidation of metals</li> <li>• No combustion energy for metals/inert</li> <li>• In reactor acid neutralisation possible</li> <li>• Syngas available</li> </ul>	<ul style="list-style-type: none"> <li>• Limited wastes</li> <li>• Process control and engineering critical</li> <li>• High skill level</li> <li>• Not widely proven</li> <li>• Need market for syngas</li> </ul>	<ul style="list-style-type: none"> <li>• Dependent on process temperature</li> <li>• Residue produced requires further processing and sometimes combustion</li> </ul>	High pre-treatment, operation and capital costs

The Applicant has carried out a review of the following candidate furnace types:

- Fixed Bed
- Rotary Kiln
- Fluidised Bed
- Gasification or Pyrolysis
- Moving Grate

The Applicant's assessment is summarised below.

Fixed bed incinerators are a proven technology but have limited potential to deal with variations in waste.

Rotary kilns provide good burnout but use more excess air than other technologies and so may have reduced efficiency.

Fluidised bed technology is expensive and requires a uniform fuel with small particle size and is therefore unsuited to mixed waste.

Gasification or pyrolysis can achieve low emissions but limited experience in UK and reliability and long term maintenance costs are uncertain.

Moving grate is a robust and proven technology in the UK. It allows agitation of the waste, improving aeration and combustion. It can handle waste with a wide range of varying size, CV and moisture content and so is well suited to mixed waste. Better energy efficiency than rotary kiln.

The Applicant has proposed to use a furnace technology comprising a moving grate furnace which is identified in the tables above as being considered BAT in the BREF or TGN for this type of waste feed.

The Applicant proposes to use gasoil as support fuel for start-up, shut down and for the auxiliary burners. The choice of support fuel is based on having a guaranteed supply.

### Boiler Design

In accordance with BAT 30 of the BAT C and our Technical Guidance Note, EPR 5.01, 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.

Any of the options listed in the BREF and summarised in the table above can be BAT. The Applicant has chosen a furnace technique that is listed in the BREF and we are satisfied that the Applicant has provided sufficient

justification to show that their technique is BAT. This is not to say that the other techniques could not also be BAT, but that the Applicant has shown that their chosen technique is at least comparable with the other BAT options. We believe that, based on the information gathered by the BREF process, the chosen technology will achieve the requirements of Chapter IV of the IED 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 as far as practicable. 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 flue gas cleaning system (FGC) 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 (FGC) systems as:

- type of waste, its composition and variation
- type of combustion process, and its size
- flue-gas flow and temperature
- flue-gas content, including magnitude and rate of composition fluctuations
- 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
- noise
- arrangement of different flue-gas cleaning devices if possible with decreasing flue-gas temperatures from boiler to stack

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

### 6.2.1 Particulate Matter

<b>Particulate matter</b>				
<b>Technique</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Optimisation</b>	<b>Defined as BAT in BREF or TGN for:</b>
<b>Bag / Fabric filters (BF)</b>	Reliable abatement of particulate matter to below 5mg/m <sup>3</sup>	Max temp 250°C Higher energy use than ESP Sensitive to condensation and corrosion	Multiple compartments  Bag burst detectors	Most plants
<b>Wet scrubbing</b>	May reduce acid gases simultaneously.	Not normally BAT.  Liquid effluent	Require reheat to prevent visible plume and dew point	Where scrubbing required for other

		produced	problems.	pollutants
<b>Ceramic filters</b>	High temperature applications  Smaller plant.	May “blind” more than fabric filters		Small plant.  High temperature gas cleaning required.
<b>Electrostatic precipitators</b>	Low pressure gradient. Use with BF may reduce the energy consumption of the induced draft fan.	Not normally BAT by itself Risk of dioxin formation if used in 200-400°C range		When used with other particulate abatement plant

The Applicant proposes to use fabric filters for the abatement of particulate matter. Fabric filters provide reliable abatement of particulate matter to below 5 mg/m<sup>3</sup> and are BAT for most installations. The Applicant proposes to use multiple compartment filters with burst bag detection to minimise the risk of increased particulate emissions in the event of bag rupture.

Emissions of particulate matter have been previously screened out as insignificant, and so the Environment Agency agrees that the Applicant’s proposed technique is BAT for the installation.

## 6.2.2 Oxides of Nitrogen

<b>Oxides of Nitrogen : Primary Measures</b>				
<b>Technique</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Optimisation</b>	<b>Defined as BAT in BREF or TGN for:</b>
<b>Low NOx burners</b>	Reduces NOx at source		Start-up, supplementary firing.	Where auxiliary burners required.
<b>Starved air systems</b>	Reduce CO simultaneously.			Pyrolysis, Gasification systems.
<b>Optimise primary and secondary air injection</b>				All plant.
<b>Flue Gas Recirculation (FGR)</b>	Reduces the consumption of reagents used for secondary NOx control.  May increase overall energy recovery	Some applications experience corrosion problems.  Can result in elevated CO and other products of incomplete combustion		Justify if not used

<b>Oxides of Nitrogen : Secondary Measures (BAT is to apply Primary Measures first)</b>				
<b>Technique</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Optimisation</b>	<b>Defined as BAT in BREF or TGN for:</b>
<b>Selective catalytic reduction (SCR)</b>	NOx emissions 40-150mg/ m <sup>3</sup>  Reduces CO, VOC, dioxins	Expensive.  Re-heat required – reduces plant efficiency		All plant
<b>SCR by catalytic filter bags</b>	50-120 mg/m <sup>3</sup>			Applicable to new and existing plants with or without existing SNCR.  Can be used with NH <sub>3</sub> as slip catalyst with SNCR

<b>Selective non-catalytic reduction (SNCR)</b>	NO <sub>x</sub> emissions 80 -180 mg/m <sup>3</sup> Lower energy consumption than SCR Lower costs than SCR	Relies on an optimum temperature around 900 °C, and sufficient retention time for reduction  May lead to Ammonia slip	Port injection locations	All plant unless lower NO <sub>x</sub> release required for local environmental protection.
<b>Reagent Type: Ammonia</b>	Likely to be BAT	More difficult to handle Lower nitrous oxide formation  Narrower temperature window		All plant
<b>Reagent Type: Urea</b>	Likely to be BAT	Higher N <sub>2</sub> O emissions than ammonia, optimisation particularly important		All plant

The Applicant proposes to implement the following primary measures:

- Low NO<sub>x</sub> burners – this technique reduces NO<sub>x</sub> at source and is defined as BAT where auxiliary burners are required.
- Optimise primary and secondary air injection – this technique is BAT for all plant.
- Flue gas recirculation (FGR) – this technique reduces the consumption of reagents for secondary NO<sub>x</sub> control and can increase overall energy recovery, although in some applications there can be corrosion problems. FGR was not proposed on the basis that NO<sub>x</sub> reduction is achieved through advanced stages combustion with secondary air injected through several staged nozzles to achieve through mixing. The Applicant concluded that FGR would give minimal environmental benefit for additional cost.

There are three recognised techniques for secondary measures to reduce NO<sub>x</sub>. These are Selective Catalytic Reduction (SCR), SCR by catalytic filter bags and Selective Non-Catalytic Reduction (SNCR) with or without catalytic filter bags. For each technique, there is a choice of urea or ammonia reagent.

SCR can reduce NO<sub>x</sub> levels to below 50 mg/m<sup>3</sup> and can be applied to all plant, it is generally more expensive than SNCR and requires reheating of the waste gas stream which reduces energy efficiency, periodic replacement of the catalysts also produces a hazardous waste. The use of SCR by catalytic filter bags can reduce emissions to 50 -120 mg/m<sup>3</sup> with low investment costs. SNCR can typically reduce NO<sub>x</sub> levels to between 80 and 180 mg/m<sup>3</sup>, it relies on an optimum temperature of around 900 °C and sufficient retention time for

reduction. SNCR is more likely to have higher levels of ammonia slip. The technique can be applied to all plant unless lower NO<sub>x</sub> releases are required for local environmental protection. Urea or ammonia can be used as the reagent with either technique, urea is somewhat easier to handle than ammonia and has a wider operating temperature window, but tends to result in higher emissions of N<sub>2</sub>O. Both reagents are BAT, and the use of one over the other is not normally significant in environmental terms.

The Applicant proposes to use SNCR with ammonia as the reagent.

Emissions of NO<sub>x</sub> cannot be screened out as insignificant. Therefore the Applicant considered the cost and benefits of alternative techniques. The cost per tonne of NO<sub>x</sub> abated over the projected life of the plant has been calculated and compared with the environmental impact as shown in the table below.

	Cost of NO <sub>x</sub> removal £/tonne	PC (long term)	PEC (long term)
SCR	14,500	0.72	29.7
SNCR	3,000	2.18	31.2

Based on the figures above the Applicant considers that the additional cost of SCR over SNCR is not justified by the reduction in environmental impact. Thus SCR is not BAT in this case, and SNCR is BAT for the Installation. The Applicant has proposed the use of ammonia as BAT. The Environment Agency agrees with this assessment.

The Applicant stated that catalytic filter bags react at a higher temperature than will be used for the proposed lime injection system and bag filters and so would not be efficient.

The amount of ammonia used for NO<sub>x</sub> abatement will need to be optimised to maximise NO<sub>x</sub> reduction and minimise NH<sub>3</sub> slip. Improvement condition IC5 requires the Operator to report to the Environment Agency on optimising the performance of the NO<sub>x</sub> abatement system. The BAT AEL for ammonia has been set and the Operator is also required to monitor and report on N<sub>2</sub>O emissions every 6 months.

### 6.2.3 Acid Gases, SO<sub>x</sub>, HCl and HF

<b>Acid gases and halogens : Primary Measures</b>				
<b>Technique</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Optimisation</b>	<b>Defined as BAT in BREF or TGN for:</b>
<b>Low sulphur fuel, (&lt; 0.1%S gasoil or natural gas)</b>	Reduces SO <sub>x</sub> at source		Start-up, supplementary firing.	Where auxiliary fuel required.

<b>Management of waste streams</b>	Disperses sources of acid gases (e.g. PVC) through feed.	Requires closer control of waste management		All plant with heterogeneous waste feed
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**Acid gases and halogens : Secondary Measures (BAT is to apply Primary Measures first)**

<b>Technique</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Optimisation</b>	<b>Defined as BAT in BREF or TGN for:</b>
<b>Wet</b>	<p>High reaction rates</p> <p>Low solid residues production</p> <p>Reagent delivery may be optimised by concentration and flow rate</p>	<p>Large effluent disposal and water consumption if not fully treated for re-cycle</p> <p>Effluent treatment plant required</p> <p>May result in wet plume</p> <p>Energy required for effluent treatment and plume reheat</p>		<p>Used for wide range of waste types</p> <p>Can be used as polishing step after other techniques where emissions are high or variable</p>
<b>Dry</b>	<p>Low water use</p> <p>Higher reagent consumption to achieve emissions of other FGC techniques but may be reduced by recycling in plant</p> <p>Lower energy use</p> <p>Higher</p>	<p>Higher solid residue production</p> <p>Reagent consumption controlled only by input rate</p>		All plant

	reliability  Lowest visible plume potential			
<b>Semi-dry (also described as semi-wet in the Bref)</b>	Medium reaction rates  Reagent delivery may be varied by concentration and input rate	Higher solid waste residues than wet but lower than dry system		All plant
<b>Boiler sorbent injection</b>	Reduced acid loading to subsequent cleaning stages. Reduced peak emissions and reduced reagent usage			Generally applicable to grate and rotary kiln plants.
<b>Direction desulphurisation</b>	Reduced boiler corrosion	Does not improve overall performance. Can affect bottom ash quality. Corrosion problems in flue gas cleaning system.		Partial abatement upstream of other techniques in fluidised beds
<b>Reagent Type: Sodium Hydroxide</b>	Highest removal rates  Low solid waste production	Corrosive material  ETP sludge for disposal		HWIs
<b>Reagent Type: Lime</b>	Very good removal rates	Corrosive material  May give	Wide range of uses	MWIs, CWIs

	Low leaching solid residue  Temperature of reaction well suited to use with bag filters	greater residue volume if no in-plant recycle		
<b>Reagent Type: Sodium Bicarbonate</b>	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

The Applicant proposes to implement the following primary measures:

- Use of low sulphur fuels for start up and auxiliary burners – gas should be used if available, where fuel oil is used, this will be low sulphur (i.e. <0.1%), this will reduce SO<sub>x</sub> at source. The Applicant has justified its choice of gasoil as the support fuel on the basis that it will provide a guaranteed supply and we agree with that assessment.
- Management of heterogeneous wastes – this will disperse problem wastes such as PVC by ensuring a homogeneous waste feed.

There are five recognised techniques for secondary measures to reduce acid gases, all of which can be BAT. These are wet, dry, semi-dry, boiler sorbent injection and direct desulphurisation. Wet scrubbing produces an effluent for treatment and disposal in compliance with Article 46(3) of IED. It will also require reheat of the exhaust to avoid a visible plume. Wet scrubbing is unlikely to be BAT except where there are high acid gas and metal components in the exhaust gas as may be the case for some hazardous waste incinerators. In this case, the Applicant does not propose using wet scrubbing, and the Environment Agency agrees that wet scrubbing is not appropriate in this case. Direct desulphurisation is only applicable for fluidised bed furnaces.

The Applicant has considered dry and semi-dry methods of secondary measures for acid gas abatement. Either can be BAT for this type of facility.



Both dry and semi-dry methods rely on the dosing of powdered materials into the exhaust gas stream. Semi-dry systems (i.e. hydrated reagent) offer reduced material consumption through faster reaction rates, but reagent recycling in dry systems can offset this.

In both dry and semi-dry systems, the injected powdered reagent reacts with the acid gases and is removed from the gas stream by the bag filter system. The powdered materials are either lime or sodium bicarbonate. Both are effective at reducing acid gases, and dosing rates can be controlled from continuously monitoring acid gas emissions. The decision on which reagent to use is normally economic. Lime produces a lower leaching solid residue in the APC residues than sodium bicarbonate and the reaction temperature is well suited to bag filters, it tends to be lower cost, but it is a corrosive material and can generate a greater volume of solid waste residues than sodium bicarbonate. Both reagents are BAT and the use of one over the other is not significant in environmental terms in this case.

Boiler sorbent injection was not proposed, the Applicant claimed that their proposed dry system will control acid gas emissions and allows re-use of lime from the filters making it very efficient.

Reagent use will be optimised with dosing linked to monitoring. Also residues will be recirculated to reduce the amount of reagent used.

In this case, the Applicant proposes to use a dry system using lime. The Environment Agency is satisfied that this is BAT.

#### 6.2.4 Carbon monoxide and volatile organic compounds (VOCs)

The prevention and minimisation of emissions of carbon monoxide and volatile organic compounds is through the optimisation of combustion controls, where all measures will increase the oxidation of these species.

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

#### 6.2.5 Dioxins and furans (and Other POPs)

<b>Dioxins and furans</b>				
<b>Technique</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Optimisation</b>	<b>Defined as BAT in BREF or TGN for:</b>
<b>Optimise combustion control</b>	All measures will increase oxidation of		Covered in section on furnace	All plants

	these species.		selection	
<b>Avoid de novo synthesis</b>			Covered in boiler design	All plant
<b>Effective Particulate matter removal</b>			Covered in section on particulate matter	All plant
<b>Activated Carbon injection</b>	Can be combined with acid gas absorber or fed separately. Metallic mercury is also absorbed	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.
<b>Catalytic filter bags</b>	High destruction efficiency	Does not remove mercury. Higher cost than non-catalytic filter bags		

The prevention and minimisation of emissions of dioxins and furans is achieved through:

- optimisation of combustion control including the maintenance of permit conditions on combustion temperature and residence time, which has been considered in 6.1.1 above;
- avoidance of de novo synthesis, which has been covered in the consideration of boiler design;
- the effective removal of particulate matter, which has been considered in 6.2.1 above;
- injection of activated carbon. This can be combined with the acid gas reagent or dosed separately. Where the feed is combined, the combined feed rate will be controlled by the acid gas concentration in the exhaust. Therefore, separate feed of activated carbon would normally be considered BAT unless the feed was relatively constant. Effective control of acid gas emissions also assists in the control of dioxin releases.

In this case the Applicant proposes separate feed and we are satisfied their proposals are BAT.

#### 6.2.6 Metals

<b>Metals</b>				
<b>Technique</b>	<b>Advantages</b>	<b>Disadvantages</b>	<b>Optimisation</b>	<b>Defined as</b>

				<b>BAT in BREF or TGN for:</b>
<b>Effective Particulate matter removal</b>			Covered in section on particulate matter	All plant
<b>Activated Carbon injection for mercury recovery</b>	Can be combined with acid gas absorber or fed separately. Can be impregnated with bromine or sulphur to enhance reactivity, for use during peak emissions.	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.
<b>Fixed or moving bed adsorption</b>	Mainly for mercury and other metals, as well as organic compounds			Limited applicability due to pressure drop
<b>Boiler bromine injection</b>	Oxidation of mercury leading to improved removal in downstream removal method.	Consumption of aqueous bromine. Can lead to formation of polybrominated dioxins. Can damage bag filter. Effects can be limited use is restricted to dealing with peak emissions		Not suitable for pyrolysis or gasification. Can deal with mercury peaks.

The prevention and minimisation of metal emissions is achieved through the effective removal of particulate matter, and this has been considered in 6.2.1 above.

Unlike other metals however, mercury if present will be in the vapour phase. BAT for mercury removal is also dosing of activated carbon into the exhaust gas stream. This can be combined with the acid gas reagent or dosed separately. Where the feed is combined, the combined feed rate will be controlled by the acid gas concentration in the exhaust. Therefore, separate feed of activated carbon would normally be considered BAT unless the feed was relatively constant.

In this case the Applicant proposes separate feed and we are satisfied their proposals are BAT.

### 6.2.7 Stack height

The Applicant proposed a stack height of 60 m. Given the size of the plant (148,800 tonnes per year) this is around the height that we would expect based on the stack height and size of other plants.

The Applicant also provided a plot of pollutant process contribution (PC) against stack height. The Applicant claimed that this showed the PC levelled out at 60 m. Our view is that the plot did show some levelling off at around 60m, however because the plot did not go above 65 m the levelling off point could not be established. We therefore requested that the Applicant carry out a cost benefit analysis of the stack height.

The Applicant submitted an assessment of pollutant process contribution against the marginal cost of increasing stack. The assessment showed that increasing costs outweigh any environmental improvements from further stack height increases above 60 m. the Applicant explained that this is because above 60 m additional basement structure is required to ensure stack stability resulting in significant increased costs.

We are satisfied that a 60 m stack height is BAT because:

- 60 m is appropriate when looking at the stack height and size of other plants
- The cost benefit assessment shows that above 60 m the costs outweigh the environmental benefits

We are satisfied that the stack height has been calculated in accordance with IED article 46(1). Having assessed the Application as a whole we are satisfied that the measures proposed, of which stack height is one aspect, are BAT.

### 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<sub>2</sub>) 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<sub>2</sub> is clearly a pollutant for IED purposes.

The principal greenhouse gas emitted is CO<sub>2</sub>, but the plant also emits small amounts of N<sub>2</sub>O arising from the operation of secondary NO<sub>x</sub> abatement. N<sub>2</sub>O has a global warming potential 310 times that of CO<sub>2</sub>. The Applicant will therefore be required to optimise the performance of the secondary NO<sub>x</sub> abatement system to ensure its GWP impact is minimised.

The major source of greenhouse gas emissions from the installation is however CO<sub>2</sub> from the combustion of waste. There will also be CO<sub>2</sub> emissions from the burning of support fuels at start up, shut down and should it be necessary to maintain combustion temperatures. BAT for greenhouse gas emissions is to maximise energy recovery and efficiency.

The electricity that is generated by the Installation will displace emissions of CO<sub>2</sub> elsewhere in the UK, as virgin fossil fuels will not be burnt to create the same electricity.

The Installation is not subject to the Greenhouse Gas Emissions Trading Scheme Regulations 2012 therefore it is a requirement of IED to investigate how emissions of greenhouse gases emitted from the installation might be prevented or minimised.

Factors influencing GWP and CO<sub>2</sub> emissions from the Installation are:

On the debit side

- CO<sub>2</sub> emissions from the burning of the waste;
- CO<sub>2</sub> emissions from burning auxiliary or supplementary fuels;
- CO<sub>2</sub> emissions associated with electrical energy used;
- N<sub>2</sub>O from the de-NO<sub>x</sub> process.

On the credit side

- CO<sub>2</sub> saved from the export of electricity to the public supply by displacement of burning of virgin fuels;

The GWP of the plant will be dominated by the emissions of carbon dioxide that are released as a result of waste combustion. This will constant for all options considered in the BAT assessment. Any differences in the GWP of the options in the BAT appraisal will therefore arise from small differences in energy recovery and in the amount of N<sub>2</sub>O emitted.

The Applicant considered energy efficiency and compared SCR to SNCR in its BAT assessment. This is set out in sections 4.3.7, 6.1.1 and 6.2.2 of this decision document.

Note: avoidance of methane which would be formed if the waste was landfilled has not been included in this assessment. If it were included due to its avoidance it would be included on the credit side. Ammonia has no direct GWP effect.

