

## Audit of noise impact assessment

**Table 1: Permit Application Details & AQMAU Audit Outcome**

Permit application details		Can NIA conclusions be used for determination?	Audit outcome
<b>Site Name:</b> Wealdon Works <b>Permit ref:</b> EPR/CB3308TD/V002 <b>Type:</b> Variation, Follow up	<b>AQMAU ref:</b> AQMAU-C2236-RP01 <b>Date requested:</b> 18/10/2021 <b>AQMAU response date:</b> 16/12/2021	YES <sup>1</sup>  Note 1: Subject to NMP & Pre-Op actions	- Follow up audit, applicant revised NIA/ NMP - Schedule 5 queries addressed - Applicant to update description of mitigation to air cooled condensers (ACCs) in NMP - Pre-operational condition recommended to ensure combined sound power level of ACCs does not exceed 97 dB L <sub>WA</sub>

**Table 2: AQMAU Risk Grading of NIA elements**

NIA Element	Risk Grading	Brief summary of AQMAU audit (Reasons for Schedule 5 actions)	NMP Actions	Pre-Op Actions
Sensitive Receptors & Background Sound Levels	Green	<ul style="list-style-type: none"> <li>- The consultant has now included a receptor to the south-west (Andrews Farm) &amp; a future receptor which has planning consent (Land North of Horsham). We agree that the consultant has now identified the nearest Noise Sensitive Receptors (NSRs) to the site.</li> <li>- We previously queried the validity of background survey noise and weather data obtained in September 2020, as the previous NIA made reference to a weather station 15km away.</li> <li>- The consultant has clarified that the weather station was actually much closer to the site and NSRs. The data is suitable for use.</li> <li>- We agree with the consultant's derived background sound levels.</li> </ul>	-	-
Sound Source Levels	Green	<ul style="list-style-type: none"> <li>- We previously noted that the Air Cooled Condensers (ACCs) are the most dominant sound source at the site. This is still the case, but there are some receptors where HGVs may contribute significantly to the specific sound levels also.</li> </ul>	-	-
Consultant's calculation method & assumptions	Green	<ul style="list-style-type: none"> <li>- We previously tested sensitivity to using higher source heights for HGV and loader shovel sound sources, but these did not result in a significant increase in specific sound level predictions.</li> </ul>	-	-

		<ul style="list-style-type: none"> <li>- We previously tested sensitivity to a higher sound power level for the HGVs. We have retained this in our follow up audit.</li> <li>- We have not tested sensitivity to any further modelling assumptions for this follow up audit.</li> </ul>		
Acoustic feature corrections	Green	<ul style="list-style-type: none"> <li>- We previously queried why the consultant did not apply an acoustic feature correction at night, due to uncertainty regarding the validity of the background sound data in relation to the weather data.</li> <li>- The consultant has identified that specific sound levels at night at all NSRs are below the background sound levels. Site operations are also below the residual (<math>L_{Aeq}</math>) sound levels from non-site sources at all NSRs. We agree that an AFC does not apply during day/evening/night periods.</li> </ul>	-	-
Mitigation	Amber	<ul style="list-style-type: none"> <li>- We previously noted that a commitment should be made to provide acoustic screening to the sides of the ACCs.</li> <li>- The revised NIA (Section 4.3) now states "...acoustic screening would be installed around the perimeter of the ACCs".</li> <li>- The revised NMP (Table 4.3) states: "Acoustic screens will be installed around the perimeter of the ACCs as required".</li> <li>- The NMP should be updated to provide more detail regarding the height of the proposed screening to the ACCs.</li> <li>- We previously noted that the sound power levels of the ACCs should be limited to the assumptions made in the original NIA, and written into the Noise Management Plan (NMP).</li> <li>- The revised NMP now states: "Low noise fans need to be selected with maximum sound power level of 97 dB <math>L_{WA}</math>".</li> </ul>	- Applicant to revise NMP to include height of acoustic screens to ACCs	- Pre-operational condition to ensure combined sound power level of ACCs does not exceed 97 dB $L_{WA}$
Context	Green	<ul style="list-style-type: none"> <li>- In discussing the predicted impacts in relation to context, the consultant has made reference to guidance from WHO for external and internal sound levels at receptors. These are not directly relevant to the assessment of context for a BS4142 assessment.</li> <li>- The consultant has noted that the predicted specific sound levels are lower than the residual (<math>L_{Aeq}</math>) sound levels from non-site sources at all NSRs, during day and night, which ensures that site operations are less likely to be audible, and a low impact is likely.</li> <li>- We agree that the existing sound climate is such that the proposed site operations are less likely to be audible.</li> </ul>	-	-
BS4142 impact assessment conclusion	Green	<ul style="list-style-type: none"> <li>- AQMAU agree that the proposed variation will result in a low impact at the majority of the nearest NSRs. There is one NSR (Langhurst Moat Cottage) where a below adverse impact is likely during daytime hours, but this will be low impact when considering context.</li> </ul>	-	-

