PROPOSED RENDERING PLANT
2121 FINLAY ROAD
TONGALA

Consideration of Noise Emissions Associated with Proposed Rendering Plant

A report prepared on behalf of:

HW Greenham & Sons Pty Ltd
2121 Finlay Rd
Tongala
VIC 3621

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1. **INTRODUCTION**

The subject site is located at 2121 Finlay Rd, Tongala Victoria.

The proposal comprises the installation and operation of a rendering plant at the subject site.

The facility will operate as an integral part of the abattoir that presently occupies the site and may operate during the day, evening or night periods. Consideration of noise emission at all times including the most sensitive night period is therefore required.

As part of the environmental approvals for the proposal, Watson Moss Growcott Acoustics Pty Ltd (WMG) has been engaged to carry out an acoustic assessment to consider the potential noise emissions associated with the proposed rendering plant.

This report presents the results of the acoustic assessment and considers noise emissions associated with the facility in accordance with the Victorian Environment Protection Authority Publication 1411 *Noise from Industry in Regional Victoria – Recommended Maximum Noise Levels from Commerce, Industry and Trade Premises in Regional Victoria* (NIRV).

This report also draws significantly on work previously conducted in relation to installation of a cogeneration plant at the subject site. Work including noise monitoring was conducted during 2018 to determine noise constraints under NIRV for residential premises in the vicinity of the subject site and calculate noise emission from the proposed cogeneration plant.

That work culminated in a report in relation to the proposed cogeneration plant prepared early in 2019 and the discussion in that report regarding existing ambient noise levels, determination of noise constraints and addition of noise sources is relevant to the current consideration of the proposed rendering plant, so has been included in this report.

The objective has been to determine if the proposed rendering plant can be added to the existing operations at the subject site while remaining in overall compliance with the NIRV Recommended Maximum Noise Levels, and to determine any necessary noise reduction requirements to enable this objective to be achieved.

2. **NOISE ASSESSMENT TERMINOLOGY**

Noise assessment terminology used within this report is defined within Table 1 below:

<table>
<thead>
<tr>
<th>Terminology</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>dB(A)</td>
<td>Decibels recorded on a sound level meter, which has had its frequency response modified electronically to an international standard, to quantify the average human loudness response to sounds of different character</td>
</tr>
<tr>
<td>(L_{90})</td>
<td>The level exceeded for 90% of the measurement period, which is representative of the typical lower levels in a varying noise environment. It is the noise measure defined by the EPA as the measure of the background noise level to use in determining noise limits.</td>
</tr>
</tbody>
</table>
### Terminology

<table>
<thead>
<tr>
<th>Terminology</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_{eq}$</td>
<td>The equivalent continuous level that would have the same total acoustic energy over the measurement period as the actual varying noise level under consideration. It is the noise measure defined by the EPA as the measure of the noise to use in assessing compliance with noise limits.</td>
</tr>
<tr>
<td>Sound power level</td>
<td>The amount of energy emitted from a source in the form of sound.</td>
</tr>
</tbody>
</table>

3. **SITE AND ENVIRONS**

The subject site is located at 2121 Finlay Road, where the local area is predominantly agricultural land.

The site abuts Finlay Road to the north, Watson Rd to the east, agricultural property to the south and the No. 19/9 Channel to the west.

Noise emissions associated with the proposed facility will require consideration at residential receptors in the vicinity of the subject site.

The aerial photograph shown below in Figure 1 identifies the subject site and the noise sensitive receptors relevant as part of this assessment.
Figure 1: Subject site and most relevant residential receptor locations

A more comprehensive locality plan including planning scheme zoning appears at Appendix One and the proposed Site Plan at Appendix Two.

The subject site is occupied by an existing operational abattoir. The proposed rendering plant is to operate as an integral part of the abattoir.

Based on the distance separation between the subject site and residential receptors, the most relevant receptors will be as shown below in Table 2 below.

Table 2: Summary of Relevant Noise Sensitive Residential Receptors

<table>
<thead>
<tr>
<th>Residential Address</th>
<th>Direction from Site</th>
<th>Distance from approximate location of proposed Rendering plant, m</th>
</tr>
</thead>
<tbody>
<tr>
<td>85 Bosse Rd Tongala</td>
<td>NE</td>
<td>1200</td>
</tr>
<tr>
<td>491 Murphy Rd Tongala</td>
<td>W</td>
<td>740</td>
</tr>
<tr>
<td>818 Henderson Rd Tongala</td>
<td>SE</td>
<td>1180</td>
</tr>
</tbody>
</table>
The site occupies land zoned Industrial 2 (IN2Z), with adjacent land to the North-West zoned Farming 1 and 2 (FZ1/FZ2) and land to the South-East zoned Public Use - Service & Utility / Local Government (PUZ1 / PUZ6).