The Applicant's assessment was that alternative furnace options would have a higher energy demand as would the use of SCR compared to SNCR.

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

## 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 (2019/1021), 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, as in fact 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 the requirements of IED. That would 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 to significantly modify existing facilities using processes that release chemicals listed in Annex III , 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, without prejudice to Directive 2010/75/EU of the European Parliament and of the Council”

The 1998 Protocol to the Convention recommended that unintentionally produced should be controlled by imposing emission limits (e.g 0.1 ng/m<sup>3</sup> 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°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°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<sup>3</sup>.

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 Chapter IV of IED 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 IED to be assessed against the I-TEQ (International Toxic Equivalence) limit of 0.1 ng/m<sup>3</sup>. 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 Permit requires that, in addition to the requirements of the IED, the WHO-TEQ values for both dioxins and dioxin-like PCBs should be monitored for 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. The Permit also requires monitoring of a range of PAHs and dioxin-like PCBs 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 as listed in the Permit. 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 5.2.1 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](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 Other Emissions to the Environment

### 6.5.1 Emissions to water

The only discharge to water will be of clean surface water run-off from roofs and clean water from areas of hardstanding. This clean water will be emitted to the River Aire.

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



### 6.5.2 Emissions to sewer

There will be no emissions to sewer.

### 6.5.3 Fugitive emissions

The IED 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 waste and for contaminated water of Article 46(5) must be arranged.

- Waste will be delivered to and stored in a reinforced, waterproof concrete bunker.
- The reception building will be kept under negative pressure.
- Waste water pit will be of similar construction to the waste bunker.
- Potentially polluting liquids stored in tanks or containers in bunds on an impermeable surfacing. All filling and emptying points will be within the bunds.
- The EMS will include procedures for unloading and storage of materials. The will include measures to prevent overfilling.
- Bottom ash will be stored inside the building with an impermeable surface with sealed drainage. It will be transported off-site in covered trucks.
- Regular cleaning of the site.
- Penstock valve can be closed to stop any releases of surface water run-off if contamination is suspected and it can be tested before releasing from site.
- APC residues will be transferred to a storage silo via a pneumatic conveying system. The storage silo will be in an area of impermeable surfacing and sealed drainage.
- When the APC silo is emptied the tanker will back vent to the silo.
- The ammonia tank will have a detection system and a wet scrubber will operate automatically if required.
- Prompt clean-up will be undertaken if spills occur.
- Process water will be collected, kept separate to the clean surface water and re-used in the process for the bottom ash quench. Any excess process water will be removed from site using a tanker
- Measures will be in place to ensure that fire water would not be released.

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

### 6.5.4 Odour

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

Waste accepted at the installation will be delivered in covered vehicles. A fast acting 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. During shut down air will be extracted via a carbon filter. An odour management plan (OMP) is in place and the Operator is required to manage odour in line with the OMP.

#### 6.5.5 Noise and vibration

The main building will have cladding to aid noise suppression. External equipment will have acoustic cladding where appropriate. Equipment and plant, in particular fans, will be maintained appropriately. Traffic flow managed to ensure smooth traffic flow around the site and minimise reversing. External operations will be carried out during the day wherever possible. An acoustic barrier will be constructed along the southern boundary of the site.

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

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 BS 4142:2014 to compare the predicted plant rating noise levels with the established background levels.

The Applicant's assessment showed that noise levels due to the Installation would be between 25 dB below and 6 dB below the existing background levels during the day time and between 10db below and 6 dB above at night time.

BS4142:2014 says that a rating level of around 5 dB above background is likely to be an indication of adverse impacts depending on the context. It goes on to say that where background levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

In this case the rating level and night time background levels are both low. On this basis the Applicant claimed that an adverse impact is highly unlikely.

On this basis and taking into account the noise attenuation measures proposed we are satisfied that significant pollution from noise impact is not likely.

Improvement condition IC9 requires the Operator to review the noise assessment with real operating data and take further measures to reduce noise if required. Permit condition 3.5.2 allows us to request a noise management plan if it were to be required.

## 6.6 Setting ELVs and other Permit conditions

### 6.6.1 Translating BAT into Permit conditions

Article 14(3) of IED states that BAT conclusions shall be the reference for permit conditions. Article 15(3) further requires that under normal operating conditions; emissions do not exceed the emission levels associated with the best available techniques as laid down in the decisions on BAT conclusions.

BAT conclusions for waste incineration were published in December 2019.

The use of IED Chapter IV emission limits for air dispersion modelling sets the worst case scenario. If this shows emissions are insignificant then we have accepted that the Applicant's proposals are BAT, and that there is no justification to reduce ELVs below the Chapter IV limits.

Below we consider whether, for those emission not screened out as insignificant, different conditions are required as a result of consideration of local or other factors, so that no significant pollution is caused (Article 11(c)) or to comply with environmental quality standards (Article 18).

#### (i) Local factors

We have considered the location in assessing BAT. However no measures beyond BAT were required. We are satisfied that the measures described above as BAT will ensure a high level of protection for the environment as a whole at this location.

#### (ii) National and European ESs

We are satisfied that the Installation will not result in an exceedance of any National or European ES.

#### Global Warming

CO<sub>2</sub> is an inevitable product of the combustion of waste. The amount of CO<sub>2</sub> 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<sub>2</sub>, which could do no more than recognise what is going to be emitted. The gas is not therefore targeted as a key pollutant under Annex II of IED, 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<sub>2</sub>. 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<sub>2</sub> emissions.

(iv) Commissioning

Pre-operational condition PO4 will ensure that measures to protect the environment during commissioning are agreed with the Environment Agency.

6.7 Monitoring

6.7.1 Monitoring during normal operations

We have decided that monitoring should be carried out for the parameters listed 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 and to enable correction of measured concentration of substances to the appropriate reference conditions; to gather information about the performance of the SNCR system; to establish data on the release of dioxin-like PCBs and PAHs from the incineration process and to deliver the requirements of Chapter IV of IED for monitoring of residues and temperature in the combustion chamber.

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

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.

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

The Operator has stated that they will provide back-up CEMS working in parallel to the operating CEMS. These will be switched into full operation immediately 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 fail Condition 2.3.7 of the permit requires that the abnormal operating conditions apply.

#### 6.7.3 Continuous emissions monitoring for dioxins and heavy metals

The BAT conclusions specify either manual extractive monitoring or long term monitoring for dioxins. For mercury either continuous or long term monitoring is specified, manual extractive monitoring is specified for other metals.

For dioxins long term monitoring does not apply if emissions are stable, and for mercury long term monitoring can be used instead of continuous if the mercury content of the waste is low and stable.

Based on the waste types and control measures proposed in the Application we expect that emissions of dioxins will be stable and that the mercury content of the waste will be low and stable. We have therefore set manual extractive monitoring in the Permit. However the Permit requires the stable and low criteria to be demonstrated through Improvement conditions IC10 and IC11 and we can require long term monitoring for dioxins and continuous monitoring for mercury if required.

#### 6.7.4 Monitoring during periods of 'other than normal operation' (OTNOC)

BAT AELs (daily averages) do not apply during period of OTNOC. However IED chapter IV limits will apply during these periods. Permit table S3.1(b) contains appropriate limits and monitoring requirements during OTNOC. Pre-operational condition PO1 will ensure OTNOC scenarios are defined.

### 6.8 Reporting

We have specified the reporting requirements in Schedule 5 of the Permit either to meet the reporting requirements set out in the IED, or to ensure data is reported to enable timely review by the Environment 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 2016 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 2016 – IED Directive

We address the requirements of the IED in the body of this document above and the specific requirements of Chapter IV in Annex 1 of this document.

There is one requirement not addressed above, which is that contained in Article 5(3) IED. Article 5(3) requires that “In the case of a new installation or a substantial change where Article 4 of Directive 85/337/EC (now Directive 2011/92/EU) (the EIA Directive) applies, any relevant information obtained or conclusion arrived at pursuant to articles 5, 6 and 7 of that Directive shall be examined and used for the purposes of granting the 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 transboundary 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 examine and use 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).
- The decision of City of Bradford Metropolitan District Council to grant planning permission.
- The report and decision notice of the local planning authority accompanying the grant/refusal of planning permission.
- The response of the Environment Agency to the local planning authority in its role as consultee to the planning process.

From consideration of all the documents above, the Environment 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 elsewhere in this decision document.

#### 7.1.2 Schedule 9 to the EPR 2016 – Waste Framework Directive

As the Installation involves the treatment of waste, it is carrying out a *waste operation* for the purposes of the EPR 2016, 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 4.3.9)

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 22 to the EPR 2016 – Water Framework and Groundwater Directives

To the extent that it might lead to a discharge of pollutants to groundwater (a “groundwater activity” under the EPR 2016), 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 the Installation are permitted. The Permit also requires material storage areas to be designed and maintained to a high standard to prevent accidental releases.

### 7.1.4 Directive 2003/35/EC – The Public Participation Directive

Regulation 60 of the EPR 2016 requires the Environment Agency to prepare and publish a statement of its policies for complying with its public participation duties. We have published our public participation statement.

This Application has been consulted upon in line with this statement, as well as with our guidance 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. 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 2.

## 7.2 National primary legislation

### 7.2.1 **Environment Act 1995**

#### (i) Section 4 (Pursuit of Sustainable Development)

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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 Environment 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.

For waste the guidance refers to ensuring waste is recovered or disposed of in ways which protect the environment and human health. The Environment 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.

(ii) Section 5 (Preventing or Minimising Effects of Pollution of the Environment)

We are satisfied that our pollution control powers have been exercised for the purpose of preventing or minimising, remedying or mitigating the effects of pollution.

(iii) Section 6(1) (Conservation Duties with Regard to Water)

We have a duty to the extent we consider it desirable generally to promote the conservation and enhancement of the natural beauty and amenity of inland and coastal waters and the land associated with such waters, and the conservation of flora and fauna which are dependent on an aquatic environment.

We consider that no additional or different conditions are appropriate for this Permit.

(iv) Section 6(6) (Fisheries)

We have a duty to maintain, improve and develop fisheries of salmon, trout, eels, lampreys, smelt and freshwater fish.

We consider that no additional or different conditions are appropriate for this Permit.

(v) Section 7 (Pursuit of Conservation Objectives)

This places a duty on us, when considering any proposal relating to our functions, to have regard amongst other things to any effect which the proposals would have on sites of archaeological, architectural, or historic interest; the economic and social well-being of local communities in rural areas; and to take into account any effect which the proposals would have on the beauty or amenity of any rural area.

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.

(vi) Section 39 (Costs and Benefits)

We have a duty to take into account the likely costs and benefits of our decisions on the applications ('costs' being defined as including costs to the environment as well as any person). This duty, however, does not affect our obligation to discharge any duties imposed upon us in other legislative provisions.

In so far as relevant we consider that the costs that the permit may impose on the applicant are reasonable and proportionate in terms of the benefits it provides.

(vii) 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.

We have also had regard to the clean air strategy 2019 and consider that our decision complies with the Strategy, and that no additional or different conditions are appropriate for this Permit.

(viii) National Emissions Ceiling Regulations 2018

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

### **7.2.2 Section 108 Deregulation Act 2015 – Growth duty**

We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.

Paragraph 1.3 of the guidance says:

“The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”

We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.

We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.

### **7.2.3 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.

### **7.2.4 Countryside and Rights of Way Act 2000 (CROW 2000)**

Section 85 of this Act imposes a duty on Environment 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.

### **7.2.5 Wildlife and Countryside Act 1981**

Under section 28G of the Wildlife and Countryside Act 1981 the Environment 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 Environment Agency has a duty to consult Natural England 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.

Further details are in section 5.4 of this document.

#### **7.2.6 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.

#### **7.2.7 Countryside Act 1968**

Section 11 imposes a duty on the Environment Agency to exercise its functions relating to any land, having regard to the desirability of conserving the natural beauty and amenity of the countryside including wildlife. We have done so and consider that no different or additional conditions in the Permit are required.

#### **7.2.8 National Parks and Access to the Countryside Act 1949**

Section 11A and section 5(1) imposes a duty on the Environment Agency when exercising its functions in relation to land in a National Park, to have regard to the purposes of conserving and enhancing the natural beauty, wildlife and cultural heritage of the areas, and of promoting opportunities for the understanding and enjoyment of National Parks by the public.

We have done so and consider that no different or additional conditions in the Permit are required. There is no National Park which could be affected by the Installation.

### **7.3 National secondary legislation**

#### **7.3.1 Conservation of Habitats and Species Regulations 2017**

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.

We consulted Natural England by means of an Appendix 11 assessment, and they agreed with our conclusion, that the operation of the Installation would not have a likely significant effect on the interest features of protected sites.

The habitat assessment is summarised in greater detail in section 5.4 of this document.

### **7.3.2 Water Environment (Water Framework Directive) Regulations 2017**

Consideration has been given to whether any additional requirements should be imposed in terms of the Environment Agency's duty under regulation 3 to secure compliance with the requirements of the Water Framework Directive, Groundwater directive and the EQS Directive through (inter alia) environmental permits, and its obligation in regulation 33 to have regard to the river basin management plan (RBMP) approved under regulation 31 and any supplementary plans prepared under regulation 32. However, it is felt that existing conditions are sufficient in this regard and no other appropriate requirements have been identified

We are satisfied that granting this application with the conditions proposed would not cause the current status of the water body to deteriorate, and that it will not compromise the ability of this water body to achieve good status.

### **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 them 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 1A: APPLICATION OF CHAPTER IV OF THE INDUSTRIAL EMISSIONS DIRECTIVE**

<b>IED Article</b>	<b>Requirement</b>	<b>Delivered by</b>
45(1)(a)	The permit shall include a list of all types of waste which may be treated using at least the types of waste set out in the European Waste List established by Decision 2000/532/EC, if possible, and containing information on the quantity of each type of waste, where appropriate.	Condition 2.3.4(a) and Table S2.2 in Schedule 2 of the Permit.
45(1)(b)	The permit shall include the total waste incinerating or co-incinerating capacity of the plant.	Condition 2.3.4 (a) and Table S2.2 in Schedule 2 of the Permit.
45(1)(c)	The permit shall include the limit values for emissions into air and water.	Conditions 3.1.1 and 3.1.2 and Tables S3.1, S3.1(a) and S3.1(b) in Schedule 3 of the Permit.
45(1)(d)	The permit shall include the requirements for pH, temperature and flow of waste water discharges.	Not Applicable
45(1)(e)	The permit shall include the sampling and measurement procedures and frequencies to be used to comply with the conditions set for emissions monitoring.	Conditions 3.6.1 to 3.6.4 and Tables S3.1, S3.1(a), S3.1(b), S3.3 and S3.4 in Schedule 3 of the Permit.
45(1)(f)	The permit shall include the maximum permissible period of unavoidable stoppages, disturbances or failures of the purification devices or the measurement devices, during which the emissions into the air and the discharges of waste water may exceed the prescribed emission limit values.	Conditions 2.3.11 and 2.3.12.
45(2)(a)	The permit shall include a list of the quantities of the different categories of hazardous waste which may be treated.	Not Applicable
45(2)(b)	The permit shall include the minimum and maximum mass flows of those hazardous waste, their	Not Applicable
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IED Article	Requirement	Delivered by
	lowest and maximum calorific values and the maximum contents of polychlorinated biphenyls, pentachlorophenol, chlorine, fluorine, sulphur, heavy metals and other polluting substances.	
46(1)	Waste gases shall be discharged in a controlled way by means of a stack the height of which is calculated in such a way as to safeguard human health and the environment.	Condition 2.3.1 and Table S1.2 of Schedule 1 of the Permit.
46(2)	Emission into air shall not exceed the emission limit values set out in part 3 of Annex VI.	Conditions 3.1.1 and 3.1.2 and Tables S3.1, S3.1a and S3.1b.
46(3)	Relates to conditions for water discharges from the cleaning of exhaust gases.	There are no such discharges as condition 3.1.1 prohibits this.
46(4)	Relates to conditions for water discharges from the cleaning of exhaust gases.	There are no such discharges as condition 3.1.1 prohibits this.
46(5)	Prevention of unauthorised and accidental release of any polluting substances into soil, surface water or groundwater. Adequate 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. The permit requires that these measures are used. Various permit conditions address this and when taken as a whole they ensure compliance with this requirement.
46(6)	Limits the maximum period of operation when an ELV is exceeded to 4 hours uninterrupted duration in any one instance, and with a maximum cumulative limit of 60 hours per year. Limits on dust (150 mg/m <sup>3</sup> ), CO and TOC not to be exceeded during this period.	Conditions 2.3.11 and 2.3.12
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IED Article	Requirement	Delivered by
47	In the event of breakdown, reduce or close down operations as soon as practicable. Limits on dust (150 mg/m <sup>3</sup> ), CO and TOC not to be exceeded during this period.	conditions 2.3.10 and 2.3.11
48(1)	Monitoring of emissions is carried out in accordance with Parts 6 and 7 of Annex VI.	Conditions 3.6.1 to 3.6.4, 3.2.1, 3.2.2, tables S3.1, S3.1(a) and S3.1(b). Reference conditions are defined in Schedule 6 of the Permit.
48(2)	Installation and functioning of the automated measurement systems shall be subject to control and to annual surveillance tests as set out in point 1 of Part 6 of Annex VI.	Conditions 3.6.1, 3.6.3, table S3.1, S3.1(a) and S3.1(b), and S3.4
48(3)	The competent authority shall determine the location of sampling or measurement points to be used for monitoring of emissions.	Conditions 3.6.1. Pre-operational condition PO6
48(4)	All monitoring results shall be recorded, processed and presented in such a way as to enable the competent authority to verify compliance with the operating conditions and emission limit values which are included in the permit.	Conditions 4.1.1 and 4.1.2, 4.2, and Tables S4.1 and S4.4
49	The emission limit values for air and water shall be regarded as being complied with if the conditions described in Part 8 of Annex VI are fulfilled.	conditions 3.1.1, 3.1.2, 3.2.1, 3.2.2 and tables S3.1, S3.1(a) and S3.1(b)
50(1)	Slag and bottom ash to have Total Organic Carbon (TOC) < 3% or loss on ignition (LOI) < 5%.	Conditions 3.6.1 and Table S3.4
50(2)	Flue gas to be raised to a temperature of 850°C for two seconds, as measured at representative point of the combustion chamber.	Condition 2.3.7, Pre-operational condition PO5 and Improvement condition IC4 and Table S3.4
50(3)	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	Condition 2.3.7
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IED Article	Requirement	Delivered by
	liquefied gas or natural gas.	
50(4)(a)	Automatic shut to prevent waste feed if at start up until the specified temperature has been reached.	Condition 2.3.7
50(4)(b)	Automatic shut to prevent waste feed if the combustion temperature is not maintained.	Condition 2.3.7
50(4)(c)	Automatic shut to prevent waste feed if the CEMs show that ELVs are exceeded due to disturbances or failure of waste cleaning devices.	Condition 2.3.7, 2.3.11
50(5)	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 PO2) and then every 2 years (Conditions 1.2.1 to 1.2.3)
50(6)	Relates to the feeding of infectious clinical waste into the furnace.	No infectious clinical waste will be burnt
50(7)	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.
51(1)	Different conditions than those laid down in Article 50(1), (2) and (3) and, as regards the temperature Article 50(4) may be authorised, provided the other requirements of this chapter are met.	No such conditions Have been allowed
51(2)	Changes in operating conditions do not cause more residues or residues with a higher content of organic polluting substances compared to those residues which could be expected under the conditions laid down in Articles 50(1), (2) and (3).	No such conditions Have been allowed
51(3)	Changes in operating conditions shall include emission limit values for CO and TOC set out in Part 3 of Annex VI.	No such conditions Have been allowed
52(1)	Take all necessary precautions concerning delivery and reception of	Conditions 2.3.1, 2.3.3, 2.3.3, 2.3.4,

<b>IED Article</b>	<b>Requirement</b>	<b>Delivered by</b>
	Wastes, to prevent or minimise pollution.	2.3.5 and 3.7
52(2)	Determine the mass of each category of wastes, if possible according to the EWC, prior to accepting the waste.	Condition 2.3.4(a) and Table S2.2 in Schedule 2 of the Permit.
52(3)	Prior to accepting hazardous waste, the operator shall collect available information about the waste for the purpose of compliance with the permit requirements specified in Article 45(2).	Not Applicable
52(4)	Prior to accepting hazardous waste, the operator shall carry out the procedures set out in Article 52(4).	Not Applicable
52(5)	Granting of exemptions from Article 52(2), (3) and (4).	Not Applicable
53(1)	Residues to be minimised in their amount and harmfulness, and recycled where appropriate.	Conditions 1.4.1, 1.4.2 and 3.6.1 with Table S3.4
53(2)	Prevent dispersal of dry residues and dust during transport and storage.	conditions 1.4.1 2.3.1, 2.3.2 and 3.3.1.
53(3)	Test residues for their physical and chemical characteristics and polluting potential including heavy metal content (soluble fraction).	Condition 3.6.1 and Table S3.4 and pre-operational condition PO3.
55(1)	Application, decision and permit to be publicly available.	All documents are accessible from the Environment Agency Public Register.
55(2)	An annual report on plant operation and monitoring for all plants burning more than 2 tonne/hour waste.	Condition 4.2.1 and 4.2.2

