



**IN THE MATTER** of the Resource Management Act 1991 (“RMA” or “the Act”)

**AND**

**IN THE MATTER** of applications under section 88 of the Act to the **Tasman District Council** by **Tasman Bay Asphalt Limited** for resource consents for an Asphalt Plant (**RM201000, RM201002, RM201018**)

**EVIDENCE OF MATTHEW BRONKA ON BEHALF OF  
TASMAN BAY ASPHALT LIMITED  
(ACOUSTICS)**

**1. INTRODUCTION**

- 1.1 My full name is Matthew Bronka. I hold the position of Director and Principal Acoustic Consultant at Bladon Bronka Acoustics Ltd (“BBA”).
- 1.2 This evidence is given on behalf of Tasman Bay Asphalt Limited (the “Applicant”). The Applicant has applied for:
- (a) Land Use consent to construct and operate an Asphalt Plant and build an acoustic barrier (RM201000);
  - (b) Discharge Permit to discharge contaminants from an Asphalt Plant to air (RM201002); and
  - (c) Land Use Consent to undertake earthworks within 10 metres of the toe of the Waimea stopbank (RM201018).
- 1.3 This evidence addresses the effects of the activities for which consent is sought on noise. In this statement I collectively refer to the activities for which consent is sought as the “Proposal” or the “Asphalt Plant”.

### **Qualifications and experience**

- 1.4 I have a Diploma in Acoustics from the Institute of Acoustics, UK.
- 1.5 I have nine years' specialist experience working as an acoustic engineering consultant providing advice for a range of noise and vibration matters in the built and natural environment in the UK and New Zealand.
- 1.6 I have provided professional advice in support of resource consent applications for residential, industrial, traffic, commercial, education, healthcare and construction projects, including prediction, measurement and assessment of noise and vibration and their associated effects.
- 1.7 I have provided acoustic advice for a range of projects to meet recognised industry standards, local authority noise rules and building codes, to control noise and vibration effects in the built and natural environment.

### **Involvement in the project**

- 1.8 BBA was initially engaged July 2020 to provide an assessment of noise from the Proposal as part of the Assessment of Environmental Effects submitted in support of the resource consent application (collectively the "Application") to Tasman District Council ("Council").
- 1.9 BBA has completed noise surveys of the Asphalt Plant's truck operations, existing traffic on surrounding roads, and existing rock crushing noise; created a 3D noise model of the site and surrounds; and assessed the noise and effects from asphalt processing operations and truck movements on surrounding roads.
- 1.10 My involvement in the project to date includes:
  - (a) Preparing an acoustic report in support of the Application ("Noise Report"), including:
    - (i) Review of the GIS information (aerial photographs, ground contour data, and site boundaries);
    - (ii) Creation of a 3D noise model using CadnaA (Computer Aided Noise Abatement Software);

- (iii) Review and processing of the noise measurement results for truck operations and existing road traffic noise;
  - (iv) Assessment of noise ratings against the permitted limits of the Tasman Resource Management Plan (“TRMP”) and potential effects to the most affected receivers; and
- (b) Preparing evidence including, review and processing of the truck movement, existing traffic noise survey and rock crushing noise measurement data.

**Purpose and scope of evidence**

1.11 The purpose of my evidence is to address the noise effects of the proposal.

1.12 In preparing this evidence I have read the following documents:

- (a) The Application
- (b) Section 17.5.2.1(c) and Section 17.6.2.1(c) of the TRMP detailing the noise rules for the Rural 1 Zone and Rural 2 Zone
- (c) Traffic noise concepts report “12410 App 4 Transportation Impact Assessment” completed by Traffic Concepts Ltd
- (d) Marini Latin America Fayat Group Sound Emission Certificate – Asphalt Plant Carbon T-Box 160 (noise data applicable to smaller Carbon T-Box 130 proposed on site)
- (e) Council’s s 42A Recommendation Report

**Purpose and scope of evidence**

1.13 My evidence is structured as follows:

- (a) Description of site and surrounding environment (Section 3)
- (b) Direction in relevant planning instruments (Section 4)
- (c) Assessment of noise effects of the Proposal (Section 5)
- (d) Recommendations to avoid, remedy or mitigate adverse effects (Section 6)
- (e) Comments on issues raised in submissions (Section 7)

(f) Comment on s 42A Recommendation Report (Section 8)

(g) Conclusion (Section 9)

1.14 A summary of my evidence is contained in Section 2. This statement should be read alongside the Noise Report.

## 2. SUMMARY

2.1 Noise from the proposed asphalt processing plant operations is generated from two main activities including the processing and loading of asphalt on the subject site in addition to truck movements on surrounding rural roads.

2.2 The site and associated truck movements will operate from 7am-6:30pm Monday to Friday and 7am-6:00pm Saturday for typical day-to-day activities.

2.3 For up to 30 times per year, the asphalt plant will operate until 9pm on any of Monday through Saturday, with associated truck movements until 10pm.

2.4 The predicted noise ratings for the asphalt plant are predicted to be 17dBA or more, below the maximum permitted TRMP daytime limit of 55dB  $L_{Aeq}$  between 7am-9pm for the Rural 1 and Rural 2 for the most affected residential receivers.

2.5 For day-to-day operations, noise from asphalt processing on site between 7am-6:30pm (7am-6:00pm Saturday) will be 1-6dBA below the background  $L_{90}$  levels at the most affected residential receivers and expected to be barely noticeable, having no effect on residential acoustic amenity for internal and external living areas.

