

**Hodgson Quarries  
and Plant Pty Ltd**

**NOISE IMPACT ASSESSMENT –  
REV 1**

Roberts Road Quarry – Modification 4

**FINAL**

May 2020

# Hodgson Quarries and Plant Pty Ltd

## NOISE IMPACT ASSESSMENT – REV 1

Roberts Road Quarry – Modification 4

### FINAL

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# 1.0 Introduction

## 1.1 Scope

Umwelt (Australia) Pty Limited (Umwelt) has undertaken an assessment of the potential noise impacts from the proposed modification of the Roberts Road Quarry (the Quarry) located at Maroota, New South Wales (NSW), across Lots 1 and 2, DP 228308 and Lot 2, DP 312327. The location of the Quarry can be seen in **Figure 1.1**. This Noise Impact Assessment (NIA) has been undertaken in accordance with the requirements of the *Noise Policy for Industry* (NSW Environment Protection Authority (EPA), 2017) (NPfI) and the suggested methodology outlined by the EPA in letters submitted on 15 April 2020 and 3 February 2020 (refer **Appendix A**). This version (Rev 1) of the NIA incorporates changes recommended by the EPA after their review of the original report.

The road traffic noise impacts have been assessed in accordance with the *NSW Road Noise Policy* (Department of Environment and Climate Change (DECC), 2011) (RNP).

## 1.2 Description of the Proposed Modification

Hodgson Quarry Products Pty Limited (Hodgson Quarry Products) is proposing to modify DA 267-11-99 to permit the importation of Virgin Excavated Natural Material (VENM) and Excavated Natural Material (ENM) to the Quarry (the proposed modification). The imported VENM and ENM would be used to facilitate rehabilitation of the Quarry void to create a final landform that is free-draining, thereby reinstating pre-Quarry drainage, with reduced slopes that will be more sympathetic to the surrounding topography and more amenable to future use of the land for agricultural or horticultural purposes. A dam would be retained within the final landform to provide for erosion and sediment control during the landform construction and rehabilitation phase, and storage and retention of water in accordance with the licensed allocation of the landholding following rehabilitation. While the management of VENM and ENM on the Quarry site is likely to be completed using existing Quarry mobile equipment, the noise assessment considers the operation of the Quarry dozer and front-end loader (FEL) while managing VENM and ENM as a separate noise source.

Imported VENM or ENM with high sand content may be processed, along with the sand excavated from the extraction area, and blended to produce sand products for sale. The proposed processing of the imported VENM and ENM would not require any additional processing infrastructure or noise sources. Blending of material would prolong the life of the extractable resource within the Quarry and as such the proposed modification includes a five-year extension of the operational life of the Quarry, out to 2030.

To accommodate the importation of VENM/ENM, the proposed modification is to include an increase to the approved daily truck movements from 100 movements (50 laden trucks) to 140 movements (70 laden trucks). Where possible, Hodgson Quarry Products will undertake 'double trucking' whereby an inbound laden truck (VENM/ENM) would unload and then be loaded with Quarry product and become an outbound laden truck.



## 2.0 Assessment Methodology

### 2.1 NPfl Requirements

The focus of *Section 6* of the NPfl is on addressing industrial sources where the noise emission levels are above contemporary standards or community expectation. Notwithstanding this, *Section 6* of the NPfl notes there is “no ‘one-size-fits-all’ approach to determine the impact from an existing industry” and that contemporary project noise trigger levels should not be applied as mandatory noise limits but used to assess all feasible and reasonable control measures that could be applied to the industrial source.

The proposed modification triggers a review of noise limits because the proposal to import VENM and ENM represents a proposal to “upgrade or expand the site”. However, the assumption in *Section 6* of the NPfl is that an existing industrial source such as the Quarry was designed for higher noise emission levels than the project noise trigger levels outlined in the NPfl. This is not the case for the Quarry. While the Quarry was granted development consent (DA 267-11-99) in 2000, the development has since been modified three (3) times in accordance with the *Environmental Planning and Assessment Act 1979*, as shown in **Table 2.1**. The noise impacts of the development and subsequent modifications were assessed under the environmental noise policy in force at the time of each development application.

**Table 2.1 Development Consent and Modification History DA 267-11-99**

Approval	Date granted	Relevant change	Environmental noise policy
Development Consent	May 2000	New Quarry	Baulkham Hills Shire Council DCP No. 500 Section 2.9 NSW Environmental Noise Control Manual, 1994
Modification 1 (MOD1)	29 November 2000	Noise management plan and operational noise limits	Industrial Noise Policy, EPA, 2000
Modification 2 (MOD2)	18 March 2016	Extend extraction from 31 May 2015 to 31 May 2025 Sequence of extraction Extraction process	Industrial Noise Policy, EPA, 2000
Modification 3 (MOD3)	18 August 2015	12-month extension of quarry life while MOD2 is determined	No noise assessment required
Modification 4 (MOD4) (this proposal)		Traffic: laden trucks limit increased up to 40% Existing on site equipment to be used for a new activity (placement of VENM and ENM)	Noise Policy for Industry, EPA, 2017

With respect to the other triggers identified in *Section 6* of the NPfl:

- the existing site is not the subject of serious, persistent noise complaints;
- the site has existing consent and licence conditions relating to noise;
- management does not need to clarify their position with respect to the acoustic performance of the existing operation; and
- the owner is not seeking to initiate an environmental improvement program.

It would therefore be reasonable to conclude that if: 1. the existing development had contemporary noise limits; and 2. the existing development operates in accordance with the noise limits; and 3. the existing development is not the subject of noise complaints; and 4. the proposed modification could fit within the existing contemporary noise limits, then the proposed modification would not necessarily trigger a review of noise limits. It is noted, however that the consent conditions in DA 267-11-99 MOD3 are inconsistent with the existing noise condition in EPL 6535 warranting a review of the EPL 6535 noise limits.

## 2.2 Existing Consent and Licence Conditions

The DA 267-11-99 MOD2/MOD3 noise conditions, established in accordance with the *Industrial Noise Policy* (EPA, 2000) are as follows:

46. *The Applicant shall prepare a Noise Management Plan as part of the EMP. The Noise Management Plan shall:*
- (a) identify existing and potential noise sources and their relative contribution to noise impacts from the development;*
  - (b) specify appropriate intervals for noise monitoring to evaluate, assess and report noise emission levels due to construction and normal operations of the development under prevailing weather conditions;*
  - (c) outline the methodologies to be used, including justification for monitoring intervals, weather conditions, seasonal variations, selecting locations, periods and times of measurements, the design of any noise modelling or other studies, including the means for determining the noise levels emitted by the development;*
  - (d) specify measures to be taken to document any higher level of impacts or patterns of temperature inversions, and detail actions to quantify and ameliorate enhanced impacts if they occur;*
  - (e) provide details of noise amelioration measures, including measures to be used to reduce the impact of intermittent, low frequency and tonal noise (including truck reversing alarms) and reactive management responses for particular noise sources; and*
  - (f) contingency measures to be implemented should noise complaints be received.*
  - (g) provision for the notification of adjoining property owners of the commencement and duration of works adjoining the boundary;*
  - (h) construction of temporary noise shielding to residences affected by short-term noise impacts, including the bund recommended under Modification 2, and include an assessment of the effectiveness of this measure in reducing noise levels; and*
  - (i) include a noise reduction strategy for typical operations to ensure the noise levels from these operations do not exceed the noise criteria specified in Condition 47.*

*The Applicant shall implement the approved management plan as approved from time to time by the Secretary.*

47. *For typical operations, noise from the premises must not exceed:*
- an LAeq,15 min noise emission criterion of 43 dB(A) (7am to 6pm) Monday to Saturday;*
  - an LAeq,15 min noise emission criterion of 40 dB(A) (6am to 7am) Monday to Saturday; and*
  - an LA1,1 minute noise emission criterion of 50 dB(A) (6am to 7am) Monday to Saturday.*

*Noise generated by the development is to be measured in accordance with the relevant requirements of the NSW Industrial Noise Policy (as may be updated or replaced from time-to-time).*

*However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.”*

- 47(a) The excavator to be used is to be fitted with acoustic mufflers to achieve a noise level of approximately 76dB(A) when measured at 7 metres.*
- 47(b) The on-site generator is to be fitted with an acoustic enclosure to ensure that noise levels less than 44dB(A) at 30m are achieved.*
- 47(c) A noise compliance investigation is to undertaken within one month of the installation of the equipment to demonstrate compliance with the noise level limits stated in Conditions 47(a) and 47(b). The results of the compliance investigation are to be provided for the approval of the Secretary within 14 days of the completion of the investigations.*
- 47(d) The Applicant must ensure works associated with atypical operations, as described in Modification 2, only occur:
 
  - (a) for a maximum of 24 days in a year, and only between 8 am to 5 pm on those days, Monday to Saturday;*
  - (b) after an investigation of options for avoiding multiple atypical operations at any one time so as to limit noise levels at affected receptors, and the outcomes of this investigation are detailed in the Noise Management Plan; and*
  - (c) at least 24 hours after notifying potentially affected receptors, with such notification to include information on the duration and extent of works, the likely noise to be experienced, and a contact telephone number.**

The EPL 6535 L2 Noise limits are as follows:

- L2.1 Noise from the premises must not exceed the sound pressure level expressed as LA10 (15 minute) of 45 dB(A), except as expressly provided by this licence.*
- L2.2 Noise from the premises is to be measured or computed at any point within one metre of any residential boundary, or at any point within 30 m of the dwelling where the dwelling is more than 30 metres from the boundary, to determine compliance with the noise level limits in Condition L2.1.*

The two sets of noise limits are not contradictory; EPL 6535 is simply out of date as it was not updated following the approval of MOD2 and MOD3 of DA 267-11-99.

## 2.3 Modified Operations

The proposed modified Quarry operations will remain substantially the same as those currently approved for MOD2 and MOD3 of DA 267-11-99. The noise impacts were comprehensively assessed in a NIA prepared by Wilkinson Murray (2015) in support of the MOD2 development application. The only substantial differences between the MOD2 development application and the proposed import and use of VENM and ENM are as follows.

- The potential increased use of the Quarry dozer and front-end loader to profile the VENM and ENM imported to the Quarry. Currently, these items of plant are utilised only occasionally for landform construction and profiling activities when sufficient clay waste or consolidated silt is available from within the site.
- Blending of VENM or ENM with high sand content with the sand excavated from the extraction area to produce sand products for sale.
- An increase in the number of trucks accessing the site per day.

## 2.4 Operational Noise Assessment

The review of noise limits applied to the development in EPL 6535 will follow the steps outlined in *Section 6* of the NPfI for the application of the policy to an existing site.

- Undertake an initial evaluation of the existing operations, including whether approvals/licences include noise limits and whether they are being met. The results of the annual attended monitoring programs demonstrate the Quarry is complying with the contemporary requirements of DA 267-11-99 and the outdated requirements of EPL 6535 (refer to **Section 3.0**). The results of the annual attended monitoring programs are available at <https://www.vgt.com.au/hodgsons>.
- Establish relevant Project Noise Trigger Levels (PNTL), in accordance with the NPfI, to establish a benchmark level to assess the need to consider noise mitigation (refer to **Section 3.0**). The method used does not differ from the requirements of the NPfI but does not necessarily follow the prescriptive method proposed by the EPA (refer to letter in Appendix A) for establishing a final rating background level (RBL) value based on day, evening and night monitoring periods.
- Measure/predict the noise levels produced by the source in question, having regard to meteorological effects such as wind and temperature inversions. The noise levels from existing operations and the proposed development are presented in **Section 4.0**. The predicted noise levels at nearest sensitive receivers from the dozer and front-end loader undertaking the proposed activities have been modelled in Cadna/A using the ISO-9613 prediction method. The noise predictions for the MOD2 NIA were also modelled using the ISO-9613 method using the same topographical data, equipment sound power levels and equipment utilisation. The noise impacts from the proposed operations were combined with the noise levels predicted in the MOD2 NIA to determine the noise impacts of the proposed modification at sensitive receivers.  
Details of the modelling scenarios for the existing operations are presented in the MOD2 NIA. This includes a plan showing the location of the noise sources, details of the noise sources including modifying factors, site conditions that offer source shielding and an assessment of weather conditions applicable to the noise predictions.
- Compare the measured/predicted noise level with the project noise trigger levels at the most sensitive receiver locations. The assessment of the proposed modification considers the findings of both the MOD2 NIA and the predictive modelling and recommendations for additional mitigation measures where relevant noise criteria have not been met.
- Where the project noise trigger levels are predicted to be exceeded, consider feasible and reasonable noise mitigation strategies that could be used to augment the strategies implemented as a result of the MOD 2/MOD3 approval.
- Develop and refine achievable noise limits that would become goals for the site.
- Ongoing monitoring to confirm compliance with the established noise limits.

## 2.5 Road Traffic Noise Assessment

The road traffic noise assessment for this NIA was prepared in accordance with the requirements of the *NSW Road Noise Policy* (RNP).

## 3.0 Existing Acoustic Environment

The area around the Quarry is predominantly rural and rural residential, and there are several other operating sand quarries in the area.

### 3.1 Receivers

The locations of sensitive noise receivers in the region surrounding the Quarry were identified in the Wilkinson Murray NIA (2015) (MOD 2 NIA). The receiver locations are provided in **Table 3.1** and shown on **Figure 3.1**. These receiver references have been retained for this assessment.

**Table 3.1 Noise receivers**

Receiver ID	Address	Distance to Quarry boundary	Direction from Quarry	MGA Coordinates (m)	
				Easting	Northing
A	100 Old Telegraph Road, Maroota	12 m	N	314418	6295660
B	35 Roberts Road, Maroota	16 m	E	314332	6295397
C	4471 Old Northern Road, Maroota	109 m	N	313781	6295850
D	11 Roberts Road, Maroota	29 m	E	314156	6295190
E <sup>1</sup>	1700 Wisemans Ferry Road, Maroota	1000 m	WSW	312820	6295008
F	4460 Old Northern Road, Maroota	46 m	W	313617	6295687
G	59 Roberts Road, Maroota	27 m	E	314489	6295576
H	45 Roberts Road, Maroota	25 m	E	314412	6295483

Notes: 1. Only road traffic noise has been assessed at Receiver E. Quarry noise has not been assessed at Receiver E

### 3.2 Existing Noise Levels

#### 3.2.1 Compliance monitoring program

Noise monitoring is undertaken annually to confirm noise levels of the Quarry against the limits imposed by DA 267-11-99 and EPL 6535. Noise levels have been measured in 2016, 2017, 2018 and 2019 in accordance with an Operational and Road Noise Management Plan (ORNMP) (MAC, 2016), prepared and implemented in accordance with Condition 46 of DA 267-11-99. All noise measurements have confirmed compliance of Quarry operations within the operational and road traffic noise limits in the conditions of DA 267-11-99 and the EPL 6535.

The results of the attended noise monitoring programs undertaken to assess compliance with consent and licence noise limits are summarised in **Table 3.2** (day period) and **Table 3.3** (shoulder period). The results of the annual attended monitoring programs are available at <https://www.vgt.com.au/hodgsons> (accessed 19 May 2020).

**Table 3.2 Measured noise levels from existing operations LAeq,15 min<sup>1</sup>, Day period**

Receiver	EPL LA10,15min	DA-267-11-99 LAeq,15min	5 May 2016 LAeq,15min	27 April 2017 LAeq,15min	23 May 2018 LAeq,15min	6 June 2019 LAeq,15min
A	45	43	39	Inaudible (<40)	37	40
B	45	43	41	Inaudible (<37)	37	41
C	45	43	Inaudible (<40)	Inaudible	Inaudible (<35)	Inaudible (<40)

Note: 1. Muller Acoustic Consulting Reports MAC160257PR1, MAC160257RP1, MAC160257RP3, MAC160257RP4

The attended monitoring results presented in **Table 3.2** indicate the existing quarry operations are consistently less than the relevant criterion at monitoring locations A, B and C as shown in **Figure 3.1**. During the June 2019 attended monitoring program the quarry noise was identified as audible at monitoring location A. Identified noise sources included engines idling, onsite truck movements and an excavator audible periodically through the measurement period. The acoustic environment at monitoring location B was dominated by passing and distant traffic noise with engine noise audible from the quarry throughout the measurement period. The quarry was inaudible at monitoring location C.

**Table 3.3 Measured noise levels from existing operations LAeq,15 min<sup>1</sup>, Shoulder period**

Receiver	EPL LA10,15min	DA-267-11-99 LAeq,15min	5 May 2016 LAeq,15min	27 April 2017 LAeq,15min	23 May 2018 LAeq,15min	6 June 2019 LAeq,15min
A	45	40	Inaudible	40	38	34
B	45	40	36	39	Nil	39
C	45	40	Inaudible	Inaudible	Inaudible	Inaudible

Note: 1. Muller Acoustic Consulting Reports MAC160257PR1, MAC160257RP1, MAC160257RP3, MAC160257RP4

**Table 3.3** shows the noise from the Quarry operations has consistently complied with the applicable noise limits during the shoulder period (6.00 am-7.00 am) during monitoring in 2016, 2017, 2018 and 2019.

Umwelt has also been advised that no complaints about noise from the quarry operations have been received.

### 3.2.2 Background noise levels

Existing background noise levels were measured in the vicinity of the Quarry at two locations in May 2019 as shown in **Figure 3.1**.

