

Environment Agency permitting decisions

Bespoke permit

We have decided to grant the permit for Cramlington Biomass CHP Plant operated by Cramlington Wood Energy Partnership Limited.

The permit number is EPR/RP3035EE/A001

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 environmental 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

- Key issues
- Annex 1 the decision checklist
- Annex 2 the consultation and web publicising responses

Key issues of the decision

BAT Assessment

The operator has included a BAT assessment with the application. This is supported with additional information provided during the determination (emails 05/08/14 and 15/08/14). The assessment identifies the appropriate measures that have been put in place on the site. This is in line with the relevant indicative BAT measures set out in the Combustion Sector Technical Guidance Note (EPR 1.01). Where an alternative measure has been selected or there is a choice of options written justification has been provided. The appropriate measures on the site are summarised below:

Energy Efficiency

The installation comprises of a Combined Heat and Power (CHP) Biomass plant with a thermal input of 75MWth and is expected to generate an output of 30MWe.

An auxiliary liquid fuel burner will be installed in the furnace. This will only be used during start up and during plant warm-up. The start-up burner is not used to support the burner during normal operations.

Operating procedures will be in place to ensure that the plant is operated efficiently. For example:

- Daily checks of motors drives, compressed air systems, leaks
- Procedures to be in place for use of pneumatic tools.
- Schedule will be in place for routine lubrication of plant machinery.

The cycle efficiency of the steam turbines is improved through improvements to the vacuum on the condensers, reheating the steam and by preheating feedwater. In addition, steam for process use is taken at the lowest practicable pressure from the steam turbine, to maximise cycle efficiency.

Heat generated from the installation is supplied to local users.

Avoidance, recovery and disposal of wastes

The primary waste stream generated from the site will be bottom ash and fly ash. Bottom ash and fly ash will be collected and stored separately. Subject to testing, it is expected that these waste residues will be used as a fertiliser. Ash will be removed from site in a covered lorry to minimise dust and odour emissions.

The demineralization plant uses Reverse Osmosis (RO) and electro-deionisation. It is planned that used RO membranes will be taken away by the supplier for recycling and reuse. If this is not possible they will be disposed of by the supplier at an appropriate disposal facility.

Point source emissions to water

High level alarms will be fitted to oil storage tanks on site. Any contaminated storm water within the bunded area of the oil tank will be disposed of at an appropriate disposal facility.

There will be no direct discharges to surface water from the CHP plant. An air cooling system is used for the purposes of steam generation. There is thus no requirement for water input for cooling purposes. However, rain water from the roof of the boiler building and the steam turbine building is harvested for cleaning the air cooled condensers (ACC). Any excess water from the harvesting tank overflows to the surface drains.

Clean surface water will be discharged via an oil interceptor to surface water sewer. All process waste waters, which cannot be reused within the plant, will be sent to the onsite water treatment plant. The waste water treatment will include pH adjustment and settlement prior to discharge to foul sewer.

Although ash is handled as a slurry it is not expected that there will be any discharge to sewer from the ash quench bath. Bottom ash comprises solid residues discharged from the furnace grate. The bottom ash is discharged from the grate into the quench bath from where it is removed by an inclined conveyor and deposited within the bottom ash bunker. Quench water will drain from the ash as it travels up the inclined conveyor and this water is returned to the quench bath. Any remaining quench water in the bottom ash bunker will either evaporate or be removed with the ash.

Point source emissions to air

The main emissions to air from the facility are Oxides of Nitrogen (NO_x), Sulphur Dioxide (SO₂) and Particulates.

The primary control of NO_x emissions will be through the use of good combustion control. Over fire air (OFA) is injected in the upper portion of the furnace, and the fuel and air supply regime is carefully controlled to ensure efficient combustion of the fuel whilst minimising pollutant generation.

Secondary control measures will also be put in place should testing during the commissioning phase identify that they are necessary in order for the Operator to comply with the emission limits set in the permit. This will be in the form of a Selective Non-Catalytic Reduction (SNCR) system. A controlled amount of ammonia is injected into the combustion chamber which reacts with NO_x producing nitrogen and water vapour.