2.6 During the evening periods when asphalt processing is proposed to operate until 9pm, noise from the asphalt plant may occasionally be noticeable during quiet periods, such as times between vehicles passing on nearby roads, but, adequately low as to have no impact on the residential activities such as rest or relaxation.

2.7 Whilst evening asphalt processing plant may occasionally be perceptible for 30 times per year, it will be audible only during quiet background noise lulls and will not be distracting or annoying to residential activities involving rest or relaxation. As a result, there is no adverse effect expected for all residential receivers in the surrounding area.

2.8 Noise from the loading-out operation between 9pm -10pm will be 14dBA below the TRMP night-time limit of 40dB  $L_{Aeq}$  and will be 4dBA below the existing background levels

of 30dBA  $L_{90}$ , and so is not expected to be perceived or noticeable for residential receivers, therefore having no effect.

- 2.9 Noise from trucks using the surrounding rural roads is not subject to the permitted TRMP noise limits and there is currently no applicable noise standard used in New Zealand for increased traffic on roads due to private activities.
- 2.10 With a worst-case scenario of 8 truck movements per hour, a maximum increase of 1-2dBA is predicted for  $L_{Aeq(24hr)}$  24hr period, or the typical daytime hour  $L_{Aeq(1hr)}$  between 7am-6:30pm (7am-6pm Saturdays). This increase is not expected to be noticeable due to the fluctuating character of traffic noise over a daytime period and not expected to cause any adverse noise effects to residential acoustic amenity.
- 2.11 During the evening/night periods when truck movements may operate past 6.30pm/6:00pm up to 10pm, a worst-case scenario with 8 truck movements per hour is predicted to increase existing hourly traffic noise levels by 3-7dBA. This increase is expected to be noticeable due to the lower traffic volumes experienced in rural areas.
- 2.12 This increase will be reduced significantly when trucks operate at lower volumes, and at reduced frequency as trucks will use a variety of routes from the site. The overall noise effect from evening truck operations is not expected to cause a significant disturbance to evening residential activities such as relaxation or dining, but may have an increased risk of causing sleep disturbance, if bedroom windows are open and residents are sleeping before 10pm.
- 2.13 As road traffic noise is commonly assessed after 10pm when considering protection of sleep disturbance, it is not expected that the proposed truck movements during the evening period up to 10pm, for up to 30 times per year will cause ongoing annoyance or disturbance to daytime residential activities not involving sleeping.

### **Summary of responses to issues raised**

- 2.14 The cumulative noise increase from existing rock crushing operations close to the Asphalt Plant site and Blackbyre Road is predicted to be less than 1dBA to the assessed asphalt processing plant and therefore not expect to have any additional effects to those considered. Rock crushing operations are only expected to occur for up to three weeks a year.

- 2.15 The Sports Youth Fishing Club use of ponds located approximately 800m to 1.5km from the site is predicted to experience a noise rating level of 35dB  $L_{Aeq}$ . This noise level may be occasionally faintly audible above the lower background noise level of the rural and natural environment, but sufficiently low to be non-intrusive and conducive to allow enjoyment of external recreational activities such as fishing. Although not directly applicable, for context this noise level is within acceptable criteria suitable for a residential bedroom of 30-35dB  $L_{Aeq}$  to ensure protection of sleep disturbance.
- 2.16 The proposed 3m noise barrier, originally recommended to control evening / night time operation noise (no longer proposed except for 30 days per year) will be retained, reducing daytime noise levels even further to the closest affected residencies to the south-east. Concern has been raised over the effectiveness of the noise barrier in relation to the Carbon T-Box 130 plant reaching a height of ~6m. The noise barrier is considered to be effective due to the predominant noise source being the burner and compressors located at low level, below 3m height.
- 2.17 Noise from truck maneuvers at road junctions demonstrated no significant increase in measured sound exposure levels (“SELS”) when compared to full speed truck pass-bys.

### 3. DESCRIPTION OF SITE AND SURROUNDING ENVIRONMENT

#### Site

- 3.1 The proposed site is located at 272 Bartlett Road, Hope to the east of Waimea River within the Rural 1 Zone. The land around is predominately Rural 2 Zone.

corrected in evidence at Hearing to Rural 2 zone, noted relevant noise district rules the same

- 3.2 The Asphalt Plant, wheeled loaders and trucks will be located on the southern end of the site at 272 Bartlett Road.
- 3.3 Trucks will also deliver and remove materials from the site on the surrounding rural road network including Bartlett Road, Ranzau Road West, Ranzau Road and Pugh Road.

#### Surrounding environment

- 3.4 The surrounding environment is of a rural character, used predominantly for farming, agriculture and occasional industrial activities. Farming and agricultural activities dictate the noise environment, along with traffic activity along Appleby Highway to the north. A sawmill and crushing site are located approximately 2km north.

- 3.5 The site is located within the Waimea River Park which is used by the community for recreation activities.
- 3.6 The surrounding environment includes residential sites with notional boundary separation distances of approximately 620m or more from the site.
- 3.7 The closest Residential Zones are those within the Richmond areas which are located approximately 3.5km to the east.

**4. DIRECTION IN RELEVANT PLANNING INSTRUMENTS**

4.1 Chapter 17.5 sets out the rules applying to activities in the Rural 1 Zone. Chapter 17.6 sets out the rules applying to activities in the Rural 2 Zone.

**corrected in evidence at Hearing to Rural 2 zone, noted relevant noise district rules the same**

4.2 Rule 17.5.2.1 states when an activity is a permitted activity in the Rural 1 Zone. Although I understand that the Asphalt Plant is not a permitted activity because it is an industrial activity, comparison of its noise against the permitted activity noise standards in Rule 17.5.2.1 is an important way of assessing the effects and acceptability of the noise it generates, in particular on people’s homes. The same applies to the Rural 2 Zone, for which Rule 17.6.2.1 states when an activity is permitted.

