



METROMIX PTY LIMITED

Noise Management Plan

August 2018

Approved by
the Secretary's nominee, Megan Dawson,
on 2 October 2018

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CONTENTS

COMMONLY USED ACRONYMS	7
1 INTRODUCTION	9
2 APPROVED ACTIVITIES	11
3 CONSULTATION	14
4 LEGAL & OTHER REQUIREMENTS	14
4.1 PROJECT APPROVAL PA 10_0183 MOD 1.....	14
4.2 STATEMENT OF COMMITMENTS	16
4.3 ENVIRONMENT PROTECTION LICENCE 0536	16
4.4 ROAD NOISE LEVELS	19
5 OBJECTIVES AND OUTCOMES	20
6 PERSONNEL MANAGEMENT	20
6.1 ROLES AND RESPONSIBILITIES	20
6.2 COMPETENCE TRAINING AND AWARENESS.....	21
7 PREDICTED NOISE LEVELS	21
8 SURROUNDING RESIDENCES AND POTENTIAL NOISE-RELATED IMPACTS	21
8.1 SURROUNDING RESIDENCES.....	21
8.2 POTENTIAL NOISE-RELATED IMPACTS	23
8.2.1 On-site Noise	23
8.2.2 Off-site Noise	23
9 CONTROL MEASURES	24
9.1 INTRODUCTION.....	24
9.2 OPERATING HOURS AND CONDITIONS.....	24
9.3 QUARRY OPERATIONS	24
9.4 TRANSPORT OPERATIONS	26
9.5 ADVERSE WEATHER CONDITIONS	26
10 NOISE MONITORING PROTOCOL AND EVALUATION OF COMPLIANCE.....	27
11 CORRECTIVE AND PREVENTATIVE ACTIONS	28
12 INFORMATION AND COMMUNICATION.....	29
12.1 INTERNAL INFORMATION AND COMMUNICATION	29
12.2 INCIDENT REPORTING	30
12.3 EXTERNAL INFORMATION AND COMMUNICATION	30
12.4 COMMUNITY COMPLAINTS AND ENQUIRIES	30
12.5 PUBLICATION OF MONITORING INFORMATION	31

CONTENTS

13	PLAN REVIEW.....	32
----	------------------	----

APPENDICES

Appendix 1	Landowner Correspondence 25 July 2014	33
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FIGURES

Figure 1.1	Locality Plan	10
Figure 2.1	Approved Quarry Layout	12
Figure 8.1	Surrounding Residences and Noise Monitoring Locations	22

TABLES

Table 2.1:	Approved Hours of Operation	14
Table 4.1:	Noise-related Project Approval Conditions	15
Table 4.2:	Noise-related Commitments.....	16
Table 4.3:	Noise-related Environmental Protection Licence Requirements	16
Table 5.1:	Objectives and Key Performance Outcomes	20
Table 6.1:	Roles and Responsibilities	20
Table 7.1:	Predicted Noise Levels – Scenarios 4 and 5	21
Table 9.1:	Sound Power Levels of Major Noise Sources $L_{Aeq} (15 \text{ min})$	25
Table 10.1	Noise Monitoring Locations.....	27

COMMONLY USED ACRONYMS

AHD	Australian Height Datum
AS	Australian Standard
CCC	Community Consultative Committee
ENM	Excavated Natural Material
EPA	Environment Protection Authority
EPL	Environment Protection Licence
PA	Project Approval
VENM	Virgin Excavated Natural Material

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1 INTRODUCTION

This *Noise Management Plan* has been prepared by Metromix Pty Limited (Metromix) for the Teralba Quarry (the Quarry). The Quarry is located west of the suburb of Teralba, beyond the western shores of Lake Macquarie (**Figure 1.1**). The Plan has been prepared in satisfaction of *Condition 3(8)* of Project Approval (PA) 10_0183 MOD 1. A modification to PA 10_0183 was approved on 16 April 2018.