## ANNEX 1B: COMPLIANCE WITH BAT CONCLUSIONS

BAT conclusion	Criteria	Delivered by
1	Implement environmental management system	Condition 1.1 and Pre-operational condition PO1
2	Determine gross electrical efficiency	Section 4.3.7 of this decision document.  Permit table S3.3
3	Monitor key process parameters	Condition 3.6.1 and table S3.3
4	Monitoring emissions to air	Condition 3.6.1 and table S3.1
5	Monitoring emissions to air during OTNOC	Condition 3.6.1 and table S3.1(b)
6	Monitoring emissions to water from flue gas treatment and/or bottom ash treatment	There are no such emissions from the installation
7	Monitor unburnt substances in slags and bottom ashes	Conditions 3.1.3 and 3.6.1, and table S3.4
8	Analysis of hazardous waste	Not applicable
9	Waste stream management techniques	The Application explains the measures that will be used. Permit condition 2.3.1, table S1.2 and pre-operational condition PO9.
10	Quality management system for bottom ash treatment plant	This will form part of the EMS as required by condition 1.1 and pre-operational condition PO1
11	Monitor waste deliveries as part of waste acceptance procedures	The Application explains the measures that will be used. Permit condition 2.3.1, table S1.2 and pre-operational condition PO9
12	Reception, handling and storage of waste	Measures are described in the Application and FPP. Permit conditions 2.3.1, table S1.2 and condition 3.8.1
13	Storage and handling of clinical waste	Not applicable
14	Improve overall performance of plant including BAT-AELs for TOC or LOI	Techniques described in the Application. Permit condition 2.3.1, table S1.2, 3.1.3, and table S3.4

<b>BAT conclusion</b>	<b>Criteria</b>	<b>Delivered by</b>
15	Procedures to adjust plant settings to control performance	Measures described in the Application condition 2.3.1 and table S1.2
16	Procedures to minimise start-up and shut down	Measures described in the Application and condition 2.3.1
17	Appropriate design, operation and maintenance of FGC system	FGC measures described in Application. Operation and maintenance procedures will form part of the EMS
18	OTNOC management plan	Pre-operational condition PO1
19	Use of heat recovery boiler	Described in the Application. Permit condition 2.3.1, table S1.2
20	Measures to increase energy efficiency and BAT AEEL	Measures described in the Application. Permit condition 2.3.1, table S1.2 Section 4.3.7 of this decision document.
21	Measures to prevent or reduce diffuse emissions including odour	Measures described in the Application. Permit conditions 2.3.1, table S1.2, 3.4.1, 3.4.2, 3.3.1, 3.3.2. Sections 4.2.2, 6.5.3 and 6.5.4 of this decision document.
22	Handling of gaseous and liquid wastes	Not applicable
23	Management system to prevent or reduce dust emissions from treatment of slags and ashes	Not applicable
24	Techniques to prevent or reduce diffuse emissions to air from treatment of slags and ashes	Not applicable
25	Minimisation of dust and metal emissions and compliance with BAT AEL	Section 5.2 of this decision document. Permit conditions 2.3.1, table S1.2, , 3.3.1, 3.3.2. 3.1.1 and 3.1.2 and table S3.1
26	Techniques and BAT AEL for dust emissions from enclosed slags and ashes treatment	Not applicable

<b>BAT conclusion</b>	<b>Criteria</b>	<b>Delivered by</b>
27	Techniques to reduce emissions of HCl, HF and SO <sub>2</sub>	Measures described in the Application. Permit condition 2.3.1 and table S1.2 Permit condition 2.3.1 and table S1.2 Section 5.2 of this decision document.
28	Techniques to reduce peak emissions of HCl, HF and SO <sub>2</sub> , optimise reagent use and BAT AELs	Measures described in the Application. Permit conditions 2.3.1, table S1.2, 3.1.1 and 3.1.2 and table S3.1
29	Techniques to reduce emissions of NO <sub>2</sub> , N <sub>2</sub> O, CO and NH <sub>3</sub> and BAT AELs	Measures described in the Application. Section 5.2 of this decision document. Permit conditions 2.3.1, table S1.2, 3.1.1 and 3.1.2 and table S3.1
30	Reduce emissions of organic compounds including dioxins/furans and PCBs. BAT AELs	Measures described in the Application. Section 5.2 of this decision document. Permit conditions 2.3.1, table S1.2, 3.1.1 and 3.1.2 and table S3.1
31	Reduce emissions of mercury. BAT AEL	Measures described in the Application. Section 5.2 of this decision document. Permit conditions 2.3.1, table S1.2, 2.3.1, table S1.2, 3.1.1 and 3.1.2 and table S3.1
32	Segregate waste water streams to prevent contamination	Measures described in the Application Sections 4.2.2, 6.5.1 and 6.5.3 of this decision document. Permit conditions 2.3.1, table S1.2, 3.1.1, 3.1.2 and table S3.2
33	Techniques to reduce water usage and prevent or reduce waste water	Measures described in the Application. Sections 4.2.2 and 4.3.8 of this decision document Permit conditions 1.3.1, 2.3.1, table S1.2
34	Reduce emissions to water from FGC and/or from treatment or storage of bottom ashes. BAT AELs	Not applicable

<b>BAT conclusion</b>	<b>Criteria</b>	<b>Delivered by</b>
35	Handle and treat bottom ashes separately from FGC residues	Permit condition 2.3.13
36	Techniques for treatment of slags and bottom ashes	No treatment carried out on site Or Measures are described in the Application Permit conditions 2.3.1, table S1.2
37	Techniques to prevent or reduce noise emissions.	Measures are described in the Application. Section 6.5.5 of this decision document. Permit conditions 2.3.1, table S1.2, 3.5.1, 3.5.2

## **ANNEX 2: Pre-Operational Conditions**

Based on the information in the Application, we consider that we do need to impose pre-operational conditions. These conditions are set out below and referred to, where applicable, in the text of the decision document. We are using these conditions to require the Operator to confirm that the details and measures proposed in the Application have been adopted or implemented prior to the operation of the Installation.

<b>Reference</b>	<b>Pre-operational measures</b>
<b>PO1</b>	<p>Prior to the commencement of commissioning, the Operator shall send:</p> <ul style="list-style-type: none"> <li>• A summary of the site Environment Management System (EMS);and</li> <li>• A copy of the full OTNOC management plan which shall be prepared in accordance with BAT 18 of the BAT conclusions</li> </ul> <p>to the Environment Agency and obtain the Environment Agency's written approval to the EMS summary and the full OTNOC management plan.</p> <p>The Operator shall 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 Environment Agency web guide on developing a management system for environmental permits (found on <a href="http://www.gov.uk">www.gov.uk</a>) and BAT 1 of the incineration BAT conclusions. The EMS shall include the approved OTNOC management plan.</p> <p>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.</p>
<b>PO2</b>	<p>Prior to the commencement of commissioning, the Operator shall send a report to the Environment Agency, and obtain the Environment Agency's written approval to it, which will contain a comprehensive review of the options available</p>

	for utilising the heat generated, including operating as CHP or supplying district heating, by the waste incineration process in order to ensure that it is recovered as far as practicable. The review shall detail any identified proposals for improving the recovery and utilisation of heat and shall provide a timetable for their implementation.
<b>PO3</b>	Prior to the commencement of commissioning, the Operator shall submit to the Environment Agency, and obtain the Environment Agency's written approval to it, a protocol for the sampling and testing of incinerator bottom ash for the purposes of assessing its hazard status. Sampling and testing shall be carried out in accordance with the protocol as approved.
<b>PO4</b>	Prior to the commencement of commissioning, the Operator shall submit to the Environment Agency, and obtain the Environment Agency's written approval to it, 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.
<b>PO5</b>	No later than one month after the final design of the furnace and combustion chamber, the operator shall submit a written report to the Environment Agency, and obtain the Environment Agency's written approval to it, of the details of the computational fluid dynamic (CFD) modelling. The report shall explain how the furnace has been designed to comply with the residence time and temperature requirements as defined by Chapter IV and Annex VI of the IED whilst operating under normal load and the most unfavourable operating conditions (including minimum turn down and overload conditions), and that the design includes sufficient monitoring ports to support subsequent validation of these requirements during commissioning.
<b>PO6</b>	At least three months before (or other date agreed in writing with the Environment Agency) the commencement of commissioning, the Operator shall submit a written report to the Environment Agency, and obtain the Environment Agency's written approval to it, specifying arrangements for continuous and periodic monitoring of emissions to air to comply with Environment Agency guidance notes M1, M2 and M20. The report shall include the following: <ul style="list-style-type: none"> <li>• Plant and equipment details, including accreditation to MCERTS</li> <li>• Methods and standards for sampling and analysis</li> <li>• Details of monitoring locations, access and working platforms</li> </ul>
<b>PO7</b>	At least 3 months before the commencement of commissioning (or other date agreed in writing with the Environment Agency) the Operator shall submit, for approval by the Environment Agency, a methodology (having regard to Technical Report P4-100/TR Part 2 Validation of Combustion Conditions) to verify the residence time, minimum temperature and oxygen content of the gases in the furnace whilst operating under normal load, minimum turn down and overload conditions.
<b>PO8</b>	The operator shall submit a revised fire prevention plan to the Environment Agency and seek the Environment Agency's approval to it, after the detailed design stage of the installation to the Environment Agency. The revised plan shall include any changes requires after the detailed design stage, it shall also include details of procedures that will be used to inform residents and receptors in the event of a fire. The plan shall be in line with current Environment Agency guidance on fire prevention plans.
<b>PO9</b>	Prior to the commencement of commissioning, the Operator shall submit a
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	<p>written report to the Agency, and obtain the Environment Agency's written approval to it, detailing the waste acceptance procedure to be used at the site. The waste acceptance procedure shall be in line with the BAT 11 in the BAT conclusion requirements and include the process and systems by which wastes unsuitable for incineration at the site will be controlled.</p> <p>The procedure shall be implemented in accordance with the written approval from the Agency.</p>
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### ANNEX 3: Improvement Conditions

Based on the information in the Application we consider that we need to set improvement conditions. These conditions are set out below - justifications for these is provided at the relevant section of the decision document. We are using these conditions to require the Operator to provide the Environment Agency with details that need to be established or confirmed during and/or after commissioning.

Reference	Improvement measure	Completion date
IC1	The Operator shall submit a written report to the Environment Agency on the implementation of its Environmental Management System (EMS) and the progress made in the certification of the system by an external body or if appropriate submit a schedule by which the EMS will be certified.	Within 12 months of the completion of commissioning.
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 <sub>10</sub> , and PM <sub>2.5</sub> ranges. On receipt of written approval from 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.
IC3	The Operator shall submit a written report to the Environment Agency on the commissioning of the installation. The report shall summarise the environmental performance of the plant as installed against the design parameters set out in the Application. The report shall also include a review of the performance of the facility against the conditions of this permit and details of procedures developed during commissioning for achieving and demonstrating compliance with permit conditions and confirm that the Environmental Management System (EMS) has been updated accordingly.	Within 4 months of the completion of commissioning.
IC4	The operator shall notify the Environment Agency of the proposed date(s) that validation testing is planned for.	Notification at least 3 weeks prior to validation testing
	During commissioning the operator shall carry out validation testing to validate the residence time, minimum temperature and oxygen content of the gases in the furnace whilst operating under normal load and most unfavourable operating conditions. The validation shall be to the methodology as approved through pre-operational condition PO7.	Validation tests completed before the end of commissioning

<p><b>IC5</b></p>	<p>The Operator shall submit a written report to the Environment Agency describing the performance and optimisation of:</p> <ul style="list-style-type: none"> <li>• The Selective Non Catalytic Reduction (SNCR) system and combustion settings to minimise oxides of nitrogen (NOx). The report shall include an assessment of the level of NOx, N<sub>2</sub>O and NH<sub>3</sub> emissions that can be achieved under optimum operating conditions.</li> <li>• The lime injection system for minimisation of acid gas emissions</li> <li>• The carbon injection system for minimisation of dioxin and heavy metal emissions.</li> </ul>	<p>Within 4 months of the completion of commissioning.</p>
<p><b>IC6</b></p>	<p>The Operator shall carry out an assessment of the impact of emissions to air of the following component metals subject to emission limit values, i.e. Cr and As. A report on the assessment shall be made to the Environment Agency.</p> <p>Emissions monitoring data obtained during the first year of operation shall be used to compare the actual emissions with those assumed in the impact assessment submitted with the Application. An assessment shall be made of the impact of each metal against the relevant EQS/EAL. In the event that the assessment shows that an environmental standard can be exceeded, the report shall include proposals for further investigative work.</p>	<p>15 months from the completion of commissioning</p>
<p><b>IC7</b></p>	<p>The Operator shall submit a written summary report to the Environment Agency to confirm 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. The report shall include the results of calibration and verification testing,</p>	<p>Initial calibration report to be submitted to the Agency within 3 months of completion of commissioning.</p> <p>Full summary evidence compliance report to be submitted within 18 months of completion of commissioning.</p>
<p><b>IC8</b></p>	<p>During commissioning, the operator shall carry out tests to demonstrate whether the furnace combustion air will ensure that negative pressure is achieved throughout the reception hall. The tests shall demonstrate whether air is pulled through the reception hall and bunker area and into the furnace with dead spots minimised. The operator shall also carry out tests of methods used to maintain negative pressure during shut-down periods to ensure that adequate extraction will be achieved. The operator shall submit a report to the Environment Agency, for approval, summarising</p>	<p>Within 3 months of completion of commissioning.</p>

	the findings along with any proposed improvements if required	
<b>IC9</b>	<p>The Operator shall undertake a noise assessment during normal operations in accordance with the procedures given in BS4142: 2014 (Rating industrial noise affecting mixed residential and industrial areas) in order to verify the assessment provided within the application. The assessment shall include, but not be limited to:</p> <ul style="list-style-type: none"> <li>• A review of the noise sources from the facility. Where any noise sources are identified as exhibiting tonal contributions, they shall be quantified by means of frequency analysis.</li> <li>• A review of noise mitigation measures</li> </ul> <p>A report shall be provided to the Environment Agency detailing the findings of the assessment and a review of whether any improvements are required together with proposals for their implementation.</p>	Within 4 months of the completion of commissioning.
<b>IC10</b>	The operator shall carry out a programme of dioxin and dioxin like PCB monitoring over a period and frequency agreed with the Environment Agency. The operator shall submit a report to the Environment Agency with an analysis of whether dioxin emissions can be considered to be stable.	Within 3 months of completion of commissioning or as agreed in writing with the Environment Agency
<b>IC11</b>	The operator shall carry out a programme of mercury monitoring over a period and frequency agreed with the Environment Agency. The operator shall submit a report to the Environment Agency with an analysis of whether the waste feed to the plant can be proven to have a low and stable mercury content.	Within 3 months of completion of commissioning or as agreed in writing with the Environment Agency
<b>IC12</b>	The Operator shall submit a report to the Environment Agency for approval on start-up and shut-down conditions over the first 12 months of operation. The report shall identify any amendments to the start-up and shut-down definitions that were described in the application.	Within 15 months of completion of commissioning or as agreed in writing with the Environment Agency

## ANNEX 4: Consultation Responses

### A) Advertising and Consultation on the Application

The Application has been advertised and consulted upon in accordance with the Environment 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 draft decision is summarised in this Annex. Copies of all consultation responses have been placed on the Environment Agency public register.

The Application was advertised on the Environment Agency website from 1<sup>st</sup> November 2018 until 13<sup>th</sup> December 2018 and in the Keighley news on 1<sup>st</sup> November 2018. The Application was made available to view on our website and at the Environment Public Register at Lateral House, Leeds.

The following statutory and non-statutory bodies were consulted: -

- City of Bradford Metropolitan District Council
- Health and Safety Executive
- Food Standards Agency
- Public Health England
- Director of Public Health
- Yorkshire Water
- Fire Service
- Civil Aviation Authority
- Leeds Bradford Airport
- National Air Traffic Services
- National Grid

### 1) Consultation Responses from Statutory and Non-Statutory Bodies

<b>Response Received from Public Health England</b>		
Brief summary of issues raised:	Summary of action taken / how this has been covered	
Emissions lower than the IED limits were modelled for NO <sub>x</sub> , SO <sub>2</sub> , NH <sub>3</sub> and PAH. This should be justified or alternative limits considered.	The level of emissions that were modelled for NO <sub>x</sub> and SO <sub>2</sub> were lower than those specified in IED chapter IV. The levels that were modelled have been set as emission limits in the Permit and we are satisfied that the Operator will be able to meet these limits.  The Applicant stated that the basis for the emission of NH <sub>3</sub> was from the design of the plant and we are satisfied that the PAH level used was appropriate.	
Some background data was used without justification.	We checked these issues when we audited the Applicant's risk assessment. We are satisfied that they were appropriately considered.	
Regulator should check whether the local topography will affect dispersion of aerial emissions.		
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PHE support approaches to minimise exposure to non-threshold pollutants.	We are satisfied that the Applicant's measures to minimise emissions are BAT.
The PHE response included reference to their statement on health impacts from municipal waste incinerators.	No response required

### **Response Received from West Yorkshire Fire & Rescue Service**

Brief summary of issues raised:	Summary of action taken / how this has been covered
No adverse comments to make regarding the application	No response required

### **Response Received from City of Bradford Metropolitan District Council**

Brief summary of issues raised:	Summary of action taken / how this has been covered
Confirmed that planning permission was granted on 11 <sup>th</sup> April 2017.	No response required
Copies of the planning committee report and decision notice were provided.	Section 7.1.1 shows how we have had regard to the planning document.
Concern over amenity issues	Amenity issues were considered in our assessment of the Application and are described in this decision document. We are satisfied that there will not be any significant impacts.
Concern over the impact at AQMAs within the Bradford District and at other areas with high background levels.	The AQMAs have been declared for NO <sub>2</sub> . We are satisfied the impact of NO <sub>2</sub> from the Installation will be insignificant at the AQMAs. We are satisfied that there will not be a significant impact at any other receptor. See sections 5.2.2 and 5.2.4 of this decision document.
Concern that background levels could be higher immediately adjacent to roads.	Kerbside background levels are often higher than the levels at receptors such as houses. We checked the background levels that the Applicant used as part of our audit of the air quality modelling. We are satisfied that appropriate values were used to assess impacts at receptors.
There are some differences in the stack input parameters from the planning application, in particular the silo and lime filter outlets and operating hours.	We have assessed the Application provided to us. The Operator will be required to operate their plant as described in the Application.  The Operator will need to comply with both their Permit and planning permission and in the event of any

	difference comply with the most stringent.
NO <sub>2</sub> and SO <sub>2</sub> emission levels used in the modelling are lower than set in legislation.	We are satisfied that these emission levels can be achieved and have set ELVs based on the modelled emission levels.
The proposed throughput at 148,000 tonnes is higher than the planning application of 100,000 tonnes per year.	Difference in throughput relate to the calorific value of the waste. We are satisfied that the impact assessment was based on the maximum throughput as set in the Permit.
The air quality report includes a 5.3 MW diesel generator with 10 m stack.	The diesel generator will only operate for emergency purposes in the event of power loss (less than 500 hours per year). Due to the size and small operating time any impacts will be trivial.

## 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 Environment 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 the National Planning Policy Framework. 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.

### a) Representations from Local MPs, Councillors and Parish / Town / Community Councils

Representations were received from Members of Parliament and local Councillors, who raised the following issues.