4.3 For the Rural 1 Zone the permitted noise levels are set out in Rule 17.5.2.1(c) and for the Rural 2 Zone in Rule 17.6.2.1(c). The permitted standard is the same in each rule. The relevant parts are as follows:

*“Except in the Richmond West Development Area, noise generated by an activity, when measured at or within the notional boundary of any dwelling in a Rural zone (other than any dwelling in a Rural zone (other than any dwelling on the site from which the noise is being generated), Rural Residential, Papakainga or Tourist Services zone, or within any site within a Residential Zone, does not exceed:*

	<b>Day</b>	<b>Night</b>
$L_{eq}$	55 dBA	40 dBA
$L_{max}$		70dBA

4.4 For the purpose of these Rules:

- (a) “Day” is 7.00am to 9.00pm Monday to Friday inclusive and 7.00am to 6.00pm Saturday (but excluding public holidays), and “Night” is all other times plus public holidays; and
- (b) Noise must be measured and assessed in accordance with the provisions of *NZS 6801:2008 Acoustics – Measurement of Environmental Sound and NZS 6802:2008 Acoustics – Environmental Noise*.
- (c) “all noise from any intermittent and temporary rural plant and animal production activity” is exempt from the rule, including noise from “mobile horticultural and agricultural equipment” and “forest and tree harvesting activities”.

4.5 For clarity:

- (a)  $L_{eq}$  is the equivalent continuous sound level, or, the time averaged sound level.
- (b)  $L_{max}$  is the maximum Root Mean Square (RMS) sound level during a single noise event.

4.6 Because the Asphalt Plant is a discretionary activity, I understand that the objectives and policies in the applicable planning instruments are also relevant. For acoustics, relevant provisions are found in Chapter 5 Site amenity effects Chapters 7 Rural effects, and Chapter 10 Land transport effects of the TRMP. At a high level, the key directions for the purposes of assessing noise effects appear to me to be:

- (a) Avoiding, remedying, or mitigating adverse noise effects on rural character and amenity and beyond the boundaries of the sites generating the noise;
- (b) Regulate effects of traffic on amenity where there is significant pedestrian activity and promote routes that avoid, remedy, or mitigate adverse effects from traffic on health and the amenity values of neighborhoods.

4.7 Further to the permitted noise limits of the TRMP, section 16 of the Resource Management Act 1991 (RMA) states:

*16 Duty to avoid unreasonable noise*

*Every occupier of land (including any premises and any coastal marine area), and every person carrying out an activity in, on, or under a water body or the coastal marine area, shall adopt the*



*best practicable option to ensure that the emission of noise from that land or water does not exceed a reasonable level.*

## 5. ASSESSMENT OF EFFECTS

### Noise Generating Activities

5.1 The assessment of potential noise effects from the Asphalt Plant can be categorized into two main activities described as follows:

- (a) Asphalt processing on site:
  - (i) a Carbon T-Box 130 comprising a burner and compressor plant at low level (up to 0-3m in height) and associated feeding machinery located above (3.-6m height);
  - (ii) filler bins and silos are located adjacent to the Carbon T-Box 130 to feed materials via conveyor belts;
  - (iii) a 4m high earth stopbank used to the western side of the Carbon T-Box 130 for wheeled loaders to feed materials into the filler bins;
  - (iv) trucks will enter the site with asphalt loaded from the silo and then depart from the site;
  - (v) the predominant source of noise from on-site activities is from the Carbon T-Box 130 (68-70dB  $L_{Aeq}$  at 50m) when compared to the truck and wheeled loader activities on site. Of the Carbon T-Box 130's constituent parts the burner and air compressor are the loudest aspects and these are at a low level; and
  - (vi) in terms of the timing and frequency of asphalt processing:
    - The Carbon T-Box 130 itself will operate between 7am – 6:30pm Monday to Friday and 7am – 6:00pm Saturday for the majority of operations throughout the year. It will not operate on Sundays or public holidays

- For up to 30 occasions per year, the Carbon T-Box 130 will operate until 9pm Monday to Saturday.
  - Once the Carbon T-Box 130 stops operation at 9pm, truck and wheeled loader operations and truck movements to and from the site will continue until 10pm Monday to Saturday.
  - Operation is connected to the number of truck movements that can be undertaken in a day which is 8 movements per hour (4 round trips) and no more than 80 movements per day; and
- (vii) a 1m high earth bund with 2m acoustically effective noise barrier will be installed approximately 18m to the south-east side of the Carbon T-Box 130 and truck loading area for a length of 75m.
- (b) Truck movements on surrounding road network:
- (i) a maximum of 80 truck movements per day (with arrival being one movement and departure another movement from the site) with a peak traffic volume of 8 movements per hour (or 4 trucks making a round trip);
  - (ii) this number of truck movements captures transport of the asphalt product as well as any supplies (diesel, bitumen, aggregate) that need to be delivered;
  - (iii) trucks will use a number of routes to and from the site to gain access to state highways or main arterial routes including Bartlett Road, Ranzau Road West, Ranzau Road, Pugh Road;
  - (iv) trucks will operate between 7am - 6:30pm Monday to Friday and 7am – 6:00pm Saturday for the majority of operations throughout the year; and
  - (v) for up to 30 occasions per year the trucks will operate 7am to 10pm on any day Monday through Saturday.

