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

Consultation on our decision document recording our decision-making process

The Permit Number is:	EPR/SP3127SF/A001
The Applicant / Operator is:	MVV Environment Limited
The Installation is located at:	Canford EfW CHP Facility, Arena Way, Poole, BH21 3BW
Consultation commences on:	11th April 2025
Consultation ends on:	23rd May 2025

What this document is about

This is a draft decision document, which accompanies a draft permit.

It explains how we have considered the Applicant's Application, and why we have included the specific conditions in the draft permit we are proposing to issue 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.

The document is in draft at this stage because we have yet to make a final decision. Before we make this decision, we want to explain our thinking to the public and other interested parties, to give them a chance to understand that thinking and, if they wish, to make relevant representations to us. We will make our final decision only after carefully taking into account any relevant matter raised in the responses we receive. Our mind remains open at this stage. Although we believe we have covered all the relevant issues and reached a reasonable conclusion, our ultimate decision could yet be affected by any further information that may be provided that is relevant to the issues we have to consider. However, unless we receive information that leads us to alter the conditions in the draft Permit, or to reject the Application altogether, we will issue the Permit in its current form.

In this document we frequently say "we have decided". That gives the impression that our mind is already made up; but as we have explained above, we have not yet done so. The language we use enables this document to become the final decision document in due course with no more re-drafting than is absolutely necessary.

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/SP3127SF/A001**. We refer to the application as "the **Application**" in this document in order to be consistent.

The number we propose to give to the permit is **EPR/SP3127SF**. We refer to the proposed permit as "the **Permit**" in this document.

The Application was duly made on 12th August 2024.

The applicant is MVV Environment Limited. We refer to MVV Environment 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 MVV Environment Limited "the **Operator**".

MVV Environment Limited proposed facility is located at Canford EfW CHP Facility, Arena Way, Poole, BH21 3BW. We refer to this as "the **Installation**" in this document.

How this document is structured

Contents

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
BREF BAT C	Best Available Techniques (BAT) Reference Documents for Waste Incineration BAT conclusions
CEM	Continuous emissions monitor
CFD	Computerised fluid dynamics
CHP	Combined heat and power
COMEAP	Committee on the Medical Effects of Air Pollutants
COT	Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment
CROW	Countryside and rights of way Act 2000
CV	Calorific value
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
EQS	Environmental Quality Standard
ES	Environmental standard
EWC	European waste catalogue
FGC	Flue gas cleaning
FPP	Fire prevention plan
FSA	Food Standards Agency
GWP	Global Warming Potential

HHRAP	Human Health Risk Assessment Protocol
HPA	Health Protection Agency (now UKHSA – UK Health Security Agency)
HRA	Human Rights Act 1998
IBA	Incinerator Bottom Ash
IED	Industrial Emissions Directive (2010/75/EU)
IPPCD	Integrated Pollution Prevention and Control Directive (2008/1/EC) – now superseded by IED
I-TEF	Toxic Equivalent Factors set out in Annex VI Part 2 of IED
I-TEQ	Toxic Equivalent Quotient calculated using I-TEF
LCPD	Large Combustion Plant Directive (2001/80/EC) – now superseded by IED
LCV	Lower calorific value – also termed net calorific value
LADPH	Local Authority Director(s) of Public Health
LOI	Loss on Ignition
MBT	Mechanical biological treatment
MSW	Municipal Solid Waste
MWI	Municipal waste incinerator
NOx	Oxides of nitrogen (NO plus NO_2 expressed as NO_2)
OTNOC	Other than normal operating conditions
PAH	Polycyclic aromatic hydrocarbons
PC	Process Contribution
PCB	Polychlorinated biphenyls
PEC	Predicted Environmental Concentration
PHE	Public Health England (now UKHSA – UK Health Security Agency)
POP(s)	Persistent organic pollutant(s)
PPS	Public participation statement
PR	Public register
PXDD	Poly-halogenated di-benzo-p-dioxins
PXB	Poly-halogenated biphenyls
PXDF	Poly-halogenated di-benzo furans
RDF	Refuse derived fuel
RGN	Regulatory Guidance Note
SAC	Special Area of Conservation
SCR	Selective catalytic reduction

SHPI(s)	Site(s) of High Public Interest
SNCR	Selective non-catalytic reduction
SPA(s)	Special Protection Area(s)
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
UN_ECE	United Nations Environmental Commission for Europe
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

Links to guidance documents

The table below provides links to the key guidance documents referred to in this document. The links were correct at the time of producing this document.

Name of guidance document	Link
RGN 6: Determinations involving sites of high public interest	RGN 6
CHP Ready Guidance for Combustion and Energy from Waste Power Plants	CHP ready
Risk assessments for your environmental permit	Risk assessments
Guidance to Applicants on Impact Assessment for Group 3 Metals Stack Releases – version 4".	Metals guide
The Incineration of Waste (EPR 5.01)	EPR 5.01
Waste incineration BREF and BAT conclusions	BREF and BAT C
UKHSA: Municipal waste incinerators emissions: impact on health	UKHSA reports

1 Our proposed decision

We are minded to grant 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 draft 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 (EPR) 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 that the details provided are sufficient and satisfactory to make use of the standard condition acceptable and 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, an explanation of the reason(s) for choosing the option that has been specified.

2 How we reached our draft decision

2.1 Receipt of Application

The Application was duly made on 12/08/24. 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 section 2.3 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 Public Participation Statement (PPS) and our own internal guidance RGN 6 for Determinations involving Sites of High Public Interest. RGN 6 was withdrawn as external guidance, but it is still relevant as Environment Agency internal guidance.

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, we consider that our consultation already satisfies the requirements of the 2009 Act.

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 placed an advertisement in the Bournemouth Echo that contained the same information. The Application was available to view on our citizen space web page where people could also submit comments.

We made a copy of the Application and all other documents relevant to our determination available to view on our Public Register. Anyone wishing to see these documents could do so and arrange for copies to be made.

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

- Bournemouth, Christchurch and Poole Council
- Local fire service
- Director of public health
- UK HSA
- Health and Safety Executive
- Food Standards Agency
- Sewerage Authority
- National Grid
- Civil Aviation Authority
- Bournemouth Airport
- National air traffic services (NATS)

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.

Further details along with a summary of consultation comments and our response to the representations we received can be found in Annex 4. We have taken all relevant representations into consideration in reaching our draft determination.

2.3 Requests for Further Information

Although we were able to consider the Application duly made, we needed more information in order to determine it which we received on 24/09/24 and 28/01/25. A copy of the information was placed on our public register.

Having carefully considered the Application and all other relevant information, we are now putting our draft decision before the public and other interested parties in the form of a draft Permit, together with this explanatory document. As a result of this stage in the process, the public has been provided with all the information that is relevant to our determination, including the original Application and additional information obtained subsequently, and we have given the public two separate opportunities (including this one) to comment on the Application and its determination. Once again, we will consider all relevant representations we receive in response to this final consultation and will amend this explanatory document as appropriate to explain how we have done this, when we publish our final decision.

Finally we are consulting on our draft decision from 10/04/25 to 22/05/25.

3 The legal framework

The Permit will be granted, if appropriate, 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 section 7 towards the end of this document.

We consider that, if we grant the Permit, it 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" (DAA) for EPR purposes, 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.

Together, these listed activities and directly associated activities comprise the Installation.

4.1.2 The Site

The Installation is located on an area forming part of the Canford Resource Park (CRP) off Magna Road, north of Poole, in Dorset. The nearest residential receptors are located off Provence Drive approximately 670 m east. Other close-by sensitive receptors include the proposed Provence Drive business units and Canford Sports Club. Dorset Heaths (SAC), Dorset Heaths (Purbeck & Wareham) & Studland Dunes (SAC), Dorset Heathlands (SPA, Ramsar), Solent and Dorset Coast (SPA), Poole Harbour (SPA, Ramsar) are within 10

km of the installation and there are several Local Wildlife Sites and an area 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 an energy from waste CHP plant. 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 is delivered by vehicles and tipped into a waste bunker in an enclosed tipping hall. Air within the tipping hall is extracted through the furnace to control odour and dust emissions. A crane is used to mix the waste in the bunker and to load it into the furnace via a feed hopper. The waste will be burned on a grate furnace at least 850 ^{o}C for a minimum of two seconds. Air supply is controlled to ensure efficient combustion. Energy from the combustion gases will be recovered in a boiler and steam used to generate electricity. The installation is designed to export up to 28 MWe of electricity to the national grid and local private wire electricity consumers, subject to suitable commercial arrangements being established. The design of the steam turbine system allows for heat export to local heat consumers, in the form of low temperature hot water, subject to suitable commercial arrangements being established. Heat that cannot be recovered in the form of electricity or hot water is dissipated through an air cooled condenser. Reformation of dioxins is minimised by ensuring rapid cooling of flue gases and boiler cleaning. Waste gases are abated before being emitted to atmosphere via a 110 m high stack. The abatement consists of:

- Selective non-catalytic using injection of urea for oxides of nitrogen
- Injection of hydrated lime for acid gases
- Injection of activated carbon for mercury and dioxins & furans
- Bag filters for particulate matter including metals

Emissions to air will be continuously or periodically monitored in line with the permit requirements.

Process waste water is re-used for quenching bottom ash. After quenching in water, bottom ash is stored in a building before transferring into vehicles for removal from site. Air pollution control (APC) residues are stored in silos prior to removal from site in sealed tankers. Normally there are no discharges of process effluent, with process effluents routed to the process water system for

re-use within the bottom ash quench. There could be an intermittent discharge to sewer during on-line maintenance of the water treatment plant if filter backwash and effluents from regeneration of the ion exchange unit cannot be routed to the process water system due to this system operating at capacity. In this scenario, these effluents will be routed to a neutralisation tank prior to being discharged to foul sewer under a trade effluent discharge consent.

Uncontaminated surface water run-off will be emitted to Knighton Stream.

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

Waste throughput (nominal capacity based on average CV of 10.9 MJ/kg)	260,000 tonne per year	33.2 tonnes per hour
Waste processed	MSW, CW	
Number of lines	1	
Furnace technology	Grate	
Auxiliary Fuel	Gas oil or hydrotreated vegetable oil	
Acid gas abatement	Dry	hydrated lime, sodium bicarbonate
NOx abatement	SNCR	Urea
Reagent consumption (tonnes per year)	Auxiliary Fuel: 806 Urea : 919 Hydrated lime : 5,204 Activated carbon: 92 Process water: 39,650	
Flue gas recirculation	No	
Dioxin abatement	Activated carbon	
Stack	Grid Reference: 403484, 96726	
	Height, 110 m	Diameter: 2.5 m
Flue gas	Flow: 62.2Nm^3/s	Velocity: 17.9 m/s
	Temperature 135 °C	
Electricity generated	30.4 MWe	
Electricity exported	28 MWe	
Steam conditions	Temperature, 420 °C	Pressure, 63.5 bar

4.1.4 Key Issues in the Determination

The key issues arising during determination of the Application were air emissions and assessment of BAT and we therefore describe how we determined these issues in greater detail in the body of this document.

4.2 The site and its protection

4.2.1 Site setting, layout and history

The 2.38 hectare site is within an existing integrated waste management park known as Canford Resource Park and the Installation will be located in the south western part. The site is currently partially used for other waste management activities including a non-operational gasification and pyrolysis facility.

The site was first developed into a surface ground working for mineral extraction around the 1980s, initially with the resultant void being water-filled. This void was gradually infilled from the north east towards the south western parts between 2000 and 2017. The filled site was subsequently used for waste management activities and associated storage and infrastructure.

4.2.2 Proposed site design: potentially polluting substances and prevention measures

The key features of the installation for the prevention of pollution to ground and ground water are listed below:

- Waste stored in a concrete bunker with impermeable surface located inside a building
- Tanks located in bunds
- Impermeable site surfacing - concrete hardstanding with sealed joints
- Sealed surface water drainage system
- Management system will be certified to ISO14001 and will include preventative maintenance measures and an accident management plan
- Spill kits and training will be provided to site operators so that any spillages can be cleaned up as soon as they are identified

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. Baseline soil data has been established. Leachate analysis of soils suggests low potential for impact from on-site made ground but does not assess risk of impact from off-site sources or petroleum hydrocarbons, PAHs, VOC/SVOCs despite these being noted as potential historic contaminants. No groundwater chemical data has been collected.

