

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

Decision document recording our decision-making process

The application number is: PAN-000045
The permit number is: EPR/BU2489IT
The variation number is: EPR/BU2489IT/V009
The applicant / operator is: Intertissue Limited
The installation is located at: Intertissue Neath
Brunel Way
Baglan Energy Park
Briton Ferry
Neath
SA11 2HZ

What this document is about

This is a decision document, which accompanies the consolidated permit and variation and consolidation notice.

It explains how we have considered the applicant's application, and why we have included the specific conditions in the consolidated permit we have issued to the applicant (hereafter referred to as the operator). 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 operator's proposals.

Preliminary information and use of terms

We gave the application the reference number PAN-000045. We refer to the application as "the **application**" in this document in order to be consistent.

The number we have given to the permit is EPR/BU2489IT. We refer to the permit as "the **permit**" in this document.

The application was duly made on 14th December 2015.

The applicant is Intertissue Limited. We refer to Intertissue Limited as “the **applicant**” in this document. Where we are talking about what would happen after the variation is issued, we call Intertissue Limited “the **operator**”.

Intertissue Limited’s facility is located at Intertissue Neath, Brunel Way, Baglan Energy Park, Briton Ferry, Neath, SA11 2HZ. We refer to this as “the **installation**” in this document.

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Glossary of acronyms used in this document

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

APC	Air Pollution Control
BAT	Best Available Technique(s)
BAT-AEL	BAT Associated Emission Level
BREF	BAT Reference Note
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
CW	Clinical waste
CWI	Clinical waste incinerator
DAA	Directly associated activity – Additional activities necessary to be carried out to allow the principal activity to be carried out
DD	Decision document
EAL	Environmental assessment level
ELV	Emission limit value
EMAS	EU Eco Management and Audit Scheme
EMS	Environmental Management System
EPR	Environmental Permitting (England and Wales) Regulations 2010 (SI 2010 No. 675) as amended
EQS	Environmental quality standard
EU-EQS	European Union Environmental Quality Standard
EWG	European waste catalogue
FSA	Food Standards Agency
GWP	Global Warming Potential
HHRAP	Human Health Risk Assessment Protocol
HRA	Human Rights Act 1998
HW	Hazardous waste
HWI	Hazardous waste incinerator

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
LHB	Local Health Board
LOI	Loss on Ignition
MBT	Mechanical biological treatment
MSW	Municipal Solid Waste
MWI	Municipal waste incinerator
NO _x	Oxides of nitrogen (NO plus NO ₂ expressed as NO ₂)
Opra	Operator Performance Risk Appraisal
PAH	Polycyclic aromatic hydrocarbons
PC	Process Contribution
PCB	Polychlorinated biphenyls
PCT	Primary Care Trust
PEC	Predicted Environmental Concentration
PHW	Public Health Wales
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
RGS	Regulatory Guidance Series
SAC	Special Area of Conservation
SED	Solvent Emissions Directive (1999/13/EC) – now superseded by IED
SCR	Selective catalytic reduction
SGN	Sector guidance note
SHPI(s)	Site(s) of High Public Interest

SNCR	Selective non-catalytic reduction
SPA(s)	Special Protection Area(s)
SS	Sewage sludge
SSSI(s)	Site(s) of Special Scientific Interest
SWMA	Specified waste management activity
SWCP	Small Waste Co-incineration Plant
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
WHO	World Health Organisation
WID	Waste Incineration Directive (2000/76/EC) – now superseded by IED

1 Our decision

We have decided to issue the variation to the applicant. This will allow it to operate the installation, subject to the conditions in the consolidated 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 consolidated permit contains many conditions taken from our standard Environmental Permit template including the relevant Annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the consolidated permit, we have considered the application and accepted the details are sufficient and satisfactory to make the standard condition appropriate.

2 How we reached our decision

2.1 Receipt of Application

The application was duly made on 14th December 2015. This means we considered it was in the correct form and contained sufficient information for us to begin our determination.

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

2.2 Consultation on the Application

We carried out consultation on the application in accordance with the EPR, our statutory PPS and our Regulatory Guidance Note RGN6 for Determinations involving Sites of High Public Interest. We consider that this process satisfies the requirements of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, which are directly incorporated into the IED, which applies to the installation and the application. We have also taken into account our obligations under the Local Democracy, Economic Development and Construction Act 2009 (particularly Section 23). This requires us, where we consider it appropriate, to take such steps as we consider appropriate to secure the involvement of representatives of interested persons in the exercise of our functions, by providing them with information, consulting them or involving them in any other way. In this case, our consultation already satisfies the Act's requirements.

We advertised the application by a notice placed on our website, which contained all the information required by the IED, including telling people where and when they could see a copy of the application.

We placed a copy of the application and all other documents relevant to our determination (see below) on our electronic 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":

- Neath Port Talbot County Borough Council (Environmental Protection Department)
- Neath Port Talbot County Borough Council (Planning Department)
- Abertawe Bro Morgannwg University Health Board
- Food Standards Agency
- Public Health Wales
- Mid and West Wales Fire and Rescue Service

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

Further details along with a summary of consultation comments and our response to the representations we received can be found in Annex 3. We have taken all relevant representations into consideration in reaching our determination.

3 The legal framework

The variation will be issued under Regulation 20 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*, including a *small waste co-incineration plant* as described by the EPR;
- subject to the provisions of Chapters II and IV of the IED (in relation to the *small waste co-incineration plant*);
- an *operation* covered by the WFD; and
- subject to aspects of other relevant legislation which also have to be addressed.

We address the legal requirements directly where relevant in the body of this document. We consider that, in issuing the variation that a high level of protection will be delivered for the environment and human health through the operation of the installation.

4 The Installation

4.1 Description of the Installation and related issues

4.1.1 The permitted activities

The existing installation is subject to the EPR because it carries out activities listed in Part 1 of Schedule 1 to the EPR:

- Section 6.1 Part A(1)(b) – Producing, in industrial plant, paper and board where the plant has a production capacity of more than 20 tonnes per day; and
- Section 5.4 Part A(1)(a)(ii) - Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day by physico-chemical treatment. (This listed activity allows the operator to treat effluent from the paper-making process before discharging it to river).

The inclusion in the consolidated permit of the small waste wood co-incineration plant (SWCP) is required because such plant is subject to the EPR via the definition of “small waste incineration plant” as given in Part 1: General, paragraph 2 of the EPR:

“small waste incineration plant” means a waste incineration plant or waste co-incineration plant with a capacity less than or equal to 10 tonnes per day for hazardous waste or 3 tonnes per hour for non-hazardous waste.”

Chapter 1, article 3(41) of the IED states that “waste co-incineration plant” means:

“any stationary or mobile technical unit whose main purpose is the generation of energy or production of material products and which uses waste as a regular or additional fuel or in which waste is thermally treated for the purpose of disposal through the incineration by oxidation of waste as well as other thermal treatment processes, such as pyrolysis, gasification or plasma process, if the substances resulting from the treatment are subsequently incinerated.”

In addition to the EPR, the SWCP is therefore also subject to the provisions of Chapter II and IV of the IED. 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.”

The purpose of the SWCP is to combust waste wood to produce heat, which is used to boil water to create steam for use in the paper-making process. The plant is therefore classed as a directly associated activity (DAA) to the paper-making process, the main listed activity. The installation also has the capacity to burn natural gas in a conventional combustion plant for the purposes of generating steam. The natural gas combustion plant will be maintained in hot standby mode so it can be used during periods when the SWCP is unavailable and to occasionally supplement the supply of energy from the SWCP. The rated thermal input of the natural gas combustion plant is 10.5MW so it is therefore included in the permit as a DAA to the paper-making listed activity. Together the listed activities and the DAAs comprise one installation, because the paper-making process, effluent treatment, and combustion / co-incineration steam-generation processes are successive steps in an integrated activity.