### **Approach to assessing noise**

5.2 Noise levels for the asphalt plant were obtained from the manufacturer of the Carbon T-Box 130. These show that the noise levels at 50m from the Carbon-T Box 130 machinery are between 68-70dBA  $L_{eq}$ . Noise levels for the wheeled loaders and truck movements on

site were taken from BS 5228-1:2009 *Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*. A detailed outline of the noise data used is provided in Section 5.1 of the Noise Report.

- 5.3 The operational noise from the processing on the site at the notional boundary of the six receiver sites assessed (discussed below) was then calculated using internationally recognized 3D noise modelling software CadnaA (Computer Aided Noise Abatement) Version 2018. This is explained in detailed in Section 5.2 of the Noise Report.
- 5.4 Noise measurements were carried out by BBA of the asphalt loading/unloading activities in addition to truck passyby on roads.

### **Predicted noise levels of asphalt processing on site**

#### *Processing noise at notional boundary of sensitive receiver sites*

- 5.5 Noise levels and ratings predictions were made based on a ‘worst case’ noise scenario 15-minute period. This ‘worst case’ scenario has the Carbon T Box 130 running continuously, five wheeled loader minutes, and two truck movements. Noise levels were predicted at six receiver sites which were identified because they are the locations of the closest dwellings to the Asphalt Plant. The predicted noise levels and ratings at these six receiver sites from operation of the Asphalt Plant under the ‘worst case’ noise scenario were:

<b>Receiver</b>	<b>Noise level Prediction</b>	<b>Noise Rating</b>
• 208 Bartlett Road	37dB $L_{Aeq}$	36dB $L_{Aeq}$
• 239 Bartlett Road	37dB $L_{Aeq}$	36dB $L_{Aeq}$
• 89 Ranzau Road West	36dB $L_{Aeq}$	35dB $L_{Aeq}$
• 101 Ranzau Road West	33dB $L_{Aeq}$	32dB $L_{Aeq}$
• 554 Waimea West Road	32dB $L_{Aeq}$	31dB $L_{Aeq}$
• 202 Edens Road	39dB $L_{Aeq}$	38dB $L_{Aeq}$

- 5.6 The predicted noise levels demonstrate the actual noise as measured at or within the notional boundary of each receiver site. The noise ratings incorporate a -1dBA correction in accordance with NZS 6802: 2008 to account for time averaging as the site will only be

operational for 70% of the TRMP Day assessment period of 7am-9pm for the Rural Zone 1 and 2 (i.e. consent is only sought to operate for a maximum of 10hours each day not the full 14hours).

- 5.7 The predicted noise ratings are 17dBA or more, below the TRMP permitted Day noise limit of 55dB  $L_{Aeq}$  for the closest receivers (the six sites assessed) in the Rural Zone 1 and 2 (set out at paragraph 4.3 above).
- 5.8 On the 30 days per year where the Asphalt Plant operates past 6:30pm/6:00pm, for the 1-hour period between 9pm to 10pm when the Carbon T-Box 130 will be off but trucks will continue loading out, maximum noise levels of 26dB  $L_{Aeq}$  or lower are predicted at the closest receiver notional boundaries. This is 14dBA below the TRMP permitted Night noise limit of 40dB  $L_{Aeq}$ .
- 5.9 A noise rating level of 17dBA below the permitted Day limit of 55dB  $L_{Aeq}$ , or 14dBA below the permitted Night limit of 40dB  $L_{Aeq}$  would indicate minimal effects as the limits are designed to provide protection of acoustic amenity based on the activities expected within the zone. The fact that the noise rating levels (and noise limits) are below the permitted activity levels applying to the Rural 1 and Rural 2 zones suggests that the noise generated by the Asphalt Plant is acceptable.
- 5.10 The TRMP permitted 70dBA  $L_{max}$  noise limit for night time operations between 9pm and 10pm, will also be achieved with a significant margin, as  $L_{max}$  levels are expected to be within 15dB above the  $L_{Aeq}$  levels.

***Processing noise in relation to existing background noise levels***

- 5.11 Further to prediction noise level below the permitted noise limits, and in light of the noise concern raised by submitters, a further assessment of noise effects has been undertaken:
- (a) based on the relation of the Asphalt Plant's operational noise in comparison to the existing background noise levels; and
  - (b) of the absolute levels experienced for internal and external residential living areas at the six receiver sites.
- 5.12 The noise character of processing operations at the Asphalt Plant will be dominated by the Carbon T-Box 130 which will be broadband (i.e. non-tonal) and continuous (non-impulsive) which is considerably less noticeable or distracting to residential acoustic

amenity when compared to tonal or impulsive noise of the same level (e.g. a continuously operating fan noise is considerably less annoying than an intermittent, “beeping” or “banging” noise of the same dBA  $L_{eq}$  level).

5.13 Background noise levels are represented by the dBA  $L_{90}$  parameter, defined as the level at which noise is exceeded for 90% of the measurement period (i.e. the quietest periods during an intermittent noise activity, such as a rural road). For the purposes of this assessment, measured background dBA  $L_{90}$  levels taken during the existing traffic noise survey on Ranzau Road West were considered indicative of the lowest noise levels experienced in the surrounding environment, and representative of the background noise level experienced at receiver sites.

