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BEFORE

Independent Commissioners appointed
by Tasman District Council

IN THE MATTER

Of the Resource Management Act 1991

AND

IN THE MATTER

Of an application by CJ Industries Ltd
for land use consent RM200488 for
gravel extraction and associated site
rehabilitation and amenity planting, for
land use consent RM200489 to establish
and use vehicle access on an unformed
legal road and erect associated signage,
and for a discharge permit to discharge
cleanfill to land RM220578

**REPLY EVIDENCE OF RHYS LEONARD HEGLEY ON BEHALF OF
CJ INDUSTRIES
ACOUSTICS**

21 April 2023

1. INTRODUCTION

1.1 My full name is Rhys Leonard Hegley. I am a partner at Hegley Acoustic Consultants.

1.2 The applicant has applied for resource consents authorising the extraction of gravel, stockpiling of topsoil, and reinstatement of quarried land, with associated amenity planting, signage and access formation at 134 Peach Island Road, Motueka:

- (a) RM200488 land use consent for gravel extraction and associated site rehabilitation and amenity planting; and
- (b) RM200489 land use consent to establish and use vehicle access on an unformed legal road and erect associated signage.

1.3 The applicant has also applied for a discharge permit authorising the discharge of contaminants to land, in circumstances where the contaminants may enter water (RM220578).

- 1.4 This evidence responds to the technical evidence provided by submitters, submitter presentations at the hearing, and submitter and Council comments following the hearing.

Qualifications and Experience

- 1.5 My qualifications and experience are as set out in my primary evidence dated 15 July 2022.

Purpose and Scope of Evidence

- 1.6 The purpose of my reply evidence is to respond to noise issues raised both at the November hearing and subsequent to it. In particular, I respond to:
- (a) The following issues raised by Mr Lang, noise expert for Valley RAGE Inc:
 - (i) The use of NZS 6802;
 - (ii) The applicable noise limits;
 - (iii) Tones;
 - (iv) Impulsive noise;
 - (v) Low frequency noise;
 - (vi) Averaging;
 - (vii) The calculation of noise levels;
 - (viii) The Best Practicable Option;
 - (b) The hearing presentations of Mr Dixon-Didier, Mr Kellogg and Mr Langridge;
 - (c) Comments from submitters of 7 April 2023; and
 - (d) The Council Memorandum of 14 April 2023.

Code of Conduct

1.7 I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023 and I agree to comply with it. My evidence is within my area of expertise, however, where I make statements on issues that are not in my area of expertise, I will state whose evidence I have relied upon. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in my evidence.

2. EXECUTIVE SUMMARY

2.1 Mr Lang suggests that the noise limits for the proposal should be based on providing the residential uses in the area with a high level of amenity but without apparent regard to the working nature of the rural zone. The land surrounding the site is not residentially zoned. My view is directed by the current noise provisions of the Tasman Resource Management Plan (TRMP). Through the adoption of 55dB L_{Aeq} during the daytime, which is the upper limit NZS 6802¹ recommends for residential amenity, I consider that the TRMP is signalling the Rural zone is to be permissive of working activities to the point that is considered reasonable for residential amenity. For this reason, I do not agree with Mr Lang that the limit for the proposal should be 45dB L_{Aeq} , or below. I support the 55dB L_{Aeq} day time limit.

2.2 Mr Lang suggests increases to my predicted levels of operational noise based on tonal, impulsive and low frequency components to the noise, and reductions to the allowable limits to account for averaging as well as questioning the accuracy of my noise modelling. I do not agree with his conclusions on these issues.

2.3 During his presentation, Mr Dixon-Didier suggested adopting the internal noise limits of a NZ Transport Agency publication as external criteria for the project. I do not agree with this.

2.4 In Mr Kellogg's presentation, he queried the accuracy of the noise model when calculating noise to houses on the surrounding hillsides. I can confirm that the noise modelling I undertook calculates such situations accurately.

2.5 I have considered the effects on the yoga retreat that O and N Langridge propose for 520 Motueka River Westbank Road. This retreat will be approximately 1400m from the

closest extraction point of the proposal. As a result, predicted noise levels do not exceed 27dB L_{Aeq} , which I consider more than reasonable for such a retreat.

2.6 In response to further comments from H. Webster, D. Sundbye and G & C. Le Frantz, I:

- (a) Do not agree that the operational hours of the proposal require shortening;
- (b) Do not agree with the adoption of Council's suggested limit of 51dB L_{Aeq} ;
- (c) Do not consider that operational noise will result in a hearing hazard to neighbours, including children;
- (d) Note that the bund proposed to screen 131 Peach Island Road could be removed if agreed by all parties but that noise levels to this site would increase as a result;
- (e) Consider that the equipment I have used for the analysis of this proposal is correct; and
- (f) Provided clarifications on the proposed Noise Management Plan (NMP).

2.7 In response to further comments by H. Mae, I:

- (a) Agree with adopting Councils' proposed condition 63 for noise monitoring;
- (b) Do not agree with the adoption of Council's suggested limit of 51dB L_{Aeq} ;
- (c) Clarify the requirements for acoustic bunding in the NMP to identify that topsoil is required so that the bund can be grassed; and
- (d) Provide clarification on the NMP and recommend a change to the flowchart addressing complaints.

2.8 In response to the further comment by M. Clark and L. Rombout, I consider that the equipment I have used to analysis proposal is correct.

2.9 In response to Council's Memorandum of 14 April 2023:

- (a) I have updated the pit size in the NMP;
- (b) I don't agree with Council's suggested operational noise limit of 51dB L_{Aeq} , preferring instead 55dB L_{Aeq} . I note that, should the noise limit be set from predicted levels, care would be required as the comments by Webster, Sundbye and Le Frantz include the removal of the bund to 131 Peach Island Road, which would result in an increase in the predicted noise levels to this site;
- (c) I agree with the Council recommendation that the plastic liners to truck trays should be maintained for the duration of the project, and I have updated the NMP as such; and
- (d) I agree with Council's suggested monitoring condition 63.

3. EVIDENCE

NZS 6802

- 3.1 Throughout his written evidence, Mr Lang refers to the New Zealand Standard for the assessment of noise, NZS 6802. Specifically, he uses two different versions of the standard. When using the current 2008¹ version (which is also adopted by the TRMP), Mr Lang dates the standard. When referencing the previous versions, the references are undated. This approach is unusual as the two standards are fundamentally different with my view being that the pre-2008 versions should not be relied on.
- 3.2 One particular difference is the passage Mr Lang quotes in his paragraph 18, which was specifically removed from the 2008 edition of NZS 6802 and is, therefore, no longer relevant. I understand that the reason the standard was updated was that the reference to setting noise limits up to 10dB below the background was not considered to provide a robust method of assessment. I discuss this issue further in the following section.
- 3.3 All references I make below to NZS 6802 are to the current 2008 version.