The relevant residential receptor locations all occupy land zoned FZ1/FZ2.

4. NOISE EMISSION ASSESSMENT CRITERIA

4.1 ASSESSMENT CRITERIA

When considering noise emissions associated with the proposed new plant at the subject site, resultant noise levels at residential receptors are considered in accordance with the following guideline and policy:

- Environment Protection Authority Publication 1411 Noise from Industry in Regional Victoria – Recommended Maximum Noise Levels from Commerce, Industry and Trade Premises in Regional Victoria (NIRV); and

The NIRV document was introduced in 2011 to provide guidance on suitable noise emission assessment criteria for regional areas within Victoria but outside Metropolitan Melbourne.

SEPP N-1 is applicable within Metropolitan Melbourne, but is also a reference document for NIRV, providing noise assessment methodologies.

The NIRV document includes Recommended Maximum Noise Levels (RMNLs) which are determined based on the Planning Scheme land use zonings associated with the location/s of the commercial noise emissions and the noise sensitive residential receptors. The RMNL’s described within the NIRV document are guideline values.

The recommended levels only gain a higher status than recommendations if adopted as Conditions in a Planning Permit or Operating Licence, which is common practice. In the absence of adoption of the RMNLs in a Planning Permit or Operating Licence, the EPA would apply the NIRV RMNLs if called upon to consider noise complaints.

For residential receptors located outside major urban centres of regional Victoria like the subject site, RMNL’s are based on set methodologies described within NIRV including:

- consideration of the land zoning of the ‘noise sender’ and the land zoning of the ‘noise receiver’ and
- the shortest distance of the house under consideration to the boundary of the zone in which the noise emitter is located, where the noise generator and the noise receiver are located in different zones.

In ‘background relevant areas’ where background levels may be higher than usual for a rural area the background level can also influence the RMNLs. ‘Background-relevant areas’ are typically near major roads or the coast, locations which include ongoing sources of ambient noise.

Using NIRV methodology, RMNLs vary depending on the time of the day, evening or night, with the highest permitted values typically occurring during week daytimes, and the lowest during the night period.
The relevant EPA-defined ‘day’, ‘evening’, and ‘night’ assessment periods are shown below in Table 3.

Table 3: EPA Assessment Periods

<table>
<thead>
<tr>
<th>EPA Assessment Period</th>
<th>Relevant Days</th>
<th>Relevant Time Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Day’</td>
<td>Monday to Friday</td>
<td>7:00am to 6:00pm</td>
</tr>
<tr>
<td></td>
<td>Saturday</td>
<td>7:00am to 1:00pm</td>
</tr>
<tr>
<td>‘Evening’</td>
<td>Saturday</td>
<td>1:00pm to 6:00pm</td>
</tr>
<tr>
<td></td>
<td>Sunday, Public Holidays</td>
<td>7:00am to 6:00pm</td>
</tr>
<tr>
<td></td>
<td>All Days</td>
<td>6:00pm to 10:00pm</td>
</tr>
<tr>
<td>‘Night’</td>
<td>All Days</td>
<td>10:00pm to 7:00am</td>
</tr>
</tbody>
</table>

For a use that can operate at any time during the ‘day’, ‘evening’ or ‘night’ periods, the night period provides the limiting constraint, so the night period has been the main focus of this assessment.

Given that IN1Z and IN2Z are in the same category in the table of noise generating and noise receiving zones in NIRV, the shortest distance from the noise receiving location to the zone that contains the source under consideration has been taken to be to either IN1Z or IN2Z land, to avoid a perverse outcome in relation to section 4.2 below of having different RMNLs for different industries affecting the same residential location.

Based the different land zoning types of the ‘noise sender’ and ‘noise receiver’ as well as the shortest distances of the receptor locations from the zoning occupied by the subject site and results of the attended and unattended noise monitoring at the subject site (as discussed in Section 5), the relevant RMNL values at the noise sensitive receptors are shown below in Table 4.