**Table 3: AQMAU Risk Grading – KEY**

Risk Grading	Implications for AQMAU audit
<p><b>Green</b> We don't see any risk with this element of the NIA.</p>	<p><i>We agree with their assumptions/conclusions in relation to this element of the NIA. <u>or</u> We disagree, but this is not considered significant, and does not affect our assessment of risk.</i></p>
<p><b>Amber</b> We see some risk with this element of the NIA and have investigated further.</p>	<p><i>We don't agree with their assumptions/conclusions in relation to this element of the NIA. This will affect our assessment of risk, and further action may be required from the applicant / consultant.</i></p>
<p><b>Red</b> We see major risk with this element of the NIA and it is likely to cause a problem.</p>	<p><i>We strongly disagree with their assumptions/conclusions in relation to this element of the NIA. This will strongly affect our assessment of risk and further action will be required from the applicant / consultant.</i></p>

## 1. Summary of work request

- 1.1 The National Permitting Service (NPS) Installations Team at Bristol asked the Air Quality Modelling and Assessment Unit (AQMAU) to audit a noise impact assessment<sup>1</sup> (NIA) prepared by RPS (the consultant) on behalf of Britaniacrest Recycling Limited (the applicant). The assessment is in support of a variation of an existing permit application for an incinerator to be located on the site of the former Wealdon Brickworks, Horsham, West Sussex.
- 1.2 Our initial audit<sup>2</sup> recommended that the applicant's conclusions could not be used for permit determination, and a Schedule 5 notice was issued which raised several technical issues. In addition to the revised NIA, the applicant has submitted a separate document<sup>3</sup> which sets out responses to the Schedule 5 queries and a revised Noise Management Plan (NMP)<sup>4</sup>. AQMAU attended a meeting with the consultant on 20<sup>th</sup> September 2021, to discuss the Schedule 5 queries.
- 1.3 We have audited the assessment and conducted check modelling with sensitivity analysis to our observations, in accordance with BS4142: 2014 +A1: 2019<sup>5</sup>.

## 2. Site Overview & Proposed Operations

- 2.1. The site will be on a former brickworks in a small industrial area to the north of Corsham, West Sussex. The surrounding area is predominantly rural. There are two major roads, the A264 and A24, within 1km of the site.
- 2.2. The facility will consist of an incinerator with associated waste handling and gas remediation plant, which will all be enclosed. The external sound sources are:
  - Loader shovel (daytime only)
  - Turbine Air Coolers
  - Air Cooled Condensers (ACCs)
  - Stack tip
  - Transformer
  - HGV movements (18 per hour, daytime only)
- 2.3. During night-time hours, the loader shovel and HGV movements would cease, all other sources would continue.

## 3. Evidence for Conclusions

### Sensitive Receptors & Background Sound Levels

- 3.1 The closest noise sensitive receptors (NSRs) are just over 200m away to the south-east (Langhurst Moat Cottage and Wealdon, on Langhurstwood Road). Additional receptors are located to the north-east (Graylands Lodge, 330m away), south-east (other properties on Langhurst Road, 370m away) south (Station Road, 330m away), north-west (Cox Farm, 420m away) and west (Andrews Farm, 550m away).

