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

Consultation on our decision document recording our decision-making process

The Permit Number is: EPR/ZP333KE/V002

The Applicant is: Anglesey Aluminium Metal Renewables Limited

The Installation is located at: Penrhos Works, PO Box 4, Holyhead, Anglesey, LL65 2UJ

Consultation commences on: Monday, 7 February 2011

Consultation ends on: Friday, 4 March 2011

What this document is about

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

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

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

In this document we frequently say "we have decided". That gives the impression that our mind is already made up; but as we have explained above, we have not yet done so. The language we use enables this

document to become the final decision document in due course with no more re-drafting than is absolutely necessary.

We try to explain our decision as accurately, comprehensively and plainly as possible. Achieving all three objectives is not always easy, and we would welcome any feedback as to how we might improve our decision documents in future.

Environment Agency Permitting decisions

We have decided to issue the variation for Anglesey Renewable Energy Plant operated by Anglesey Aluminium Metal Renewables Limited.

The permit number is EPR/ZP3337KE

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

Purpose of this document

This decision document:

- explains how the application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been taken into account
- justifies the specific conditions in the permit other than those in our generic permit template.

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Structure of this document

- Annex 1 Decision checklist and Key Issues
- Annex 2 Advertising and consultation responses
- Annex 3 Improvement conditions
- Annex 4 Pre-Operational measures for future development

Annex 1: Decision checklist

This checklist should be read in conjunction with the Duly Making checklist.

Activity	Justification / Detail	Determination criteria met	
		Yes	N/A
Receipt of submission			
Confidential information	A claim for commercial or industrial confidentiality has been made.		✓
Consultation			
Scope of consultation	The consultation requirements were identified and implemented. The decision was taken in accordance with RGN 6 High Profile Sites, our Public Participation Statement and our Working Together Agreements.	✓	
Responses to consultation, web publicising and newspaper advertising	The consultation, web publicising and advertising responses (Annex 2) were taken into account in the decision. The decision was taken in accordance with our guidance.	✓	
Operator			
Control of the facility	We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with EPR RGN 1 Understanding the meaning of operator.	✓	
The facility			
The regulated facility (only where there has been debate on the extent of the facility)	The extent/nature of the facilities taking place at the site required clarification.		✓
European Directives			
Applicable Directives	All applicable European Directives have been considered in the determination of the application.	✓	
The site			
Extent of the site of the facility	The operator has provided a plan which we consider is satisfactory, showing the extent of the site of the facility [including indicative discharge points]. A plan is included in the permit and the operator is required to carry on the permitted activities within the site boundary.	✓	
Biodiversity, Heritage, Landscape and Nature Conservation	The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat. A full assessment of the application and its potential to affect the habitat has been carried out as part of the permitting process. We consider that the application will not affect the features of the site/habitat.	✓	

Activity	Justification / Detail	Determination criteria met	
		Yes	N/A
	Formal consultation has been carried out with The Countryside Council For Wales (CCW). See section 12.3 below. An appropriate assessment was completed and agreed with CCW - consultation responses were taken into account in the permitting decision.		
Environmental Risk Assessment and operating techniques			
Environmental risk (where the operator has carried out the risk assessment)	We have reviewed the operator's assessment of the environmental risk from the facility.	✓	
Operating techniques	We have reviewed the techniques used by the operator and compared these with the relevant guidance notes. The proposed techniques / emission levels for priorities for control are in line with the benchmark levels contained in the TGN and we consider them to represent appropriate techniques for the facility.	✓	
The permit conditions			
Use of conditions other than those from the template	Based on the information in the application, we consider that we need to impose conditions other than those in our permit template, which was developed in consultation with industry having regard to the relevant legislation. Additional requirements have been set in tables s1.5 and s2.1 to control fugitive emissions.	✓	
Pre-operational conditions	Based on the information on the application, we consider that we need to impose pre-operational conditions. Pre-operational measures for future development are identified in Annex 4 below along with justification for their inclusion.	✓	
Improvement conditions	Based on the information on the application, we consider that we need to impose improvement conditions. These are listed in Annex 3 and justification for their inclusion given in the same table.	✓	
Conditions where the consent of another person is needed.	Based on the information submitted in the application, we consider that it is necessary to impose conditions where the consent of another person is needed.		✓
Incorporating the application	We have specified that the applicant must operate the permit in accordance with descriptions in the application, including all additional information received as part of the determination process. These are specified in the Operating Techniques table in the permit.	✓	
Emission limits	We have decided that emission limits should be set for the	✓	

Activity	Justification / Detail	Determination criteria met	
		Yes	N/A
	parameters listed in the permit.		
Monitoring	We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods and to the frequencies specified.	✓	
Reporting	We have specified reporting in the permit.	✓	
Operator Competence			
Environment Management System	There is no known reason to consider that the operator will not have the management systems to enable it to comply with the permit conditions. The decision was taken in accordance with RGN 5 on Operator Competence.	✓	
OPRA			
Opra Score	The Opra score has changed from that set out in the application – see section 3.0 below.	✓	

Key Issues of the decision

1.0 Description of the installation

The variation will permit the combustion of virgin biomass wood. The activity is listed under Schedule1, section 1.1 Part A (1)(a); burning any fuel in an appliance with a thermal input of 50 megawatts or more, of the Environmental Permitting (England and Wales) Regulations 2010.

Anglesey Renewable Energy Plant (REP) is located on land within the existing site boundary (Grid Reference: SH26570 81350) The installation is to be operated by Anglesey Aluminium Metals Renewables Limited (AAMR).