Biomass derived from virgin timber produces a low level of Sulphur Dioxide. Management of the plant through the use of good combustion control is expected to be sufficient to meet emission limits.

Particulate matter will be controlled through the use of a bag filter system. The bag filter system will contain multiple compartments which allow for isolation of a compartment in the event of bag failure. Dust detectors will be included in each compartment to allow for fast detection in the event of a failed bag.

Fugitive Emissions

The chipper is housed within an enclosed building ensuring that noise emissions are minimised.

The installation will be on an impermeable surface with sealed drainage minimising the risk of the contamination of land from run-off.

Emissions to Air

Air Emissions

The operator has submitted an air quality impact report in order to predict expected pollutant concentrations at the nearest human and ecological receptors.

The air quality assessment was undertaken by RPS on behalf of the applicant. RPS used the air dispersion modelling software AERMOD (Version 7.7.1) to make predictions of pollutant concentrations.

The air quality impact report concludes that there would be no exceedences of Air Quality Environmental Quality Standards (EQS) and no impacts at nearby habitat sites.

In order to check the validity of the consultant's predictions, we have undertaken our own detailed check modelling. We identified some issues with the applicant's air quality assessment which were raised through a request for information and have been addressed. Our checks indicate that the plant is not likely to contribute significantly to an exceedence of any of the EQS' at sensitive human and ecological receptors.

The plant has not yet been constructed and thus it is not possible to predict pollutant concentrations at the receptors based on actual emission values. Therefore, the modelling has been undertaken based upon a worst case scenario using continuous emissions at benchmark limits.

Once the commissioning phase is completed the operator is required to verify the actual emissions values from the plant in accordance with Improvement Condition (IC) 2.

The operator has agreed to install a Selective Non-Catalytic Reduction system in order to reduce NOx emissions from the plant should this be required.

Noise Emissions

The Applicant has used the BS4142 methodology to assess noise emissions from the Cramlington Biomass energy facility. This assesses the likelihood of complaints by subtracting the measured background noise level from the predicted rating level:

- A difference of +10dB or more indicates complaints are likely.
- A difference of +5dB is of marginal significance.
- If the rating level is more than 10dB below the measured background level then this is a positive indication complaints are unlikely.

The consultant has used the noise software SoundPLAN 7.2 which is based on the ISO 9613-2 calculations scheme. This model has the ability to take into account terrain, which the consultant has included.

In order to check the validity of the consultant's predictions, we have undertaken our own detailed check modelling. There were two issues that arose from this assessment which required addressing.

The consultants did not measure actual background levels. Instead a representative background noise level for the area was selected based on professional experience. This has been verified by another background survey taken in 2012 at the receptor of concern Plessey Hall Farm, the levels recorded were a similar level to that used by the consultants. Therefore, we are satisfied with the background level used.

The consultants did not use a correction factor of +5db in their assessment as they judged that the noise generated from the facility is not tonal. We do not agree with this. However, using a +5db factor to the consultant's rating level at Plessey Hall Farm predicted a BS4142 noise rating level of +8 dB which is still below the +10dB threshold.

As this does not leave much headroom, we decided to include improvement condition 1 which requires the submission of a noise assessment based on actual emissions. This will assess noise emissions from the plant and whether they are acceptable. If appropriate the operator will be required to implement remedial measures.

Emissions to Sewer

All waste water arising from the facility is to be discharged to the foul sewer. Consent to discharge from the Sewage Treatment Undertaker (Northumbrian Water) was not provided with the permit application. The operator has applied for a consent to discharge up to 50m³/day and Northumbrian Water have confirmed (email 15/08/14) that a water discharge consent is expected to be issued subject to providing further details of the effluent discharge.