4.1.2 The Site

The SWCP will be developed within the boundary of the existing Intertissue installation. New bespoke buildings will be constructed to house the proposed co-incinerator. The location of the SWCP has been determined as a result of the need to locate the facility in close proximity to the building housing the paper machine's yankee dryer.

The installation is located on the Baglan Energy Park (BEP) and the surrounding land use is predominantly industrial. Immediately adjacent to the site lies Baglan Power Station, a gas-fired power plant installation. The Baglan Brook water course is located immediately to the north east, beyond which is a plot currently being developed for a new health centre, and the offices / service depot occupied by Neath Port Talbot County Borough Council. Brunel Way is located immediately to the east, beyond which are business premises forming part of the wider BEP. An earth landscaping bund (including a belt of semi-mature trees) is located to the south, beyond which are railway lines associated with the neighbouring Baglan Bay Power Station (including associated overhead power lines) and vacant previously developed brownfield land. A track forming part of the Wales Coast Path is located immediately to the west and northwest, beyond which are sand dunes and salt marshes which in turn give way to the River Neath and Baglan Bay.

The location of the SWCP is centred on National Grid Reference SS 73076 92802. The closest residential receptors are located approximately 910m to the north east of the site and are associated with the Giants Wharf Caravan Site. Access to the site is gained from the roundabout off Brunel Way which in turn provides a connection to the A48 / A474 and ultimately the M4. A road bridge crossing the railway line (to the south east of the paper mill site) was completed in April 2015. This forms part of the BEP link road and the Port Talbot to Swansea bus corridor. In addition, the installation also benefits from its own railway siding which extend into the buildings.

There are a number of ecologically sensitive sites including three Sites of Special Scientific Interest (SSSIs) within 2km of the site boundary and one Special Area of Conservation (SAC) / Ramsar within 10km of the site boundary. There are also several non-statutory sites within 2km of the installation. The habitats assessment focusses on these sites. The location of the SWCP is material to our determination of the variation application to the extent that it has implications for the following matters:

- The impact of emissions on local communities and sensitive environmental receptors; and
- The question of whether or not the recovery of process heat is a Best Available Technique (BAT) for the installation; and
- The nature and scale of pollution prevention measures necessary to minimise the risk to the environment and human health.

These matters are addressed in this decision document.

The applicant submitted a plan which we consider is satisfactory, showing the site of the installation (including the SWCP), its extent, all existing emission points (with the exception of the emission points to water) and the new emission point associated with the SWCP. The emission points to water are not included in the site plan as they are located some distance from the installation boundary; instead the National Grid References for these points are included in the emissions to water tables in Schedule 3 of the consolidated permit. The site plan is included in Schedule 7 to the consolidated 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 4.2.

4.1.3 What the Installation does

The applicant has described within the Best Available Techniques Assessment document and the main supporting document submitted with the application what the installation does. The SWCP is an 8MW combustion process employing moving grate technology to co-incinerate non-hazardous waste wood and to subsequently use the heat generated to boil water for the purposes of creating steam for use in the paper-making process.

4.1.4 Key Issues in the Determination

The key issues arising during this determination were:

- Emissions to air. The emissions from emission point A6 required careful consideration of the potential impacts on human health and nature conservation sites in the context of the Emission Limit Values (ELVs) set by the Industrial Emissions Directive (IED). The applicant used air dispersion modelling to establish the predicted impact of the SWCP on air quality and made comparisons against Environmental Quality Standards (EQS) for the protection of human health and standards for the protection of habitats provided in the Environment Agency's H1 Environmental Risk Assessment guidance which Natural Resources Wales have adopted; and
- Emissions to surface water. The effluent generated periodically through boiler blow down activities will be transferred to the existing effluent management system on the installation, which has sufficient spare capacity to accept the volume of effluent arising from this periodic activity. We are satisfied that the existing emission limits and monitoring requirements for the on-site biological treatment plant can remain unchanged as a result of this variation. The installation benefits from an existing drainage network (including pollution control infrastructure) which directs surface water into purpose built lagoons located on the northern and southern boundaries of the site. The lagoons discharge into the River Neath under an existing discharge consent.

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

4.2 The site and its protection

4.2.1 Site setting, layout and history

The site setting, layout and history of the site is described by the applicant in section 1 of the supporting document supplied with the variation application.

4.2.2 Proposed site design: potentially polluting substances and prevention measures

There are no releases to land or groundwater associated with the installation.

The applicant has confirmed that all relevant elements of the SWCP will be designed in accordance with recognised standards, methodologies and practices.

External areas of hardstanding will be provided with kerbed containment, where appropriate, to prevent any potential spills from causing pollution of the ground/groundwater and surface water.

All chemicals will be stored in an appropriate manner incorporating the use of bunding and other measures (such as acid and alkali resistant coatings) to ensure appropriate containment. The potential for accidents, and associated environmental impacts, is therefore limited.

Adequate quantities of spillage absorbent materials will be made available on-site, at an easily accessible location(s), where liquids are stored. A site drainage plan, including the locations of foul and surface water drains and interceptors, will be made available on-site. Off-loading of chemicals will take place within areas of concrete hardstanding with falls to a gully and/or a sump.

Storage tanks will be bunded at 110% of the tank capacity and the offloading point will be fully contained with the appropriate capacity to contain any spills during fuel or urea delivery. Process water drains within the SWCP and associated structures will drain to the existing effluents management system.

Drainage for the external areas associated with the SWCP will be fitted with a shut-off alarm, linked to the fire detection systems to contain any contaminated water from firefighting from external areas. Additional storage will be available from site kerbing. In accordance with the existing EMS for the site, spillages will be reported to the site management and a record of the incident will be made.

Lime and activated carbon will be delivered to the plant for storage in silos and big bags respectively. Silos will be fitted with high level alarms. The tops of the silos will be equipped with vents fitted with fabric filters. The filters will be regularly cleaned and inspected for leaks.

The operator has identified the hazards associated with the SWCP, which could present a risk to the environment in the event of an accident. The risks have

been evaluated in Section 8 “H1 Environmental Risk Assessment” of the variation application and the operator has described the procedural and physical control measures which are being developed to mitigate them. We have assessed this information and are satisfied that the operating techniques set out in the application supporting documents will offer appropriate protection of the surrounding environment. We have included improvement condition IC 4 to require the operator to demonstrate that the operating techniques for the SWCP have been incorporated into their Environmental Management System.

4.2.3 Closure and decommissioning

Having considered the information submitted in the variation application, we are satisfied that the appropriate measures will be in place for the closure and decommissioning of the SWCP, as referred to in section 2.9 of the supporting information document within the permit application. Permit condition 1.1.1a requires the operator to have a written management system in place which identifies and minimises risks of pollution including those arising from closure.

At the definitive cessation of activities, the operator has to satisfy us that the necessary measures have been taken so that the entire installation ceases to pose a risk to soil or groundwater, taking into account both the baseline conditions and the site’s current or approved future use. To do this, the operator has to apply to us for surrender, 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 continue to have control over the operation of the installation after the issue of the variation, and that the applicant will be able to continue to operate the installation so as to comply with the conditions included in the consolidated permit.

The co-incineration of waste is not a specified waste management activity (SWMA). Natural Resources Wales has considered whether any of the other activities taking place at the installation are SWMAs and has decided that there are no such activities.

We are satisfied that the applicant's submitted OPRA profile is accurate. The OPRA score will be used as the basis for subsistence and other charging, in accordance with our Charging Scheme. OPRA is Natural Resources Wales method of ensuring application and subsistence fees are appropriate and proportionate for the level of regulation required.

4.3.2 Management

The applicant has stated in the application that they will include the operation of the SWCP in the installation's existing Environmental Management System (EMS), which is certified under ISO14001. We have included improvement condition IC 4 in the consolidated permit which requires that the operator include procedures for operating the SWCP within six months of the date of commissioning of the plant.

