

Environment Agency Permitting decisions

We have decided to grant a permit to **Western Bio-Energy Limited** for operation of the **Western Wood Energy Plant-Margam**.

The permit number is **EPR/ZP3939GL**

The operator is **Western Bio-Energy Limited**

The facility is located at **Longlands Lane, Margam, Port Talbot, SA13 2NR**

The decision was effective from **18 August 2009**

Summary of the decision

We have decided to grant a permit to the operator, subject to the conditions in the permit. We consider that the conditions included within the permit will ensure that the installation is operated in a manner that will result in appropriate minimisation of pollution risk and no harm to the local environment.

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.

This application is effectively a re-submission of an earlier permit application originally made to the Environment Agency under the PPC Regulations in February 2007 (application reference SP3735UJ). This application was effectively withdrawn as a result of the applicant deciding to progress an application to Neath Port Talbot CBC for a Part B Permit under the PPC Regulations. This change in approach resulted from uncertainty in the regulatory position regarding waste wood when utilised in biomass combustion plants. The applicant was subsequently granted a Part B Permit by Neath Port Talbot CBC in January 2008 (permit reference E3/1/129) to burn virgin timber only in the proposed plant. As a result of the applicant's requirement to burn clean waste wood as part of the installation activities, this new application for a Part A(1) activity was effectively re-submitted to the Environment Agency in September 2008, under the Environmental Permitting (England and Wales) Regulations 2007.

Brief description of the facility

The Western Wood Energy Plant is a power plant for the generation of electrical power by the combustion of biomass. The plant has a capacity for burning approximately 160,000 tonnes of biomass per annum which will provide the potential to export 14 MWe of electrical power to the National Grid

network. The plant will consume both virgin wood biomass material and waste wood biomass sourced from local suppliers. The waste wood biomass is derived from sources of clean waste wood which will meet the exemption requirements of the Waste Incineration Directive (WID). At 47.5 MWt capacity, the plant is not subject to the requirements of the Large Combustion Plant Directive (LCPD).

The plant is currently in operation burning virgin biomass under the control of a Part B Permit issued by the Local Authority. The Part B Permit will be superseded by the issue of this permit, which enables the operator to burn clean waste wood biomass in addition to the virgin wood biomass fuel used in the current operation.

The plant comprises a single travelling grate combustor unit which receives chipped biomass fuel introduced by conveyor and spreader stoker arrangement. Hot gases from the combustor unit are passed through a boiler to generate high pressure steam which in turn is used to drive a turbine which generates the electrical power for export to the Grid. The steam exiting from the turbine is condensed via an air cooled condenser before being returned to the boiler unit. The exhaust combustion gases are cleaned in flue gas treatment plant using a coarse ash separator and fabric bag filters prior to discharge from a 55 metre chimney. The plant has a rated thermal input capacity of 47.5 MWt.

The main emissions to air are combustion gases, predominantly oxides of nitrogen, carbon monoxide and particulate, resulting from the biomass combustion process. Spent process water from the activities is initially treated by an on-site effluent treatment plant prior to discharge to a Welsh Water sewer under a discharge consent. Surface storm water is collected from roofs and hard standing areas of the site via oil interceptors, prior to discharge to an off-site ditch which drains to an adjacent marshland area.

The plant is located close to the nearby Corus Steel Works and BOC Gases Plant at the south eastern side of Margam. Eglwys Nunydd Reservoir and Margam Moor SSSI sites lie approximately 1.0 km to the south of the site. The M4 motorway lies approximately 500m to the east of the site.

Purpose of this document

This decision document:

- explains how the applicant's 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.

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

Structure of this document

- Key Issues of the decision;
- Annex 1 the decision check list;
- Annex 2 the consultation responses.

Key Issues of the decision

The key environmental issues in determining this application are considered to be as follows :-

- Renewable energy, thermal efficiency and global warming potential.
- Biomass fuel sourcing and receipt.
- Efficient use of raw materials.
- Emissions to air.
- Ash handling and disposal from the biomass combustion process.

Renewable energy, thermal efficiency and global warming potential

The plant benefits from renewable obligation certificates (ROCs) issued to it in relation to the amount of electrical power generated from renewable fuel sources. The input biomass fuel consists of virgin wood and virgin wood wastes from forestry operations and clean waste wood from approved waste wood recovery and reclamation companies. All input biomass fuel is therefore considered to arise from renewable fuel sources. Only clean waste wood, meeting the criteria for exclusion from the Waste Incineration Directive (WID) will be utilised at the plant.

The plant does not currently have any provision for utilisation of waste heat within a combined heat and power (CHP) arrangement. Planning approval considerations have in principle determined the acceptability of the location of the plant, and as such there are currently no viable users for the waste heat that could be made available from the combustion and steam generation plant. However, the combustion unit, superheater and two stage economiser for steam generation have been optimised to maximise electrical energy generation via the steam turbine.