PA Condition 3(8): Noise Management Plan

“The Proponent must prepare and implement a Noise Management Plan for the project to the satisfaction of the Secretary. This plan must:

- a) *be submitted for approval to the Secretary within 4 months of the date of this approval;*
- b) *describe the measures that would be implemented to ensure:*
 - *best management practice is being employed on site;*
 - *the noise impacts of the project are minimised during any meteorological conditions when the noise limits in this approval do not apply; and*
 - *compliance with the relevant conditions of this approval;*
- c) *describe the proposed noise management system in detail; and*
- d) *include a monitoring program that:*
 - *is capable of regularly evaluating the performance of the project, including noisy individual items of plant, such as haulage trucks and the bulldozer;*
 - *includes a protocol for determining any exceedances of the relevant conditions in this approval at locations listed in Table 2; and*
 - *evaluates and reports on the effectiveness of the noise management system on site.”*

The Proponent must implement the plan as approved by the Secretary.

The plan addresses the following elements.

- The activities approved under PA 10_0183 MOD 1.
- The consultation undertaken during preparation of this Plan.
- The legal and other requirements associated with management of noise emissions from the Quarry.
- The objectives and key performance outcomes for this Plan and the Quarry.
- Roles and responsibilities in implementing this Plan.



Figure 1.1
LOCALITY PLAN

- Competence training and awareness for Metromix’s personnel and contractors.
- The proximity of surrounding residences and noise monitoring locations.
- A description of the potential noise-related impacts.
- Noise management measures that will be implemented during the ongoing operation of the Quarry both on and off site.
- Noise-related monitoring that will be undertaken.
- Evaluation of compliance with noise criteria.
- Corrective and preventative actions that will be implemented should exceedance(s) of the relevant criteria be identified.
- Complaints handling and response procedures that will be implemented.
- Incident reporting procedures.
- Publication of monitoring information.
- Plan review.

The above elements reflect each of the relevant specific issues outlined in *Condition 5(3)* of PA 10_0183 MOD 1, where relevant.

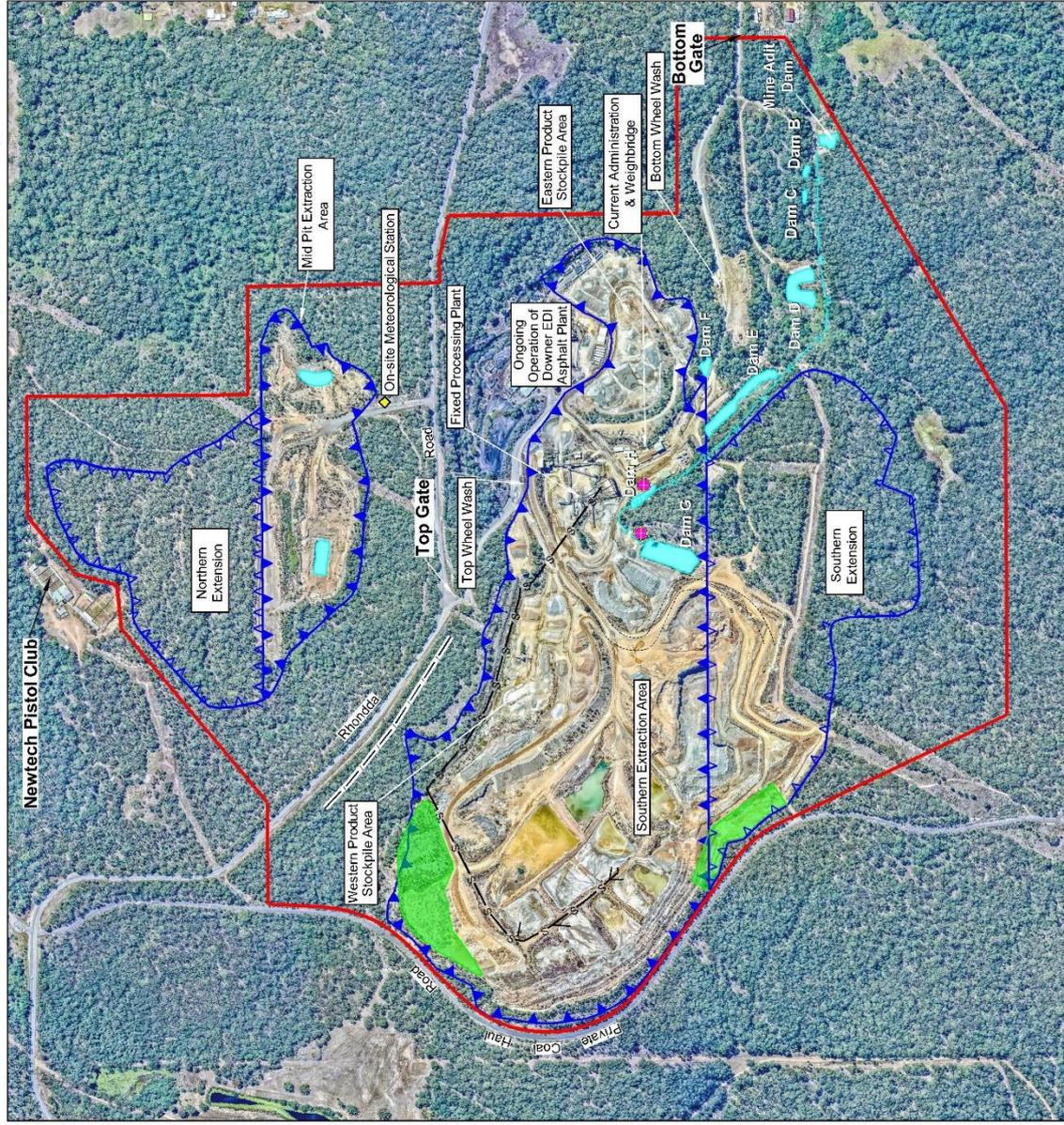
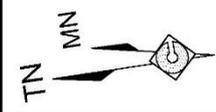
The approved Quarry and the noise assessment of the approved extension are fully described in the following documents.