The operator provided an assessment of emissions to sewer using H1 methodology. This was submitted in response to a request for further information in the report dated 17th October 2014. The assessment identifies

that although none of the pollutants screen out at less than 10% of the Environmental Quality Standard (EQS), after taking into account the Sewage Treatment Reduction Factors, discharge rates and receiving water (River Blyth) flows, all likely pollutants screen out as insignificant with Process Contributions of less than 4% of the EQS. Although a consent has not been granted to the applicant at this stage, Northumbrian Water has provided the parameters and limits the anticipated consent is likely to include. We are satisfied the Applicant's proposals for discharge to sewer together with the anticipated consent from Northumbrian Water will ensure suitable protection of the receiving water for the Cramlington Sewage Treatment Works. A Pre-operational Condition (POC4) has therefore been included within the permit, which requires the Operator to submit a copy of the discharge consent 4 weeks prior to the burning of any fuel on the site.

Annex 1: decision checklist

This document should be read in conjunction with the Duly Making checklist, the application and supporting information and permit/ notice.

Aspect considered	Justification / Detail	Criteria met
		Yes
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 and web publicising	The web publicising and consultation 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.	✓
European Directives		
Applicable directives	All applicable European directives have been considered in the determination of the application. The Industrial Emissions Directive (IED) 2010/75/EU [which recast several directives including the Large Combustion Plant Directive (LCPD) 2001/80/EU] applies to this Installation.	✓
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 and the operator is required to carry on the permitted activities within the site boundary.	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
Site condition report	<p>The operator has provided a description of the condition of the site.</p> <p>We consider this description is satisfactory. The decision was taken in accordance with our guidance on site condition reports and baseline reporting under IED–guidance and templates (H5).</p> <p>The site is located on a Greenfield site and there is no record or visual evidence of any pollution.</p>	✓
Biodiversity, Heritage, Landscape and Nature Conservation	<p>The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation.</p> <p>There are ten designated sites within the relevant screening distances. Within 10km of the site are Northumbria Coast SPA and Northumbria Coast RAMSAR. Within 2km of the site is Arcot Hall Grassland & Ponds SSSI and the following non statutory sites:</p> <ul style="list-style-type: none"> - Bedlington Country Park LNR - Bassington LWS - Pegwhistle Fen LWS - Wellwood AW - Unnamed AW - Hartford/Bebside Woods AW <p>The applicant has submitted an air quality report to assess the potential for impact from this installation on the above sites. We have audited this assessment and agree with the Operator’s conclusions that exceedences of the EQS are not likely to occur at any of the above ecological receptors.</p> <p>A full assessment of the application and its potential to affect the sites has been carried out as part of the permitting process. We consider that the application will not affect the features of the site.</p> <p>We have not formally consulted on the application. The decision was taken in accordance with our guidance.</p>	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
Environmental Risk Assessment and operating techniques		
Environmental risk	<p>We have reviewed the operator's assessment of the environmental risk from the facility.</p> <p>The operator's risk assessment is satisfactory.</p>	✓
Operating techniques	<p>We have reviewed the techniques used by the operator and compared these with the relevant guidance notes.</p> <p>The proposed techniques and 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 ensure compliance with relevant BREFs and BAT Conclusions, and ELVs deliver compliance with BAT-AELs.</p> <p>This includes:</p> <ul style="list-style-type: none"> - Control of NOx emissions through the use of Over Fire Heating (OFH) and Installation of a Selective Non-Catalytic Reduction (SNCR) System as required. - Installation of a bag filter to remove particulates. - Fire risk has been considered in the Environmental Risk Assessment submitted with the application. Site procedures are to be put in place to manage fire risk from the site as required by Pre-operational Condition 3 (POC3). 	✓
The permit conditions		
Raw materials	<p>We have specified limits and controls on the use of raw materials and fuels.</p> <p>We have specified that only virgin timber can be used as a fuel. These materials are never to be mixed with or replaced by, waste.</p> <p>Limit has also been made on the sulphur content of the fuel used for starting up the combustion plant. The fuel should have a sulphur content of less than 1.0% w/w.</p>	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
Pre-operational conditions	<p>Based on the information in the application, we consider that we need to impose pre-operational conditions (POC).</p> <p>POC1 - The operator is required to provide a written commissioning plan at least 4 weeks prior to the burning of any fuel at the installation. The purpose of this is to ensure that the construction phasing and testing of the plant does not present any environmental risk.</p> <p>POC2 - The operator is required to submit an Environment Management System at least 4 weeks prior to the burning of any fuel at the installation. Operational procedures are still being formulated, which environmental management measures will form part of. Therefore, it has not been possible to submit and EMS with the application.</p> <p>POC3 - The operator is required to submit an accident management plan at least 4 weeks prior to the burning of any fuel at the installation. Operational procedures, including the accident management plan, are still being formulated. Therefore, it has not been possible to submit an accident management plan with the application.</p> <p>POC4 – The operator is required to submit the discharge consent from Northumbrian Water at least 4 weeks prior to the burning of any fuel at the installation. The discharge consent is still being assessed by Northumbrian Water at the time of permit issue. Therefore, it has not been possible to submit this with the application.</p>	✓
Improvement conditions	<p>Based on the information on the application, we consider that we need to impose improvement conditions.</p> <p>We have imposed improvement conditions (IC) to ensure that:</p> <p>IC1 – an assessment of the impacts of noise from the installation is provided based on measured noise levels from the installation that are representative of normal</p>	✓