As this is an existing installation, the applicant did not provided a detailed appraisal of furnace technology options within the application. However, the Agency would regard mass burn moving grate or fluidised bed combustion technology as BAT in respect to thermal efficiency for this scale of plant. Any marginal gains in thermal efficiency from fluidised bed technology would only be realised from plant at two or three times the capacity of this one. Gasification or Pyrolysis are still regarded as emergent technologies and require lower and controlled input fuel moisture content, which is not possible to achieve when a significant proportion of the input biomass fuel is from forestry derived materials.

The combustion unit incorporates pre-heating of combustion air with controlled staged introduction of primary and secondary air to the furnace. Spreader air is also utilised for introduction of biomass fuel into the furnace. The combustion unit also has provision for Flue Gas Recirculation (FGR) for additional NO_x control of the combustion process.

The plant has a designed thermal capacity of 47.5 MWt (utilising biomass fuel with an average net calorific value of 8.5 MJ/kg). This will enable gross electrical power generation of 15.2 MWe resulting in a gross efficiency of 32%. However the plant has a typical average parasitic load of 1.3 MWe, which results in a net plant efficiency of approximately 29%. The BReF for large combustion plants states in Section 5.5.4 that the gross efficiency of biomass fluidised bed combustion plants is around 28-30% and that for grate firing it is around 20%. Plant performance is therefore at the upper end of the range described in the BReF for grate and fluidised bed type furnaces. The Agency therefore considers that the spreader stoker moving grate furnace is BAT, considering the scale of the plant and the biomass fuel being input to it. However, in the absence of any identified potential users of waste heat from the combustion process, IC2 has been included in the permit, which requires the operator to investigate the potential for use of waste heat to pre-dry the input biomass fuel so that overall combustion efficiency might be increased.

Over 99% of the fuel used in the process will be from renewable resources (plant derived biomass), only small quantities of fuel oil will be used during plant start up, to initiate the combustion process after any shutdown period. Therefore virtually all of the carbon dioxide released from the process is viewed to be biogenic and is not considered to contribute to global warming, since this carbon has been recently extracted from the atmosphere via photosynthesis by the plant derived biomass fuel. The combustion carbon dioxide released is therefore not new, and does not add to the global inventory. This installation acts to reduce the global CO₂ inventory, by only emitting carbon which is already in the cycle and negating the need for emissions of carbon dioxide from fossil fuel (new carbon dioxide) to generate electricity.

The operator has undertaken a BAT assessment to evaluate the potential for possible further reduction of NO_x emissions from the combustion process. The application considers the use of Selective Non-Catalytic Reduction (SNCR) and Selective Catalytic Reduction (SCR) in the form of ammonia injection into the furnace or to the waste gas stream. This would reduce the emissions of NO_x to atmosphere but would require the use of an additional reagent (ammonia), would increase capital and operating costs of the plant and would lead to emissions of ammonia and nitrous oxide (N₂O) to atmosphere. The Operator states that SNCR would lead to a significant increase in emission of N₂O from the process as well as increasing the risk of 'ammonia slip', with the associated risk of odour release and additional impact from this emission. As nitrous oxide has a global warming potential 310 times higher than carbon dioxide, this would result in a significant increase to the existing global warming potential from the site relative to the small existing non-biogenic carbon dioxide releases associated with supplementary fuel burning. The air quality assessment report submitted as part of the application has demonstrated that the predicted baseline NO_x emissions will not result in any breach of local air quality objectives for NO_x, and that both SNCR and SCR abatement systems would have only a minimal reduction effect on predicted total ground level concentration of nitrogen dioxide. The utilisation of plant derived biomass fuel at the installation is therefore

considered to be 'carbon neutral' in respect to global warming potential. The current emissions of nitrogen oxides do not have an unacceptable impact on local air quality, the disadvantages of SNCR or SCR therefore outweigh any reduction in emissions of nitrogen oxides that might be achieved from these abatement technologies. The proposed techniques are therefore considered BAT in respect to global warming potential.

Biomass Fuel Sourcing and Receipt

Biomass fuel delivered to the plant will be from a number of sources and in a variety of physical forms:- Roundwood logs, virgin wood chips, baled brush bundles, waste wood chips and shavings, peelings and sawdust.

Chipped and particulate fuel materials are delivered in covered transport and stored in storage bays inside the building. Roundwood and baled forestry product materials will be delivered on open sided transport and stored at an outside log store storage yard. Roundwood logs and baled material are processed through a diesel powered log chipping plant prior to conveying to the combustion plant.

It is important that both the waste wood biomass and virgin fuel material used within the combustion process meet the exemption criteria detailed within the WID, and as described in the Environment Agency Position Statement – The Environmental Regulation of Wood v5, July 2008. The original application documentation did not adequately describe how the operator would ensure this, and further clarification and details of this were requested through a Schedule 4 Notice to the original application. The applicant responded that detailed contracts of supply had been set up for each fuel supplier. Details of each contact were provided, whereby the exclusion of any contaminated materials is explicitly stated. The contracts also make provision for the Operator to visit the supplier premises, to audit their operations and procedures and validate that contract conditions are being complied with.