Table 4: NIRV RMNLs for nearby noise sensitive receivers during EPA Periods

<table>
<thead>
<tr>
<th>EPA Assessment Period</th>
<th>NIRV Recommended Maximum Noise Levels, dB(A) $L_{eq}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>W Receptor</td>
</tr>
<tr>
<td>‘Day’</td>
<td>51</td>
</tr>
<tr>
<td>‘Evening’</td>
<td>46</td>
</tr>
<tr>
<td>‘Night’</td>
<td>41</td>
</tr>
</tbody>
</table>

4.2 Noise Allowances for Other Industry

The Recommended Maximum Noise Levels apply to the total of all industrial noise emissions affecting a noise-sensitive area. A site may need to meet lower levels when more than one industry contributes or will contribute to the total noise level affecting a noise-sensitive area.

The “SEPP N–1 and NIRV Explanatory Notes” (EPA publication 1412, October 2011) identify that approval decisions need to allow for noise from existing or anticipated future industry. A proposed industry may need to be required to meet noise levels below the NIRV RMNLs taking
into account possible future growth of industry in the areas near noise sensitive locations, or contributions from other existing industry. Appendix F to the Explanatory Notes provides guidance on this.

The guidance is that new industries, plant expansion or major new sources should be abated to the RMNL minus 10 x \( \log_{10}(N) \) in decibels at the noise-sensitive area (for each of the day, evening and night periods), where \( N \) is the total number of existing and likely contributing industrial plant installations.

For two installations producing equal residual noise at the noise sensitive locations this equates to a 3 decibel reduction to the RMNL for each individual contributing industry. For three installations producing equal residual noise at the noise sensitive locations this equates to a 5 decibel reduction for the Permissible Noise Limit for each individual industry.

The subject site includes the existing operating abattoir and the locality includes an existing fertiliser plant east of the subject site along Finlay Rd and a milk processing plant further again to the east. Allowance also needs to be made for the cogeneration plant that was the subject of the recent assessment as a discrete source.

The approach that has been adopted in this assessment has been to consider the combined noise level due to the proposed cogeneration and rendering plants, to ensure that the additive effects of noise due to both sources remains within the NIRV Recommended Maximum Noise Levels when considered in conjunction with all existing noise sources in the area.

In broad terms this means that the proposed rendering and cogeneration plants could be viewed as a fourth noise emitting entity being added to three existing noise emitting entities, which implies a notional design target of the NIRV RMNL minus 6 dB \([10\log(4)=6]\) for the combined noise emission of the cogeneration and rendering plants. However, this would be a very conservative approach, as it is not likely that all industrial sources would contribute equally at all residential premises.

In recognition of this, in similar assessments which have involved consultation with and have been approved by the EPA, WMG has adopted design objective values equal to the calculated SEPP N-1/NIRV noise limits minus 5 dB(A) as a notional allowance for the contributions of other sources.

This would imply night period noise targets for the combined cogeneration and rendering plants of 36, 38 and 36 dB(A) for the western, south eastern and north eastern receptor locations respectively.

A component of the site noise monitoring work was determining if these other potential noise sources are contributors at the residential premises most relevant to the subject site, to assist in considering specific noise targets for the cogeneration plant and subsequently for the rendering plant.

At a location representative of the NE location, the measured level with audible contributions from the fertiliser and milk processing plants was approximately equal to the night period Recommended Maximum Noise Level. This implies that the desirable target for the rendering plant noise contribution at this location would be 10 dB(A) below the RMNL so as not to contribute to an increase in the existing level. The logarithmic nature of the decibel scale means that adding a contribution 10 dB lower than an existing level does not add to the existing level.

This implies a desirable target for the combined noise emission of the cogeneration and rendering plants of less than 31 dB(A) at the north eastern receptor location.
At a location representative of the western residential location, the measured level with audible contributions from the abattoir existing plant was 39 dB(A), 2 dB(A) below the night period Recommended Maximum Noise Level. Adding a contribution of 37 dB(A) from the combined noise emission of the cogeneration and rendering plants would add logarithmically to the existing 39 dB(A) to give an overall 41 dB(A), equal to the night period Recommended Maximum Noise Level.

On this basis the design target for the combined noise emission of the cogeneration and rendering plants would be 37 dB(A). Adopting the 36 dB(A) derived above for this location to allow for more contributors would be a more conservative approach.