The installation comprises of a 299MWe power station. The combustion unit uses circulating fluidised bed (CFB) technology. The REP will be fuelled primarily by biomass wood, in the form of wood chip or pellets pre-dominantly imported from North America and Europe. The biomass wood is delivered to the site by ship into Holyhead Jetty. The installation includes a series of hoppers and conveyors that transport the biomass wood from the deep water jetty to the wood storage buildings on the REP site. The unloading operation and conveyors are deemed to be under the operational control of Anglesey Aluminium Metal Renewables Limited and are included within this Permit.

The biomass wood is transferred onto conveyor systems within the wood storage buildings and fed into the combustion unit via boiler feed silos located within the boiler house.

Steam produced by the combustion unit is used to power a steam turbine which in turn generates electricity that can be fed into the National Grid.

The installation includes a small oil fuelled auxiliary boiler (3MWth) to generate steam to enable rapid start up of the steam turbine.

After passing through the steam turbine, the steam is cooled by air cooling technology.

The installation also includes a small diesel powered emergency stand-by generator (1MWe) to provide electricity for essential systems in the event of mains power supply interruption.

The installation is subject to the Large Combustion Plant Directive and will generate emissions to air from the combustion process, emissions to water, such as cooling water and waste in the form of bottom ash and fly ash.

There are a number of designated habitats, Beddmanarch-Cymyran (Site of Special Scientific Interest), The Glannau Ynys Gybi, The Ynys Feurig, Cemlyn Bay and The Skerries (Special Protection Area) and Llyn Dinam (Special Area of Conservation) located within 15km of the installation.

2.0 Operator competence

We are satisfied that the Operator is the person who will have control over the day to day operation of the installation. We are satisfied that they will be able to operate the Installation so as to comply with the conditions we have included in the Environmental Permit.

The Operator has confirmed within their application that an Environmental Management System (EMS) will be developed for the site and that this will be subject to independent third party assessment and registration to ISO14001.

No specified waste management activities will occur on site as a result there is no requirement for an individual to obtain a Certificate of Technical Competence (COTC) in this respect.

3.0 OPRA profile

As a result of our determination we have amended the OPRA score for the installation. The OPRA score has increased from 126 (submitted by the Operator) to 136 for the following reasons:

- Location attribute did not include for European statutory designated site SAC/SPA's with 15km of the installation boundary.

The revised OPRA score will be used as the basis for the subsistence and other charging in accordance with the OPRA Scheme. However, the operators OPRA profile for the installation may change over time and will need to be revised as the site develops.

4.0 The installation and its management

4.1 General Management — Permit condition 1.1

Based upon the information submitted in the Application, we are satisfied that sufficient financial, technical and manpower resources are available to the Operator to ensure compliance with all the permit conditions.

However, the Operator does not yet have a management system in place as the site has not been constructed at the time of Permit issue. Therefore, Pre-operational condition POC01 requires the Operator to send a copy of their Environment Management System (EMS) to the Environment Agency for review at least 3 months prior to starting operations at the site. The Operator is also required to indicate any plan they may have to obtain external certification such as ISO 14001 approval for their EMS.

4.2 Accident management plan — Permit Condition 1.1.1

We are satisfied that appropriate measures will be in place to ensure that accidents that have the potential to cause pollution are minimised. As the site has not been constructed at the time of Permit issue, no accident management plan has been developed. There is, however, a commitment within the application to develop an Accident Management Plan as an integral part of the Operator's site environmental management system.

We have included pre-operational condition POC02 to require the Operator to submit an Accident Management Plan for approval at least one month prior to commencement of operations at the site. Operations can not commence unless the plan has been approved.

The existence of an Accident Management Plan is a requirement of the Environmental Permit (condition 1.1.1 (a)) and we are satisfied that by requiring this to be produced as a pre-operational condition that this does not prejudice the wider determination of the Permit.

The site is not subject to regulation under "The Control of Major Accident Hazard Regulations (SI 743 1999)" (COMAH). The application confirms that ammonia solution storage at the site will remain below COMAH threshold levels.

Condition 1.3.3 and 1.3.4 have been added to the Permit to place restrictions on the length of time the wood can be stored and the height of the stockpiles.

Note: although condition 1.3.3 and 1.3.4 impose restrictions that aim to minimise the occurrence of a wood fire at the site, the site will also be required to prepare a Risk Assessment and Fire Management Plan as required under the Regulatory Reform (Fire risk) order [(2)]. This risk assessment will need to be approved by North Wales Fire and Rescue Service and the Isle of Anglesey County Council Emergency Planning Service prior to wood being accepted and stored on site. There are likely to be conditions on any fire certificate issued to minimise the potential of a fire on site.

4.3 Energy efficiency

Permit Condition 1.2

We are satisfied that appropriate measures will be in place to ensure that energy is used and generated efficiently. There is a commitment within the Application that general energy efficiency principles will be followed, energy efficient equipment used and a commitment for regular maintenance and monitoring to ensure continued efficiency.
There is potential to increase the energy efficiency of the plant further with the provision of combined heat and power (CHP). Investigations carried out by the Operator have failed to identify any firm opportunities at present. The Operator has, however, confirmed that plant design will incorporate suitable modification to allow for the distribution of heat should a suitable user be identified in the future.

We have included pre-operational condition POC03 to require the Operator to submit an Energy Efficiency plan in line with the Technical Guidance Note for Combustion Activities, for approval at least 1 month prior to commencement of operations at the site. The measures approved will need to be implemented by the Operator.

The Operator is required to report with respect to energy usage under condition 4.2.1 and Schedule 4. These permit conditions require the Operator to submit information to the Environment Agency on an annual basis to detail the amount of biomass wood and diesel oil fuel used on the site during the previous calendar year and the amounts of electrical energy produced, consumed at the site and fed into the National Grid. This data will enable the Environment Agency to ensure that the predicted 37% conversion efficiency of the power generating process is maintained.

