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Dyddiad / Date: 8/9/17

Dear Madam

**RE: THE ENVIRONMENTAL PERMITTING (ENGLAND AND WALES) REGULATIONS 2016**

**Response to the Consultation for the Woodham Rd Biomass Power Station**

Thank you for inviting us to comment on the consultation for the Biomass Power Station Environmental Permit. This response will focus exclusively upon the expected Noise and Air Quality impacts from the Power Station.

**Noise Comments.**

**Officer : Gwyn Mapp**

As I am sure you are aware, Shared Regulatory Services is responsible for the enforcement of Statutory Nuisances in the Vale of Glamorgan area.

By virtue of fairly recent case law, it has been established that a permitted site could not rely upon the compliance with their environmental permit to avoid liability in Nuisance law<sup>1</sup>. The ultimate outcome of this case is that the standard required for Environmental Permitting should to be more stringent that would be expected for Statutory Nuisance. As such, our comments have been formed by not only considering whether the Environmental Noise Impact Assessment carried out by Sol Acoustics (ref: P1714-REP02-Rev A-SJF – dated the 14<sup>th</sup> July 2017) is sensible in seeking to achieve Best Available Techniques (BAT) for the site, but also whether post commissioning enforcement action under the Statutory Nuisance regime would be likely.

<sup>1</sup> Barr and others vs. Biffa Waste Services Ltd [2012] EWHC Civ. 312

Our comments are as follows:

### **Assessment of Impacts – Context**

Section 11 of BS4142:2014 describes how an assessment of the impacts is to be carried out. The commentary on Page 16 states:

*"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context."*

Continuing:

*"Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level from the rating level, and consider the following:*

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

Also,

*"Where the initial estimate of the impact needs to be modified due to context, take all pertinent factors into consideration, including the following:"*

The standard continues by describing three issues in particular, the absolute level of sound, the character and level of the residual sound compared to the character and level of the specific sound and the sensitivity of the receptor.

The Environment Noise Impact Assessment makes an attempt to assess the initial estimate of the impact of the specific sound however does not consider whether this impact needs to be modified due to context. As a result, it can be said that the assessment is incomplete, in particular in relation to low frequency noise (see below).

### **Assessment of Impacts – Initial Assessment of Impact**

Following on from the discussion of the assessment of impacts in Section 11 of BS4142: 2014, mentioned above, the Environmental Noise Impact Assessment states in paragraph 4 of Page 14 that:

*"BS 4142 states that the significance of sound of an industrial and/or commercial nature depends upon both the margin by which the Rating Level exceeds the background sound level and the context in which the sound occurs. Typically, the greater the difference, the greater the resulting environmental noise impact:*

- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context

*It is thus the case that for a Rating Level which is less than +5dB above the typical background sound level, this is below the Standard defined "adverse impact" i.e. is sub adverse. (As reported in Section 6 of this report, the calculated and assessed night time Rating Level ranges from +2dB to +4dB above background sound level only depending on NSR location, and is between -1dB and -7dB below the typical daytime background sound level)."*

As can be seen, the Environmental Noise Impact Assessment does not mention the paragraph that states that *"The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact."* Instead the Environmental Noise Impact Assessment attempts to state that anything less than background +5dB is *"sub adverse"*. This statement is misleading and not in keeping with either the letter or spirit of BS4142: 2014 which clearly states that the lower the specific sound source relative to background the better.

### **Choice of penalty for determination of the Rating Level for BS4142: 2014**

Notwithstanding the point about the initial assessment of impact, discussed above, it is stated in paragraph 3 of section 3.2 (page 14) of the Environmental Noise Impact Assessment that:

*"The Standard advises that where "specific sound features" are present, a penalty of +3dB can be applied to the Specific Sound Level (i.e. total, calculated, aggregate plant noise level at each NSR in this instance, daytime and night time), in order to obtain the Rating Level."*

This statement provides a very selective reading of BS4142: 2014. Section 9 of BS4142:2014 states for Tonality that:

*"For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0dB and +6dB. Subjectively, this can be converted to a penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible."*