- *Environmental Assessment for the Teralba Quarry Extensions* - November 2011.
- *Specialist Consultant Studies Compendium for the Teralba Quarry Extensions* – September 2012. Volume 2, Part 6 – Noise Assessment.
- *Environmental Assessment of Modification 1 for Project Approval 10_0183 for the Teralba Quarry* – December 2017.

A brief description of the approved activities within the Quarry is provided in Section 2.

2 APPROVED ACTIVITIES

The approved activities within the Teralba Quarry comprise the full range of activities undertaken prior to 22 February 2013 and the extension of extraction operations to the north and south of the previously approved extraction areas. The approved activities on site comprise the following, the locations of which are displayed on **Figure 2.1**.



SCALE 1:12 000 (A4)



Figure 2
QUARRY SITE LAYOUT

- Conglomerate extraction (blasting and excavation).
 - Southern Extraction Area.
 - Mid Pit Extraction Area.
 - Southern Extension.
 - Northern Extension.
- Processing Operations (size reduction, screening and blending).
 - Existing processing plant and pugmill.
- On-site Load and Haul Operations.
 - Off-road trucks on the on-site road network.
 - Conveying primary-crushed rock from the Southern and Northern Extensions to processing plant (including conveyor beneath Rhondda Road).
- Off-site Transportation of Products.
- Vehicle/equipment maintenance and ancillary activities and stores.
- Administration and product despatch.
- Progressive rehabilitation and maintenance.

The sequence of extraction throughout the life of the Quarry will be consistent with the staging of vegetation clearing and therefore retirement of biodiversity credits specified in Conditions 3(54) to 3(56) of PA 10_0183 MOD 1.

It is estimated that extraction activities over approximately the next 15 years, will only take place in the Southern Extension. Subject to sales, extraction activities will be progressively transferred beyond this period to the extraction areas north of Rhondda Road. The relevant limitations upon the approved activities nominated in Conditions within Project Approval 10_0183 MOD 1 are as follows.

- “The Proponent shall not carry out quarrying operations below 20 AHD in the Southern Extension and 24m AHD in the Mid Pit Extraction Area and Northern Extension” *Condition 2(6)* of PA 10_0183 MOD 1.
- “The Proponent shall not extract more than 1.2 million tonnes of extractive materials from the site in any calendar year” *Condition 2(7)* of PA 10_0183 MOD 1.
- “The Proponent shall not:
 - a) transport more than 1 million tonnes of quarry products from the site in any calendar year; or
 - b) dispatch more than 326 laden trucks from the site on any day; or
 - c) dispatch more than 241 laden trucks per day or 20 per hour westwards along Rhondda Road;
 - d) dispatch more than 85 laden trucks per day or 8 per hour eastwards through Teralba;

- e) dispatch laden trucks for travel through Teralba between 6:00pm and 6:00am; or
 - f) receive unladen trucks via the Railway St entrance between 6:00pm and 7:00am”
PA Condition 2(8).
- The approved quarry life is until 31 December 2038 in accordance with Condition 2(5) of PA 10_0183 MOD 1 and the approved hours of operation are set out in Condition 3(6) of PA 10_0183 MOD 1 and presented in **Table 2.1**.