Noise levels were measured in general accordance with *Australian Standard 1055-2018 Acoustics – Description and measurement of environmental noise* and the NPfI (EPA, 2017). Existing ambient noise levels were measured at two properties with frontage to Wisemans Ferry Road, Maroota. Location L1 was at a residence approximately 350 m west of Haerses Road (1643 Wisemans Ferry Road) and Location L2 was on the corner of Wisemans Ferry Road and Hitchcock Road to the east of Haerses Road (5 Hitchcock Road).

The results of the noise monitoring are summarised in **Table 3.4**. The values shown in **Table 3.4** are the measured equivalent continuous noise levels (LAeq, period) and the measured rating background levels (RBL) (10<sup>th</sup> percentile LA90 noise levels). The full noise monitoring results are shown graphically in **Appendix B** and **Appendix C**. Noise data measured during periods of unsuitable weather conditions was excluded from the data analysis using meteorological data measured simultaneously at the private weather station located at Maroota Public School, approximately 820 m north-north-west of the Quarry. Unsuitable weather includes periods of rain or when wind speeds exceed 5 m/s, as defined in the NPfI.

**Table 3.4 Noise monitoring results, dB(A)<sup>1</sup>**

Location	LAeq Day	LAeq Evening	LAeq Night	Measured RBL Day	Measured RBL Evening	Measured RBL Night
L1	60	53	54	36	32	27
L2	60	48	47	34	31	24

Note: 1. Noise levels measured during periods of unsuitable meteorological conditions were excluded from the data set

### 3.3 Meteorological conditions

Meteorological conditions have been studied for this site (Wilkinson Murray, 2015). The study concluded that noise-enhancing meteorological conditions, as defined by the INP, do not occur with sufficient frequency to be classed as a characteristic feature of the region, as defined by the INP. The definition of noise-enhancing meteorological conditions and the defined thresholds of frequency of occurrence of noise-enhancing meteorological conditions in the INP are identical to the definitions in the NPfI.



FIGURE 3.1  
Noise Assessment Receivers

## 4.0 Assessment Criteria

### 4.1 Operational noise

#### 4.1.1 Noise Policy for Industry Assessment Noise Levels

The Project Noise Trigger Levels (PNTL) derived in accordance with the NPfl provide a benchmark or objective for assessing a proposal or site. They are not intended for use as a mandatory requirement. The PNTL is a level that, if exceeded, would indicate a potential noise impact on the community, and so 'trigger' a management response; for example, further investigation of mitigation measures.

The PNTL, feasible and reasonable mitigation, and consideration of residual noise impacts are used together to assess noise impact and manage the noise from a proposal or site.

The PNTL is the lower (that is, the more stringent) value of the project intrusiveness noise level (PINL) and project amenity noise level (PANL) determined in the NPfl Sections 2.3 and 2.4. Neither the intrusiveness noise levels nor the amenity noise levels are used directly as regulatory noise limits.

#### 4.1.2 Project Intrusiveness Noise Level

The Project Intrusiveness Noise Level (PINL) ( $L_{Aeq,15\text{minute}}$ ) is defined as the rating background noise level (RBL) + 5 dB. The RBL is determined by measurement of the long-term background noise level  $L_{A90}$  and calculated in accordance with the NPfl Fact Sheets A and B. However, the PINL for the evening period should not be set at greater than the PINL for the day period, and the PINL for the night period should not be set greater than the PINL for the day or evening periods.

The NPfl Table 2.1 provides minimum assumed RBLs. If the RBLs derived from site measurements are lower than the minimum assumed RBLs, the PINLs are based on the minimum assumed RBLs, as shown in **Table 4.1**.

**Table 4.1 Minimum Assumed RBLs and PINLs (NPfl Table 2.1)**

Time of day	Minimum assumed rating background noise level dB(A)	Minimum project intrusiveness noise level $L_{Aeq(15\text{ minute})}$ dB(A)
Day period (7.00am-6.00pm Monday-Saturday; 8.00am-6.00pm Sunday & Public Holidays)	35	40
Evening period (6.00pm-10.00pm)	30	35
Night period (10.00pm to commencement of day period)	30	35

The Project RBLs are derived as the greater of the measured RBLs shown in **Table 3.4** and the minimum assumed RBLs shown in **Table 4.1**.

It is considered that the background noise levels measured on Wisemans Ferry Road at Locations L1 and L2 are representative of background noise levels at receivers C, D, and F (refer to **Figure 3.1**), since:

- Receivers C, D and F are approximately the same distance from Old Northern Road as the distances that measurement locations L1 and L2 are from Wisemans Ferry Road
- Old Northern Road and Wisemans Ferry Road both carry approximately the same traffic volumes at approximately the same vehicle speeds, as shown in **Table 4.2**.

**Table 4.2 Estimated traffic volumes (Year 2020)**

Road	Speed km/hr	Existing Total Traffic Volume 7.00 am-10.00 pm	Existing % Heavy Vehicles
Old Northern Road	90	2304	9.0
Wisemans Ferry Road	80	2011	10.2

The Project RBLs at all other receivers are assumed to be the minimum assumed RBLs shown in **Table 4.1**.

Based on the assessed Project RBLs at the nearby receivers, the derived PINLs are as shown in **Table 4.3**.

**Table 4.3 Derived PINLs at Receivers LAeq(15 minute) dB(A)**

Receiver	Project RBL			PINL		
	Day	Evening	Night	Day	Evening	Night
A	35	30	30	40	35	35
B	35	30	30	40	35	35
C	36	31	30	41	36	35
D	36	31	30	41	36	35
F	36	31	30	41	36	35
G	35	30	30	40	35	35
H	35	30	30	40	35	35

### 4.1.3 Project Amenity Noise Levels

The Project Amenity Noise Levels (PANL) (LAeq(period)) at receivers are defined as the recommended amenity noise levels in NPfI Table 2.2 minus 5 dB(A). For derivation of the PTNLs, the PANLs LAeq(period) are converted to LAeq,15 min by the addition of 3 dB(A). The PANL at a receiver depends on the type of receiver and the noise amenity area of each receiver. All receivers potentially affected by the project are residential, and all are within Rural amenity areas. The project PANLs are shown in **Table 4.4**.

**Table 4.4 Project Amenity Noise Levels – Residential Receiver, Rural Noise Amenity Area**

Time of day	Recommended amenity noise level LAeq,period dB(A)	PANL LAeq,period dB(A)	PANL LAeq,15min dB(A)
Day	50	45	48
Evening	45	40	43
Night	40	35	38

### 4.1.4 Project Noise Trigger Levels

The PNTLs are defined as the lower (that is, the more stringent) of the PINL and the PANL in terms of LAeq,15 min noise levels, given in **Table 4.5**.

**Table 4.5 Project Noise Trigger Levels LAeq,15min dB(A)**

Receivers	Time of day	PINL	PANL	PNTL
A, B, E, G, H	Day	40	48	40
	Evening	35	43	35
	Night	35	38	35

Receivers	Time of day	PINL	PANL	PNTL
C, D, F	Day	41	48	41
	Evening	36	43	36
	Night	35	38	35

#### 4.1.5 Maximum noise level event assessment

The potential for sleep disturbance from maximum noise level events is assessed by comparison of the predicted noise levels against the screening levels described in the NPfI Section 2.5. The NPfI screening levels are:

- LAeq,15min 40 dB(A) or the prevailing RBL plus 5 dB(A), whichever is the greater, and/or
- LAFmax 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater.

Based on the Project RBL (**Table 4.3**), the screening noise levels at all receivers are:

- LAeq,15min 40 dB(A), and
- LAFmax 52 dB(A).

#### 4.1.6 Early morning shoulder period

In areas which experience background noise levels growing steadily early in the morning (between 5.00am and 7.00 am) the NPfI allows for consideration of a noise assessment level specifically for this “shoulder period” in the transition between the night time acoustic environment and the day time acoustic environment. The NPfI states that the noise level targets may be negotiated with the regulatory/consent authority on a case-by-case basis.

### 4.2 Road traffic noise criteria

Traffic noise criteria are given in the *NSW Road Noise Policy* (RNP). Traffic noise from the development is not to exceed the following noise limits at any affected residence on minor roads:

- an LAeq,1hr of 55 dB(A) between 7.00 am and 10.00 pm, and
- an LAeq,1hr of 50 dB(A) between 10.00 pm and 7.00 am.

In addition to the above, road noise criteria are also provided in the RNP as follows:

*For existing residences and other sensitive land uses affected by **additional traffic on existing roads generated by land use developments**, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding ‘no build option’.*

The NSW EPA Application Note *Applying the NSW Road Noise Policy* further states:

*The 2 dB increase applies to both the relevant day and night assessment criteria.*

The time periods for the day and night assessment criteria are defined in the RNP as:

- LAeq,15hr represents the LAeq noise level for the period 7.00 am to 10.00 pm.
- LAeq,9hr represents the LAeq noise level for the period 10.00 pm to 7.00 am.

## 5.0 Noise Predictions

### 5.1 Operational Noise Assessment

Cadna/A using the ISO-9613 prediction method has been used to predict the noise levels at each of the sensitive receivers from the proposed modification to the Quarry operations. The noise modelling and prediction of noise impacts for the MOD2 NIA were also undertaken using the ISO-9613 method. By using the same modelling methodology and modelling software for the proposed modification to the Quarry operations a direct comparison can be made with the predicted noise impacts for MOD2 of the Quarry operations. Additionally, the compliance monitoring program discussed in **Section 3.0** indicates the approved MOD2 operation is working within the approved noise limits of DA 267-11-99.

The noise sources representing the typical quarry operation in the MOD2 NIA were:

- 1 × Excavator at base of excavation
- 2 × Dump trucks continuously working between face and processing area
- 1 × Front-end loader feeding processing plant and managing stockpiles
- 1 × Diesel Screen/Conveyers
- 1 × Processing and Washing Plant/Conveyers
- 1 × Front-end loader loading haul trucks/managing stockpiles
- 3 × Road trucks in 15 minutes taking product off site (representing the maximum number of trucks that can be loaded in a 15 minute period due to operational constraints).

The MOD2 development application included minimal additional noise mitigation as the Quarry had already implemented a range of controls. The additional controls included:

- a commitment to additional perimeter noise bunding to supplement the perimeter noise bunding already in place
- an extraction methodology designed to minimise surface activities as much as possible
- machinery modifications to limit excavator emitted sound power levels to approximately 76 dB(A) when measured at 7 metres
- machinery modifications to limit on-site generator noise levels to less than 44 dB(A) when measured at 30 m
- development and maintenance of a Noise Management Plan.

With these and the existing noise controls in place the compliance monitoring program discussed in **Section 3.0** indicates the approved MOD2 operation is working within the approved noise limits specified in DA 267-11-99.

The proposed modification to the Quarry operations is complementary to the existing Quarry operation as it does not add additional noise sources but aims to optimise the use of the existing machinery. Both the dozer and front-end loader to be used for VENM and ENM management are already used on site and were previously included in the noise modelling undertaken for the MOD2 NIA. The dozer and front-end loader are currently used for approved Quarry backfill, landform construction and rehabilitation operations. Therefore, the dozer and front-end loader utilisation rates would increase but they do not represent new noise sources on site. The potential impact on receiver noise levels due to the proposed modification would

be solely as a result of the more frequent operation of the dozer and front-end loader undertaking the same activities due to the importation of VENM and ENM. It is also noted that the front-end loader and dozer to be used for the proposed VENM and ENM management are already included in the inventory of noise sources for the typical quarry operation. Therefore, in the adopted noise calculation methodology this noise source has effectively been modelled in two locations at the same time, which would have the effect of conservatively overpredicting the total estimated noise levels.

### 5.1.1 Plant and equipment sound power levels

As noted in **Section 3.2**, the noise sources associated with the proposed modification have been identified as a dozer and a front-end loader operating to manage VENM and ENM. As these items of equipment are to be the same as those currently used at the Quarry, the sound power levels used in the modelling are based on the values given in the MOD2 noise assessment, shown in **Table 5.1**.

**Table 5.1 Dozer and front-end loader sound power levels**

Plant Item	Sound Power Level $L_w$ dB(A) re $10^{-12}W$
Volvo L180G Front End Loader (based on Volvo L150 dynamic)	105
Komatsu D375A Dozer (pushing sand)	110

### 5.1.2 Noise source locations

The previous modelling for the MOD2 noise assessment placed noise sources in the approved extraction area, the infrastructure area and the haul/access roads. **Table 5.2** provides details of the activities modelled by the MOD2 noise assessment.

**Table 5.2 MOD 2 noise assessment scenarios and equipment**

Scenario	Operating Equipment
Core Activities	1 Excavator at base of excavation 2 Dump trucks working continuously between face and processing area 1 Front-end loader feeding processing plant managing stockpiles 1 Diesel Screen/Conveyers 1 Processing and Washing Plant/Conveyers 1 Front-end loader loading haul trucks/managing stockpiles 3 Haul trucks in 15 minutes taking product off site
Dozer Extraction/Emplacement	Dozer at highest RL within extraction or emplacement area
Surface Extraction	1 Excavator (from base) repositioned at surface behind bund
Bund Construction	1 Excavator (from base) repositioned at surface building bund

The dozer extraction/emplacement scenarios considered activities in each of the extraction areas shown in **Figure 5.1**. For the purposes of the MOD2 noise assessment, extraction operations were modelled in each of the identified extraction stages (1A to 6A) to ensure the worst-case noise levels were identified at each of the receivers surrounding the Quarry.

The dozer and front-end loader noise sources were located in the proposed MOD4 VENM/ENM placement and profiling area, as shown in **Figure 5.2**. These locations reflect the fact that backfill and landform construction activities at the very north-eastern extent of the extraction area have been completed. These locations represent the most exposed locations of these noise sources to the nearest receivers.

### 5.1.3 Predicted operational noise levels

The predicted noise levels at receivers are presented in **Table 5.3**. The results are the worst-case noise levels for typical operations predicted for MOD2 (Wilkinson Murray, 2015), the noise received as a result of the VENM/ENM management activities (front-end loader and dozer operation), and the combined noise predictions.

**Table 5.3 Predicted noise levels at receivers LAeq,15 min dB(A)**

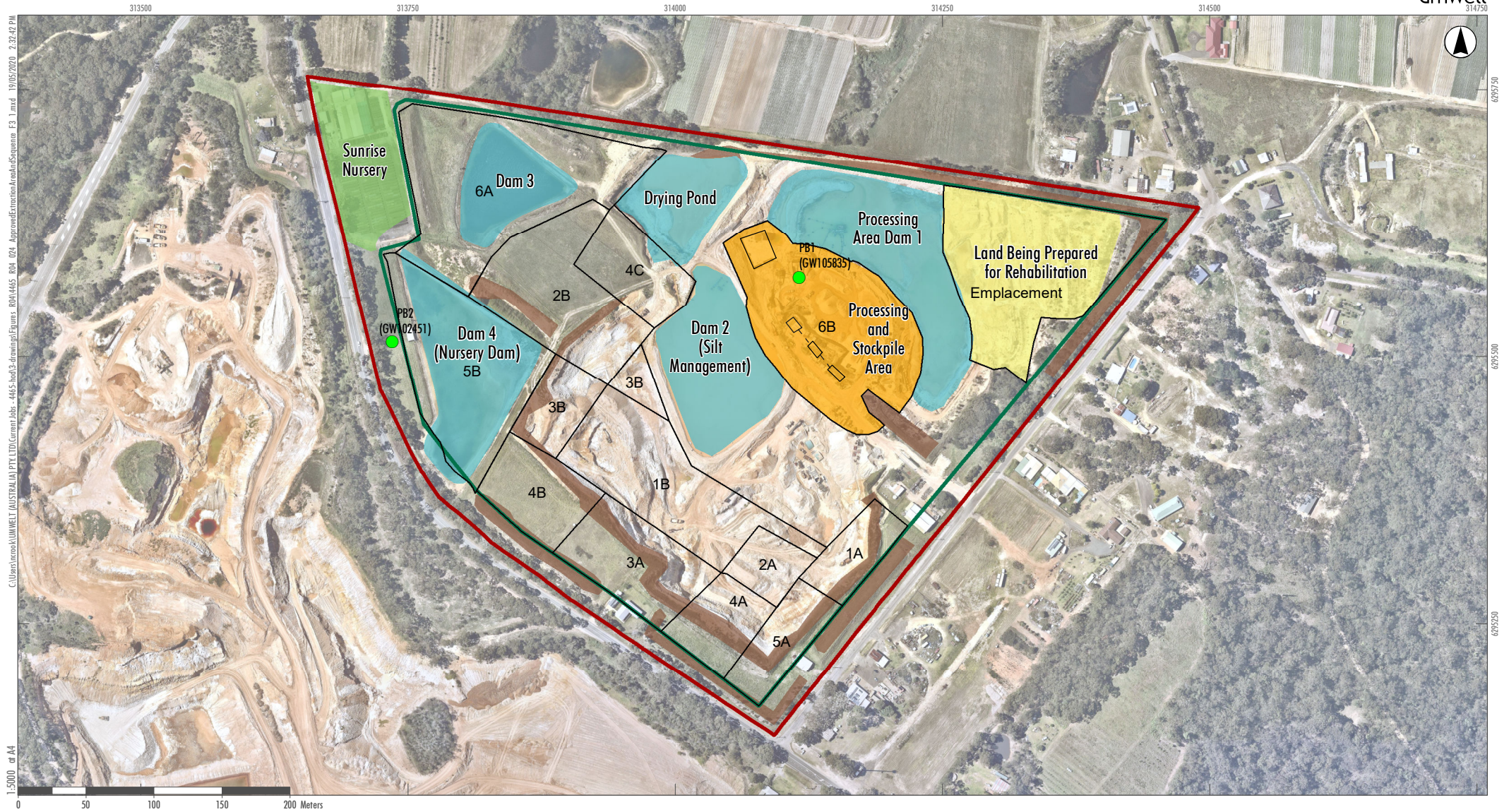
Receiver	Location of mobile noise sources - worst-case of typical activities <sup>1,2</sup>	Noise levels from MOD 2 worst-case of typical activities <sup>2</sup>	Predicted Noise from FEL and dozer during proposed VENM and ENM operations <sup>3</sup>	Combined noise from typical worst-case MOD2 plus dozer and FEL
A	1A	37	35	39
B	1A	42	39	44
	5A	43	39	44
C	6B	38	38	41
D	5A	40	39	43
F	6B	35	35	38
G	1A	38	32	39
H	1A	41	38	43