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<sup>1</sup> Wealden Works 3Rs Facility, Noise Assessment for Environmental Permitting, For Britaniacrest Recycling Ltd, Report No. JAE02231\_Report01\_Rev2, Date of Issue 15/10/2021, RPS

<sup>2</sup> AQMAU report reference: AQMAU-C2166-RP1.pdf, issued 27/07/2021

<sup>3</sup> EPR/CB3308T/V002 – Response to Schedule 5 Notice, Date of Issue 12/10/2021, RPS

<sup>4</sup> Wealden Works 3Rs Facility. Environmental Noise Management Plan, For Britaniacrest Recycling Ltd. Report no. JAE02231\_Report02\_Rev2, Date of Issue 18/10/2021, RPS

<sup>5</sup> BS4142: 2014 + A1: 2019. Methods for rating and assessing industrial and commercial sound. British Standards Institute

- 3.2 The NSR at Andrews Farm was not included in the previous NIA. We identified a property to the south-east (Bramblewood), but the consultant has noted that this the applicant is in the process of purchasing this property, which is derelict.
- 3.3 A query was also raised in the Schedule 5 notice as to the inclusion of future NSRs at the consented Land North of Horsham residential scheme (DC/16/1677 – Horsham District Council) – the nearest properties associated with this development (over 2700 dwellings) will be located 450m to the south-east. A NSR representing the closest properties at this development to the proposed scheme has been included in the revised NIA.
- 3.4 The consultant undertook a long term background noise survey over 8<sup>th</sup> – 16<sup>th</sup> September 2020 at three locations near local receptors:
- Langhurst Moat Cottage
  - Graylands Lodge
  - 3 Station Rd
- 3.5 For a fourth location near Cox Farm (420m to the north-west), the consultant undertook short term attended monitoring.
- 3.6 The consultant undertook previous monitoring in 2016 at several locations (Haybarn Cottage, Station Road, Cox Farm). We advised in our previous audit that the 2020 monitoring covered the most sensitive (nearest) NSRs, so use of the 2016 data was not required. The consultant has compared the 2016 and 2020 data in Table 3.2 of the NIA, and demonstrated that use of 2016 data at some NSRs is conservative. The consultant has therefore used the background sound levels measured at Haybarn Cottage to represent the future NSRs at the Land North of Horsham residential scheme, as agreed during the meeting in September 2021.
- 3.7 We noted in our previous audit that the long-term locations are appropriate but advised that the consultant could have considered additional receptors at Andrews Farm. During the meeting on 20<sup>th</sup> September 2021, it was agreed that the sound levels measured at 3 Station Road could be used to represent this NSR.
- 3.8 We previously queried the validity of the background survey sound data obtained in September 2020, due to the fact that the previous NIA stated that meteorological data was measured at weather station in Horley, which is 15km to the north-east. Weather data from this location would be unlikely to be representative of weather conditions near the site and NSRs. The consultant has clarified that this was an error in the previous NIA, and the weather station data was actually obtained from another, closer weather station in Holbrook, which is 1.2km to the south-west of the site. Although weather conditions at this location may not be entirely comparable to localised conditions near the site and NSRs, we consider the risk of potentially lower background sound levels to be lower than previously considered. The background sound levels can therefore be used for the purposes of this assessment.
- 3.9 The weather data provided shows that the wind direction throughout the survey period was variable, but characterised by westerly, south-westerly and southerly components. This would have resulted in road traffic from the A24 to the west, and A264 to the south contributing to the background ( $L_{A90}$ , dB) and residual ( $L_{Aeq}$ , dB) sound climates at the NSRs. This is consistent with the consultant's observations. The measured wind speeds do not exceed 5m/s.

- 3.10 The consultant has summarised the background sound levels used in the revised assessment in Table 3.3 of the NIA, for day (0700 – 1900), evening (1900 – 2300) and night (2300 – 0700) periods.
- 3.11 We agree with the consultant's derived background sound levels for the updated NIA.