We have therefore set a pre-operational condition (PO6) requiring the Operator to provide this information prior to the commencement 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

Having considered the information submitted in the Application, we are satisfied that the appropriate measures will be in place for the closure and decommissioning of the Installation. 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 submitted an assessment of accident risk and confirmed that a formal accident management plan will form part of their EMS. Having considered the assessment and other information submitted in the Application, we are satisfied that appropriate measures will be in place to ensure that accidents that may cause pollution are prevented but that, if they should occur, their consequences are minimised. Pre-operational condition (PO1) requires the EMS to be in place prior to commissioning.

The Applicant submitted a Fire Prevention Plan (FPP). We are satisfied that the plan will ensure fire risk is controlled.

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:

Description	Parts Included	Justification
The Application	Operating techniques described in the following section of the application Supplementary Information Report: • 3.2.2 • 3.3 • 3.4 • 3.5 • 3.7 • 4.1 • 4.2 • 4.3 to 4.6 • 4.8 to 4.10 • 4.11	Contain key operating techniques

	• 4.13 • 5.1.2 • 5.2 • 5.3 • 5.4 • 5.5 • 5.6	
Response to Schedule 5 Notice dated 13/01/2025	The response to question 2	

The details set out above describe the techniques that will be used for the operation of the Installation that have been assessed by us 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:

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

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 take municipal waste and industrial & commercial waste which mostly has not been source-segregated or separately collected or otherwise recovered, recycled or composted. The amount of recyclable material in the waste feed is largely outside the remit of this permit determination with recycling initiatives being a matter for the local authority. However Permit conditions 2.3.5 and 2.3.6 limit the burning of separately collected fractions in line with regulation 12 of the Waste (England and Wales) Regulations 2011.

We have limited the capacity of the Installation to 260,000 tonnes per annum. This is based on the installation operating 7,830 hours per year at a nominal capacity of 33.2 tonnes per hour. This is based on the design load conditions at an average CV of 10.9 MJ/kg. The maximum continuous rating (MCR) is 40.8 tonnes per hour, based on lowest CV of 9.0 MJ/kg which would equate to 357,408 tonnes per year if the plant were to operate at that point continually. Impact assessments were based on the MCR however the Applicant stated that their maximum waste throughput would be 260,000 tonnes per year and that is the limit we have set in the Permit.

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:

- Preventative maintenance measures specifically aimed at maximising the energy efficiency.
- Design, including appropriate insulation levels, will be used throughout
- The main combustion chambers in the furnace will be insulated to retain energy.
- The boiler generated high pressure steam will be transported within well insulated steam mains to the turbine.
- All condensate pipes will be insulated to minimise heat loss during the transfer of boiler feed water back to the header tank.
- High efficiency lighting
- High efficiency motors

The Application states that the specific energy consumption, a measure of total energy consumed per unit of waste processed, will be 111 kWh/tonne. The installation capacity is 260,000 t/a.

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 10.9 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 combined heat and power (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, we consider 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, EPR S5.01, states that where electricity only is generated, 5-9 MW of electricity should be recoverable per 100,000 tonnes of waste.

The Installation will mainly generate for supply to national grid and will also aim to supply up to 5 MWth of hot water to local users.
Based on electricity only, the Application shows 30.4 MW of electricity produced based on waste input of 260,000 tonnes, which represents 11.7 MW per 100,000 tonnes/yr of waste burned (0.9 MWh/tonne of waste). The Installation is therefore above the top of the indicative BAT range.

The Applicant provided a calculation of the gross electrical efficiency, assuming no heat export, and compared it to the BAT AEEL specified in BAT conclusions BAT 20.
The gross electrical efficiency was calculated as 30.2%.
The BAT AEEL for gross electrical efficiency is 25-35,the value calculated by the Applicant is just above the middle of the range.

In accordance with BAT 2 table S3.4 of the Permit requires the gross electrical efficiency to be measured by carrying out a performance test at full load.

Guidance note EPR 5.01 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 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. As well as generating electricity the Applicant stated that they aim to supply up to 5 MWth of heat as low temperature hot water to local users. This is proposed to be supply to the nearby Magna business park and other users close to the Installation, although negotiations with potential off-site users of heat are ongoing and no formal agreements are currently in place. Establishing a district heating network to supply local users would involve significant technical, financial and planning challenges and as such we have set an improvement condition (IC8) for the Applicant to provide a report on progress with implementing the CHP scheme.

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) R1 Calculation and the DEFRA Good Quality CHP Scheme

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

The Applicant has presented a calculation of the R1 factor (as defined under the WFD 2008). The R1 formula is a measure of the extent to which energy is recovered from incineration plant. The formula is:

$$R1 = (Ep – (Ef + Ei)) / (0.97 \times (Ew + Ef))$$

Where:

- Ep means annual energy produced as heat or electricity. It is calculated in the form of electricity being multiplied by 2.6 and heat for commercial use being multiplied by 1.1 (GJ/yr).
- Ef means annual energy input to the system from fuels contributing to the production of steam (GJ/yr).
- Ew means annual energy contained in the treated waste calculated using the net calorific value of the waste (GJ/yr).
- Ei means annual energy imported excluding Ew and Ef (GJ/yr)
- 0.97 is a factor accounting for energy losses due to bottom ash and radiation.

Where municipal waste incinerators can achieve an R1 factor of 0.65 or above, the plant will be considered to be a ‘recovery activity’ for the purposes of the Waste Framework Directive. Whether or not an installation achieves an R1 score of >0.65 is not a matter directly relevant to this determination. However by being classified as a ‘recovery activity’ rather than as a ‘disposal activity’, the Operator could draw financial and other benefits.
The Applicant’s R1 factor was 0.83 which is well above the 0.65 threshold.

The R1 factor can only be determined from operational data over a full year. At application stage it is only possible to make a provisional assessment. Ep measures the energy recovered for use from the incinerator. This energy will have been recovered not just from the combustion of waste (Ew), but also from the combustion of the support fuel at start up and shut down and where required to maintain the 850 ºC combustion temperature (Ef). Ei is additional energy imported, which will primarily be electricity from the grid. These parameters will depend on the way in which the plant is operated, e.g. number of start ups and shut downs.

Note that the availability or non-availability of financial incentives for renewable energy such as the ROC and RHI schemes is not a consideration in determining this application.

(v) Choice of Steam Turbine

The Applicant stated that steam conditions would be 420ºC and 63.5 Bar. High steam of conditions of above 400ºC, 45 Bar are a technique in the Bat C for maximising energy recovery.

(vi) Choice of Cooling System

The Applicant considered the use of:

- Once through sea or river water cooling systems
- Closed circuit wet evaporative cooling systems
- Air cooled condensers

The Applicant concluded that air cooled condensers are BAT for the Installation because whilst the efficiency of an ACC is less than a once through cooling system or closed circuit wet evaporative cooling system, water consumption is minimised and there are fewer cross media effects such as visible plume and water emissions. We agree with the Applicant's assessment.

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

The operator carried out a screen of heat demand within 15 km of the Installation.

The Applicant identified a potential heat demand within 1.5 km of the Installation comprising of 0.5 MWth for Magna Business Park and 4.4 MWth for other users. The initial design of the EfW CHP Facility allows for up to 5 MWth export of hot water, which includes additional allowance/contingency for potential further increase in demand in the future. The Applicant submitted a cost-benefit assessment for that opportunity 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 -£2.23 million which demonstrates that operating as a high-efficiency cogeneration installation will not be financially viable. However the Applicant is still proposing to design the plant to be able to supply this heat demand and we have included an improvement condition (IC8) for the operator to submit a plan for implementing the scheme.

(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.

Improvement condition IC8 has been included in the permit requiring the operator to submit a plan for implementing the scheme.

The Operator is required to report energy usage and energy generated under condition 4.2 and Schedule 5 of the Permit. 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 us 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 we accept 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 that the Operator will make 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 urea 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_x. These are the most significant raw materials that will be used at the Installation, other than the waste feed itself (addressed elsewhere). The efficiency of the use of auxiliary fuel will be tracked separately as part of the energy reporting requirement under condition 4.2.1. 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 permitted 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 incinerator bottom ash (IBA) and air pollution control (APC) residues.

The first objective is to avoid producing waste at all. Waste production will be avoided by achieving a high degree of burnout of the ash in the furnace, which results in a material that is both reduced in volume and in chemical reactivity. Condition 3.1.3 and associated Table S3.5 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.

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 IBA at the Installation 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.

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 IBA sampling protocols. Table S3.5 requires the Operator to carry out an ongoing programme of monitoring.

The Application proposes that, where possible, bottom ash will be transported to a suitable treatment 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 Waste Framework Directive (WFD) will be applied to the generation of waste and that any waste generated will be treated in accordance with that 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 (GWP) 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' 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) for air emissions. ES are described in our web guide 'Air emissions risk assessment for your environmental permit'.

Our web guide sets out the relevant ES as:

- Air Quality Standards Regulations 2010 Limit Values
- Air Quality Standards Regulations 2010 Target Values
- UK Air Quality Strategy Objectives
- Environmental Assessment Levels

Where a Limit Value exists, the relevant standard is the Limit Value. Where a Limit Value does not exist, 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 limit values, target values and AQS objectives. In a very small number of cases, e.g. for emissions of lead, the AQS objective is more stringent that the Limit Value. In such cases, we use the AQS objective for our assessment.

Target values, AQS objectives and EALs do not have the same legal status as 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** PC is less than **1%** of the relevant ES; and
- the **short-term** PC is less than **10%** of the relevant ES.

The **long term** 1% PC 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 human health and the environment.

The **short term** 10% PC 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 human health and the environment.

Where an emission is screened out in this way, we would normally consider 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 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 Application. The assessment comprises:

- Dispersion modelling of emissions to air from the operation of the incinerator.
- A study of the impact of emissions on nearby protected conservation areas

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 air dispersion model software ADMS 6.0, 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 Bournemouth Airport (~ 8 km east of the Installation) between 2016 and 2020. The effect 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.

- They assumed that the ELVs in the Permit would be the maximum permitted by Article 15(3), Article 46(2) and Annex VI of the IED. These substances are:
    - Oxides of nitrogen (NO_x), expressed as NO_2
    - Total dust
    - Carbon monoxide (CO)
    - Sulphur dioxide (SO_2)
    - Hydrogen chloride (HCl)
    - Hydrogen fluoride (HF)
    - Metals (cadmium, thallium, mercury, antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel and vanadium)
    - Polychlorinated dibenzo-para-dioxins and polychlorinated dibenzo furans (referred to as dioxins and furans)
    - Gaseous and vaporous organic substances, expressed as Total Organic Carbon (TOC)
- Ammonia (NH_3) emission were based on an ELV of 5 mg/m^3 which is lower than the BAT AEL of 10 mg/m^3.
- They assumed that the Installation operates continuously at the relevant long-term or short-term ELVs, i.e. the maximum permitted emission rate (metals are considered further in section 5.2.3 of this decision document).
- The model also considered emissions of pollutants not covered by Annex VI of IED, specifically, polycyclic aromatic hydrocarbons (PAH) and polychlorinated biphenyls (PCBs). Emission rates used in the modelling were taken from WR 0608 Emissions from Waste Management Facilities, ERM Report on Behalf of Defra (July 2011).
- Emissions of oxides of nitrogen from the 3MWth emergency diesel generator were also considered. It will only operate for emergency use and for 50 hours testing per year. Short term impacts were based on continual usage and represent a very conservative assessment.

We are in agreement with this approach. The assumptions underpinning the model have been checked and are a reasonable worst-case .

The Applicant established the background (or existing) air quality against which to measure the potential impact of the incinerator.

As well as predicting the maximum ground level concentration of the pollutants within the modelling domain, the Applicant has modelled several discrete receptor locations to represent human and ecological exposure.

The Applicant's use of the dispersion models, selection of input data, use of background data and the assumptions made, have been reviewed by our 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 human health impacts and impact on protected conservation

areas. Our audit takes account of modelling uncertainties. We make reasonable worst case assumptions and use the uncertainties (minimum 140%) in analysing the likelihood of exceeding any particular standard.

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 their predicted ground level concentrations at the most impacted receptor, unless noted in the tables below.