In addition, for Impulsivity the standard states:

*"A correction of up to +9dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it is clearly perceptible, and 9dB where it is highly perceptible."*

The standard continues by stating:

*"Where the specific features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied"*

Note 2 of paragraph goes on to state that:

*"Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant then it might be appropriate to apply a single correction. Where both features are likely to affect perception and response, the corrections ought normally to be added in a linear fashion."*

And finally, for Intermittency section 9 states that:

*"When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. This can necessitate measuring the specific sound over a number of shorter sampling periods that are in combination less than the reference time interval in total, and then calculating the specific sound level for the reference time interval allowing for time when the specific sound is not present. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied."*

In other words, BS4142: 2014 expects that the correction for translating a specific sound to a Rating level considers the Tonality and Impulsivity, which could attract a penalty of up to 15dB. Only if the specific sound features characteristics that are neither tonal nor impulsive but is readily distinctive should a penalty of 3dB be applied.

There is no indication that the tonality and impulsivity of the site has been considered, thereby potentially underestimating the impact of the site by up to 12dB. Also, there is no consideration within the report of whether the noise from the site is to be intermittent, thereby possibly attracting a further 3dB penalty.

In total, it is possible that the initial assessment of the impact has been underestimated by up to 15dB which consequently means that the initial assessment of impacts described in Section 6.0 has also possibly been underestimated by up to 15dB.

### **Choice of Typical Measured Background Noise Levels**

Sections 4.2 and 4.3 (pages 18 - 21) of the Environmental Noise Impact Assessment provide tables that present summaries of the "Typical  $L_{A90, 15min}$ " readings that were taken for each daytime and night-time period over the duration of the measurement. Tables 1, 2 and 3 summarise the results for Positions 1, 2 and 3 respectively. Table 4 provides a summary of Tables 1, 2 and 3.

Section 8 of BS4142: 2014 describes how an assessment of the background noise levels is to be conducted. The document states that a statistical analysis should be conducted to determine the background sound level. BS4142:2014 even shows in Figure 4 how the statistical analysis of the typical background noise levels could be presented.

There appears to be no explanation within the Environmental Noise Impact Assessment of how the “typical” background noise levels were decided upon. For example, why have the “typical” background readings per daytime and night-time periods been further revised to provide a “typical” “typical” level per site?

If the Environmental Noise Impact Assessment had considered the worst case “typical” background noise level per site the background noise level would have been 2-3dB lower than reported. This equates to a potential overestimation of the background noise levels by 2-3dB and a subsequent underestimation of the assessment of the impacts in in Section 6.0 by 2-3dB per site.

### **Uncertainty**

Section 10 of BS4142:2014 describes how an assessment needs to consider the level of uncertainty involved with the data and associated calculations that could affect the conclusion of the report. The Environmental Noise Impact Assessment makes no mention of the uncertainty involved with the data collection or the associated calculations. As a result, it is not certain whether the assessment presented by Section 6.0 is accurate or what the margins for error are.

As a result, it is possible that the results of the assessment presented in Section 6.0 are an overestimation of the true value, but equally the results could be an underestimation. In relation to the magnitude of the over or underestimation, it is likely to be at least 1dB due to the uncertainty involved with Class 1 Sound Level Meters, however is likely to be more due to the other steps involved in the calculation and assessment process.

### **Choice of whether Typical Measured Background Noise Levels are Appropriate**

Following on from the comments about context , mentioned above, Sections 4.2 and 4.3 (pages 18 - 21) of the Environmental Noise Impact Assessment provide tables that present summaries of the “Typical  $L_{A90, 15min}$ ” readings that were taken for each daytime and night-time period over the duration of the measurement. Tables 1, 2 and 3 summarise the results for Positions 1, 2 and 3 respectively. Table 4 provides a summary of Tables 1, 2 and 3. Also, Appendix B presents Graphs B1, B2 and B3, which shows the sound pressure levels for the three main indices,  $L_{A90, 15 min}$  being one of them, for sites 1, 2 and 3 respectively.