It was not possible to measure at a location close to the south eastern residential location without entering private property, so the conservative approach would be to adopt the desirable design targets established above, which is 38 dB(A) for this location.

Taking all the foregoing factors into account, desirable objective target levels for the combined noise emission of the cogeneration and rendering plant for the night period have been adopted as 36, 38 and 31 dB(A) for the western, south eastern and north eastern receptor locations respectively.

The design objective values are to be achieved within 10 metres of residential dwellings located at the noise sensitive receptors, but outside the house.

For scenarios where operations are 24 hours per day, compliance during the night period will typically result in compliance during all other periods.

The previous noise assessment in relation to the cogeneration plant found that there was a margin for compliance with the adopted noise targets for additional plant. This outcome means that there is scope to add the proposed rendering plant to the site while remaining within the noise targets, provided that the rendering plant noise emission is compatible with this.

5. AMBIENT NOISE MONITORING

A visit to the site and surrounds was made during the 2018 work in relation to the proposed cogeneration plant, including the critical night period, to establish the following as part of the process of determining noise constraints for the cogeneration plant:

- Under NIRV, the RMNLs are determined based on Planning Scheme zonings and distance from the noise source, unless the ambient background noise level exceeds a threshold of the RMNL determined based on the Planning Scheme zonings minus 8 dB(A) for the day period or 5 dB(A) for evening/night periods. Noise measurements were therefore conducted to determine if the background level is sufficiently high to influence the RMNLs.
- In relation to the discussion on multiple noise contributors in section 4.2 above, noise measurements and observations were undertaken at locations representative of residential premises without entering private property to determine contributions of existing industrial sites to the existing noise levels at the residential premises.

The site work was conducted between approximately 1700 hours on Wednesday 19 and 1100 hours on Thursday 20 December 2018. Weather conditions during the site work were suitable for conducting outdoor noise measurements, with calm to light breeze conditions.
5.1 **MEASUREMENT EQUIPMENT**

Equipment used as part of the assessment is shown below in Table 5:

*Table 5: Equipment Used as Part of Assessment*

<table>
<thead>
<tr>
<th>Equipment Designation</th>
<th>Use of Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rion NA-27 Sound Level Meter</td>
<td>Attended handheld measurements</td>
</tr>
<tr>
<td>Ngara Real Time Sound Acquisition System</td>
<td>Unattended Noise Logging Measurements</td>
</tr>
</tbody>
</table>

The field calibration of the measurement equipment was checked with a Bruel & Kjaer Type 4230 Sound Level Calibrator at the commencement and completion of the noise logging period and found to be within the correct calibration range.

5.2 **NOISE MEASUREMENT LOCATIONS**

Noise measurements were conducted at the locations indicated by the pink markers on the annotated aerial photo below.

*Figure 2: Locations of site noise measurements*
The unattended noise logger was installed at a location within the boundary of the subject site near the western residential location.

5.3 **Noise Measurement Results and Discussion**

A significant feature of the ambient environment during the site work was noise due to cicadas, which was very dominant at times.

Noise due to cicadas is seasonal, so there would be times of the year when cicada noise is not so prominent. Cicada noise is therefore not included in the background level for the purpose of determining RMNLs.

Graphs of the unattended noise monitoring results have been included in Appendix Three.

The first graph is the ‘raw’ dB(A) level, which was significantly influenced by cicada noise at times, particularly around 2100 hours.

The second graph is of the dB(A) level excluding higher frequency noise in the 2500 Hz one-third octave frequency band and above, which substantially removes the cicada noise contribution to be more representative of other times of the year.

This removes the significant increase in noise levels around 2100 hours but leaves an increase around 0600-0700 associated with birds.

The background $L_{90}$ level varies during the night but drops to the low 30s dB(A) at times, which confirms that this is not a ‘background-relevant area’ and the NIRV RMNLs are based purely on zoning and distance considerations.

Hand-held measurements at a range of locations further confirmed this finding.

Hand-held measurements were also conducted where possible at locations representative of the relevant residential premises. These are discussed in section 4.2 above in relation to noise contributions from multiple industries.

6. **Proposed Site Layout**

The full site layout plan has been included in Appendix Two, with plans of the proposed rendering plant in Appendix Four.
7. PREDICTED NOISE EMISSION FROM PROPOSED FACILITY

7.1 NOISE SOURCES FORMING PART OF PROPOSAL

The proposal is to install a rendering plant, which is to be substantially enclosed within a building. Some components of the process are also to be located outside the building.