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 variation application, we are satisfied that appropriate infrastructure and procedures will be in place to ensure that the site remains secure.

4.3.4 Accident management

The applicant has submitted an Accident Risk Assessment and Management Plan as part of the Environmental Risk Assessment document included in the variation application. Considering this along with 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. In order to ensure that the management system proposed by the applicant sufficiently manages the

residual risk of accidents, permit condition 1.1.1a requires the implementation of a written management system which addresses the pollution risks associated with, amongst other things, accidents.

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 installation must be operated in accordance with the techniques set out in table S1.2 of the permit. The details referred to in that table describe the techniques that will be used for the operation of the installation that have been assessed by Natural Resources Wales as BAT; they form part of the consolidated permit through condition 2.3.1 and Table S1.2 in the schedules.

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 Commission Decision 2000/532/EC as amended from time to time (the 'List of Wastes Decision'), if possible, and containing information on the quantity of each type of waste, where appropriate. The application contains a list of those wastes set out in the List of Wastes Decision, 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 for co-incineration in table S2.2.

We are satisfied that the applicant can accept the wastes contained in table S2.2 of the permit because: -

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

The applicant is permitted to accept up to 25,000 tonnes of waste at the facility per annum. The nominal design capacity of the plant is 18,450 tonnes of waste per annum, based on the installation operating 8,200 hours per year at a nominal capacity of 2.25 tonnes per hour, using fuel with a net calorific value of 12.8 MJ/kg. The difference between the total waste quantity to be accepted on site and the nominal design capacity provides for:

- (i) variations in the net calorific value of the fuels being combusted. Net calorific value is expected to range between 9.6 MJ/kg to 15.2 MJ/kg; and
- (ii) any availability exceeding the predicted 8,200 hours.

The SWCP will be designed, constructed and operated using BAT for the co-incineration of the permitted wastes. We are satisfied that the operating and abatement techniques are BAT for co-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 SWCP which are normal aspects of all EPR permit determinations. This issue is dealt with in this section.
2. The extent to which the SWCP 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 SWCP 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.

(ii) Use of energy within the Installation

Having considered the information submitted in Section 2.6 of the supporting document included in the variation application, we are satisfied that appropriate measures will be in place to ensure that energy is used efficiently within the SWCP.

The variation application states that the specific energy consumption, a measure of total energy consumed per unit of waste processed, will be 30 kWh/tonne (based on the use of a dry acid gas abatement system). This is based on the permitted annual volume of waste to be accepted of 25,000 tonnes.

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

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

The BRef says that it is BAT to reduce the average installation electrical demand to generally below 150 kWh/tonne of waste with an LCV of 10.4 MJ/kg. The LCV in this case is expected to be 12.8 MJ/kg. Taking account of the difference in LCV, 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”*. The Environment Agency’s Sector Guidance Note EPR 5.01 “How to Comply with your Environmental Permit: Additional Guidance for the Incineration of Waste” states that indicative BAT includes the use of steam from boilers in on-site or off-site applications. Natural Resources Wales have adopted this guidance.

The SWCP will have a thermal efficiency of approximately 85% and will utilise all heat generated for use within the installation’s paper manufacturing process. We therefore consider that the requirements of Article 50(5) are met.

(iv) R1 Calculation

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 not presented an R1 calculation with this application, nor have we received a separate application for a determination on whether the installation is a recovery or disposal facility.

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) Permit conditions concerning energy efficiency

The operator is required to report energy usage and energy generated under condition 4.2 and Schedule 4. The following parameters are required to be reported: thermal energy produced (e.g. steam), thermal energy used on installation, together with the total waste wood co-incinerated per year. This will enable Natural Resources Wales to monitor energy recovery efficiency at the Installation and take action if at any stage the energy recovery efficiency is less than proposed.

The energy generated by the SWCP will be used solely to boil water for the purposes of generated steam, which will be used in the paper-making process. All of the energy-generating capacity of the SWCP will be used for steam generation. There are no site-specific considerations that require the imposition

of standards beyond indicative BAT, and so Natural Resources Wales accepts that the applicant's proposals represent BAT for this installation.

4.3.8 Efficient use of raw materials

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

The operator is required to report with respect to raw material usage under condition 4.2 and Schedule 4, including consumption of urea / ammonia (we have included pre-operational condition PO 2 which requires the operator to confirm and justify the selection of the SNCR reagent before commissioning of the SWCP), activated carbon and lime used per tonne of waste burned. This will enable Natural Resources Wales 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 in the SWCP, other than the waste feed itself. The efficiency of the use of auxiliary fuel will be tracked separately as part of the energy reporting requirement under condition 4.2.2.

4.3.9 Avoidance, recovery or disposal of wastes produced by the activities

This requirement addresses wastes produced at the installation and does not apply to the waste being treated there. The principal waste streams produced by the SWCP are bottom ash, boiler ash, air pollution control residues and recovered metals.

The first objective is to avoid producing waste at all. Waste production will be minimised 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 3.1.4 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 furnace and waste generation is being avoided where practicable.

Incinerator bottom ash (IBA) will normally be classified as non-hazardous waste. However, IBA is classified in the List of Wastes Decision 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 co-incinerator ash will be carried out in accordance with the requirements of Article 53(3) of IED. Classification of IBA for its subsequent use or disposal is controlled by other legislation and so is not duplicated within the permit.

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

In order to ensure that the IBA and APC residues are adequately characterised, pre-operational condition PO 4 requires the Operator to provide a written plan

for approval detailing the ash sampling protocols. Table S3.5 requires the operator to carry out an ongoing programme of monitoring.

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

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

5. Minimising the Installation's environmental impact

Regulated activities can present different types of risk to the environment, these include odour, noise and vibration, accidents, fugitive emissions to air and water; as well as point source releases to air, discharges to ground or groundwater, global warming potential and generation of waste. Consideration has also been 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 SWCP on human health and the environment and what measures we are requiring to ensure a high level of protection.

5.1 Assessment of Impact on Air Quality

The applicant's assessment of the impact on air quality is set out in the H1 assessment and Air Quality Assessment sections of the variation application. The assessment comprises:

- An H1 screening assessment of emissions to air from the operation of the co-incinerator;
- Dispersion modelling of emissions to air from the operation of the co-incinerator; and
- A study of the impact of emissions on nearby sensitive receptors, including human receptors and habitat / conservation sites.

This section of the decision document deals primarily with the dispersion modelling of emissions to air from the co-incinerator chimney and its impact on local air quality. The impact on conservation sites is considered in section 5.3.

The applicant has assessed the SWCP's potential emissions to air against the relevant air quality standards, and the potential impact upon human health. These assessments predict the potential effects on local air quality from the SWCP's stack emissions using the ADMS 5.1 dispersion model, which is a commonly used computer model for regulatory dispersion modelling. Since there are a number of sources of emissions to air on site (including the existing natural gas-fired boiler and dryer), the applicant's assessment is based on the change in emissions associated with the SWCP.

The model used 5 years of meteorological data collected from the weather station at Mumbles Head between 2010 and 2014. Mumbles Head is located approximately 12 km to the south west of the facility. The impact of the terrain

surrounding the site upon plume dispersion was considered in the dispersion modelling.