<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
<b>Comments about air emissions and air risk assessment</b>	
Concern over emissions from traffic.	The air quality assessment considered existing background pollution levels which includes emissions from traffic. Movement of traffic to and from the Installation is outside of our remit but will normally be an

	<p>issue for the planning authority to consider. Our consideration is whether the emissions from traffic could affect the prevailing pollutant background levels which could be a consideration where there are established high background concentrations contributing to poor air quality. In this case the small increase in pollutants from traffic would not affect the background levels to the point where it would affect the conclusions of the air quality assessment.</p> <p>Vehicle movements within the Installation boundary are considered within the remit of the Environmental Permit. However the emissions from this limited area are highly unlikely to be significant and will not affect the conclusions of the air quality impact assessment.</p>
Concern over the effect of the valley and temperature inversion of the impact of emission dispersal.	We checked the effect of the valley and local weather conditions when we audited the Applicant's modelling. Our conclusion was that the Applicant's modelling represented a reasonable worst case. Further details are in section 5.2.4 of this decision document.
Existing high pollution levels should not be added to.	The Applicant considered existing pollution (background) levels in their dispersion modelling. As part of our audit we checked the background levels and we are satisfied that they were appropriate and that significant pollution will not be caused.
Concern over whether the regulatory standards for emissions to air are adequate.	We are satisfied that they are appropriate to protect human health and the environment.
Concern over bag filter failure.	<p>The Applicant has proposed a multi compartment bag filter, this allows individual bags to be isolated in case of an individual failure. Complete failure of the filters is therefore highly unlikely. Pressure will be monitored so that bag filter failure can be detected.</p> <p>Particulate emissions will be monitored continuously. Any exceedance of the ELV will require the plant to shut-down unless it is abnormal operation when particulate emissions will not be permitted to exceed 150 mg/m<sup>3</sup>. We are satisfied that abnormal operation will not give rise to significant impacts. Sections 5.5 and has further details.</p>
Concern over emissions of particulates.	The impact from the emissions of particulates has been show to be insignificant. See section 5.2 for further details.
Concern over the emissions of metals	The impact from metal emissions is considered further in section 5.2. We are



	satisfied that impacts will not be significant.
Concern over the effect of emissions on sensitive receptors.	The Applicant considered sensitive receptors in their dispersion modelling report. They also assessed the impact at the point of maximum impact. We are satisfied that there will not be a significant impact, further details are in section 5.2.
Concern as to what substances will be emitted to air.	IED chapter IV and the BAT conclusions set limits for the most significant substances that will be emitted, this is discussed in more detail in section 5 of this decision document.
<b>Comments about health impacts</b>	
Concern was expressed that there will be an impact on health due to the Installation including those with existing health conditions.  Concern over health of young people.	We are satisfied that there will not be a significant impact on health due to the Installation. Section 5.3 of this decision document has further details.  The standards that we have used to assess against are set to protect all members of the public including young people.
Concern over health because the location does not meet the guidelines set out in a World Health Organisation document; including: Not locating in a valley, near trees, populated areas or agricultural areas	The document referred to is titled 'Findings of an assessment of small-scale incinerators for health care waste'. The types of plant considered in this report are low cost small scale incinerators used to dispose of health-care wastes in developing countries. These plants are not comparable to the Installation.
Concern over impacts from dioxins/furans including accumulation of dioxins/furans in the food chain.	The Applicant's health risk assessment included consideration of accumulation in the food chain. The impact from dioxins/furans is described in more detail in section 5.3 of this decision document. We are satisfied that impacts will not be significant.
<b>Comments about pollution of water and land</b>	
Concern that water emissions will pollute the river.	The only water emission allowed under the Permit will be clean surface water run off that will be emitted to the River Aire. We are satisfied that this will not cause pollution on the river.
<b>Comments about noise impacts</b>	
Concern over noise from traffic.	Only vehicle movements within the Installation can be considered through environmental permitting. Vehicle movements outside of Installations are within the remit of the planning permission. The Applicant's noise assessment included on-site vehicle movements and we are satisfied that there will not be a significant impact.
<b>Comments about other impacts</b>	
Concern over the emissions of carbon dioxide and the impact on global warming.	Our assessment of global warming is covered in sections 6.3 and 6.6 of this

	decision document.
<b>Comments about BAT, emissions limits and control measures</b>	
Concern over how efficient the filters will be.	The Applicant has proposed a multi compartment fabric filter to abate particulate matter. This type of filter is very efficient at removing particles. Further details are in section 6.2.1 of this decision document.
Concern that the filters could be by-passed.	The Plant will not have an exhaust gas by-pass.
Concern over the stack height. The refusal of the Rivenhall permit was cited.	We are satisfied that the proposed stack height will safeguard human health and the environment. See section 6.2.7 of this decision document for further details.
<b>Comments about residues</b>	
Concern over how ash will be handled and dealt with.	Measures for handling of IBA and APC residues are summarised in section 4.2.2 of this decision document. We are satisfied that the measures are appropriate.
Concern over pollution from disposal of APC residues by landfill.	APC residues will be disposed of at a hazardous waste landfill site. The permit for the landfill site will control emissions.
<b>Comments about waste</b>	
Concern that radioactive waste could be received and burned.	The Permit will not allow radioactive material to be accepted as a specific waste. Waste acceptance procedures will ensure they are not. It is possible that smoke alarms (containing small radioactive sources) could be placed in household bins and received at the incinerator under the municipal waste code. However they are likely to be small in number and have a low level of radioactivity. It is not considered there is any significant risk from radioactive waste.
Concern that infectious waste could be received and burned.	The Permit does not allow infectious clinical waste to be received and burned.
<b>Comments about regulation</b>	
Concern over how the Environment Agency will regulate the site.	<p>We will regulate the site carrying out a continual assessment of plant operations and its environmental performance. This will include:</p> <p>The operator must monitor emissions and report the results to us.</p> <p>We will regularly inspect the Installation, review monitoring techniques and assess monitoring results to measure the performance of the plant, review operating techniques and review management systems and plans.</p> <p>We will carry out on-site audits of operator monitoring.</p> <p>The operator must inform us within 24 hours of any breach of the emissions limits, followed by a fuller report of the size of the release, its impact and how they propose to avoid this happening in the future.</p>

	<p>The operator's monitoring results will be placed on the public registers.</p> <p>If there is a breach then we will take appropriate enforcement action and/or prosecute.</p>
There should be a robust independent regulator to inspect the site.	We are independent from those we regulate and will regulate the site in an appropriate manner that will be as robust as required..
Concern over how the Environment Agency will ensure that the Operator does not cause noise and odour issues.	The Application contained a description of measures to control noise and odour and we are satisfied that the controls are appropriate. The Permit contains conditions to control noise and odour. We will regulate the site to ensure that the Operator operates the plant as described in the Application and complies with these conditions. If there are noise or odour issues we will investigate them and take enforcement action if required and/or require additional measures to be implemented to reduce noise and/or odour.
Concern that the Operator will be expected to self-declare breaches of limits.	We will carry out announced and unannounced visits to check that the Permit is being complied with. We will carry out audits of the Operator's monitoring. If the Operator is not complying with the Permit will take action in line with our enforcements and sanctions policy.
Concern over what action the Environment Agency will take if there are permit breaches.	Permit breaches will be dealt with in line with our enforcement and sanctions policy. We will investigate to determine the cause of the breach. If appropriate, we will require the Operator to put measures in place to prevent re-occurrence.
Concern over how unacceptable odour and noise will be determined.	We are satisfied that the measures proposed in the Application will prevent significant odour or noise. Permit conditions 3.4 and 3.5 will ensure that this remains the case. If any issues were to occur we would investigate and take enforcement action if required.
Concern over whether the Environment Agency will investigate individual complaints.	If we receive any complaint we will assess the complaint and investigate it if required.
Concern as to whether the Environment Agency could force operation to stop and/or revoke the Permit.	These are options that we can take if appropriate. Action will be taken in line with our enforcement and sanctions policy.
<b>Comments about the Applicant</b>	
Concern as to whether the Applicant is competent to operate this type of facility.	<p>We requested additional information from the Applicant on this. We are satisfied that the Applicant will be a competent operator because:</p> <ul style="list-style-type: none"> <li>• An EMS certified to ISO 14001 will be in place</li> <li>• A suitably qualified facility manager will be appointed who will have responsibility of Permit compliance</li> <li>• An environmental policy will require that the Installation operates in full</li> </ul>

	<p>compliance with legislative requirements</p> <ul style="list-style-type: none"> <li>• Additional information in section 4.3 of this decision document</li> </ul>
<b>Comments about accidents</b>	
Concern over the impacts in the event of a fire.	<p>The Applicant submitted a Fire Prevention Plan.</p> <p>We have approved this plan and incorporated this within operating techniques table S1.2 meaning that the site has to follow such requirements.</p> <p>We are satisfied that appropriate measures will be in place to prevent fires and to minimise the impact from a fire if it was to occur.</p>
Concern over the impact in the event of a major leak and how this would be managed.	<p>Measures to prevent leaks are summarised in section 4.2.2 of this decision document. We consider that the risk of a major leak is low.</p> <p>We are satisfied that the risk of accidents and their consequences will be minimised through the EMS and condition 1.1. See section 4.3.4 of this decision document.</p>
<b>Comments on other Issues</b>	
Concern over pollution in the event of flooding.	<p>The site is located close to a flood zone 1 meaning there is less than a 1 in 1,000 chance of flooding.</p> <p>If a flood did occur the building doors will be closed to prevent pollution occurring. The bunker is also above the height that water could reach.</p>
The Environment Agency should carry out monitoring to establish a baseline for air, odour and noise pollution.	<p>We consider that this is not required.</p> <p>The Applicant presented background air pollution levels and background noise levels in their impacts assessments. We are satisfied with the levels used.</p> <p>Background odour levels are not required for us to make an assessment of whether there will be significant pollution. We are satisfied that the measures proposed will prevent any significant odour pollution.</p>
Concern over how long the permits are valid for.	<p>The Permit does not have an expiry date. It will be valid until it is surrendered or revoked. It can also be varied if changes are required.</p>
Concern over whether the planning application will need to be amended.	<p>This will be a matter for the planning authority to make a decision on. However the Operator will need to comply with the conditions of the Environmental Permit and their planning permission.</p>
Waste should be recycled.	<p>This is primarily outside the scope of this determination. Recycling initiatives are a matter for the local authority.</p>

	The Permit does not allow wastes that have been separately collected for recycling to be burned, unless they are subsequently found to be unsuitable for recovery by recycling.
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b) Representations from Community and Other Organisations

Representations were received from Aire Valley Against Incineration, Keybury Fire & Security, Riddlesden Scouts, The Micklethwaite Village Society, Gather, The Governing Body and Crossflats Primary School, Bramble Hedge Pre-School, national Trust, Airedale Cricket Club, Disco Planet, Carmeleon, The Governing Body and Strong Close Nursery School, Riddlesden St Mary's Primary school governing body, Long Lee Primary School, Ingrow Primary School a number of these issues are the same as those raised by the Local MP / Councillors/ Town Council and are not necessarily repeated below.

<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
<b>Comments about air emissions and air risk assessment</b>	
Concern over the impact of air emissions on nearby businesses.	We are satisfied that there will not be a significant impact from emissions to air when based on the maximum concentrations that represent the worst case predictions. Impacts at individual receptors will be lower than the maximum.  Section 5.2 of this decision document has further details.
Concern over the impact from emissions of oxides of nitrogen.	We are satisfied that there will not be a significant impact from emissions of oxides of nitrogen. Section 5.2 and specifically section 5.2.2(i) of this decision document has further details.
Concern over the impact from the emission of very fine particles (nano-particles).	We are satisfied that there will not be a significant impact from very fine particles. Section 5.3 of this decision document has further details.
Concern over the effect of wind direction on impacts.	Weather data was included in the dispersion modelling and therefore the wind direction has been taken into account.
Concern over controls during the commissioning period.	The Operator will be required to submit a commissioning plan, as required by pre-operational condition PO4. This will include measures to control emissions during commissioning.
East Riddlesden Hall is identified as a residential receptor, people who work and visit it should also be considered.	As a residential receptor the impacts for both long a short term impacts against the relevant ES have been considered. These standards will be protective for anyone at East Riddlesden Hall.
Concern over air quality impacts on	Emissions will not cause damage to

<p>artefacts, buildings and stonework.</p>	<p>stonework or artefacts. Stonework can be damaged by acid rain but the emission of acid gasses from the Installation will not be at a level that could cause acid rain.</p>	
<p>ADMS and AERMOD give different results in hilly areas, so the Applicant should have assessed using more than one model.</p>	<p>We used multiple models in our audit of the Applicant's modelling (ADMS, AERMOD and Calpuff). Our conclusion was that the Applicant's modelling results could be used for permit determination and were a reasonable worst case.</p>	
<p>Concern that background pollutant levels are not representative of the site.</p> <p>Claim that testing showed higher levels at nearby roundabout.</p>	<p>As part of our audit we checked the background levels and we are satisfied that they were appropriate and that significant pollution will not be caused.</p> <p>Roadside measurements are likely to be higher however they are not necessarily representative of levels at receptors due to the drop off in concentrations with distance between the kerbside and receptor location. Therefore we consider that the Applicant's selected background vales are appropriate.</p>	
<p>Concern that the weather data used in the modelling is not representative of conditions at the Installation.</p>	<p>We checked the weather data used by the Applicant when we audited the Applicant's dispersion modelling. We are satisfied with the weather data that was used.</p>	
<p>KLAM_21 should have been used to assess the impact of temperature inversions.</p>	<p>KLAM_21 is a method of assessing cold air drainage that can occur during inversions. We considered temperature inversions in our audit as discussed in section 5.2.4. We are satisfied that no further modelling work is required.</p>	
<p>The dispersion modelling is based on a different emission concentration of NO<sub>2</sub> than that stated in the BAT assessment document.</p>	<p>The values in these two documents were slightly different. The maximum PCs for NO<sub>2</sub> predicted by the dispersion modelling was are 2.18 µg/m<sup>3</sup> for long term and short term. The value stated in the BAT assessment are 2.69 µg/m<sup>3</sup>. The Applicant submitted additional information on the BAT assessment including a corrected PC of 2.18 µg/m<sup>3</sup></p>	
<p>Although the waste amount has increased from the planning application the flue gas volume has not had a corresponding increase.</p>	<p>The flue gas volume used in the modelling was based on the capacity to reflect the maximum emissions. The same value was used for the planning application and Permit application. The value used can represent a range of waste throughputs depending on the calorific value of the waste.</p>	
<p>There are impacts from dust at other incinerator sites.</p>	<p>Our view is that other incineration plants do not give rise to any significant dust issues.</p>	
<p>Concern over the way terrain was considered. The impact at receptors that are higher up. Some receptors are higher than the stack.</p>	<p>Terrain was taken into account in the modelling and when we audited the modelling. We are satisfied that the worst case impacts have been assessed.</p>	
<p>Concern that some local receptors were not included in the dispersion modelling report.</p>	<p>The Applicant has reported maximum concentrations in the modelled grid, these</p>	
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	represent 'worst case' predictions and do not necessarily represent public exposure. However, the predicted impacts have been shown to be not significant. As a result making predictions at further discrete receptor locations is not required as these will be less than the reported maximums which are already considered to be permissible and not cause any significant air quality pollution issues.
The proposed plant does not fit with policy of reducing air pollution.	We do not agree that the plant will contravene government or local authority air quality policy. We are satisfied that the plant will not have a significant effect on air quality.
<b>Comments about health impacts</b>	
Concern as to whether health impacts have been realistically assessed.	We consider that the health risk assessment was based on very conservative assumptions and as such represent a worst case. Further details are in section 5.3 of this decision document.
Concern that there is no safe level for dioxins/furans.	Dioxins/furans are non-threshold acting contaminants which means that any exposure results in some level of risk. However we have assessed the impact and we are satisfied that there will not be a significant impact on health, even when based on very conservative assessment criteria. Section 5.3 has further details.
Concern over the impact on animals including livestock and grazing animals.	We are satisfied that emissions will not have a significant impact on animals including livestock and grazing animals.  We are also satisfied that there will not be a significant impact on the food chain from grazing animals. The HHRA included the uptake of dioxins from the food chain which included grazing animals.
Concern over health impacts due to traffic.	Air emissions from traffic were considered in the previous section (Annex 4(A)(2)(a) above.  We are satisfied that on-site vehicle movements will not have a significant effect on health.
Concern that the risks are unknown, further research is required.	We consider that the risks are sufficiently understood and that there will not be a significant impact on health. Section 5.3 of this decision document has further details.
<b>Comments about noise impacts</b>	
Concern over noise impacts which will be made worse due to the location in a valley.	The Applicant considered receptors on the side of the valley in their assessment. We are satisfied that noise will not cause a significant impact.
Concern about noise impacts at other incinerator sites.	Our view is that noise is not a significant issue at municipal waste incinerators and is generally well controlled.

A noise baseline should be set and then operational noise compared to it.	The Applicant considered noise background levels in their noise assessment and operational noise was then compared to the background in making an assessment to noise impacts. Our preferred approach is not to set numerical noise limits in permits but to use permit condition 3.5.1 to control and regulate noise impacts.
<b>Comments about odour impacts</b>	
Concern over the impact from odour	We are satisfied that there will not be a significant impact from odour, further details are in section 6.5.4 of this decision document.
There are odour impacts at other incinerator sites.	Our view is that odour is not a significant issue at municipal waste incinerators and is generally well controlled.
Concern on how odour will be monitored and how issues will be rectified if required.	<p>Whilst odour monitoring has its role our approach is to impose operational controls which should prevent odour occurring in the first place.</p> <p>Our view is that odour monitoring is not required in this case. We will use Permit condition 3.4.1 to control and regulate odour.</p> <p>If there are odour complaints we will investigate and look into the source and cause. There are several ways we can do this including visiting the site, discussions with the complainant and with the Operator. If appropriate we will require the Operator to put measures in place to rectify any issues.</p>
A baseline for odour should be established and then operational odour compared to the baseline.	We do not regulate odour by comparing to a baseline. Odour is not cumulative with background levels in the way that air emissions are. Instead we focus on ensuring that sites we permit do not cause odour pollution. We have set permit condition 3.4.1 and will regulate odour through this condition.
<b>Comments about pollution of water and land</b>	
Concern that water supplies could become contaminated.	We consider that there is not a risk of water supplies being contaminated by emissions from the Installation.
Concern over the adequacy of the site condition report (SCR).	The purpose of the SCR is to establish the baseline ground conditions and we are satisfied that this has been done.
<b>Comments about impacts at ecological sites</b>	
Concern over the impact at habitat sites and other ecological sites.	Our assessment at ecological sites is described in section 5.4 of this decision document. We are satisfied that there will not be a significant impact and Natural England agreed with our assessment.
Concern over the impact on wildlife, plants and protected species.	We are satisfied that there will not be an impact on wildlife or species. Section 5.4.4 has further details.



<b>General comments about impacts</b>	
Concern over general impacts on several schools, outdoor play areas, playing fields, sports facilities, homes, care homes, day nurseries, outdoor events and pre-schools that are nearby.	We are satisfied that impacts at receptors have been considered and that there will not be significant pollution of the environment or harm to human health at any receptors.
Concern that micro plastics could be emitted.	We are satisfied that this will not be a significant issue with emissions from the Installation.
<b>Comments about other impacts</b>	
Concern about the impact from pests, there are impacts at other incinerator sites.	We are satisfied that there will not be a significant problem with pests. Pests are not usually a problem at other municipal waste incinerators that we regulate.
Concern over the impacts from light pollution.	Pollution from light is primarily a concern for considering visual impacts and as such covered by the planning process. In any event light pollution is not likely to have a significant effect on health or the environment.
The stack location is not clear.	The location of the stack is shown on a site plan in the Application. The dispersion modelling report gives the grid reference of the stack.
<b>Comments about BAT, emissions limits and control measures</b>	
Concern over whether emissions will be controlled.	Measures will be in place to control emissions and the Permit has limits for the main emitted pollutants. Section 6 of this decision documents has further details on the control measures.
Concern as to whether tighter controls and limits are needed due to the location.	The location has been taken into account when assessing the impacts from the Installation. We are satisfied that the controls and limits are appropriate to ensure that significant pollution or harm to human health does not occur.
Query as to whether a different measurement uncertainty will apply if limits lower than those specified in IED are set for NO <sub>2</sub> , SO <sub>2</sub> and NH <sub>3</sub> .	The measurement uncertainty is set in annex VI of the IED. They do not vary dependant on the level of the emission.
Concern over whether the NO <sub>x</sub> limit proposed in the Application can be achieved.	The Applicant confirmed that the NO <sub>x</sub> BAT AEL could be achieved. We are satisfied that new incineration plants, including this Installation, can meet this limit.
The PC for NO <sub>x</sub> is higher than other plants.	For this Installation the long term PC for NO <sub>2</sub> is 2.18 µg/m <sup>3</sup> and the short term PC is 21 µg/m <sup>3</sup> . These are similar to those seen at similar plants. We are satisfied that the control measures for NO <sub>x</sub> are BAT, further details are in section 5.2 of this decision document.
The PCs are >1% - this shows that BAT has not been proposed.	If PC are >1% this does not necessarily mean that measures are not BAT. This is explained in more detail in section 5 and 6 of this decision document.
The use of urea in the SNCR abatement will cause higher N <sub>2</sub> O levels than if ammonia	The BREF confirms that urea can give rise to higher N <sub>2</sub> O emissions. However the
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was used.	BREF shows that there are advantages and disadvantages to each reagent. Our view is that either reagent can be BAT. In this case the Applicant has chosen to use ammonia. Section 6.2.2 has further details.
Concern that flue gas recirculation is not proposed.	The Applicant considered flue gas recirculation but concluded that it is not BAT for the Installation. We agree with that assessment. Further detail is in section 6.2.2 of this decision document.
Concern that the technology is not well proven in the UK.	The proposed technology is well proven in the UK and across Europe.
Concern that PM10 and PM2.5 will not be captured by the filters.	Bag filters are proposed to abate particulate emissions. Bag filters are very effective at removing PM10 and PM2.5. Section 5.2 has further details.
<b>Comments about waste</b>	
Concern over the types of waste and where they come from.	<p>The Operator will have waste pre-acceptance and waste acceptance procedures to ensure that only waste authorised by the Permit is received and burned.</p> <p>The Permit does not control where the waste comes from because that falls outside the scope of this permit determination.</p> <p>Waste types are specified in table S2.2 of the Permit. We are satisfied that these wastes are suitable for burning at the Installation, further details are in section 4.3.6 of this decision document. We are satisfied that the operating techniques will ensure that emission limits can be met, the emission limits apply at all times whatever wastes are being burned.</p>
Concern that the waste might not all be residual waste.	<p>The permit does not allow wastes that have been separately collected for recycling to be burned, unless they are subsequently found to be unsuitable for recovery by recycling.</p> <p>We requested further information from the Applicant on some wastes types that appeared to be recyclable materials. Further details on this are in section 4.3.6 of this decision document.</p>
Concern as to how receipt of waste and the types will be monitored and enforced.	<p>The Operator will have waste pre-acceptance and waste acceptance procedures to ensure that only waste authorised by the Permit is received and burned.</p> <p>We will check that these procedures are being adhered to when we inspect the Installation.</p>
Concern over the burning of plastics.	The Applicant confirmed that large amounts of plastic will not be burned.