During determination of this application the Operator was requested to produce and supply detailed inspection, testing and receipt procedures for deliveries of fuel to the plant and to demonstrate that the results of the inspection procedures would be adequately logged and recorded. The detailed procedures supplied also included quarantine and rejection procedures if it is found that any delivered load contains unacceptable material.

The biomass fuel input is also controlled through Conditions 2.3.2 and 2.3.3 of the permit as detailed in Tables S3.1 and S3.2 of Schedule 3.

Table S3.1 Raw materials and fuels	
Raw materials and fuel description	Specification
Light Fuel Oil for supplementary firing in combustor.	Less than 0.1% w/w sulphur content
Virgin wood biomass	From approved suppliers in accordance with specific contract for supply.

Table S3.2 Permitted waste types and quantities for use in combustion appliance	
Maximum quantity	
EWC code	Description
02 01 07	Wastes from forestry
03 01 01	Waste bark and cork
03 01 05	sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04. (Virgin and untreated non-virgin timber offcuts, shavings, chippings and sawdust from the processing of virgin and non-virgin timber that are exempt from the requirements of the Waste Incineration Directive 2000/76/EC – but excluding particle board waste).
03 03 01	Waste bark and wood
15 01 03	Wooden packaging. (clean waste wood from non returnable pallets that is exempt from the requirements of the Waste Incineration Directive 2000/76/EC).

Virgin timber is timber from:

- a) Whole trees and the woody parts of trees including branches and bark derived from forestry works, woodland management, tree surgery and other similar operations (it does not include clippings or trimmings that consist primarily of foliage).
- b) Virgin wood processing (e.g. wood offcuts, shavings or sawdust from sawmills) or timber product manufacture dealing in virgin timber.

The supplier contract arrangements and the detailed fuel receipt procedures have now been incorporated as a operating techniques for the plant, through inclusion in Table S1.2 of the permit. We are now satisfied that the Operator has suitable controls in place that will ensure that only clean waste wood will be burned in the combustion plant and that this will satisfy the WID exemption criteria and the Agency Position Statement on the Environmental Regulation of Wood.

Efficient use of raw materials

Other than the input biomass fuel for the combustion plant, the consumption of other raw materials within the installation will be low and will provide few opportunities for environmental gain through alternative selection or improved utilisation. Table 2.5 of the application details the non-biomass materials that are used within the installation and their typical expected annual usage. Towns water for boiler feed replenishment and light fuel oil for start-up firing in the furnace will be consumed in significant quantities. Exit steam from the turbine will be recirculated via air cooled condensers, but make-up water for the boiler system will be required to compensate for boiler blow downs. A reverse osmosis plant will be used to provide the high quality replacement water for this purpose. Small quantities of chemicals will be used for membrane cleaning in the RO plant and to treat the the small quantities of boiler blow down and other accumulated effluent from the site prior to discharge to sewer. Small quantities of hydraulic and lubricating oils will also be consumed by the plant machinery and equipment.

Although the majority of the anticipated water usage at the site (14,000 tonne/annum) will arise from boiler make-up requirements, there is significant loss due to replenishment of the bottom ash quench system and through clean-down procedures on the plant. IC1 requires the Operator to investigate ways of harvesting storm water draining from roofs and hardstanding areas, so that it might be utilised in the low grade consumption requirements of quench bath make-up and general clean down usage.

Emissions to Air

The plant consists of a single combustion unit with the flue gases from the combustion process being discharged via a single 55m chimney stack which is referenced as A1.

There is also an emission from the exhaust of the 650hp diesel engine powering the woodchipper unit, however this emission is considered to be minor and no monitoring or emission limits are considered necessary. Periodic delivery of light fuel oil to the supplementary fuel storage tank is undertaken via a vapour transfer filling arrangement with no passive venting.

In Table 2.4 of the application, the operator has provided an analysis of the expected chemical composition of the wood biomass to be used as input fuel for the combustion process. The moisture content of the incoming fuel is indicated to be relatively high at 49%, which results in the 'as delivered' net calorific value of the fuel to be relatively low at only 8.5 KJ/kg.

In Table 3.2 of the application, the operator has detailed the emissions they expect in the flue gas and proposed emission limits that they consider the plant is capable of operating to. These are summarised in the table below along with the indicative BAT benchmark values taken from the the Agency Combustion Sector Technical Guidance Note S1.01, March 2009. LCPD emission limit values are also included for reference. SGN S1.01 does not specifically refer to biomass combustion plants between 3 and 50MWt, however although this Guidance is intended for reference against larger scale combustion plant (above 50MWt) it is considered a relevant reference for combustion plant regulated by the Environment Agency. It should also be noted that this plant is below the threshold for LCPD consideration. (The existing Defra guidance note PG 1/3 (95) for plant in the range 20 – 50 MWt gives limit values in excess of those detailed below).

Emission	Operator proposed limit value - mg/m3	SGN S1.01 Benchmark Value – (grate system) - mg/m3	LCPD ELV - mg/m3
Particulate (PM ₁₀)	10	20	50
Oxides of Nitrogen	250	300	300
Carbon Monoxide	250	100 – 250*	-
Sulphur Dioxide	150	300	200
Hydrogen Chloride	100	25**	-

* Upper end of range applies where higher moisture content biomass is BAT.