As part of our checks, we carry out sensitivity analysis of the data provided and conduct our own check modelling to ensure that the applicant's modelling predictions are reliable.

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

Pollutant	**ES**		**Back-ground**	**Process Contribution (PC)**		**Predicted Environmental Concentration (PEC)**	
	µg/m³	**Reference period**	**µg/m³**	**µg/m³**	**% of EAL**	**µg/m³**	**% of EAL**
NO_2	40	Annual mean	19.6	0.32	0.80	19.9	49.8
	200	99.79th %ile of 1 hour means	39.2	2.3	1.2	41.5	20.8
PM_{10}	40	Annual mean	18.7	0.019	0.05	18.7	46.8

Pollutant	ES		Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	µg/m³	Reference period	µg/m³	µg/m³	% of EAL	µg/m³	% of EAL
	50	90.41st %ile of 24 hour means	22.1	0.072	0.14	22.172	44.3
$PM_{2.5}$	20	Annual mean	12.8	0.019	0.10	12.82	64.1
	266	99.9th %ile of 15-min means	17.7	1.9	0.7	19.6	7.4
	350	99.73rd %ile of 1 hour means	13.2	1.6	0.46	14.8	4.2
SO_2	125	99.18th %ile of 24 hour means	7.8	0.88	0.7	8.68	6.9
HCl	750	1-hour mean	0.52	0.87	0.116	1.4	0.19
	16	Monthly mean	0.1	0.014	0.09	0.114	0.71
HF	160	1 hour mean	0.2	0.14	0.088	0.34	0.2
	10000	Maximum daily running 8 hour mean	214	2.4	0.02	216	2.2
CO	30000	1 hour mean	306	7.2	0.02	313	1.0
	2.25	Annual mean	0.18	0.038	1.69	0.22	9.69
TOC	30	Daily mean	0.21	0.36	1.20	0.57	1.90
	2.25	24 Hour mean (Short Term)	0.21	0.36	16.00	0.57	25.33
PAH	0.00025	Annual mean	3.40×10^{-7}	3.4×10^{-7}	0.14	0.00008	31.2
	180	Annual mean	1.3	0.019	0.01	1.32	0.73
NH_3	2500	1 hour mean	2.6	0.72	0.03	3.32	0.1

Pollutant	ES		Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	µg/m³	Reference period	µg/m³	µg/m³	% of EAL	µg/m³	% of EAL
	0.2	Annual mean	$2.70x10^{-5}$	$1.40x10^{-11}$	$7.00x10^{-9}$	$2.70x10^{-5}$	0.01
PCBs	6	1 hour mean	0.000054	$5.20x10^{-10}$	$8.67x10^{-9}$	$5.40x10^{-5}$	0.00

TOC as 1,3 butadiene for long term and benzene for short term
PAH as benzo[a]pyrene

Pollutant	ES		Back-ground	Process Contribution		Predicted Environmental Concentration	
	ng/m³	Reference period	ng/m³	ng/m³	% of EAL	ng/m³	% of EAL
Cd	5	Annual mean	0.11	0.075	1.5	0.19	3.7
	30	24 hour mean (short term)	0.13	0.72	2.4	0.85	2.8
Hg	600	1 hour mean	5.4	2.9	0.48	8.30	1.38
	60	24 hour mean (long term)	3.2	0.72	1.20	3.92	6.53
Sb	5000	Annual mean	-	1.1	0.02		
	150000	1 hour mean	-	43.4	0.03		
Pb	250	Annual mean	3.9	1.1	0.44	5.00	2.00
Cu	50	24 hour mean (long term)	3.2	10.9	21.80	14.10	28.200
Mn	150	Annual mean	2.6	1.1	0.73	3.70	2.47
	1500000	1 hour mean	5.2	43.4	0.003	48.60	0.00
V	1000	24 hr average (short term)	0.85	10.9	1.09	11.75	1.18
As	6	Annual mean	0.64	1.1	18.33	1.74	29.0

Cr (II)(III)	2000	24 hour mean (long term)	1.1	10.9	0.55	12.00	0.600
Cr (VI)	0.25	Annual mean	0.22	0.23	92.00	0.45	180.0
Ni	20	Annual mean	0.66	1.1	5.50	1.76	8.8
	700	1 hour mean	1.3	43.4	6.20	44.70	6.4

(i) Screening out emissions which are insignificant

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

- NO_2, PM_{10}, $PM_{2.5}$, SO_2, HCl, HF, CO, PAH, NH_3, PCBs, Sb, Pb, Mn, V, Cr(II)(III)

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 PEC is less than 100% (taking expected modelling uncertainties into account) of both the long term and short term ES.

- TOC, Cd, Hg, Cu, As, Ni

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

(iii) Emissions requiring further assessment

From the tables above the following emissions are considered to have the potential to give rise to significant pollution in that the Predicted Environmental Concentration exceeds 100% of the long term or short term ES.

- Cr(VI)

Further assessment of Cr(VI) is shown in below in section 5.2.3.

In any case, with respect to these pollutants, 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.

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.

5.2.2 Consideration of key pollutants

(i) Nitrogen dioxide (NO_2)

The impact on air quality from NO_2 emissions has been assessed against the ES of 40 $\mu g/m^3$ as a long term annual average and 200 $\mu g/m^3$ as a short term hourly average.
The model assumes a 70% NO_X to NO_2 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 maximum long term PC is less than 1% of the ES and the maximum 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.

(ii) Particulate matter PM_{10} and $PM_{2.5}$

The impact on air quality from particulate emissions has been assessed against the ES for PM_{10} (particles of 10 microns and smaller) and $PM_{2.5}$ (particles of 2.5 microns and smaller). For PM_{10}, the ES are a long term annual average of 40 $\mu g/m^3$ and a short term daily average of 50 $\mu g/m^3$. For $PM_{2.5}$ the ES of 20 $\mu g/m^3$

as a long-term annual average was used, having changed from 25 μg/m^3 in 2020.

The Applicant's predicted impact of the Installation against these ES is shown in the tables above. The assessment assumes that **all** particulate emissions are present as PM_{10} for the PM_{10} assessment and that **all** particulate emissions are present as $PM_{2.5}$ for the $PM_{2.5}$ 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_{10}) or 2.5 microns ($PM_{2.5}$), when some are expected to be larger.

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

The above table shows that the predicted PC for emissions of PM_{10} 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 table also shows that the predicted PC for emissions of $PM_{2.5}$ is also below 1% of the ES. Therefore, the Environment Agency concludes that particulate emissions from the installation, including emissions of PM_{10} or $PM_{2.5}$, will not give rise to significant pollution.

There is currently no emission limit prescribed nor any continuous emissions monitor for particulate matter specifically in the PM_{10} or $PM_{2.5}$ fraction. Whilst we are confident that current monitoring techniques will capture the fine particle fraction ($PM_{2.5}$) 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 we are 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, sulphur dioxide (SO_2), hydrogen chloride (HCl) and hydrogen fluoride (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. The ES for HCl is 750 μg/m^3, this is an hourly short term average, there is no long term ES for HCl. HF has 2 assessment criteria – a 1-hr ES of 160 μg/m^3 and a monthly ES of 16 μg/m^3 – the process contribution is <1% of the monthly ES

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 EAL for SO_2 for the protection of human health. Protection of ecological receptors from SO_2 for which there is a long term ES is considered in section 5.4. There are three short term ES, hourly of 350 $\mu g/m^3$, 15 – minute of 266 $\mu g/m^3$ and daily of 125 $\mu g/m^3$.

From the above table, emissions of SO_2 can be screened out as insignificant in that the short term process contribution is <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.

(iv) Emissions to air of carbon monoxide (CO), Volatile Organic Compounds (VOCs), Polycyclic Aromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs), Dioxins and ammonia (NH_3)

The above tables show emissions of that for CO 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 VOC emissions, the maximum long term PC is greater than 1% of the ES and therefore cannot be screened out as insignificant. However, the emission is not expected to result in the ES being exceeded.

The Applicant has used the ES for 1,3 butadiene for their assessment of the impact of VOC. This is based on 1,3 butadiene having the lowest ES of organic species likely to be present in VOC (other than PAH, PCBs, dioxins and furans).

The above tables show that for PAH and PCB emissions, the maximum long term PC is less than 1% of the ES and the maximum 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 impact from VOCs was based on the emission limit set in the permit for total organic carbon.

The Applicant has 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 ammonia emissions can be screened out as insignificant in that the PC is < 1% of the long term ES and <10% of the short term ES.

The ammonia emission is based on a release concentration of 5 mg/m^3 which is lower than the BAT AEL of 10 mg/m^3. We are satisfied that this level of emission is achievable with a well controlled SNCR NO_x 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 have not screened out as insignificant, 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.

There are three sets of BAT AELs for metal emissions:

- An emission limit value of 0.02 mg/m^3 for mercury and its compounds (formerly WID group 1 metals).
- An aggregate emission limit value of 0.02 mg/m^3 for cadmium and thallium and their compounds (formerly WID group 2 metals).
- An aggregate emission limit of 0.3 mg/m^3 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:

- Sb, Pb, Mn, V, Cr(II)(III)

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, Hg, Cu, As

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

Where the BREF 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 Cr(VI) the Applicant Used representative emissions data from other municipal waste incinerators using our guidance note "Guidance to Applicants on Impact Assessment for Group 3 Metals Stack Releases – version 4". 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 emissions of Cr(VI) were screened out as insignificant.
We have set improvement condition IC6 for this to be confirmed with 12 months of operating data.

The installation has been assessed as meeting BAT for control of metal emissions to air. See section 6 of this document.

5.2.4 Emergency diesel generator

Long term impacts of NO_2, based on 50 hours use per year are unchanged from those shown in tables above. For short term impacts the generator was assumed to run continually for the whole year, which is a very conservative assumption. The table below shows the impacts when combined with emissions from the incinerator. Short term impacts are insignificant.

Pollutant	ES		Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	µg/m³	Reference period	µg/m³	µg/m³	% of EAL	µg/m³	% of EAL
NO_2	200	99.79th %ile of 1 hour means	39.2	13.9	6.95	-	-

5.2.5 Consideration of Local Factors

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

The nearest AQMAs are 4.6 km and 5.3 km away. They have been declared for NO_2.

From the Applicants model, the maximum long term process contribution at any point in the modelled grid is below 1% of the ES and can be considered insignificant. Impacts at the AQMAs will be lower still, so even though the background is already above the ES, the contribution from the Installation will be negligible.

The Applicant is required to prevent, minimise and control emissions using the best available techniques; this is considered further in Section 6.

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. The EPR include the requirements of relevant EU Directives, notably, the IED, the WFD, and ADD.

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 of the IED. 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 (BAT-C) 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, GWP and the 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

There is a significant amount of literature on whether there are links between operation of incineration plants and effects on health. We have not referenced them here, but we have included information on one of the most recent studies that was commissioned by the UK Health Security Agency (UKHSA), previously Public Health England (PHE). The overall weight of the evidence is that there is not a significant impact on human health.

UKHSA review research undertaken to examine suggested links between emissions from municipal waste incinerators and effects on health. UKHSA's risk assessment is that modern, well run and regulated municipal waste incinerators are not a significant risk to public health. While it is not possible to rule out adverse health effects from these incinerators completely, any potential effect for people living close by is likely to be very small.

UKHSA keep literature on health effects under review and would inform us if there were any changes to the above position. Similarly, we would consult UKHSA if new evidence was provided to us.

In 2012 the UK Small Area Health Statistics Unit (SAHSU) at Imperial College was commissioned by 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 PM_{10} 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.

UKHSA 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, UKHSA have further stated that their position remains that modern, well run and regulated municipal waste incinerators are not a significant risk to public health.

We agree with the view stated by the UKHSA. We 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 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 mathematical 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 to allow for different body size, such as for adults and children of different ages. In the UK, the COT has set a TDI for dioxins, furans and dioxin like PCBs of 2

picograms WHO-TEQ/kg-body weight/day (a picogram is a millionth of a millionth (10^{-12}) of a gram).

In addition to an assessment of risk from dioxins, furans and dioxin like PCBs, 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.