5.14 The dBA  $L_{90}$  levels measured on Ranzau Road West demonstrate the background noise levels and thus reflect when potential asphalt processing is most likely to be audible above the existing noise environment, such as quiet periods between vehicle passbys. These background noise levels are presented for six time slots below:

- 7am-8am - 41dBA  $L_{90}$
- 8am-9am - 40dBA  $L_{90}$
- 9am-10am - 40dBA  $L_{90}$
- 1:30pm-2-30pm - 45dBA  $L_{90}$
- 2:30m-3pm - 44dBA  $L_{90}$
- 8pm-9:30pm - 30dBA  $L_{90}$

5.15 The 40-45dB  $L_{90}$  levels shown above are representative of background noise levels experienced at receiver sites during the typical asphalt processing operations between 7am-6:30pm/6:00pm, this is due to rural roads being busiest or agricultural activity predominantly occurring within these times.

5.16 The 30dB  $L_{90}$  measured level shown above is considered to be representative of the lowest background noise level experienced during the evening and night time operations up to

9pm for the Carbon T-Box 130, or 10pm for loading operations on site, limited to 30 times per year only.

- 5.17 NZS 6802: 2008 section 6.5.2 advises that the intrusiveness or impact of a specific noise (such as from a site activity) is dependent on its relation to the existing background sound level (dBA  $L_{90}$ ) at a receiver location, however no guideline values for each are provided.
- 5.18 BS 4142 2014+A1 2019 helpfully provides guideline values for the potential impact of a specific source noise in relation to existing background noise as follows:
- (a) A rating noise level that is +10dB above the background noise<sup>1</sup> level is likely to be an indication of a Significant Observed Adverse Effect Level.
  - (b) A rating noise level that is +5dB above the background noise level is likely to be an indication of a Lowest Observed Adverse Effect Level.
  - (c) The lower the rating noise level of the specific noise source is relative to the measured background noise level, the less likely it is that the specific noise source will have an adverse impact or a significant adverse impact. Where the rating noise level does not exceed the background noise level, this is an indication of the specific sound source having a low impact or no impact, and would therefore be classified as a No Observed Adverse Effect Level.
- 5.19 As explained above the maximum asphalt processing noise is predicted to be 39dB  $L_{Aeq}$  or lower at the identified receiver sites. This will be -1 to -6dB below the background dB  $L_{90}$  noise levels measured across the daytime period, assumed to be representative of traffic noise between 7am – 6:30pm/6:00pm when rural roads are busiest due to peak traffic movements.
- 5.20 This means that for the likely typical asphalt plant processing hours of between 7am-6:30pm therefore not expected to cause any adverse impact.
- 5.21 In terms of the 30 times a year when the Carbon T-Box 130 will operate until 9pm with loading of trucks on site continuing until 10pm:

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<sup>1</sup> I note that the standard itself uses the term “sound” as opposed to “noise” but they have the same meaning.

- (a) between 9pm-10pm when the Carbon T-Box 130 is off and only truck loading operations are proposed, noise levels will be -4dBA below the existing background levels of 30dB  $L_{90}$ , and again not expected to cause any adverse impact;
  - (b) between 6:30pm-9pm when the Carbon T-Box 130 plant will operate, the maximum noise level will be +1 to + 8dB above the background dB  $L_{90}$  levels.
- 5.22 The noise level in (b) above indicates that an adverse impact may occur depending on the absolute level experienced and the frequency of events per year. The ‘absolute level’ refers to the measured or audible level, rather than its relation to the background  $L_{90}$  as previously described.
- 5.23 The impact of the change in background noise levels during the evening periods will be significantly reduced as evening operations until 9pm on the asphalt processing plant site will only occur for 30 times per year, and, the absolute noise levels experienced for external or internal residential areas will not exceed recommended World Health Organization (“WHO”) criteria for residential amenity as described below.
- 5.24 The WHO “Community Noise 4” provides recommended guideline values for the protection of critical health effects in relation to residential acoustic amenity as follows:
- (a) 30dB  $L_{Aeq(8hr)}$  maximum inside bedrooms for sleep disturbance.
  - (b) 35dB  $L_{Aeq(16hr)}$  maximum inside dwellings (other habitable rooms) for speech intelligibility and moderate annoyance, daytime or evening.
  - (c) 55dB  $L_{Aeq(16hr)}$  maximum for outdoor living areas, serious annoyance during the daytime and evening.
  - (d) 50dB  $L_{Aeq(16hr)}$  or outdoor living areas, moderate annoyance, daytime and evening.
- 5.25 An open window being used for ventilation/cooling generally provides 15dBA reduction from external noise levels, therefore with maximum predicted external noise levels of 39dB  $L_{Aeq}$  (minus 15dBA for an open window), internal noise levels of 24dB  $L_{Aeq}$  or less may be expected for the closest receivers from asphalt processing operations on site up to 9pm if windows/doors are open, or 11dB  $L_{Aeq}$  from the night time operation of truck loading out between 9pm-10pm. These are both well below the WHO maximum noise values set out above.