Applicable Noise Limits

¹ NZS 6802:2008 Acoustics – Environmental noise

- 3.4 From Mr Lang's evidence² it appears he has based his assessment on the view that residential amenity is the sole factor for consideration when setting noise limits. My reading of the Rural zone chapter of the TRMP is that it supports the dual use of the rural zone by balancing the effects of the working aspects of the zone against its residential function.
- 3.5 This approach is relatively common for the rural zone throughout New Zealand.
- 3.6 In paragraphs 3.28 – 3.32 of my primary evidence, I set out my views on the permitted baseline. While not repeating them in full here, I do wish to reiterate that they are based on the fact that Council has set the expectations for the rural zone through the noise provisions of the TRMP. In this instance, Rule 17.5.2.1(c) permits a day time level of 55dB L_{Aeq} .
- 3.7 NZS 6802 identifies 55dB L_{Aeq} as the upper noise level for residential amenity³. In discussing this level, the standard states:
- C8.6.2 The recommended daytime limit of 55 dB $L_{Aeq (15 min)}$ is consistent with the guideline values for community noise in specific environments published by the World Health Organization. The World Health Organization identifies that during the daytime, few people are seriously annoyed by activities with levels below 55 dB L_{Aeq} .*
- 3.8 As a summary of the above, my view is that Council intended to be relatively permissive of activities within the Rural zone to the point permitted by residential amenity.
- 3.9 I do not, therefore, support Mr Lang's proposed limit of 45dB L_{Aeq} ⁴ or less than 45dB L_{Aeq} ⁵ for the proposal.
- 3.10 In his presentation, Mr Lang referred to NZS6802: 2008 which states (Clause C8.1.2) that wilderness areas often deserve management controls in addition to numerical noise limits. The section to which Mr Lang referred to relates to the setting of noise limits, which Council has presumably already undertaken when writing the TRMP. Regardless, I do not consider the site and the surrounding area to be a wilderness area given that it is

² Mr Lang, paragraphs 26, 29 and 66

³ NZS 6802: 2008 Clause 8.6.2

⁴ Mr Lang, paragraph 15

⁵ Mr Lang, paragraph 66

within the rural zone where the ambient sound is controlled by road traffic (as I describe from paragraph 3.33 of my primary evidence).

- 3.11 In support of his preferred noise limit, Mr Lang refers⁶ to other District Plans throughout the country adopting day time limits of 50dB L_{Aeq} for the rural zone. Of the Plans he references, I am only familiar with that of Auckland, which adopts 55dB L_{Aeq} for the rural zone⁷. In his presentation, Mr Lang noted that the Palmerston North District Plan (PNDP) uses 45dB L_{Aeq} . My reading of Rule R9.11.1 of the PNDP is that it permits a day time level of 50dB L_{Aeq} for the rural zone.
- 3.12 Mr Lang references⁸ a measurement he undertook of the ambient sound. Without knowing where the measurement was, or its duration, it is not possible to respond. I would expect this information to be provided as part of a noise assessment. Both location and duration are important as, as my ambient measurements show⁹, there is considerable variation in level both over the course of the day and across the different receivers, depending on their proximity to the local road network. For example, it would be inappropriate to measure the ambient sound at some distance from the surrounding road network and then use the measured level to assess the effects of the proposal at dwellings close to a road.
- 3.13 During his presentation at the hearing, Mr Dixon-Didier referenced the NZ Transport Agency publication 'State Highway Guide to Acoustic Treatment of Buildings' 2015 (the Guide). This document references AS/ NZS 2107:2000¹⁰ which, Mr Dixon-Didier notes, recommends an upper level of 45dB L_{Aeq} internally for living areas. I do not agree with Mr Dixon-Didier that, given the outdoor nature of the New Zealand lifestyle, this level should be applied as an external noise limit. AS/NZS 2107 was developed specifically for internal amenity of spaces and using it to set external limits would be contrary to its intended purpose. In my view, there are much better documents to inform the setting of external noise limits for District Plans, such as NZS 6802.

⁶ Mr Lane, paragraph 19

⁷ Auckland Unitary Plan E25.6.3

⁸ Mr Lang, paragraph 9

⁹ Hegley primary evidence, paragraphs 3.33 – 3.47

¹⁰ AS/ NZS 2107:2000 Acoustics - Recommended design sound levels and reverberation times for building interiors

Tonal Component to Noise from the Proposal

- 3.14 In his paragraph 32, Mr Lang provides a plot that shows a frequency analysis of a measurement he undertook of an excavator. The plot associated with paragraph 34 shows a frequency analysis of a YouTube video of an excavator. In both instances, the sample time is short, being approximately 0.2 and 0.3 seconds respectively. Such short measurements do not comply with the requirement of NZS 6802 that “*Measurement time intervals ... should cover any significant variations in the sound*”¹¹. My view is that the measurements are too short in duration for analysis.
- 3.15 NZS 6802 provides three analytical methods for investigating noise measurements to determine the presence of a tone. Mr Lang has not applied such analytical methods to his measurements and has, instead, relied upon his subjective assessment of the sound. In my experience, subjective assessments are useful, but it is ultimately an objective assessment that is used to identify the presence of a tone.
- 3.16 Analysis of over 20 field measurements I have undertaken of excavators of various sizes show that none included a tonal component. I have been involved with multiple projects where excavators and loaders are proposed and note that no peer reviewer has ever queried the presence of a tone. I further note that from peer reviews I have conducted of the work of other consultants, none have included a tone.
- 3.17 Figure 1 below provides a spectral analysis of an excavator loading a truck with fractured rock over a representative 5 minutes, 32 seconds. Where a tone is present, it can be identified through a spike in noise level at a particular frequency. (Columns A and L are the overall noise level of the measurement, either A-weighted or Linea, and do not form part of the spectral analysis). No such spike is apparent and analysis in accordance with NZS 6802 confirms there is no tone.