By comparing the “typical” background noise level for each site with the  $L_{A90, 15min}$  plot there appears to be considerable periods where the measured background levels drop below “typical” background noise level for a many hours at a time and by a considerable margin.

For example, if the “typical” background noise level is plotted on to graph B3 it can be seen that for the night time periods the measured background noise levels dropped below the “typical” background noise levels for 8 out of the 12 night-time periods, sometimes for 4-5 hours at a time, dropping by as much as 5-10dB below the “typical” background noise level.

If the process is repeated for graph B1 it can be seen that the measured background levels drop below the "typical" background noise levels for 10 of the 12 night-time periods, again sometimes for 4-5 hours at a time, sometimes dropping by as much as 5-10dB below the "typical" background noise level.

Again, if the process is repeated for graph B2 it can be seen that the measured background levels drop below the "typical" background noise levels for every one of the 11 night-time periods, again sometimes for 4-5 hours at a time, sometimes dropping by as much as 12-13dB.

As a result of these points it can be said that the "typical" background noise levels that have been chosen are not actually representative of the noise environment at sites 1, 2 and 3 given the context of the area. It could be argued, in fact, that the background noise level could be 5dB lower than the "typical" background noise levels chosen, possibly more. Subsequently, it could be argued that the assessment of impacts has been considerably underestimated in Section 6.0, perhaps by 5dB, maybe much more.

### **Consideration of Low Frequency Noise**

Also, following on from the comments about context, mentioned above, we have concerns about the potential for Low Frequency Noise to affect nearby noise sensitive receptors.

Appendix E of the Environmental Noise Impact Assessment provides the expected noise levels of each piece of equipment, including octave band levels, and the mitigation measures that are to be installed. Also, Appendix F of the Environmental Noise Impact Assessment provides the expected Sound Reduction Index for each building element for each of the new buildings that are to be installed. Appendix G takes the information from Appendices E and F and provides details of the composite Sound Reduction Index for the buildings and details the expected reverberant Sound Pressure Level that would exist within the building when the site is operating.

By comparing the expected reverberant sound pressure level and the composite Sound Reduction Index it is possible to predict the likely noise breakout from the building. I have concerns that the low frequency noise, in particular that in the 63Hz and 125Hz Octave Bands have not been adequately considered at the measurement positions.

For example, Appendix G examines the noise breakout for the Reception Building. Page 69 states that the composite Sound Reduction Index for 63Hz ranges between 8 and 9dB for the facades and the roof. For the 125Hz Octave Band the composite Sound Reduction Index (SRI) ranges between 12-15dB. However, page 71 states that the corrected Reverberant Sound Pressure Level (SPL) for 63Hz is 81dB and for 125Hz is 71dB. This means that the machinery noise immediately outside of the building is likely to be between 72- 73dB in the 63Hz Octave Band and between 56-59dB for the 125Hz Octave Band.

A similar pattern is found for the Main Process Building (corrected reverberant SPL of 83dB in 63Hz octave band and 77dB in 125Hz octave band but a composite SRI of 12-16dB for the 63Hz octave band and 13-20dB for the 125Hz octave band).

Again, the same pattern is present for the lean to building (corrected reverberant SPL of 100dB in 63Hz octave band and 100dB in 125Hz octave band but a composite SRI of 13-16dB for the 63Hz octave band and 13-19dB for the 125Hz octave band).

The pattern is also present for the Turbine Building (corrected reverberant SPL of 75dB in 63Hz octave band and 75dB in 125Hz octave band but a composite SRI of 11-14dB for the 63Hz octave band and 14-19dB for the 125Hz octave band).

As a result of these points the Environmental Noise Impact Assessment should compare the predicted noise levels in the different octave band levels at each measurement position, especially the 63Hz and 125 Hz octave bands, with the measured background noise levels in the different octave bands. This would allow the assessment to fully understand the context of the noise and allow a better understanding of what mitigation measures may be needed to control the noise from site.

## **Conclusion**

Having reviewed the Environmental Noise Impact Assessment I have considerable reservations about the conclusions presented in Section 6.0.