Condition 1.2.1 of the Permit requires regular on-going reviews of energy efficiency at the site and that where improvements are identified that they are implemented.

4.4 Efficient use of raw materials

Permit Condition 1.3

Based upon the information submitted in the Application we are satisfied that the appropriate measures are in place to ensure the efficient use of raw

materials and water. There is evidence within the application to indicate that the use of water on the site will be optimised.

Condition 1.3.1. of the Permit requires an audit to ensure the efficient use of raw materials (including water) at least once every 4 years.

Condition 1.3.5 requires that all wood used as fuel on site is sourced from certified sustainable plantations.

4.5 Avoidance of waste produced by the activity Permit Condition 1.4

The main source of waste generated from the fuel combustion process is ash; bottom ash and fly ash. As a result of additional information requested from the Operator we are satisfied that the appropriate measures are in place such that waste production will be avoided as far as possible, and where waste is produced it will be recovered where technically and economically viable. We are satisfied that the Operator's proposed waste disposal options show that disposal methods avoid or minimise any impact on the environment.

The installation has yet to be constructed and as such it is not possible for the Operator to supply detailed information on the disposal/recovery/re-use of all waste streams. We are, however, satisfied that the Operator will assess the wastes from the site in line with the waste hierarchy and actively explore potential recovery routes for key wastes such as ash. We are also satisfied that the Operator has assessed the process in order to minimise the generation of waste as far as possible.

Pre-operational condition POC04 has been added to require the Operator to submit a report, justifying how waste production will be minimised and how each of the waste streams produced at the site will be re-used/recycled/disposed of. This is to be submitted to the Environment Agency for approval at least one month before commencement of operations at the site. This condition has been added to ensure that the Operator has given due consideration to the waste hierarchy in deciding on how each of the waste streams produced is dealt with.

Pre-operational condition POC05 has been added to require the Operator to send a detailed report of the location and the associated infrastructure with each of the waste storage areas on site. This will enable the Environment Agency to assess whether adequate infrastructure is in place to contain any accidental spillage of waste that may occur at the site, therefore protecting the surrounding environment.

4.6 Site Security

Based upon the information submitted in the Application, we are satisfied that appropriate infrastructure and procedures will be in place prior to start up of operations at the site to ensure that the site remains secure.

4.7 Multiple operator installations

The site is not regarded as a multi-operator installation.

5.0 The permitted activities Permit Condition 2.1

We have determined that the Installation comprises the following activities listed in Part 1 of Schedule 1 to the Environmental Permitting (England & Wales) Regulations 2010 and the following directly associated activities.

Listed activities.

Schedule 1, Section 1.1 Part A(1) (a) – burning any fuel in an appliance with a rated thermal input of 50 or more megawatts (aggregated)
The combustion units on site included within this listed activity are:
(i) combustion of biomass wood within a circulating fluidised bed (CFB) boiler with a thermal input of approximately 810MW to produce steam.
(ii) a small auxiliary steam boiler with a thermal input of 3MW and an air emission stack.
(iii) Emergency stand-by diesel generators.

Directly associated activities.

Schedule1, Section 5.4 Part A(1) (b) – cleaning or regenerating ion exchange resins by removing matter which is, or includes, any substance listed in paragraphs 6 to 8 of part 1. **Water demineralisation plant** - From receipt of water from mains supply to discharge of water to CFB and auxiliary boiler plant.

Fuel unloading and transfer - Loading biomass wood at dockside and movement of biomass wood by a series of conveyors and hoppers to the wood storage buildings on site.

Fuel storage and movement - Storage of biomass wood within dedicated buildings, loading of biomass wood on to conveyor and transfer by conveyor to CFB boiler.

Gas oil storage and handling - Off-loading of gas oil from road tanker to dedicated storage tank and transfer by pipe to auxiliary boilers.

Storage and movement of ash - From transfer of ash from CFB boiler to discharge into road container for transport off-site.

Fire protection and detection - Operation of pressurised fire fighting ring and sprinkler system. Regular testing of firewater system and for pumping firewater in the event of an emergency.

Steam turbines - Operation of steam turbines by steam from CFB boiler and/or auxiliary boilers to produce electricity which is fed into National Grid.

The activities comprise a single installation because

(i) they are successive steps in one integrated industrial activity. (fuel supply, fuel storage and movement, CFB boiler, steam turbines).
(ii) Directly associated activities (Gas oil storage and handling, water demineralisation plant, storage and movement of ash, fire protection and detection), as these activities serve the listed activity,

are technically connected and can impact the overall emissions from the site.

6.0 The site

Permit Condition 2.2

The Operator has provided a plan that we consider is satisfactory, showing the site of the Installation and its extent. A plan is included in the permit at Schedule 7, and the Operator is required to carry on the permitted activities within the site boundary.

The installation boundary reflects the fact that the unloading of biomass wood at the jetty, its transport via conveyor and storage are part of the installation. Anglesey Aluminium Metal Renewables (AAMR) are deemed to be responsible for these activities. The final detailed design of the installation has not been received from the operator as the plant is in the early stages of development. A pre-operational condition (POC06) has been included in the permit to require the operator to submit a plan of the installation, associated structures and drainage systems.

7.0 Operations and releases

We have specified that the Operator must operate this installation in accordance with the following descriptions provided in the Application:

Description	Parts	Justification
Application	The response to section 2.1, excluding 2.1.3 and 2.1.5, and 2.2 in the Application.	These sections describe the key operational measures
Schedule 5 Notice Request dated 03/08/10	Response to questions 1-5 detailing abstraction and discharge of cooling water, specification of fuels and waste management.	
Receipt of additional information to the application	Responses to additional questions raised during determination held as part of case file.	