The Committee on the Medical Effects of Air Pollution (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_2, SO_2 and particulates) in terms of the numbers of "deaths brought forward" and the "number of hospital admissions for respiratory disease brought forward or additional". Defra reviewed this methodology and concluded that the use of the COMEAP methodology is not generally recommended for modelling the human health impacts of individual installations.

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 modelling 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 the lifetime of the receptor.

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 WHO-TEQ / kg body weight/ 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.

Agricultural	0.016	0.024
Residential	0.00048	0.0014

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

In 2010, the FSA studied the levels of chlorinated, brominated and mixed (chlorinated-brominated) dioxins and dioxin-like PCBs in fish, shellfish, meat and eggs consumed in the 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 µm, 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 µm and much of what is smaller. It is not expected that particles smaller than 0.3 µm 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 µm in diameter ($PM_{0.1}$). Questions are often raised about the effect of nano-particles on human health, in particular on children's health, because of their high surface to volume ratio, making them more reactive, and their very small size, giving them the potential to penetrate cell walls of living organisms. The small size also means there will be a larger number of small particles for a given mass concentration. However, the UKHSA 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 UKHSA addresses the issue of the health effects of particulates in their September 2009 statement 'The Impact on Health of Emissions to Air from Municipal Incinerators'. It refers to the coefficients linking PM_{10} and $PM_{2.5}$ with effects on health derived by 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. UKHSA 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 $PM_{2.5}$ by 1 $\mu g/m^3$ would result in an increase in life expectancy of 20 days for people born in 2008." However, "The Committee stresses the need for careful interpretation of these metrics to avoid incorrect inferences being drawn – they are valid representations of population aggregate or average effects, but they can be misleading when interpreted as reflecting the experience of individuals."

UKHSA also point out that in 2007 incinerators contributed 0.02% to ambient ground level PM_{10} levels compared with 18% for road traffic and 22% for industry in general. UKHSA noted that in a sample collected in a day at a typical urban area the proportion of $PM_{0.1}$ is around 5-10% of PM_{10}. It goes on to say that PM_{10} includes and exceeds $PM_{2.5}$ which in turn includes and exceeds $PM_{0.1}$. The National Atmospheric Emissions Inventory (NAEI) figures show that in 2016 municipal waste incineration contributed 0.03% to ambient ground level PM_{10} levels and 0.05% to ambient ground level PM2.5 levels. The 2016 data also shows that road traffic contributed to 5.35% of PM10 and 4.96% of PM2.5 and that domestic wood burning contributed 22.4% to PM10 and 34.3% of PM2.5 levels.

This is consistent with the assessment of this Application which shows emissions of PM_{10} to air to be insignificant.
A 2016 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

Our assessment of health impacts is summarised below

i. We have applied the relevant requirements of the Environmental legislation in imposing the permit conditions. We are satisfied that compliance with these conditions will ensure protection of the environment and human health.

ii. In carrying out air dispersion modelling as part of the environmental impact assessment and comparing the PC and PEC with the ES, the Applicant has effectively made a health risk assessment for many pollutants. The ES have been developed primarily to protect human health. The Applicant's assessment indicated that the Installation emissions screen out as insignificant or where the impact of emissions were not been screened out as insignificant, the assessment still shows that the PEC are well within the ES.

iii. 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).

iv. We have reviewed the methodology employed by the Applicant to carry out the health impact assessment.

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 risk to human health.

v. We agree with the conclusion reached by UKHSA that modern, well run and regulated municipal waste incinerators are not a significant risk to public health. While it is not possible to rule out adverse health effects from these incinerators completely, any potential effect for people living close by is likely to be very small.

vi. The UKHSA and the Local Authority Director of Public Health were consulted on the Application. They concluded that they had no significant concerns regarding the risk to the health of humans from the installation. The Local Authority Director of Public Health did not provide a response. The Food Standards Agency was also consulted during the permit determination process and did not provide a response to our consultation. Details of the responses provided by UKHSA, the Local Authority Director of Public Health and the FSA to the consultation on this Application can be found in Annex 4.

We are therefore satisfied that the Applicant's conclusions presented above are reliable and we conclude that the potential emissions of pollutants including

dioxins, furans and metals from the proposed facility are unlikely to have a significant impact on human health.

5.4 Impact on protected conservation areas (SPAs, SACs, Ramsar sites and SSSIs and local nature sites)

5.4.1 Sites Considered

The following Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar) sites are located within 10 km of the Installation:

- Dorset Health (SAC)
- Dorset Heaths (Purbeck & Wareham) & Studland Dunes (SAC)
- Dorset Heathlands (SPA, Ramsar)
- Poole Harbour (SPA, Ramsar)
- Solent and Dorset Coast (SPA)

The following Sites of Special Scientific Interest (SSSI) are located within 2 km of the Installation:

- Canford Heath

The following local nature sites (ancient woodlands, local wildlife sites and national and local nature reserves) are located within 2 km of the Installation:

- Knighton Heath Golf Course
- Moortown Copse
- Arrowsmith Coppice
- Haymoor Bottom
- Delph Woods
- Alderney Waterworks
- Bearwood

5.4.2 Habitats Assessment

The Applicant's habitats assessment was reviewed by our technical specialists for air dispersion modelling and assessment and specialists for, habitats and conservation who agreed with the assessment's conclusions, that there would be no adverse effect on the interest features of the protected sites.
Our full assessment was recorded on an appendix 11 form that we used to consult with natural England. A summary is set out below.

Emissions to air

Assessment against critical levels

The Applicant assessed impacts against the following critical levels:
Oxides of nitrogen: 30 µg/m^3 annual mean, 75 µg/m^3 24 hour mean
Sulphur dioxide: 10 µg/m^3 annual mean
Hydrogen fluoride: 0.5 µg/m^3 weekly mean, 5 µg/m^3 24 hour mean
Ammonia: 1 µg/m^3 annual mean

Table 1 critical levels (Cl)

	NOx		**SO_2**	**HF**		**NH_3**
	Annual mean PC as % Cl	Daily mean PC as % Cl	Annual mean PC as % Cl	Weekly mean PC as % Cl	Daily mean PC as % Cl	Annual mean PC as % Cl
Dorset Heaths SAC/SPA/Ramsar	0.43	5.87	0.34	2.40	0.74	0.56
Poole Harbour (SPA/Ramsar)	0.15	1.12	0.11	0.54	0.14	0.19
Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	0.09	0.59	0.07	0.28	0.07	0.11

Table 2 nitrogen deposition

Site	**Habitat type**	**Critical load (kgN/ha/yr)**	**PC (kgN/ha/yr)**	**PC % CLo**
Dorset Heaths SAC/SPA/Ramsar	Heathland	5	0.05	1.00
	Woodland	10	0.085	0.85
Poole Harbour (SPA/Ramsar)	Coastal Dunes	5	0.016	0.32
Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	Bog woodland	5	0.017	0.34

Table 3 acid deposition

Site	**Habitat type**	**Critical load (keq/ha/yr)**	**PC (keq/ha/yr)**	**PC % CLo**	**PEC (keq/ha/yr)**	**PEC % CLo**
Dorset Heaths SAC/SPA/Ramsar	Heathland	0.553	0.0110	1.989	1.27	230
	Woodland	0.872	0.011	1.261	1.27	146
	Coniferous woodland	1.013	0.021	2.073	2.16	213
Poole Harbour (SPA/Ramsar)	Coastal Dunes	4.856	0.0036	0.074	-	-
Dorset Heaths (Purbeck & Wareham) and Studland Dunes SAC	Bog woodland	0.558	0.0022	0.394	-	-

Solent and Dorset Coast (SPA) is not specifically included in the tables above, however the SPAs on the south coast are upwind of the source so will have lower predictions compared to Canford Heath or the SSSIs NE of the facility.
All impacts screened out except for acid deposition at Dorset Heaths SAC.

Emissions to water

There are two emissions to water, one of clean site surface run off to Knighton stream which will not cause any effect at all on the designated sites. The effluent going to foul sewer will be treated in Cabot Lane WWTW (Poole), before discharge the effluent will be neutralised in a neutralisation tank, with the pH, temperature and volumetric flow rate of the discharge continuously monitored under the requirements of a trade effluent discharge consent.
Any suspended solids in the effluent will be adequately treated by the WWTW which has associated limits on the discharge to surface waters. The principal pollutant of concern in this case is nutrients as the receiving waters in Poole harbour are designated as nutrient neutral/sensitive, where impacts from excess nutrients are already occurring. However the effluent is not anticipated to contain any nutrients and would not lead to any net increase in nutrients in the receiving waters.
We conclude there is no effect at all on the designated sites from emissions to water.

Visual disturbance from light

The Applicant concluded that habitat fragmentation could be caused by light pollution from the site. They have provided mitigation measures to reduce this impact.

We considered acid deposition and light impacts in an **appropriate assessment**.
In the appropriate assessment we concluded no adverse effect.

Acid deposition and associated habitat loss at Dorset Heath SAC

The Applicant has proposed the following mitigation:

- Air pollution control systems to reduce levels of pollutants in the facility's emissions, including an ammonia ELV of 5 mg/m^3 which is lower than the BAT AEL.
- Increasing the stack height from the initial design of 90 m to 110 m above ground level.
- Contributions towards appropriate management of Dorset Heaths SAC/SPA/Ramsar in the form of a Biodiversity Enhancement Contribution and Trickle Fund, in addition to a future monitoring strategy, to be secured through a Section 106 agreement. *'This agreement will also include preparation of a Monitoring and Supportive Management Plan, which will set out a schedule of future soil sampling and bryophyte and lichen monitoring surveys and action to be taken should this monitoring indicate deterioration of the habitats.'*

The HRA completed by the local authority confirms that NE have reviewed the proposal and have approved the mitigation stating in the response letter *'Natural England advise that the additional information provided by the applicant in the updated shadow HRA allows Natural England to agree with the*

conclusion, reached at paragraph 5.60 of the report that, on the basis of the proposed mitigation and avoidance measures being secured there will not be an adverse effect on the integrity of the Dorset Heaths SAC, Dorset Heathlands SPA and Ramsar.'
On this basis we concluded that adverse effects alone can be avoided.

Visual disturbance and associated habitat loss at Dorset Heathlands SPA
The Proposed Development will operate 24-hours a day 365-days a year. Residual waste will only be accepted between 07:00 and 20:00 hours. This will require constant use of light during nighttime operation. Mitigation was proposed as part of the planning application and agreed with Natural England.

We therefore concluded no adverse effect and Natural England agreed with our assessment.

5.4.3 SSSI Assessment

The Applicant's assessment of SSSIs was reviewed by our technical specialists for air dispersion modelling and assessment and specialists for habitats and conservation, who agreed with the assessment's conclusions, that the proposal does not damage the special features of the SSSI.

Table 1 critical levels

	NOx		**SO_2**	**HF**		**NH_3**
Site	Annual mean PC as % Cl	Daily mean PC as % Cl	Annual mean PC as % Cl	Weekly mean PC as % Cl	Daily mean PC as % Cl	Annual mean PC as % Cl
Canford Heath	0.27	4.53	0.2	0.98	0.36	0.31

Table 2 nitrogen deposition

Site	**Critical load (kgN/ha/yr)**	**PC (kgN/ha/yr)**	**PC % CLo**
Canford Heath	5	0.028	0.56

Table 3 acid deposition

Site	**Critical load (keq/ha/yr)**	**PC (keq/ha/yr)**	**PC % CLo**
Canford Heath	0.571	0.0044	0.771

All emissions are insignificant and we are satisfied that emissions will not damage the SSSI.

5.4.4 Assessment of local nature sites

Conservation sites are protected in law by legislation which provides the highest level of protection for SACs and SPAs, and also for protection of protection for SSSIs. Finally, the Environment Act 1995 provides more generalised protection for flora and fauna rather than for specifically named conservation designations. It is under the Environment Act 1995 that we assess other sites (such as ancient woodlands, local wildlife sites and national and local nature reserves) 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 PC and the background levels in making an assessment of impact. In assessing the local nature sites under the Environment Act 1995 we look at the impact from the Installation alone 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 local nature 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.

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

5.5 Impact of abnormal operations

Article 50(4)(c) of the 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 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 during abnormal operation. The CO and TOC limits are the same as for normal operation, and are intended to ensure that good combustion conditions are maintained. The backstop limit for particulates is 150 mg/m^3 (as a half hourly average) which is five times the limit in normal operation.