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

- First, they assumed that the ELVs in the permit would be the maximum permitted by Article 46(2) of the IED, converted from 11% to 6% oxygen where appropriate to reflect the fact that the installation is a co-incineration plant. These substances are:
 - Oxides of nitrogen (NO_x), expressed as NO₂
 - Total dust
 - Sulphur dioxide (SO₂)
 - Hydrogen chloride (HCl)
 - Hydrogen fluoride (HF)
 - Metals (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)

For particulate matter (PM), the applicant used an emission concentration of 15 mg/m³, which is below the IED emission limit of 50 mg/m³ (at 6% oxygen). However, our own check modelling assessed the PM emission at the IED emission limit concentration;

- Second, they assumed that the installation operates continuously at the relevant long-term or short-term emission limit values, i.e. the maximum permitted emission rate; and
- Third, the model also considered emissions of pollutants not covered by Annex VI of IED, specifically ammonia (NH₃), Polycyclic Aromatic Hydrocarbons (PAH) and PCBs.

We are in agreement with this approach. The assumptions underpinning the model have been checked and are reasonably precautionary.

The applicant has assessed data on background concentrations of pollutants from a number of available sources. These include monitoring undertaken by Neath Port Talbot County Borough Council at a number of locations across the borough, the closest of which is located approximately 4.5km to south-east of the site. The applicant has also drawn information from Background Air Pollution maps published by Defra. The background concentration incorporates emissions from the natural gas-fired boiler which will be used when required to supplement the energy-output of the SWCP.

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

The way in which the applicant used dispersion models, its selection of input data, use of background data and the assumptions it made have been reviewed by Natural Resources Wales modelling specialists to establish the robustness

of the applicant's air impact assessment. The output from the model has then been used to inform further assessment of health impacts and impact on habitats and conservation sites.

Our review of the air quality assessment indicated that the impact at a new health centre that has been constructed to the north-east of the installation and a caravan site to the north was not assessed. We have carried out check modelling and sensitivity analysis of the impact of emission on sensitive receptors within the vicinity of the site - including the health centre and caravan site - using ADMS 5 dispersion modelling software. This indicated that predicted process contributions at sensitive receptors for all pollutants excluding metals are likely to be insignificant, following H1 criteria. The predicted metals process contributions are likely to be insignificant following the Environment Agency guidance document "Guidance to applicants on impact assessment for group 3 metals stack". Our review of the applicant's assessment leads us to agree with the applicant's conclusions.

We have included improvement condition IC 9, which requires the operator to carry out an assessment of the impact of emissions of metals from the SWCP which did not screen out as insignificant. This condition requires the operator to compare monitoring data obtained during the first year of operation with the emission levels predicted by the air quality assessment submitted with the application.

5.1.1 Consideration of Local Factors

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

Neath Port Talbot County Borough Council has declared an Air Quality Management Area (AQMA) with respect to Particulate Matter (PM₁₀) expressed as a 24-hour mean. This is located as follows:

- Neath Port Talbot AQMA Taibach / Margam

The AQMA covers the majority of the land and properties between the Tata steelworks and M4 motorway and it is located approximately 4.75 km to the south and east of the installation.

From the applicant's model, the process contribution for PM₁₀ at the point of maximum impact is predicted to be below 10% of the short term AQO. Therefore there is little risk of emissions from the SWCP significantly impacting upon the AQMA more than 4km away and releases from the SWCP can therefore be considered insignificant.

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

5.2 Human health risk assessment

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

The human health risk assessment calculates the dose of dioxins and furans that would be received by local receptors if all their food and water were sourced from the locality where the deposition of dioxins and furans is predicted to be the highest.

Natural Resources Wales has reviewed the methodology employed by the applicant to carry out the human health risk assessment. The applicant used the modelling software (IRAP-H) to make their human intake predictions. This software is commonly used for this purpose and incorporates the USEPA HHRAP equations.

For those substances with a threshold level for toxicity, a tolerable daily intake (TDI) is defined. This is “an estimate of the amount of a contaminant, expressed on a bodyweight basis, which can be ingested daily over a lifetime without appreciable health risk”. For substances where a TDI has been derived, in order to assess the impact of emissions from the SWCP, the applicant has determined the predicted intake of each substance by adding the emissions from the SWCP to the mean daily intake (MDI) and comparing the sum as a percentage of the TDI. The TDI level established by the COT is 2 picograms I-TEQ / kg bodyweight / day. For substances without a threshold level for toxicity, an Index Dose (ID) is defined. This is a level of exposure which is associated with a negligible risk to human health. For these substances, the applicant has compared emissions from the SWCP directly, without including the MDI. We consider this approach acceptable as the ID represents a much more conservative threshold of exposure than the TDI.

The results of the applicant’s modelling show that for all substances, the maximum predicted process contributions at any of the sensitive receptor locations are all less than 1% of the relevant adult and child TDIs and IDs for both the ingestion and inhalation pathways. For dioxins, the maximum predicted process contribution at any of the sensitive receptor locations is 0.08% and 0.11% of the COT TDI for adult and child intake respectively.

NRW modelling specialists have undertaken check modelling based on both the HHRAP and HMIP methodologies. This check modelling included the potential uptake of dioxins through all defined pathways. We agree the impact of dioxins and dioxin-like-PCBs is not likely to be greater than 1% of the COT TDI at sensitive receptors.

The maximum predicted environmental concentration (which is the PC at a sensitive receptor location added to the mean daily intake) generated by the applicant’s model is 3.508% for an adult and 90.12% for a child. We are therefore satisfied that there is unlikely to be an exceedance of the COT TDI for dioxins associated with the operation of the SWCP.

In the local area of the proposed development, there are no obvious population level health concerns if the process is managed properly and meets strict emission and operational standards.

Public Health Wales and Abertawe Bro Morgannwg University Health Board were consulted on the variation application. A response was received from Public Health Wales and their comments are summarised in Annex 3. We have taken these comments into account when making our decision.

The Food Standards Agency was also consulted during the permit determination process. However no response to this has been received. We have therefore concluded that it is unlikely that there will be any unacceptable effects on the human food chain as a result of the operation of the SWCP. Details of the responses provided by the consultees on this application can be found in Annex 3.

Natural Resources Wales is therefore satisfied that the applicant's conclusions presented in the Human Health Risk Assessment are soundly based and we conclude that the potential emissions of pollutants including dioxins, furans and metals from the proposed facility are unlikely to have an impact upon human health.

5.3 Impact on Habitats sites, SSSIs and non-statutory conservation sites.

5.3.1 Sites Considered

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

- Crymlyn Bog SAC / Ramsar

The following Sites of Special Scientific Interest are located within 2km of the installation:

- Crymlyn Burrows
- Earlswood Road Cutting and Ferryboat Inn Quarries
- Pant-y-Sais

The following non-statutory Local Wildlife Sites and National Nature Reserves are located within 2km of the installation:

- Crymlyn Burrows NNR
- Pant-y-Sais LNR
- 26 x Ancient Woodlands

5.3.2 Habitats Assessment

The applicant's habitats assessment was reviewed by the statutory nature conservation body in Wales, who agreed with the assessment's conclusions that emissions from the SWCP would have no likely significant effect on the interest features of the European protected sites, were not likely to damage the interest features of the SSSIs, and were not likely to cause significant pollution of non-statutory sites.

For all designated and non-statutory sites the impacts have screened out as being environmentally insignificant. Further to this the prevailing wind direction in this area is from a westerly direction. This means that for the majority of time, any emissions are carried away from the designated sites which are located to the north and east of the facility.

Details of our assessment are recorded within the Stage 2 Assessment of Likely Significant Effects (Appendix 11) and Stage 2 Assessment of likelihood of damage (Appendix 4) completed during our assessment of this application.

5.4 Impact of abnormal operations

Article 50(4)(c) of IED requires that waste incineration and co-incineration plants shall operate an automatic system to prevent waste feed whenever any

of the continuous emission monitors show that an emission limit value (ELV) is exceeded due to disturbances or failures of the purification devices. Notwithstanding this, Article 46(6) allows for the continued incineration and co-incineration of waste under such conditions provided that this period does not (in any circumstances) exceed 4 hours uninterrupted continuous operation or the cumulative period of operation does not exceed 60 hours in a calendar year. This is a recognition that the emissions during transient states (e.g. start-up and shut-down) are higher than during steady-state operation, and the overall environmental impact of continued operation with a limited exceedance of an ELV may be less than that of a partial shut-down and re-start.