Noise sources are therefore in two categories, located within and outside the building.

The building is to comprise four main compartments as shown in Figure 3 below.

![Figure 3: Rendering plant building layout](image)

Advice has been provided by Keith Engineering, the suppliers of the equipment to be installed in the rendering plant, regarding the dominant noise sources in the different compartments of the proposed building. Dominant noise sources have been identified as follows:

A. Hammermill dominant noise source
B. Centrifuge and presses dominant noise sources
C. No significant noise sources in this area
D. Boiler.

The proposed construction of the rendering plant building includes precast concrete panels at the bottom of the walls, the remainder of the walls double skin metal cladding and a metal roof with insulation blanket and sisalation. The building will also include ventilation openings in the walls and five rooftop ventilation exhaust fans.

Outdoor noise sources are to be:
- Air cooled condenser comprising three fans located east of the proposed building, at the northern end of the building east wall
- Biofilter fan located south of the proposed building.
Keith Engineering directed WMG to an existing rendering plant in NSW with similar equipment to that proposed for the subject site, to measure noise source data for indoor sources and the Biofilter fan. It was noted that the biofilter fan measured to obtain source noise data for the noise modelling was exhibiting what appeared to be more than normal noise associated with the belt drive, so noise emission calculations based on this source data may overestimate noise emission for a fan in good condition.

Noise data for the rooftop ventilation exhaust fans has been based on fan manufacturer data for fans capable of meeting the required ventilation duty and the air-cooled condenser noise has been estimated based on an air-cooled condenser of similar magnitude.

Noise data for input into the noise model is the sound power level for the external sources and the sound pressure level for indoor sources. The noise data used in the modelling has been included in Appendix Five.

7.2 NOISE PREDICTION METHODOLOGY

Modeling of operational noise emissions has been conducted using DataKustik CadnaA 2018 environmental noise modelling software, implementing the ISO 9613-2 environmental noise calculation algorithms.

As part of the noise prediction methodology, CadnaA 2018 considers the following attenuation measures:

- Geometrical spreading;
- Atmospheric absorption;
- Ground attenuation;
- Meteorological effects based on downwind sound propagation;
- Source/Receiver height effects;
- Barrier attenuation due to the surrounding environment including existing buildings/structures;

7.3 NOISE MODELLING INPUT PARAMETERS

The noise modelling input parameters reflect the Environment Protection Authority (EPA) Victoria assessment methodology requirements. These include:

- Residual noise levels at noise sensitive receivers have been considered when weather conditions assist with propagation of noise emissions in the direction of the relevant noise sensitive receivers.
- Predicted noise level impacts have been assessed over a continuous 30-minute assessment period.

As a source that operates continuously during operation, the instantaneous level of the rendering plant is equal to the L_{eq} over a 30-minute period.

7.4 NOISE PREDICTION RESULTS

The calculated resultant noise levels associated with emission from the proposed cogeneration and rendering plants at each of the off-site noise sensitive receptor locations is summarised below in Table 6.
Table 6: Predicted noise levels associated with proposed facility operation

<table>
<thead>
<tr>
<th>Noise Sensitive Receptor</th>
<th>Predicted Cogeneration and Rendering Plant Noise Level, dB(A)</th>
<th>NIRV Night Period Recommended Maximum Noise Level, dB(A)</th>
<th>Desirable Combined Rendering and Cogeneration Plant Noise Target, dB(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>85 Bosse Rd Tongala (NE of subject site)</td>
<td>26</td>
<td>41</td>
<td>31</td>
</tr>
<tr>
<td>491 Murphy Rd Tongala (W of subject site)</td>
<td>34</td>
<td>41</td>
<td>36</td>
</tr>
<tr>
<td>818 Henderson Rd Tongala (SE of subject site)</td>
<td>30</td>
<td>43</td>
<td>38</td>
</tr>
</tbody>
</table>

The highest ranked noise sources at the western house with the highest calculated noise level in order of noise contribution were found to be:
- Biofilter fan
- Cogeneration plant
- Roof vent fans B to E.

At the south eastern houses, the condenser fans ranked between the cogeneration plant and the roof vent fans and at the north eastern house the condenser fans ranked highest, followed by the cogeneration plant, the roof vents and the biofilter fan.

That is, the highest ranked noise sources at residential receptors were all found to be external sources, not noise breakout from the building.