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. In this case we have decided to set the time limit at 4 hours, which is the maximum period prescribed by Article 46(6) of the IED.

These abnormal operations are limited to no more than a period of 4 hours continuous operation and no more than 60 hours 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 x normal
- Mercury emissions are 100 x normal
- NO_x emissions of 800 mg/m^3
- Particulate emissions of 150 mg/m^3
- Metal emissions other than mercury are 5 times those of normal operation
- SO_2 emissions of 250mg/m^3
- HCl emissions of 1,200mg/m^3
- PCBs 100 x normal

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. Where the ES is based on a reference period of 24 hours, emissions are taken to be at the abnormal level for 4 hours and normal for the remaining 20 hours.

Pollutant	**ES**		**Back-ground**	**Process Contribution (PC)**		**Predicted Environmental Concentration (PEC)**	
	µg/m³		**µg/m³**	**µg/m³**	**% of EAL**	**µg/m³**	**% of EAL**
NO_2	200	99.79th %ile of 1-hour means	39.2	40.5	20.3	79.7	39.9
PM_{10}	50	90.41st %ile of 24-hour means	22.1	1.1	2.20	23.2	46.4
SO_2	266	99.9th ile of 15-min means	17.7	48.4	18.2	66.1	24.8
	350	99.73rd %ile of 1-hour means	13.2	36.1	10.31	49.3	14.1
	125	99.18th %ile of 24-hour means	7.8	2.4	1.92	10.2	8.2
HCl	750	1-hr average	0.52	173.5	23.13	174.0	23.20
HF	160	1-hr average	0.2	8.7	5.44	8.90	5.6
PCBs	6	1-hr average	$5.4x10^{-8}$	$5.2x10^{-8}$	0.000001	0.0000001	0.0000018

Pollutant	ES		Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	ng/m³		ng/m³	ng/m³	% of EAL	ng/m³	% of EAL
Hg	600	1 hour mean	5.4	289	48.17	294.40	49.067
Sb	150000	1 hour mean	-	217	0.14	-	-
Cd	30	24 hour mean (short term)	0.13	1.2	4.00	1.33	4.433
Mn	1500000	1 hour mean	5.2	217	0.01	-	-
V	1000	24 hour mean (short term)	0.85	18.1	1.81	18.95	1.90
Ni	700	1 hour mean	1.3	217	31.00	218.30	31.19

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

- PM10, HF, PCBs, Sb, Cd, Mn, V,

Also, from the table above emissions of the other substances (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^3 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 0.04 pg(WHO-TEQ/ kg-BW/day), which is 2% of the COT TDI. At this level, emissions of dioxins will still not pose a risk to human health.

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 BAT 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. They are: TOC and some metals.

- 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 GWP 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 ELV. 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-C shall be the reference for setting the permit conditions,. The BAT-C were published on 03/12/2019 and set BAT AELs for various substances mainly as daily average values which are in many cases lower than the chapter IV limits.

Operational controls complement the ELV 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 that sought to operate its installation continually at the maximum permitted limits would almost inevitably breach those limits regularly, simply by virtue of normal fluctuations in plant performance, resulting in enforcement action (including potentially prosecution, suspension or revocation) being taken. Assessments based on BAT AELs or Chapter IV limits are therefore "worst-case" scenarios.

We are 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 identified in the BREF would be considered as BAT provided the Applicant has justified it in terms of:

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

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)	• Low to medium heat values (LCV 5 – 16.5 GJ/t) • Municipal and other • heterogeneous solid wastes • Can accept a proportion of sewage sludge and/or medical waste with municipal waste • Applied at most modern • MSW installations	• 1 to 50 t/h with most projects 5 to 30 t/h. • Most industrial applications not below 2.5 or 3 t/h.	• Widely proven at large scales. • Robust • Low maintenance cost • Long operational history • Can take heterogeneous wastes without special • preparation	• Generally not suited to powders, liquids or materials that melt through the grate	TOC 0.5% to 3%	High capacity reduces specific cost per tonne of waste
Moving grate (liquid Cooled)	Same as air-cooled grates except: LCV 10 – 20 GJ/t	Same as air-cooled grates	As air-cooled grates but: • higher heat value waste is treatable • Better combustion control possible.	As air-cooled grates but: • risk of grate damage/ leaks • higher complexity	TOC 0.5% to 3%	Slightly higher capital cost than air-cooled

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Rotary Kiln	Can accept liquids and pastes as well as gases Solid feeds more limited than grate (due to refractory damage) often applied to hazardous Wastes	<16 t/h	• Very well proven • Broad range of wastes • Good burn out even of HW	Throughputs lower than grates	TOC <3 %	Higher specific cost due to reduced capacity
Fluid bed - bubbling	• Wide range of CV (5-25 MJ/kg) • Only finely divided • consistent wastes. • Limited use for raw MSW • Often applied to sludges co fired with RDF, shredded MSW, sludges, poultry manure	Up to 25 t/h	• Good mixing • Fly ashes of good leaching quality	• Careful operation required to avoid clogging bed. • Higher fly ash quantities.	TOC <1%	FGT cost may be lower. Costs of waste preparation
Fluid bed - circulating	• Wide range of CV (6-25 MJ/kg) • Only finely divided consistent wastes. • Limited use for raw MSW • Often applied to sludges co-fired with RDF, coal, wood waste	Up 70 70 t/h	• Good mixing • High steam parameters up to 500oC • Greater fuel flexibility than BFB • Fly ashes of good leaching quality	• Cyclone required to conserve bed material • Higher fly ash quantities	TOC <1%	• FGT cost may be lower. • Costs of waste preparation

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Spreader - stoker combustor	• RDF and other particle feeds • Poultry manure • Wood wastes	No information	• Simple grate construction • Less sensitive to particle size than FB	Only for well defined mono-streams	No information	No information
Gasification - fixed bed	• Mixed plastic wastes • Other similar consistent streams • Gasification less widely used/proven than incineration	Up to 20 t/h	• Low leaching residue • Good burnout if oxygen blown • Syngas available • Reduced oxidation of recyclable metals	• Limited waste feed • Not full combustion • High skill level • Tar in raw gas • Less widely proven	• Low leaching bottom ash • Good burnout with oxygen	High operating/ maintenance costs
Gasification - entrained flow	• Mixed plastic wastes • Other similar consistent streams • Not suited to untreated MSW • Gasification less widely used/proven than incineration	Up to 10 t/h	• Low leaching slag • Reduced oxidation of recyclable metals	• Limited waste feed • Not full combustion • High skill level • Less widely proven	low leaching slag	• High operation/ maintenance costs • High pre-treatment costs
Gasification - fluidised bed	• Mixed plastic wastes • Shredded MSW • Shredder residues • Sludges • Metal rich wastes • Other similar consistent streams • Gasification less widely used/proven than incineration	5 – 20 t/h	• Can use low reactor temperatures e.g. for Al recovery • Separation of main non combustibles • Can be combined with ash melting • Reduced oxidation of recyclable metals	• Limited waste size (<30cm) • Tar in raw gas • Higher UHV raw gas • Less widely proven	If combined with ash melting chamber ash is vitrified	Lower than other gasifiers

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Pyrolysis	• Pre-treated MSW • High metal inert streams • Shredder residues/plastics • Pyrolysis is less widely used/proven than incineration	~ 5 t/h (short drum) 5 – 10 t/h (medium drum)	• No oxidation of metals • No combustion energy for metals/inert • In reactor acid neutralisation possible • Syngas available	• Limited wastes • Process control and engineering critical • High skill level • Not widely proven • Need market for syngas	• Dependent on process temperature • Residue produced requires further processing and sometimes combustion	High pre-treatment, operation and capital costs

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

- Moving Grate Furnace
- Rotary Kiln
- Fluidised Bed
- Pyrolysis / Gasification

The Applicant concluded that moving grate is BAT due to it being the only proven technology for large volumes of unsorted, mixed residual household, industrial and commercial waste. As the EfW CHP Facility will not accept powdered or liquid wastes that may melt through the grate, there is no requirement to use a technique more favoured for these types of waste, such as fluidised beds.
The Applicant has proposed to use a furnace technology comprising moving grate which is identified in the tables above as being considered BAT in the BREF for this type of waste feed.

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

Boiler Design

In accordance with BAT 30 of the BAT-C and our guidance, 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 computerised fluid dynamics (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/LOI on bottom ash. We are also satisfied that the proposed boiler design will be BAT.

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) system as a whole unit. Individual units often interact, providing a primary abatement for some pollutants and an additional effect on others.

The BREF lists the general factors requiring consideration when selecting 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 BREF points to a range of technologies being BAT subject to circumstances of the Installation.

6.2.1 Particulate Matter

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

		Liquid effluent produced	plume and dew point problems.	other pollutants
Ceramic filters	High temperature applications Smaller plant.	May "blind" more than fabric filters		Small plant. High temperature gas cleaning required.
Electrostatic precipitators (ESP)	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^{o}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^3 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 we agree that the Applicant's proposed technique is BAT for the installation.

6.2.2 Oxides of Nitrogen

Oxides of Nitrogen : Primary Measures				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Low NOx burners	Reduces NOx at source		Start-up, supplementary firing.	Where auxiliary burners required.
Starved air systems	Reduce CO simultaneously.			Pyrolysis, Gasification systems.
Optimise primary and secondary air injection				All plant.
Flue Gas Recirculation (FGR)	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

Oxides of Nitrogen : Secondary Measures (BAT is to apply Primary Measures first)				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Selective catalytic reduction (SCR)	NOx emissions 40-150mg/ m^3 Reduces CO, VOC, dioxins	Expensive. Re-heat required – reduces plant efficiency		All plant
SCR by catalytic filter bags	50-120 mg/m^3			Applicable to new and existing plants with or without existing SNCR. Can be used with NH_3 as slip catalyst with SNCR

Selective non-catalytic reduction (SNCR)	NOx emissions 80 -180 mg/m^3 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 NOx release required for local environmental protection.
Reagent Type: Ammonia	Likely to be BAT	More difficult to handle Lower nitrous oxide formation Narrower temperature window		All plant
Reagent Type: Urea	Likely to be BAT	Higher N_2O emissions than ammonia, optimisation particularly important		All plant

The Applicant proposes to implement the following primary measures:

- Low NO_x burners – this technique reduces NO_x 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 is not proposed due to increased parasitic energy demand and increased levels of corrosion and maintenance costs.

There are three recognised techniques for secondary measures to reduce NO_x. 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_x levels to below 50 mg/m^3 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^3 with low investment costs. SNCR can typically reduce NO_x levels to between 80 and 180 mg/m^3, it relies on an optimum temperature of around 900 ^oC 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_x 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_2O. 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 urea as the reagent.

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

The amount of urea / ammonia used for NO_x abatement will need to be optimised to maximise NO_x reduction and minimise NH_3 slip. Improvement condition IC5 requires the Operator to report to the Environment Agency on optimising the performance of the NO_x abatement system. An ELV has been set for ammonia and the Operator is also required to monitor and report on N_2O emissions every quarter. The ammonia limit is lower than the BAT AEL as proposed by the Applicant.

6.2.3 Acid Gases, SO_x, HCl and HF

Acid gases and halogens : Primary Measures				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Low sulphur fuel, (< 0.1%S gasoil or natural gas)	Reduces SOx at source		Start-up, supplementary firing.	Where auxiliary fuel required.
Management of waste streams	Disperses sources of acid gases (e.g. PVC) through feed.	Requires closer control of waste management		All plant with heterogeneous waste feed

Acid gases and halogens : Secondary Measures (BAT is to apply Primary Measures first)				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Wet	High reaction rates Low solid residues production Reagent delivery may	Large effluent disposal and water consumption if not fully treated for re-cycle		Used for wide range of waste types Can be used as polishing

	be optimised by concentration and flow rate	Effluent treatment plant required May result in wet plume Energy required for effluent treatment and plume reheat		step after other techniques where emissions are high or variable
Dry	Low water use Higher reagent consumption to achieve emissions of other FGC techniques but may be reduced by recycling in plant Lower energy use Higher reliability Lowest visible plume potential	Higher solid residue production Reagent consumption controlled only by input rate		All plant
Semi-dry (also described as semi-wet in the Bref)	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
Direct injection into boiler	Reduced acid loading to			Generally applicable to grate

	subsequent cleaning stages. Reduced peak emissions and reduced reagent usage			and rotary kiln plants.
Direction desulphurisation	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
Reagent Type: Sodium Hydroxide	Highest removal rates Low solid waste production	Corrosive material ETP sludge for disposal		HWIs
Reagent Type: Lime	Very good removal rates Low leaching solid residue Temperature of reaction well suited to use with bag filters	Corrosive material May give greater residue volume if no in-plant recycle	Wide range of uses	MWIs, CWIs
Reagent Type: Sodium Bicarbonate	Good removal rates Easiest to handle	Efficient temperature range may be at upper end for use with bag filters	Not proven at large plant	CWIs

	Dry recycle systems proven	Leachable solid residues Bicarbonate more expensive		

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_x at source. The Applicant has justified its choice of gasoil or hydrotreated vegetable oil as the support fuel on the basis of 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 we agree 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. Any of these methods 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.