Notes

<sup>1</sup> Predicted for MOD2

<sup>2</sup> Refer to Figure 5.1

<sup>3</sup> Refer to Figure 5.2



# Legend

- Quarry Site
- Approved Extraction Area
- Processing Plant and Product Stockpile
- Land Being Prepared for Rehabilitation
- Water Management
- Nursery
- Bundwalls (including topsoil)
- Extraction Sequence Stages
- Production Bores

FIGURE 5.1  
Approved Extraction Area and Sequence

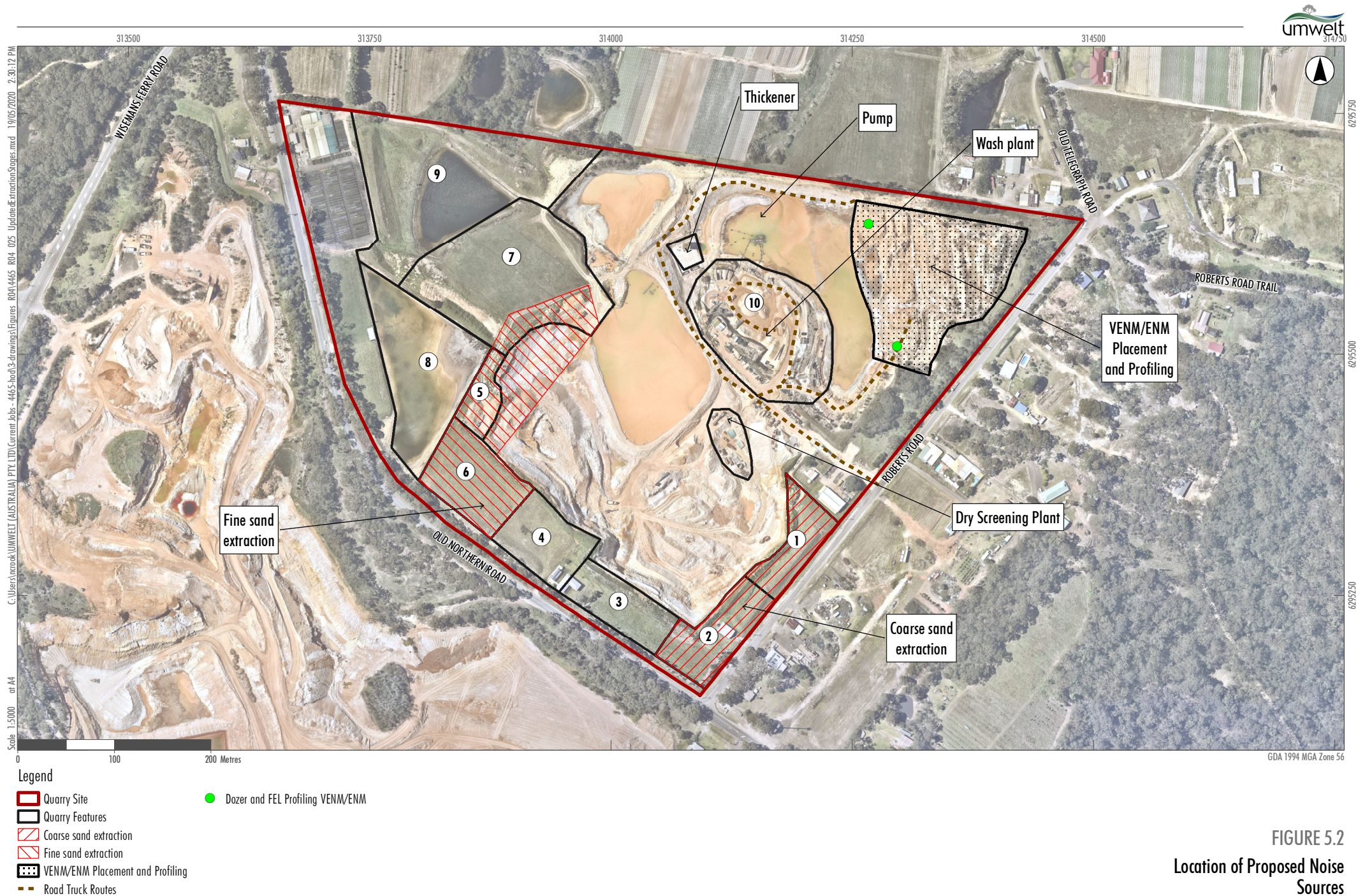


FIGURE 5.2  
Location of Proposed Noise  
Sources

## 5.2 Road Traffic Noise

### 5.2.1 Assessment Method

The modification proposes an increase from a maximum of 100 to 140 truck movements per day. The modification does not propose to increase the maximum number of truck movements per hour of operation. Consequently, the only impact will be the change in the total number of truck movements during the daytime period (7.00 am to 10.00 pm).

The proposed modification will not increase the number of trucks that will access the Quarry in any single 15-minute period, and consequently there will be no net change in noise emissions from the Quarry due to the number of trucks on site at any time. As the MOD2 noise assessment modelled the worst-case scenario of the maximum number of trucks on site at any time in order to predict the highest  $L_{Aeq,15min}$  noise level, the noise impacts from trucks on site for the proposed modification have already been predicted. Therefore the net effect of the proposed increase in truck movements relates only to the road traffic noise levels of trucks on the public roads which are described as an acoustic average over the time period (either Day 7.00 am to 10.00 pm or Night 10.00 pm to 7.00 am).

As Roberts Road is a local road, the noise level criterion in the RNP is given in terms of  $L_{Aeq,1hr}$  (refer to **Section 4.2**). The proposed modification would not change the maximum number of truck movements in any hour. As a result no increase in the maximum  $L_{Aeq,1hr}$  from quarry trucks would occur as a result of the proposed modification.

The potential road traffic noise impact of the proposed modification has been assessed by estimating the relative increase in  $L_{Aeq,15hr}$  traffic noise levels during the daytime period (7.00am to 10.00pm) as a result of the increased numbers of truck movements in and out of the quarry during the hours of operation 7.00 am to 6.00 pm.

The Traffic Impact Assessment (TIA) (Seca Solution, 2019) describes the proposed increase in the number of trucks as follows:

*The subject site has an approved haulage rate of 100 trucks per day (50 laden/50 unladen), which allows for inbound and outbound truck movements with the daily total two-way flows not to exceed 100 per day. The project seeks to increase the daily approval to 140 trucks per day, with no increase proposed for the existing hourly maximum of 20 trucks per hour. Instead the project shall see the additional heavy vehicle movements spread over the course of the day during periods of high demand.*

*All truck access will remain via the existing site access direct onto Roberts Road, with the existing distribution onto Old Northern Road to be maintained.*

- *80% to/from the north, turning right onto Old Northern Road and the reverse left turn in.*
- *20% to/from the south, being left turns onto Old Northern Road and right turns in.*

Contemporary road traffic volume data was not available for this NIA, which was also the case for the MOD2 NIA. The specialist reports including the Acoustic Impact Assessment and the Traffic and Transport Study by Lyle Marshall & Associates prepared for the Environmental Impact Statement (EIS) (Appendices 11 and 15 of the EIS respectively) were also not available.

For this NIA, the current daily traffic volumes have been estimated from the traffic volumes presented in the EIS (Nexus Environmental Planning, 1999), indexed by an annual growth factor of 2% as nominated in the TIA (Seca Solution, 2019), as shown in **Table 5.4**.

**Table 5.4 Average Two-Way Traffic Volumes (derived from EIS (Nexus, 1999) Table 3.10)**

Average Daily Vehicles (7 days)	Old Northern Road (Location D)		Wisemans Ferry Road (Location E)	
Year	1999	2020	1999	2020
Total Vehicles	2026	3071	1769	2681
Light Vehicles	1844	2795	1589	2408
Heavy Vehicles	183	277	180	273

In order to estimate the increase in the daytime 7.00 am to 10.00 pm period noise levels  $L_{Aeq,15hr}$  it is necessary to estimate the proportion of 24-hour traffic that occurs between 7.00 am and 10.00 pm. For the purposes of this assessment, it is considered that a conservatively low estimate of the traffic volumes between 7.00 am and 10.00 pm on Old Northern Road and Wisemans Ferry Road is 75% of total 24-hour volumes.

As described in the TIA, the existing distribution of Quarry trucks will be maintained for the proposed modification, where 80% of trucks will access the Quarry from the north, turning left onto Roberts Road from Old Northern Road, and 20% from the south, turning right onto Roberts Road from Old Northern Road.

## 5.2.2 Traffic noise sources

The current approved daily truck movements for the quarry is 100 total truck movements (50 laden trucks). The modification is seeking approval for up to 140 movements per day (70 laden trucks). Based on the expected distribution of 80% of trucks to/from the north, and 20% to/from the south, the maximum increase in the number of quarry trucks during the daytime period is:

- 8 trucks per day on Old Northern Road south of Roberts Road, and
- 32 trucks per day on Old Northern Road north of Roberts Road and Wisemans Ferry Road.

The posted speed limits at the locations where traffic volumes were previously measured (Nexus Environmental Planning, 1999) and where traffic noise levels have been previously assessed are 90 km/hr on Old Northern Road and 80 km/hr on Wisemans Ferry Road. Table 5.5 summarises the additional noise sources.

**Table 5.5 Quarry truck traffic noise sources**

Road	Speed km/h	Number of additional quarry trucks per day 7 am to 6 pm
Old Northern Road, south of Roberts Road	90	8
Old Northern Road, north of Roberts Road	90	32
Wisemans Ferry Road, south of Old Northern Road	80	32

Based on the methodology described in **Section 5.2.1**, the existing and proposed traffic volumes for Old Northern Road and Wisemans Ferry Road between 7.00 am to 10.00 pm are shown in **Table 5.6**.

**Table 5.6 Estimated traffic volumes on Old Northern Road and Wisemans Ferry Road  
7.00 am to 10.00 pm (Year 2020)**

Road	Existing LV <sup>1</sup>	Existing HV <sup>1</sup>	Proposed Additional HV	Proposed Total HV
Old Northern Road (south of Roberts Road)	2096	208	8	216
Old Northern Road (north of Roberts Road)	2096	208	32	240
Wisemans Ferry Road	1806	205	32	237

Note 1: LV = Light Vehicles (Class 2 and below); HV = Heavy Vehicles (Class 3 and above)

### 5.2.3 Predicted road traffic noise

The predicted change in road traffic noise  $LA_{eq,15hr}$  due to the addition of 40 trucks between 7.00 am and 6.00 pm is shown in **Table 5.7**.

**Table 5.7 Predicted increase in road traffic noise due to the proposed modification (Year 2020)**

Road	Speed km/hr	Existing Total Traffic Volume 7.00 am-10.00 pm	Existing %HV	Proposed Total Traffic Volume 7.00 am-10.00 pm	Proposed %HV	Increase in noise level $LA_{eq,15hr}$ dB(A)
Old Northern Road (south of Roberts Road)	90	2304	9.0	2312	9.3	0.1
Old Northern Road (north of Roberts Road)	90	2304	9.0	2336	10.3	0.3
Wisemans Ferry Road	80	2011	10.2	2043	11.6	0.3

As shown in **Table 5.7** the maximum increase in  $LA_{eq,15hr}$  road traffic noise levels is predicted to be 0.3 dB(A) due to the proposed modification.

## 6.0 Noise Impact Assessment

### 6.1 Operational noise assessment

#### 6.1.1 Early morning shoulder period

The Quarry currently operates under a reduced level of activity consisting of only the loading of trucks between 6.00 am and 7.00 am in order to maintain compliance with the DA 267-11-99 noise limits during the early morning shoulder period, which are:

- an  $L_{Aeq,15min}$  noise emission criterion of 40 dB(A) (6.00 am to 7.00 am) Monday to Saturday; and
- an  $L_{A1,1min}$  noise emission criterion of 50 dB(A) (6.00 am to 7.00 am) Monday to Saturday.

It is noted that the regular noise monitoring has confirmed that the Quarry consistently maintains compliance with the existing noise limits in DA 267-11-99.

No additional activities will occur during the early morning shoulder period as a result of the Quarry operations handling VENM and ENM.

#### 6.1.2 Day time period

The predicted worst-case noise levels from the total site operation including the proposed VENM and ENM activities are compared against the NPfI assessment noise levels PINL, PANL and PNTL in **Table 6.1**. The current noise limits from DA-267-11-99 are also shown for additional information.

**Table 6.1 Predicted noise levels and NPfI assessment noise levels  $L_{Aeq,15 min}$  dB(A) – Day period**

Receiver	Predicted Combined noise from typical worst-case MOD2 plus Dozer and FEL	Existing DA 267-11-99 Noise Limits	PINL	PANL	PNTL
A	39	43	40	48	40
B	44	43	40	48	40
C	41	43	41	48	41
D	43	43	41	48	41
F	38	43	41	48	41
G	39	43	40	48	40
H	43	43	40	48	40

In order to reduce noise impacts on the community, the Quarry has implemented substantial noise mitigation measures on site, including a significant noise bund adjacent to the weigh bridge and eastern boundary to protect Receiver B. Furthermore, the Quarry maintains an Operations and Road Noise Management Plan (ORNMP, MAC, 2016) which includes ongoing noise management strategies which may be implemented as required (for instance, the construction of temporary acoustic bunds as required as quarrying works progress through the site). The ORNMP includes a framework whereby the Quarry can continue to maintain compliance with their existing noise limits in DA 267-11-99. As demonstrated in **Section 3.2.1**, the Quarry has been maintaining compliance with the site noise limits in DA 267-11-99, and as the proposed modification will not increase the number of noise sources on site in any 15-minute period,

the Proponent is confident that the Quarry would be able to maintain compliance with these noise levels under the proposed modification. As shown in **Table 5.7**, the predicted noise levels from the proposed Modification would comply with the current noise limit of 43 dB(A) LAeq(15 minute) in DA 267-11-99 at all receivers, except for minor 1 dB(A) exceedances at Receiver B.

As previously noted in the MOD2 NIA, the on-site plant and equipment is considered to be modern and well maintained, and the site is already protected by acoustic bunds at the site perimeter. These acoustic bunds have been included in the noise modelling of the typical worst-case site operations. The residual noise exceedances of the PNTL including the noise reduction benefit of these reasonable and feasible noise mitigation measures are shown in **Table 6.2**. An assessment of the significance of the residual noise impacts is also provided in **Table 6.2**. For the estimate of the significance of residual noise impacts, it has been assumed that the total cumulative industrial noise level at all receivers is less than then recommended amenity level of 50 dB(A) LAeq(day). This assumption is supported by previous noise monitoring (MAC 2016, 2017, 2018, 2019). It is noted that the NPfI stresses that *“the significance of residual noise impacts should be addressed on a case-by-case basis. The guidance contained in Table 4.1 should not be applied to existing situations without proper consideration of the specific circumstances.”* The note to NPfI Table 4.1 also states *“This approach is designed for new and substantially-modified developments and should be applied with caution to assessments of existing operations.”* It is noted that the proposed modification is not a substantial modification, in terms of site operations and acoustic impacts.

**Table 6.2 Predicted noise levels and NPfI assessment noise levels LAeq,15min dB(A), day period**

Receiver	Predicted combined noise from typical worst-case MOD2 plus dozer and FEL	PNTL	Residual noise impacts (exceedance above PNTL)	Significance of residual noise exceedances (NPfI Table 4.1)
A	39	40	-	-
B	44	40	4	Marginal
C	41	41	0	-
D	43	41	2	Negligible
F	38	41	-	-
G	39	40	-	-
H	43	40	3	Marginal

Based on the results of the noise modelling, the measured existing noise levels and considering the predicted noise levels from the proposed modification and the site’s ongoing proactive noise management practices, it is recommended that the noise limits for the MOD4 proposed quarry operations be as shown in **Table 6.3**.