### Sound Source Levels

- 3.12 Sound power and other data were submitted in the updated NIA, updated modelling files and QSI data export files.
- 3.13 As noted in our previous audit, the Air Cooled Condensers (ACCs) are the most dominant sound source at the NSRs at the majority of NSRs. There are some NSRs where HGVs are equally dominant, but this is due to the use of a higher sound power level in our sensitivity analysis, as set out in 3.14. We previously noted that the sound power levels of the ACCs should be limited to the assumptions made in the original NIA, and written into the NMP. We also noted that a commitment should be made to provide acoustic screening to the sides of the ACCs. These issues are discussed further in the Mitigation section.
- 3.14 In our previous audit, we tested sensitivity to the following sound sources:
- HGV and loader shovel emission height
  - Use of HGV sound power data from BS 5228<sup>6</sup>
- 3.15 As noted in our previous audit, changing the emission height of the HGV and loader shovel did not result in significant increases in specific sound level predictions. However, we have retained the use of a higher sound power level for HGVs in the follow up audit, as this resulted in higher predictions at all NSRs.

### Consultant's calculation method & assumptions

- 3.16 The consultant used SoundPlan acoustic modelling software (Version 7.2) to predict BS4142 specific sound levels at local receptors, in accordance with the calculation methodology described in ISO 9613-2<sup>7</sup>. The consultant provided updated computer noise modelling files (ref: 02231 Update Oct2021) with the revised NIA submission.
- 3.17 We noted in our previous audit that the noise modelling files considered 1<sup>st</sup> floor receptors for night-time only, and tested sensitivity to 1<sup>st</sup> floor receptors during daytime and evening hours also. The updated modelling files include receptors at ground (1.5m above ground level) and 1<sup>st</sup> floor height (4m above ground level).

### Acoustic feature corrections

- 3.18 In our previous audit, we queried why the consultant did not apply an acoustic feature correction (AFC) at night, due to potentially higher specific sound levels at some NSRs (Langhurst Moat), and uncertainty regarding the validity of the background sound data in relation to the weather data. In the event that a lower background sound level had been likely at the NSRs, it may have been possible for

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<sup>6</sup> Code of practice for noise and vibration control on construction and open sites – part 1: Noise, BS 5228-1:2009+A1:2014, British Standards Institution, 2014

<sup>7</sup> ISO 9613-2: 1996. Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation

site operations to be audible at night, compared to the existing sound climate. We now consider the background sound levels to be reasonably representative of those at the NSRs, so can assess the appropriateness of an AFC at night based on a comparison between the specific sound and residual ( $L_{Aeq}$ ) non-site sound levels.

- 3.19 The consultant has identified that overall specific sound levels at night at all NSRs are below the background ( $L_{A90}$ ) sound levels. Site operations would also be below the residual ( $L_{Aeq}$ ) sound levels from non-site sources at all NSRs, so it is less likely that site operations would be audible compared to contributions from road traffic on the A24, A264 and other environmental sound sources. We agree that an AFC does not apply at night.
- 3.20 For daytime and evening hours, we did not consider that an AFC would apply at most NSRs in our previous audit, as our predicted specific sound levels were below the background ( $L_{A90}$ ) and residual ( $L_{Aeq}$ ) sound levels. There is one NSR (Langhurst Moat Cottage) where our predicted specific sound levels exceed the background sound level during daytime hours, but the residual ( $L_{Aeq}$ ) sound levels are still above our predicted specific sound level, which reduces the likelihood of an AFC being required. We do not consider an AFC to be necessary for day or evening operations.

### Mitigation

- 3.21 We previously noted that the sound power levels of the ACCs should be limited to the assumptions made in the original NIA (combined sound power not to exceed 97dB  $L_{WA}$ , and written into the NMP.
- 3.22 The revised NMP now states: “Low noise fans need to be selected with maximum sound power level of 97 dB  $L_{WA}$ ”. A pre-operational condition is recommended to request evidence that the combined sound power level of the ACCs does not exceed 97 dB  $L_{WA}$  as specified in the current NIA and NMP.
- 3.23 We previously noted that a commitment should be made to provide acoustic screening to the sides of the ACCs. The revised NIA (Section 4.3) now states “...acoustic screening would be installed around the perimeter of the ACCs”. The revised NMP (Table 4.3) also states: “Acoustic screens will be installed around the perimeter of the ACCs as required”.
- 3.24 We note that the modelling files and information in Appendix C: Noise Model Input Data suggest that the screening will be provided by a floating screen, the base of which is located 9m above local ground level, and is 17m in height.
- 3.25 However, the NMP does not include this specific information regarding the height of the screening around the ACCs. The NMP should be updated to provide more detail regarding the height of the proposed screening to the ACCs.