- 5.26 When existing background noise levels are higher due to the increased traffic volumes during the standard work hours of approximately 7am to 6:30pm/6:00pm, internal noise levels of 24dB  $L_{Aeq}$  or lower will be experienced from the asphalt processing plant when windows are open, which will be barely audible or discernable above the existing traffic noise, therefore having no effect on residential amenity.
- 5.27 If for brief moments the existing background noise levels are low, such as when no vehicles pass by on nearby rural roads or for the limited number of evening operations of 30 times per year, internal noise from asphalt processing activities on site will be just audible or discernable, but not distracting from internal residential activities involving rest and relaxation.
- 5.28 The overall noise effects inside dwellings at identified receiver sites from asphalt processing plant operations on site are expected to cause no distraction or interruption to the most sensitive of residential activities such as sleep which is generally expected during the night time periods only, but also allowing internal activities such as rest and relaxation.
- 5.29 For external living areas, maximum notional boundary noise levels from the asphalt processing plant are predicted to reach 39dB  $L_{Aeq}$ , 11dBA below the WHO upper guideline limit of 50dB  $L_{Aeq(16hr)}$  for which moderate annoyance is considered to occur.
- 5.30 However, at external living areas noise from the asphalt processing plant on site will actually only be occasionally audible above the background noise during quiet periods when traffic volumes are low, such as during the evening periods, or, inaudible when vehicles pass on nearby roads.
- 5.31 This is because, whilst asphalt processing noise may be occasionally audible in external areas, the external noise level of 39dB  $L_{Aeq}$  is sufficiently low and broadband in nature to have little or no impact on the acoustic comfort of external residential activities such as dining, conversations, rest and relaxation.
- 5.32 Noise predictions from asphalt processing on site to the closest receivers also assume slightly enhanced meteorological conditions (i.e. unfavorable wind or temperature gradients), providing a typical worst-case scenario when noise levels will be higher at further distances due to wind or temperature gradients.



- 5.33 When meteorological conditions are more favorable, noise levels may be 4-7dB lower than predicted depending on the separation distances between the Asphalt Plant site and the receiver site, thus reducing the likelihood of audibility, or adverse effects even further.

*Effects alongside existing crushing operations*

- 5.34 The cumulative noise levels from asphalt processing in addition to existing rock crushing operations on the wider Downer Group NZ Ltd lease site will not increase the assessed levels discussed above by more than 1dBA when operating simultaneously. This is based on noise measurements carried out by BBA on 29/11/2021 of existing rock crushing operations on Blackbyre Road of 56dB  $L_{Aeq(15min)}$  at 110m distance.
- 5.35 With rock crushing expected to occur for approximately 3 weeks per annum (although not confirmed), the overall effects of a 1dBA increase will have no additional effect on the residential amenity for nearby receivers.

*Effects to the Waimea River Park Area and access route via Bartlett Road*

- 5.36 Concern has been raised about the potential effects of noise from the asphalt processing on site to recreational users of the Waimea River Park areas, immediately adjacent to the site. It is understood that users generally walk, cycle or canoe past the site to access more attractive parts of the park, due to the industrial character. Park users would predominantly pass the asphalt processing area at a distance of approximately 50-70m from the asphalt loading bank, or access the river walkway on Bartlett Road, approximately 6m from the site boundary noise barrier.
- 5.37 Predicted noise levels for users passing on Bartlett Road or the river walkway are presented below for all operations with the Carbon T Box 130 + loading, or loading operations only. Both scenarios consider the cumulative noise from existing rock crushing operations next to the river:

<b>Area</b>	<b>Carbon T Box 130+ Loading</b>	<b>Loading Only</b>
Bartlett Road	60-62dB $L_{Aeq}$	52-61dB $L_{Aeq}$
River Walkway	49-62dB $L_{Aeq}$	48-61dB $L_{Aeq}$
River	50-59dB $L_{Aeq}$	50-59dB $L_{Aeq}$

- 5.38 The noise levels shown above demonstrate that users of the river or river walkway would experience noise levels of 50-59dB  $L_{Aeq}$  depending on the separation distance from the asphalt processing plant, with noise level dominated by the existing rock crushing operations. For users using Bartlett Road to access the river/walkway noise levels of 62dB  $L_{Aeq}$  would be experienced for brief periods when passing the site in close proximity.
- 5.39 A noise level of 70dB  $L_{Aeq}$  would be required to make the users passing the site uncomfortably loud, or offensive, so as to require hearing protection. A maximum noise levels of 62dB  $L_{Aeq}$  would be experienced by users passing the site which would only be unpleasant to experience for a long duration, but comfortably bearable for brief moments when passing the site in close proximity.
- 5.40 WHO recommends maximum noise levels residential outside living areas of 50dB  $L_{Aeq}$  for moderate annoyance, or 55dB  $L_{Aeq}$  for serious annoyance. Whilst not directly applicable, recreation activities within the Waimea River Park area that would involve a prolonged stay (i.e. not passing through) would require similar noise levels, or lower, to allow comfortable use.
- 5.41 On this basis, users of the Waimea River Park area would experience noise levels of 55dB  $L_{Aeq}$  at a distance of approximately 75m from the site, or 50dB  $L_{Aeq}$  at a distance of approximately 150m from the site.
- 5.42 As users are not expected to carry out recreational activities or a prolonged stay in close proximity to the site, they will generally experience noise levels of 50 dB  $L_{Aeq}$  at a distance of approximately 150m and will be able to comfortably pass the site without experiencing uncomfortably loud noise levels. The noise effects from the asphalt processing on site will be very similar to those already experienced by existing industrial operations.

#### **Predicted noise levels from truck movements**

- 5.43 In regards to noise from trucks using the rural roads surrounding the site, the permitted TRMP noise limits are not applicable to traffic noise.
- 5.44 There are currently no New Zealand standards applicable to the noise associated with increased traffic volumes on existing roads.