** Where straw or other high Cl containing biomass is used, HCl concentrations may be up to 300 mg/m3.

The Operator proposes to achieve NO_x control by the staged input of primary and secondary combustion air to the furnace and FGR. They propose to control Particulate by a cyclone and dual stream bag filter system with differential pressure monitoring. The proposed limits are below those indicated in the Guidance Note, therefore the Agency considers these control systems are BAT for a combustion unit of this size burning biomass.

Carbon monoxide is interdependent with NO_x production in the furnace (low NO_x usually means high CO and vice versa) and is therefore influenced by the same measures, and the moisture content of the input biomass. The plant also has continuous monitoring of flue gas oxygen and moisture content as a process control measure to aid control of these releases. The sulphur and chlorine content of the input fuel is expected to be low as indicated by the fuel composition analysis provided in the application, but with some variation dependent on the input sourcing of the biomass fuel. The limits proposed by the Operator are therefore considered acceptable for this plant in view of the nature of the biomass fuel being utilised by the plant and by reference to the benchmark values indicated in the Guidance Note.

The proposed limit values have been used in the Operators air dispersion modelling study (see subsequent Air Quality section of this document) where it has been demonstrated that they will not result in any breach of local air quality standards.

Through Table S4.1 of Schedule 4 of the permit the Operator is required to continuously monitor Particulate, Nitrogen Dioxide and Carbon Monoxide and to conduct periodic monitoring for Sulphur Dioxide, Hydrogen Chloride, Cadmium/Thallium and their compounds, Mercury and its compounds and Dioxins/Furans. No limits have been set for the heavy metal and dioxin/furan determinands. The Agency has required monitoring of these materials in view of the waste wood biomass now being included as input fuel, it will support validation of the input fuel acceptance procedures during the early stages of operation with this fuel. IC4 has been included in the permit, which requires the Operator to undertake a study of input fuel sampling results and correlate these with flue gas emission analysis. From this validation of fuel sampling and analysis techniques, it may then be possible to make proposals to reduce the periodic monitoring frequency for some determinands.

Ash handling and disposal from the biomass combustion process

Bottom ash from the moving grate is deposited into a water quench bath prior to being conveyed to a collection bunker where some of the residual water content is enabled to drain back to the quench bath. The damp ash is then transferred to purpose designed skips in a covered holding area with drainage containment back to the quench system circuit. Coarse fly ash which accumulates in the superheater and economiser stages of the boiler system is collected and re-introduced to the furnace. Finer fly ash particles collected from the cyclone and bag filter systems are conveyed to a fly ash storage silo prior to being removed from site in a purpose designed transport container.

Both accumulated ash streams are currently transported off site for recovery as a soil conditioner by a soil reclamation company. The Agency considers that these waste handling procedures are BAT having regard to the combustion process, abatement techniques and biomass fuel used in the process. However, IC4 and the process monitoring of ash residues required through Table S4.4 of the permit will enable the ongoing acceptability of this waste recovery route to be validated in view of the waste wood biomass now being used as an input fuel.

Environmental risk

The most significant risk from the installation is that associated with the release of flue gases from the 55m high stack at the site. These are considered in more detail in the previous 'Emissions to Air' section of this document and the 'Air Quality and Impact' and 'Conservation' sections below. The Operator has provided a detailed air dispersion modelling and impact assessment report as part of the application.

The storage of significant quantities of wood biomass in chip, sawdust, peelings, shavings and brash physical format presents a risk of accidental fire accident incident at the site. An installed sprinkler system in the main site buildings reduces the likelihood of this event, but any established accidental fire incident could result in significant quantities of fire fighting water having to be used at the site. The site is contained by a bund covering the west and south side perimeters (natural gradient fall) with a surface drainage isolation facility. This bunded arrangement has the capacity to contain 750m³ of firewater. The application contains a detailed consideration of Hazard Identification and Risk Assessment, but a detailed site specific Accident Management Plan is not currently included as part of the management system for the installation. IC6 has therefore been included in the permit that requires the Operator to prepare and submit an Accident Management Plan for the site to the Agency for approval.

Conservation

Margam Moors SSSI is located approximately 1.1 km from the site and Kenfig SAC approximately 2.8 km from the site. The dispersion modelling study and impact assessment supplied as part of the application considered both of these receptors utilising the proposed emission limit values as inputs to the modelling study. The potential impact on these conservation sites has been considered for Nitrogen Dioxide, Sulphur Dioxide, N Deposition and Acidification. The predicted impacts have been summarised in the tables below, utilising predicted process contribution values from the modelling study and background concentration and Critical Load/Level values from the apis website.