**Table 6.3 Proposed noise limits LAeq,15min dB(A), day period**

Receiver	Proposed noise limits for MOD4 Quarry operations – Day Period
A	43
B	44
C	43
D	43
F	43
G	43
H	43

### **6.1.3 Discussion of operational noise impacts**

The proposed modification to import VENM and ENM to the site could result in a 1 dB (A) increase in the maximum predicted noise levels at the sensitive receiver location, and increase from 43 to 44 dB(A) at Receiver B. Two other properties could potentially experience an increase in the noise level up to a maximum of 43 dB(A). It is noted that the maximum potential increase in noise levels would occur when machines are working in the VENM and ENM emplacement areas associated with the site rehabilitation.

The potential increase in the noise levels are a conservative estimate as the management and emplacement of the VENM and ENM at the Quarry is likely to use existing equipment that will be relocated for specific periods of time to handle the VENM and ENM. It is noted that the noise levels associated with the handling the VENM and ENM do not exceed the PNTLs.

## **6.2 Road traffic noise assessment**

As seen in **Table 5.7**, the predicted worst-case increase in road traffic noise due to the proposed maximum number of quarry trucks along Old Northern Road and Wisemans Ferry Road is below 2dB(A). This increase in road traffic noise complies with the RNP.

## 7.0 References

*Hodgson Quarry Products Sand Extraction Roberts Road, Maroota - Operational Noise Assessment*, Wilkinson Murray Report No. 14229-B, May 2015

*Environmental Impact Statement Sand, Clay & Pebble Extraction, Lot 1 & 2 DP 228308, Lot 2, DP 312327 Maroota. Volume I – Text*, Nexus Environmental Planning Pty Ltd, 1999

*ISO 9613-2:1996 Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation*, International Organization for Standardization

*Industrial Noise Policy*, NSW Environment Protection Authority, 2000

*Noise Policy for Industry*, NSW Environment Protection Authority, 2017

*NSW Road Noise Policy*, Department of Environment and Climate Change, 2011

Traffic impact assessment letter report, Seca Solution Project Reference P1340, 1 February 2019

*Noise Monitoring Assessment*, Muller Acoustic Consulting Report MAC160257PR1, 2 June 2016

*Noise Monitoring Assessment*, Muller Acoustic Consulting Report MAC160257RP1, 15 May 2017

*Noise Monitoring Assessment*, Muller Acoustic Consulting Report MAC160257RP3, 31 May 2018

*Noise Monitoring Assessment*, Muller Acoustic Consulting Report MAC160257RP4, 20 June 2019

*Operational and Road Noise Management Plan*, Muller Acoustic Consulting Report MAC160257NMPV02, 17 November 2016

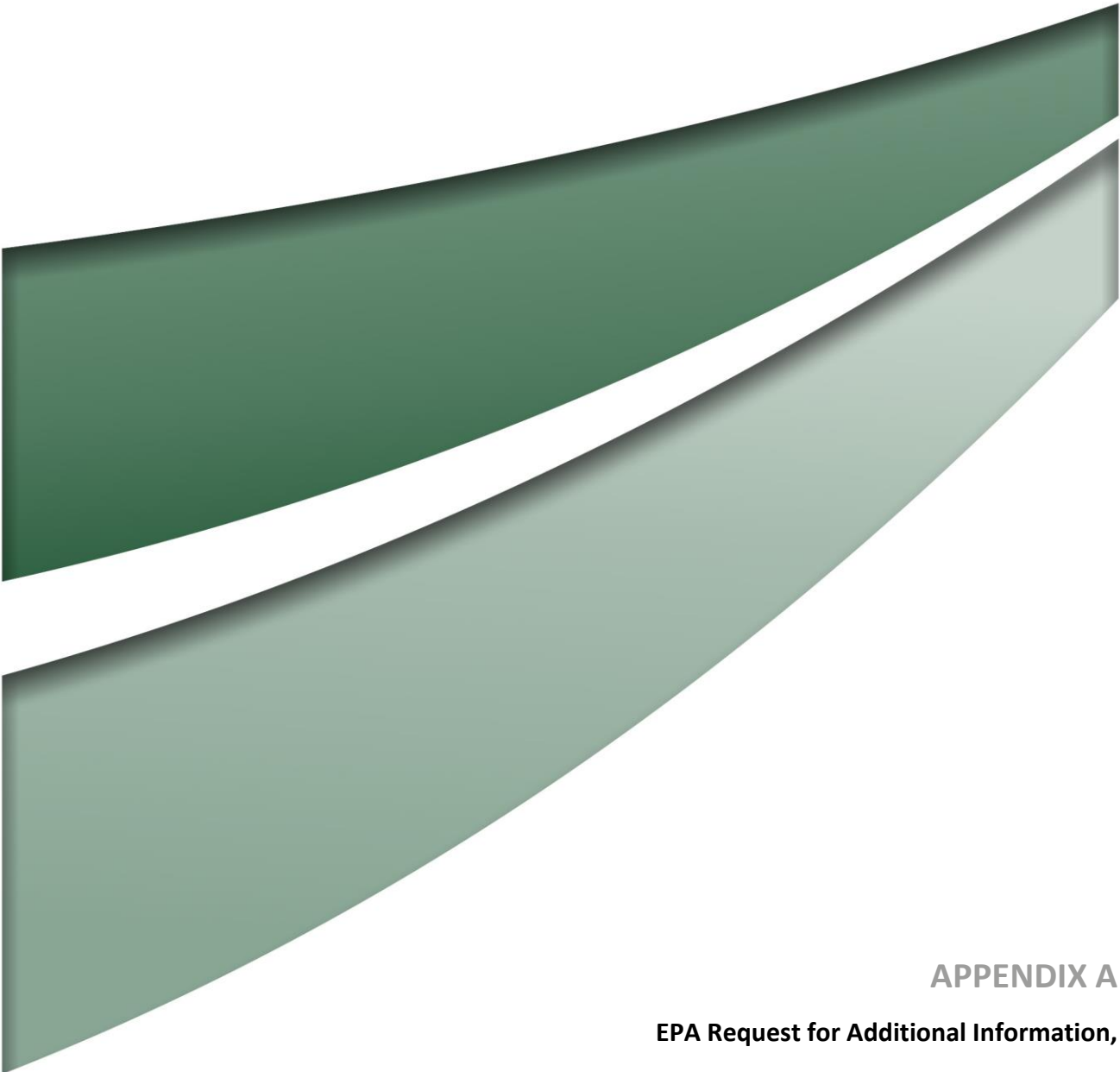
## 8.0 Glossary

Table 8.1 provides descriptions of terms and abbreviations which may be used in this report.

**Table 8.1 Glossary of Terms and Abbreviations**

Term	Description
ABL	Assessment background level – A single-figure background noise level representing each assessment period – day, evening and night (that is, three assessment background levels are determined for each 24-hr period of the monitoring period). It is determined by taking the lowest 10th percentile of the L90 level for each assessment period.
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dB(A), dBA	Decibels A-weighted.
dB(Lin), dB(Z)	Decibels Linear or decibels Z-weighted.
Decibel (dB)	The units of sound level and noise exposure measurement where a step of 10 dB is a ten-fold increase in intensity or sound energy and actually sounds a little more than twice as loud.
EPA	Environment Protection Authority
EPL	Environmental Protection Licence
Hertz (Hz)	The measure of frequency of sound wave oscillations per second – 1 oscillation per second equals 1 Hertz.
INP	Industrial Noise Policy
L <sub>A10</sub>	The percentile sound pressure level exceeded for 10 per cent of the measurement period with 'A' frequency weighting calculated by statistical analysis. Typically used to assess the impact of an existing operation on a receiver area and is referred to as the cumulative noise levels at the receiver attributable to the noise source.
L <sub>A90</sub>	Background Noise Level. The percentile sound pressure level exceeded for 90 per cent of the measurement period with 'A' frequency weighting calculated by statistical analysis.
L <sub>Amax</sub>	The maximum of the sound pressure levels recorded during the measurement.
L <sub>A1,1minute</sub>	The measure of the short duration high-level noises that cause sleep arousal. The noise level is measured as the percentile sound pressure level that is exceeded 1 per cent of measurement period with 'A' frequency weighting calculated by statistical analysis during a measurement time interval of 1 minute.
L <sub>Aeq,t</sub>	Equivalent continuous sound pressure level – The value of the sound pressure level of a continuous steady noise that, a measurement interval of time (t), has the same mean square sound pressure as the sound under consideration whose level varies with time. Usually measured in dB with 'A' weighting.
L <sub>An</sub>	Percentile level – A measure of the fluctuation of the sound pressure level which is exceeded 'n' per cent of the observation time.
MOD	Modification (to development consent)
NPfl	Noise Policy for Industry
NSW	New South Wales
PNTL	Project noise trigger levels – The target noise levels for a particular noise generating facility based on the most stringent of the intrusive criteria or amenity criteria.

Term	Description
RBL	Rating background level – The overall single figure background level representing each assessment period over the whole monitoring period determined by taking the median of the ABLs found for each assessment period.
RNP	Road Noise Policy
SPL (dBA)	<p>Noise: Sound pressure level – The basic measure of noise loudness. The level of the root-mean-square sound pressure in decibels given by:</p> $\text{SPL} = 10 \log_{10} (p/p_0)^2$ <p>where <math>p</math> is the rms sound pressure in pascals and <math>p_0</math> is the reference sound pressure at 20 <math>\mu\text{Pa}</math>. decibels.</p>
SWL	<p>Sound power level - a measure of the energy emitted from a source as sound and is given by:</p> $\text{SWL} = 10 \log_{10} (W/W_0)$ <p>where <math>W</math> is the sound power in watts and <math>W_0</math> is the reference sound power at <math>10^{-12}</math> watts.</p>



**APPENDIX A**

**EPA Request for Additional Information,**



DOC20/249727-8  
Your Ref. DA267-11-99-Mod-4

Mr Caleb Ferry  
Department of Planning, Industry and Environment  
4 Parramatta Square,  
12 Darcy Street  
PARRAMATTA NSW 2150

[caleb.ferry@planning.nsw.gov.au](mailto:caleb.ferry@planning.nsw.gov.au)

15 April 2020

Dear Caleb,

**RE: EPA review of Response to Submissions  
Roberts Road Quarry Modification 4 (DA267-11-99-Mod-4)**

I refer to your correspondence dated 25 March 2020 seeking advice from the Environment Protection Authority (EPA) in relation to the Response to Submissions (RtS) report dated March 2020, for the above modification located at Roberts Road, Lot 1 and part Lot 2 DP 228308 and Lot 2 DP 312327 Maroota, NSW 2756.

Hodgson Quarries and Plant Pty Ltd (the proponent) operates the Roberts Road Quarry located on Roberts Road at Maroota NSW (the premises). The proponent is seeking to modify the development consent (DA 267-11-99) for the premises to allow for importation of Virgin Excavated Natural Material (VENM) and Excavated Natural Material (ENM) for backfilling the extraction area to construct a free-draining final landform, and to undertake processing and blending. Specifically, the modification to the consent seeks:

- Extending the life of the quarry by five years (to 2030);
- Importing up to 320,000 tonnes per annum of Virgin Excavated Natural Material (VENM) and Excavated Natural Material (ENM);
- On-site processing of selected VENM and ENM for sale or blending with sand produced from in-situ resources;
- Increasing maximum allowable truck movements from 100 to 140 per day;
- Removal of a condition limiting exposed and active areas in the quarry to permit backfill and rehabilitation of completed sections of the quarry with VENM and ENM; and
- Construction of a free-draining final landform.

An Environmental Protection Licence 6535 (the licence), issued by the EPA to HB Maroota P/L (the licensee), permits extractive and crushing/grinding/separating activities at the premises, which a capacity limit of 500,000t per activity per year. With the proposed importation and processing of the VENM and ENM, the EPL will require a variation application to include an ancillary activity for 'Receipt and processing of VENM and ENM' with limitations under additional conditions of the licence

to restrict the amount of VENM/ENM received as approved by any conditions of consent and the need to meet all conditions of any resource recovery order, made under Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2019, at the time the VENM/ENM is received. The EPL variation will also include changes to conditions, where relevant, around Air, Water and Noise. The EPA previously provided comments to NSW Department of Planning (DPIE) in a letter dated 3 February 2020 (DOC20/6390). The EPA understands that the latest RtS is in response to this letter.

The EPA has reviewed the RtS and has determined that at this stage that responses and assessments are still not adequate to determine the impacts and provide recommended conditions of approval in relation to air and noise impacts. These concerns and recommendations are outlined below, and further detail is provided in Attachments A to B.

## **Air**

The EPA have reviewed the RtS, which included a revised Air Quality Impact Assessment. The EPA has provided detailed comments and advice on the adequacy of the information in addressing the issues identified, in **Attachment A**. In summary, the EPA considers that whilst issues identified with the air quality impact assessment for the have been adequately addressed, the referenced site-specific monitoring data for annual average PM<sub>2.5</sub> is significantly above the annual average impact assessment criteria of 8 ug/m<sup>3</sup>. The revised Air Quality Impact Assessment identifies an annual average PM<sub>2.5</sub> monitoring result of 11.6 ug/m<sup>3</sup> for the 2017 calendar year.

This indicates that that there is an impact occurring from the existing operations, and hence there are potential issues with the actual implementation of best practice mitigation measures. The EPA recommends that prior to project determination the proponent investigate the source of elevated annual average PM<sub>2.5</sub> impacts from current operations (which have been adopted as background), and if required, propose mitigation and rectification measures to reduce these impacts. If rectification and mitigation measures are proposed, the EPA will consider requiring these measures to be implemented via a pollution reduction program or special condition on the licence.

## **Noise**

On 24 April 2019 the EPA responded to a letter from Umwelt, dated 9 April 2019 (EPA Ref: DOC19/313616-1), providing advice in relation to the Environmental Impact Assessment for Modification 4 of DA-267-11-99. In this advice the EPA specifically requested that a noise assessment be undertaken in accordance with the EPA *Noise Policy for Industry* (2017), and information on what the assessment should include.

As mentioned in both the 24 April 2019 and 3 February 2020 letters to Umwelt and DPIE respectively, the EPA's review of the Noise Impact Assessment (NIA) identified a key missing information. The EPA requested that the proponent update the assessment to take account of the *Noise Policy for Industry* (NPfI) 2017 and to address specific technical concerns raised in that letter.

The March 2020 RtS has not addressed the EPA's concerns and as such the EPA cannot fully evaluate the likely noise impact of this project or recommend any conditions to manage potential noise impacts. The EPA also notes that the licence should reflect existing consent conditions, however during the MOD3 process this did not occur and different metrics are used to assess compliance with noise related monitoring limits (L10 vs. Leq). Aligning the licence with the consent conditions will require an assessment against the NPfI, as requested, rather than including conditions in the licence that are derived from a superseded document.

Therefore, in the absence of the information requested on a number of occasions, the EPA cannot support this development without these concerns being appropriately addressed. As requested previously, the EPA recommends that the NIA be revised in line with the NPfI to address the issues in Attachment B of the EPA's letter dated 3 February 2020.

## **Water**

The RtS clarifies that no discharges are expected to occur during operational quarrying, however the RtS indicates that discharges may be required during construction of the final landform.

No further assessment is required at this stage, given that no licensed discharge point is currently proposed, and noting the site-specific circumstances, including:

- the immediate receiving waterway is not considered a sensitive receiving environment; and
- there are likely to be practical measures readily available to manage any potential water quality risks (which can be managed under the licence, if required).

The RtS suggests that water quality data from the receiving waterway could be used to inform future licensed discharge concentration limits and that limits would only be required for total suspended solids, turbidity, pH and electrical conductivity. The EPA would expect that any water quality impact assessment would include consideration of all pollutants present at non-trivial levels with reference to the relevant guideline values from the national Water Quality Guidelines. Any discharge limits would be determined with consideration for the s45 POEO Act matters (e.g. practical measures to minimise pollution and impacts).

The recommended condition of approval is outlined in **Attachment B**.

Should you have further questions in relation to this matter, please contact Lisa Crambrook on 02 8837 6079 or email [lisa.crambrook@epa.nsw.gov.au](mailto:lisa.crambrook@epa.nsw.gov.au).

Yours sincerely,



15 April 2020

**JAMES BOYLE**  
**A/Unit Head – Regulatory Operations**  
**Environment Protection Authority**

## **Attachment A – Air Quality Impact Assessment**

### **Information reviewed**

- *Hodgson Quarries and Plant Pty Ltd Roberts Road Quarry Modification 4 Response to Submissions*, dated March 2020 prepared by Umwelt (Australia) Pty Limited (the Response to Submissions)
- *Air Quality Impact Assessment for Proposed Modification 4*, dated 18 March 2020, prepared by Jacobs Group (Australia) Pty Limited (the revised AQIA)

### **Adequacy of additional information and assessment in addressing issues identified**

#### **1. Variables for emission estimation**

The EPA recommended that the proponent revise the Air Quality Impact Assessment to ensure emission estimates are robustly justified and represent a reasonable worst-case emission estimate. It was noted that the exhibited Air Quality Impact Assessment adopted a silt content of 2 % for haul road emissions.

The revised AQIA incorporates revisions to the estimated emissions for haul roads. The silt contents adopted within the revised AQIA are considered representative of the ranges reported in the literature referenced within the AQIA (US AP42). The assessment also incorporates revisions to other parameters utilised for emission estimation of particular sources (such as moisture content). The revised parameter values have also been referenced from ranges reported in the literature referenced within the revised AQIA (US AP42). The EPA considers that the issue with adopted parameters for emission estimation have been adequately addressed.