	We are satisfied that the plastics proposed in the Application can be burned whilst complying with the Permit emission limits.
<b>Comments about energy efficiency</b>	
Concern that waste with a low CV will be used that will affect energy efficiency.	Waste with a range of CV will be burned. When operating at lower CV the throughput will be higher and the total energy input and output is not expected to be affected significantly.
<b>Comments about regulation</b>	
A claim was made that the compliance history is poor at other incinerators.	We do not agree with this claim. The sector is generally a good sector in terms of compliance.
Concern over Environment Agency regulation of other sites with lack of prosecutions and enforcement action.	If there are compliance issues then we will take appropriate action in line with our enforcement and sanctions policy as we do at all sites we regulate.
Concern over how noise issues would be investigated.	If there are noise and/or noise complaints we will investigate and look into the source and cause. There are several ways we can do this including visiting the site, discussions with the complainant and with the Operator. If appropriate we will require the Operator to put measures in place to rectify any issues.
<b>Comments about the Applicant</b>	
Concern that the Applicant is registered in the Isle and Man	The EPR allow permits to be issued to an overseas company. The Applicant provided an address in the UK that could be used if we needed to serve instruments on the Operator.
Questions about the financial backing of the Applicant.	The core EPR guidance states at 9.22 we should only consider financial solvency explicitly in cases where we have doubts as to the financial viability of the activity. We have no doubts as to the general financial viability of the activity. Based on this we have no reason to consider that the Applicant will not be financially competent. In any event, given the conditions in the permit if they cannot discharge the pre-operational conditions they will not be able to commence activities and they can only get to that stage if they are financially competent.
There has been a lack of communications/engagement by the Applicant.	We are not responsible for the level of engagement carried out by the Applicant. However we are satisfied that we have consulted appropriately – section 2.2 has further details on how we did this.
<b>Comments about accidents</b>	
Concern over impacts on local area during an accident. An accident plan and emergency plans should be in place in case of a major accident. Evacuation of local area needs to be considered.	The Applicant provided an accident risk assessment in the Application. An accident management plan will also form part of their environmental management system that is subject to Pre-operational condition PO1.

	<p>COMAH legislation covers sites that pose the highest accident risks and these sites would have major accident plans. This Installation is not subject to COMAH regulations due to not meeting any of the COMAH thresholds.</p>
<p>Concern as to how the public and businesses will be informed (as described in the FPP) in the event of a major incident.</p>	<p>In the unlikely event of a fire the FPP states that residents and business will be informed. There are several ways that this could be done and we expect the Operator to have procedures in place to achieve this. Pre-operational condition PO8 has been set for the Operator to submit a final FPP after the final design has been finalised and this will need to include these procedures.</p>
<p>Concern over the provision of firewater including whether it will meet the guidance requirement of 2000 l/min for 3 hours.</p>	<p>The firewater provision will not meet guidance requirement of 2000 l/min for 3 hours. However the Applicant proposed alternative measures that we are satisfied with.</p>
<p>Will locals be informed if pollution is high?</p>	<p>The Permit is written to prevent significant pollution during normal operations or in the event of accidents so the situation should not arise. Any breaches of emission limit values will be recorded on public registers.</p> <p>In the unlikely event of an emergency situation we could notify locals if we considered that was appropriate.</p>
<p>Concern over the risk of gas main running under the site and location of a gas tank.</p>	<p>The site has been designed with sufficient distance to the gas pipeline (28 m) in line with the recommendation of the Institution of Gas Engineers and Managers Document TD1 edition 5. The gas tanks are approximately 50 m away. We consider the accident risk to be low.</p>
<p>Concern that the FPP does not accurately describe receptors and locations.</p>	<p>We are satisfied that the descriptions along with the receptor plan drawing are appropriate for the purposes of the FPP.</p>
<p><b>Comments about monitoring</b></p>	
<p>Concern about how pollutants will be monitored.</p>	<p>Monitoring is specified in schedule 3 of the Permit. We are satisfied that the monitoring is appropriate.</p>
<p>Ambient air monitors should be placed nearby.</p>	<p>Ambient air monitoring around operating incinerators is not a reliable method of establishing the impact as it does not identify the source of the emissions. We consider it is better to use air dispersion modelling to predict the impact based on the highest allowed emissions (emission limit values). We have audited the modelling and we are satisfied that it is suitable for assessing the impact from the Installation. The Permit requires monitoring to be carried out to ensure that the emission limits values that were used in the modelling are met.</p>

<b>Comments about other issues</b>	
Concern as to whether the increase in waste throughput from the planning application has been taken into account in the risk assessments including an increased number of vehicle movements.	We are satisfied that the risk assessments have been carried out on the correct plant throughput. The air quality risk assessments in the Application was based on continual operation at a throughput of 19.6 tonnes per hour which is the maximum continuous rating.
Concern over the impact of a visible plume.	Visible plumes can occur during certain weather conditions. The Applicant's assessment showed that the plume is unlikely to be visible for significant periods and we agree with this assessment.
Concern over differences between the planning application documents and the EPR application.	Our view is that the planning and the Permit are not likely to conflict but in any event the Applicant will have to comply with both their planning permission and the Permit and in the event of any difference comply with the most stringent.
Concern over the Permit consultation.	We are satisfied that we took appropriate steps to inform people about the Application and to inform people about the consultation. This was proven by the large number of consultation responses that we received. Further details on how we consulted are in section 2.2 of this decision document.
The location of the Installation and receptors are not described accurately in the Application.	The Applicant submitted a revised non-technical summary (at our request) with an updated description of the location of the Installation. In terms of the impact assessment, we are satisfied that they have considered impacts at appropriate receptors.

c) Representations from Individual Members of the Public

Over 2100 responses were received from individual members of the public. Many of the issues raised were the same as those considered above. To avoid repetition, generally only those issues additional to those already considered are listed below:

<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
<b>Comments about air emissions and air risk assessment</b>	
Concern that aerial emissions could cause pollution of the River Aire and other waterways.	Air emissions are not at the level where they could cause pollution of any waterways.
Many responses were submitted showing photographs and video footage of low lying cloud in the valley.	We checked the effect of the valley and local weather conditions when we audited the Applicant's modelling. Our conclusion was that the Applicant's modelling represented a reasonable worst case.

	Further details are in section 5.2.4 of this decision document.
Concern that it will contravene the human right to clean air.	We do not agree that human rights will be contravened or that the proposal will give rise to air pollution.
Many responses were submitted with details of receptors not included in the air dispersion modelling. They included schools, nurseries, nearby houses, housing estates and other towns/villages.	The Applicant has reported maximum concentrations in the modelled grid, these represent 'worst case' predictions and do not necessarily represent public exposure. However, the predicted impacts have been shown to be not significant. As a result making predictions at further discrete receptor locations is not required as these will be less than the reported maximums which are already considered to be permissible and not cause any significant air quality pollution issues.
Concern over the impacts as shown on the Plume Plotter website.	Plume Plotter appears to be a tool which uses air quality modelling software to predict the ground level concentrations of nitrogen oxides and other pollutants that may arise from the incinerator based on a number of factors. The information on the website indicates that the results may be based on expected modelling methods. However, there is no information on the website as to how the model was validated and we have not seen the model input parameters, and so cannot comment on the validity of the predictions. We have audited the dispersion modelling submitted with this Application and we are satisfied that there will not be any significant impacts.
Concern over smoke emissions.	There will not be emissions of smoke from the Installation. Smoke is made up of high concentrations of particulates. Particulate emissions will be controlled to low levels by the bag filter system.
Concern over the impact on the ozone layer.	Complete combustion will minimise the emission of ozone depleting substances. We are satisfied they will not have a significant impact and will not be emitted in significant quantities.
Concern over the formation of ozone pollution.	Ozone can be produced by the action of sunlight on volatile organic compounds (VOCs) and oxides of nitrogen (NOx). Whilst the PC for NO <sub>2</sub> and VOCs have not been screened out as insignificant, it is considered that there is very little if any risk from the incinerator of an exceedance of an air quality standard. This has been considered in Section 5.2 of this document. The potential of substances to form ozone and other substances when reacting with sunlight is a factor considered when setting ambient air quality standards. Therefore it is not considered that any additional controls or conditions are required, beyond those already proposed to minimise emissions.
Concern that ash residues could be released to atmosphere.	Bag filters will minimise the emission of particles relating to APC residues to atmosphere.  Fugitive emission of bottom and or APC residues will be minimised. The measures are set out in section 6.5.3 of this decision document.

Concern over increased emissions at start-up and shut-down and whether this will require the Operator to notify the Environment Agency.	The emissions limits set by IED do not apply at start-up and shut-down. The combustion units will be fired on a support fuel (gas oil), to ensure that the temperature meets the required levels before waste is permitted to be fed for incineration. This support fuel is automatically fed if the temperature of the furnace falls below a permitted level. The impact at start-up and shut-down, when emission limits do not apply, is considered not significant. We consider that notification of start-up and shut-down is not required.
Concern over the emission of unknown pollutants.	IED chapter IV sets limits for the most significant substances that will be emitted. This is discussed in more detail in section 5 of this decision document. The operating techniques and abatement plant will minimise emissions of these substances and also of other substances. Other substances will not be released in significant quantities.
Concern over the emission of carbon.	Activated carbon is used to abate dioxin/furan emissions. The emission of activated carbon, as with other particulates, will be minimised by the use of bag filters. We are satisfied that there will not be a significant impact from particulates, section 5.2 has further details.
Concern was expressed over the Environmental Standards that were used. It was claimed that they are higher than some WHO levels.	We are satisfied that the Environmental Standards are appropriate. The use of the standards and the basis of them is explained in section 5.1 of this decision document.
It was claimed that emissions will be worse than from a coal fired power station.	We have not compared emissions to coal combustion in our assessment of this Application. The Applicant has not applied to operate a power station, the Application is for an incineration plant with the primary purpose of waste disposal whereas a power station's primary purpose is to generate energy. Our assessment of BAT is set out in section 6 of this decision document.
Concern over the impact on areas where background levels already exceed the ES.	We have considered impacts at AQMAs and are satisfied that the impact will be insignificant for the relevant pollution at the AQMAs and that the contribution from the Installation will be negligible. Section 5.2.4(i) of this decision document has further details.
Concern that emissions will be continuous.	The dispersion modelling considered the worst case of continual impacts.
It was claimed that pollution will exceed government guidelines.	We are satisfied that the relevant pollution standards (ES) will not be exceeded due to emissions from the Installation.
The composition of particulate emissions should be determined.	The ES for PM10 and PM2.5 are relevant for all particulate matter and not dependent on the composition. In addition to this emission limits have been set for metals and dioxins that could be in the particulate phase. These limits will ensure that significant pollution is not caused.
Emissions of NOx should meet the new lower limits.	The Permit includes the BAT AEL for NOx of 120 mg/m3. We are satisfied the Operator can meet this limit
Concern over mercury impacts including accumulation.	The impacts of mercury were compared to the ES which is considered to be protective for human

<p>Concern over accumulation of other pollutants.</p>	<p>health impacts. The exception would be if a fish farm was nearby in which case a human health impact assessment to consider mercury intake via fish would be required. However there are no commercial fisheries within 10 km of the Installation. Therefore specific consideration of accumulation is not required in this case. We are satisfied that impacts from mercury will not be significant.</p> <p>Dioxins and furans can accumulate in the food chain. This is considered in section 5.3 of this decision document. The issue of accumulation is covered in section (a) above. Other pollutants are assessed against the ES and we are satisfied that the ES are protective of human health and that further assessment of accumulation is not required.</p>
<p>Emissions will lead to acid rain.</p>	<p>Acid rain can be caused by emissions of large amounts of acid gases. Historically large coal fired power station without flue gas desulphurisation contributed to acid rain. The emission of acid gasses from the Installation will not be at a level that could cause acid rain.</p>
<p>Concern was expressed about how the modelling was carried out including:</p> <ul style="list-style-type: none"> <li>• surface roughness not representative</li> <li>• It should be based on a worst case</li> <li>• It is not clear which model was used</li> <li>• Only 1 windrose included in the report</li> <li>• The guidance used to assess metals is for municipal waste not commercial and industrial waste</li> <li>• Tables missing from the air quality addendum</li> <li>• The assumption of all particulate being PM10 and PM2.5 ignores larger and smaller particles.</li> <li>• Impact from multiple failure not considered</li> <li>• impacts from major incidents not considered</li> </ul>	<p>We audited the dispersion modelling and we are satisfied that the results are reliable. Specific responses to the concerns are set out below:</p> <ul style="list-style-type: none"> <li>• Surface roughness was considered in our audit.</li> <li>• Our view is that the modelling was based on a worst case</li> <li>• The model used was ADMS 5.2. This was stated in the Applicant's modelling report.</li> <li>• One windrose was included but 5 years of weather data was used in the modelling which we consider is appropriate</li> <li>• We are satisfied that the guidance is appropriate for the waste types that were proposed that are similar to municipal waste. Improvement condition IC6 will check this with real monitoring data</li> <li>• Although there were some errors in the referencing of the table numbering the tables were not missing and the information required to assess the impact was present.</li> <li>• Smaller particles are not ignored. PM10 and PM2.5 includes all particles smaller than 10 µm and 2.5 µm respectively.</li> <li>• The assessment of abnormal operation considered complete failure of abatement plant (with the exception of particulates as explained in section 5.5) and as such considers the worst case.</li> <li>• Accident risk will be controlled through the accident plan that forms part of the EMS and we are satisfied that the risk of a major incident is low. However in the event of a major incident the plant would shut-down. If such an event were to cause emissions</li> </ul>



	then it would not be authorised by the Permit and so it is not appropriate to try to predict the impact through dispersion modelling, but we would require them to take remedial action if such an event occurred.
Concern that there are no ES to assess As, Cr, Cr(VI), Tl, Co and dioxins/furans.	There are ES for As, Cr and Cr(VI) and they were used to assess the impacts. There are no ES for Tl and Co, however given that ES are set for the most significant substances, we are satisfied that the predicted PCs will not cause a significant impact. There is no ES for dioxins and furans but we have assessed by considering potential intake against the TDI and TWI. This is explained further in sections 5.2 and 5.3 of this decision document.
Concern over dust impacts from chimney blasting.	This appears to relate to steam purging that can be used during commissioning to clear debris from the stack. Impacts during commissioning will be covered by the commissioning plan as required by pre-operational condition PO4. Steam purging is not expected to be routinely required during normal operation or maintenance.
Concern that emissions could leak through the sides of the stack.	This is not an issue at modern incineration plants that we regulate. We have no reason to doubt that the stack will be built to appropriate construction standards.
Concern that if stack height changes then the location of impacts will change.	We agree that this is possible. If the Operator wishes to change the stack location then they will need to apply for a variation to their Permit which will need to include an assessment of whether the impacts have changed.
Concern expressed over the emission of benzene, phenols, methane and other hydrocarbons.	The impact of VOCs was assessed assuming it is all butadiene. Even when making this worst case assessment impacts were screened out. Section 5.2 has further details.
Concern over the emissions of PCBs.	The Applicant considered PCBs in their impact assessment. The impact was shown to be insignificant. Further information is in section 5.2 of this decision document.
Concern that emissions will be the same as from a hazardous waste incinerator.	Whilst the limits set for hazardous waste plants can be the same (as specified by the BAT C and IED chapter IV), hazardous waste incinerators have extra conditions, such as a higher combustion temperature, to ensure the limits are met. The limits for both types of plant are set at levels that protect people and the environment.
Concern over emissions due to incomplete combustion.	The required combustion temperature and residence time will ensure complete combustion of the waste to minimise emissions.
Concern expressed in relation to the UKWIN report about particulate pollution and regulation.	We did not agree with the claims made in this report. Our response to the UKWIN report can be found at the link below:  <a href="http://www.esauk.org/download_file/view/256/204">http://www.esauk.org/download_file/view/256/204</a>
Concern that operation can continue whilst emissions are exceeded.	The Permit allows emission limits to be exceeded for short periods during certain circumstances, known as abnormal operation. The reason we allow this is explained in section 5.5 of this decision document. We have assessed the impact from

	abnormal operation and we are satisfied that there will not be a significant impact, this is also explained in section 5.5.
MSW incinerators are the dominant source of dioxin emissions to air. A 1997 HMIP report was cited.	Emissions of PCDD/F (dioxins and furans) are much lower from modern waste incinerators regulated under the IED. Modern plants make up a small proportion of total dioxin/furan emissions.
Air emissions will be trapped in nearby woodland.	We are satisfied that woodland will not have an impact on dispersion of the emissions and that emissions will not adversely affect the woodland.
Concern over emissions of carbon monoxide.	The impacts from CO were assessed and were screened out as insignificant. Further details are in section 5.2 of this decision document.
There are no details of the dispersion modelling parameters in the report.	This is not correct, the parameters used are set out in the report.
Concern that the estimated PAH emission level is too low.	We do not agree with this. The emission value used in the assessment was 0.001 mg/m <sup>3</sup> . This is in line with expected average emissions from this type of plant as shown in the BREF.
Concern that maximum particulate emissions have not been specified.	This is not the case, the dispersion modelling was based on the emission limits which are the maximum level allowed by the Permit.
Concern over fugitive dust.	We are satisfied that the control measures will prevent significant emissions. Section 6.5.3 contains further details.
Concern over the emission of bio-aerosols.	Our view is that bio-aerosols will not be a significant issue. Waste will be stored inside the reception building and will only be stored for short periods before being burned. Emissions from the reception hall will be minimised by keeping it under negative pressure.
Concern that vehicle movements could lead to dust.	The Application set out measures to avoid dust on roadways including sweeping them and dampening them if required.
Concern over the impact from persistent organic pollutants.	Sections 6.4 and 7.3.3 contains details on how this has been considered.
<b>Comments about health impacts</b>	
Several reports, papers and articles were cited to support the claim that the incinerator would cause health impacts due to air emissions.	We considered the reports, papers and articles that were submitted. Our view is that the Installation will not have a significant impact on health. This view is supported by Public Health England. Further details on in section 5.3 of this decision document.
Concern over impact on pregnant women and on unborn children including birth deformities.	We are satisfied that there will not be a significant impact on health including pregnant women and unborn children.  The Environment Agency takes advice from PHE on the health implications of incinerators generally and specifically on each application for a permit. In January 2012 they confirmed they would be undertaking a study to look for evidence of any link between municipal waste incinerators and health outcomes including low birth weight, still births and infant deaths. Further details of the findings are in section 5.3 of this decision document.  PHE's position remains that modern, well run

	municipal waste incinerators are not a significant risk to public health.
The new PHE study did not look at the smallest particles and birth abnormalities were not considered	In the study the assumption was that total particulate matter equated to PM10. PM10 includes everything smaller than 10 microns. PHE then linked the information on exposure to particulates to an epidemiological study on birth outcomes. Further details are in section 5.3 of this decision document.
Concern about the impact from people taking part in sports activities due to increased inhalation.	There is research to show that people undertaking athletic activities can be more at risk from pollution in ambient air. However our detailed assessment has shown that the incinerator will have a negligible impact on ambient air pollution levels and therefore any impact from the installation on the health of people taking part on sports activities will also be negligible.
Health in the area should be monitored by the Environment Agency and PHE.	Our view is that this is not necessary in relation to any impacts from the Installation because it will not have a significant impact on health.
Concern that the PHE position statement does not rule out health risks.	It does not rule them out but it makes it clear that the risks are very small as shown by this extract: <i>'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'</i>
Concern that the SEPA report on health impacts from incineration was inconclusive and did not rule out health impacts. Report also says precautionary principle should be applied and awareness about locating near to people	This report is covered in section 5.3 of this decision document.  The United Kingdom Interdepartmental Liaison Group on Risk Assessment (UK-ILGRA) state in their paper "The Precautionary Principle: Policy and Application" that the precautionary principle should be invoked when there is good reason to believe that harmful effects may occur and the level of scientific uncertainty about the consequences or likelihood of the risk is such that the best available scientific advice cannot assess the risk with sufficient confidence to inform decision making. The Health Protection Agency (as it was called then) stated in its response to the British Society for Ecological Medicine Report, "The Health Effects of Waste Incinerators that "as there is a body of scientific evidence strongly indicating that contemporary waste management practices, including incineration, have at most a minor effect on human health and the environment, there are no grounds for adopting the 'precautionary principle' to restrict the introduction of new incinerators". As explained in section 5.3 Public Health England maintain their view on impacts from incineration.
The incinerator will cause mental health issues.	Our view as set out in this decision document (section 5.3) is that emissions from the Installation will not have a significant effect on health. There is therefore no reason that there should be an impact on mental health.