Table 1 **Oxides of Nitrogen**

	Kenfig SAC	Margam Moors SSSI
CLe ($\mu\text{g}/\text{m}^3$)	30	30
Process Contribution ($\mu\text{g}/\text{m}^3$)	< 0.1	0.1
PC as % of CLe (%)	< 0.3%	0.3%
Background ($\mu\text{g}/\text{m}^3$)	26.6	26.6
PEC ($\mu\text{g}/\text{m}^3$)	26.6	26.7
PEC as % of CLe (%)	89%	89%

Table 2 **Sulphur Dioxide**

	Kenfig SAC	Margam Moors SSSI
CLe ($\mu\text{g}/\text{m}^3$)	20	20
Process Contribution ($\mu\text{g}/\text{m}^3$)	< 0.03	0.03
PC as % of CLe (%)	< 0.15%	0.15%
Background ($\mu\text{g}/\text{m}^3$)	4.7	4.7
PEC ($\mu\text{g}/\text{m}^3$)	4.8	4.9
PEC as % of CLe (%)	24%	25%

Table 3 **Nitrogen Deposition**

	Kenfig SAC	Margam Moors SSSI
CLo (kg N/Ha/Year)	10 - 20	20 - 30
Process Contribution (kg N/Ha/Year)	< 0.05	< 0.05
PC as % of CLo (%)	< 0.5%	< 0.25%
Background (kg N/Ha/Year)	9.4	9.4
PEC (kg N/Ha/Year)	9.4	9.4
PEC as % of CLo (%)	94%	47%

Table 4 **Acidification**

	Kenfig SAC	Margam Moors SSSI
CLo (keq/Ha/Year)	4.0	1.5
Process Contribution (keq/Ha/Year)	< 0.05	< 0.05
PC as % of CLo (%)	< 1.25%	< 3.3%
Background (keq/Ha/Year)	0.91	0.91
PEC (keq/Ha/Year)	0.96	0.96
PEC as % of CLo (%)	24%	64%

All of the predicted process contribution impacts on Kenfig SAC are considered to be insignificant according to H1 assessment methodology. The predicted process contribution impact on Margam Moors SSSI is also considered unlikely to cause damage to the SSSI. An Appendix 11 has been completed with the above summary data and sent to CCW on an 'For Information Only' basis as all impacts are considered insignificant and the application proposal is not considered to be Large, Novel or Complex.

Groundwater

There are no process discharges to groundwater. All process effluent is discharged to the Welsh Water sewer. Surface water drainage from the site is collected and discharged to an adjacent ditch via a Spel class 2 oil interceptor.

The land beneath the site was previously used as agricultural grazing land. The Operator supplied an Application Site Report as part of the original application which included a conceptual site model and analytical data obtained from trial pit and bore hole sampling at the site. The geological sequence beneath the site is described as drift deposits of alluvium and glacial sands and gravels overlying Middle Coal Measures. The Agency Groundwater Vulnerability Map indicates the site is located over a Minor Aquifer but not within a SPZ.

There are no below ground storage tanks at the installation and only a limited number of sub-surface drainage routings. Other than the Light Fuel Oil for auxiliary firing in the combustion unit, the usage and storage of other chemical materials is very low. The fuel oil for auxiliary firing in the combustion unit is stored in an above ground 50m³ double skinned storage tank with a leak detection system fitted. The storage and loading/unloading areas for these materials and waste materials is concrete surfaced. We therefore accept the Operator's assessment of little likelihood of pollution to the land at the site. However, now that the site is fully operational we have included IC7 in the permit that requires the operator to undertake a review of these measures and to make proposals for an ongoing assessment and testing programme for the site.

Air quality

The site is located in proximity to the Corus Steelworks and the M4 motorway. As a result of these activities, Neath Port Talbot Borough Council have declared an Air Quality Management Area covering the adjacent Margam and Taibach area due to high levels of PM₁₀. The site is located outside of the AQMA and to the south east from it, but is inside the Action Plan area relating to it.

The Operator completed an impact assessment using the H1 screening assessment tool, but has also supplied a detailed air quality assessment report as part of the application (Appendix A).

The air quality assessment report includes a detailed dispersion modelling study utilising ADMS 3.3 which incorporates two sets of meteorological data (5 years) - from St Athan and more local data from the NPTBC Groesven Hospital monitoring station outside Margam. Background data has been taken from the NETCEN Groesven Hospital monitoring station. NAQMAU have reviewed the submitted air impact report and dispersion modelling study including the model input files. They concluded that the dispersion modelling study adequately describes predicted air impacts and that that the air quality

assessment report takes account of all relevant factors. (A copy of their review of the report is attached to this document).

The Operator undertook a D1 stack height assessment as the initial part of their study, this resulted in a recommended stack height of 45 metres. However, they subsequently undertook a further sensitivity analysis and concluded that a significant reduction of process contributions could be achieved by increasing the stack height to 55 metres. The plant has been constructed with a 55 metre high stack for discharge of the flue gases, and the modelling studies are based on this parameter.

The modelling study considered the releases of Nitrogen Dioxide, Sulphur Dioxide, Particulate (PM₁₀), Carbon Monoxide and Hydrogen Chloride. All predicted ground level concentrations screened out according to the H1 significance criteria for Long and Short Term impacts, with the exception of Long Term NO₂ (St Athan), Long Term HCl (St Athan), Long Term NO₂ (Margam), Short Term SO₂ (Margam), Long Term HCl (Margam) and Short Term HCl (Margam). These are summarised in the table below, along with the predicted ground level Process Contribution for PM₁₀.