Table 2.1: Approved Hours of Operation

Day	Receipt of Concrete or VENM	Loading and Dispatch of Quarry Trucks	Extraction and Processing Operations
Monday to Friday	7:00am to 5:00pm	4:00am Monday to midnight Friday	7:00am to 7:00pm
Saturdays	7:00am to 2:00pm	midnight Friday to 6:00pm Saturday	7:00am to 2:00pm
Sundays and Public Holidays	None	None	None

Note: Maintenance activities may occur at any time provided they are inaudible at privately owned residences.

3 CONSULTATION

This Plan was prepared without formal consultation with any agency or with the local community as *Condition 3(8)* of PA 10_0183 MOD 1 does not require any formal consultation. However, the EPA has previously been consulted informally and have expressed that the Authority does not wish to review the draft Plan prior to submission. Metromix regularly consult with the owners of the properties at locations used for monitoring regarding monitoring near their respective residences.

In addition, it is noted that Metromix consults with the Community Consultative Committee twice per year and no issues have been raised by the committee in relation to noise from the Quarry.

4 LEGAL & OTHER REQUIREMENTS

4.1 PROJECT APPROVAL PA 10_0183 MOD 1

PA 10_0183 MOD 1 includes the required criteria for construction and operational activities that Metromix must comply with and sets out the core requirements of this Plan. The relevant performance-based noise-related conditions associated with this approval are reproduced in **Table 4.1**

Table 4.1: Noise-related Project Approval Conditions

Condition	Requirement					
3(5)	The Proponent shall ensure that the noise generated by the project does not exceed the criteria in Table 2 at any residence on privately-owned land.					
	Location	Day Shoulder 6:00am – 7:00am	Day 7:00am – 6:00pm	Evening 6:00pm – 10:00pm	Night 10:00pm – 6:00am	
		L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{A1} (1 min)
	A	38	38	37	35	45
	B	42	46	36	35	45
	C	42	42	35	35	45
D, E, G, H, I	35	35	35	35	45	
F	37	38	38	35	45	
<p>Notes: Receiver locations are shown in Figure 2 Appendix 1.</p> <p>Noise generated by the project is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.</p> <p>However, these criteria do not apply if the Proponent has a written agreement with the relevant landowner to exceed the criteria, and the Proponent has advised the Department in writing of the terms of this agreement.</p>						
3(6)	The Proponent must comply with the operating hours set out in Table 3.					
	<i>Table 3: Operating Hours</i>					
	Day	Receipt of Concrete or Virgin Excavated Natural Material	Loading and Dispatch of Quarry Trucks	Extraction and Processing Operations		
	Monday – Friday	7:00am to 5:00pm	4:00am Monday to midnight Friday	7:00am to 7:00pm		
Saturday	7:00am to 2:00pm	midnight Friday to 6:00pm Saturday	7:00am to 2:00pm			
Sundays and Public Holidays	None	None	None			
Note: Maintenance activities may occur at any time provided they are inaudible at privately-owned residences.						
3(7)	The Proponent must:					
	(i). implement best practice noise management to minimise the construction, operational and traffic noise of the project;					
	(ii). minimise the noise impacts of the project during meteorological conditions when the noise limits in this approval do not apply;					
	(iii). maintain the effectiveness of any noise suppression equipment on plant at all times and ensure defective plant is not used operationally until fully repaired; and					
	(iv). regularly assess noise monitoring data and relocate, modify, and/or stop operations on site to ensure compliance with the relevant conditions of this approval; and to the satisfaction of the <i>Secretary</i> .					

Condition 3(8) of PA 10_0183 MOD 1, which sets out the requirements for the Noise Management Plan, has previously been reproduced in Section 1.

4.2 STATEMENT OF COMMITMENTS

Table 4.2 presents the relevant noise-related commitments from the Statement of Commitments incorporated within PA 10_0183 MOD 1 - *Appendix 3*.