Aspect considered	Justification / Detail	Criteria met								
		Yes								
	<p>operations. Appropriate measures are to be put in place as required to prevent annoyance from noise and vibration.</p> <p>IC2 – a commissioning report is provided:</p> <ul style="list-style-type: none"> - verifying that the operator is complying with the emissions limits in the permit. This is to ensure that appropriate measures are in place to prevent air pollution. - verifying the outcome of the noise assessment in IC1 in order to prevent annoyance from noise and vibration. - confirming the energy efficient data provided in the application to demonstrate that appropriate measures are in place to ensure that energy is used efficiently. - to identify any changes to the operating techniques provided in the application to ensure that the operation of the installation is being conducted in a satisfactory manner. 									
Incorporating the application	<p>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.</p> <p>These descriptions are specified in the Operating Techniques table in the permit.</p>	✓								
Emission limits	<p>We have decided that emission limits should be set for the parameters listed in the permit.</p> <p>The following substances have been identified as being emitted in significant quantities and ELVs have been set for those substances.</p> <p>These limits have been set as prescribed in the Industrial Emissions Directive.</p> <table border="0"> <thead> <tr> <th><u>Substance</u></th> <th><u>Emission Limit Value</u></th> </tr> </thead> <tbody> <tr> <td>Oxides of Nitrogen (NO_x)</td> <td>250 mg/m³</td> </tr> <tr> <td>Sulphur Dioxide (SO₂)</td> <td>100 mg/m³</td> </tr> <tr> <td>Particulate Matter</td> <td>20 mg/m³</td> </tr> </tbody> </table> <p>In addition, we have also imposed a limit 50m³/day on the</p>	<u>Substance</u>	<u>Emission Limit Value</u>	Oxides of Nitrogen (NO _x)	250 mg/m ³	Sulphur Dioxide (SO ₂)	100 mg/m ³	Particulate Matter	20 mg/m ³	
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Particulate Matter	20 mg/m ³									