This is confirmed in table S1.2 of the permit.

7.1 BAT Assessment of proposed operating techniques

Combustion unit and consideration of Combined Heat and Power generation

The Operator has concluded within their application that Circulating Fluidised Bed (CFB) technology is BAT (Best Available Technique) for the proposed development. We accept that CFB technology is considered BAT for this type of installation. This is due to the fact that:

- We consider CFB technology to be sufficiently well advanced to be used in the development of 299MWe wood fuelled power plant.

- CFB technology reduces ash production in comparison with other combustion techniques such as grate firing or pulverised solid fuel firing.

- CFB are well suited to burning biomass as they allow for firing on larger wood chips than is the case for alternative boiler and plant designs.

- Biomass wood chip, being a light, non-dusty fuel should fluidise well within the bed.

The Installation will produce electrical energy only; surplus steam will be condensed by air cooling and recycled to the CFB boiler unit for further steam production.

The Environment Agency considers that where there are steam users local to the Installation then Combined Heat and Power (CHP) technology should be used to produce electrical power with surplus steam being utilised as a heating medium either on site or in the immediate locality wherever viable. Such a Combined Heat and Power plant (CHP) would be considered BAT for combustion units as it maximises the amount of energy recovered from the fuel used.

It is noted within the application that the combustion unit will be designed such that it will be possible to easily convert the unit to supply steam for external users as well as electricity if the need should arise. The Operator has demonstrated that they have tried to identify potential users of steam in the vicinity of the site (CHP Assessment – August 2009). However, at this time no such demand is present.

Improvement Condition - IP01 has been included in the Permit to ensure the Operator reviews opportunities for CHP on a regular basis.

Steam turbines.
The Operator indicates within the application that the CFB and steam turbine(s) used will result in a 37% conversion efficiency for the power station. Solid fuel power stations typically achieve a conversion efficiency of 30-35%, the predicted conversion efficiency is favourable and therefore considered BAT. The conversion efficiency provided by the Operator does not take into account the potential for added efficiency should it prove technically and economically feasible to provide heat to surrounding facilities and operate in combined heat and power (CHP) mode. This is not deemed practical for Anglesey Aluminium Metal Renewables Limited at the time of application but opportunities should continue to be explored.

Improvement Condition - IP02 is added to the Permit to require the Operator to demonstrate that they are routinely achieving a 37% conversion efficiency.

Auxiliary boiler
A small conventional gas-oil-fuelled auxiliary boiler (thermal input 3MWth) is planned for the site. This boiler will only be operational during periods of start-

up for the plant and during routine testing. The information supplied indicates that the boiler will only be operational for around 4 hours during the year. The boiler is used to create steam to facilitate the start-up of the steam turbines.

The conventional boiler technology chosen is considered BAT, as it operates for short periods only, combusts liquid fuels efficiently and minimises formation of thermal NOx due to the lower temperatures of combustion.

Biomass wood chip, receipt, storage and on-site transfer.

The Application and additional information provide by the Operator describes the system for the receipt, storage and on-site transfer of the biomass fuel. There is no statement within the Application regarding which option is deemed BAT for the receipt, storage and transfer of wood chip. Wood chip is to be unloaded by grab hoist or bucket loader to a receiving hopper in a controlled manner. We have decided that all onward movement and transfer should be made either within a building or within enclosed systems. This is essential to ensure that fugitive emissions of wood are minimised as far as possible.

The permit states this approach as a condition of operation with a number of requirements regarding ensuring wood is transferred within enclosed systems being added to Table S1.5.

In addition the size of wood chip ensures that the wood is in sufficiently large pieces to be easily handled without creating a dust nuisance but is sufficiently small to ensure efficient combustion. In order to ensure that the fine fractions within the wood chip is minimised to avoid generation of air-borne particulate matter a wood fuel specification is set within Table S2.1.

The maximum particle size will be determined by the requirements of the boiler plant to be installed. The Operator has confirmed the fuel will be compliant with BS EN 14961:2010 *Solid Biofuels – fuel specification and classes.*

Table S2.1 Raw materials and fuel (reproduced below) has been included within the permit. This specifies limits and controls on the use of raw materials and fuels.

The permit does not authorise the acceptance of waste wood or any form of waste derived fuels.

Ash generation, storage and transfer

Table S2.1 Raw materials and fuels	
Raw materials and fuel description	**Specification**
Biomass wood chip	In accordance with specification for Bio Fuels BS EN 14961
Gas oil	Less than 0.1% w/w sulphur content

The application confirms that all ash generated from the installation will be stored and transported within fully enclosed systems to eliminate any fugitive emissions. We agree that this is BAT for ash handling. Additional information

has been provided by the operator to confirm that fly ash and bottom ash will be stored as separate ash fractions to aid recycling and recovery. It is also considered BAT for ash to be transported off site within fully enclosed bulk road tankers. A requirement to transport ash off site in totally enclosed road tankers has been included in the permit in table S1.5.

8.0 Off Site Conditions

Based on the information submitted in the application we are satisfied that it is not necessary to impose any off site conditions.

9.0 Improvement Conditions

Permit Condition 2.4

We have decided to set a number of improvement conditions. These are listed in Annex 3 and justification for their inclusion in the permit are given in the same table.

This is a new installation and as such will be required to operate at BAT in line with the Permit determination from the start of operations. The improvement conditions established here are not improvement conditions in the true sense and are included to ensure that the Operator provides the Environment Agency with information confirmed during and/or after commissioning of the plant. It is not possible to verify such information prior to operations commencing at the site.