Table 4.2: Noise-related Commitments

Commitment	
10.1	Ensure all mobile earthmoving equipment used onsite is not fitted with high-frequency reversing alarms and is regularly serviced.
10.2	Ensure all earthmoving equipment used on site (including temporary equipment) have sound power levels and frequency spectra consistent with those nominated in Section 6 of Spectrum Acoustics (2011).
10.3	Ensure that the eastern, side of the Southern Extension is extracted in such a manner that the active extraction face is retained on the eastern face thereby providing a topographic barrier between operating earthmoving equipment and residences to the east.
10.4	Construct a 5m high bund on the eastern edge of the Mid Pit Extraction Area.
10.6	Commission a noise monitoring program that comprises: <ul style="list-style-type: none"> • attended noise monitoring for the Southern and Northern Extensions; and • General noise monitoring.
10.7	Include a summary of all noise monitoring results in the Annual Review.
10.8	Ensure all trucks departing the Project Site via the bottom gate travel at speeds <15km/hr.
10.6	Review blast designs and modify, if required.

4.3 ENVIRONMENT PROTECTION LICENCE 0536

Table 4.3 presents the relevant noise-related requirements from the Environment Protection Licence (EPL) 0536.

Table 4.3: Noise-related Environmental Protection Licence Requirements

Page 1 of 4

Condition	Requirement																												
L5.1	Where a noise limit has not been prescribed, all operations and activities occurring on the premises must be conducted in a manner that will not cause offensive noise.																												
L5.2	<p>Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2.</p> <table border="1"> <thead> <tr> <th>Time Period</th> <th>Measurement Parameter</th> <th>Measurement Frequency</th> <th>Noise Level dB(A)</th> </tr> </thead> <tbody> <tr> <td colspan="4">POINT 12</td> </tr> <tr> <td>Day-Shoulder</td> <td>Day Shoulder-LAeq (15 minute)</td> <td>-</td> <td>38</td> </tr> <tr> <td>Day</td> <td>Day-LAeq (15 minute)</td> <td>-</td> <td>38</td> </tr> <tr> <td>Evening</td> <td>Evening-LAeq (15 minute)</td> <td>-</td> <td>37</td> </tr> <tr> <td>Night</td> <td>Night-LAeq (15 minute)</td> <td>-</td> <td>35</td> </tr> <tr> <td></td> <td>Night-LA1 (1 minute)</td> <td>-</td> <td>45</td> </tr> </tbody> </table>	Time Period	Measurement Parameter	Measurement Frequency	Noise Level dB(A)	POINT 12				Day-Shoulder	Day Shoulder-LAeq (15 minute)	-	38	Day	Day-LAeq (15 minute)	-	38	Evening	Evening-LAeq (15 minute)	-	37	Night	Night-LAeq (15 minute)	-	35		Night-LA1 (1 minute)	-	45
Time Period	Measurement Parameter	Measurement Frequency	Noise Level dB(A)																										
POINT 12																													
Day-Shoulder	Day Shoulder-LAeq (15 minute)	-	38																										
Day	Day-LAeq (15 minute)	-	38																										
Evening	Evening-LAeq (15 minute)	-	37																										
Night	Night-LAeq (15 minute)	-	35																										
	Night-LA1 (1 minute)	-	45																										

Table 4.3: Noise-related Environmental Protection Licence Requirements (Cont'd)