#### **2. Particulate matter emission estimates for screening activities**

The EPA recommended that the proponent review the emission estimates for screening activities and revise the Air Quality Impact Assessment to include further information and justification for the adopted emission factors and throughputs. Additionally, it was requested that a demonstration be provided that screening activities adequately account for any additional increase in material throughput associated with the proposed modification.

The Response to Submissions advises that a higher emission factor had previously been used for screening for the two proposed scenarios and that there would not be any change in throughput as a result of the proposal with the additional truck movements proposed for VENM/ENM importation.

The revised AQIA incorporates changes to emission estimation for screening. The EPA understands that emission estimates for screening activities were based on some errors/inconstant application of emission factors for screening. The revised AQIA does not account for any mitigation measures (i.e. wet suppression) for screening activities, however the EPA considers that the issue with estimation of emissions for screening activities have been adequately addressed.

#### **3. Potential emissions associated with proposed crushing activities**

The EPA recommended that the Air Quality Impact Assessment be revised to include emission estimates for proposed crushing activities.

The Response to Submissions advises that emission estimates for crushing were included within the emission estimates for the screening activities. Additionally, the Response to Submissions advises that the crushing activities have been included as a separate item in the emission estimates of the revised AQIA.

The revised AQIA incorporates emission estimates for crushing as separate item with supporting information on the emission estimation techniques applied. The EPA considers the issues for emissions from proposed crushing activities have been adequately addressed.

#### 4. Assessment predicts exceedances and has not benchmarked mitigation measures against best management practice

The EPA recommended that the proponent benchmark mitigation measures against best management practices and revise the Air Quality Impact Assessment incorporating all feasible and reasonable best practice mitigation measures.

The Response to Submissions advises that:

- In consultation with Hodgson Quarries, and based on the outcomes of the revised AQIA the controls listed in Table 6-4 of the revised AQIA were applied in the existing and proposed emission inventories
- These controls are considered the most reasonable and feasible measures which can practically be applied

Table 6-4 of the revised AQIA includes the following mitigation measures:

- Watering of internal haul route (50% control efficiency applied)
- Water sprays for Unloading and loading materials (50% control efficiency applied)
- Water of primary haul route (75 % control efficiency applied)
- Watering of exposed areas (50% control efficiency applied)

The EPA advises that:

- Screening is a significant emission source from the premises as assessed and accounts for:
  - ~19% of total particulate emissions for proposed scenarios
  - ~21% of PM<sub>10</sub> emissions for proposed scenarios
  - ~23% of PM<sub>2.5</sub> emission for proposed scenarios
- The assessment is based on uncontrolled emission estimates for screening activities

The revised AQIA concludes that “*Measures consistent with best-practice were recommended to control emissions to air including the use of water during material hauling, loading and unloading and screening, as well as on exposed surface and stockpiles and during screening and crushing activities as identified as being required*”. The EPA notes that the revised AQIA has not accounted for implementation of mitigation measures on screening activities.

The EPA advises that whilst the assessment identifies mitigation measures, the existing site specific annual average PM<sub>2.5</sub> concentrations are significantly above the impact assessment criteria. This indicates an impact occurring from existing operations. This then further identifies potential issues with the actual implementation of mitigation measures consistent with best practice.

#### 5. Change in potential PM<sub>10</sub> (24-hour average) and PM<sub>2.5</sub> (24-hour average) impacts not clear

The EPA recommended that the proponent revise the Air Quality Impact Assessment to include tabulated results articulating maximum incremental and cumulative ground level concentrations for 24-hour average PM<sub>10</sub> and PM<sub>2.5</sub> for each scenario and the number of additional exceedances predicted for each scenario.

The revised AQIA provides the additional information requested. The revised AQIA predicts:

- Compliance with the annual average TSP, and annual average PM<sub>10</sub> impact assessment criteria;
- Predicts 6 exceedances of the 24-hour average PM<sub>10</sub> impact assessment criteria for the existing and proposed scenarios. No additional exceedances of the 24-hour average are predicted as a result of the proposal. The exceedances are attributable to background air quality data being above the impact assessment criteria.
- Predicts 17 exceedances of the 24-hour average PM<sub>2.5</sub> impact assessment criteria for the existing and proposed scenarios. No additional exceedances of the 24-hour average are predicted as a result of the proposal. The exceedances are attributable to background air quality data being above the impact assessment criteria.

- Predicts exceedances of annual average PM<sub>2.5</sub> impact assessment criteria for the existing and proposed scenarios. Adopted PM<sub>2.5</sub> background air quality concentration exceeds the impact assessment criteria without contributions from the premises. The maximum predicted increment is approximately 6% of the cumulative impact assessment criteria under the proposed scenarios.

The EPA advise that whilst the revised assessment addresses the information requested and predicts that there is unlikely to be a significant change in predicted off site impacts as a result of the proposal, it is noted that referenced existing annual average PM<sub>2.5</sub> concentrations are significant: Specifically:

- The adopted annual average PM<sub>2.5</sub> annual average concentration for cumulative assessment purposes is 13 ug/m<sup>3</sup>
- The annual average PM<sub>2.5</sub> from site specific monitoring was 11.6 ug/m<sup>3</sup> for the 2017 calendar year

The referenced site specific annual average concentrations are significantly above the impact assessment criteria of 8 ug/m<sup>3</sup>, which indicate an impact occurring from the existing operations. Whilst the revised assessment provides further clarity on the change in potential 24-hour average impacts, the assessment identifies a potential impact from existing operations which must be investigated prior to project approval.

In regard to Item 4 and 5 above, the EPA recommends that prior to project determination the proponent investigate the source of elevated annual average PM<sub>2.5</sub> impacts from current operations (which have been adopted as background), and if required, propose mitigation and rectification measures to reduce these impacts. If rectification and mitigation measures are proposed, the EPA will consider requiring these measures to be implemented via a pollution reduction program or special condition on the licence.

### **Attachment B – Water Assessment**

The following condition of approval is recommended to ensure potential water quality impacts of any future proposed discharge are appropriately assessed and managed:

*There must be no discharges to waters from the premises, except as regulated by an environment protection licence. Consistent with section 45 of the Protection of Environment Operations Act, any application to include a discharge point on the environment protection licence would require a water quality impact assessment consistent with the national Water Quality Guidelines to inform consideration by the EPA. Any such assessment must include consideration of all pollutants present at non-trivial levels, based on a risk assessment of the materials and activities at the premises, with reference to the relevant guideline values from the national Water Quality Guidelines.*



DOC20/6390  
Your Ref. DA267-11-99-Mod-4

Mr Caleb Ferry  
Department of Planning, Industry and Environment  
4 Parramatta Square,  
12 Darcy Street  
PARRAMATTA NSW 2150

[caleb.ferry@planning.nsw.gov.au](mailto:caleb.ferry@planning.nsw.gov.au)

**3 February 2020**

Dear Caleb,

**RE: EPA Response to Roberts Road Quarry Modification 4 (DA267-11-99-Mod-4)**

I refer to your correspondence dated 20 December 2019 seeking advice from the Environment Protection Authority (EPA) on the Statement of Environmental Effects (SEE) report in relation to the above modification for Hodgson Quarries and Plant Pty Ltd located at Roberts Road, Lot 1 and part Lot 2 DP 228308 and Lot 2 DP 312327 Maroota, NSW 2756.

Hodgson Quarries and Plant Pty Ltd (the proponent) operates the Roberts Road Quarry located on Roberts Road at Maroota NSW (the premises). The proponent is seeking to modify the development consent (DA 267-11-99) for the premises to allow for importation of Virgin Excavated Natural Material (VENM) and Excavated Natural Material (ENM) for backfilling the extraction area to construct a free-draining final landform, and to undertake processing and blending. Specifically, the modification to the consent seeks:

- Extending the life of the quarry by five years (to 2030);
- Importing up to 320,000 tonnes per annum of Virgin Excavated Natural Material (VENM) and Excavated Natural Material (ENM);
- On-site processing of selected VENM and ENM for sale or blending with sand produced from in-situ resources;
- Increasing maximum allowable truck movements from 100 to 140 per day;
- Removal of a condition limiting exposed and active areas in the quarry to permit backfill and rehabilitation of completed sections of the quarry with VENM and ENM; and
- Construction of a free-draining final landform.

Current approved activities are permitted at the premises under Environmental Protection Licence (EPL) 6535 (the licence), issued by the EPA to HB Maroota P/L (the licensee). Extractive and crushing/grinding/separating activities at the premises are each permitted up to 500,000t per year. With the proposed importation and processing of the VENM and ENM, the EPL will require a variation application to include an ancillary activity for 'Receipt and processing of VENM and ENM' with limitations under additional conditions of the licence to restrict the amount of VENM/ENM

received as approved by any conditions of consent and the need to meet all conditions of any resource recovery order, made under Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2019, at the time the VENM/ENM is received.

The EPA has reviewed the environmental assessment and has determined that at this stage that the assessment is not adequate to determine the impacts and provide recommended modified conditions of approval in relation to air, noise and water impacts. Details of the EPA's assessment, concerns and recommendations are provided below and further detail is provided in Attachments A to C.

## **Air**

The EPA's Technical Advice Air unit has reviewed the Statement of Environmental Effects (the SEE) and the Air Quality Impact Assessment (the AQIA) submitted for the proposed Modification 4 to the Roberts Road Quarry development consent.

The AQIA assessed potential impacts of PM<sub>2.5</sub>, PM<sub>10</sub> and Total Suspended Particles (TSP) for existing operations, proposed VENM/ENM importation taking place at the north-east corner of site and proposed VENM/ENM importation to the south east corner of the site.

The AQIA predicts that there will be:

- up to four additional exceedances of the PM<sub>10</sub> (24-hour average) impact assessment criteria for proposed VENM/ENM importation taking place at the north-east corner of the site and up to 1 additional exceedance for proposed VENM/ENM importation taking place at the south east corner of the site.
- Exceedances of the PM<sub>2.5</sub> (annual average) impact assessment criteria. It is noted that adopted background concentrations are above the impact assessment criteria without the proposal;
- No exceedances of PM<sub>2.5</sub> (24-hour average) and TSP (annual average) impact assessment criteria

However, the EPA has identified that there are issues with the AQIA including that the:

- Variables for emission estimation are not justified
- Particulate matter emission estimates for screening activities require review and clarification
- Assessment does not account for potential emissions associated with proposed crushing activities
- Assessment predicts exceedances and has not benchmarked mitigation measures against best management practice
- Change in potential PM<sub>10</sub> (24-hour average) and PM<sub>2.5</sub> (24-hour average) impacts are not clear.

The issues identified are outlined in **Attachment A**. To ensure a robust assessment is provided for decision making purposes, the EPA recommends that the proponent revise the AQIA to address the issues identified.

## **Noise**

The EPA's Noise Technical Advice Unit has reviewed the Final Noise Impact Assessment (NIA) prepared by Umwelt in November 2019. The Operational Noise Assessment prepared by Wilkinson Murray in May 2015 (Report 14229 Version B) for MOD 3 was also reviewed, as the NIA relies on modelling assumptions within the Wilkinson Murray Report and therefore it is important to consider both together.

The EPA has identified that there is key information missing in the Noise Impact Assessment, as outlined in Attachment B. The EPA recommends that the NIA be revised in line with the Noise Policy for Industry (NPfI) to address the issues in **Attachment B**.

The EPA also notes that noise conditions in the licence will need to be varied to be consistent with the NPfI.

## **Water**

The EPA's Water Technical Advice Unit has reviewed the Statement of Environmental Effects (the SEE) submitted for the proposed Modification 4 to the Roberts Road Quarry development consent.

The *in-situ* resource to be extracted will remain unchanged by the proposal modification. No modification to the approved extraction area is proposed. As such, the proposed modification is unlikely to change interception of the groundwater table.

The erosion and sediment controls are correctly proposed in accordance with *Managing Urban Stormwater Volume 1* (Landcom, 2004) and *Volume 2e Mines and Quarries* (DECC, 2008).

The general drainage pattern of the site is in a northerly direction along a first-order creek line which joins a tributary of Coopers Creek approximately 2km to the north, before eventually flowing into the Hawkesbury River. Coopers Creek is within the Marramarra National Park which has conservation and recreational values.

Since operation commenced, there has been no discharge from the quarry site with all runoff contained and reused within the four onsite dams. As such, there is no licenced discharge point for site water and no existing water quality monitoring requirements within the applicant's current Environment Protection Licence (EPL) 6535.

However, the EPA notes that potential water pollution risks and mitigation measures to address these risks associated with this modification proposal have not been adequately identified. To ensure this occurs, it is recommended that the applicant undertake a discharge impact assessment. This should include assessment of impacts from all pollutants that may be introduced into the water cycle by source and discharge point.

Further details of the water impact assessment requirements are outlined in **Attachment C**, along with recommended licence conditions to address residual water pollution risks.

Should you have further questions in relation to this matter, please contact Lisa Crambrook on 02 8837 6079 or email [lisa.crambrook@epa.nsw.gov.au](mailto:lisa.crambrook@epa.nsw.gov.au).

Yours sincerely,



**JACQUELINE INGHAM**  
**Unit Head– Sydney Industry**  
**Environment Protection Authority**

## **Attachment A – Detailed review of Air Quality Impact Assessment**

### **Information reviewed**

- *Air Quality Impact Assessment for Proposed Modification 4*, dated June 2019 (the AQIA)
- *Hodgson Quarries and Plant Pty Ltd Roberts Road Quarry Modification 4 Statement of Environmental Effects*, dated December 2019 (the SEE)

### **Issues identified**

#### **1. Variables for emission estimation not justified**

The AQIA estimates particulate matter emissions utilising emission factors adopted from NPI, 2012 and US EPA AP42. The EPA notes that the emission factors for haul roads are derived using variables, including silt content. The AQIA adopts a silt content of 2 % for estimating emissions from haul roads. The AQIA does not include a justification for the adopted 2%, noting the Chapter 13 of US EPA AP42 includes silt content for unpaved roads for various industries, and the mean silt contents for various industries are all greater than 2%. Hence the adopted value of 2% potentially underestimates emissions from haul roads, and hence potentially underpredicts the predicted ground level concentrations of particulate matter.

**Recommendation: Revise the Air Quality Impact Assessment to ensure emission estimates are robustly justified and represent a reasonable worst-case emission estimate.**

#### **2. Particulate matter emission estimates for screening activities requires review and clarification**

The EPA notes that the AQIA has accounted for particulate matter emissions from screening activities. A summary of the emission estimates for screening activities is presented in table 1 below.

*Table 1 – Summary of emissions from screening activities*

	Existing	Proposed VENM filling North	Proposed VENM filling South
TSP (kg/year)	6,000	14,400	14,400
PM <sub>10</sub> (kg/year)	2,064	4,800	4,800
PM <sub>2.5</sub> (kg/year)	480	960	960

Additionally, the EPA notes that:

- Screening activities account for a large portion of total assessed emissions and hence have the potential to have a greater influence on predicted ground level concentrations;
- Emission estimates are based on total throughput of 480,000 tonnes per year for each scenario assessed
- There are differences in the emission factors for screening activities between the different scenarios.

However, the assessment does not include a detailed discussion on the adopted emission factors for screening activities (including specific information on where emission factors have been referenced), hence it is unclear as why there is a difference in estimated emissions between scenarios when the material throughput used to derive emission estimates remains constant.

Furthermore Section 3.2 of the SEE states “*The Applicant is proposing to import VENM and ENM, both as a backfill material to assist in the rehabilitation of the Quarry, as well as a feed stock for crushing, screening and washing to produce sand products*”. It is not clear if the assessment has accounted for any proposed increases in quantity of material throughput to screening activities, as the emission estimate is based on the same throughput for each assessed scenario.

**Recommendation: The proponent review the emission estimates for screening activities and revise the Air Quality Impact Assessment to include:**

- **Further information and justification for the adopted emission factors, and throughputs**
- **A demonstration that screening activities have adequately accounted for any additional increase in material throughput associated with the proposed modification**

3. Assessment does not account for potential emissions associated with proposed crushing activities

Section 3.2 of the SEE states “*The Applicant is proposing to import VENM and ENM, both as a backfill material to assist in the rehabilitation of the Quarry, as well as a feed stock for crushing, screening and washing to produce sand products*”.

However, the EPA notes that the emissions inventory as per Appendix A of the AQIA does not include emission estimates for proposed crushing activities. Hence it appears that the assessment has not accounted for proposed crushing activities as advised within the SEE.

**Recommendation: Revise the assessment to account for emissions from proposed crushing activities**

4. Assessment predicts exceedances and has not benchmarked mitigation measures against best management practice

The AQIA accounts for wet suppression mitigation measures, including the following:

- Watering of unsealed roads (50% control factor adopted)
- Watering during unloading of materials to screens (70% control factor adopted)
- Water sprays during loading of materials to stockpiles (50% control factor adopted)

The EPA notes that there are emission sources which do not include mitigation measures (screening activities).

Section 5.1.3 of the *Approved Methods for Modelling and Assessment of Air Pollutants* provides guidance when exceedances of the impact assessment criteria are predicted. The guidance advises that proponents must demonstrate that best management practices will be implemented to minimise emissions of air pollutants as far as practical. The AQIA does not benchmark mitigation measures against best management practices noting that exceedances of impact assessment criteria are predicted, and there are unmitigated particulate emission sources.

