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Victoria Seller,  
Permitting Service,  
Natural Resources Wales,  
Cambria House,  
29 Newport Road,  
Cardiff,  
CF24 0TP

Date: 22<sup>nd</sup> February 2017

Our Ref: SOL1605BUK201

Dear Ms Seller,

**RE: BIOMASS POWER NO.2 LTD – Barry Energy Production Facility – PAN-000869**

Further to your letter dated 24<sup>th</sup> January 2017 please find below our formal responses to each of the questions in turn.

#### ***Air Impact Assessment and Human Health Risk Assessment***

*In relation to the computer modelling carried out as part of the air impact assessment and human health risk assessment, as referenced in the report 'Proposed Wood Gasification Plant Facility, Woodham Road, Barry: Air Quality Assessment' (the Air Quality report), we note that the locations of on-site buildings included in the modelling software different to the locations as they appear on site plans 'BUK202' and 'BARRY\_01\_DWG\_01\_20111'.*

*Please repeat the modelling exercise using the correct building orientation and re-submit the modelling files to NRW. Please also re-calculate the process contributions at sensitive receptors and re-assess the impact of the PCs in a revised Air Quality report.*

*Please also answer / address the following questions / queries in a revised Air Quality report:*

- 1. In relation to Section 3.5 on page 9 of the Air Quality report. The emission limit for polycyclic aromatic hydrocarbons (PAHs) listed in Table 3.8 on page 156 of the cited reference is "< 0.01 mg/m<sup>3</sup>", not "< 0.001 mg/m<sup>3</sup>" as shown in the above referenced report. Please amend the predictions shown in Table 20 on page 23 of the Air Quality report;*
- 2. In relation to the AERMET modelling files, surface roughness for water was used several sections, which does not reflect land use within 1 km of the installation. Please revise the AERMET modelling files accordingly to include the correct surface roughness factors within 1km of the installation and re-process the modelling data to produce new PCs;*
- 3. In relation to Table 4 on page 15 of the Air Quality report. Please provide explanation why the Seven Estuary SAC was not included in the impact assessment, as this receptor is within the relevant screening distance of the installation;*
- 4. There are errors in the page numbering from Section 4 of the Air Quality report onwards, which restart at page 1 from page 17. Please amend these errors;*
- 5. In relation to Table 6 on the restarted page 1 of the Air Quality report. NO<sub>2</sub> diffusion tube data for more recent years than is used in the assessment are available now. Please amend the assessment carried out in Table 6 to include the most recent diffusion tube data that is available;*

6. In relation to Table 33 on page 34 of the Air Quality report. Please confirm that ammonia deposition and hydrogen chloride deposition (wet & dry) has been included in the acidification calculations. Please include this calculation;

7. In relation to Table C2 on page 46 of the Air Quality report. The NO<sub>x</sub> emission concentration when the installation is operating in abnormal conditions (specifically, during periods of failure of the urea injection system) is stated to be lower than the short-term emission limit value for NO<sub>2</sub> given in Annex VI of the Industrial Emissions Directive. Please provide evidence / justification for this statement; and

8. In relation to Table C3 on page 46 of the Air Quality report. The SO<sub>2</sub> emission concentration when the installation is operating in abnormal conditions (specifically, during periods of failure of the lime dosing system) is stated to be lower than the short-term emission limit value for SO<sub>2</sub> given in Annex VI of the Industrial Emissions Directive. Please provide evidence / justification for this statement.

As discussed, the updated Air Quality Assessment and HHRA will be submitted w/c 27<sup>th</sup> February 2017.

### **Noise Impact Assessment**

In relation to the noise impact assessment report 'Barry Biomass Energy Plant, Barry. Noise Assessment', please provide a plan that shows the locations of the noises sources referenced in Appendix B.

Please refer to the plan provided within Annex 1 of this letter.

### **Computational fluid dynamics modelling**

Page 31 of the report 'Biomass UK No. 2 Ltd. Barry Energy Production Facility' states that:

*"Detailed Computational-Fluid-Dynamic modelling (CFD) of the gasification/combustion process has been carried out to ensure complete combustion of the fuels under varying conditions, and also ensures the 2 seconds minimum dwell time above 850°C. This information is commercial in confidence and has not been included within the application."*

*Please provide a summary of the model set up and input parameters and results to demonstrate that the requirements of Article 50(2) of the Industrial Emissions Directive will be met.*

The CFD modelling carried out in support of the plant design has been calculated using 'Plug Flow Residence Calculations'.

The modelling assumes the following:

- 105% MCR (i.e 105% of operational design flow) with 14.3 MJ/kg Waste Wood fuel and 936.1 °C Flue Gas (Worst Case Res. Time);
- All modelling calculates the residence time after the last Secondary Air Injection to Boiler Inlet (this essentially means that all time temperature residence prior to this point is discounted – this is a very conservative calculation);
- The flue gas at the entry point (at 105% design flow) is at 936.1 degrees C (again this is the worst case temperature scenario) - the gas is hotter than this normally.
- Under these conditions the gas residence time is 3.53 seconds and exceeds 850 degrees C.

Please refer to the document provided within Annex 2 of this letter which provides more information on the Computational fluid dynamics modelling.

Please note that this document is commercial in confidence. Due to this it is requested that the document is not included in the public documents.

***Industrial Emissions Directive – Article 22(2) on a baseline report on relevant hazardous substances in soil and / or groundwater***

*The application report 'Biomass UK No. 2 Ltd. Barry Energy Production Facility' does not indicate whether the installation will use, produce or release relevant hazardous substances to soil and / or groundwater, in line with Article 22(2) of the Industrial Emissions Directive.*

*Please indicate whether or not the installation will use, produce or release relevant hazardous substances, in line with Article 22(2) of the Industrial Emissions Directive.*

The Site Condition Report has been updated to include a Phase I – II Geoenvironmental Report carried out by CC Geotechnical Ltd and is provided within Annex 3 of this letter.

The baseline report confirms both the present and past use. Historical ground assessment works have been carried out which provide all the necessary information relating to the existing baseline condition of the site.

The design of the plant is such that there are no potential releases to ground of any List I and List II substances (or any other hazardous substances) and hence the provided baseline data can be relied on.

All pollution control, foundation and floor slab design meets with recognised best practice and provide an effective barrier between the site and underlying soils and groundwaters.

Should you have any further questions in relation to the above please do not hesitate to contact me.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'S. Butler', with a stylized flourish extending from the end.

**Steve Butler**

## ANNEX 1: NOISE PLAN

## ANNEX 2: CFD MODELLING

## ANNEX 3: SITE CONDITION REPORT