Condition	Requirement			
L5.2 (Cont'd)	Time Period	Measurement Parameter	Measurement Frequency	Noise Level dB(A)
	POINT 13			
	Day-Shoulder	Day Shoulder-LAeq (15 minute)	-	42
	Day	Day-LAeq (15 minute)	-	46
	Evening	Evening-LAeq (15 minute)	-	36
	Night	Night-LAeq (15 minute)	-	35
		Night-LA1 (1 minute)	-	45
	Time Period	Measurement Parameter	Measurement Frequency	Noise Level dB(A)
	POINT 14			
	Day-Shoulder	Day Shoulder-LAeq (15 minute)	-	42
	Day	Day-LAeq (15 minute)	-	42
	Evening	Evening-LAeq (15 minute)	-	35
	Night	Night-LAeq (15 minute)	-	35
		Night-LA1 (1 minute)	-	45
	Time Period	Measurement Parameter	Measurement Frequency	Noise Level dB(A)
	POINT 17			
	Day-Shoulder	Day Shoulder-LAeq (15 minute)	-	37
	Day	Day-LAeq (15 minute)	-	38
	Evening	Evening-LAeq (15 minute)	-	38
	Night	Night-LAeq (15 minute)	-	35
		Night-LA1 (1 minute)	-	45
Time Period	Measurement Parameter	Measurement Frequency	Noise Level dB(A)	
POINT 15, 16, 18				
All hours	LAeq (15 minute)	-	35	
<p>Note: The licensee may provide to the EPA written evidence of any agreement with a landholder which is subject to the above noise limits. The written evidence may be submitted with a licence variation to remove the landholder from the above table.</p>				
L5.3	<p>For the purposes of the condition above:</p> <p>a) Day-Shoulder is defined as the period between 6am to 7am Monday to Saturday.</p> <p>b) Day is defined as:</p> <ul style="list-style-type: none"> i. the period from 7am to 6pm Monday to Saturday; and ii. the period from 8am to 6pm Sundays and Public Holidays. <p>c) Evening is defined as the period from 6pm to 10pm.</p> <p>d) Night is defined as:</p> <ul style="list-style-type: none"> i. the period from 10pm to 7am Monday to Saturday; and ii. the period from 10pm to 8am Sundays and Public Holidays. 			

Table 4.3: Noise-related Environmental Protection Licence Requirements (Cont'd)

Condition	Requirement
L5.4	The contributed noise level from the premises must not exceed the noise limits specified within this licence at the most noise-affected point on or within the boundary of any residential premises to the north and/or south of the premises, except as expressly provided by this licence, or by the EPA in writing.
L5.5	The noise limits set out in the apply under all meteorological conditions except for anyone of the following: <ol style="list-style-type: none"> a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or b) Stability category F temperature inversion conditions and wind speeds greater the 2 metres/second at 10 metres above ground level; or c) Stability category G temperature inversion conditions.
L5.6	For the purpose of the conditions specified within this licence: <ol style="list-style-type: none"> a) the meteorological data to be used for determining meteorological conditions is the data recorded at the meteorological station identified in this licence as EPA Identification Point 19. b) Stability category temperature inversion conditions are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the <i>NSW industrial Noise Policy (EPA 2000)</i> Note: The weather station must be designed, commissioned and operated in a manner to obtain the necessary parameters required under the above condition.
L5.7	To determine compliance: <ol style="list-style-type: none"> 1. With the $L_{Aeq(15\ min)}$ noise limits in condition L5.2, the licensee must locate noise monitoring equipment; <ol style="list-style-type: none"> a) within 30 metres of a dwelling facade (but not closer than 3 metres) where any dwelling on the property is situated more than 30 metres from the property boundary that is closest to the premises; b) approximately on the boundary where any dwelling is situated 30 metres or less from the property boundary that is closest to the premises, or, where applicable, c) within approximately 50 metres if the boundary of a national park or nature reserve. 2. With the $LA1(1\ \text{minute})$ noise limits in condition L5.2, the noise monitoring equipment must be located within 1 metre of a dwelling facade. 3. With the noise limits in condition L5.2, the noise monitoring equipment must be located; <ol style="list-style-type: none"> a) at the most affected point at a location where there is no dwelling at the location, or b) at the most affected point within an area at a location prescribed by conditions L5.7 1(a) or L5.7 1(b).
L5.8	A non-compliance will still occur where noise generated from the premises in excess of the appropriate limit is measure; <ul style="list-style-type: none"> • at a location other than an area prescribed by the conditions of this licence, and/or • at a point other than the most affected point at a location.
L5.9	For the purpose of determining the noise generated at the premises the licensee must use a Class 1 or Class 2 noise monitoring device as defined by AS IEC61672.1 and AS IEC61672.2-2004, or other noise monitoring equipment accepted by the EPA in writing.
L5.10	For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

Table 4.3: Noise-related Environmental Protection Licence Requirements (Cont'd)