¹¹ NZS 6802: 2008 Clause 5.2

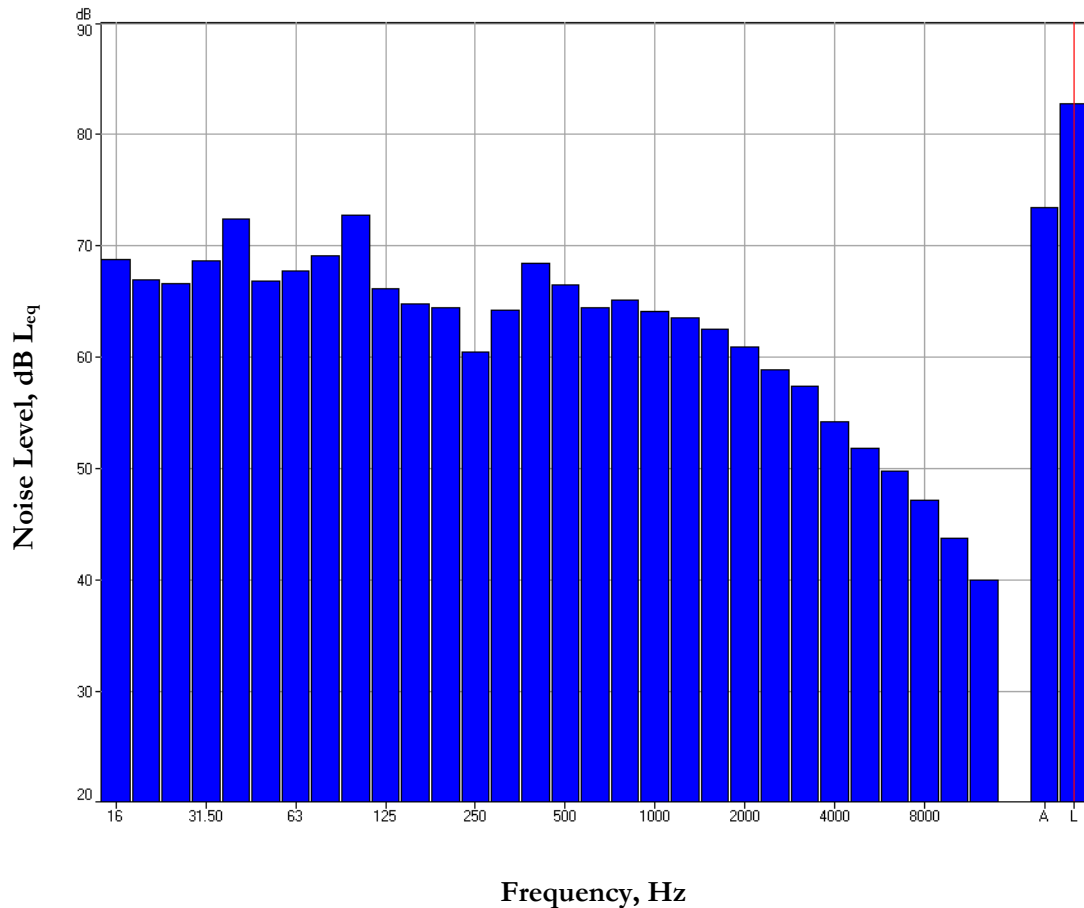


Figure 1. Spectral Analysis of Excavator Loading a Truck

3.18 Based on the above, I do not agree with Mr Lang's view¹² that any of the plant associated with the proposal should be assessed as having a tone.

Impulsive Component to Noise from the Proposal

3.19 Mr Lang provides figures in paragraphs 33 and 37 as a demonstration of the impulsive noise of excavators loading. Mr Lang does not confirm whether the truck being loaded has a plastic liner like the ones being proposed to control noise from the loading of gravel. Without titles or units to the graph axes, it is difficult to comment on these figures. Again, NZS 6802 provides a method of identifying impulsive events. As with the tonal component to the noise, I do not consider that loading of trucks with excavators should be assessed as being impulsive and have never been involved with a project (either as designer or reviewer) where this has occurred.

¹² Mr Lang, paragraph 42

- 3.20 During his presentation, Mr Lang commented that if a noise is not continuous, it must have an impulsive component. I disagree with this. NZS 6801 defines an impulsive sound as being transient with a peak level of less than 100 milliseconds. For reference, I consider impulsive noise to be the likes of gun shots, blasting and hammering, all of which are much shorter in duration than the noise from an excavator bucket emptying into a truck tray.
- 3.21 I, therefore, do not agree with Mr Lang's paragraph 42 where he considers the 5dB penalty should be included in the assessment to account for impulsive noise.

Low Frequency Noise

- 3.22 In his paragraphs 27 and 67 Mr Lang expresses his concerns about potential low frequency noise from the proposal. My experience is that when low frequency is an issue, it typically results from amplified music. I do not consider that the low frequency component from the proposal warrants specific consideration. This is supported by my Figure 1 which does not show a high proportion of low frequency sound for an excavator operating (up to approximately 125Hz). Elevated levels of low frequency noise would be apparent as a marked increase in noise levels at the left hand side of Figure 1.
- 3.23 I am not aware of any project where earth moving plant is used (including quarries) that has been assessed as having elevated levels of low frequency noise.
- 3.24 From the above, I do not agree with Mr Lang that any penalty should be added to the analysis to account for low frequency noise.

Averaging

- 3.25 Mr Lang disagrees with the concept of averaging¹³ described by NZS 6802. This is relevant as it was also discussed by Mr Winter, Council's noise specialist. I discuss my views on averaging from paragraph 2.5 of my supplementary evidence in response to the s42 A report and do not repeat them here. By way of summary, I support averaging and therefore disagree with its removal, as proposed by Mr Lang.

¹³ Mr Lang, paragraph 68

Noise Level Calculation

3.26 This section responds to the various technical issues raised with respect to the predictions of noise I provide in my primary evidence.

NOISE SPECTRA

3.27 My primary evidence contained a summary¹⁴ of the base noise data I used for my analysis. Mr Lang is concerned¹⁵ that I do not include spectral data (the noise level broken down into its constituent frequencies, such as Figure 1). I confirmed the use of spectral data in my primary evidence¹⁶ through reference to the adopted calculation method of ISO 9613 parts 1 and 2¹⁷. I do not provide the data itself as I consider it to be too technical in nature to include in evidence.

458, 470 and 472 MOTUEKA RIVER WEST BANK ROAD

3.28 In paragraph 47 of his evidence, Mr Lang queries why the reported noise levels are higher for 470 and 472 Motueka River West Bank Road than for the neighbouring 458. The reason for this is that numbers 470 and 472 are closer to the plant than 458. Specifically, these dwellings are closer to the accessway and, therefore, to the road trucks accessing the site. Consequently, they receive higher levels of noise. The extraction plant is well removed from these three sites meaning it only provides a minor contribution to the noise they receive.

BASE NOISE DATA

3.29 Mr Lang bases his analysis on published noise data for an excavator that he then corrects to what he considers a more likely machine¹⁸. The base data is then further corrected for a machine undertaking the correct activity¹⁹. I believe that the base noise level of 120dBA (sound power) that Mr Lang arrives at is unrealistic. This level exceeds all

¹⁴ Hegley primary evidence, paragraph 3.12

¹⁵ Mr Lang, paragraph 44

¹⁶ Hegley primary evidence, paragraph 3.5

¹⁷ ISO 9613-1:1993 “Acoustics -- Attenuation of sound during propagation outdoors - Part 1: Calculation of the absorption of sound by the atmosphere”

ISO 9613-2:1996 “Acoustics -- Attenuation of sound during propagation outdoors -- Part 2: General method of calculation”

¹⁸ Mr Lang, paragraph 48

¹⁹ Mr Lang, paragraph 59

published²⁰ and measured noise data that I am aware of for the type of machinery proposed. By way of context, 120dBA would be similar to the noisiest items of construction plant, such as a large rock breaker working on a hard material or a large pile driver installing steel piles. Neither are proposed as part of this project.