Firstly, the initial assessment of the likely impact of the site appears to significantly underestimate the initial assessment of impact, potentially up to 19dB.

Secondly, there appears to be insufficient consideration of the context after the initial assessment of the impact, meaning that the impact assessment presented is incomplete.

Thirdly, in light of the potential underestimated initial assessment and the incomplete assessment of context the proposed mitigation measures cannot be considered appropriate at this stage.

Fourthly, as the proposed mitigation measures cannot be considered appropriate at this stage it cannot be said that Best Available Techniques have been used to mitigate the noise from the site.

Fifthly, due to the levels of expected noise from the site, the measured background noise levels and the currently proposed mitigation package it has to be concluded that Statutory Nuisance enforcement would be likely if the site were to operate as planned.

And finally, as a result of all of these issues it is not suggested that an Environmental Permit is granted to the site for the operations as planned.

## Air Quality Comments

Officer : Craig Lewis

This response addresses the revised Air Quality Assessment (AQA) July 2017 (V6), produced by Entran Environmental and Transportation on behalf of Power Consulting Midlands Ltd. The revised report has been submitted under a Section 5 amendment direction issued by Natural Resources Wales (NRW); "NRW Schedule 5 notice re Biomass requesting more information" dated 4 May 2017.

There are no major concerns with the outcomes expressed from the remodelling, however I would like to highlight a few aspects which need further clarification. In summary it would be appreciated if further detail and reasoning could be provided for the following areas;

- Baseline concentration used
- Modelled receptors and topography detail
- Detail surrounding site generated traffic and potential emissions arising both on and off site

### Baseline Concentration Used

Referring to Section 4.1 and Table 6 in the report;

#### Nitrogen Dioxide

4.1 There are no automatic air quality monitoring stations measuring NO<sub>2</sub> in the vicinity of the proposed facility, however routine monitoring of NO<sub>2</sub> concentrations is undertaken by passive diffusion tube at a number of locations in Barry. A summary of bias adjusted annual mean NO<sub>2</sub> concentrations measured between 2011 and 2015 is presented in Table 6. The locations of the monitoring sites is presented in Figure 4

Table 6: NO<sub>2</sub> Diffusion Tube Monitoring Data

| ID   | Site Name             | Type (a) | OS Grid Reference | 2011 (a) | 2012 (a) | 2013 (c) | 2014 (c) | 2015 (c) |
|--|-----------------------|----------|-------------------|----------|----------|----------|----------|----------|
| 1  | 110 Dock View Road    | R        | 312663, 168289    | 19       | 20       | 20.3     | 17.4     | 17.1     |
| 2  | Port Road East        | R        | 310813, 169693    | 26       | 27       | 24.2     | 25.8     | 23.1     |
| 3  | 24 Cardiff Road       | R        | 313597, 168829    | 28       | 32       | 28.8     | 26.9     | 27.8     |
| 4  | Bendrick Road         | UB       | 313407, 167477    | 15       | 15       | 22.5     | 14.0     | 14.9     |
| 5  | Thalasa, Dying Street | UB       | 311980, 166965    | 14       | 17       | 16.7     | 13.5     | 14.2     |
| 6  | Hollon Road           | R        | 311768, 168101    | 31       | 37       | 24.9     | -        | -        |
| (a) B = Background, UB = Urban Background                    |                       |          |                   |          |          |          |          |          |
| (b) Data from 2013 LAQM progress Report, bias adjusted       |                       |          |                   |          |          |          |          |          |
| (c) Raw data from Welsh Air Quality Forum, not bias adjusted |                       |          |                   |          |          |          |          |          |

A baseline concentration of 20µg/m<sup>3</sup> taken from the nearest representative site (Dock View Road) was used for the modelling to derive final cumulative concentrations. As stated by footnote C the figures used

are RAW data figures taken from Welsh Air Quality Forum, not bias adjusted. Although this figure would provide a conservative outcome to the modelling, it would have been best practise to utilise most up to date bias adjusted data taken from the Vale of Glamorgan's annual LAQM reports. In addition, from