Direct boiler injection is applicable for all plants and can improve overall performance of the acid gas abatement system as well as reducing reagent usage. Whilst this may provide a higher level of abatement than dry scrubbing alone, it will increase raw material consumption and costs. As the BAT-AELs can be met with a dry scrubbing solution in isolation, and as process contributions of acid gases are screened as insignificant it is not BAT for this Installation.

In this case, the Applicant proposes to use a dry system. We are 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.

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

6.2.5 Dioxins and furans (and other POPs)

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

	Metallic mercury is also absorbed.			feed is constant and acid gas control also controls dioxin release.
Catalytic filter bags	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

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

	Can be impregnated with bromine or sulphur to enhance reactivity, for use during peak emissions.			acid gas control also controls dioxin release.
Fixed or moving bed adsorption	Mainly for mercury and other metals, as well as organic compounds			Limited applicability due to pressure drop
Boiler bromine injection	Injection during mercury peaks. 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 one or a combination of the techniques listed above. The Applicant has proposed 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.

6.3 BAT and global warming potential

This section summarises the assessment of greenhouse gas impacts which has been made in the determination of this Application. Emissions of carbon dioxide (CO_2) and other greenhouse gases differ from those of other pollutants in that,

except at gross levels, they have no localised environmental impact. Their impact is at a global level and in terms of climate change. Nonetheless, CO_2 is clearly a pollutant for IED purposes.

The principal greenhouse gas emitted is CO_2, but the plant also emits small amounts of N_2O arising from the operation of secondary NO_x abatement. N_2O has a global warming potential 310 times that of CO_2. The Applicant will therefore be required to optimise the performance of the secondary NO_x abatement system to ensure its GWP impact is minimised.

The major source of greenhouse gas emissions from the installation is however CO_2 from the combustion of waste. There will also be CO_2 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_2 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 the IED to investigate how emissions of greenhouse gases emitted from the installation might be prevented or minimised.

Factors influencing GWP and CO_2 emissions from the Installation are:
On the debit side

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

On the credit side

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

The GWP of the plant will be dominated by the emissions of carbon dioxide that will be released as a result of waste combustion. This will be 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_2O emitted.

The Applicant considered energy efficiency and BAT for the de-NOx process in its BAT assessment.

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.

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

We agree 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. We are 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 co-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 the 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 POPs should be controlled by imposing emission limits (e.g 0.1 ng/m^3 for MWIs) and using BAT for incineration. UN Economic Commission for Europe (Executive Body for the Convention) (ECE-EB) produced BAT guidance for the parties to the Convention in 2009. This document considers various control techniques and concludes that primary measures involving management of feed material by reducing halogenated substances are not technically effective. This is not surprising because halogenated wastes still need to be disposed of and because POPs can be generated from relatively low concentrations of halogens. In summary, the successful control techniques for waste incinerators listed in the ECE-EB BAT are:

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

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

We believe that the Permit ensures that the formation and release of POPs will be prevented or minimised. As we explain above, high-temperature incineration is one of the prescribed methods for destroying POPs. Permit conditions are based on the use of BAT and Chapter IV of the 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 International Toxic Equivalence (I-TEQ) limit of 0.1 ng/m^3. Further development of the understanding of the harm caused by dioxins has resulted in the World Health Organisation (WHO) producing updated factors to calculate the WHO-TEQ value. Certain **PCBs** have structures which make them behave like dioxins (dioxin-like PCBs), and these also have toxic equivalence factors defined by the 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 the 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 of this document details the assessment of emissions to air, which includes dioxins and concludes that there will be no adverse effect on human health from either normal or abnormal operation.

Hexachlorobenzene (HCB) is released into the atmosphere as an accidental product from the combustion of coal, waste incineration and certain metal processes. It has also been used as a fungicide, especially for seed treatment although this use has been banned in the UK since 1975. Natural fires and volcanoes may serve as natural sources. Releases of (HCB) are addressed by the European Environment Agency (EEA), which advises that:

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

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

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

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

6.5 Other Emissions to the Environment

6.5.1 Emissions to water

Uncontaminated surface water run-off will be emitted to Knighton Stream.

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

Normally there will be no discharges to sewer, with process effluents routed to the process water system for re-use within the bottom ash quench. There could be intermittent discharge to sewer during on-line maintenance of the water treatment plant if filter backwash and effluents from regeneration of the ion exchange unit cannot be routed to the process water system due to this system operating at capacity. In this scenario, these effluents will be routed to a neutralisation tank prior to being discharged to foul sewer under a trade effluent discharge consent.
Based upon the information in the Application we are satisfied that appropriate measures will be in place to prevent and /or minimise 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 under Article 46(5) of the IED must be arranged.
Key measures as set out in the Application are listed below:

- Waste stored in concrete bunker with impermeable surface inside building
- Tanks located in bunds
- Impermeable site surfacing - concrete hardstanding with sealed joints
- Sealed surface water drainage system
- Management system will be certified to ISO14001 and will include preventative maintenance measures and an accident management plan
- Spill kits and training will be provided to site operators so that any spillages can be cleaned up as soon as they are identified
- Lime, activated carbon and APC residues stored in silos fitted with filters
- Bottom ash stored and handled in a building
  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, including the Applicant's odour management plan (OMP) 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 or within containers and bulk storage of waste will only occur in the installation's waste bunker. 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 to prevent odours and airborne particulates from leaving the facility building.
During shut-down the Applicant had proposed to extract air via an alternative system comprising of dust and carbon filter. Prior to a planned shutdown waste receipt will be reduced to lower the level of waste stored within the bunker to a minimum and waste will continue to be received at a reduced capacity for the duration of the outage. Waste inputs will also be reduced to a minimal level if an un-planned shut down occurs that lasts longer than 2 days.

6.5.5 Noise and vibration

The following measures were described in the Application to minimise noise impacts:

- waste acceptance will be limited to the period between 07.00 and 20.00
- Engines will be required to be switched off when not in use
- On-site mobile plant will be fitted with non-tonal reversing alarms
- Site speed limit of 10 mph will be enforced
- Road surfaces within the installation boundary will be maintained in a good state of repair
- Reversing of waste delivery vehicles will only take place in the enclosed tipping hall
- Where possible, noise generating equipment will be installed within a building or, where that is not possible, will be housed in suitable enclosures to provide additional attenuation. The ACC will be surrounded by cladding that achieves a weighted sound reduction index (Rw) of 24 dB on four sides
- inspection and maintenance plan
- Closing doors of enclosed areas where possible
- All silencers/mufflers are to be inspected to ensure they are in good repair and are correctly fitted
- If identified as a requirement during detailed design to meet the BS 4142 adverse impact descriptors as summarised in the Environment Agency's Noise and vibration management: environmental permits guidance, the EPC Contractor will be required to include provision for low-noise compressors, pumps and fans as part of its design.
- The Exhaust Steam pipe between the turbine hall (ID09) and the air-cooled condenser (ID10) will be treated acoustically to achieve at least 10 dB(A) in mitigation.

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.

At the worst impacted receptors the assessment showed:

- Rating level during daytime 1dB below background
- Rating level during night-time 11dB above background

According to BS 4142, a difference between the rating level and background sound level of around +10 dB or more is likely to be indication of a specific sound source having a significant adverse impact. BS 4142 goes on to indicate that the impact derived by the comparison of the Rating Level with background sound level is however dependent on the context of the sound environment at an assessment location. The Applicant's assessment showed that background levels are very low (24 dB) at the most impacted receptor and the actual rating level is also very low at 35 dB. The Applicant concluded low impact when taking the context of very low background levels into account.

We audited the Applicants assessment and we generally agree with the Applicant on context, particularly with respect to the consideration of absolute sound levels. BS 4142 mentions 'Where background sound 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.' Although we found higher rating levels than the Applicant, the predicted levels are still low and are consistently lower than residual levels during both day and night-time periods. Additionally, only a small number of residential receptors are identified as having the potential to be adversely or significant adversely affected, these are located to the north-west of the site and this result is primarily driven by the low background sound levels in this area. We agree that the predicted numerical significant adverse impacts from the development need to be considered in context and can be considered to be lower than initially predicted, but consider that sound emissions from the site may still be perceptible during certain time periods. When considered in context we are satisfied that there will not be significant pollution.

We are satisfied that the measures proposed by the Applicant are BAT but given that the detailed design of the plant has not been completed, we have set pre-operational conditions PO9 and PO10 to ensure this is the case.

6.6 Setting ELVs and other Permit conditions

6.6.1 Translating BAT into Permit conditions

Article 14(3) of the IED states that BAT-C 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 BAT as laid down in the decisions on BAT-C.

BAT-C for waste incineration or co-incineration were published on 03/12/2019

The use of BAT AELs and 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 BAT AELs and Chapter IV limits.

Below we consider whether, for those emissions 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 (EQS) (Article 18).

(i) Local factors

An ammonia ELV of 5 mg/m^3 was set. As proposed by the Applicant this is lower than the BAT AEL of 10 mg/m^3, to minimise impacts on ecological sites.

(ii) National and European ESs

No different conditions were required.

(iii) Global Warming

CO_2 is an inevitable product of the combustion of waste. The amount of CO_2 emitted will be essentially determined by the quantity and characteristics of waste being incinerated, which are already subject to conditions in the Permit. It is therefore inappropriate to set an ELV for CO_2, 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 the IED, which lists the main polluting substances that are to be considered when setting ELVs in permits.

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

(iv) Commissioning

Pre-operational condition PO4 requires a commissioning plan to be 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 ELVs 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 the 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 our guidance 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 2.3.10 of the permit requires that the abnormal operating conditions apply.

6.7.3 Continuous emissions monitoring for dioxins and heavy metals

The BAT-C 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.

6.8 Reporting

We have specified the reporting requirements in Schedule 4 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 us to ensure compliance with the 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 assimilated and national law.

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 Environmental Statement (ES) submitted with the planning application (which also formed part of the Environmental Permit Application).

From consideration of the ES, the Environment Agency considers that no additional or different conditions are necessary.

We have complied with our obligation under Article 9(2) so far as we are able in that no conclusion has yet been arrived at. From consideration of the

Environmental Statement we are satisfied that no additional or different permit 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 is being 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 draft decision in this case has been reached following a programme of extended public consultation, both on the original application and later, separately, on the draft permit and a draft decision document. 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)

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.

(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 (General Environmental Duties)

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 or urban area or on any such flora, fauna, features, buildings, sites or objects.

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.

(viii) 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.

We have had regard to the National Air Pollution Control Programme (set under the National Emissions Ceiling Regulations 2018) 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 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 statutory guidance issued by the Department of Business, Energy and Industrial Strategy in March 2017 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 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. It also ensures that any pollution that may arise from the regulated facility does not adversely affect local businesses.

7.2.3 **Legislative and Regulatory Reform Act 2006**

In accordance with section 21 of this Act, when making this decision we have had regard to the need to be transparent, accountable, proportionate and consistent, and the need to target action where it is needed.

In accordance with section 22 of the Act we have had regard to the Regulators’ Code; in particular the need to base our decision on environmental risk, and to support the applicant to comply and grow, so that burdens have only been imposed where they are necessary and proportionate.

7.2.4 **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.

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

Section 85 of this Act imposes a duty on Environment Agency to seek to further 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.