- 3.30 To avoid the estimations and corrections that Mr Lang makes, which I consider inappropriate, I use measurements that I have undertaken of the type of plant proposed for the site while it is engaged in the correct activity.
- 3.31 Part of the reason for Mr Lang considering that higher base noise data should be used may be due to the short duration of his sample measurements. In paragraph 3.14 above, I discuss his use of measurements that are of less than 1 second duration. In his presentation, Mr Lang described what he considers the inaccuracies in the prediction of a sound that varies over time, such as an excavator loading a truck. In response, I note the importance of selecting an appropriate period for noise measurement so that the reported level is representative of the activity being undertaken (see reference to NZS 6802 in paragraph 3.14 above). The L_{Aeq} metric used to describe noise is the average level from an activity meaning it is important that any measurement capture the activity in its entirety. For loading a truck, this would include the truck arriving, the placement of the initial load into the empty truck tray as well as all subsequent loads followed by the truck departure. Each activity is not considered in isolation.
- 3.32 For completeness, I note the L_{Aeq} is a logarithmic average of the noise and differs substantially from an arithmetic average. The L_{Aeq} is used as it has been shown to correlate well with how people perceive noise. The difference between the two averaging methods is that the logarithmic method weights to the higher level. For example, while the arithmetic average of 0 and 100 is 50, the logarithmic average is 97.

NUMBER OF PIECES OF PLANT

- 3.33 In his paragraph 58, Mr Lang explains how increasing the amount of plant on site will increase the levels of noise. I have modelled the operation as it has been explained to me by the applicant and which I describe in section 3 of my primary evidence. Analysis

²⁰ NZS 6803: 1999 Acoustics – Construction noise/ BS 5228: Part 1: 1997 and DEFRA Update of noise database for prediction of noise on construction and open sites Phase 3 : Noise measurement data for construction plant used on quarries, July 2006

includes multiple pieces of plant operating at once and, I believe, accurately describes how the proposal will operate.

- 3.34 During his presentation, Mr Lang provided the example of how the addition of a second truck will increase noise levels by 3dBA. In addition to my comments above, I do not agree with Mr Lang. Firstly, considering trucks in isolation, doubling their numbers from one to two would increase truck noise by 3dBA. However, this increased noise from the trucks must then be combined with all other sources. Doing so would not result in an overall increase of 3dB. Secondly, it is not the number of trucks on site that create the noise but the number of trips they make. My analysis is based on a steady stream of trucks transporting the gravel from the excavator to the stockpile. Whether these movements are made by a single vehicle moving about a continuous circuit or multiple trucks makes no difference to the noise produced.

WIND

- 3.35 Downwind receivers can experience higher noise levels than those upwind with the difference increasing with wind speed. Mr Lang provides the view that noise predictions should be based on a fresh breeze and suggests, in his paragraph 53, Beaufort 5. I understand this to be wind speeds of approximately 8.1– 10.6m/s (29 – 38km/hr).
- 3.36 My view is that such wind speeds are too high for noise prediction. They are contrary to NZS 6801 which describes the window for noise measurements (and, as a result, noise predictions) as including:

B4 The following meteorological window is derived from ISO 1996-2 and ANSI S12.18. Many methods yield results which fall within this range:

- (a) ...
- (b) *Wind velocity is between approximately 1 and 3 m/s measured at a height of 2 ± 0.2 m above the mean ground level at the measurement site during daytime ...*
- (c) ...

- 3.37 Mr Lang reports in his paragraph 53 that ISO 9613 limits itself to a similar 1 – 5m/s range.

- 3.38 The reason for limiting wind speed is that in addition to its effects on noise propagation, wind also generates noise through its interaction with foliage and structures as well as with the microphone itself. This has a number of practical implications. Firstly, high levels of foliage noise can result in a degree of masking of the source, lessening its effects. Secondly, the masking could lead to enforcement issues as it is likely to be impracticable to remove the foliage noise from the measurement, which is necessary if the noise from the plant is to be isolated. These wind effects are exacerbated by wind over the microphone, which results in additional noise. Essentially, enforcement at such wind speeds is unlikely to be possible.
- 3.39 In preparing my primary evidence I avoided repeating the technical data included in the noise assessment I prepared for the resource consent application²¹. In section 4.1 of the noise assessment, I explain how my analysis was compliant with NZS 6801²² and its requirement for slightly positive meteorological conditions. My predictions, therefore, include a provision for downwind effects to all receivers.
- 3.40 Mr Lang suggests that it is necessary to add 3dB²³ to my predicted noise levels but provides no basis for this correction. From the above, I do not agree with Mr Lang as my calculations have already included an appropriate correction for a downwind situation to all receivers that were calculated using the algorithms of ISO 9613.

PREDICTION ACCURACY

- 3.41 In paragraph 56, Mr Lang introduces the challenges of noise modelling by noting that ground height and buildings can introduce inaccuracies into the predictions. My experience has been that the modelling is accurate to within acceptable bounds. I do note that this point is somewhat moot as, in this case, there are no intervening buildings and, with the exception of the bund, the ground is relatively flat to the most exposed receivers. I acknowledge the hillside location of some of the more distant houses that receive relatively low levels of noise and discuss these further below in my response to Mr Kellogg's submission.
- 3.42 In the following paragraph, Mr Lang raises concerns over the accuracy of modelling he has undertaken previously. With respect to my modelling, I do not share his concerns. I

²¹ Hegley primary evidence, paragraph 3.6

²² NZS 6801:2008 Acoustics – Measurement of environmental sound

²³ Mr Lang, paragraph 53

have modelled a number of hard and soft rock quarries, sand quarries and large construction sites as well as industrial and commercial activities. To date, I have observed no discrepancies that raise concern. From peer reviews I have completed of the work of others, I consider my approach is consistent with industry best practice. The accuracy of the noise model clearly relies heavily on the accuracy of the input data. I have discussed the importance of the measurement period with respect to accurate measurements above in paragraphs 3.14 and 3.31.

- 3.43 Mr Lang provides a discussion on the efficacy of noise barriers in his paragraphs 69 - 72, which I generally agree with. He notes that as the distance between the barrier and the source and/or receiver increases, the reduction provided by the barrier decreases. At the same time, the reduction in noise level with distance increases. I have considered this phenomenon a number of times for previous projects where my experience has been that the two factors largely cancel out, meaning there is no change in noise level. Mr Lang's paragraph 70 supports this. He suggests at 190m, the reductions from a barrier will be 4dB less than at 130m. The corresponding reduction in noise level due to the increased distance alone²⁴ is a similar 3dB. Regardless, the point of using noise prediction software for projects such as the proposal is that they allow a large number of operating scenarios to be considered and reduced to the critical case, which is what I have done. From this, I am confident that the reductions provided by the proposed bund are accurate, to all neighbours.

TREES

- 3.44 During his presentation, Mr Lang discussed the trees between 394 Motueka River West Bank Road and the proposal noting both their effect on noise and that they may be removed in the future. I can confirm that I have excluded all trees from my noise modelling as their presence, or acoustic performance, cannot be guaranteed. As such, the future of the trees Mr Lang refers to have no effect on my assessment.
- 3.45 As a note, it is generally accepted that it takes at least 30m of dense planting to result in a noticeable reduction in noise level. Based on this, there is the potential that the actual

²⁴ Other factors that affect noise propagation such as ground and atmospheric absorption are ignored in this discussion but are included in the computer modelling of the project.

noise levels from the proposal will be noticeably lower than I have reported to 394 Motueka River West Bank Road while the trees remain in place.