Condition	Requirement			
L7.1	The licensee must comply with the operating hours specified in Column 2, Column 3, and Column 4 of the table below:			
	Day	Loading and Dispatch of Quarry Trucks	Extraction and Processing	RECEIPT OF CONCRETE
	Monday to Friday	4am Monday to midnight Friday	7am to 7pm	7am to 5pm
	Saturday	Midnight Friday to 6pm Saturday	7am to 2pm	7am to 2pm
	Sundays and Public Holidays	none	none	none
<p>Note: For the purpose of the hours of operations specified within this licence:</p> <ol style="list-style-type: none"> Maintenance activities may occur at any time provided they are inaudible at privately-owned residence. The hours of operations may be varied with written consent if the EPA is satisfied that the amenity of the residents in the locality will not be adversely affected. The licensee may apply to vary the hours of operations specified in this licence by submitting a Licence Variation Application to the EPA. It is recommended that supporting documentation is provided to assist the EPA with the assessment of the Application. 				

4.4 ROAD NOISE LEVELS

There are no criteria referred to in either PA 10_0183 MOD 1 or Environment Protection Licence 0536 relating to truck traffic on public roads. The Noise Assessment for the Teralba Quarry Extensions notes that the total noise level at residences adjacent to public roads should not exceed 60dB(A), $L_{Aeq(1hr)}$ between 7:00am and 10:00pm and 55dB(A), $L_{Aeq(1hr)}$ between 10:00pm and 7:00am. Rather than demonstrating compliance with any specific noise criterion relating to trucks travelling to and from the Quarry, Metromix simply needs to demonstrate compliance with the following maximum hourly despatch levels as recorded in *Condition 2(8) of PA 10_0183 MOD 1*.

- **Maximum hourly despatch rates.**

- 6:00am - 7:00am – 28 loaded trucks All directions.
- 7:00am - 6:00pm – 20 loaded trucks Westward along Rhondda Road.
- 6:00pm - 5:00am – 6 loaded trucks Westward along Rhondda Road.
- 5:00am - 6:00am – 12 loaded trucks Westward along Rhondda Road.
- 6:00am - 6:00pm – 8 loaded trucks Through Teralba.

5 OBJECTIVES AND OUTCOMES

The objectives and key performance outcomes of this Plan and Quarry are presented in **Table 5.1**.

Table 5.1: Objectives and Key Performance Outcomes

Objectives		Key Performance Outcomes	
a)	To ensure compliance with all relevant Project Approval and Environment Protection Licence conditions and reasonable community expectations.	1)	Compliance is achieved with all relevant criteria nominated in the Project Approval 10_0183 MOD 1 and Environment Protection Licence 0536 and reasonable community expectations.
b)	To implement appropriate noise management and mitigation measures during throughout the life of the Quarry.	2)	All identified noise management and mitigation measures are implemented to the extent required.
c)	To implement an appropriate monitoring program to establish compliance or otherwise with relevant criteria throughout the life of the Quarry.	3)	All identified monitoring is undertaken in accordance with the relevant procedures and at the relevant intervals.
d)	To implement an appropriate complaints handling and response protocol	4)	Complaints (if any) are handled and responded to in an appropriate and timely manner.
e)	To implement continual improvement for investigating, implementing and reporting on reasonable and feasible measures to reduce noise.	5)	An appropriate continual improvement program has been implemented.
f)	To implement an appropriate incident reporting program, if required.	6)	Incidents (if any) are reported in an appropriate and timely manner.

6 PERSONNEL MANAGEMENT

6.1 ROLES AND RESPONSIBILITIES

The roles & responsibilities for the implementation of this Plan by the management and personnel of the Quarry are presented in **Table 6.1**.

Table 6.1: Roles and Responsibilities

Position	Responsibility
Quarry Manager	<ul style="list-style-type: none"> Lead the investigation of any noise-related incidents or complaints and provide feedback to complainants. Ensure noise management training is included in the induction (and re-induction) of relevant personnel.
Quarry Supervisor	<ul style="list-style-type: none"> Ensure earthmoving equipment is operating in elevated locations at appropriate times and preferred meteorological conditions. Assist in the investigation of any noise-related incidents or complaints.
All Personnel	<ul style="list-style-type: none"> Report any noise related incidents that may impact on the community Minimise excessive noise from the operation of plant and equipment

6.2 COMPETENCE TRAINING AND AWARENESS

All Metromix personnel and contractors and their employees will undergo site specific training incorporating noise management awareness as part of the Quarry's Safety, Health and Environmental (SHE) program.