- 5.45 NZS 6806: 2010 provides noise limits for new or altered<sup>2</sup> roads only, so is therefore not directly applicable to increased traffic volumes on existing roads.
- 5.46 However, in order to assess noise effects with Asphalt Plant trucks, BBA conducted a noise survey, including traffic counts, of the existing traffic (14 October 2021) on Ranzau Road West which is considered to be representative of the traffic noise experienced on the rural road routes used by the Asphalt Plant trucks, based traffic count data.
- 5.47 Measured traffic noise levels for vehicle passby's were adjusted logarithmically to provide a prediction of the existing traffic noise levels on each of the proposed rural road routes based on the Council's 2019 hourly traffic counts.
- 5.48 BBA also conducted a noise survey of the proposed 6-wheeler trucks that will be using the rural road network to and from the site for a maximum of 8 movements per hour, and also of 4 movements per hour.
- 5.49 As the distances of receiver building façades form the road vary, a typical worst-case distance of 10m has been assumed. The noise levels were predicted for each of the proposed routes at a distance of 10m from the roadside edge for (a) the existing traffic and (b) the existing traffic in conjunction with the proposed peak truck movements. These data were then used to provide:

- (a) the average 24hr traffic noise  $L_{Aeq(24hr)}$  for both;
- (b) the typical  $L_{Aeq(1hr)}$  between 7am – 6:30pm which were considered to reflect standard working hours; and
- (c) the worst-case dB  $L_{Aeq(1hr)}$  between 6:30pm to 10pm when existing traffic levels are lower and a limited number of evening operations are proposed up to 10pm for 30 times a year:

**dB  $L_{Aeq(24hr)}$  – Average 24 hour traffic noise**

Road	Existing dB $L_{Aeq(24hr)}$ traffic noise at 10m	Existing + 80 truck movements per day dB $L_{Aeq(24hr)}$ traffic noise at 10m	Increase in dB $L_{Aeq(24hr)}$ noise level
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<sup>2</sup> NZS 6806: 2010 defines altered roads as an existing road subject to alterations of the horizontal or vertical alignment.

Bartlett Road (South)	55	57	2
Bartlett Road (North)	57	58	1
Ranzau Road West	58	59	1
Pugh Road	59	60	1
Ranzau Road	61	62	1

**dB L<sub>Aeq(1hr)</sub> - One hour traffic noise between 7am-6:30pm**

Road	Existing dB L <sub>Aeq(1hr)</sub> between 7am-6:30am traffic noise at 10m	Existing + 8 truck movement per hr dB L <sub>Aeq(1hr)</sub> between 7am-6:30pm traffic noise at 10m	Increase in dB L <sub>Aeq(1hr)</sub> between 7am-6:30pm noise level
Bartlett Road (South)	58	60	2
Bartlett Road (North)	60	61	1
Ranzau Road West	61	62	1
Pugh Road	62	63	1
Ranzau Road	64	65	1

**dB L<sub>Aeq(1hr)</sub> –Worst case Evening/Night one hour low traffic noise between 6:30pm - 10pm**

Road	Existing dB L <sub>Aeq(1hr)</sub> between 8pm-10pm traffic noise at 10m	Existing + 8 truck movement per hr dB L <sub>Aeq(1hr)</sub> between 8pm-10pm traffic noise at 10m	Increase in dB L <sub>Aeq(1hr)</sub> between 8pm-10pm noise level
Bartlett Road (South)	49	56	7
Bartlett Road (North)	51	55	4

Ranzau Road West	52	58	6
Pugh Road	53	56	3
Ranzau Road	55	58	3

- 5.50 As trucks will use different road routes throughout the day, or may occur at a lower frequency, the predicted traffic noise increases will commonly be lower than predicted.
- 5.51 The overall noise level increase over a 24 hour period assuming maximum operations of 80 movements per day is predicted to be 2dBA or less on each of the proposed road routes assuming worst case peak movements.
- 5.52 During typical daytime operations between 7am-6:30pm, a 1 hour traffic noise level increase of 2dBA or less is predicted for each of the proposed road routes assuming worst case peak movements (8 movements per hour).
- 5.53 The worst-case 2dBA noise increase during a 7am-6:30pm 1 hour period is predicted only in the event of peak truck movements (8 per hour). The increase will only be 1dBA if only 4 truck movements occur.
- 5.54 The effect of a 1-2dBA increase in hourly traffic noise levels during 7am-6:30pm, which is when the Asphalt Plant will typically operate, is not expected to be noticeable for external or internal residential activities due to the intermittent and fluctuating nature of traffic noise on roads.
- 5.55 During the more sensitive evening/night periods between 6:30pm-10pm when existing traffic is at its lowest volumes, for 30 times per year, trucks operating until 10pm is expected to increase existing traffic noise levels by 3-7dB  $L_{Aeq(1hr)}$  assuming a worst-case scenario of all 8 truck movements operating within a 1-hour period. This is expected to be a noticeable increase during evening or night time periods.
- 5.56 The effect of the evening/night worst-case truck movements up to 10pm may be slightly distracting from internal and external residential activities requiring rest or relaxation only for the brief periods when trucks pass-by, with a similar effect to an existing vehicle pass-by on the road, albeit car pass-bys are at a lower frequency of events.

- 5.57 During the late evening or night time period between 9pm-10pm, there is an increased risk of distraction or of sleep disturbance when compared to the effects of the existing traffic noise for the closest receivers to the roadside edge.
- 5.58 Whilst the TRMP defines the night time period for Monday – Friday starting at 9pm, night time traffic noise and potential sleep disturbance is commonly assessed by NZTA<sup>3</sup> from 10pm onwards when most residents are asleep, for which no truck operations are proposed.
- 5.59 The impact of this increase in traffic noise on residential acoustic amenity between 6:30pm – 10pm is significantly reduced as:
- (a) Evening/night truck movements between 6:30pm and 10pm are limited to 30 times per year;
  - (b) trucks will not always be operating at peak volumes of 8 movement per hour; and
  - (c) trucks will be using a range of the expected road routes, thus reducing the frequency of potential traffic noise increases per year.
- 5.60 Noise from trucks contain more noticeable low frequency energy (such as bass content) than a smaller car when compared, due to the larger diesel engines. However, this difference is reduced at higher vehicle speeds once tyre noise becomes the dominant noise source over the engine.
- 5.61 Noise from truck maneuvers at road junctions demonstrated no significant increase in measured SELs when compared to full speed truck passbys, within +/-1dBA.
- 5.62 Noise from trucks has the ability to cause increased instantaneous noise  $L_{max}$  events from loose chains, or closing mechanism if the road surface is not level, such as from bumps or potholes. This can be mitigated with the proper maintenance of trucks and training of staff to ensure trucks do not contain loose items that may cause additional noise.