ELEVATED RECEIVERS

- 3.46 The submission by Mr Kellogg (of 398 Motueka River West Bank Road) queries whether their residence, because of its elevated position on the side of a hill, will receive increased noise levels compared to a receiver on the valley floor. In response, I note that Predictor is a sophisticated noise model that takes into account the topography of the site and the surrounding area as well as all other factors that influence the propagation of noise. These include both air and ground absorption along all transmission paths between source and receiver. As such, I am confident that the noise levels I have reported for this project take into account all relevant factors and are accurate.

THE BEST PRACTICABLE OPTION

- 3.47 From paragraph 63, Mr Lang introduces s16 of the RMA before offering his interpretation of the Best Practicable Option (BPO). My view is that s16 requires mitigation to be implemented where it is practicable, regardless of whether it is needed to comply with a noise limit or not. In addressing s16, this project proposes to install liners to the truck trays to reduce noise from material being tipped into the trays and the access road is to be sealed. My view is that compliance would be achieved without either, but both are offered by the applicant in accordance with s16. I note the Council has recommended a condition for liners to be maintained over the term of consent and I support that recommendation.

LANGRIDGE HEARING PRESENTATION

- 3.48 The hearing presentation by Ollie and Nataliya Langridge of 520 Motueka River Westbank Road queried whether the noise modelling included the topography of the area. From paragraph 3.9 of my primary evidence, I provide a detailed explanation of how topography was included in the noise model.
- 3.49 I understand that a yoga retreat has been consented for this site and there is a concern as to how such levels might affect the yoga activities. From the consent application I have added the location of the retreat into my noise model. The resulting noise levels from the proposal are:

- (a) 25 – 27dB L_{Aeq} for the approximately one week per month while excavations is taking place and trucks are being loaded out; and
- (b) 20dB L_{Aeq} for the remainder of the month while only trucks are being loaded out.

3.50 These low levels of noise are due to the fact that, at its closest, the excavation point is approximately 1400m from the retreat.

3.51 I consider such low levels of noise more than reasonable for a yoga retreat.

3.52 The submitters also refer to effects on native birds. I have provided information about noise levels at this property to Mr Payne who provides an ecological analysis.

4. FURTHER COUNCIL COMMENTS

4.1 Council's Memorandum of 14 April 2023 includes some comments on noise, to which I respond below.

Table 1. Response to Council Memorandum

| Paragraph | Response |
|--|---|
| Section 2.3 Bullet point 3 | NMP v2 was updated to include the pit size of 20m x 80m. |
| Section 2.3 Bullet point 4 / Condition 61. | <p>Council proposes a noise limit of 51dB L_{Aeq} for the project on the basis that this level can be complied with. My view is that while the proposal is able to comply with 51dB L_{Aeq} provided a noise bund is used, criteria should be set based on effects rather than predicted noise, and I support a level of 55dB L_{Aeq} (as further explained in my primary evidence).</p> <p>I note that should the noise limit be set using predicted levels of noise, consideration would be required to the Webster, Sundbye and Le Frantz submission which notes a preference for the removal of the bund currently proposed to screen 131 Peach Island Road. If the bund is omitted, the uppermost</p> |

| Paragraph | Response |
|---------------|--|
| | <p>level of noise to this property increases to 52dB L_{Aeq} and the noise limit should consequently increase to 52dB L_{Aeq}.</p> <p>Should consent be granted with a noise limit other than 55dB L_{Aeq}, the NMP would require amendment prior to certification.</p> |
| Condition 60. | <p>Council suggests adding a requirement that the plastic liners proposed for the truck trays be maintained for the duration of the consent, which I support. I have amended the NMP to suit.</p> |
| Condition 63. | <p>Council proposes an amendment to the monitoring condition, which I support.</p> |

5. FURTHER SUBMISSIONS

5.1 I address submitters' comments from 7 April 2023 below.

Table 2. Response to H. Webster, D. Sundbye and G & C. Le Frantz Comments

| Submission Paragraph (relating to NMP) | Response |
|--|--|
| 1. | <p>Section 2.1 of the NMP proposes limits on operation hours of the proposal. I see no need to reduce the hours that trucks can enter the site to 8am to 4pm. Appropriate noise levels will be set and then complied with.</p> |
| 2. | <p>The submission notes support for Council's noise limit of 51dB L_{Aeq}. I do not agree with this and provide my reasoning in my response to Council's comments above.</p> |

| Submission Paragraph (relating to NMP) | Response |
|--|--|
| 3. | <p>The Health and Safety in Employment Regulations 1995 Reprinted on 16 December 2013 state that for the protection of hearing, people should be exposed to not more than 85dB L_{Aeq} on a daily basis. I acknowledge that this criterion is for adults, but I do not expect it to be notably different for children. This hearing hazard criterion is significantly greater than the levels being discussed for this project. Based on this, I do not consider that the project poses a risk to the hearing of neighbours, including children.</p> |
| 4. | <p>Section 4.a of the NMP proposes bund mitigation to screen the owners of 131 Peach Island Road from the effects of noise. If the owners wish, the bund could be removed. Table 1 of my evidence reports noise levels of 42 – 47dB L_{Aeq} to this site with the bund. Should it be removed, levels increase to 45 – 52dB L_{Aeq} and any noise condition relying on predicted levels of noise should be updated accordingly. However, I consider the noise bund is part of the applicant's steps to implement the best practicable option to manage noise.</p> |
| 5. | <p>Section 4.c)1 of the NMP notes the efficiencies being proposed by the applicant by way of using larger plant to minimise the amount of work required. All noise analysis is based on this larger plant. Regardless, I note that larger plant is not necessarily louder than smaller plant. For example, in my experience, 20t and 30t excavators produce similar levels of noise.</p> |

| Submission Paragraph (relating to NMP) | Response |
|---|---|
| 6. | Section 8 of the NMP addresses how the applicant will address noise complaints. Neighbours are able to complain to Council if they wish. |
| 7. | Section 8 of the NMP also includes a flow chart for addressing complaints. My view is that it will not always be necessary to measure the noise. For example, if equipment breaks, resulting in increased noise levels, a pragmatic approach would be to simply turn the equipment off, fix it and then continue rather than introduce noise measurements to the process. |
| 8. | Section 9 of the NMP is included for completeness and addresses a theoretical situation whereby the applicant, for some reason, finds they cannot meet the agreed noise levels. Section 9 simply points out that, to operate, Council consent would be required. |

Table 3. Response to H. Mae Comments

| Submission Paragraph | Response |
|-----------------------------|--|
| 55. | This submission requests the addition of the noise monitoring condition suggested by Mr Winter (condition 63), to which I agree and address above in my response to Council. I note that, the applicant could not avoid the monitoring requirement by operating below 80% as the condition also requires monitoring within three months of commencement. |

| Submission Paragraph | Response |
|-----------------------------|---|
| 56. | The submission notes support for Council's noise limit of 51dB L_{Aeq} . I do not agree with this and provide my reasoning in my response to Council's comments above. |
| 84. | Part 4.b)1 of the NMP notes that the bund will comprise, rather than be built from, topsoil. I have amended the wording of the NMP to identify that a topsoil layer will be required for grass. |
| 114, 115 and 118 | I address complaints, the contingency plan and the measurement of noise in my response to the Webster, Sundbye and Le Frantz Submission |
| 116. | I have suggested a modification to the flow chart for addressing complaints (Figure 3) in an updated version 3 of the NMP. |
| 117. | The purpose of escalating any unresolved complaints to the directors of CJ Industries is to ensure that every opportunity is taken to rectify the situation. |

Table 4. Response to M. Clark and L. Rombouts Comments

| Submission Bullet Point | Response |
|--------------------------------|---|
| 1 | I address the impact of 'heavier' trucks in my response to the Webster, Sundbye and Le Frantz submission above. |

6. CONCLUSIONS

- 6.1 Having reviewed Mr Lang's evidence, I do not agree with any of his conclusions. I remain of the opinion that the analysis I have presented to date is accurate and provides

a full assessment of the effects of the proposal, which I believe are reasonable for the rural zone.