**Recommendation: The proponent:**

- **Benchmark mitigation measures against best management practices;**
- **Revise the Air Quality Impact Assessment incorporating all feasible and reasonable best practice mitigation measures.**

5. Change in potential PM<sub>10</sub> (24-hour average) and PM<sub>2.5</sub> (24-hour average) impacts not clear

The AQIA advises that:

- Up to four additional exceedances of the PM<sub>10</sub> (24-hour average) impact assessment criteria are predicted for proposed VENM/ENM importation taking place at the north-east corner of the site and up to 1 additional exceedance for proposed VENM/ENM importation taking place at the south east corner of the site
- No additional exceedances of PM<sub>2.5</sub> (24-hour average) are predicted

The EPA understands that the additional exceedances are due to the proposed modification, however, the AQIA does not include tabulated results for maximum predicted incremental 24-hour average PM<sub>10</sub> and PM<sub>2.5</sub> for each scenario assessed (existing, VENM/ENM importation to the north, VENM/ENM importation to the south). Hence it is unclear as to the potential increase in incremental 24-hour average PM<sub>10</sub> and PM<sub>2.5</sub> ground level concentrations from existing operations and the potential for additional exceedance days above existing operations (as the assessment does not clearly advise on any predicted exceedances for the existing operations).

**Recommendation: Revise the Air Quality Impact Assessment to include tabulated results articulating:**

- maximum incremental and cumulative ground level concentrations at each sensitive receptor for 24-hour average  $PM_{10}$  and  $PM_{2.5}$  for each scenario (existing, VENM/ENM importation to the north, VENM/ENM importation to the south)
- Number of additional exceedances for each scenario (existing, VENM/ENM importation to the north, VENM/ENM importation to the south) at each sensitive receptor.

## **Attachment B – Detailed review of Noise requirements**

### **Information reviewed**

- *Noise Impact Assessment* prepared by Umwelt, November 2019 (the NIA)
- Operational Noise Assessment prepared by Wilkinson Murray in May 2015 (Report 14229 Version B for MOD 3).

### **Issues identified**

At this stage, the EPA has not included recommended conditions of approval as there is important missing information which is required to determine what noise levels should be included in the licence, including:

- The Wilkinson Murray noise monitoring was based on short term attended monitoring only. An analysis of the data presented within the report shows that the quarry operation at the time of the monitoring significantly increased the background noise level in the area by 5 - 10 dBA. Providing licence limits for the current modification application will need to be based on up to date noise levels that are obtained as per the most recent EPA noise policy documentation, namely the Noise Policy for Industry (NPfI) (EPA, 2017). The Umwelt Report has been not based on the NPfI. It is possible that there would be significant changes in the Project Trigger Noise Levels (PNTLs) derived under NPfI assessment.
- The Wilkinson Murray report recommended changing the licence conditions from the outdated L10 metric to an  $L_{Aeq}$  level. However, this was not adopted at the time. As outlined within the NPfI transition policy, the NPfI should be applied to this application. The relevant section of the transition policy is presented below:

*4. The Noise Policy for Industry (2017) will be used to assess and develop requirements for existing industrial developments/activities under the circumstances and through the processes described in points 5 and 6 below.*

*5. Modification to a planning approval: a. where the planning authority requires a noise impact assessment to support the modification;*

As per the above, we would expect that Umwelt undertake an assessment as per the NPfI for this development, including derivation of Project Noise Trigger Levels in  $L_{Aeq}$ .

- All of the recommendations contained within the Wilkinson Murray report were to enable compliance with their assessment under the Industrial Noise Policy (INP, EPA, 2000). As an assessment under the NPfI may lead to different/lower PNTLs, Umwelt's assumption of existing compliance may not be valid because the existing noise levels from the site may be over the targets that would be derived from the NPfI.
- The modelled noise levels in the Wilkinson Murray report have been used as a basis for the Umwelt NIA assessment. We also note that the Umwelt NIA has used the "typical" noise level assessment from the Wilkinson Murray report, rather than the worst case scenario. Umwelt have not addressed the frequency or impact of the worst-case noise levels presented within Table 5.5 of the Wilkinson Murray report. The proposed additional operations, in conjunction with the worst case noise levels may lead to significant increases over the NPfI PNTLs.
- Neither of the assessments consider adverse meteorological conditions. Assessment of all meteorological conditions is important as they can affect the noise levels at the receivers (by increasing them). Due to the distances between the development and the receivers, this may impact some residents more than others. However, this has not been assessed within either report.

**Recommendation: Based on the above, we recommended that the noise assessment be updated to reflect the Noise Policy for Industry (NPfI).**

Please note that the updated noise assessment should include new noise levels that will need to be included in the licence.

The number of truck movements are predicted to increase from 100 (50 laden trucks) to 140 (70 laden trucks). This modification in truck movements is unlikely to result in a significant increase in noise levels (less than 3 dB).

### **Attachment C – Detailed review of Water requirements**

Section 45 of the *Protection of Environment Operations Act 1997* (POEO Act) sets out the matters that the EPA must consider when making licensing decisions, including:

the pollution caused Section 45 POEO Act matters

- or likely to be caused by the carrying out of the activity or work concerned and the likely impact of that pollution on the environment
- the practical measures that could be taken to prevent, control, abate or mitigate that pollution and protect the environment from harm as a result of that pollution
- in relation to an activity or work that causes, is likely to cause or has caused water pollution the environmental values of water affected by the activity or work, and the practical measures that could be taken to restore or maintain those environmental values.

The *Statement of Environmental Effects* does not provide the information required to consider all these matters. The assessment does not include a characterisation of the quality of discharges or assess the impact of discharges on the environmental values of waterways.

Water from the sediment basin will be reused for dust suppression and irrigation, however water demand modelling during landform placement indicates that the quarry will be required to discharge water to maintain minimum settling and sediment storage volumes. The controlled discharge frequency ranges from a minimum of three days per year to a maximum of 51 days per year. During dry years, controlled discharges are predicted to be minimal while discharge volumes are expected to range from 4 to 82 ML/year during median and wet years. An assessment of the impact of discharges on the environmental values of waterways is required to inform consideration of the s45 POEO Act matters. The applicant should demonstrate that all practical and reasonable measures will be implemented to avoid discharges and minimise pollution.

The applicant has supplied summarised site monitoring data within the four onsite dams as well as average groundwater quality for several bores within the region. Data was collected from 2017 to 2019 however It is not clear how many sampling events were undertaken. Monitored parameters are restricted to pH, electrical conductivity, total dissolved solids, and several cations and anions (chlorine, sulphate, alkalinity, calcium, magnesium, sodium and potassium). The report does not assess concentrations of the monitored parameters against any guidelines, however a preliminary review by the EPA indicates that observed concentrations of parameters such as chlorine are significantly above recommended guidelines. Water quality data should be assessed against the relevant guidelines values from the national Water Quality Guidelines (ANZG 2018) and to determine the potential impacts of discharges. This assessment is required to ascertain whether further water quality management and mitigation measures are required.

It is unclear whether all pollutants that may be present at non-trivial levels have been identified as metals (including iron, manganese, cadmium, copper, nickel, lead and zinc) and nutrients (such as total nitrogen, total phosphorus) have not been assessed. The report also does not consider the expected water quality (surface and groundwater) following importation of VENM and ENM.

#### **Incorrect methodology to derive site specific guideline values**

The applicant proposes monitoring within the drainage line directly to the north of the Quarry '*on a monthly basis for a period of 24 months to prepare a dataset that can be used to define site specific trigger values in accordance with ANZECC 2000*'. The drainage line directly to the north of the Quarry is not an appropriate reference site for the purposes of deriving site-specific guideline values as the site is impacted by surrounding catchment land uses.

Site-specific guideline values used to assess potential impacts should be derived consistent with the national Water Quality Guidelines. The policy in NSW is that the level of protection applied to most waterways is the one suggested for 'slightly to moderately disturbed' ecosystems. For highly

disturbed systems, the emphasis should be on improvement of the waterway and not maintenance of a degraded condition. Therefore, if site-specific guideline values are to be used to assess impacts and inform licence conditions, they should be derived from data from an appropriate reference site(s) representative of slightly disturbed condition.

The ANZG (2018) guidelines provides further details regarding the derivation of site-specific guideline values and selection of representative reference sites.

### Recommendations

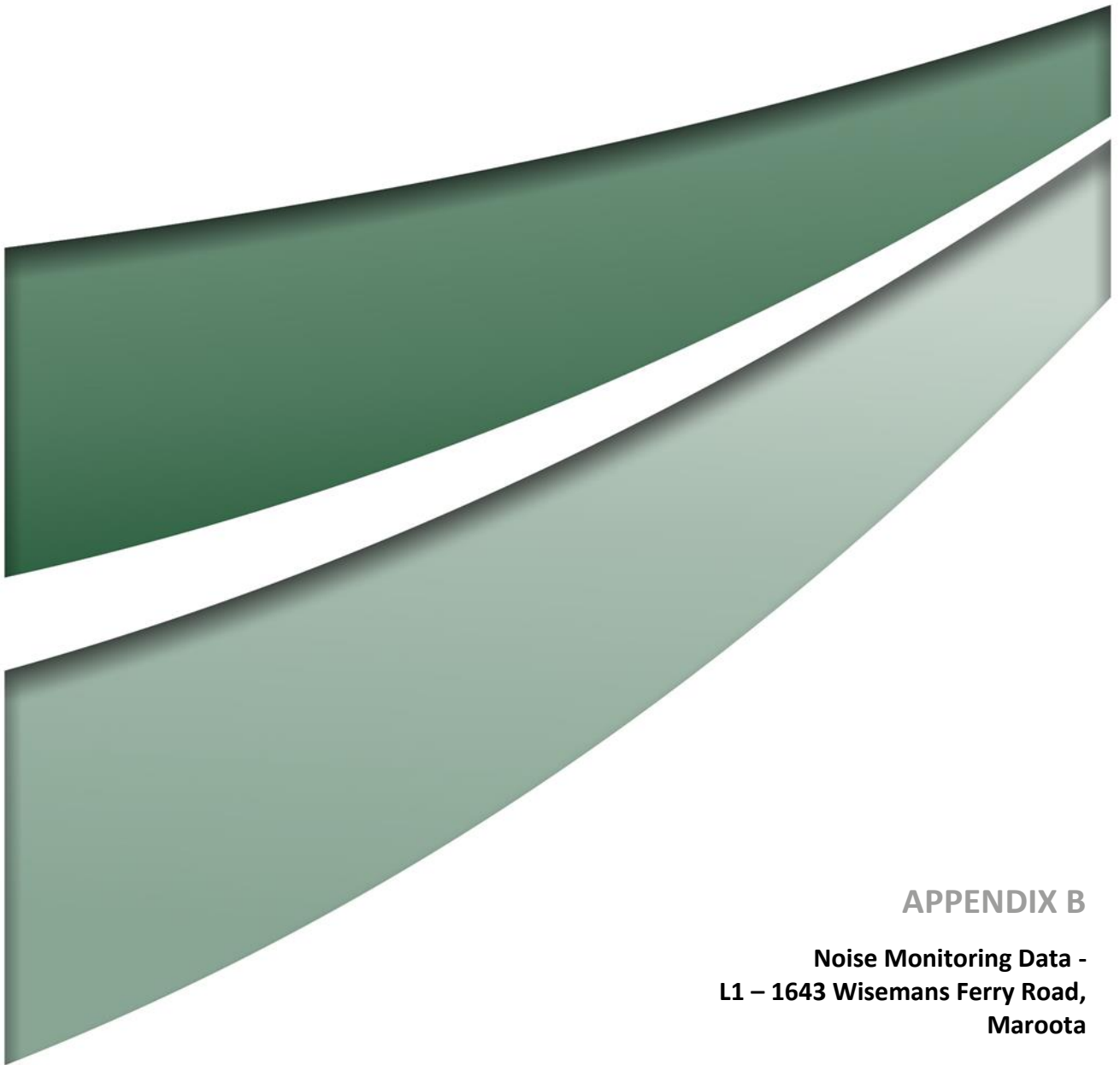
It is the responsibility of the licensee to ensure that their licence specifically regulates the discharge from its premises of all those pollutants that pose a risk of non-trivial harm to human health or the environment. Where the premises discharges a pollutant that is not regulated by the licence, the licence holder does not have a defence against the pollution of waters offence by that pollutant.

**Recommendation: Given that the EPA will need to provide discharge criteria for inclusion in the modification consent, the following information is required to enable the EPA to provide conditions of approval, to address residual water quality risks:**

**1. The applicant should prepare a water quality impact assessment. This assessment should:**

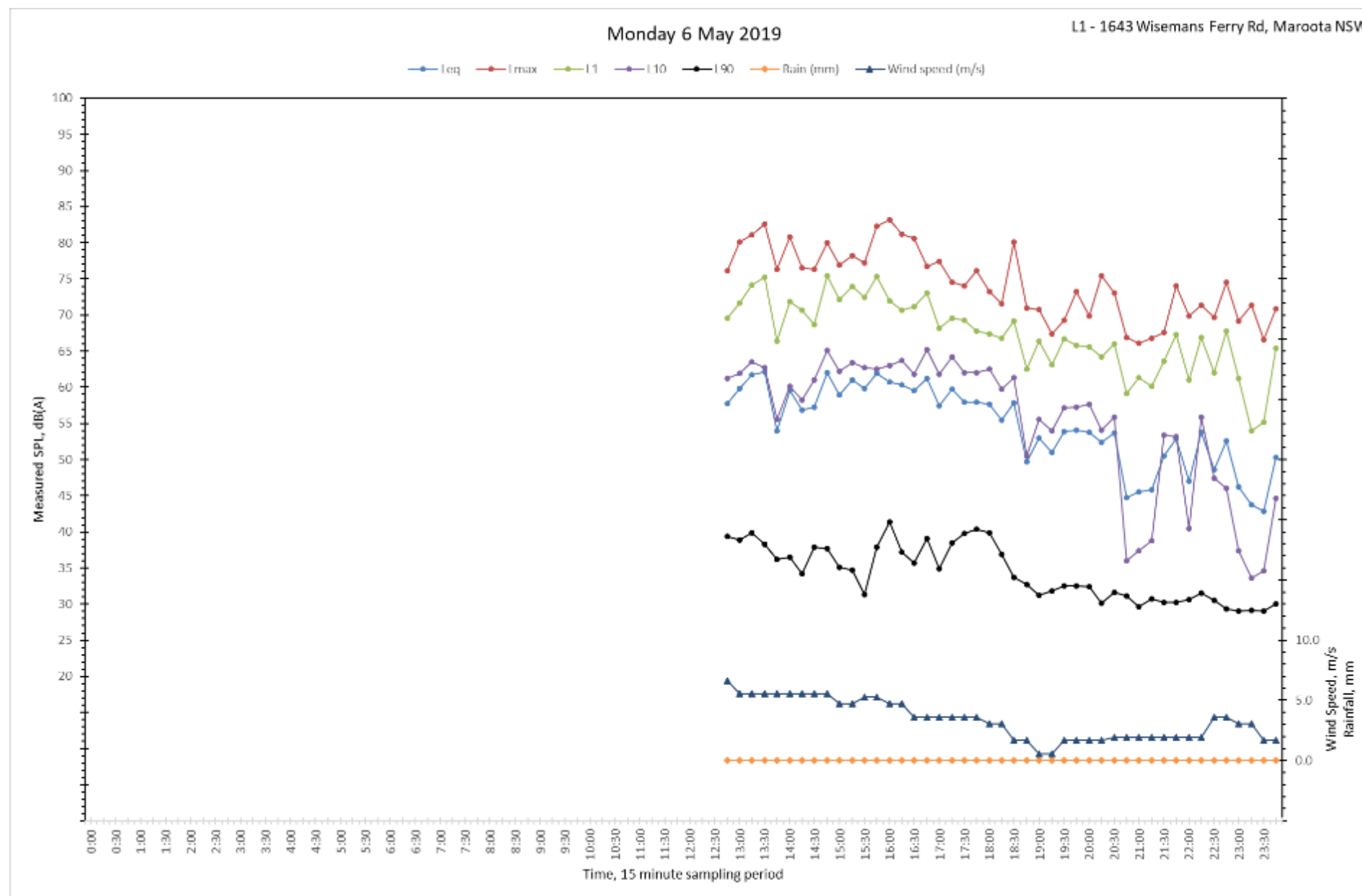
- **demonstrate that all practical and reasonable measures will be implemented to avoid discharges and minimise pollution**
- **identify and estimate the quality and quantity of all pollutants that may be introduced into the water cycle by source and discharge point including residual discharges after mitigation and waste avoidance measures are implemented (where possible, this should be based on monitoring at the site)**
- **describe the nature and degree of impact that any residual discharges will have on the environmental values of the receiving waterways with reference to the relevant guideline values from the national Water Quality Guidelines**
- **where relevant, consider practical measures to address identified impacts.**