The improvement conditions will enable the area compliance team to ensure that the site operates within the parameters stated in their Application and in line with the Permit.

10.0 Pre-operation measures

Permit Condition 2.5

Based on the information in the Application, we have decided to impose pre-operational conditions. These are listed in Annex 3 and justification for their inclusion in the permit are given in the same table. We are using these conditions to require the Operator to confirm that the measures proposed in the application have been adopted or implemented in full prior to the operation of the facility.

11.0 Closure and decommissioning

The site is in the early stages of development and details of closure and decommissioning is limited. We have set a pre-operational condition POC08 in Table S4.1A of the Permit to require the Operator to develop a site closure plan based on the final construction of the site. The permit requires that they submit such a plan for approval at least three month before operations start.

12.0 Emissions to Air, Water or Land

12.1 Emissions to air

A detail report of AQMAU team assessment of the Air dispersion modelling and additional monitoring work has been made available on the public register. This work demonstrated that the air dispersion modelling work for the protection of human health submitted by the applicant was robust.

Oxides of Nitrogen

The boiler for the plant will burn biomass wood chip in a circulating fluidised bed. The Operator has confirmed that the boiler will operate at around 1100K and the combustion environment will remain turbulent to avoid formulation of hot or cold spots. The boiler will be equipped with selective non-catalytic NO_x reduction technology (SNCR). We are satisfied the lower operating temperatures and the use SNCR is considered BAT for this process.

Acid Gases (Sulphur Dioxide and Hydrogen Chloride)

The concentration of hydrogen chloride and sulphur dioxide in emissions to air is dependent on the sulphur and chloride content of the biomass wood chip. This may vary depending on the geographical location in which wood is grown. Abatement for these acid gases can either be wet scrubber technique, or alternatively injection of an alkaline solid (calcium oxide or calcium bicarbonate) to neutralise the gases, with the resultant solids being filtered from the gaseous stream. Typical fuel analysis provided by the Operator confirms that the sulphur content of the fuel is expected to be <0.1%. The operator proposes to remove sulphur emissions via fabric bag filters. The bag filter system is also capable of injecting into condition the flue gases to further reduce emissions as and when required. The Operator commits to this and confirms that the emission limit under indicative BAT of 200mg/m3 is achievable.

We agree with Operator that 'as required' dosing with calcium oxide or calcium bicarbonate is considered BAT for this assessment. An emission limit value of 150mg/m3 has been set in the permit although actual emissions are expected to be well below this level.

Particulate Matter

Particulate matter may arise from point source and fugitive emission. This section describes specific arrangements for point source emissions. The Operator has concluded that bag filters are BAT in respect of particulate abatement for point source emissions. We agree with this conclusion as:

- Combustion processes particulate emissions contain a high proportion of smaller particles (PM_{10}) and bag filters have higher removal efficiency than other techniques for particulate in this range.
- Bag filters can be cleaned and maintained without a need to take the abatement facility off-line.
- Bag filters do not produce an aqueous waste that would require further treatment.

There are no recognised primary abatement techniques for reducing particulate emissions other than ensuring efficient combustion. CFB

technology maximises the efficiency of combustion by ensuring a large surface area between fuel and air.

To ensure that the particulate abatement system operates as reliably as possible, the Operator will need to ensure that sufficient stock of replacement bag filters are kept on site and that replacement occurs without causing a breach of the stated emission limit values.

Emission Limit Values

Emission limit values established by the permit have been set in accordance with indicative BAT or lower for Biomass fuelled combustion units as stated within the relevant Environment Agency Technical Guidance Note – EPR1.01 Combustion Activities.

The table below gives a comparison of indicative BAT, the LCPD limits for biomass combustion and the emissions limit values set within schedule S3.1 of the permit for this installation.

Pollutant	Indicative BAT (mg/Nm^3)	LCPD limits (mg/Nm^3) ('A' limits for solids fuel)	Anglesey Aluminium Renewable Energy Plant Emission limit value (mg/Nm^3)
Carbon monoxide	100-150	n/a	100
Sulphur dioxide	200	400	150
Oxides of nitrogen	150	500 (200 from 2016)	150
Particulate	20	50	20
Hydrogen chloride	25	n/a	20

The Permit, Table S4.1 also allows for emission of the combustion gases carbon monoxide, oxides of nitrogen, particulate and sulphur dioxide from the emission stacks of the stand-by emergency generators. No limits or monitoring requirements are set for these as the Operator has confirmed that these stand-by/emergency generators will only be used for short duration throughout the year.

Dioxins and metals

The release of dioxins and metals from the installation are expected to be negligible due to the nature of the fuel used. However, in order to ensure that

the environment is adequately protected from these pollutants Improvement Condition IP06 has been included. IP06 requires the Operator to monitor and report on dioxin emissions to air from the stack. The monitoring is to be representative of the type and source of the biomass wood used.

Odour Permit Condition 3.3

There are few odour sources on site and all potentially odorous substances such as, gas-oil, wood and ash are required to be transported and stored within enclosed systems. We are satisfied that the appropriate measures will be in place to prevent annoyance from odour.

Condition 3.3 of the permit requires the Operator to control odours at the site so that they do not cause annoyance beyond the site boundary.

12.2 Emissions to water

Abstraction of water

Water used in the cooling process will be abstracted from Holyhead Harbour. As this is a new installation which has yet to enter detailed design the exact location of the abstraction point has yet to be determined. An indicative abstraction point (Grid ref:SH25389 83519) is proposed in the application. The abstraction point will be located so as to prevent thermal recirculation between it and the cooling water discharge point. The abstraction intake will incorporate measures designed to prevent entrapment, entrainment and impingement of marine wildlife. The Operator is required to agree these measures with the Agency.