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).

Given that these abnormal operations are limited to no more than a period of 4 hours continuous operation and no more than 60 hour aggregated operation in any calendar year. This is less than 1% of total operating hours and so abnormal operating conditions are not expected to have any significant long term environmental impact. For the most part therefore consideration of abnormal operations is limited to consideration of its impact on short term EQSs.

In making an assessment of abnormal operations the following emission levels have been assumed based on plausible abnormal emission levels based primarily on the data obtained from other modern plants. Where actual data is not available, worst case conservative assumptions have been made.

- Dioxin emissions of 10 ng/m³ (100 x normal);
- Mercury emissions are 15 times those of the IED emission 0.05mg/m³ emission concentration;
- NO_x emissions of 825 mg/m³ (1.375 x normal half hourly average ELV);
- Particulate emissions of 225 mg/m³ (5 x normal half hourly average ELV);
- Metal emissions other than mercury are 15 times those of normal operation;
- SO₂ emissions of 675 mg/m³ (2.25 x normal half hourly average ELV); and
- HCl emissions of 160 mg/m³ (1.16 x normal half hourly average ELV).

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).

The applicant has assessed the short term impact of abnormal emissions by increasing the calculated short term ground level concentrations on a pro-rata basis using the factors given above. Comparing these abnormal short term ground level concentrations with the relevant short term AQOs and EALs, the following substances can still be considered insignificant, in that the PC is still <10% of the short-term AQO/EAL: hydrogen chloride, mercury, antimony, chromium, copper, manganese and vanadium.

Emissions of the following substances were not screened out as insignificant: nitrogen dioxide, particulate matter (PM₁₀), sulphur dioxide (daily, 24-hour and 1-hour) and hydrogen fluoride. The applicant has considered the short term abnormal ground level concentrations in combination with the background concentration and for all pollutants the PEC is less than 100% of the relevant AQO/EAL.

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 EQSs for the reasons set out above. Except that if dioxin emissions were at 10 ng/m³ for the maximum period of abnormal operation, this would result in an increase of approximately 70% in the TDI reported. In these circumstances the TDI would be 0.5% of the COT TDI. At this level, emissions of dioxins will still not pose a risk to human health.

Natural Resources Wales agrees with this assessment and we therefore agree with the applicant's conclusions that there will be no adverse impact on human health as a result of abnormal operation at the site.

6. Application of Best Available Techniques

6.1 Combustion unit and control of emissions to air.

The applicant details the technology of the combustion unit and associated abatement of the emissions to air which will be used in the SWCP within the BAT Assessment document and within Section 1.6 of the supporting document submitted with the variation application.

The applicant has proposed to use a furnace technology comprising of an air cooled reciprocating grate which is designed to mix and transport waste as part of the combustion process. It is widely used in combustion of waste wood and biomass fuels in Europe and the UK. The furnace will be designed to ensure that the exhaust gases are raised to a minimum temperature of 850°C, with a minimum of 2 seconds flue gas residence time at this temperature, in line with the requirements for incineration and co-incineration of non-hazardous waste given in the IED. We have imposed improvement condition IC 6 which requires the operator to verify the residence time, minimum temperature and oxygen content of the exhaust gases in the furnace whilst operating under the anticipated most unfavourable operating conditions to demonstrate compliance with IED requirements as specified in the variation application.

The grate will be designed to process waste with a net calorific value (CV) of 12.8MJ/kg. The grate will have the ability to process waste with a CV ranging from 9.6MJ/kg to 15.2MJ/kg. The grate will allow continuous mixing to ensure complete combustion of the fuel. The grate will follow a modular design allowing the adaptation of the grate in order to accommodate specific needs.

Combustion control will take place using a number of different plant features. The main features will include the following;

- primary air system;
- secondary air system;
- waste feed system;
- additive dosing system; and
- auxiliary fuel firing system.

Primary air for combustion will be fed to the underside of the grate by a single inverter-driven fan. Secondary air will be injected higher in the grate to create turbulence and ensure complete combustion with minimum levels of oxides of nitrogen (NO_x). The volume of both primary and secondary air will be regulated by a combustion control system. A urea or ammonia based reagent will be injected into the combustion chamber to react with the oxides of nitrogen, chemically reducing them to nitrogen and water.

The waste feed system mechanically moves the waste by means of reciprocating or rotating grate elements, through a drying zone, a main combustion zone and, finally, a burn out zone. This allows movement and mixing of the fuel to distribute primary combustion air evenly across the bed of material.

The furnace will also be fitted with auxiliary burners, which will be designed for firing on natural gas. The burners will be set to operate when the temperature within the furnace drops to 860-870°C. These auxiliary burners will also be fired during plant start up and shut down. We have included pre-operational condition PO 5 in the permit which requires the operator to carry out and provide details of Computational Fluid Dynamic modelling (CFD) to demonstrate that residence times and temperature requirements comply with the IED.

The heat released by the combustion of the fuel is recovered in a proven steam boiler, either of the fire-tube type, the water-tube type or a combination of the two; with the final design depending on the selected contractor.

The flue gas treatment (FGT) system consists of:

- Selective Non-Catalytic Reduction (SNCR);
- hydrated lime and activated carbon injection; and
- fabric filter.

Concentrations of NO_x will be regulated by the careful control of combustion air and the use of the SNCR process in which a urea or ammonia based reagent will be injected into the high temperature region of the boiler to further reduce the amount of NO_x in the gas stream. SNCR is a proven, economical technology, widely used in the Energy from Waste industry. We have included pre-operational condition PO 2 in the permit which requires the operator to confirm and justify the selection of the reagent to be used within the SNCR system.

Hydrated lime and activated carbon will be injected into the flue gases upstream of the fabric filter in order to abate acidic gases, heavy metals and any remaining dioxins and furans. The hydrated lime will abate the emission of acidic components, including hydrogen fluoride, hydrogen chloride and sulphur dioxide. The activated carbon will abate emissions of mercury, organic compounds and dioxins. The hydrated lime and activated carbon will be stored in separate silos in proximity of the FGT system.

Following the injection of lime and activated carbon, the flue gas will then pass through the fabric filter, which will remove the particulates and reaction products, collectively known as Air Pollution Control residues (APCr).

The applicant has indicated that they may wish to install a flue gas recirculation system (FGR). This involves the recirculation of a proportion of the flue gases into the combustion chamber to replace some of the secondary air. We have included pre-operational condition PO 3 in the permit which requires the operator to confirm whether or not flue gas recirculation (FGR) has been included in the final design of the plant no less than three months before commissioning.

Natural Resources Wales have reviewed this information and agree that the proposed technologies can be regarded as BAT for the site.

6.2 Emissions to water.

The techniques proposed to control water releases from the site are detailed in Section 2.2.3 of the supporting document submitted with the variation application.

Surface water run-off from all external areas of hardstanding will be discharged into the surface water system. The installation benefits from an existing drainage network (including pollution control infrastructure) which directs surface water into purpose built lagoons located on the northern and southern boundaries of the site. The lagoons discharge into the River Neath under an existing discharge consent which is separate to the permit. The applicant has not applied to change any of the emission limits to water in the permit and therefore the impact on the aquatic environment remains unchanged.

The installation site comprises existing hardstanding. The inclusion of the SWCP in the installation will not increase the size of impermeable surface and therefore rates of run-off will remain the same. Surface water arising from the roof and surrounding hard standing will be collected via a new drainage system which connects to the existing surface water drainage network that supports the site.