Table 6 it is evident that there are a number of identified human sensitive receptors with calculated higher annual average NO<sub>2</sub> readings which could have been included in the review for a baseline figure. I have replicated Table 6 with the LAQM reported bias adjusted results.

| ID | Site Name              | Type | OS Grid Reference | 2011 | 2012 | 2013 | 2014 | 2015 |
|----|------------------------|------|-------------------|------|------|------|------|------|
| 1  | 110 Dock View Road     | R    | 312663, 168289    | 20   | 18.9 | 17   | 16.6 | 14.8 |
| 2  | Port Road East         | R    | 310813, 169693    | 26   | 25.3 | 23   | 22.5 | 21.3 |
| 3  | 24 Cardiff Road        | R    | 313597, 168829    | 28   | 29.5 | 27   | 23.2 | 23.2 |
| 4  | Bendrick Road          | UB   | 313407, 167477    | 15   | 13.8 | 15   | 12.9 | 12.5 |
| 5  | Thalasa, Dyfrig Street | UB   | 311980, 166965    | 14   | 15.6 | 14   | 13.7 | 11.9 |
| 6  | Holton Road            | R    | 311768, 168101    | 27   | 34.2 | 18   | 22.8 | 24.9 |

### **Modelled Receptor & Topography Detail**

It has been quantified that building heights greater than 30-40% of the emission release height were included in the assessment. Although this falls in line with best practise guidance, no detailed information is provided regarding the modelled receptors location and height taking into account the height of the land. It is best practise that these details be provided for quality reassurance.

**Detail surrounding site generated traffic and potential emissions arising both on and off site**

The revised report fails to include any particular detail surrounding proposed traffic flows/ movements generated off and on site and therefore the potential impact arising from traffic derived emissions to air quality levels. From a Local Air Quality Management perspective the potential adverse impact this may have to air quality levels at sensitive receptor locations could be significant. Although it may be possible that such movements calculated may not generate sufficient evidence to be included due to the fact modelling criteria specifications may not be met, this must be outlined in the report to provide clarity.

Further to the above raised points from an LAQM point of view it must be noted that adjacent to the proposed facility is an identified piece of land which has been outlined in the Vale of Glamorgan's Local Development Plan (2011- 2026). The LDP outlines an 8.9 Ha plot of land at Ffordd y Mileniwm to be used for employment purposes, B1, B2 & B8 uses.

This proposed site could potentially suffer from adverse air quality due to its close proximity to the proposed biomass facility and therefore may not be procurable, hindering the objectives and conflict with the policies set out by Local Development Plan.

If you have any queries regarding this matter, please do not hesitate in contacting me or the specialist officers on the above number or by e-mail at [pollution-vale-srswales@valeofglamorgan.gov.uk](mailto:pollution-vale-srswales@valeofglamorgan.gov.uk)

Yours faithfully



**Sian James,**  
**Team Manager, Neighbourhood Services**

*The Council welcomes correspondence in English or Welsh and we will ensure that we communicate with you in the language of your choice, whether that's English, Welsh or in Bilingual format as long as we know which you prefer. Please contact [welshstandards@valeofglamorgan.gov.uk](mailto:welshstandards@valeofglamorgan.gov.uk) to register your language choice. If we do not receive your language choice, we will continue to correspond with you in accordance with current procedure. Corresponding in Welsh will not lead to any delay.*

*Mae'r Cyngor yn croesawu gohebiaeth yn Gymraeg a Saesneg a byddwn yn sicrhau ein bod yn cyfathrebu â chi yn yr iaith o'ch dewis, boed yn Saesneg, yn Gymraeg neu'n ddwyieithog cyhyd â'n bod yn ymwybodol o'ch dewis. Cysylltwch â [safonaucymraeg@bromorgannwg.gov.uk](mailto:safonaucymraeg@bromorgannwg.gov.uk) i nodi dewis iaith. Os na fyddwn yn derbyn eich dewis iaith, byddwn yn parhau i gyfathrebu â chi yn unol â'r weithdrefn bresennol. Ni fydd gohebu yn Gymraeg yn creu unrhyw oedi.*