Pre-operational condition (POC07) has been included in the permit to require the operator to submit the design details to the Agency for approval to ensure that the intake system prevent entrapment, entrainment and impingement of marine wildlife.

Discharge of cooling water

The application together with additional information provided by the Operator confirms arrangements for the discharge of cooling water from the process to Holyhead Bay. As the installation has yet to enter detailed design the exact location of the discharge point has yet to be determined. An indicative cooling water discharge point (CW1) (Grid Ref:SH25695 84118) is proposed in the application. The maximum rate of discharge for the cooling water is limited in the permit to 7,200m^3/day (approximately 720m^3/hr).

The final design of the discharge is expected to include multiple outlets to minimise the mixing zone and encourage rapid dilution of this water. Tidal currents will also ensure mixing dilution of the thermal plume which is expected to extend to a limit of 30 metres from the outlet. The operator has confirmed that with mixing and dilution the thermal plume will result in a net increase of <0.7^oC in the immediate area only. There will be no significant impact of marine flora and fauna.

Discharge of process water, sewerage and surface water
Discharge locations for SW1 (surface water), SW2 (sewerage from an effluent treatment plant) and PW1 (process effluent discharge) referenced in the application relate to existing discharge points controlled under a separate permit (EPR/BL1100IX) held by Anglesey Aluminium Metals Limited. Anglesey Aluminium Metals Renewables Limited have obtained permission to utilise existing pipe work to enable discharge. The point source for emissions referenced in table S3.2 are located at the site boundary interface between the two operators. Parameters set in table S3.2 reflect those established in the original permit.

12.3 Emissions to land

Habitat Assessment
We are satisfied that the proposed installation which has been assessed following guidance agreed jointly with the Countryside Council for Wales (CCW), will have no significant impact on any European site, Site of Special Scientific Interest (SSSI) or non statutory sites.

Details of the Operators assessment are contained in appendix D of the supporting documents. Assessment of the sites were made within agreed distance criteria and the key site identified were:

- Glannau Ynys Gybi (SAC/SPA)
- Ynys Feurig, Cemlyn Bay and The Skerries (SPA)
- Beddmanarch-Cymyran (SSSI)
- Clegir Mawr (SSSI)
- Glannau Rhoscolyn (SSSI)
- Llyn Garreg Lwyd (SSSI)
- Llyn Llwenan (SSSI)
- Llynnau Y Fal/Valley Lakes (SSSI)
- Porth Diana (SSSI)
- Rhoscolyn Reedbed (SSSI)
- Rosneigr (SSSI)
- Rhosneigr Reefs (SSSI)
- Tre Wilmot (SSSI)

The Operator compared predicted concentrations of particulates, nitrogen oxides (NOx) and sulphur dioxide (SO2) to critical levels at the habitat sites. They concluded that the impact at these site was insignificant (i.e. less than 1% of the critical levels) with the exception of one location, Glannau Ynys Gybi (SAC/SPA) where critical levels for Sulphur deposition were exceeded.

It is recognised that background levels for Sulphur deposition at this location exceed critical loads.

The Environment Agency's Air Quality Modelling and Assessment Unit audited the model submitted with the application and identified that the

applicant used an incorrect conversion factor for converting the predicted deposition of kg/ha/yr sulphur to keq/ha/yr sulphur. The applicant's predicted impact of sulphur keq/ha/yr was under estimated by a factor of two.

Our Appendix 11 Assessment, in consultation with CCW also concluded that the impact of Sulphur deposition was significant and that a further 'Appropriate Assessment' (Appendix 12) was required.

The Operator was requested to submit a more detailed assessment of Sulphur deposition for this area. The modelling was based upon maximum emission concentrations from the installation of 150mg/Nm3 (levels associated with the start up of plant) with 100% availability. This represents a significant over estimation of annual emission concentrations and deposition effects.

For the Agency assessment we retained the 100% availability but utilised a typical Sulphur emission concentration for biomass of 50mg/Nm3 in line with the EU BREF note. This assessment demonstrated that the process contribution for Sulphur deposition will be less than 1%-3%. This figure is expected to reduce further still when referenced against an emission concentration of 30mg/Nm3, a more realistic figure for this type of combustion plant.

CCW responded to this assessment on 15 December 2010 and confirmed that they were in agreement with our conclusion that there is no adverse effect on the features of Glannau Ynys Gybi SAC/SPA alone or in combination, but added that it is important that SO2 emissions are minimised as far as possible.

A copy of the Appendix 11 and Appendix 12 (Appropriate Assessment) as approved by CCW has been placed on the public register.

13.0 Monitoring Permit Condition 3.5

We are satisfied that point source emissions monitoring will be undertaken in accordance with EA technical guidance notes, in particular M1 and M2. We have decided that monitoring should be carried out for the parameters listed in tables S3.1 and S3.2 in schedule 3 using the methods and to the frequencies specified in these tables.

Continuous monitoring is required for particulate, oxides of nitrogen, sulphur dioxide, hydrogen chloride, carbon monoxide, nitrous oxide and ammonia. For each of these parameters an annual spot monitoring sample is also required. This spot sample may also be used to calibrate the continuous monitors.

Based on the information in the application we are satisfied that the operator's monitoring techniques and equipment will have either MCERTS certification or MCERTS accreditation as appropriate.

14.0 Reporting Permit Condition 4.2

We have specified reporting as specified in Schedule 4 based on the frequency of monitoring.

In the case of continuous monitoring reporting is required on a quarterly basis.

Periodic spot monitoring reporting is required on an annual basis.