Process effluents from the SWCP will be recirculated through the installation's existing effluent management system. All excess effluents which cannot be recirculated will be collected in the existing waste water system, prior to discharge to the long sea outfall to Swansea Bay in accordance with the installation's existing emission limits to water.

As there are no changes in the emission limits to water, the impact on the aquatic environment remains unchanged as a result of this variation. Natural Resources Wales are therefore satisfied that there will be no adverse impact on the environment as a result of emissions to water from the changes.

6.3 Emissions to land or groundwater.

There are no releases to land or groundwater associated with the installation.

We are satisfied that the pollution risk associated with the installation is low based on the use of appropriate surfacing, satisfactory containment, inspection measures and the operating procedures which will be put in place as part of the ISO 14001 environmental management system.

Based upon the information in the variation application we are satisfied that appropriate measures will be in place to prevent emissions to land or groundwater.

6.4 Emissions to sewer

There are no process releases to sewer associated with the SWCP, or the installation as a whole.

6.5 Fugitive emissions

The applicant describes within the Environmental Risk Assessment document submitted with the variation application details of the techniques and processes that will be used to minimise fugitive emissions from the site.

The design of the buildings is based on the principles of containment, extraction and treatment in order to prevent fugitive releases. With regards to fugitive emissions of dust, fuel will be delivered in covered road vehicles and all process activities will occur inside enclosed buildings.

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

6.6 Odour

The waste wood fuel which will be accepted at the installation is inherently non-odorous. 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 fuel storage building. No fuel will be stored in external areas.

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

6.7 Noise and vibration

The applicant has carried out a detailed assessment of potential noise impacts associated with the operation of the SWCP.

The applicant's noise modelling was conducted using proprietary software CadnaA. CadnaA implements the attenuation calculation scheme detailed in ISO 9613-2.

The applicant has conducted background noise surveys over a 20 hour period covering Sunday day and Sunday night, at three locations; Giants Grave Caravan Site; the junction of Old Road and Crawford Road; and Handel Avenue.

The applicant's noise impact assessment has considered the impact from noise from the co-incineration plant itself, HGV movements on site and an external pump. Noise levels were predicted at eight sensitive receptor locations.

The applicant has assessed operational noise using BS 4142: 2014 'Methods for rating and assessing industrial and commercial sound'. This standard is based on the measurement of background sound using LA₉₀ noise measurements, compared to source noise levels measured in LA_{eq} units. The differential between the two measurements; once any corrections have been applied for source noise tonality, distinct impulses etc. (i.e. the 'rating' level); determines the likelihood of adverse effects:

- Typically, the greater this difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source would have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

The assessment suggests that the following noise mitigation measures are put in place:

- Mobile plant used on site should be fitted with broadband noise type reverse alarms or visual alarms;
- Plant noise levels would not exceed a noise level of 85dB(A) Leq15mins at 1m under normal plant operation. This includes the noise level at the end of the ventilation stack;
- The Boiler House Building would have a minimum Rw value of 24dB;
- Doors into the building to be closed during night-time periods; and
- Mobile plant not operated external to buildings during night-time periods.

The daytime sound rating level for operation of the SWCP predicted by the applicant's model is given as 33dB. The lowest background sound level (LA₉₀) measured during the surveys is 42dB. Therefore the difference between the rated sound level and the background is -9dB. The applicant's assessment therefore concludes that this is an indication of the specific sound source having a low impact, in line with BS 4142:2014. The applicant's assessment concludes that the levels at residential receptors would indicate that impact is likely to be low.

The applicant's assessment was reviewed by Natural Resources Wales's noise specialists, who noted that there were two inconsistencies in the assessment. These were some differences between the defined operating times for the plant and the defined reference period, and inconsistency between the stated heights of several surrounding buildings when compared to the information given in the

air quality assessment. Our specialists also noted that the applicant had not provided any information on the sources of noise within the boiler plant building and no evidence of the derived assumed noise level within the building and did not use a noise character correction factor when calculating the predicted noise level at sensitive receptors.

Check modelling was carried out by our specialists using CadnaA software. This check modelling corrected the reference time to correspond with the defined operating times and corrected the building heights to correspond with the air quality assessment. The check modelling also applied a noise character correction factor to the predicted noise levels at sensitive receptors.

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

We have included the applicant's noise risk assessment and management plan (which references the noise impact assessment) in the operating techniques table of the permit. Both documents are therefore enforceable, including the mitigation measures described above. In addition, the permit also contains the standard conditions for noise (3.5.1 and 3.5.2). We consider that these measures will be sufficiently protective.

6.8 Global warming potential

This section summarises the assessment of greenhouse gas impacts which has been made in the determination of this variation. Emissions of carbon dioxide (CO₂) 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, CO₂ is clearly a pollutant for IED purposes.

The principal greenhouse gas emitted is CO₂, but the plant also emits small amounts of N₂O arising from the operation of secondary NO_x abatement. N₂O has a global warming potential 310 times that of CO₂. The is required to optimise the performance of the secondary NO_x abatement system to ensure its GWP impact is minimised through the inclusion of pre-operational condition PO 2 and improvement condition IC 8.

The major source of greenhouse gas emissions from the SWCP is however CO₂ from the combustion of waste. There will also be CO₂ 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 applicant has considered GWP as part of its BAT options appraisal. There are a number of areas in which a difference can be made to the GWP of the SWCP, e.g. the applicant's BAT options appraisal compared SCR and SNCR

methods (SNCR alone and SNCR plus FGR) of secondary NO_x abatement. In summary, the following factors influence the GWP of the SWCP:-

On the debit side:

- CO₂ emissions from the burning of the waste (however wood is considered to be a renewable fuel and with a GWP of zero in accordance with the Environment Agency guidance H1, Annex H);
- CO₂ emissions from burning auxiliary or supplementary fuels;
- CO₂ emissions associated with electrical energy used; and
- N₂O from the de-NO_x process.

On the credit side:

- CO₂ saved from burning of natural gas.

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

The applicant's assessment shows that the GWP of the SWCP is dominated by the emissions of carbon dioxide that are released as a result of waste combustion. This is constant for all options considered in the BAT assessment. The differences in the GWP of the options in the BAT appraisal arise from differences in energy recovery and in the amount of N₂O emitted.

Taking all these factors into account, the applicant's assessment shows their preferred option is best in terms of GWP. Natural Resources Wales agrees with this assessment and that the chosen option is BAT for the installation.

7. Setting ELVs and other Permit conditions

7.1 Translating BAT into Permit conditions

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

At the time of writing of this document, no BAT conclusions have been published for waste incineration or co-incineration.

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

7.1.1 National and European EQSs

As detailed in section 5.1, the environmental impact of the installation has been assessed against relevant EQSs, at the level of performance required by IED. The installation will not result in the breach of any EQSs. We accept that the applicant's proposals are BAT and that there is no justification to reduce ELVs below IED levels in these circumstances.

7.1.2 Global Warming

CO₂ is an inevitable product of the combustion of waste. The amount of CO₂ emitted will be essentially determined by the quantity and characteristics of waste being incinerated, which are already subject to conditions in the permit. It is therefore inappropriate to set an emission limit value for CO₂, which could do no more than recognise what is going to be emitted. The gas is not therefore targeted as a key pollutant under Annex II of IED, which lists the main polluting substances that are to be considered when setting emission limit values (ELVs) in permits.

We have therefore considered setting equivalent parameters or technical measures for CO₂. 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 recovery of energy from 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 CO₂ emissions.

7.1.3 Commissioning

Before the plant can become fully operational, it will be necessary for it to be commissioned. Before commissioning is allowed to start, the operator is

required by pre-operational condition PO 1 to submit a commissioning plan to Natural Resources Wales for approval. The commissioning plan will address the expected emissions to the environment associated with the different stages of commissioning and the duration and timelines for completion of each stage. The purpose of this pre-operational condition is to ensure that the risks to the environment continue to be minimised throughout the commissioning process. As such, the operator is required to describe the actions that will be taken to protect the environment and also to inform Natural Resources Wales in the event of actual emissions exceeding expected emissions. The operator will be required to carry out commissioning in line with the commissioning plan, once it is approved by Natural Resources Wales.