Pollutant	AQS (µg/m ³)	PC(µg/m ³)	PC %	PEC (µg/m ³)	PEC %
NO ₂ LT (St Athan)	40	0.84	2.1	22.39	56.0
HCl LT (St Athan)	20	0.78	3.9	No Data	N/A
NO ₂ LT (Margam)	40	1.41	3.5	22.37	55.9
SO ₂ ST (Margam)	266	35.14	13.2	149.81	56.3
HCl LT (Margam)	20	0.99	5.0	No Data	N/A
HCl ST (Margam)	750	82.10	10.3	No Data	N/A
PM ₁₀ LT (St Athan)	40	0.078	0.2	-	-
PM ₁₀ ST (St Athan)	50	0.40	0.8	-	-
PM ₁₀ LT (Margam)	40	0.099	0.25	-	-
PM ₁₀ ST (Margam)	50	0.45	0.9	-	-

Although no background data is available for hydrogen chloride, there are no other significant local source of this pollutant, so it is considered unlikely that there will be any exceedences of the EALs. Emission values used in the modelling are in any case likely to be precautionary considering the expected low chlorine content of the input biomass fuel.

When considering the background concentration of Nitrogen Dioxide it has been demonstrated that there will be no expected exceedence of the AQ objective for this pollutant.

The maximum Long Term process contribution of PM₁₀ is less than 1% of the AQ objective and close to the 'insignificance' value of 0.2% described in the Action Plan Policy. The Short-Term background concentration of PM₁₀ currently exceed the AQ objective within the AQMA. The maximum Short Term process contribution of PM₁₀ is predicted to be less than 1% of the AQ objective, and the modelling study indicates that the contribution at the nearest point of the AQMA will be less than the 0.2% 'insignificance' value described in the Action Plan Policy.

Monitoring and compliance

Although the installation is not subject to the LCPD, the Operator has committed to the continuous monitoring of Nitrogen Dioxide, Carbon Monoxide and Particulate (PM₁₀) with MCERTs certified CEM equipment. They have also committed to the periodic monitoring of Sulphur Dioxide and Hydrogen Chloride and limits have been set for these determinands in Schedule 4 of the permit. We have also requested the Operator to conduct periodic exhaust stream monitoring for heavy metals and dioxins/furans during the first year of operation under this permit. This will support validation of fuel supply procedures when waste wood biomass is introduced to the process.

The Operator has yet to finalise the details of a trade effluent Consent to Discharge with the sewerage undertaker Welsh Water. As the composition and quantity of the effluent discharge is not significant, we have not imposed any additional monitoring requirements for this, but have requested that the Operator supplies details of the Consent when finalised, and reports data to the Agency on a periodic basis.

Operator

Western Bio-Energy Ltd are considered to be the operator of the installation as they have direct control over operations at the site and have responsibility for financial decisions, manpower and the rate of operation of the plant. Day to day operation and maintenance are contracted to the Western Biomass Operating Company (WBOC). Fuel supply and sourcing is contracted to Eco2 Ltd.

The site management arrangements are outlined in section 2.3 of the application where the Operator has also indicated an intention to progress to external certification of the management system. Additional details of the management of fuel supply arrangements and those for operations and maintenance at the site were provided during determination. However, improvement condition IC8 has been included in the permit, which requires the operator to produce an integrated documented environmental management system for the site, such that responsibilities are clearly defined and that the permanent contractor systems are fully integrated within it.

Annex 1: decision checklist

Activity	Justification / Detail	Determination criteria met	
		No	Yes
Receipt of submission			
Application fee	The application fee is correct The total Application Fee (£20,020) submitted with the original application (SP3735UJ) was never refunded and considering the circumstances associated with this and the re-submitted application – the Agency considers that this fee is appropriate.		✓
Commercial confidentiality	The operator has not made a claim for commercial confidentiality. We have not received any information in relation to this application that appears to be confidential in relation to any party.		✓
Consultation			
Scope of consultation	The consultation requirements were identified and implemented. The decision was taken in accordance with our Public Participation Statement. Copies of the application were sent to – Neath Port Talbot County Borough Council Neath Port Talbot Local Health Board FSA Dwr Cymru/Welsh Water CCW Copies of the application were also placed on relevant Agency and Local Authority Public Registers. The application was advertised on the EA website and in the South Wales Evening Post on 08/10/08.		✓
Consultation responses	The consultation responses (Annex 2) were taken into account in the decision.		✓
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	The regulated facility is an installation which comprises the following activities listed in Part 2 of Schedule 1 to the Environmental Permitting Regulations and the following directly associated activities. <ul style="list-style-type: none"> Section 1.1 A(1)(b)(iii) : Burning any fuel manufactured from, or comprising, any other waste, in an appliance with a rated thermal input of 3 or more megawatts, but less than 50 megawatts. And the following Directly Associated Activities – Electrical Power Generation, Water Treatment, Storage and preparation of biomass fuel, Storage of Supplementary Firing Fuel Oil and storage and transfer of ash Wastes. 		✓
European Directives			
Applicable Directives	The European Directives that apply are as follows – The IPPC Directive.		✓
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. A plan is included in the permit at Schedule 2, and the operator is required to carry on the permitted activities within the site boundary.		✓
Site condition report	The operator has provided a description of the condition of the site which we consider is satisfactory. The decision was taken in accordance with our guidance on site condition reports – guidance and templates TGN H5. The Application Site Report supplied with the application was in H7 Guidance format and this is considered to be satisfactory.		✓