- 6.2 I generally agree with the Comments made by Council in their Memorandum of 14 March 2023. The exception is their recommendation that the noise limit for the proposal should be based on predicted noise levels (51dB L_{Aeq}) rather than effects. I remain in favour of 55dB L_{Aeq} as an operational noise limit.
- 6.3 Having read the further comments by submitters, I propose an amendment to Figure 3 of the NMP. I have also amended the pit size and the description of the bund construction materials and included the requirement of proposed condition 60 that the plastic liners be maintained for the duration of the consent.

Rhys Hegley

21 April 2023



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NOISE MANAGEMENT PLAN

THE EXTRACTION OF AGGREGATE FROM 134 PEACH ISLAND

Report No. 19213NMPv3

Prepared for:
CJ Industries Ltd
20 April 2023

Prepared by:

Rhys Hegley

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1. INTRODUCTION

This Noise Management Plan (NMP) has been prepared for CJ Industries Ltd and in relation to the Resource Consent Application RM20048 & RM200489. The purpose of this NMP is to describe the process by which noise from the extraction of aggregate will be managed to the surrounding environment. The NMP has been prepared in response to conditions 12 and 15 of the resource consent. Specifically, the NMP addresses the requirements of section 16 (1) of the Resource Management Act 1991 which states that 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.

2. OPERATION

2.1. OPERATING HOURS

Condition 54 provides the operating hours as:

54. Work shall only be carried out between 7:00 am and 5:00 pm Monday to Friday. No heavy machinery shall be operated on site earlier than 7.30am. No operations shall occur on Saturdays, Sundays, public holidays, or between 20 December and 10 January the following year (Christmas holiday period).

2.2. NOISE CRITERIA

The resource consent provides the following limits for noise:

51. Noise associated with construction activities on site (such as construction of the noise bund and haul roads) shall not exceed 70dB L_{Aeq} and 85dB L_{AFmax} when measured 1m from the most exposed façade of any dwelling located beyond the subject site.

52. *The consent holder shall ensure that all other activities on site, (other than construction work), are designed and conducted, and all equipment used on site is maintained, so that noise generated by activities on site does not exceed a noise level of 55 dBA L_{eq} (day) when measured at the notional boundary of any dwelling.*

All noise shall be measured and assessed in accordance with the provisions of NZS6801:2008 – Acoustics – Measurement of environmental sound and NZS 6802:2008 - Acoustics - Environmental Noise.

Advice note

Construction work relates to activities defined as construction under NZS6803:1999. This includes the construction of the earth bund and the haul road, but not the gravel extraction operation or truck movements on site.

Where the notional boundary is a line 20m from any side of a dwelling, or the legal boundary where this is closer to the building.

3. OVERVIEW

3.1. AGGREGATE EXTRACTION AND MOVEMENT AT EXTRACTION SITE AND SURROUNDING AREAS

The aggregate will be extracted from a pit that is a maximum size of 20 x 80m and stockpiled behind the stock bank. Trucks will be loaded behind this bund. It is planned to excavate this stockpile area to provide screening to the closest neighbours, and also mitigate visual effects. Figure 1 below shows the layout of the site.

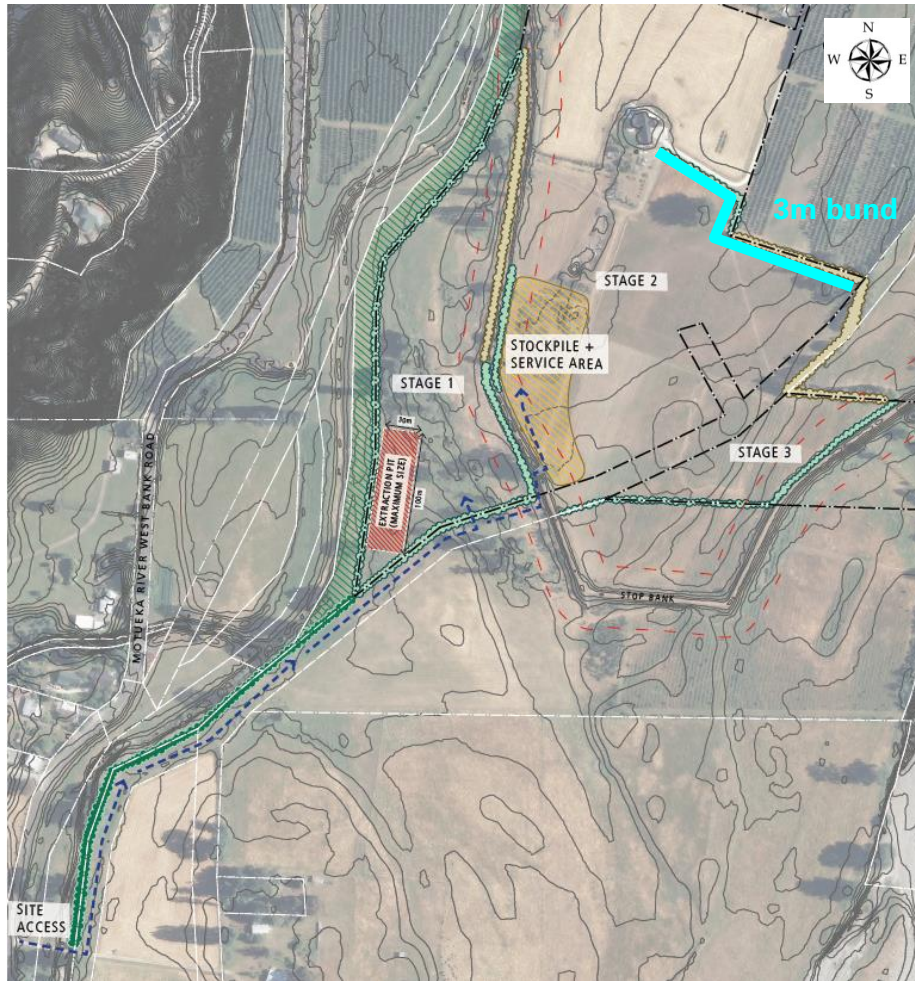


Figure 1. Site Layout

Figure 2 below shows the various parts of the sites (and the surrounding noise sensitive dwellings, the addresses of which are shown in Table 1.