The modelled noise levels at residential locations arising from the operation of the rendering plant in conjunction with the cogeneration plant were all found to be well below the NIRV RMNLs for the night period at all locations.

The modelled levels are also below the derived desirable targets for the combined noise contribution of both the cogeneration and rendering plants taking into consideration all existing industrial noise sources in the area.

This conclusion is based on the rendering plan as currently proposed. At the detailed design stage, it would be prudent to pursue opportunities to minimise noise emission so as to maximise flexibility in the addition of additional plant items in future by creating a greater margin for compliance with the site noise constraints.
8. CONCLUSIONS

Watson Moss Growcott Acoustics (WMG) has carried out an acoustic assessment for the proposed installation and operation of a rendering plant at the subject site.

The purpose of the assessment was to consider potential noise emission associated with the proposed use on noise sensitive residential receptors surrounding the subject site.

Noise emissions associated with the proposed use have been considered in accordance with methodologies described in the following guidelines and policies:

- Environment Protection Authority Publication 1411 Noise from Industry in Regional Victoria – Recommended Maximum Noise Levels from Commerce, Industry and Trade Premises in Regional Victoria (NIRV); and

Based on the assessment, WMG has concluded that operation of the proposed facility can comply with the NIRV Recommended Maximum Noise Levels and project design objectives at each of the existing residential noise sensitive receptors during the EPA-defined day, evening and night periods without any additional noise control measures.

This conclusion takes into account the noise contributions of existing industries in the area and the proposed cogeneration plant at the subject site.

NEVILLE GODDARD
WATSON MOSS GROWCOTT
Acoustics Pty Ltd
APPENDIX ONE: PLANNING SCHEME ZONING MAP AND LOCALITY PLAN

North-East Residential Receptor
85 Bosse Rd

West Residential Receptor
Cnr Murphy & Finlay Rds

Subject Site
21121 Finlay Road

South-East Residential Receptor
818 Henderson Rd
APPENDIX TWO: PROPOSED SITE PLAN

Proposed Cogeneration Plant Comprising Two Packaged Sound-Attenuated Cogeneration Units

Proposed Rendering Plant
APPENDIX THREE: AMBIENT NOISE MONITORING RESULTS

Unattended Noise Logging Location - West Point - 2121 Finlay Rd, Tongala

Sound level [dB(A)]

Time (hrs:mins)

Leq 1-minute
L90 1-minute
Unattended Noise Logging Location - West Point - 2121 Finlay Rd, Tongala 1700hrs Tue 19 to 1100hrs Wed 20 Dec 2018 limited to Frequency Range 0-2238 Hz
APPENDIX FOUR: PROPOSED RENDERING PLANT PLANS
### APPENDIX FIVE: NOISE SOURCE SOUND LEVEL INFORMATION USED IN MODELLING NOISE EMISSION

<table>
<thead>
<tr>
<th>Noise Source</th>
<th>Octave Band Centre Frequency (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>63</td>
</tr>
<tr>
<td><strong>External Sources, sound power level dB re 1 pW</strong></td>
<td></td>
</tr>
<tr>
<td>Biofilter fan, derived from site measurements</td>
<td>105</td>
</tr>
<tr>
<td>Air condenser fans, each of three, based on fan manufacturer’s data</td>
<td>93</td>
</tr>
<tr>
<td>Roof vent fan A, based on typical fan manufacturer’s selection for 17,500 m³/h fan</td>
<td>80</td>
</tr>
<tr>
<td>Roof vent fans B to D, based on typical fan manufacturer’s selection for 40,000 m³/h fan, per fan</td>
<td>85</td>
</tr>
<tr>
<td><strong>Internal Sources, sound pressure level dB re 20 µPa</strong></td>
<td></td>
</tr>
<tr>
<td>Hammer mill spatial Leq in large room based on measurements at existing rendering plant</td>
<td>80</td>
</tr>
<tr>
<td>Tallow centrifuge and press spatial Leq in large room based on measurements at existing rendering plant</td>
<td>80</td>
</tr>
<tr>
<td>Raw material area and MCC, estimate based on overall estimated 80 dB(A) in the absence of any data</td>
<td>74</td>
</tr>
<tr>
<td>Boiler room based on flat linear spectrum for overall level 80 dB(A) provided by suppliers</td>
<td>79</td>
</tr>
</tbody>
</table>