The health assessment should take account of the plant location.	The dispersion modelling and HHRA did take account of the location.
Concern that PHE has not carried out health studies.	The PHE statement of health risks is based on a review of research undertaken on health from various sources. The new study covered in section 5.3 was commissioned by PHE.
Concern that in the future incineration could be found to be linked to health impacts.	If this was to occur, we would take appropriate action as required to prevent any Installation causing a significant impact. Permits are reviewed periodically in line with a regulatory timetable for permit review.
Concern expressed about PHE's statement on health – Claimed that it is out of date and does not apply to this Application because it only applies to municipal waste.	The statement was first issued in 2009, however PHE have confirmed that it is still valid. PHE quoted the statement in their consultation response on this Application and we are satisfied that it is relevant to this Application. The waste types that this incinerator are similar to municipal waste.
Concern that health assessment only considered point of maximum impact.	Assessing at the point of maximum impact gives a worst case prediction of impacts and we were satisfied that this worst case still showed no significant impact.
Concern expressed over the method used for the HHRA.	We audited the Applicant's methodology and are satisfied that the method used was appropriate.
It was claimed that there is increased infant mortality in areas near to incinerators. The Wolverhampton incinerator was cited.	Our view, supported by Public Health England, is that there will not be a significant impact on health. Further details are in section 5.3.  We are not aware with a link to infant mortality due to the incinerator in Wolverhampton.
Concern over a recent report of contamination in eggs near a Dutch incinerator.	This relates to a report by Zero Waste Europe on the Reststoffen Energie Centrale plant in Harlingen, Holland. The report has not been peer reviewed or published.  The report claims that the plant has a by-pass that operates so that emissions can by-pass the bag filter plant. The proposed Installation will have no by-pass. We are satisfied that the Installation will not have a significant impact on local food.
Concern that houses at the Croft are identified as a farm in the Application.	The Croft was modelled as a farm for the purpose of the HHRA. This is a conservative assumption when assessing uptake into the food chain.
The Croft is incorrectly stated in the Application to be 175 m from the proposed site.	The Croft is correctly identified in the HHRA and the air quality assessment and was considered as a receptor.
Concern that some people could be more sensitive than others to emissions.	The ES are set to protect the whole population.
Concern over the synergistic effect of emissions.	We are satisfied that the ES that we have used to assess impacts are protective of both human health and ecological receptors and take account of synergistic effects.
It was claimed that health studies have been carried out on areas 5-10 km away from incinerators and not closer.	This is not correct, as set out in section 5.3 and the PHE statement on health studies have been carried out in areas near to incineration plants.

Concern over the cancer risk estimate benchmark that was used in the HHRA.	In the HHRA the Applicant included the US-EPA cancer risk methodology. This is not used formally in the UK and we have not used this in our assessment. The way we have assessed health is covered in section 5.3 of this decision document.
Concern as to whether the dioxin risk assessment takes continual exposure into account.	We can confirm that the assessment assumes continual operation and continual exposure.
Concern over impacts on breast milk and how this was assessed.	This was considered in the Applicant's HHRA. We are satisfied that impacts will not be significant.
<b>Comments about noise impacts</b>	
Receptors further away should have been considered in the noise assessment.	We are satisfied that the worst case receptors were considered and an assessment at receptors further away is not required.
Concern over noise outside of normal working hours/night time including traffic. Operating hours should be restricted.	The noise assessment considered impacts during the daytime and night time and we are satisfied that there will not be a significant impact either during the day or the night. The Permit does not restrict operating hours, however permit condition 3.5.1 requires that noise pollution is prevented at all times.
Concern over how the noise assessment was carried out	We audited the Applicant's noise assessment. We required additional information including updated background monitoring. We are satisfied that the noise assessment was appropriate.
Concern that the Application states that there is the possibility of frequent noise pollution.	The Applicant's conclusion is that the risk of noise issues is low. See section 6.5.5 for further details. We are satisfied that noise will be adequately controlled.
Concern over noise from reversing beepers.	To comply with Permit noise conditions, traffic will be managed to ensure smooth traffic flow around the site and minimise reversing.
Concern expressed about whether the proposed acoustic fence will be effective. Not high enough to protect houses that will be higher than the fence.	The noise assessment included the effect of the acoustic fence. We are satisfied that the noise impact will be acceptable at receptors higher than the fence.
Concern over statement in the noise assessment 'Wardell Armstrong has not been provided with details of noise emissions from the facility'	The Applicant submitted a revised noise assessment that contained details of the noise sources.
Concern over vibration impacts on houses.	We are satisfied that vibration will not be a significant issue.
Noise should be monitored.	Our view is that this is not necessary. However if noise impacts occur would can require the Operator to implement further measures that could include noise monitoring as part of a noise management plan.
Concern as to what measures will be used to control noise.	The Application included details of measures. They are summarised in section 6.5.5.
Specific concern over tonal noise.	The noise assessment took account of the tonal nature of noise sources.
Concern that it was stated in the noise assessment that detailed design has not been confirmed.	We are satisfied that sufficient information on the design was provided for us to assess noise impacts. If the Operator wishes to make any changes after the detailed design stage that could adversely affect noise impacts will need to apply for

	a variation to the Permit.	
<b>Comments about odour impacts</b>		
Concern that odour will be trapped in the valley.	We are satisfied that the proposed control measures will prevent any significant emission of odour and the location in the valley will not be an issue. Section 6.5.4 has further details.	
Concern over effectiveness of negative pressure in controlling odour in the reception hall.	The use of combustion air in the furnace to generate negative pressure in the reception hall is used in many incineration plants and generally works well to control odour. We are satisfied that there will not be a significant impact from odour. Improvement condition IC8 has also been set to check that it is working effectively.	
Concern over odour impacts during shut-down	The Applicant described measures in the odour management plan including the use of carbon filters for air extraction. We are satisfied that the measures are appropriate.	
Concern over odorous wastes being received.	Some wastes do have the potential to cause odour. However all waste will be delivered to the reception building which will be kept under negative pressure.	
The OMP only considers RDF and not the other more odorous waste types.	The Applicant provided an updated OMP that included the other waste types. In any event we are satisfied that the proposed measures are appropriate to control odour from this Installation.	
Receptors are missing in the OMP. Receptors further away should have been considered as well.	We are satisfied that the OMP covers appropriate receptors. Odour will dissipate with distance and so receptors further away would be less impacted by odour.	
Concern over odour from the exhaust gas emissions.	The exhaust gases will not be a source of odour. Combustion at 850 °C for 2 seconds will destroy odorous substances.	
<b>Comments about impacts at ecological sites</b>		
Description of Bingley Bog in the Application is not correct.	Bingley Bog is a SSSI. As stated in section 5.4 there are no SSSIs within 2 km of the Installation and we are therefore satisfied that the Installation will not cause damage to any SSSI.	
The report in the EIA about protected species is from 2003.	We did not rely on this report to make our assessment. We are satisfied that emissions from the Installation will not have a significant effect on protected species.	
Concern over the cumulative impact.	As part of our assessment we considered in combination impacts. This is described in section 5.4 of this decision document.	
<b>Comments about other impacts</b>		
Concern over impact at Saltaire World Heritage Site.	Saltaire Village is designated as a World Heritage Site. We are satisfied that there will not be a significant impact at Saltaire.	
Concern over the impact on rock structures.	Acid rain can potentially damage rock structures. It can be caused by emissions of large amounts of acid gases. Historically large coal fired power station without flue gas desulphurisation contributed to acid rain. The emission of acid gasses from the Installation will not be at a level	
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	that could cause acid rain and so will not damage rock structures.
Concern over the stability of the stack.	Stack stability is not an issue at incineration plants that we regulate. We have no reason to doubt that the stack will be built to appropriate construction standards.
<b>General Comments about impacts</b>	
There were several responses expressing general concern about impacts at many nearby receptors including schools, nurseries and other education areas, nearby hospital, medical centres, shops, restaurants and pubs, the canal, caravan parks, tourist sites, East Riddlesden Hall, mini railway, play centre, playing fields and footpaths. .	We are satisfied that there will not be a significant impact from the Installation. Section 5 covers the risk assessment.
Concern over the impact at future new housing developments.	If new housing was proposed in the future they would require planning permission and the incinerator should be taken into account in assessing those proposals. However, we have the ability to review the Permit and vary the conditions if required.
Environmental Protection Act 1990 requires no impacts at all.	The Application is determined under EPR. EPR requires that emissions are prevented or where that is not practicable reduced. We are satisfied that this is achieved through the issue of this Permit as explained in the body of this decision document.
Several receptors are missing from the Application documents including schools, nurseries and nearby houses and housing estates such as the Croft.	We are satisfied that impacts have been considered at appropriate receptors as described in this decision document.
Concern over the impacts from the Installation combined with existing pollution.	Background levels of pollution were considered in the risk assessments where appropriate as discussed in this decision document.
Air and water emissions will affect the water treatment at the nearby sewage treatment works.	We are satisfied that emissions will not affect operation of the sewage treatment works,
Concern that the plastic plant is not included in the Application documents.	The plastic plant (that was part of the planning application) does not form part of the EPR Application. If the Operator wishes to operate the plastic plant they would need to apply to vary the Permit or apply for a separate permit for the plastic plant. We would assess the risks at that point.
<b>Comments about BAT, emissions limits and control measures</b>	
Concern was expressed over the criteria that was used to determine safe impacts.	We are satisfied that appropriate standards were used in assessing impacts from the Installation in particular for air emissions, health assessment and the noise assessment. Further details are provided in section 5 of this decision document.
Concern over whether there will be adequate maintenance of the plant.	The EMS will include a preventative maintenance programme. This will ensure that equipment is kept in working order. We will routinely audit the EMS.
Concern that filters will not trap all particulate matter including metals and dioxins.	It is correct that all particulate matter will not be removed, however bag filters are highly efficient. We are satisfied that bag filters are BAT for removal of particulate matter and that impacts will

	not be significant.
Concern over the impacts during filter bag cleaning and back flushing.	Bag filter cleaning during operation is a standard procedure of bag filter operation. Emission limits will apply at all times including during periods of on-line cleaning.
Concern over what type of waste crane will be used. Concern over whether a standby cranes will be available.	Cranes are a standard recognised technique for loading waste at municipal waste incinerators. The Applicant stated that a standby crane will be available. We are satisfied that we do not need further details of the crane design.
Concern as to what abnormal events the statement about alarms alerting abnormal emissions refers to.	The statement in the Application that alarms will alert to any problems that could lead to abnormal conditions is contained in a section that describes what the key control systems are including the flue gas cleaning system and monitoring systems. We are satisfied that appropriate alarms and monitors will be in place.
Query as to what combustion temperature is required, how it will be checked and whether waste feed stops if it is not achieved.	The combustion chamber must achieve 850°C for 2 seconds after the last injection of combustion air. The Permit requires that this is achieved, checked and monitored through permit conditions 2.3.7, 3.6.1, and table S3.3, pre-operational conditions PO5 and PO7, and improvement condition IC4. The Permit requires that waste feeds stops if the temperature is below 850°C.
Concern over recirculation of residues.	Recirculation of acid gas abatement residues is BAT to optimise reagent usage.
The application is not clear on what reagent will be used for NOx abatement.	The Application states that either ammonia or urea will be used. We are satisfied that either reagent can be BAT. In this case the Applicant has proposed to use ammonia.
Concern expressed that the proposed technology and control measures are not BAT and also whether measures beyond BAT should be used.	Our view is that the control measures proposed by the Applicant are BAT and that further measures are not required. Our assessment is set out in section 6 of this decision document.
Concern about how ammonia slip will be monitored and controlled.	Improvement condition IC5 requires reagent dosing to be optimised. The Permit sets a limit for ammonia emissions and requires emissions to be monitored.
The feed chute is described as water cooled but water use is not mentioned in the raw materials section.	The raw material list was amended to include this water use.
Concern as to how the validation of combustion conditions will be carried out.	Pre-operational condition PO7 and improvement condition IC4 will ensure that the validation is carried out to correctly.
Concern that the plant could operate under capacity. The minimum stack exit velocity was not provided.	The Applicant considered the sensitivity of varying throughputs and exit velocities. The analysis showed that operation at reduced throughout and exit velocity would result in lower impact than those that were modelled by the Applicant.
Carbon capture technology should be used.	We require combustion plants that generate 300 MW or more electricity to be carbon capture ready. This Installation is well below this level and carbon capture is not appropriate at this scale.
Plant should shut-down in the event of poor air quality.	If emissions from the Installation are meeting the ELVs then we are satisfied that it will not cause significant pollution and a condition linking plant



	operation to ambient air quality is not required.  The Permit does require operation to stop if ELVs are exceeded.
It was claimed that incineration forms hazardous substances such as dioxins.	As explained in section 6.4 of this decision document, incineration is a recognised method of destroying POPs such as dioxins. Measures will be in place to minimise the reformation of dioxins and to abate the emission of them from the stack, further details are in section 5 of this decision document.
Concern over how BAT is determined.	We are satisfied that we have assessed BAT in an appropriate way. The way we have done this is set out in section 6 of this decision document.
The BAT assessment should have considered the cost of replacing filter bags.	Bag filters are a recognised BAT for control of particulate emissions. The way we assessed BAT is set out in section 5. We are satisfied that the cost of filter bag failure will not affect our view that they are BAT.
Concern over whether the Installation will be able to keep up to date with changing technology.	If standards change in the future we can review the permits of sites in the incineration sector to check whether any additional controls would be required. We have the power to vary the Permit if required.
Concern over whether a derogation will be granted in relation to IED standards.	A derogation from IED standards is not required.
<b>Comments about energy efficiency</b>	
Concern that the plant will not operate as combined heat and power (CHP).	The Applicant assessed the possibility of supplying heat to the local area. The conclusion was that opportunities are not currently viable. Section 4.3.7 of this decision document has further details.
Electricity should be supplied to the local area.	Electricity will be supplied to the National Grid. Electricity demand varies at different time of the day and year across the country, supply to the Grid will ensure that electricity from the Installation is supplied in line with the demand.
Concern over the amount of energy that will be recovered from the waste.	We are satisfied that as much energy as practicable will be recovered from the waste. Further details are in section 4.3.7 of this decision document.
It is not clear how much of the generated energy will be exported	The draft decision document stated 11.35 MWe would be generated with 9.55 MWe exported whereas the gross energy efficiency calculation was based on generation of 13.26 MWe. The Applicant clarified that 13.26 MWe would be generated with 11.35 MWe exported. The decision document had been updated.
Query about whether the R1 calculation has been checked and what the correct threshold is.	Our view on the R1 calculation provided in the Application is set out in section 4.3.7 of this decision document.
Gas turbines should be used because they are more efficient than steam turbines.	Gas turbines are used to generate electricity from the burning of combustible gas such as natural gas. They are not appropriate for the use in this process where energy needs to be recovered from the hot flue gases.
<b>Comments about pollution of water and land</b>	
Concern that Yorkshire Water would not take the water discharge that is	The discharge to the River Aire will be of uncontaminated surface water run-off. It is not

proposed to be emitted to the River Aire.	unusual for water companies to not wish to have clean water discharged to their treatment plants so that capacity is maintained for discharges that require treatment.
Concern that there could be pollution of land or groundwater from water emissions.	The are no emissions to land or groundwater.
Concern that leaching from the waste could cause pollution.	Waste will be stored in the waste bunker. The bunker will be constructed of waterproof reinforced concrete. We are satisfied that there will not be pollution via this source.
There will be an impact on Salmon, other fish and otters in the River Aire.	The only water emission to water will be clean surface water run off that will be emitted to the River Aire. We are satisfied that this will not affect species in the River Aire.  Measures will be in place to prevent fugitive emissions as set out in section 6.5.3 of this decision document.
Concern that water discharge could affect the temperature of the River Aire.	The discharge of surface water run-off will essentially be at ambient temperature and so will not significantly affect the temperature of the River Aire.
Concern over elevated levels of substances identified as ground contaminants and the potential impacts from those substances.	The site condition report (SCR) contained information on the levels of substances in the ground. The purpose of the SCR is to establish a baseline of any ground contamination and we are satisfied that the SCR does so. We are also satisfied that any ground contamination does not pose a pollution risk from operation of the Installation.
Concern that dioxins could contaminate ground and water. Claim that this has occurred in the USA.	The HHRA considered uptake of dioxins through the food chain including plants and water. The assessment showed no significant impact, we are therefore satisfied that ground and water will not be significantly impacted.
A baseline of pollution in the River Aire should be established and there should then be on-going monitoring.	This is not required because the only discharge is of uncontaminated surface water. No monitoring of the discharge or the river is required.
Receptors are missing from the Site condition report.	This does not affect our conclusion that the SCR has established a baseline for ground and groundwater at the site.
Concern about damage to the marine environment.	There are no discharges to the marine environment.
It is not clear where surface water will discharge to.	It will discharge to the River Aire as described in the Application.
Concern that site condition report mentions use of effluent treatment for groundwater.	This section is referring to groundwater remediation work that was carried out in 2004 and 2005. This is not part of the techniques that will be used in relation to operation of the Installation.
Concern over lack of plan for site decontamination post operation.	A site closure plan will form part of the EMS that is subject to pre-operational condition PO1. Section 4.2.3 of this decision document has further details.
Concern over the emission of process water to sewer.	There will be no discharge to sewer
Concern that heavy metals could be released to the river.	Bottom ash contains heavy metals. We are satisfied that the measures proposed in the Application and the conditions of the Permit will prevent bottom ash entering the river .

<b>Comments about monitoring</b>	
Concern that Operator will carry out the monitoring.	The Operator's monitoring will have either MCERTS certification or MCERTS accreditation as appropriate. MCERTS is the Environment Agency's Monitoring Certification Scheme. If monitoring complies with MCERTS we can have confidence in the monitoring of emissions. In addition we will carry out audits of the Operator's monitoring. If we found problems with the monitoring we would take action to put this right and could do our own monitoring if required.
Monitoring results should be publically available.	The Permit requires that monitoring results are reported to the Environment Agency. We will make the reports available on our public register.
The water discharge run-off should be monitored.	The run-off is only for uncontaminated surface water run-off. Monitoring is not required.
There should be continuous monitoring of filter bags.	There will be pressure drop monitoring to detect any problems with the filters. Particulate emissions will be continuously monitored.
Concern that PM 10 and PM 2.5 will not be monitored and reported.	The monitoring methods will give a result for total particulate matter that will include PM10 and PM2.5.  In addition improvement condition IC2 requires the Operator to propose a methods for determining PM10 and PM2.5 fractions.
Concern about emissions monitoring at start-up and shut-down.	The emission limits do not apply at start-up and shut-down and so emissions monitoring would not be required. However we are satisfied that emissions during these periods will not lead to significant pollution.
Concern that dioxins will only be monitored twice per year.	The prevention and minimisation of dioxins and furans is achieved through injection of activated carbon, optimisation of combustion control, avoidance of de novo synthesis and the effective removal of particulate matter. The plant has to shut down if abatement is not operating outside of abnormal operation. The Permit also requires continuous monitoring of several process variables (e.g. combustion temperature) to ensure that the incinerator is running optimally and minimising emissions. Therefore dioxin control will be maintained in-between monitoring periods  Periodic monitoring of dioxins is in line with the IED and we consider it to be appropriate.
Concern about what calibration and verification of CEMS means.	This relates to measures to ensure that the continuous monitors measure correctly. The Permit ensures that appropriate monitoring standards are used and IC8 requires a report on calibration and testing to be submitted.
Concern that continuous HF monitoring will not be used.	IED allows periodic monitoring of HF and we are satisfied that it is appropriate in this case.
Query about what back-up CEMS are for and how they work.	Back up continuous monitors (CEMS) are provided so that continuous monitoring can continue if the main CEMS fail.

Concern over the statement that additional emission points will not be monitored.	This statement refers to emission points (other than the main stack) including vents, pressure relief valves and the emergency generator. These are not the main emission points at the Installation with emissions likely to be trivial. We are satisfied that monitoring is not required from these emission points.
There should be continuous monitoring of the APC residues.	Monitoring for APC residues has been specified in the Permit in table S3.4. The monitoring is in line with the requirements of IED. We are satisfied that the monitoring is appropriate and that continuous monitoring is not required.
Concern that monitoring will not be audited independently.	The Environment Agency will audit the monitoring. The Environment Agency is independent.
<b>Comments about waste</b>	
Concern over receipt of hazardous, infectious, human, asbestos, sewage, and contaminated soil wastes.	These waste types are not permitted to be received and burned at the Installation.
Concerns that animal (including birds) body parts will be received.	Waste code 02 02 03 is included in the period which is waste from processing of meat, fish and others foods of animal origin. It is possible that waste under this code could contain some animal parts, however such material is likely to be small quantities compared to the overall waste throughput and we do not have any concerns over such wastes.
Query as to what the terms unsorted municipal waste (MSW), commercial and industrial wastes similar to municipal waste and residual waste mean.	<p>Unsorted MSW waste refers to household waste that has been collected and has not gone through further treatment. Municipal waste can also refer to commercial and industrial waste that has a similar composition to household waste.</p> <p>Commercial and industrial waste similar to MSW is waste from businesses and industries that has a similar composition to household waste.</p> <p>Residual waste refers to the waste that is left over after recyclable materials have been removed either by kerbside sorting or at a treatment plant.</p>
Will the amount of waste that can be incinerated be limited?	The waste quantity is limited through condition 2.3.4 and table S2.2.
Concern over long storage times of the waste.	Bunker management techniques such as mixing the waste with the crane and ensuring first in last out are BAT and will be used to avoid long storage times.
The waste feed should be pre-treated.	Pre-treatment of the waste is not usually necessary for moving grate plants because the grate can cope with a range of waste types and sizes.
Concern as to whether there will be sufficient capacity to store the waste to prevent a backlog of waste.	The waste bunker will capacity for approximately 3.5 days worth of waste, we are satisfied that this will be a sufficient storage capacity. The Applicant stated that waste will not be accepted if there is insufficient storage capacity available.
<b>Comments about residues</b>	
Concern over the generation of hazardous waste.	APC residues will be hazardous waste but will be handled and disposed of appropriately.