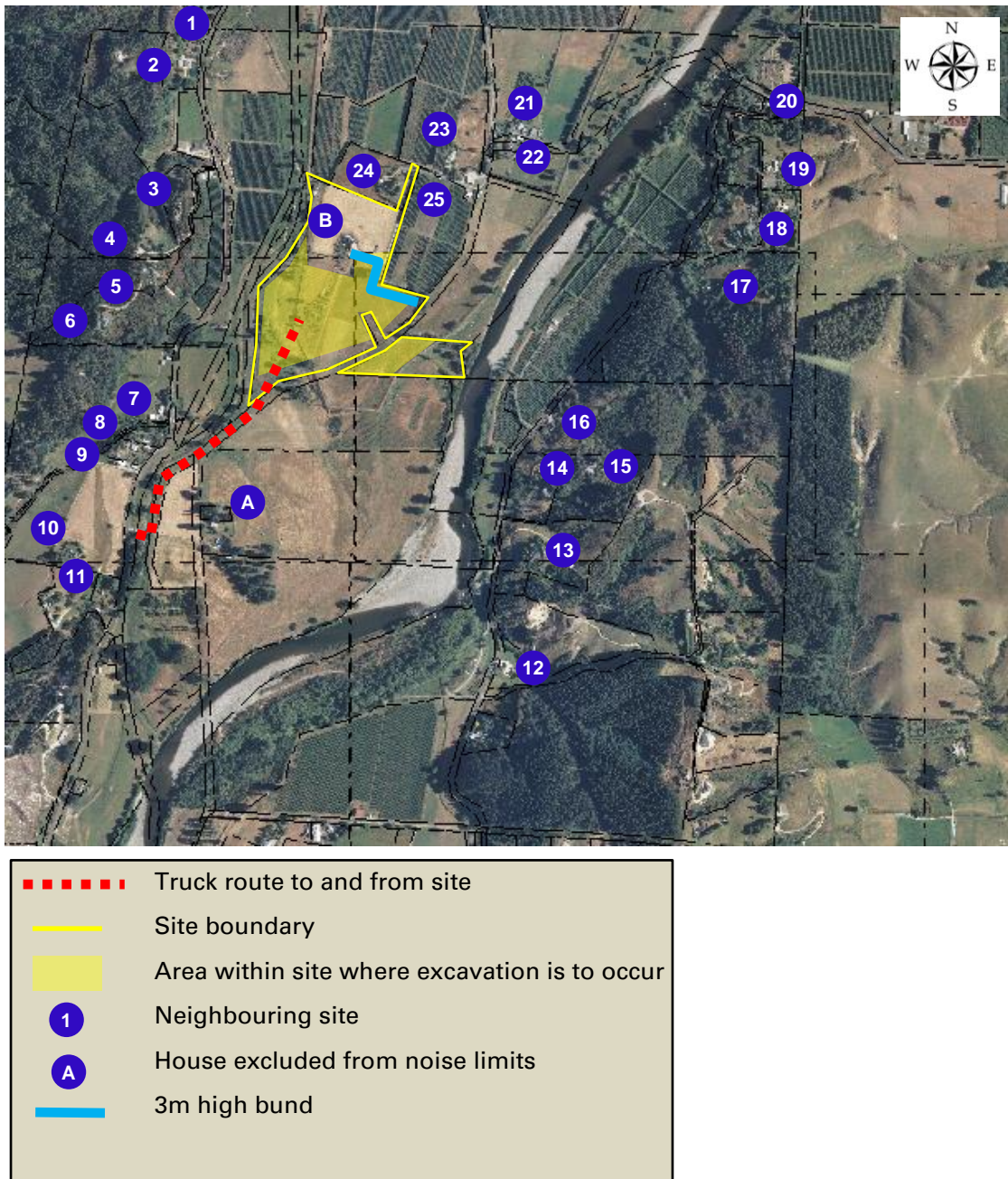


Figure 2. Aerial Photograph of Site and Surrounding Area

Table 1. List of Neighbouring Sites

| Site (Fig 2) | Site Address |
|---------------------|----------------------------------|
| 1 | 352 Motueka River West Bank Road |
| 2 | 370 Motueka River West Bank Road |
| 3 | 392 Motueka River West Bank Road |
| 4 | 394 Motueka River West Bank Road |
| 5 | 396 Motueka River West Bank Road |
| 6 | 398 Motueka River West Bank Road |
| 7 | 458 Motueka River West Bank Road |
| 8 | 470 Motueka River West Bank Road |
| 9 | 472 Motueka River West Bank Road |
| 10 | 478 Motueka River West Bank Road |
| 11 | 506 Motueka River West Bank Road |
| 12 | 155 Motueka Valley Highway |
| 13 | 133 Motueka Valley Highway |
| 14 | 119 Motueka Valley Highway |
| 15 | Motueka Valley Highway |
| 16 | 85 Motueka Valley Highway |
| 17 | 45 Motueka Valley Highway |
| 18 | 273 College Street |
| 19 | 269 College Street |
| 20 | 279 College Street |
| 21 | 113 Peach Island Road |
| 22 | 121 Peach Island Road |
| 23 | 130 Peach Island Road |
| 24 | 132 Peach Island Road |
| 25 | 131 Peach Island Road |

4. MITIGATION

The underlying approach for controlling the effects of construction on the surrounding environment will be through the adoption of the Best Practicable Option (BPO). This means that regardless of the magnitude of effects from the activity, mitigation of that activity will still be considered and implemented where it is found to be both practicable and effective.

Regardless of the noise resulting from an activity or an item of plant and whether that noise will comply with the noise limits identified in Section 2.2, quarry management will endeavour to adopt the BPO with respect to the control of noise. This will include the consideration of and, where practicable, the implementation of mitigation, which could include, but is not limited to:

- a) Construct a 3m high bund to screen the dwelling at 131 Peach Island Road, as shown on Figures 1 and 2.
- b) Consider site layout and the location of activities within the site with respect to sensitive receivers.
 1. Wherever excavation is undertaken, a bund with a top layer of topsoil to enable it to be grassed will be created between the excavation and the nearest neighbour (Figure 2).
 2. The storage and loading area will be located behind the stop bank.
- c) Identify plant options for undertaking specific work and consider the noise from each during selection, including:
 1. Larger loaders / excavators will make for quicker loading;

2. HPMV trucks / trailers will require less visits to the site.
 3. Trucks exporting material from site will be fitted with a sound deadening, plastic deck liner. These liners will be maintained for the duration of the consent (as required by condition 60).
 4. Ensure all plant is well maintained; all plant has a monitored maintenance schedule and a daily pre-start check. Any maintenance issues that will create noise are to be immediately addressed.
- d) Turn vehicle engines/ plant off when not in use.
- e) Use plant appropriately; all plant will be used within the supplier's specifications and for the purposes they have been designed for.
- f) Any maintenance of equipment that creates noise, will be moved off site for repair if practicable.
- g) Tonal warning/ reversing alarms on plant will be replaced with broad band alarms.
- h) Drivers will be instructed to be considerate when closing tail gates so that they do not slam.
- i) The first bucket load on the truck will be the noisiest and will be tipped from as low a level as possible to both minimise noise and wear on the plant. Care will be taken before 8am, when the background noise is lower.