7.2.6 **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. This was recorded on a CROW Appendix 4 form

The Wildlife and Countryside Act (CRoW) assessment is summarised in greater detail in section 5.4 of this document. A copy of the full Appendix 4 Assessment can be found on the public register.

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

Section 40 of the Natural Environment and Rural Communities Act 2006 has been amended with effect from 1 January 2023 to require consideration as to what action we can properly take, consistently with the proper exercise of our functions, to further the general biodiversity objective, which is to further the conservation and enhancement of biodiversity and having considered, determined such policies and specific objectives as we consider appropriate for taking action to further the general biodiversity objective, and take such action as we consider appropriate, in the light of those policies and objectives, to further that objective.
Section 40(2A) states that in complying with the duty in section 40(1) and (1A) we must have particular regard to any relevant local nature recovery strategy and species protection strategy or protected sites strategy
We have, also, considered the general biodiversity objective when carrying out our permit application determination and, consider that no different or additional conditions are required in the permit.

7.2.8 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.

7.2.9 **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 further 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.

7.2.12 Environment Act 2021

Section 110(10) requires that we must have regard to a protected site's strategy, which Natural England has prepared and published in relation to improving the conservation and management of a protected site, and managing the impact of plans, projects or other activities (wherever undertaken) on the conservation and management of the protected site, where relevant to exercise of our duties under Conservation of Habitats and Species Regulations 2017, sections 28G to 28I Wildlife and Countryside Act 1981 or Marine and Coastal Access Act 2009.

We have had regard to this in our assessments.

7.3 National secondary legislation

7.3.1 Conservation of Habitats and Species Regulations 2017

We have assessed the Application in accordance with our guidance and concluded that there will be no likely significant effects on any European Site.

We consulted Natural England on the appropriate assessment, and they agreed with our conclusion, that the operation of the Installation would not have adverse effects on the interest features of European sites.

The Habitats Regulations Assessment is summarised in greater detail in section 5.4 of this document. A copy of the Habitats Regulations Assessment can be found on the public register.

We have also considered our general duties under Regulation 9(3) to have regard to the requirements of the Habitats Directive in the exercise of our powers and under Regulation 10 in relation to wild bird habitat to take such steps in the exercise of their functions as they consider appropriate so far as lies within our powers to secure preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds.

We considered whether we should impose any additional or different requirements in the permit in terms of these duties but concluded that we should not.

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, amongst other things, 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.

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.

7.3.4 **Bathing Water Regulations 2013**

We have considered our duty, under regulation 5 of these Regulations, to exercise our relevant functions to ensure compliance with the Bathing Water Directive, and in particular to take realistic and proportionate measures with a view to increasing the number of bathing waters classified as "good" or "excellent".

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

7.4 Other relevant legal requirements

7.4.1 Duty to Involve

Section 23 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. Section 24 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 RGN6.

Annexes

Annex 1A: Application of chapter IV of the Industrial Emissions Directive

IED Article	Requirement	Delivered by
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) 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), S3.3 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 2.3.12 and 2.3.13.
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

IED Article	Requirement	Delivered by
45(2)(b)	The permit shall include the minimum and maximum mass flows of those hazardous waste, their lowest and maximum calorific values and the maximum contents of polychlorinated biphenyls, pentachlorophenol, chlorine, fluorine, sulphur, heavy metals and other polluting substances.	Not Applicable
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 2.3.1and 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.
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.	Conditions 2.3.12 and 2.3.13

IED Article	Requirement	Delivered by
	Limits on dust (150 mg/m3), CO and TOC not to be exceeded during this period.	
47	In the event of breakdown, reduce or close down operations as soon as practicable. Limits on dust (150 mg/m3), CO and TOC not to be exceeded during this period.	condition 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). 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 S3.4
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 PO7
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, 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)
50(1)	Slag and bottom ash to have Total Organic Carbon (TOC) < 3% or loss on ignition (LOI) < 5%.	Conditions 3.1.2, 3.1.3, 3.6.1 and Table S3.5
50(2)	Flue gas to be raised to a temperature of 850ºC for two seconds, as measured at representative point of the combustion chamber.	Condition 2.3.9, Pre-operational condition PO5 and Improvement

IED Article	Requirement	Delivered by
		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 liquefied gas or natural gas.	Condition 2.3.14
50(4)(a)	Automatic shut-down to prevent waste feed if at start up until the specified temperature has been reached.	Condition 2.3.9
50(4)(b)	Automatic shut-down to prevent waste feed if the combustion temperature is not maintained.	Condition 2.3.9
50(4)(c)	Automatic shut-down to prevent waste feed if the CEMs show that ELVs are exceeded due to disturbances or failure of waste cleaning devices.	Condition 2.3.9 and 2.3.13
50(5)	Any heat generated from the process shall be recovered as far as practicable.	See section 4.3.7 for discussion and permit conditions that deliver this.
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 me.	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	No such conditions Have been allowed

IED Article	Requirement	Delivered by
	for CO and TOC set out in Part 3 of Annex VI.	
52(1)	Take all necessary precautions concerning delivery and reception of Wastes, to prevent or minimise pollution.	Conditions 2.3.1, 2.3.3, 2.3.4, 2.3.5 and 2.3.7
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 3 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 S3.5
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 S3.5 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 4.2.2 and 4.2.3.

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 S3.4
3	Monitor key process parameters	Condition 3.6.1 and table S3.4
4	Monitoring emissions to air	Condition 3.6.1 and table S3.1
5	Monitoring emissions to air during OTNOC	Condition 1.1.1 and pre-operational condition PO1
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 S3.5
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 PO1
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 PO1.
12	Reception, handling and storage of waste	Measures are described in the Application and FPP. Permit conditions 2.3.1, table S1.2 and 3.8.1.
13	Storage and handling of clinical waste	Not applicable

BAT conclusion	Criteria	Delivered by
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, 3.6.1 and table S3.5
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
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, 3.3.1, 3.3.2, 3.3.3. 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, IBA will not be treated the Installation
24	Techniques to prevent or reduce diffuse emissions to air from treatment of slags and ashes	Not applicable, IBA will not be treated the Installation

BAT conclusion	Criteria	Delivered by
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, IBA will not be treated the Installation
27	Techniques to reduce emissions of HCl, HF and SO_2	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_2, 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_2, N_2O, CO and NH_3 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 or 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, 3.1.1 and 3.1.2 and table S3.1

BAT conclusion	Criteria	Delivered by
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
35	Handle and treat bottom ashes separately from FGC residues	Permit condition 2.3.15
36	Techniques for treatment of slags and bottom ashes	Not applicable, IBA will not be treated the Installation
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 on the Application, we consider that we do need to impose pre-operational conditions. These conditions are set out in the Permit 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.

Annex 3: Improvement Conditions

Based in the information in the Application we consider that we need to set improvement conditions. These conditions are set out in the Permit - 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.

Annex 4: Consultation Reponses

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 consultation responses have been placed on the Environment Agency public register.

The Application was advertised on the Environment Agency website from 13/09/24 to 27/10/24 and in the Bournemouth Echo on 13/09/24. The Application was made available to view on the Environment Public Register and on our citizen space webpage.

The following statutory and non-statutory bodies were consulted:

- Bournemouth, Christchurch and Poole Council
- Local fire service
- Director of public health
- UK HSA
- Health and Safety Executive
- Food Standards Agency
- Sewerage Authority
- National Grid
- Civil Aviation Authority
- Bournemouth Airport
- National air traffic services (NATS)

1) Consultation Responses from Statutory and Non-Statutory Bodies

Response Received from: **Bournemouth, Christchurch and Poole Council**	
Brief summary of issues raised:	**Summary of action taken / how this has been covered**
The site condition report (SCR) needs updating to ensure that baseline conditions at the site are adequately characterised and to ensure that the preliminary risk assessment is appropriate for all relevant receptors.	The risk assessment aspect is not part of our remit because this would relate to impacts during construction. We agree with the council that the baseline has not been fully established and we have set a pre-operational condition to address this. See section 4.2.2 of this decision document for further details.

Response Received from the UKHSA

Brief summary of issues raised:	Summary of action taken / how this has been covered
The applicant has provided suitable modelling to assess the possible impact to human health from inhalation. As a matter of course, however, the EA should ensure that they are satisfied with the modelling output from assessed dioxins and furans emissions to residential receptors.	We have audited the modelling and are satisfied.
No significant concerns about this installation and impact to public health.	No action required

Response Received from Bournemouth, Christchurch and Poole Council	
Brief summary of issues raised:	**Summary of action taken / how this has been covered**
An odour control plan should be required as part the permit	The Permit requires the Installation to be operated in line with the odour control measures that were set out in the Application including an odour management plan.
Concern over nigh-time noise. A noise impact assessment in the planning application showed a 9dB difference between the background and rating noise levels, indicating an adverse impact is likely to occur.	We have audited the noise assessment. Our detailed consideration of noise is in section 6.5.5 of this decision document.

Response Received from Wessex Water	
Brief summary of issues raised:	**Summary of action taken / how this has been covered**
No objections to the proposed surface water drainage strategy with surface water being emitted into Knighton Stream. Stated that the site itself is not located within a source protection (SPZ) but it is on the edge of an SPZ 3 into which the stream discharges.	1.1km from SPZ3, only uncontaminated surface water run-off emitted.

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 MP, Assembly Member (AM), Councillors and Parish / Town / Community Councils

Representations were received from Ferndown Town Council who raised the following issues.

Brief summary of issues raised:	Summary of action taken / how this has been covered
Comments about air emissions and air risk assessment	
Concern over the impacts from: • Particulate matter	We have assessed the impacts from particulates and we are satisfied that there will not be any significant impacts. See section 5.2 including section 5.2.2 (consideration of key pollutants) of this decision document for further details on how we considered it.
Concern about impacts at receptors including the Bournemouth AFC training ground.	We are satisfied that there will not be a significant impact from emissions to air when based on the worst impacted receptors that represent the worst case predictions. Impacts at other individual receptors will be lower than the maximum and we are satisfied there will not be an unacceptable impact at any receptor. Section 5.2 of this decision document has further details.
Comments about health impacts	
Concern was expressed that there will be an impact on health due to the Installation.	We are satisfied that there will not be a significant impact on health due to the Installation. Section 5.3 of this decision describes in detail how we have considered this.
Concern over impacts on agriculture.	The Applicant's health risk assessment included consideration of accumulation in the food chain. Section 5.3 of this decision document explains how we assessed this. We are satisfied that impacts will not be significant.
Comments about impacts at ecological sites	
Concern over the impact at habitat sites, SSSIs and other ecological sites.	Our assessment at ecological sites is described in detail in section 5.4 of this decision document. We are satisfied that there will not be a significant impact. We consulted Natural England who agreed with our conclusion.

Comments about BAT, emission limits and control measures	
Concern over reliability of the plant and 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 and check it is being complied with. The technology proposed by the Applicant is tried and tested.
Comments about other issues	
Alternative technologies to incineration should be used.	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 of the BAT appraisal. Alternative incineration techniques, such as gasification/pyrolysis, are not commercially available at the scale required for this Installation.
Some waste types could be recycled or recovered.	This is primarily outside the scope of this determination. Recycling initiatives are a matter for the local authority. The Permit (conditions 2.3.5 and 2.3.6) restrict the receipt of wastes that have been separately collected for recycling.
Concern that the stack could affect aircraft routes.	The issue of stack height and aircraft is primarily a planning issue. We consulted with the Civil Aviation Authority, Bournemouth Airport and National air traffic services (NATS). No concerns were raised by any of these bodies.

b) Representations from Community and Other Organisations

Representations were received from Magwatch (resident group) and Poole & Purbeck Group of Dorset, a number of these issues are the same as those raised by Ferndown Town Council. Of the additional issues raised.