Aspect considered	Justification / Detail	Criteria met
		Yes
	emissions of waste water to foul sewer S1. This is to establish discharge patterns	
Monitoring	<p>We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified.</p> <p>These monitoring requirements have been imposed in order to comply with the Industrial Emissions Directive. We made these decisions in accordance with the Combustion Technical Guidance Note (1.01) and the monitoring methods are in accordance with the Monitoring of Stack Emissions to Air Technical Guidance Note (M2).</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	<p>We have specified reporting in the permit.</p> <p>The operator is required to report the emissions of Oxides of Nitrogen, Sulphur Dioxide, Particulate matter and Ammonia every three months for the first year of operation then every 6 months. This is to ensure compliance with the Emission Limit Values and ensure that ammonia slippage from the use of the Selective Non Catalytic Reduction system is minimised.</p> <p>The quarterly reporting periods during the first year of operation is to ensure that operations and procedures to minimise air pollution have been satisfactorily implemented.</p> <p>The operator is also required to provide annual reports on the following performance parameters: electricity output, heat energy output, water usage (input), waste water to sewer (output) and waste disposal and/or recovery.</p> <p>This will allow for assessments of the energy efficiency of the plant in line with condition 1.2.1, how efficiently water is being used in line with condition 1.3.1 and to ensure waste is being managed appropriately in line with condition 1.4.1.</p>	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
	We made these decisions in accordance with the Combustion Technical Guidance Note (1.01)	
Operator Competence		
Environment management system	<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. The decision was taken in accordance with RGN 5 on Operator Competence.</p> <p>An Environment Management System (EMS) has not been submitted with the application. Pre-operational condition 2 requires that the operator produces a written EMS and confirms to the Environment Agency that this has been completed and that it is available for inspection. The EMS must be completed at least 4 weeks before any fuel is burnt.</p>	✓
Relevant convictions	<p>The National Enforcement Database has been checked to ensure that all relevant convictions have been declared.</p> <p>No relevant convictions were found.</p>	✓
Financial provision	There is no known reason to consider that the operator will not be financially able to comply with the permit conditions. The decision was taken in accordance with RGN 5 on Operator Competence.	✓

Annex 2: Consultation and web publicising

Summary of responses to consultation and web publication 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
Health and Safety Executive - 04/07/14
Brief summary of issues raised
No issues raised
Summary of actions taken or show how this has been covered
None required

Response received from
Public Health England -14/07/14
Brief summary of issues raised
No issues raised
Summary of actions taken or show how this has been covered
None required

Response received from
National Grid – 07/08/14
Brief summary of issues raised
No objection to the proposal. The response highlighted that there are overhead lines close to the installation. A map was provided showing their location. No issues were raised in relation to this.
Summary of actions taken or show how this has been covered
None required

Response received from
Northumberland Fire and Rescue Service – 22/07/14
Brief summary of issues raised
The Fire and Rescue Service highlighted a section from the permit application which said that an Accident Management Plan (AMP) will be established prior to the commencement of operations. They highlighted that the AMP should consider risk relating to: <ul style="list-style-type: none">• Dust explosions• Hazardous material storage• Self-combustion of raw materials• Stack sizes of raw material, suitable separation (guidance available in TGN 7:01), access for Fire Service in the event of a fire and availability of plant machinery to assist fire fighting techniques.• Fire side explosions• Anti-burn back

- Soot management
- Ash management
- Flue and chimney risks in the 75m stack, such as tar fires in stack or ducting
- Dangerous substances and explosive atmospheres.

The site operators must give consideration to the availability of water in the event of a fire and the capture of fire water runoff in the event of a fire situation, on site capture and storage for disposal should be identified.

The site operator must give consideration to potential impact of a fire smoke plume on local amenities such as:

- nearby chemical plant,
- the East Coast Railway line
- the A1 road network
- the River Blyth
- Newcastle Airport flight path

The Fire and Rescue Service require a Site Specific Risk Assessment (SSRI) to be carried out on the site when operation commences. It is recommended that the Fire and Rescue Service are involved in the planning of actions in the event of an emergency situation to ensure that the personnel on site have an understanding of the actions and capabilities of the Fire and Rescue Service and the approach that they will adopt in the event of an emergency.

Summary of actions taken or show how this has been covered

Condition 1.1.1 requires the operator to manage the site in accordance with a written management system that identifies and minimises, amongst other things the risk of accidents.

This document will be provided prior to the commencement of operations as required by pre-operational condition number 3 (POC3). This POC requires the operator to submit an accident management plan which provides full details of how fire risk will be managed on the site. It requires that the information provided is in accordance with the advice provided by the Fire and Rescue Service, as detailed above.

The Local Planning Authority, Environmental Health and the Director of Public Health were also consulted; however, no response was received.

This proposal was also publicised on our website between 02/07/14 and 30/07/14. No representations were received.