Concern over how filter bags will be disposed of.	Filter bag disposal will not be a frequent occurrence, but if disposal is required then the Permit requires that any waste are recovered or disposed of appropriately (conditions 1.4.1 and 1.4.2).
Residues should be tested for composition and pollution potential.	Residues will be tested as required by condition 3.1.3 and table S3.4.
Query about whether waste disposal/recovery routes will be audited by the Operator and how this will be enforced.	Permit condition 1.4.2 requires a regular review. We will check on this when we inspect or audit the Installation.
Concern as to whether the <3% TOC limit on the ash can be achieved.	All incineration plants have to meet either this limit or <5% LOI. We are satisfied that it can be met.
Concern over ash storage facilities getting full.	The Applicant stated that storage will be properly designed and that inspections will be used to assess whether storage is filled. The EMS (as required by pre-operational condition PO1) will contain the detailed operating techniques for procedures such as to prevent overflowing.
Concern that residues will contain persistent organic pollutants.	Incineration is a method of destroying persistent organic pollutants. The residues could contain a level of persistent organic pollutants (for example the APC residue will contain dioxins removed from the flu gas with activated carbon). However we are satisfied that the wastes will be handled and recovered or disposed of appropriately. Further details are in section 4.3.9 of this decision document.
<b>Comments about regulation</b>	
Concern as to whether the public will be kept informed about site operations and plant changes.	<p>Reports that are required to be submitted by the Permit (including monitoring results) will be placed on our public register.</p> <p>If the Operator wishes to make a change that has the potential to impact on the environment or health this would require a variation application. The application would be placed on our public register and we would consult on the application if required in accordance with our Public Participation Statement. We would only grant such a variation if we were satisfied that the change would not have a significant impact on the environment or health.</p>
Concern over whether the Environment Agency have sufficient resources to deal with an incident.	A major incident is unlikely from this type of plant/ However If one was to occur, We are satisfied we have sufficient resources to deal with a major incident
Concern that regulation will fall between the Environment Agency and the council or other bodies.	We will ensure that we regulate the site in line with the duties for which we are responsible.
Question on how pollution incidents could be reported.	If there are pollution incidents then people can report them by phoning our incident hotline on 0800 80 70 60. It is available 24 hours a day
Concern that re-testing when a dioxin breach occurs means that breaches will be underreported.	Any dioxin emissions above the ELV will be recorded as a breach and a non-compliance with the Permit. If a breach does occur, re-testing along with assessing other operational data will be carried out in order to establish the cause of the breach and enable causes to be rectified.
Question as to how the permit will	Key operating techniques are incorporated into

control material storage.	table S1.2 of the Permit. In addition Permit condition 3.2.3 requires the use of secondary containment or other appropriate measures.	
Concern that emission compliance is based on averaged emissions.	Emission limits are based on averaging as specified in IED and the BREF.	
Concern over the proposal for site boundary checks on amenity issues.	We are satisfied that the conditions in the permit mean there is unlikely to be a significant issue from amenity issues. However our experience is that operator checks of amenity issues at the site boundary can be a useful way of identifying if there are any problems.	
<b>Comments about the Applicant</b>		
Concern if the Operator were to cease trading. A performance bond should be held.	We require operators of landfill sites to demonstrate financial provision. This is so that money is available to ensure that pollution control measures and monitoring can continue during the aftercare phase when waste is no longer being received. The aftercare phase can last for several years.  This is not the case for incineration plants and financial provision or equivalent is not required for this Installation.	
Concern over who will operate the plant?	The Applicant will be the Operator after the Permit is issued. Our decision on who the operator is was taken in line with our web guidance on what a legal operator is.	
Concern as to whether employees will have sufficient experience/training.	Qualifications and experience and training requirements will all be part of the EMS.	
The Applicant should be part of an approved competence scheme.	The EPR core guidance states 'that if an operator is carrying out a 'relevant waste operation' they must comply with an approved technical competence scheme'. An incineration activity is not a relevant waste operation.	
Concern over claimed criminal record of the directors.	We assessed convictions as part of our determination. We are satisfied that the Applicant is competent to operate the plant and comply with the Permit conditions.	
<b>Comments about accidents</b>		
Concern over malfunctions causing increased impacts.	Unavoidable malfunction of abatement plant is classed as abnormal operation and is covered in the tables above as well as in section 5.5.  The occurrence of malfunctions will be minimised by the Operator's preventative maintenance programme. If a malfunction did lead to a Permit breach then we would take appropriate enforcement action.	
Concern over the risk of explosion.  Concern over storage of flammable materials.	Our view is that there is not a significant risk of explosion from incineration plants.  We are satisfied that materials will be stored appropriately. Incoming compliant wastes are unloaded through the tipping area into the waste bunker. If there were wastes that were burning within the bunker these can be dampened using the fire suppression system or transferred directly to the hopper using a	
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<p>Concern over lime spillage that occurred at another plant.</p> <p>Concern over extreme events such as war, terrorism or earthquake.</p> <p>Concern over site security and sabotage.</p>	<p>crane within the waste bunker. Two cranes are provided within the waste bunker. One crane will be on duty, with the other on stand-by.</p> <p>If non-compliant loads are inadvertently tipped they will be re-loaded or if re-loading is not possible they will be transferred to the quarantine area, located to the south of the tipping hall and waste bunker.</p> <p>We are aware of two spillages at a plant operated by a different operator but the lime did not leave the site and there were no environmental impacts from the spillages.</p> <p>We are satisfied that there is not a significant risk to the environment from lime spillages from this Installation.</p> <p>These are not events that we would expect to see included in an accident management plan due to very low risk of them occurring.</p> <p>We are satisfied that the site will be secure.</p>
<p>Concern over the risk of fire from external cladding</p>	<p>The fire risk from cladding will be controlled by other legislation and is not something we need to consider further through this Permit determination.</p> <p>In any event we are satisfied that the FPP will control fire risk.</p>
<p>Concern over water run-off in the event of a fire.</p>	<p>Measures will be in place to ensure that firewater can be contained on-site.</p>
<p>Concern that the FPP lacks information on fire walls, quarantine area and risk from other activities on site.</p>	<p>The FPP covers these issues and we are satisfied with the measures proposed.</p>
<p><b>Comments about other issues</b></p>	
<p>Concern about whether suitably qualified people will assess the Application</p>	<p>We are satisfied that the Environment Agency has the skills and experience to assess the Application.</p>
<p>Concern that recovered fuel oil (RFO) will be used as a start-up fuel.</p>	<p>Gas oil will be used as start-up fuel. The use of RFO has not been proposed by the Applicant.</p>
<p>Concern over the accuracy of the Application documents.</p>	<p>We are satisfied that the documents are accurate. The Permit requires the plant to be operated as described in the Application.</p>
<p>Concern over whether Incineration is the best way to deal with the waste.</p>	<p>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). Mass burn incineration at this scale is considered BAT provided it meets the requirements (as set out in the BREF and BAT conclusions. See section 6 of this DD for more details. We have to assess the environmental impacts of what is proposed which is</p>

	an activity that can be authorised under EPR wider issues of waste policy are outside our remit.
Concern over whether the capacity of the plant could change in the future.	The Operator would need to apply for a variation to the Permit if they want to increase the waste quantity in the future. We would assess such an application and would only grant a variation if we were satisfied that it would not cause a significant impact.
Concern that the Environment Agency do not refuse many applications.	We do refuse applications where refusal is the correct decision.
The Environment Agency does not have enough knowledge of the local area.	The Environment Agency is aware of the local area and we have enough information to make our decision on this Application
Concern that Application documents that were consulted on were complicated.	The Application documents included a non-technical summary. However all of the Application documents were written by the Applicant and the style that they were written in was a choice for them. We have not provided our own summary of these documents because it is important that we consult on the Applicant's proposal rather than our own summary of it. By its nature the documents can be complicated.  In this decision document we have tried to explain our decision as accurately, comprehensively and plainly as possible.
Concern over whether European directives and limits will apply after the UK leaves the European Union.	If Permit changes are required due to future legislation then we have the ability to vary the Permit to reflect this. We have to determine this application based on the law as it currently is.
Query about whether the public will have another chance to comment on the Application and on the way the Environment Agency has dealt with consultation responses.	We consulted on our draft decision which provided another chance to comment and explained how we have considered the consultation responses from the first round of consultation
Query as to what ISO 14001 means, how it is achieved and maintained.	ISO 14001 is a standard that an EMS can be certified to. The Applicant stated that their EMS will be certified to the ISO 14001 standard. To do this the EMS will need to be assessed by an ISO auditor. It will then be subject to on-going audits to check whether it still meets the standard.
Concern about whether a trade effluent discharge consent will be required.	There are no emissions to sewer from the Installation so a trade effluent discharge consent will not be required.
The permit boundary should include the access route from the A650.	The Applicant provided a revised plan that included the access route.
Concern that site plans do not have a scale.	The site plans do have scales marked on them.
Concern that water run-off to the river will increase the flood risk.	The risk of downstream flooding was considered in the planning application. The site will have a storage and flow control system to control the flow rate to the River. The drainage was based on a 1 in a 100 year flood event with a calculation allowing for climate change.
Concern as to what will happen to the site after the incinerator has stopped operation.	The Permit would stay in force until it is surrendered. To surrender the Permit the Operator would have to demonstrate that any pollution risk



	had been removed and that the land had been returned to a satisfactory state. Further details are in section 4.2.3 of this decision document
Concern that granting a permit would not fit with the Environment Agency's aims of: • protect and improve the environment and • create better places for people and wildlife	Our role in EPR permitting is to ensure that any Installation does not cause significant pollution or harm to human health. We are satisfied that this Installation will not cause significant pollution or harm and that it will provide a high level of protection for the environment as a whole.
East Riddlesden Hall and Leeds Liverpool Canal should have been consulted.	We are satisfied that we consulted with the appropriate bodies in order to determine the Application. Further details are in section 2.2 of this decision document.
Lack of information on the standby generator.	The Applicant clarified that the generator was for use in the event of loss of main electricity to the plant.
Concern over litter.	Waste will be delivered in enclosed delivery vehicles and tipped into the bunker within the reception building. We are satisfied that impacts from litter are unlikely to occur.
Concern that the stack could affect aircraft routes.	The issue of stack height and aircraft is primarily a planning issue.  We consulted with Leeds Bradford Airport, National Air Traffic Services and the Civil Aviation Authority. No concerns were raised by any of these bodies.

d) Representations on issues that do not fall within the scope of this permit determination

<b>Brief summary of issues raised:</b>	<b>Environment Agency comment</b>
View expressed that this is not the right location for the Installation.	Location is primarily a land use planning issue. We have a legal duty to determine any application made to us for an environmental permit. Our role is to determine whether appropriate measures are used to prevent and minimise emissions and whether any impacts on the environment and health are acceptable. We have considered the location of receptors in making our decision.
Concern over the effects of increased traffic on the local roads. Waste should be delivered by rail.	Movement of traffic to and from the Installation is a relevant consideration for the grant of planning permission, but does not form part of the Environmental Permit decision making process.
Concern over impacts during construction.	Impacts from construction cannot be considered through environmental permitting. Our remit is to look at the impacts from operation of the Installation.
Concern over the visual impact of the site.	Visual impacts are a consideration for the planning process of the Environmental Permit decision making process is concerned with emissions from the process.

Concern over damage general downgrading of the area including damage to the economy and house prices and tourism.	The permitting process is concerned with the impact of emissions from the process and we are satisfied these will not cause significant pollution of the environment or harm to human health
The incinerator will have a negative effect on recycling.	This is primarily outside the scope of this determination. Recycling initiatives are a matter for the local authority.  The Permit does not allow wastes that have been separately collected for recycling to be burned, unless they are subsequently found to be unsuitable for recovery by recycling.
The site should be used to generate renewable energy such as from wind or solar.  Concern over government subsidies for incineration  Concern over the cost to the taxpayer.  The amount of packaging should be reduced	These issues are outside the scope of this permit determination.
The need for the plant was questioned.	The need for a facility is not something we can consider through environmental permitting.
Concern as to who would pay for the cost of responding to a major accident.	If an incident occurred, this would depend on the specific circumstances, but it is not something that we can consider through this permit determination.
Concern that air quality monitoring equipment in Bingley was removed.	Local air quality monitoring is the responsibility of the local authority.
There is a lot of public opposition to the incinerator.	We have considered the issues raised from the consultation responses that we received as set out in this decision document. However the number of responses and strength of opposition is not something we can take account of in this permit determination.
Query about whether the timescale for clearance of the site (as stated in the Ecology report) will be enforced.	These are matters for the planning authority and are not things we can consider in the permit determination.
Questions about other works specified in planning application including bat roosting opportunities and Wildflower grassland.	
Question about whether a revised planning application will be required.	
Concern over whether the HSE will have the resources to regulate the site.	This is a matter for the HSE.

<p>It was claimed that incinerators are regulated differently in other countries and banned in some.</p>	<p>This is a matter for other countries. We are satisfied that we have assessed the Application in line with standards and legislation that apply in the UK and the European Union.</p>
<p>Concern over leaks or spillage from vehicles on off-site roads.</p>	<p>The Permit does not control spillage of material outside of the site. However from the information provided in the Application we are satisfied that waste and materials will be transported appropriately.</p>
<p>Concern over odour during waste transport to the site.</p>	<p>The Permit does not control emissions that occur outside of the site. In any event waste will be delivered in enclosed or covered vehicles that will minimise odour emissions and prevent significant impacts.</p>
<p>Concern over regulation of waste carriers.</p>	<p>Waste carriers are required to register with the Environment Agency and renew the registration every 3 years under the Waste (England and Wales) Regulations 2011. It is not something that is relevant to this permit determination.</p>

## **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 08/06/20 and 12/08/20.

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 necessarily been repeated and reference should be made to section A for an explanation of the particular concerns or issues.

We received many responses to our minded to consultation expressing concern about whether we had adequately considered local weather conditions including temperature inversions in the Aire valley and whether this would trap emissions leading to increased impacts. This is an issue that we have looked at in detail. Our expert modelling team (AQMAU) used several methods of checking this as set out in section 5.2.4 of this decision document. In summary our view is that air quality impacts will not be higher than those predicted by the Applicant's modelling. We considered these comments in detail and we are still satisfied that impacts will not be higher than those predicted by the Applicant. Further comments on local weather conditions are set out below in the sections headed 'concern about air emissions and air risk assessment'. These can be found on pages 148, 149 and 153 and 154.

### **a) Representations from Local MPs, Councillors and Parish / Town / Community Councils**

Representations were received from Members of Parliament, local Councillors, Keighley Town Council, Bingley Town Council and Shipley Town Council, who raised the following issues.

<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
<b>Comments about air emissions and air risk assessment</b>	
Concern that Covid-19 will make the impact of air pollution worse, including on BAME communities.	A link between air pollution and severity of Covid-19 has been reported.  The incinerator will not cause any significant air pollution, local air quality will continue to comply with air quality standards, and so will not have a significant impact on health including on the severity of Covid-19 symptoms for all ethnic groups.
The draft decision did not address the effect of the valley and local weather conditions on the impact on emissions to air.	The draft decision document did cover this issue. It is covered in section 5.2.4 (ii).
Concern that Natural Resources Wales (NRW) refused a permit for an incinerator in a valley.	Comparisons between the predicted concentrations from the proposed facility with the NRW Nine Mile Point facility should not be made as both facilities have a number of significant differences that affect dispersion of pollutants; both in terms of

	location and the emission source characteristics.	
<p>Concern over the Environment Agency audit of the Applicant's dispersion modelling including:</p> <ul style="list-style-type: none"> <li>• Calpuff was delisted by US EPA in 2017</li> <li>• NWP and MM5 data were from 2012 and 2001</li> <li>• MM5 was replaced by WRF</li> </ul>	<p>We are satisfied that our audit was appropriate. Our findings were that impacts would not be higher than those predicted by the Applicant.</p> <ul style="list-style-type: none"> <li>• The Environment Agency does not favour or prescribe the use of any particular model in the same way the US EPA does. CALPUFF was delisted as the US EPA preferred model for long-range transport assessment and a screening approach was established instead. CALPUFF is still included on the US EPA alternative models list. The US EPA position for the use of CALPUFF in the near-field as an alternative model for situations involving complex terrain and complex winds has not changed.</li> <li>• We used NWP and MM5 data we have available and are licensed to use to conduct our modelling checks. For check modelling purposes the use of alternative years, even less recent, can still be used to understand model sensitivities, uncertainties and inter-model variations. Variations in predictions between different models are likely to be more significant than the difference in predictions resulting from different years' met data when using a single model.</li> <li>• MM5 and WRF are in use today. WRF is an evolutionary successor to MM5. MM5 was the prognostic meteorological data we had available to run our modelling checks using CALPUFF (non-steady-state model) as one of two alternative model to ADMS. We are satisfied that the use of MM5 was appropriate.</li> </ul>	
<p>The Environment Agency audit should be made public.</p>	<p>Our audit report was placed on our public register.</p> <p>It was the draft decision document and draft Permit we were consulting on and we considered these were sufficient for people to understand how we came to our draft decision. We added our audit report to the consultation webpage so it was easier to</p>	
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	access for anyone with an interest in it.
<b>Comments about health impacts</b>	
Concern over health impacts from Radon gas.	Radon gas can be given off from radioactive decay of uranium found in certain rocks in the ground. Such emissions are not relevant to this permit determination.
<b>Comments about noise impacts</b>	
The noise background measurements are out of date and could reduce in future due to changes in vehicle types.	We are satisfied that the background noise monitoring is up to date.  It is not possible to predict future background noise as a result of changes in car types. If further noise reduction measures were to be required in the future, then we could vary the Permit to require this, however this should not be necessary as the permit requires the Operator to take all appropriate measures which could change over time to reflect changing circumstances anyway.
Concern over choice of receptors in the noise assessment, others should have been included. Receptor ESR 1 changed description.	We are satisfied that the noise assessment and our audit have considered the appropriate receptors and that there will not be a significant impact from noise at any receptors. Any change in receptor description was not material to our view.
<b>Comments about odour impacts</b>	
Concern whether the quarantine area will be used for odorous materials.	Odorous wastes will be turned away from site and will not be placed in the quarantine area.
Concern over odour during shut-down because carbon filters not kept on-site.	The use of carbon filters for extraction during shut-down is just one of the measures proposed; and we are satisfied that those measures as a whole will ensure no significant odour impacts.
Concern over bunker waste management.	Bunker waste management, as proposed by the Applicant, is standard practice for municipal waste incinerators and is BAT
<b>Comments about BAT, emissions limits and control measures</b>	
Concern over lack of evidence for costs for the stack height BAT assessment.	We asked the Applicant to explain the reason for the cost increase at stack heights above 60m. The Applicant provided a justification and this is summarised in section 6.2.7 of this decision document.  We are satisfied that the stack height has been calculated in accordance with IED article 46(1). Having assessed the Application as a whole we are satisfied that the measures proposed, of which stack height is one aspect, are BAT.
The Applicant failed to consider global warming in the NOx abatement BAT assessment.	The Applicant did consider global warming potential in their assessment and we have considered it in detail in this decision document. We are satisfied that the control measures as a whole, which includes

	SNCR, are BAT and this conclusion includes consideration of global warming potential.	
<b>Comments about accidents</b>		
Concern that the quarantine area will be used for rejected waste and for FPP purposes.	The Applicant explained how this would be managed in their FPP. In summary rejected wastes will be kept in skips which would be removed from site to a licensed waste facility if the area was required to be used for FPP purposes. We are satisfied with the proposed measures.	
The Environment Agency requested an updated FPP but it was not submitted.	The FPP that was on our consultation webpage was received in July 19. A final revised FPP was submitted on 23/10/19. The revised plan contained one change from the version submitted in July which was to clarify the distance to the designated smoking area. This distance clarification was clearly set out in the schedule 5 response document (question 16) that was on our consultation page.	
<b>Comments about energy efficiency</b>		
Concern that energy efficiency has been overestimated.	<p>The BREF contains a method for calculating gross energy efficiency for comparison against a BAT range known as BAT AEEL. This is a new assessment that forms part of the BAT conclusions.</p> <p>The method in the BREF allows for internal steam uses to be counted towards the energy calculation. The Applicant included several steam uses in their calculation some of which themselves would contribute to steam production. The BREF does not preclude such steam uses from being counted, but on reflection we decided that it was sensible to exclude them and therefore required the Applicant to submit a revised calculation. The revised calculation is still in the BAT range particularly for plants of this size and we are satisfied that it is BAT. Section 4.3.7 (iii) has been updated accordingly. PO2 requires a review of all measures to ensure heat recovery is maximised.</p>	
<b>Comments about waste</b>		
The amount of plastic waste and PVC should be limited through the Permit.	<p>Our view is that this is not required.</p> <p>Waste acceptance criteria will prevent separately collected plastic unless contaminated. Other measures such as bunker management, combustion control and emission limits will provide sufficient control to ensure that any plastic in the waste will not cause significant pollution or harm.</p>	
Concern over how rejected wastes will be stored.	Rejected wastes will be stored in covered skips and a concrete pad area. We are satisfied that this will provide appropriate storage and containment.	
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Quarantine area is only mentioned in the FPP not in main process documents.	The FPP forms part of the Permit operating techniques.  Pre-operational condition PO9 requires waste acceptance procedures to be in place. These procedures will include use of the quarantine area and will form part of the EMS.
<b>Comments on the consultation</b>	
Concern with the way the consultation was carried out including that it took place during the Covid-19 pandemic.	We are satisfied that we took appropriate steps to inform people of our draft decision and on how they could submit comments.  We have a statutory duty to determine the application and it was not practicable to delay the consultation to an unspecified date at the end of the pandemic.
Concern that the draft decision document was not clear.	We consider that the document set out our reasoning as clearly and simply as possible given the highly technical nature of the Application.
<b>Comments about other issues</b>	
No information provided on the lifespan of the plant.	We did not require this information to assess the Application. The Installation will have to comply with Permit conditions throughout its lifespan and the Operator will be required to maintain the plant to ensure they comply with the Permit.
Concern as to how abnormal operation and OTNOC have been included in the Permit.	This has been done in accordance with IED and the BAT conclusions. Any periods of OTNOC will be approved through improvement condition IC1 and kept to a minimum.
Concern as to how the bunker will be cleaned.	Bunker cleaning is a standard practice at MWIs and is usually carried out at MWIs during planned maintenance. Such detail will be set out in the site EMS as required by pre-operational conditions PO1. We have no concerns over bunker cleaning.



b) Representations from Community and Other Organisations

Representations were received from Air Valley Against Incineration (AVAI), a legal firm on behalf of AVAI, Micklethwaite Village Society, Keighley Urban Meadows Community and Environmental Development Group, Yorkshire Wildlife Trust, several businesses and sports clubs. A number of these issues are the same as those raised by the Local MP / Councillors/ Town Council and are not necessarily repeated below.