Brief summary of issues raised:	Summary of action taken / how this has been covered
Comments about air emissions and air risk assessment	
Concern over how the air dispersion modelling was carried out including: • Background pollution levels are not representative	We audited the Applicant's dispersion modelling. As part of the audit, we checked that the modelling parameters, weather data and background levels used by the Applicant were appropriate and we are satisfied that they were. Based on the Applicant's

	modelling we are satisfied that there will not be a significant impact in air quality. Further information is in section 5.2 of this decision document.
Comments about other impacts	
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.
Carbon capture should be used or plant should be carbon capture ready.	There is currently no legal requirement by for incineration plants to have carbon capture or be carbon capture ready. This is likely to change, in the near future, following a government consultation on decarbonisation readiness legislation for combustion plants (including energy from waste plants). If required any relevant requirements will be applied at that time.

c) Representations from Individual Members of the Public

157 responses were received from individual members of the public. Many of the issues raised were the same as those considered above. Only those issues additional to those already considered are listed below:

Brief summary of issues raised:	Summary of action taken / how this has been covered
Comments about air emissions and air risk assessment	
Concern over how the air dispersion modelling was carried out including: • The weather data that was used including local weather conditions and temperature inversions	We audited the Applicant's dispersion modelling. As part of the audit, we checked that the weather data used by the Applicant was appropriate and we are satisfied that it was. Based on the Applicant's modelling, and our review of it, we are satisfied that there will not be a significant impact in air quality. Further information is in section 5.2 of this decision document.
Claim that background levels exceed ES at some receptors.	We audited the Applicant's dispersion modelling. As part of the audit, we checked that the background levels used by the Applicant were appropriate and we are satisfied that there were. Based on the Applicant's modelling we are satisfied that there will not be a significant impact on air quality. Our view is that background levels do not exceed the ES at receptors. Further information is in section 5.2 of this decision document.

Concern that impacts at all receptors were not considered, including: • Schools • Nurseries • Other residential areas • Bournemouth hospital • Care homes	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 and we are satisfied there will not be an unacceptable impact at any receptor. Section 5.2 of this decision document has further details.
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 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. 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.
Concern over the impacts from: • Oxides of nitrogen • Acid gases • Particulate matter • Metals • Volatile organic compounds • PCBs • PAH • Carbon monoxide	We have assessed the impacts from these pollutants and we are satisfied that there will not be any significant impacts. See section 5.2 including section 5.2.2 (consideration of key pollutants) of this decision document for further details.
Concern over the impact from very fine particulate matter such as PM2.5, PM1 and smaller.	These issues are covered in section 5.3 of this decision document. We are satisfied that there will not be a significant impact from very fine particles.
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 that smoke will be emitted.	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 abatement failure.	The EMS will include a preventative maintenance scheme so that equipment is serviced and replaced before it breaks down. The permit sets limits on how long the plant can operate during abatement failure (abnormal operation). Section 5.5 of this decision document has more details including details of the risk assessment that shows there will not be a significant impact during abnormal operation. If an emission limit is exceeded at other times then the plant must stop feeding waste immediately.
In-combination effects from other facilities have not been considered including planned incinerators at Portland and West Parley.	The air quality assessment considered existing background pollution levels which includes emissions from existing sources. The proposed incinerator at Portland is approximately 40 km from this Installation so there is no potential for cumulative impacts. The Applicant considered impacts from nearby sites that are not yet operating in their dispersion model. We are satisfied that an ES will not be exceeded The West Parley site has planning permission for a 60,000 tonnes per year plant and is approximately 6.5 km from the Installation but has not yet applied for an EPR permit and so was not required to be considered for in-combination impacts. If we receive a permit application we would check if there would be any in-combination impacts at that point as part of the assessment of whether a permit could be granted for the West Parley site.
Concern that emissions to air will contaminate soil and water.	Soil and water will not become contaminated. This is evidenced by the health risk assessment that showed insignificant impact on the food chain and also the air quality

	assessment that showed ES will not be exceeded.
Concern over impacts at new housing areas.	As well as impacts at discreet receptors, 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 air quality standards used in the impact assessment.	The standards used (ES) are the most up to date standards used in the UK. They are based on various pieces of legislation. A full description of what they are based on is in section 5.1.2 of this decision document
Comments about health impacts	
Concern was expressed that there will be an impact on health due to the Installation including: • those with existing health conditions • young people • elderly • people undertaking sports • effect on fertility • unborn babies	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.
Concern over impacts from dioxins/furans including accumulation the food chain and via breast milk.	The Applicant's health risk assessment included consideration of accumulation in the food chain, including breast milk. 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.
Tolerable weekly intake should be used instead of tolerable daily intake for the dioxin/furan assessment.	The advice from the UKHSA, based on recommendation from the COT, is to use the tolerable daily intake for the assessments.
Concern that metals will accumulate in the food chain.	The impacts of metals were compared to the ES which is considered to be protective for human health impacts.
There will be an impact from mercury through consuming fish from nearby fish farms.	The impacts of mercury were compared to the ES which is considered to be protective for human 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 may be required. However there are no commercial fisheries around the Installation. Therefore specific consideration of accumulation is not

	required in this case. We are satisfied that impacts from mercury will not be significant.
Concern over how the HHRA was carried out including the parameters used.	We audited the Applicant's HHRA which included checking the key parameters and carrying out sensitivity checks. We are satisfied that the HHRA was carried out correctly and that there is no significant risk to health.
Comments about noise impacts	
Concern over noise from reversing alarms.	Non tonal reversing alarms will be used to minimise the impacts.
Concern over noise impacts	We are satisfied that there will not be a significant impact from noise due to measures that will be used Our assessment of noise is considered in detail in section 6.5.5 of this decision document.
Comments about odour impacts	
Concern over the impact from odour.	We are satisfied that there will not be a significant impact from odour due to measures that will be used. This is described in section 6.5.4 of this decision document.
Comments about impacts at ecological sites	
Concern over the impact on ecological receptors.	See section 5.4 for detailed discussion on ecological impacts.
Comments about other impacts	
Concern over the emissions of nitrous oxide (N_2O) and the impact on global warming.	Our assessment of global warming is covered in sections 6.3 and 6.6 of this decision document. Improvement condition IC5 requires the SNCR system to be optimised which will minimise N_2O emissions.
Concern over emissions to water.	The only water emission allowed under the Permit will be clean surface water run off that will be emitted to Knighton Stream. We are satisfied that this will not cause pollution. Measures will be in place to prevent fugitive emissions to water, these measures are described in section 6.5.3 of this decision document.
Concern over emissions to sewer.	Water will be re-used at the site, there will be an occasional discharge to sewer from the boiler water treatment plant. We are satisfied that this occasional discharge will not be significant. It can only be discharged with the consent of the sewerage undertaker See section 6.5.2 for further details.
Concerns about flies and pests	Pests are not usually an issue at incineration plants because the waste is only stored for a short period of time. The waste reception and storage area, and all incoming waste handling activities will be undertaken within a fully enclosed building. The Applicant has set out good housekeeping practices in the

	Application to prevent and minimise the risk of pests and vermin. Conditions 3.7.1 and 3.7.2 will provide controls through the permit.
Concern over how residues will be handled and disposed of.	Measures will be in place to ensure bottom ash, fly ash and APC residues will not be released as fugitive emissions to air, water or land. Section 6.5.3 of this decision document describes those measures. Recovery or disposal of residues will be carried out off site and will be controlled by the permits for those sites.
Damage costs should be considered.	In general terms the environmental damage costs would be relevant to the formulation of strategic decisions as a way of approximating impacts. They can also be relevant to comparing the costs of different technologies in terms of BAT assessment. However, they are not a replacement for a detailed assessment of environmental impact based on detailed air quality modelling. We have based our decision on such an assessment and are satisfied that there will not a significant environmental impact, as set out in section 5 of this decision document.
Concern that drinking water will become contaminated.	Measures will be in place to prevent accidental releases or fugitive emissions to land and water. Our view is that there is not a risk of drinking water contamination.
Comments about BAT, emission limits and control measures	
Concern that BAT is not being used including: • Furnace type • Abatement techniques	Our view is that the furnace type and abatement systems proposed by the Applicant are BAT. This is explained in detail in section 6 of this decision document.
Comments about monitoring	
Concern that the Operator will carry out their own monitoring.	The Environment Agency used to carry out check-monitoring when there were relatively few standards for monitoring. Check monitoring is no longer routinely undertaken because of increased standards for monitoring that provide assurance that the results are reliable. There is now a wide variety of standards for monitoring, covering CEMs, periodic monitoring, and quality assurance. We have MCERTS for CEMs and test labs. We have EN 14181 for quality assurance of CEMs. We require CEMs and test labs to be accredited to MCERTS and all the applicable standards. We carry out audits of operators' provisions for monitoring. However, we still do check monitoring where it is considered appropriate.

	Furthermore, as well as auditing operators' provisions for monitoring, and how they apply the monitoring requirements of the permit, we also regularly audit test laboratories.
Comments about accident prevention	
Comments submitted expressing concern over fire risk.	The Applicant submitted a Fire Prevention Plan. We have approved this plan and incorporated this within operating techniques table S1.2 meaning that the site has to follow such requirements. 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.
Concern over risk from methane from nearby landfill site.	The Installation is located near to an historic closed landfill. We are not aware of any landfill gas migration issues around the Installation area. We do not consider there is any risk to the incinerator from the landfill.
Comments about waste types	
Concern over the types of waste and where they come from.	The Operator will have waste pre-acceptance and waste acceptance procedures to ensure that only waste authorised by the Permit is received and burned. The Permit does not control where the waste comes from because that falls outside the scope of this permit determination. 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.
Issues on specific waste types were raised including: • Radioactive waste • Smoke alarms • Batteries • Infectious waste • Hazardous waste	The Permit will not allow these waste types to be burned. It is possible that the waste received could contain some of these waste types, for example smoke alarms (containing small radioactive sources) or batteries could be placed in household bins and received at the incinerator under the municipal waste code. However if this did happen quantities are likely to be small and not pose a significant risk.
Comments about regulation	
Concern over how the Environment Agency will regulate the site.	We will regulate the site carrying out a continual assessment of plant operations and its environmental performance. This will include:

	The operator must monitor emissions and report the results to us. 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. We will carry out on-site audits of operator monitoring. 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. The operator's monitoring results will be placed on the public registers. If we find that the Operator has failed to comply with the Permit in any way then we will take appropriate action in accordance with our enforcement and sanctions policy.
Concern over how complaints or concerns will be dealt with.	If we receive any concerns or complaints we will assess, investigate it and if required take enforcement action.
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.
Comments about other issues	
Concern over flooding.	Flooding is primarily an issue for the planning process. When making permitting decisions, flood risk is still a relevant consideration, but generally only in so far as it is taken into account in the accident management plan and that appropriate measures are in place to prevent pollution in the event of a credible flooding incident. We are satisfied that appropriate measures will be in place.
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.
The consultation was not adequate.	We are satisfied that we took appropriate steps to inform people about the Application and how they could comment on it. How we did this is described in section 2 of this decision document.
Concern over the impact of a visible plume and light pollution	Pollution from light or plumes are primarily a concern for considering visual impacts and as such generally covered by the planning process. In any event light is not likely to be in issue, with the Permit requiring energy to be used efficiently. Visible plumes are not likely to occur frequently. Light and visible plumes are not likely to have a significant effect on health or the environment.

Concern over burning wastes containing PFAS and PFOS.	Per- and polyfluoroalkyl substances (PFAS) and perfluoroalkyl sulfonic acids (PFSA) contamination is a growing global concern due to their persistence and potential long-term impacts on ecosystems and human health. The principle source of waste which is currently known to contain PFAS in high concentrations is waste firefighting foams and those wastes require high temperature incineration (at least 1,100^{o}C). This Installation is not permitted to burn firefighting foams. We are not aware of any evidence that municipal waste incinerators are a significant source.
Concern over human rights being breached.	We do not consider this to be the case. Section 7.2.4 has details of this.

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

Brief summary of issues raised:	Environment Agency comment
View expressed that this is not the right location for the Installation.	Decisions over land use are matters for the planning system. The location of the installation is a relevant consideration for Environmental Permitting, but only in so far as its potential to have an adverse environmental impact on communities or sensitive environmental receptors. The environmental impact is assessed as part of the determination process and has been reported upon in the main body of this document. The location of the installation can have an impact on the ability to recover waste heat for use in nearby residential, commercial or industrial premises and we commented on this in our consultation response to the local planning authority.
Comments about vehicle access to the installation and traffic movements on local roads.	These are relevant considerations for the grant of planning permission, but do not form part of the Environmental Permit decision making process except where there are established high background concentrations contributing to poor air quality and the

	increased level of traffic might be significant in these limited circumstances. That is not the case here.
Generating electricity by incineration produces more carbon dioxide than burning coal.	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.