Activity	Justification / Detail	Determination criteria met	
		No	Yes
Environmental Risk Assessment and operating techniques			
Environmental risk	We have reviewed the operator's assessment of the environmental risk from the facility. The assessment shows that when applying the conservative criteria in our guidance on Environmental Risk Assessment all emissions may be categorised as acceptable to ensure protection of human health, ecological receptors and the environment.		✓
Operating techniques	We have reviewed the techniques used by the operator and compared these with the relevant guidance notes – Combustion Activities Sector Guidance Note - EPR 1.01) 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	<p>The permit contains many conditions taken from our permit template (this is available at). We developed these conditions in consultation with industry having regard to the relevant legislation. This decision document does not include an explanation for these usual conditions.</p> <p>Where such conditions are imposed we have considered the application and accepted the details are sufficient and satisfactory to control that aspect of the operation. Where we consider information supplied with the application and subsequent responses to further information requests is not fully sufficient and satisfactory, we have included Improvement Conditions within the Permit as justified below.</p> <p>IC1 - This has been included such that the Operator is required to investigate further opportunities to improve water utilisation at the site by collecting storm water from roofs and hardstanding areas for use in low grade water usage activities at the site.</p> <p>IC2 - This has been included so tha the Operator is required to further investigate opportunities for increased energy efficiency from the combustion unit by considering the utilisation of waste heat from the process to pre-dry incoming higher moisture content biomass fuel.</p> <p>IC3 - The Operator does not yet have finally agreed Discharge Consent with Dwr Cymru/Welsh Water for their process discharge to foul sewer. Although this emission is not of a high volume or to contain harmful materials, the Agency requires details of this consent as a means to ensuring that emissions to sewer are adequately controlled.</p> <p>IC4 - This has been included to validate the effectiveness of the incoming biomass fuel specification and acceptance procedures now that waste biomass is being used in the combustion process. It will also provide information for justification of any reduced monitoring frequency for specified determinands after the first year of operation.</p> <p>IC5 - This has been included so that the Operator optimises the combustion process such that use of the bag filter bypass system is minimised and invstigates ways such that it might be eliminated.</p> <p>IC6 – This has been included such that the Operator is required to formalise their detailed risk assessment for activities at the site into a documented site specific Accident Management Plan in compliance with permit condition 1.2.1.</p> <p>IC7 – Now that the site is operational this has been included so that the Operator undertakes a review of the as installed containment measures to protect the land</p>		✓

Activity	Justification / Detail	Determination criteria met	
		No	Yes
	<p>at the site and to develop an ongoing integrity testing and assessment procedure so that these risks are adequately managed throughout the life of the permit in accordance with H5 Guidance.</p> <p>IC8 – This has been included so that the Operator is required to develop an integrated Site Management System for the site that incorporates those currently deployed by the permanent contractors and ensures that responsibilities are clearly defined and cover all site activities.</p>		
Raw materials	We have specified the following limits and controls on the use of raw materials and fuels. Controls for input fuel streams and input waste biomass are specified through Condition 2.3.2 of the permit, with the associated detail in Table S3.1.		✓
Waste types	We have specified the permitted waste types, descriptions and quantities, which can be accepted at the regulated facility in tables S3.2. We are satisfied that the operator can accept these waste for the following reasons. The materials detailed in table S3.2 relate to waste biomass to be utilised as fuel in the combustion process. These limit the waste biomass input fuel such that it meets the exemption from WID requirements.		✓
Incorporating the application	<p>We have specified that the applicant must operate his installation in accordance with the following descriptions in his application.</p> <ul style="list-style-type: none"> • The response to sections 2.1 and 2.2 in the Application. • The response to questions 1, 2, 4, 5, 7,13,15, 16,17,18 and 20 of the Schedule 4 Notification for the original application, now considered part of this application. • Information relating to bag filter abatement equipment and operation of wood chipping plant. • Information relating to supply sources of waste wood and biomass fuels. Operating procedures relating to the control and acceptance of incoming biomass fuels to the site. 		✓
Emission limits	<p>ELV's for emissions to air have been set as detailed in Table S4.1 (NO2, CO, Particulate, SO2 and HCl) to demonstrate the effective operation of the combustion process and abatement equipment. These limits are in line with the indicative BAT values described in the Combustion Sector Technical Guidance Note.</p> <p>It is considered that the ELVs/ equivalent parameters or technical measures described above will ensure that significant pollution of the environment is prevented and a high level of protection for the environment secured.</p>		✓
Monitoring	<p>We have decided that monitoring should be carried out for the parameters listed in tables S4.1 and S4.4 in schedule 4 using the methods and to the frequencies specified in those tables. These monitoring requirements have been imposed in order to demonstrate compliance with the ELV's set and to ensure close process control of the combustion process. We made these decisions in accordance with Sector Guidance Note – EPR 1.01 – Combustion Activities.</p> <p>Based on the information in the application we are satisfied that the operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate.</p>		✓
Reporting	We have specified reporting as specified in Schedule 5 for the following reasons. We have specified reporting as detailed in Schedule 5 to confirm compliance with the ELV's imposed in the permit and to enable monitoring of plant performance with regard to the efficiency of raw materials used. We made these decisions in accordance with Sector Guidance Note – EPR 1.01 – Combustion Activities.		✓