Annex 2: Consultation, publication and advertising responses

Summary of responses to consultation, web publication and newspaper advertising and the way in which we have taken these into account in the determination process. (Newspaper advertising is only carried out for certain application types, in line with our guidance.

Response received from
Friends of the Earth (FoE), 26 May 2010
Brief summary of issues raised
Correspondence confirms that FoE oppose the application on the grounds of: 1. Lack of CHP provision 2. Concerns over the 'sustainability' claims of biomass feedstock and long haul transportation of product. 3. Effect on marine life from cooling water. 4. Impact on landscape value with regards to additional pylons to supply the grid.
Summary of actions taken or show how this has been covered
A summary of how these issues have been considered is provide below: 1. The lack of CHP provision is recognised. Improvement condition IP01 has been included to ensure that further consideration is given to potential users of CHP within the area. The Operator has confirmed that the as built design will allow for easy conversion of the unit to supply steam to external users. 2. We recognise the concerns raised over the sustainability claims of the feedstock. Previous analysis carried out by the Agency confirms that even taking into account the long distance transport by ship CO2 emissions are still greatly reduced when compared to a conventional CCGT power station. In order to ensure that all trees cut are replaced condition 1.3.5 has been included in the permit. This requires wood to be sourced only from certified forest plantations. 3. The potential for impact of the cooling water discharge on the marine environment has been assessed and agreed with CCW as part of the Appendix 11 Assessment. Pre-operational condition PC07 has been included to address concerns over impingement and entrapment of marine flora and fauna. 4. The impact of pylons on the landscape value is a matter for the relevant Planning Authority and not therefore considered in the determination of this application.

Response received from
Primary Care Trust, 14 June 2010
Brief summary of issues raised
Confirms general conclusions made in the application. Highlights that no consideration has been given to the potential for bio-aerosols. And makes the following recommendations: 1. Request monitoring data to compare against predicted emissions. 2. Visual assessments to be conducted as part of monitoring requirements 3. Concerns that bio aerosols will not impact on public health 4. Noise survey to be carried out once plant operational 5. Operator to ensure preventive maintenance and availability of spares. 6. Agree timescales for seeking external certification to ISO14001.
Summary of actions taken or show how this has been covered
1. This request is met by improvement conditions and quarterly monitoring compliance records. 2. Visual assessments will be carried out as part of compliance officer visits. 3. Applicants submission confirm that bio-aerosols will not be an issue. Additional conditions imposed in table S1.5 and fuel specification to minimise the potential for bio-aerosols. 4. The requirement for a noise survey to be carried out is addressed by Improvement Condition IP06. 5. This concern is addressed by conditions 1.1.1 of the permit. 6. This issue is addressed by Pre-Operational Condition POC1.

Response received from
Harbour Authority (Stenaline Ports), 08 July 2010
Brief summary of issues raised
No issues raised with regards the installation. 1. Concerns expressed over extension to offloading jetty raised as part of separate application for FEPA licence
Summary of actions taken or show how this has been covered
This issue is to be addressed as part of FEPA licence determination by the Marine Management Organisation.

Response received from
WAG Fisheries, 12 April 2010
Brief summary of issues raised
Thermal plume from cooling water discharge could, on a positive note, attract fish into the area, in particular Bass and Mullet. Could provide increased fishing in the area and scope for Bass nursery. Could monitoring be established by the operator?
Summary of actions taken or show how this has been covered
Comments noted but not considered as part of permit determination. Will be

raised with the Operator as part of the permit handover and may be addressed in the final design of cooling water discharge point.

Response received from
WAG Transport dept, 11 May 2010
Brief summary of issues raised
Confirm comments sent to Isle of Anglesey County Council relating to routing of construction traffic to the site and future traffic issues should biomass feedstock be sourced locally.
Summary of actions taken or show how this has been covered
Comments noted but not considered as part of permit determination. Will be raised with the Operator as part of the permit handover and may be addressed in the final design of cooling water discharge point.

Response received from
Network Rail, 19 May 2010
Brief summary of issues raised
Confirms that any development work must not compromise the safety and integrity of the operational railway. Also highlights a potential opportunity to import biomass via the existing branch line which serves the site.
Summary of actions taken or show how this has been covered
Not considered as part of permit determination. Will be raised with the Operator as part of the permit handover.

Annex 3 - Improvement Conditions

Ref No.	Condition	Date	Reason
IP01	The Operator shall submit a report to the Agency providing an assessment of potential users of steam within the vicinity of the site. The assessment shall be in line with the requirements of a) Section 2.7.3, Annex 1 and Annex 3 of the Environment Agency's Horizontal Guidance note IPPC H2 – Energy Efficiency. b) The Environment Agency's Horizontal Guidance note H1 – Annex (k) – Justifying and cost-benefit analysis of control measures. c) Article 6 of the Large Combustion Plant Directive. The operator in carrying out the assessment shall also make reference to, as a minimum: (d) National heat maps published by DECC, (e) Sections 2.4 and 2.7 of the European BAT reference note for Large Combustion Plants 2006. Where such users are identified the Operator shall assess the feasibility of supplying the potential user with steam by conversion of the combustion unit at the site to a Combined Heat and Power plant. Where applicable, the report shall include a time-tabled plan to implement such improvements. The report shall also include a commitment for regular structured investigations of potential users of Combined Heat and Power in the vicinity of the site.	18 months after start of operations.	This improvement condition requires the Operator to re-assess whether potential users of CHP are available within the vicinity of the site that can viably be supplied with steam from the power station. The last assessment identified Parc Cybi business park as a potential user. The report should also include a plan on how regular assessments for potential steam users will occur in order to ensure that if such users should come apparent in the future that the Anglesey Renewable Energy Plant will be in a position to supply steam.
IP02	The Operator shall submit a report to the Agency detailing an assessment of the operational conversion efficiency of the power station. Where the calculated operational percentage conversion efficiency is lower than 37% the Operator shall assess how the conversion efficiency can be improved. Where applicable, the report shall include a time-tabled plan to implement such improvements.	12 months after start of operations.	This improvement condition has been established to ensure that the operators energy efficiency calculations are actually met.