We have also set improvement condition IC 3 which is required to be completed within two months of the completion of commissioning. IC 3 requires the operator to submit a written report for approval on the commissioning of the installation. The purpose of this condition is to provide a comparison of the environmental performance of the plant as installed against the original design parameters which were set out in the application. The report shall also review the performance of the installation against the permit conditions and shall include details of any procedures developed during commissioning for achieving and demonstrating compliance with permit conditions. This will provide an accurate picture of the plant's performance in its "as built" state and the response to this improvement condition will be incorporated into Table S1.2 of the permit as an operating technique.

In addition, it is recognised that certain information presented in the variation application was based on design data, or data from comparable equipment and the commissioning phase is the earliest opportunity to verify much of this information. The following improvement conditions have been included in the permit so that appropriate verifications will be determined by the operator:

- Calibration of the CEMs in accordance with BS EN 14181 (IC5); and
- Identification of the size distribution of particulate matter in exhaust gases (IC7);

7.2 Monitoring

7.2.1 Monitoring during normal operations

We have decided that monitoring should be carried out for the parameters listed in Schedule 3 using the methods and to the frequencies specified in those tables. These monitoring requirements have been imposed in order to demonstrate compliance with emission limit values and to enable correction of measured concentration of substances to the appropriate reference conditions; to gather information about the performance of the SNCR system and to deliver the requirements of Chapter IV of IED for monitoring of residues and temperature in the combustion chamber.

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

Based on the information in the variation 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.

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

The operator has confirmed that they wish to take advantage of the IED Article 45(1)(f) allowance which allows abnormal operation of the plant under certain circumstances when the CEM for releases to air have failed.

The operator has confirmed that when a CEMS failure occurs an assessment will be carried out immediately to determine whether the failure can be resolved within 4 hours. If it is expected that the repair can be undertaken within 4 hours, as permissible by the IED, then repair work, such as cleaning the filter, resetting systems, or replacing parts, will be carried out and operation of the SWCP will resume. If during this 4 hour period or during the initial assessment it becomes evident that a repair of the CEMS cannot be carried out within 4 hours then the SWCP will be immediately shut down to enable the CEMS to be repaired. If a shutdown is required the SWCP will not be restarted until the CEMS equipment has been fully repaired / replaced.

Condition 2.3.10 of the permit requires that the abnormal operating conditions apply in such instances.

7.3 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 Natural Resources Wales to ensure compliance with permit conditions and to monitor the efficiency of material use and energy recovery at the installation.

ANNEX 1: Pre-Operational Conditions

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

Reference	Pre-operational measures
PO 1	At least two months prior to commencement of commissioning of the waste wood co-incineration plant referred to in activity A5 in table S1.1, the Operator shall provide a written commissioning plan, including timelines for completion, for approval by Natural Resources Wales. The commissioning plan shall include the expected emissions to the environment during the different stages of commissioning, the expected durations of commissioning activities and the actions taken to protect the environment and report to Natural Resources Wales in the event that actual emissions exceed expected emissions. Commissioning shall be carried out in accordance with the commissioning plan as approved.
PO 2	At least two months prior to the commencement of commissioning of the waste wood co-incineration plant referred to in activity A5 in table S1.1, the Operator shall submit a written report to Natural Resources Wales which confirms and justifies the selection of the reagent to be used within the SNCR system. The report shall also include details of the procedures in place for the safe handling and management of the reagent and an assessment of the level of oxides of nitrogen and nitrous oxide emissions that can be achieved under optimum operating conditions.
PO 3	At least three months prior to the commencement of commissioning of the waste wood co-incineration plant referred to in activity A5 in table S1.1, the Operator shall submit a written report to Natural Resources Wales which confirms whether or not flue gas recirculation (FGR) has been included in the final design of the plant. The report shall demonstrate how the chosen design will minimise the impact on the environment (including waste generated / raw material used).
PO 4	At least one month prior to the commencement of commissioning of the waste wood co-incineration plant referred to in activity A5 in table S1.1, the Operator shall submit a written report to Natural Resources Wales for approval a protocol for the sampling and testing of co-incinerator bottom ash for the purposes of assessing its hazard status. Sampling and testing shall be carried out in accordance with the protocol as approved.
PO 5	After completion of furnace design and at least three calendar months before any furnace operation; the operator shall submit a written report to Natural Resources Wales of the details of the computational fluid dynamic (CFD) modelling. The report shall demonstrate whether the design combustion conditions comply with the residence time and temperature requirements as defined by the Industrial Emissions Directive.

ANNEX 2: Improvement Conditions

Based in the information in the variation application we consider that we need to set improvement conditions. These conditions are set out below - justifications for these are provided at the relevant section of the decision document. We are using these conditions to require the operator to provide Natural Resources Wales with details that need to be established or confirmed during and/or after commissioning.

Reference	Improvement measure	Completion date
IC 3	The Operator shall submit a written report to Natural Resources Wales for approval on the commissioning of the waste wood co-incineration plant referred to in activity A5 in table S1.1 on commissioning of the installation. The report shall summarise the environmental performance of the plant as installed against the design parameters set out in variation application PAN-000045 (Variation number EPR/BU2489IT/V009). The report shall also include a review of the performance of the facility against the conditions of the permit and details of procedures developed during commissioning for achieving and demonstrating compliance with permit conditions.	Within four months of commissioning of the waste wood co-incineration plant
IC 4	The Operator shall submit a written report to Natural Resources Wales that demonstrates that the operation of the waste wood co-incineration plant referred to in activity A5 in table S1.1 has been incorporated in its Environmental Management System.	Within six months of commissioning of the waste wood co-incineration plant
IC 5	With reference to the waste wood co-incineration plant referred to in activity A5 in table S1.1, the Operator shall submit a written report to Natural Resources Wales which presents the results of calibration and verification testing to confirm that the performance of Continuous Emissions Monitors for parameters as specified within tables S3.1 complies with the requirements of BS EN 14181 (specifically the requirements of QAL1, QAL2 and QAL3).	Initial calibration report to be submitted to Natural Resources Wales within three months of completion of commissioning Full summary of evidence compliance report to be submitted within 18 months of commissioning
IC 6	With reference to the waste wood co-incineration plant referred to in activity A5 in table S1.1, the Operator shall carry out checks to verify the residence time, minimum temperature and oxygen content of the exhaust gases in the furnace whilst operating under the anticipated most unfavourable operating conditions. The results shall be submitted in writing to Natural Resources Wales.	Within four months of the completion of commissioning
IC 7	The Operator shall submit a written proposal to Natural Resources Wales to carry out tests to determine the size distribution of the particulate matter in the exhaust gas emissions to air from emission point A6, identifying the fractions within the PM10, and PM2.5 ranges. The proposal shall include a timetable for approval by Natural Resources Wales to carry out such tests and produce a report on the results. On receipt of written agreement by Natural Resources Wales to the proposal and timeline, the Operator shall carry out the tests and submit to Natural Resources Wales a report on the results.	Within six months of completion of commissioning of the waste wood co-incineration plant referred to in activity A5 in Table S1.1