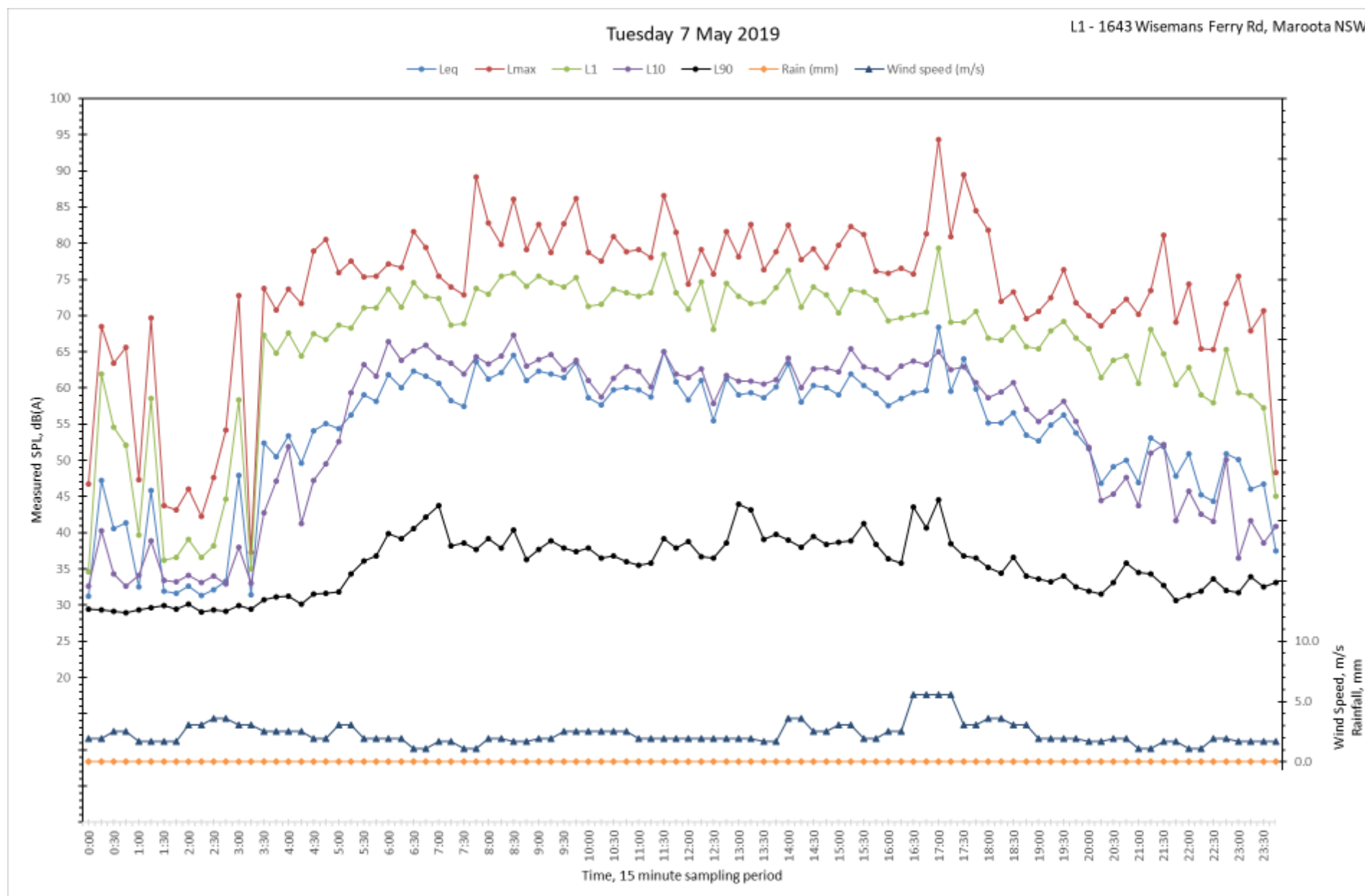
**The assessment should adopt the guideline values for slightly to moderately disturbed ecosystems. If site-specific guideline values are used, these should be derived consistent with the national Water Quality Guidelines, including being based on at least 24 months of contiguous monitoring data from a suitable reference site/s, representative of slightly disturbed condition.**

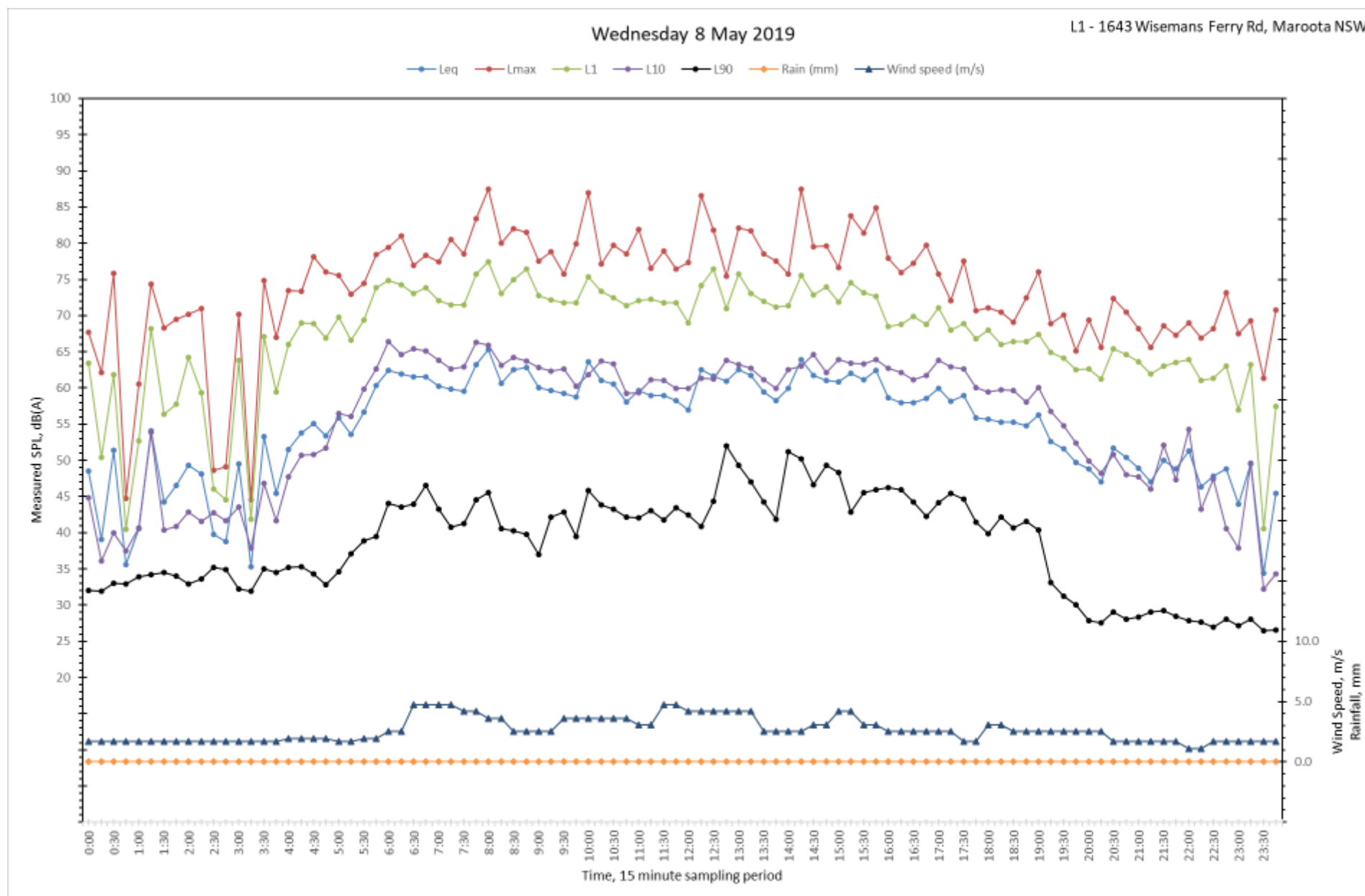


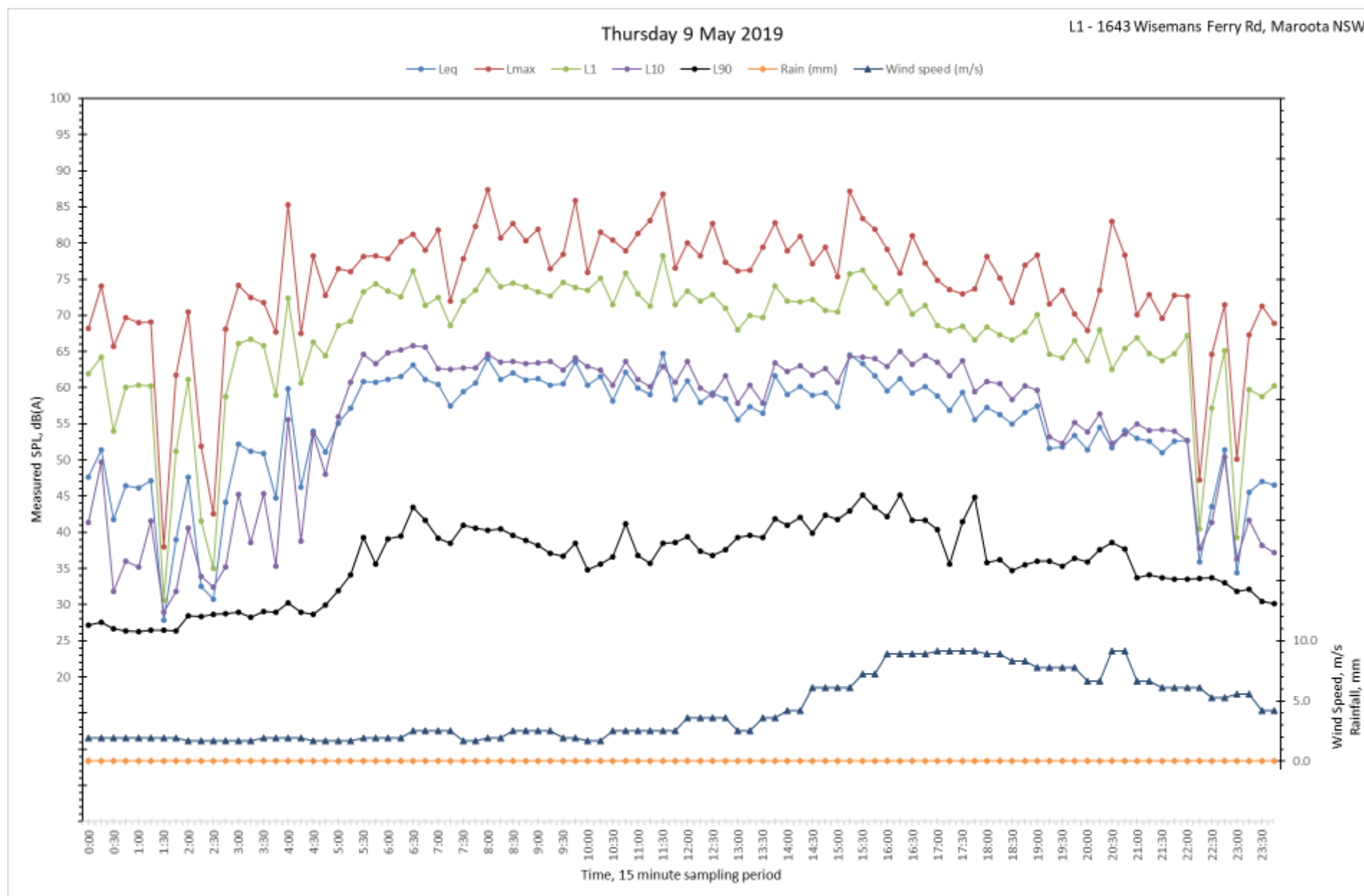
## **APPENDIX B**

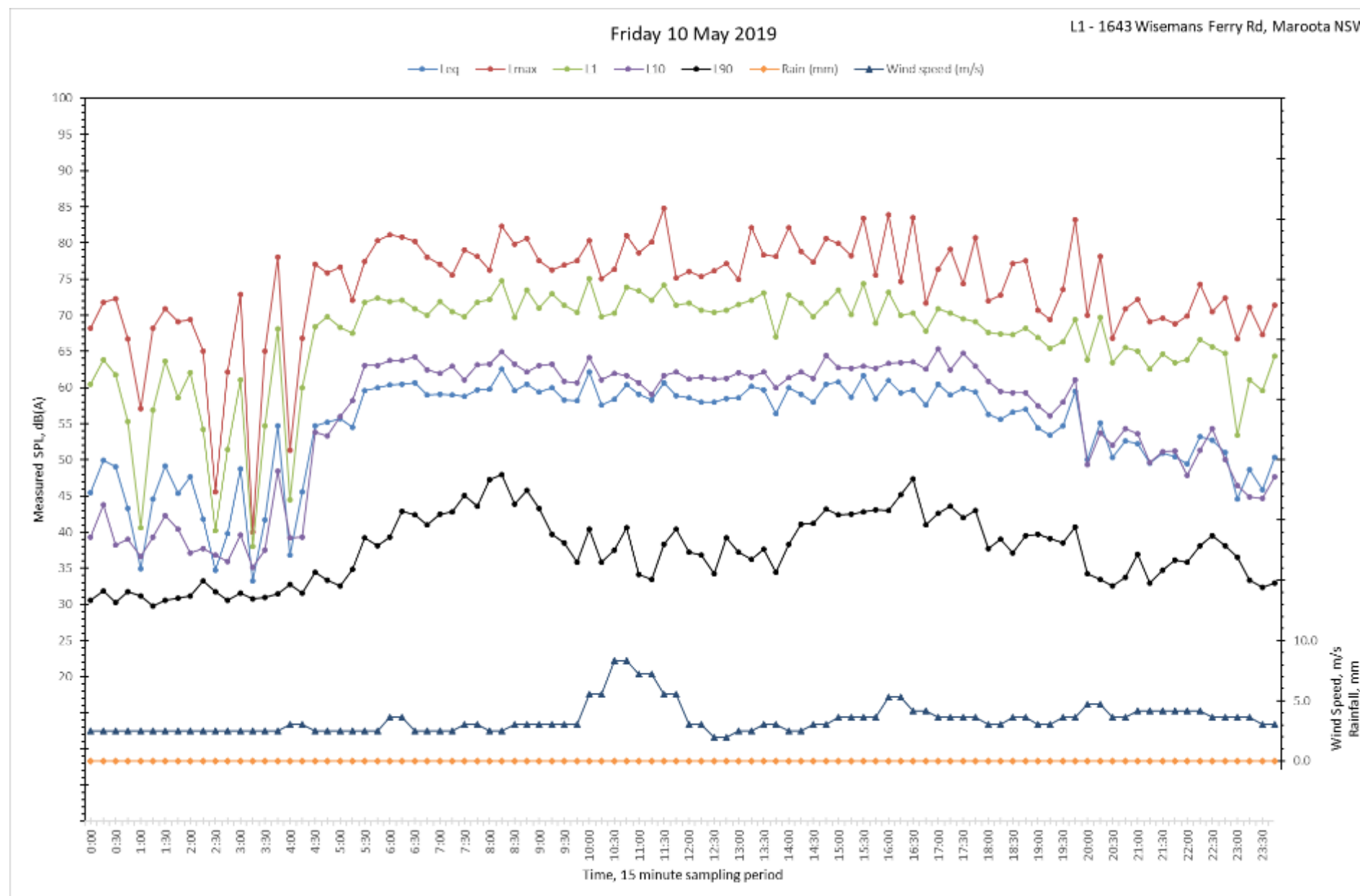
**Noise Monitoring Data -  
L1 – 1643 Wisemans Ferry Road,  
Maroota**