Activity	Justification / Detail	Determination criteria met	
		No	Yes
Operator Competence			
Technical competence	<p>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.</p> <p>The decision was taken in accordance with RGN 5 on Operator Competence.</p>		✓
OPRA			
Opra Score	<p>The Opra score is 110</p> <p>The Opra score has not changed from that set out in the application. (This application – EPR/ZP3939GL/A001)</p> <p>Note – The EPOPRA score as submitted with the original application was 95. However, prior to this application being Duly Made the score was increased to 110 in agreement with the Applicant, in view that an externally certified management system was not in place. An additional application fee was submitted at that time to match the revised EPOPRA score.</p>		

Annex 2: consultation responses

Advertising and consultation

Summary of responses to advertising and consultation and the way in which we have taken these into account in the determination process:

Response received from
Neath Port Talbot County Borough Council
Brief summary of issues raised
Summary of four noise complaints made to the council in early 2008 which related to steam releases during the early stages of plant commissioning.
Summary of actions taken or show how this has been covered
None. NPT CBC did not report any further recorded noise complaints during the remainder of the year once the plant was in more regular operation.

Response received from
Neath Port Talbot Local Health Board
Brief summary of issues raised
Issues relating to – <ol style="list-style-type: none">1. The nearby AQMA and predicted level of particulates from the installation.2. Potential for fugitive dust emissions.3. Once plant is operational actual emission data should be used to confirm modelled impacts.4. Once operational a new noise survey should be conducted to demonstrate no adverse effect.5. The applicant should discuss with the Regulator a timetable for fitting acid gas abatement.
Summary of actions taken or show how this has been covered
<ol style="list-style-type: none">1. The applicant has provided detailed dispersion modelling that indicates all predicted emissions will be less than 1% of the applicable AQS. The modelling indicates that predicted emissions of particulate will be less than 0.2% of the AQS within the nearby AQMA. NPT LHB were advised that this is not a new plant and is currently in operation under a Part A (2) permit with the Local Authority. It is not expected that emissions of particulate from the installation will increase as a result of burning waste biomass in the combustion process. Actual monitoring data supplied during determination indicates that particulate emissions are typically less than 20% of the ELV now included in the permit.2. Chip and small format biomass materials are delivered in covered transport and unloaded inside the building. Flyash from the abatement system is conveyed to a silo with a filter system for displaced air. Flyash is conveyed to a specifically designed container using a similar system, prior to removal from site. We believe that these and other measures are adequate to control fugitive emissions of dust from the installation.3. Reporting of emission data as required under Schedule 5 of the permit will enable this. Interim emission data supplied during determination indicates that ELV's set within the permit will be readily achieved during continuous

operation.

4. The applicant has supplied detailed noise assessments with the application, including a re-assessment associated with re-location of the chipping unit. No further noise issues have been reported by NPT CBC since the initial commissioning.

5. The periodic monitoring of SO₂ and HCl emissions during the first year of operation will influence any decision on the need for acid gas abatement. The sulphur and chlorine content of the incoming biomass is expected to be low. IC4 requires the Operator to report correlation of input fuel sampling/characterisation with emission monitoring and make proposals to control emissions of these determinands via input fuel control if necessary.

Response received from
Food Standards Agency
Brief summary of issues raised
<ul style="list-style-type: none"> - That the Operator should use appropriate monitoring techniques in accordance with Combustion Sector Guidance requirements when burning all fuel types in the installation. - The potential for deposition of persistent contaminants such as dioxins, dioxin like PCB's and PAH's in areas of food cultivation or watercourses.
Summary of actions taken or show how this has been covered
<ul style="list-style-type: none"> - Monitoring has been specified in the permit which is in accordance with Combustion Sector Guidance EPR 1.01. - The Operator is required to conduct periodic extractive monitoring for dioxins/furans during the first year of operation to establish if any of these materials are released in the exhaust stream. This is not a normal requirement identified in the Combustion Sector Guidance for small scale combustion plant or those subject to the LCPD.

Response received from
Response to advertising and public consultation.
Brief summary of issues raised
No responses received.
Summary of actions taken or show how this has been covered
No action taken.