5. TRAINING OF STAFF

CJ Industries Ltd. (section 10) will be responsible for ensuring that all personnel working on site are appropriately inducted onto the site. In relation to the control of noise effects, a suitable induction will include the following:

- a) The roles of all those working on site with respect to controlling the adverse effects of noise.
- b) The individual's responsibility to control noise.
- c) The noise limits that construction noise must comply with (section 2).
- d) The location of the neighbours, shown on Figure 2.
- e) Identify activities likely to result in high levels of noise.
- f) Confirm that any mitigation installed on equipment by the original equipment manufacturer (OEM) is installed and operated as intended (section 6);
- g) Information about practical methods of controlling adverse effects (section 4).
- h) Procedure for dealing with noise complaints (section 8).

- i) Approach to dealing with any activities that it is suspected, or demonstrated, may breach the criteria (section 9).

6. EQUIPMENT MAINTENANCE

CJ Industries Ltd. shall be responsible for ensuring that all plant used on site, including that of subcontractors, is properly maintained. Any mitigation introduced by the original equipment manufacturer must be installed and operated as intended. Usual prestart and maintenance schedule to be followed.

7. NEIGHBOUR LIAISON

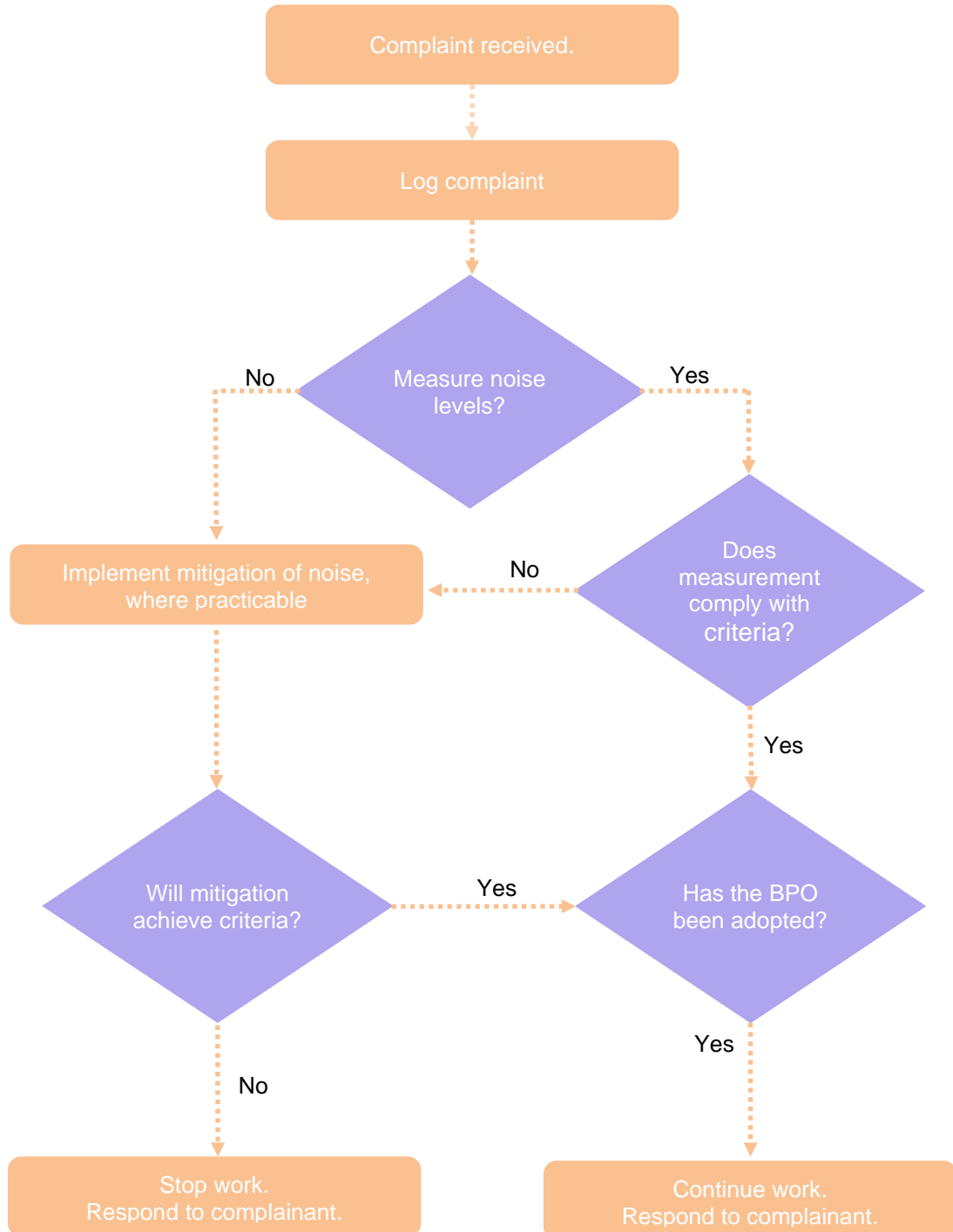
CJ Industries Ltd shall ensure there is a contact person available on-site during work hours.

8. COMPLAINTS

Any complaints received will be the responsibility of Site Manager (Section 11) to address. Should the complaint not be resolved it will, where necessary, be escalated to the Directors of CJ Industries Ltd.

The flow chart below sets out the procedure by which any complaints will be addressed. The flow chart includes information such as the day, date and time of the complaint, nature of the complaint, location of the complaint and if available the complainant's address to allow the contractor to inform the person of the outcome of the complaint.

Figure 3. Chart for Addressing Complaints



Monitoring shall be undertaken:

1. When required to do so because of a request from TDC.
2. At the commencement of any activity that is expected to approach or exceed the noise limits identified in section 2.2.

9. CONTINGENCY PLAN

If noise from the activity is found to exceed the limits of section 2.2, the activity shall be modified as soon as it is practical to do so. CJ Industries Ltd, and any relevant sub-contractor, shall assess the activity to determine what, if any, mitigation can be implemented.

If it is not considered practicable for an activity to comply with the construction criteria, Council shall be informed with the intent of gaining a dispensation of the noise and/ or vibration criteria for the activity. Such a request will include the reason for the application, the duration of the activity, the resulting noise level and those that will be affected by the elevated levels.

10. KEY PERSONNEL AND THEIR RESPONSIBILITIES

The Site Manager will be the principal point of contact and responsible for the implementation of the NMP. Their role will include:

- a) Develop and implement suitable mitigation strategies for specific items of plant and/or construction activities (section 4).
- b) Ensure all contractors receive appropriate site inductions (section 5).
- c) Ensure all equipment is adequately maintained (section 6).
- d) Responsible for neighbour liaison (section 7).
- e) Responsible for receiving and actioning complaints (section 8).
- f) Organise all necessary monitoring (section 9); and
- g) Develop any contingency plans (section 10).