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<sup>3</sup> The NZTA online noise metric tool refers to  $L_{Aeq(9hr)}$  for the night time period between 10pm to 7am and  $L_{Aeq(15hr)}$  for the daytime period between 7am-10pm  
<https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/tools/noise-metrics-tool/>

5.63 In summary, the effects of truck noise on the residential receiver's acoustic amenity is considered to be acceptable based on the restricted number of movements per day/hour and the limited number of evening/night operations.

## **6. RECOMMENDATIONS TO AVOID, REMEDY OR MITIGATE ADVERSE EFFECTS**

6.1 A 1m high earth bund and 2m high noise barrier are proposed to be installed on the south-east side of the Carbon-T-Box 130 and loading area for a length of 75m to reduce noise emissions to the closest affected receiver sites.

6.2 All trucks will be regularly maintained and serviced, with training of staff to ensure loose truck parts do not create additional instantaneous noise levels from loose parts or chains when driving on rural roads.

6.3 The Applicant has also now reviewed the proposed operating hours and has reduced these so that the standard day-to-day hours are 7am-6:30pm Monday to Friday and 7am-6pm Saturday for both processing on site and truck movements, with operations up to 9pm and truck movements until 10pm only 30 times per year. This is a notable reduction from what was sought which was for operations and truck movements to be undertaken 7am-9pm with trucks until 10pm.

6.4 Conditions of consent have also been included in response to the s 42A Report that:

- (a) require noise generated from the site to comply with noise limits specified in the consent which are the same as the TRMP noise limits; and
- (b) require a noise management plan for managing noise from trucks.

## **7. ISSUES RAISED IN SUBMISSIONS**

7.1 Concerns have been raised on the following issues:

- (a) Effectiveness of the noise barrier in relation to the processing plant height;
- (b) Cumulative noise from existing rock crushing plant on the subject site;
- (c) Enhanced meteorological conditions generating higher noise levels over larger distances (wind, temperature gradients etc);

- (d) Day and evening noise from truck movements over the existing background noise levels;
- (e) Truck noise levels at junction's vs straight roads at full speed;
- (f) Character of noise from trucks including increased low frequency noise or instantaneous noise from loose parts (chains/doors etc); and
- (g) Site noise experienced within the river park reserve.

7.2 All of these matters have been addressed in my analysis above.

## **8. ISSUES RAISED IN S 42A RECOMMENDATION REPORT**

8.1 The s 42A Report included a memorandum from Daniel Winter, Team Leader Environmental Health specifically addressing noise. Mr Winter supported the proposal to include a noise barrier. He also recommended that the number of trucks is limited to 80 movements per day and that the speed limit for tucks on site is limited to 10km/h. Both recommendations have been adopted.

8.2 Mr Winter agreed with the methodology used in the Noise Report. He also agreed that daytime noise levels are likely to be reasonable.

8.3 He raised some concern about noise from the Asphalt Plant in combination with noise from proximate crushing operations. This is addressed above at paragraphs 5.34-5.35. I do not consider this to be an issue.

8.4 Mr Winter noted that the Noise Report did not address noise from truck movements on the rural road network. This has now been done as discussed above.

8.5 Mr Winter recommended that either noise limits be included in the consent conditions or that a noise management plan be required. It is proposed that limits apply to noise from operations at the site and that a noise management plan be prepared to manage truck noise.

## **9. CONCLUSION**

9.1 I have assessed the potential noise effects from the proposed asphalt plant operations on the subject site in addition to noise from truck movements on surrounding rural roads.

9.2 Due to the noise predictions of asphalt processing on site being barely audible above the existing background noise levels during the 7am-6:30pm (7am-6:00pm Saturdays) when



typical operations are proposed, there will be no adverse effect on the residential acoustic amenity for all receivers using internal or external living areas.

- 9.3 For the limited number of evening operations of up to 30 times per year, noise from the asphalt processing plant may be audible and noticeable during quiet periods when no vehicles use nearby roads. Whilst audible during quiet periods, the absolute noise level is adequately below WHO recommended criteria for internal and external living areas and therefore not considered to have any significant impact on the overall acoustic amenity of nearby receivers.
- 9.4 Noise from truck operations during the typical operating hours is not expected to cause any impact on the acoustic amenity of residential receivers due to the maximum increase of 1-2dBA over existing traffic noise  $L_{Aeq(1hr)}$  levels.
- 9.5 Noise from truck operations during the evening periods (6:30pm/6:00pm-10pm) is expected to result in a noticeable increase from the existing traffic noise. This may be slightly distracting only for the closest receiver buildings to the nearby roads during the most sensitive internal and external residential activities such as rest or relaxation, but not distracting for less sensitive activities such as dining, conversation, watching television or radio.
- 9.6 Due to the limited number of evening operations (30 times per year), the increase in traffic noise due to the truck operations is not expected to significantly impact on the overall acoustic amenity of residential receivers.

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**10 December 2021**