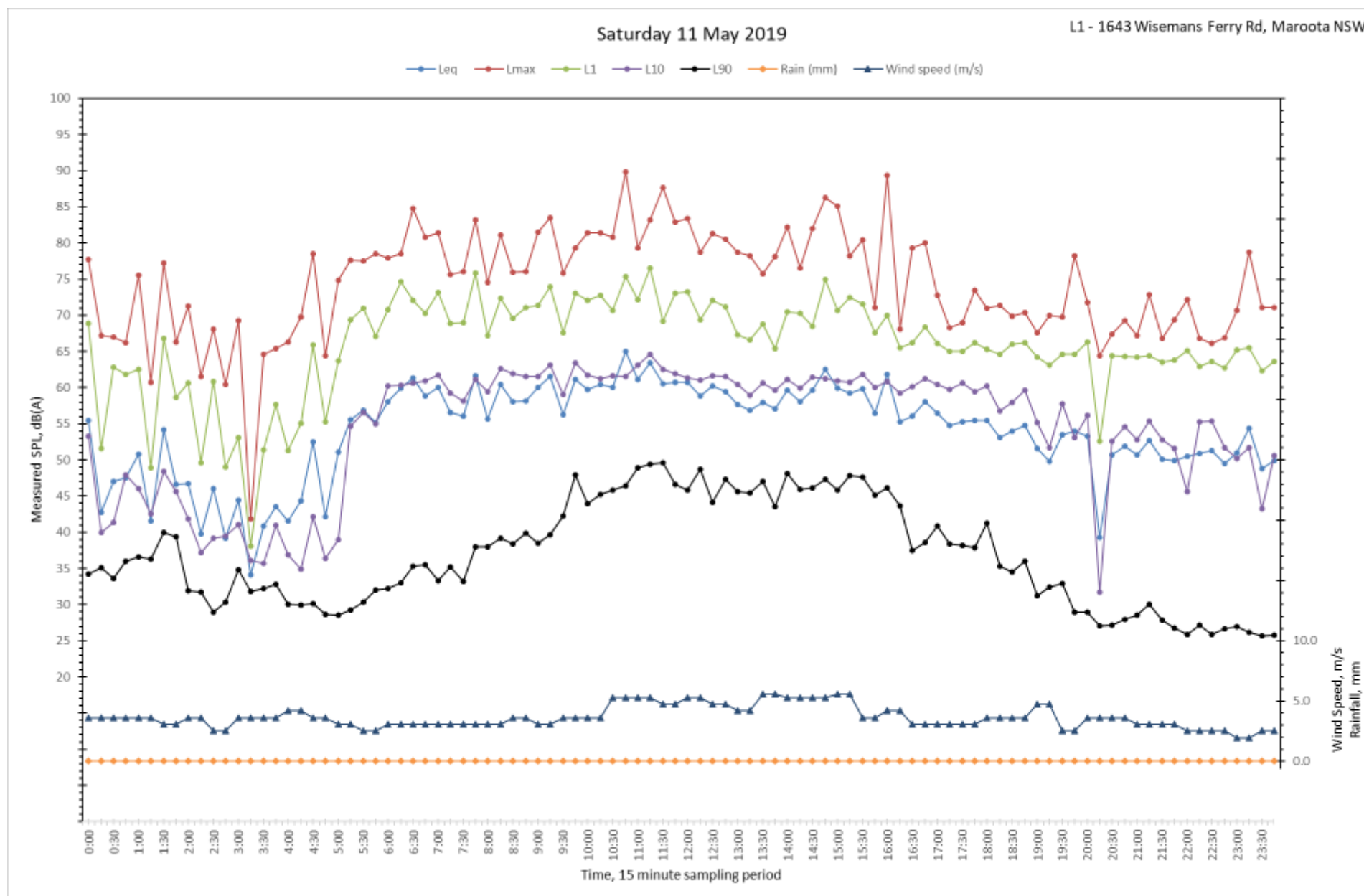


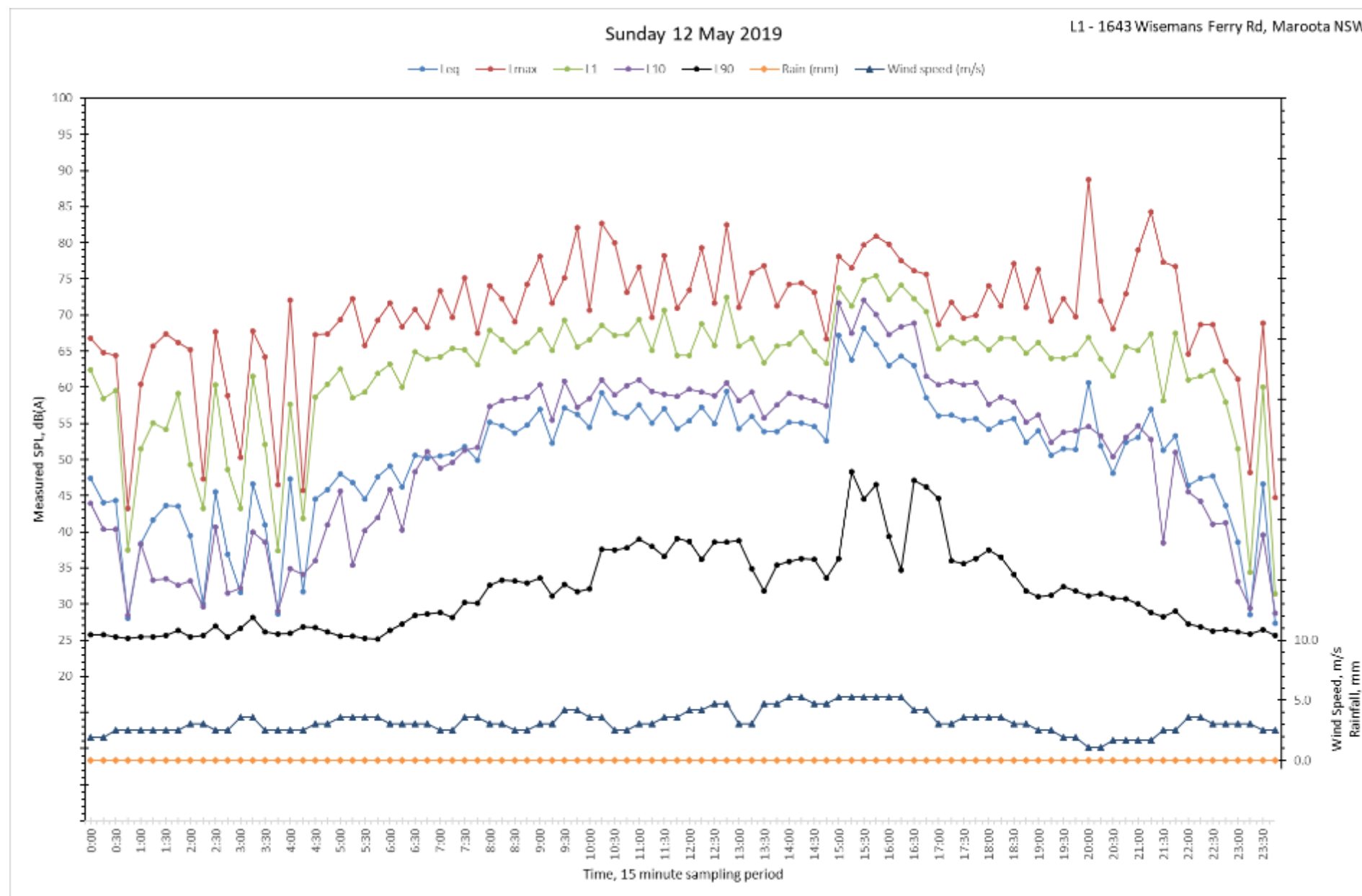


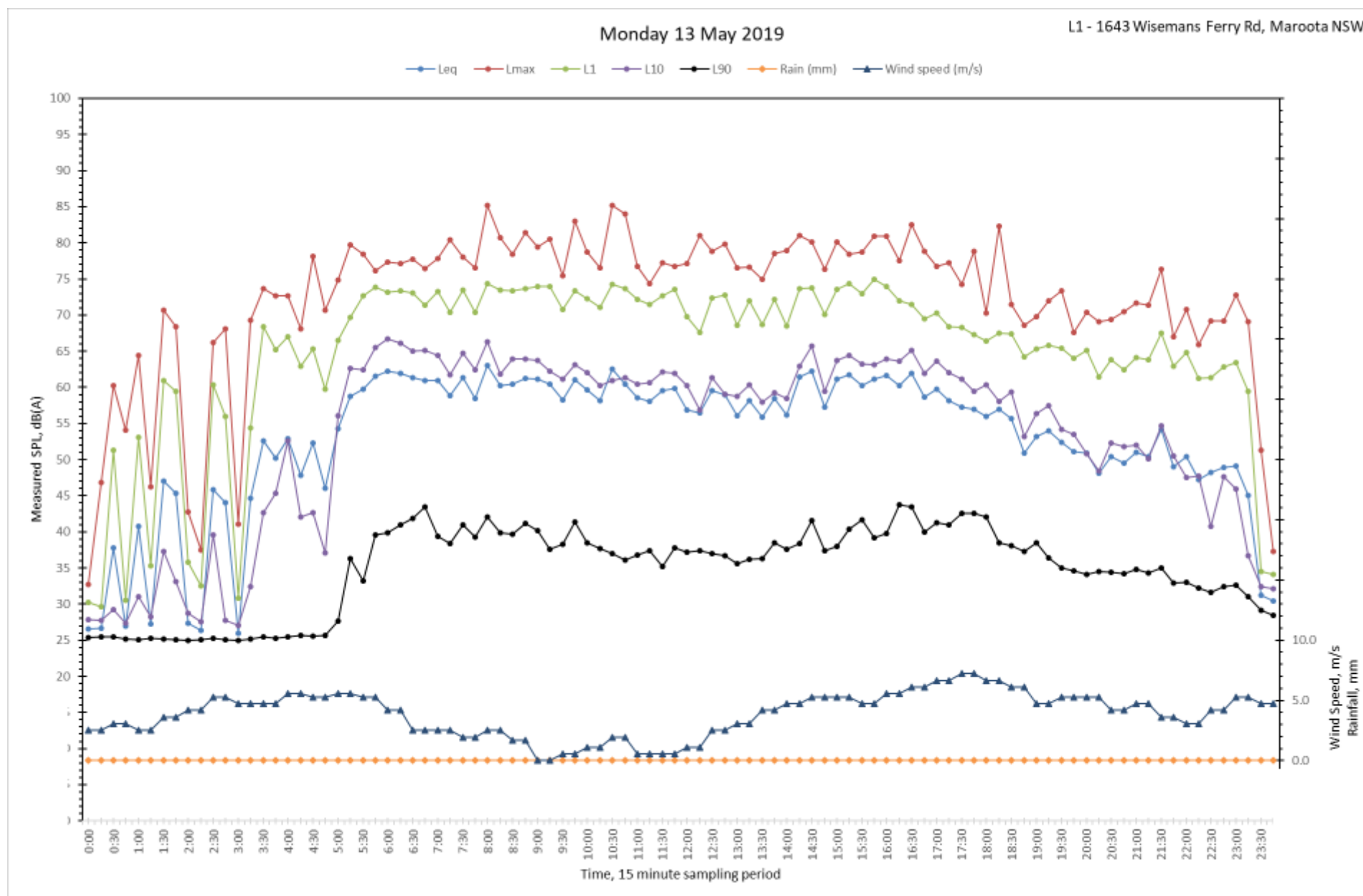


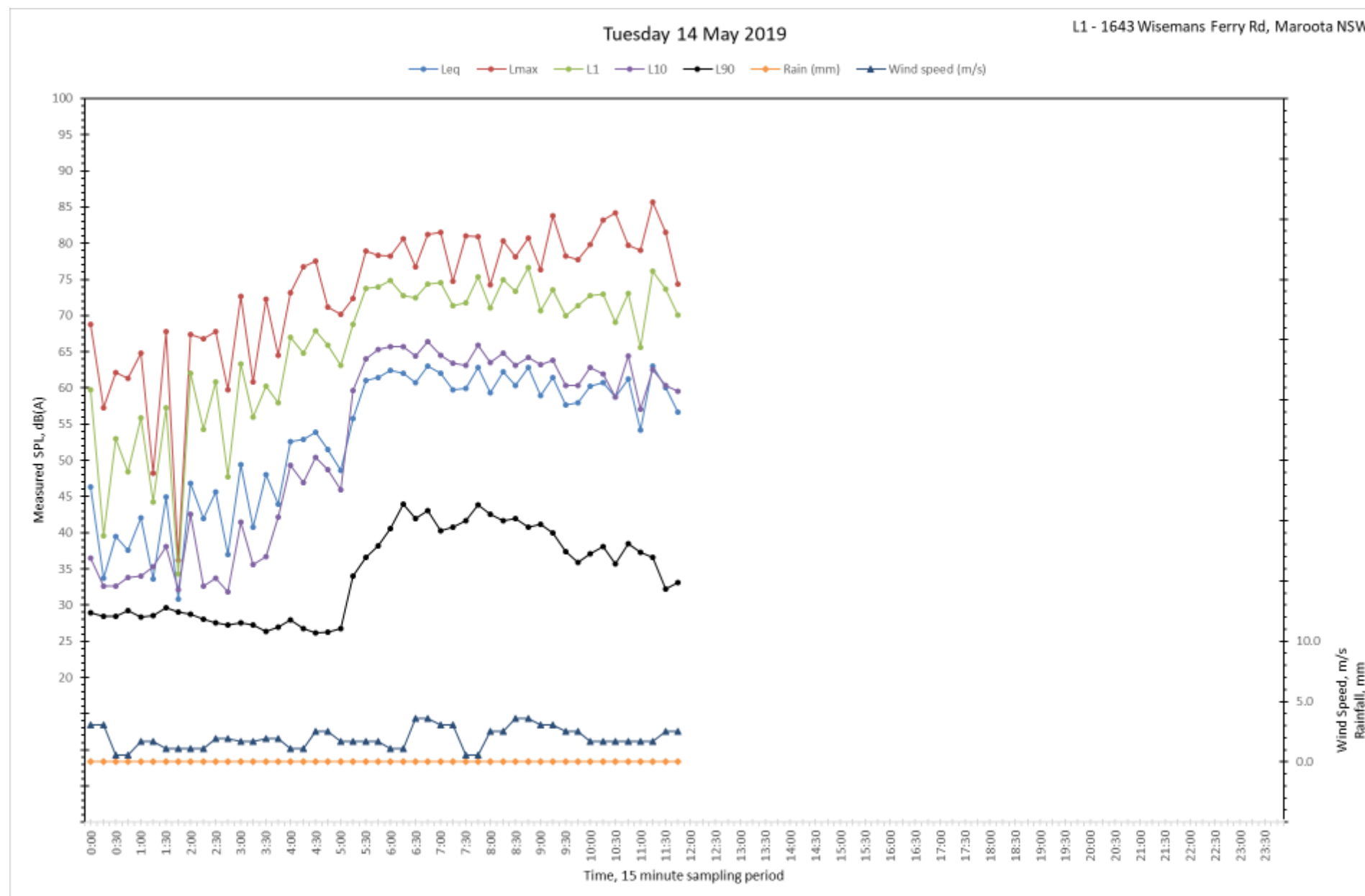


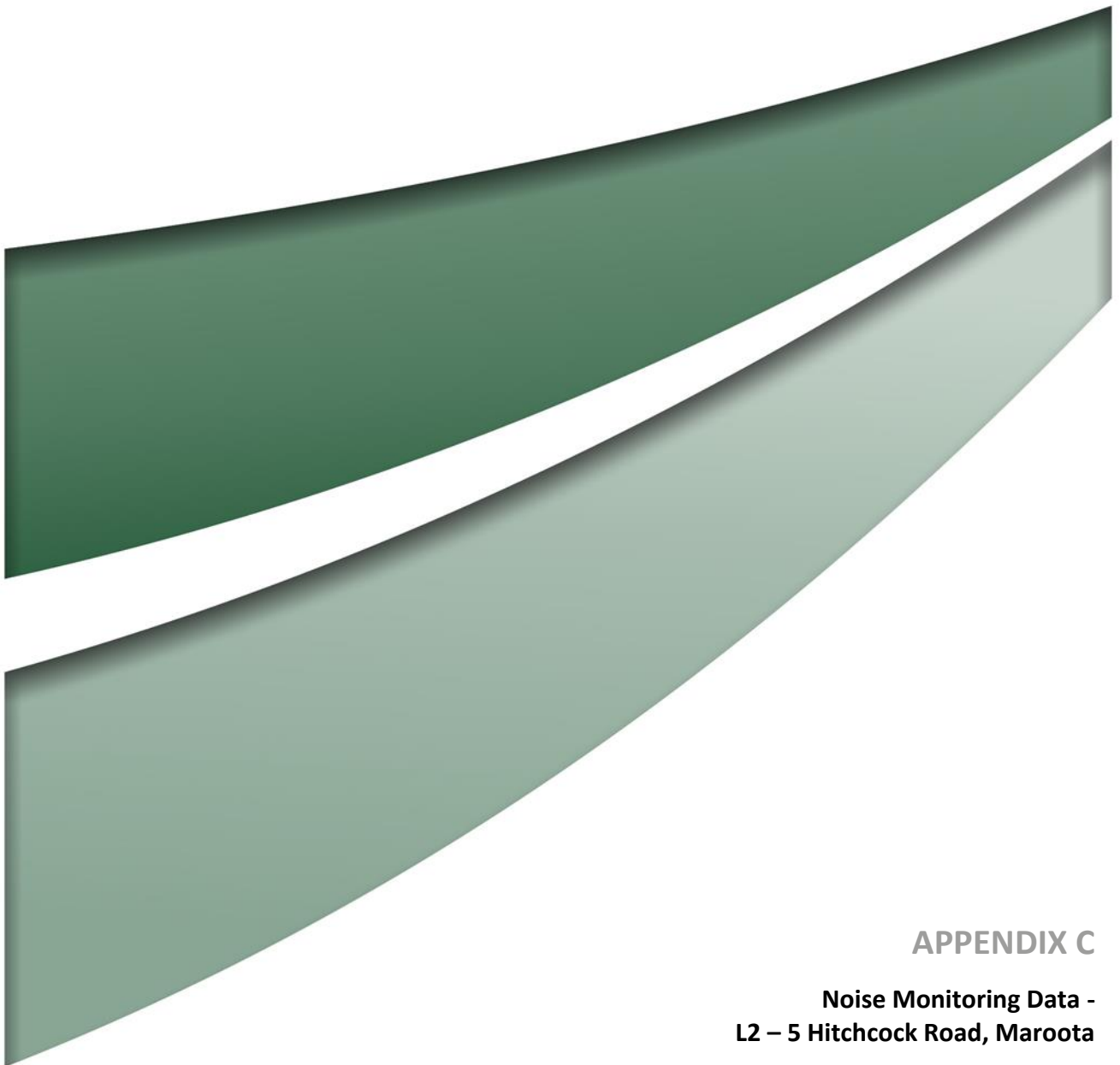












## APPENDIX C

Noise Monitoring Data -  
L2 – 5 Hitchcock Road, Maroota