IP03	The Operator shall submit a report to the Agency detailing the metals content of the emissions to air through A1 Stack. The metals tested should include but not be limited to cadmium, mercury, chromium, arsenic, vanadium, copper, zinc, nickel and lead. The analysis shall be carried out during the combustion of wood from distinct geographical areas and be representative of the full range of wood received as a fuel at the site. The report should also include a plan for on-going analysis of metals content of emissions from this point source.	6 months after start of operations.	To confirm predictions made in the application, to ensure effective flue gas treatment and to identify any potential differences due to changes in the geographic location of the feedstock.
IP04	The Operator shall submit a report to the Agency detailing the metals and dioxin content of fly ash and bottom ash. The ash shall be sampled at least 20 times over a period of at least 6 months. The range of metals analysed shall include, but not be limited to, copper, zinc, arsenic, lead, cadmium, chromium, mercury, nickel and vanadium. The report shall indicate the geographical source and the nature of the wood that was burnt during the formation of the ash. The analysis shall be carried out during the combustion of woods from distinct geographical area and be representative of the full range of wood received as fuel at the site. The report shall also include a plan for on-going analysis of the ash streams at the site. As a minimum this plan shall include metal analysis of ash for all wood sourced from distinct geographical areas other than those assessed during the initial sampling period.	6 months after start of operation.	Metals and dioxin content of the ash is likely to be dependent on the source and type of wood chip used. This condition requires that the variation in concentration of these pollutants be assessed.
IP05	The Operator shall carry out a noise monitoring survey at the installation to quantify the noise impact during operation against information supplied in the application. The measurement methodology and monitoring locations shall be agreed in writing with the Environment Agency. The results of the survey shall be provided to the Agency.	3 months after start of operation.	To quantify the noise impact of the installation during operation against information supplied in the application.
IP06	The Operator shall submit a report to the Agency analysing the dioxin content of the emissions to air through A1 stack. The analysis shall be carried out during the combustion of wood from distinct geographical areas and be representative of the full range of wood received as fuel at the site. The report should also include a plan for on going analysis of dioxins if the source of biomass wood changes.	3 months after start of operation.	To confirm dioxin content of stack emissions. The dioxin content is likely to be dependent on the source and type of biomass wood chip used. This condition also requires that dioxin emissions be assessed if the primary source of fuel changes.

Annex 4 - Pre-Operational measures for future development

Ref No.	Condition	Timescale	Reason
POC 01	**Environmental Management –** The Operator shall develop and implement an Environmental Management System (EMS) and make this available for inspection from the Environment Agency. The Operator shall confirm that the EMS is subject to independent third party assessment and where appropriate submit a schedule by which the EMS will be subject to third party registration.	At least 3 months prior to start of operations.	To ensure that a written management system is in place to meet the requirements of condition 1.1.
POC 02	**Accident Management Plan -** The Operator shall submit written details of the Accident Management Plan for approval to the Agency. Operations at the site shall not commence until the Accident Management Plan is approved in writing by the Environment Agency.	1 month prior to the installation commissioning date.	To ensure that formal arrangements are in place for dealing with incidents.
POC 03	**Energy Efficiency Plan –** The Operator shall submit a written Energy Efficiency Plan for approval by the Environment Agency. Operations at the site shall not commence until the plan is approved in writing by the Environment Agency.	1 month prior to the start of the installation commissioning date.	To ensure energy efficiency during operation in line with Environment Agency guidance.
POC 04	**Waste Management Plan –** The Operator shall submit details of how waste produced at the site will be minimised and how any waste will be reused, recycled and/or disposed. The plan shall include storage arrangements and an assessment of whether the proposed routes represent the Best Environmental Option for each waste. Where improvements are identified the Operator shall propose a schedule to implement these improvements. Operations shall not commence until waste management proposals have been approved in writing by the Agency.	1 month prior to the start of the installation commissioning date.	To confirm waste hierarchy is considered and that arrangements are in place for the management/storage of waste. In particular bottom ash and fly ash.
POC 05	**As built site plan –** The operator shall submit a detailed report / plan showing the location and infrastructure in place for managing and storing waste materials from the process	1 month prior to the start of the installation commissioning date.	To confirm arrangements and location of the waste storage areas.

Ref No.	Condition	Timescale	Reason
POC 06	**Detailed design -** The operator shall submit a written report to the Environment Agency providing detailed design for the installation, including all drainage systems.	At least 3 months prior to the installation commissioning date.	Required for information and records.
POC 07	**Design of Abstraction/Discharge Points –** The operator shall submit a written report for approval design proposal for the cooling water abstraction and discharge. This will confirm grid reference points for abstraction and discharge and measures to prevent entrapment, entrainment and impingement of marine flora/fauna.	At least 3 months prior to the installation commissioning date.	To confirm location of abstraction and discharge points and to ensure best practice employed to protect wildlife. This also addresses concerns raised during determination by CCW.
POC 08	**Site Closure Plan -** The Operator shall submit a written Site Closure Plan to the Environment Agency. The plan (based on the final constructed plant design) should demonstrate how best environmental practice will be used to minimise impact on the environment during any closure or decommissioning of all or part of the site. Operations shall not commence until this plan has been approved in writing by the Environment Agency.	At least 3 months prior to start of operations.	To ensure protection of the environment during decommissioning and closure of the installation.