IC 8	<p>The Operator shall submit a written report to Natural Resources Wales describing the performance and optimisation of the Selective Non Catalytic Reduction (SNCR) system and combustion settings to minimise oxides of nitrogen (NO_x) emissions within the emission limit values described in this permit with the minimisation of nitrous oxide emissions. This report shall include an assessment of the level of NOX and N2O emissions that can be achieved under optimum operating conditions.</p> <p>The report shall also provide details of the optimisation (including dosing rates) for the control of acid gases and dioxins.</p>	<p>Within four months of the completion of commissioning of the waste wood co-incineration plant referred to in activity A5 in Table S1.1</p>
IC 9	<p>The Operator shall carry out an assessment of the impact of emissions to air of all the following component metals subject to emission limit values: Cd, As, Cr(VI), Pb, Mn and Ni. A report on the assessment shall be made available to Natural Resources Wales.</p> <p>Emissions monitoring data obtained during the first year of operation shall be used to compare the actual emissions with those assumed in the impact assessment submitted with variation application PAN-000045 (Variation number EPR/BU2489IT/V009). An assessment shall be made of the impact of each metal against the relevant EQS/EAL. In the event that the assessment shows that an EQS/EAL can be exceeded, the report shall include proposals for further investigative work to determine whether the emissions of these metals from the site can be further reduced.</p>	<p>Within 15 months of the completion of commissioning</p>

ANNEX 3: Consultation Responses

A) Advertising and Consultation on the Application

The application has been advertised and consulted upon in accordance with Natural Resources Wales Public Participation Statement. The way in which this has been carried out along with the results of our consultation and how we have taken consultation responses into account in reaching our draft decision is summarised in this Annex. Copies of all consultation responses have been placed on Natural Resources Wales public registers.

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

- Neath Port Talbot County Borough Council (Environmental Protection Department)
- Neath Port Talbot County Borough Council (Planning Department)
- Food Standards Agency
- Abertawe Bro Morgannwg University Health Board
- Public Health Wales
- Mid and West Wales Fire and Rescue Service

1) Consultation Responses from Statutory and Non-Statutory Bodies

Response Received from Neath Port Talbot County Borough Council – Planning Department	
Brief summary of issues raised:	Summary of action taken / how this has been covered
No issues raised	None required

Response Received from Abertawe Bro Morgannwg University Health Board / Public Health Wales	
Brief summary of issues raised:	Summary of action taken / how this has been covered
<p>(i) A caravan site is located 900m from the waste wood co-incineration plant which has not been identified as a sensitive receptor by the applicant;</p> <p>(ii) Waste wood should be locally sourced to fall in line with the ethos of current Welsh policy on reducing greenhouse gases, which promotes the use of waste woods and local supply of biomass;</p> <p>(iii) The air quality assessment has not considered the emissions from transport associated with the proposed development;</p> <p>(iv) In relation to emissions of Chromium VI (Cr(VI)); careful consideration should be given to a further source of Cr(VI) in an area of already elevated background concentrations;</p> <p>(v) With regard to the use of monitoring data from the Wilton 10 biomass facility in the air quality assessment; 40% of wood stock at the Wilton 10 plant is made up of forest tree felling and coppice willow: a further explanation by the applicant of this assumption is required;</p> <p>(vi) Any variation granted should be subject to conditions, specifically these should include robust emissions management plans (dust, odour, noise), strict waste acceptance and handling criteria and provision of an accredited environmental management system (EMS);</p> <p>(vii) The Regulator should be satisfied that the applicant's fire prevention plans are robust and comply with current guidance;</p> <p>(viii) A noise monitoring exercise is undertaken upon commencement of operations to confirm the modelled scenario.</p>	<p>(i) We have carried out check modelling and sensitivity analysis using dispersion modelling software ADMS version 5. This included the caravan site as a sensitive receptor. Our check modelling is in agreement with the applicant that there is unlikely to be an exceedance of any long-term and short-term air quality standards for human health at sensitive receptors. This includes the caravan site;</p> <p>(ii) The source of waste wood supply for the co-incinerator is outside the scope of the Environmental Permitting Regulations, and therefore cannot be enforced by the permit;</p> <p>(iii) Transport of waste wood and other raw materials to the site will occur outside the boundary of the installation; emission from vehicles used for transport to and from the installation is therefore outside the scope of the permit;</p> <p>(iv) In relation to the air quality assessment, the applicant has assessed emissions of heavy metals using the Environment Agency guidance "Guidance to applicants on impact assessment for group 3 metals stack". This methodology incorporates the existing background levels of metals in the assessment and also takes into account site specific factors. The applicant's assessment uses data on Cr(VI) concentrations in the APC residues from the Wilton 10 biomass plant, which uses similar fuel profile and abatement technology. Monitoring of metals within the APC residues is undertaken at Wilton 10 as a condition of the Environmental Permit. This data is provided as proportion of the composition of each monitored metal to the total metals within the APC residue. The total metals emission concentration was multiplied by the proportion of each</p>

	<p>metal in the APC residue to estimate each individual metal release concentration as a proportion of the total metals ELV. The applicant has used total chromium monitoring data from Wilton 10 as chromium is not speciated. The total chromium emissions are a maximum of 3.57% of the limit; this includes some contribution from Cr(VI). The applicant has used data published by the Environment Agency that combines the APC residue monitoring data of 10 municipal waste incinerators. This data gives a mean concentration of Cr(VI) as a proportion of the ELV of 2.2%, which is similar to the Wilton 10 data. Therefore assuming the flue gas treatment system performance will be no worse than other facilities (the maximum of the Environment Agency analysis), the PC is less than 1% of the EAL at the point of maximum impact. We therefore agree with the applicant's conclusion that there is little potential for significant pollution as a result of emissions of Cr(VI). We have set improvement condition IC 9 which requires the operator to assess monitored emissions of total chromium (which will include a small proportion of Cr(VI)) to verify that they are as predicted.</p> <p>(v) The applicant has stated that the Wilton 10 facility processes a similar feedstock and employs a similar flue gas treatment system. We are therefore satisfied that this comparison is appropriate;</p> <p>(vi) The applicant has submitted dust and noise risk assessments and management plans with the variation application, which contain mitigation and avoidance measures. The applicant has also submitted an odour risk assessment, although this is limited because waste wood is inherently non-odorous. We have checked these documents against the Environment Agency document SGN EPR 5.01 and consider them to represent BAT. These documents have been added to the operating techniques table of the permit and are therefore enforceable. Emissions of noise, odour and dust will be controlled through permit conditions 3.1.1, 3.4.1, 3.4.2, 3.5.1 and 3.5.2. The applicant has submitted a procedure for waste acceptance and handling with the application which we have checked against SGN EPR 5.01. We consider that the applicant's proposals represent</p>
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	<p>BAT. The waste types that are to be accepted are specified in Schedule 2 of the permit and therefore any wastes with waste codes other than those listed in this schedule cannot be accepted. Waste at the site will be controlled by conditions 2.3.3, 2.3.4, 2.3.5 and 2.3.6. The installation currently holds an ISO 14001-accredited EMS. We have included an improvement condition (IC 4) in the permit requiring the operator to include procedures for the co-incineration plant within six months of commissioning;</p> <p>(vii) The applicant's environmental risk assessment submitted with the application contains an accident risk assessment and management plan. This document includes an assessment of the risks from fires and mitigation and avoidance measures. We have checked this document against SGN EPR 5.01 and consider that the applicant's assessment and plan represents BAT;</p> <p>(viii) Noise specialists in NRW have reviewed the noise impact assessment included with the application, and, although there are some inconsistencies in the assessment, our check modelling using data that corrects these inconsistencies agrees with the applicant's conclusions, namely that the impact from the SWCP will be low. The applicant has also included a noise risk assessment in the application; this document has been included in the operating techniques table (along with the noise impact assessment): mitigation measures for noise proposed by the applicant are therefore enforceable. We therefore do not consider that an improvement condition is required and that permit conditions 3.5.1 and 3.5.2 are sufficiently protective.</p>
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<p>No responses received from</p>	<ul style="list-style-type: none"> • Neath Port Talbot County Borough Council – Environmental Health Department • Mid and West Wales Fire and Rescue Service • Food Standards Agency
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