### Context

- 3.26 The consultant has discussed the predicted BS4142 impacts at the NSRs in relation to context. However, the discussion of context has been based on comparing the predicted specific sound levels to guidance from the World Health Organization<sup>8</sup> for external and internal sound levels at receptors. The consultant has also provided an indication of internal sound levels inside receptors with

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<sup>8</sup> Berglund, B. et al. Guidelines for Community Noise. World Health Organisation. 2000

windows open, in accordance with Report NANR 116<sup>9</sup>. The guidance chosen by the consultant is not directly relevant to the assessment of context for a BS4142 assessment.

- 3.27 The consultant has however noted that the predicted specific sound levels are lower than the residual ( $L_{Aeq}$ ) sound levels from non-site sources at all NSRs, during day and night periods, which ensures that site operations are less likely to be audible compared to contributions from road traffic and other environmental sound sources, and a low impact is likely.
- 3.28 We agree that the existing residual sound levels at the NSRs are sufficiently high that the proposed site operations are less likely to be audible during day, evening and night periods.

#### BS4142 impact assessment conclusion

- 3.29 The consultant has presented a BS4142 impact for daytime (0700 – 1900), evening (1900 – 2300) and night-time (2300 – 0700) in Tables 4.1, 4.2 and 4.3 respectively.
- 3.30 The consultant concludes that the rating sound level is predicted to be at or below the background sound level at all NSRs, which is an indication of a low impact depending on context.
- 3.31 We have compared the predicted rating sound level to the residual ( $L_{Aeq}$ ) sound levels at the NSRs. While we predict higher specific sound levels at the NSRs than the consultant, we agree that a low impact is likely at the majority of NSRs for day, evening and night periods, depending on context.
- 3.32 There is one NSR (Langhurst Moat Cottage) where our derived rating sound levels exceed the background sound level, indicating a below adverse impact during daytime hours, depending on context. We note that the residual sound levels ( $L_{Aeq}$ ) are higher than the predicted specific sound levels at this location, which reduces the impact to low.

#### AQMAU Modelling Checks

- 3.33 We carried out check modelling using SoundPlan (V8.2) based on the sound emissions, assessment data and the operator's modelling file/data. We found that the model outputs matched the results presented by the consultant in the revised NIA.
- 3.34 We retained the higher sound power level for HGVs used in our previous audit, and adjusted the operator's model to include this. The outputs from this revised model were used to inform our conclusions. We found higher specific sound levels than the consultant at all NSRs.

#### AQMAU Audit Conclusion & Recommendations

- 3.35 Although we predict higher specific sound levels at the NSRs than the consultant, we agree that a low impact is likely at the majority of NSRs for day, evening and night periods, depending on context. The worst-affected NSR is Langhurst Moat Cottage, where a below adverse impact is possible during daytime hours. This impact could

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<sup>9</sup> Report NANR 116 (Building performance Centre, 2007)



be reduced to low when considering the predicted site emissions in the context of the existing sound climate.

- 3.36 The applicant has taken steps to provide acoustic screening around the sides of the ACCs. However, the revised NIA and NMP do not provide specific information on the height of this screening.
- 3.37 The NMP should be further updated to provide more detail regarding the height of the proposed screening to the ACCs.
- 3.38 The BS4142 impact assessment, as presented in the revised NIA, depends on the ACCs achieving a maximum sound power level of 97 dB  $L_{WA}$ . A pre-operational condition is recommended to request evidence that the combined sound power level of the ACCs does not exceed 97 dB  $L_{WA}$ , as specified in the current NIA and NMP.

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