Brief summary of issues raised:	Summary of action taken / how this has been covered	
<b>Comments about air emissions and air risk assessment</b>		
<p>Bingley is not appropriate weather data. Bingley weather station is set above the valley. This means that temperature inversions and conditions where cloud is trapped in the valley has not been considered.</p>	<p>Bingley weather station is approximately 6 km south of the proposed facility at a greater altitude than the stack. The meteorological conditions observed at Bingley are considered to be reasonably representative. However, due to the topographical differences at both locations there could be localised differences in the meteorology. We conducted modelling checks using our own 5 years of Bingley data, and NWP (numerical weather prediction) and MM5 (fifth generation NCAR/Penn State Mesoscale Model) data extracted for the location of the proposed facility to account for localised differences on predicted concentrations.</p> <p>Temperature inversions typically occur on clear nights with calm winds. They develop during the night and typically break up a few hours after sunrise. Valley inversions are a certain type of temperature inversion that can form in mountain valleys. They can last for days, but only in certain valleys, under specific meteorological conditions. The Applicant's ADMS model considered the impact under stable condition type temperature inversions. However, in order to account for valley type inversions and their effect on predicted concentrations, we conducted modelling checks using ADMS and alternative modelling software AERMOD and CALPUFF (non-steady-state model) with several meteorological data sets.</p> <p>Our audit used meteorological data sets that are likely to be representative of the local area for dispersion modelling purposes, and we used alternative dispersion models that have the capability to model more complex meteorological conditions such as the temperature inversion/low lying cloud that people have reported and sent us photographs of.</p>	
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	Our audit showed that even when taking valley type inversions into account, impacts would be no higher than those shown in the Applicant's dispersion modelling.
Concern that the Environment Agency used Bingley weather data from 2003 -2007 in the audit of the Applicant's dispersion modelling.	We are licensed by the UK Met Office to use Bingley meteorological data from 2003 to 2007 (5 years of data). Changes in land use, such as urbanisation, and technological advances in meteorological observation equipment are the main factors that lead to some meteorological datasets becoming outdated. There are no known such issues with our Bingley meteorological data. Our modelling checks with an alternative set of meteorological years indicated agreement with the Applicant's conclusions
<b>Comments about noise impacts</b>	
Concern that other receptors that were not assessed have lower background due to reduced traffic noise, and could be more affected due to weather conditions and so should be considered further.	<p>The suggested additional assessment locations are at a greater distance from the on-site sources, and the dominant background noise source of the A650 is intervening. Calculations on noise propagation are done using ISO 9613 which has an assumption of moderately favourable meteorological conditions. Therefore any favourable conditions for noise propagation will be present for both the road and on-site noise sources at these locations. Intervening buildings present will also offer some screening from the on-site sources.</p> <p>Therefore, assessing these additional receptor locations would not affect the outcome of our audit or the Applicant's conclusions</p>
Concern over how HGV movements were considered. Lack of detail of type or movements of the HGVs.	HGV movements were considered in the Applicant's noise assessment and we were satisfied with the detail provided. We checked this in our audit and were satisfied that there would not be a significant impact. We also checked sensitivity to the number of vehicle movements and found that the overall noise impact was not significantly influenced by increased numbers.
Difference between CNIM report and the one in the Application.	<p>The most up to date submission that we received formed part of the Application and was placed on our public register. It is this report that we have audited.</p> <p>Improvement condition IC9 requires a noise survey to be carried out to validate the information provided in the Application.</p>
Concern as to whether BAT has been applied to noise.	Our view is that the measures proposed by the Applicant are BAT.
Concern over context and character of background and plant noise.	We have checked the Applicant's predictions and their consideration of context and character, and we are satisfied

	with the way they were considered.	
Absolute noise is not relevant.	Based on the WHO night noise guidelines for Europe and Noise Policy Statement for England (NPSE) Lowest Observed Adverse Effect Level (LOAEL), we would consider specific and background levels of below the 40 dBA LOAEL to be considered 'low' for the night-time, and this would therefore also indicate 'low' levels for daytime. Where this applies, consideration of absolute levels is appropriate.	
Concern over noise level of outdoor equipment.	This was included in the Applicant's modelling and our audit and we are satisfied that the Installation will not lead to a significant impact.	
The engineering specification of the acoustic fence should have been requested.	The Applicant has described the barrier as an acoustic barrier. This is an engineering term, and any acoustic barrier should prevent transmission of noise through its body by having an area density greater than 15 kg/m <sup>2</sup> . The Applicant has also confirmed the height of the barrier to be 3.5 m and location of the barrier. Inclusion of this barrier in the Applicant's model is consistent with this.  Improvement condition IC9 requires a noise survey to be carried out to validate the information provided in the Application.	
Concern that a numerical noise limit has not been set and that the noise permit condition will permit noise pollution.	We generally do not set numerical noise limits. Permit condition 3.5.1 and 3.5.2 enables us to take action if noise nuisance is caused, giving us more options to take action that would be the case if a numerical limit was set.	
Typo in section 5.3.4 of the noise report states 'mitigation measures are not required'	The noise assessment took into account the noise mitigation measures. This sentence refers to further measures. Our view is that the proposed measures, as included in the noise assessment, and as required by the Permit conditions, are BAT.	
<b>Comments about odour impacts</b>		
Errors in the way the versions of the OMP had been updated.	We were satisfied with the amendments that the Applicant had made to their OMP, however there had been an error in the way the versions had been consolidated. The Applicant provided a consolidated OMP that took into account all of the changes they had made. The Permit was updated to refer to the consolidated OMP.	
Not clear if waste will be delivered in enclosed vehicles.	The operating techniques document stated in one place that vehicles would be enclosed or covered where possible. The Applicant clarified that all waste delivery vehicles will be enclosed or covered. The permit was updated to reflect this.	
Concern as to whether the air changes quoted in the OMP will be sufficient to	Air changes will be due to the use of combustion air in the furnace to generate	
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control odour.  Odour when doors are open.	negative pressure in the reception hall. This technique is used in many incineration plants and generally works well to control odour including for plants where doors open for delivery vehicles. We are satisfied that the measures proposed by the Applicant, and implemented through the Permit conditions, will ensure that there will not be a significant impact from odour. Improvement condition IC8 has also been set to check that it is working effectively
Concern that odour monitoring will be carried out by staff who have become acclimatised to the odour.	The OMP confirms that monitoring will be undertaken by office staff or off-site staff to avoid this issue.
The OMP does not address spillages.	The OMP does address spillages. Based on measures in the OMP and in the rest of the Application we are satisfied that appropriate measures will be in place.
<b>Comments about pollution of water and land</b>	
Concern that surface water discharge will not be monitored.	Our view is that routine monitoring in the Permit is not required. The Permit requires that the discharge is un-contaminated and we are satisfied that the conditions in the Permit will ensure this is the case.
<b>Comments about impacts at ecological sites</b>	
Concern as to whether Natural England were consulted.	Natural England were consulted and agreed with our assessment of the impact at habitat sites. See section 5.4 for further details.
No habitat risk assessment was carried out.	The risk to habitats was assessed as described in section 5.4
Comments were received about biodiversity net gain and planning requirements.	These specific issues relate to the planning application. We are satisfied that operation of the Installation will not result in significant impact on the environment. Further details on the ecological assessment are in section 5.4.
Impacts on local wildlife sites not considered.	This is not the case. See section 5.4 for further details.
<b>Comments about other issues</b>	
The Environment Agency has ignored previous consultation comments.	We have not ignored previously submitted comments. Annex 4 of this decision document shows how we have addressed the key issues raised during the consultation.
Inconsistencies between OMP and FPP in terms of waste storage times.3-4 days in OMP and 7 days in FPP.	These are not inconsistencies. The documents are produced for different purposes. Our view is that the OMP and FPP are not inconsistent. The OMP says that the bunker will be emptied to prevent generation of odour if a shut-down occurs for longer than 3-4 days. The statement in the FPP is that during shut-down waste will be stored for no longer than 7 days. Our view is that we would not necessarily require the waste to be removed after 3-4 days unless there was a risk of odour and that the risk would depend on several factors including the time of year. However

	7 days in the FPP is an absolute maximum storage time to ensure fire risk is controlled during shut-down.
Bunker capacity is not clear.	Bunker capacity is clearly stated in the Application documents at 4,632 m <sup>3</sup> .

c) Representations from Individual Members of the Public

Over 1600 responses were received from individual members of the public. Many of the issues raised were the same as those considered above. To avoid repetition, generally only those issues additional to those already considered are listed below:

<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
<b>Comments about air emissions and air risk assessment</b>	
Concern over infectious emissions.	Infectious clinical waste is not permitted to be received. If low level infectious material was present in household or commercial waste it is likely to be in very small volumes and would be destroyed in the furnace.
Concern over the emission of sulphur.	Sulphur will be emitted in the form of sulphur dioxide. Impacts were screened out as being insignificant, see section 5.2 for further details.
There are no limits for dioxin like PCBs or nitrous oxide.	Nitrous oxide is required to be monitored in order to track the efficiency of the SNCR system. Our view is that a limit is not required.  Dioxin like PCBs were considered in our health assessment as described in section 5.3. The requirement to monitor for dioxin like PCBs but not set a limit is discussed in section 6.4.
There are no emission limits for dioxins and metals.	Limits are set for dioxins and metals.
Concern that expansion of Leeds Bradford airport will affect background air quality.	The airport is approximately 14 km from the Installation. At this distance any expansion will not affect the conclusions of the air quality assessment.
The decision document should state what results the Environment Agency audit of the modelling produced.	This is not required. The purpose of our audit was to check whether the Applicant's figures could be used for determination of the Application; and our decision was that they could be.
Emissions will damage car paintwork.	Emissions from the Installation will not be at a level that could damage paintwork.
Concern over emissions from air extraction points and outlets as listed in noise report.	These are areas such as the turbine hall where emissions will be just ventilation air. The reception hall will be kept under negative pressure to control emissions.
<b>Comments about health impacts</b>	

Concern that OTNOC could pose a risk to health.	We do not agree that OTNOC poses a risk to health, during OTNOC limits will still need to comply with IED limits as specified in the Permit. Further details are in section 5.6.
Concern over the impact on farms.	Impact at receptors was considered in the air quality assessment (see section 5.2). Impacts on the food chain was considered in the human health risk assessment. We are satisfied that there will not be a significant impact. See section 5.3 for further details.
BSEM report about health impacts was cited.	Public Health England (PHE) reviewed this report. PHE did not agree with the findings of the report and maintained their position statement on health effects of incineration plants.  See section 5.3 of this decision document for more detail on our health assessment.
The recent PHE study showed birth defects for people living near to incinerators.	Please refer to section 5.3 where the findings of this study are discussed. In summary PHE confirmed that the study did not change their position of the health risks.
Combined health impact with new crematoria at Oakworth and Nab Wood.	These are both several kilometres away and any in-combination impacts will not be significant.
Further papers /articles on health impacts were cited to support the claim that the incinerator would cause health impacts	We considered the reports, papers and articles that were submitted. Our view is that the Installation will not have a significant impact on health. This view is supported by Public Health England. See section 5.3 of this decision document for more detail on our health assessment.
<b>Comments about impacts at ecological sites</b>	
Rare lichen are present on valley sides.	The lower critical level (for sensitive lichen) was used in our assessment of impact at ecological sites. See section 5.4 for further details. Also refer to section 5.4.4 for specific consideration of species.
Concern over impact on Yorkshire Dales.	The Yorkshire Dales National Park is ~ 10 km away from the Installation. Any impacts here will be lower than those at ecological sites closer to the Installation that we have already assessed as acceptable.
<b>Comments about odour impacts</b>	
Errors in the OMP: <ul style="list-style-type: none"> <li>Distance to Keighley town centre</li> <li>Stated that gas works is operational</li> </ul>	The OMP states that the Installation is ~ 3km to the east of Keighley town centre. Our measurements show that it is ~ 2km to the east depending on where the town centre is determined to be. However we are still satisfied that the proposed measures including those in the OMP will prevent significant pollution from odour.  Whether the gas works is operational or not does not change our assessment that there will not be a significant impact from odour and that we are satisfied with the OMP.

<b>Comments about noise impacts</b>	
Concern over noise from alarms mentioned in the FPP.	The alarms in the FPP are for things such as fire detection. They will sound very infrequently and so noise from them will not be a significant issue.
Concern that people will be expected to have double glazing and keep windows closed to control noise. Noise assessment assumes all houses have double glazing.	Our conclusion of no significant impact from noise is not dependent on houses having double glazing or having the windows closed.
<b>General Comments about impacts</b>	
Concern over damage to soil quality.	Soil quality will not be significantly impacted. This is evidenced by the health risk assessment that showed insignificant impact on the food chain.
Concern over safety of ammonia storage.	We are satisfied that appropriate measures will be in place for all raw materials including ammonia. Section 6.5.4 has further details.
<b>Comments about pollution of water and land</b>	
Concern over pollution from process water storage pit in the event of heavy rain or flooding.	The process water pit has been designed to be over capacity. Water levels in the pit will be monitored and trigger levels set. If levels are high the water will be removed from site by tanker.
<b>Comments about BAT, emissions limits and control measures</b>	
Concern over the NOx abatement BAT assessment including the cost figures used for SNCR being too high.	The costs are similar to those proposed for other sites of similar size. The cost element is one part of the BAT assessment as described in more detail in section 6.2.2 and we are satisfied taking all the relevant factors into account that SNCR is BAT.
<b>Comments about accidents</b>	
Concern over how smouldering waste will be dealt with.	Measures were described in the FPP and we are satisfied that the measures are appropriate.
Waste storage amount could be exceeded.	When we inspect the site we will check to ensure that storage of waste is being carried out in accordance with the Permit and as described in the Application.
Description of the site location including in the FPP is not accurate.	When we assessed the FPP we assessed the measures proposed based on the actual location of the site rather than considering them acceptable based on the Applicant's description.  We are satisfied that the measures described in the FPP will prevent fires and minimise impact should a fire occur.
<b>Comments about energy efficiency</b>	
Concerns were raised about the energy efficiency calculations as follows: <ul style="list-style-type: none"> <li>• Conflicting values in the draft decision document</li> <li>• Use of higher steam conditions and design of plant</li> <li>• Different figures used in R1 calculation for internal steam uses.</li> </ul>	The draft decision document stated 11.35 MWe would be generated with 9.55 MWe exported whereas the gross energy efficiency calculation was based on generation of 13.26 MWe. The Applicant clarified that 13.26 MWe would be generated with 11.35 MWe exported. The decision document had been updated.

	<p>The use of higher steam conditions is common in incineration plants and we have no concerns over its use.</p> <p>Our view on the R1 calculation provided in the Application is set out in section 4.3.7 of this decision document. If the Applicant seeks R1 in the future they will need to submit a formal R1 application. In any event the Applicant amended their gross electrical efficiency calculation as described above on page 151.</p>
<b>Comments about waste</b>	
Concern that variation in waste feed will cause problems in the furnace and the boiler.	Moving grate plants are designed to deal with waste with varying composition and size. In addition bunker management will be used to homogenise the waste.
Concern that waste could be infected with Coronavirus.	Infectious clinical waste is not permitted to be received. If low level infectious material was present in household or commercial waste it would be destroyed in the furnace.
Concern over certain waste types including asbestos and soil.	<p>The Permit does not allow asbestos or soil to be received. Wastes are identified by a 6 figure code. Where 2 and 4 figure numbers appear these are chapter headings and sub-headings respectively and not waste types.</p> <p>In table S2.2 the only waste code listed under the 17 06 heading is 16 06 04 which relates to insulation materials not containing asbestos. Likewise soil is not listed under the 17 02 heading.</p>
Some waste types could be recycled or recovered.	<p>This is primarily outside the scope of this determination. Recycling initiatives are a matter for the local authority.</p> <p>The Permit does not allow wastes that have been separately collected for recycling to be burned, unless they are subsequently found to be unsuitable for recovery by recycling. Also see section 4.5.6 of this decision document.</p>
<b>Comments about the Applicant</b>	
Directors of the Applicant have changed.	The Applicant confirmed that the directors had not changed.
Concern that that the Applicant will not operate the site.	We are satisfied that the Applicant will be the Operator of the Installation.
<b>Comments on the consultation</b>	
Concern as to how the consultation on the draft decision was communicated.	<p>We are satisfied that we took appropriate steps to inform people about the consultation; this included:</p> <ul style="list-style-type: none"> <li>• Sending out newsletters to interested parties</li> </ul>



	<ul style="list-style-type: none"> <li>• Informing local politicians</li> <li>• A press release</li> <li>• Use of social media</li> </ul> <p>The large number of consultation responses shows that our communication was effective. Further detail is in section 2.</p>
<b>Comments about other issues</b>	
Concern over water usage.	We are satisfied that raw materials including water will be used efficiently. Permit condition 1.3.1 will ensure that this remains the case.
Gasification results in zero emissions.	This is not correct. Gasification generates a gas from the waste (syngas) that is then burned. Such plants are subject to the same emission limits as conventional incineration plants.
Several responses were received in favour of the draft decision.	No response required.
The hydrology and drainage report is out of date.	<p>This was an extract from a planning document that was submitted to support information provided by the Applicant on flood risk.</p> <p>We are satisfied with the information submitted to us on hydrology and drainage.</p>
Sodium bicarbonate should be used instead of lime.	As explained in section 6.2.3 both reagents are BAT.
Concern over whether Stockholm, Basel and Rotterdam Conventions have been considered.	<p>The Stockholm Convention is discussed in section 6.4.</p> <p>The Basel Convention relates to trans boundary movements of hazardous waste and the Rotterdam Convention relates to hazardous chemicals and so are not relevant to this Permit application.</p>
Concern that gas oil will be used as auxiliary fuel.	Gas oil is commonly used as auxiliary fuel. Gas oil was proposed in this case to ensure a guaranteed supply for the auxiliary fuel and we are satisfied that it is BAT.
Waste types received should be reported through the permit.	Permit condition 4.2.5 requires reporting of wastes received and exported from the Installation.
Permit cannot be reviewed if needed.	We can review and vary the Permit if required at any time.

d) Representations on issues that do not fall within the scope of this permit determination

Brief summary of issues raised:	Environment Agency comment
Concern as to where corporation tax will be paid.	These are not issues that we can consider in the Environmental Permit determination.
Query about whether we are considering the Policy Connect report in our determination.	
Concern over privacy of children at nearby nursery due to visibility from the Installation.	
Operator should have a pandemic contingency plan.	
The Applicant's constructor went into administration.	
An incineration tax should be applied.	
Waste should be transported by train.	Building regulations will ensure that this is not an issued.
Concern over land stability.	