7 PREDICTED NOISE LEVELS

Table 7.1 presents the predicted noise levels at the nine representative residences for the proposed extraction operations in the Northern and Southern Extensions respectively. Scenario 4 included operations within the Northern Extension and Scenario 5 included operations within the Southern Extension (the location of existing operations).

Table 7.1: Predicted Noise Levels – Scenarios 4 and 5

Receiver No.	Shoulder/Daytime			Evening		
	Criterion	4	5	Criterion	4	5
A	40/44	36.6	36.6	42	33.6	34.1
B	42/46	44.6	44.5	42	27.0	27.0
C	42/46	39.2	38.0	42	25.6	25.5
D	42/46	33.6	33.8	42	29.7	29.5
E	38/40	28.5	27.2	40	27.6	26.5
F	38/40	25.6	23.3	40	26.7	22.9
G	39/39	25.2	21.6	39	26.4	22.5
H	39/39	17.6	17.2	39	16.7	16.4
I	39/39	22.4	22.4	39	23.9	21.9

Source: 2011 EIS (RWC, 2011) modified after Spectrum (2011) - Table 6.9, 6.10, 6.11 and 6.12.

Assessment for the 2011 EIS (RWC, 2011) established that there is a potential for noise levels to approach the criteria for the morning shoulder period near the intersection of the private access road (from Teralba Engineering) to Railway Street. As a result, the Quarry drivers code of conduct includes a requirement for drivers not to exceed the 15 km/hr speed limit on Railway St, between exiting the Teralba Business Park and Rhonda Rd.

8 SURROUNDING RESIDENCES AND POTENTIAL NOISE-RELATED IMPACTS

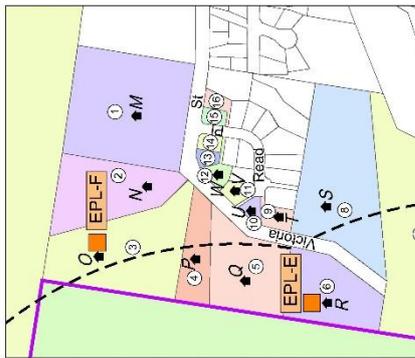
8.1 SURROUNDING RESIDENCES

Figure 8.1 displays the locations of residences surrounding the Quarry and the noise monitoring locations.

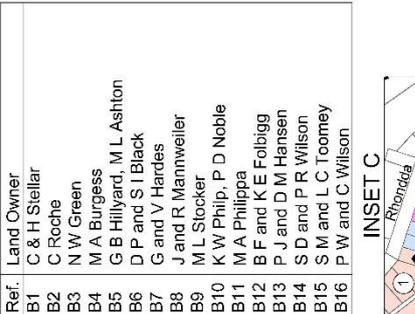
Ref.	Land Owner
A1	Lake Macquarie City Council
A2	Fassifem Colliery (Pty) Limited
A3	Mount Thorley Operations Pty Limited
A4	Perpetual Trustee Company Limited
A5	Rail Corporation New South Wales
A6	Landcom
A7	The State of NSW
A8	A C Fowkes
A9	R W Miller & Co Pty Ltd
A10	Oceanic Coal Australia Pty Ltd, Manubeni Coal Pty Limited, Ocal Macquarie Pty Limited, J F E Mineral (Australia) Pty Limited
A11	M and L Burns
A12	W and J Donnelly
A13	R Peel, V Dewez
A14	N and J Dawson
A15	Minister for Education
A16	M Hamm
A17	A and B McGhee
A18	P J G Enterprises Pty Limited
A19	R Donnelly
A20	Centennial Fassifem Pty Limited
A21	Teraba Engineering Pty Limited
A22	Makerain Pty Limited
A23	J P Farrell
A24	R W Miller & Company Pty Limited

Ref.	Land Owner
B1	C & H Stellar
B2	C Roche
B3	N W Green
B4	M A Burgess
B5	G B Hillyard, M L Ashton
B6	D P and S I Black
B7	G and V Hardes
B8	J and R Mannweiler
B9	M L Stocker
B10	K W Philip, P D Noble
B11	M A Philippa
B12	B F and K E Folbigg
B13	P J and D M Hansen
B14	S D and P R Wilson
B15	S M and L C Toomey
B16	P W and C Wilson

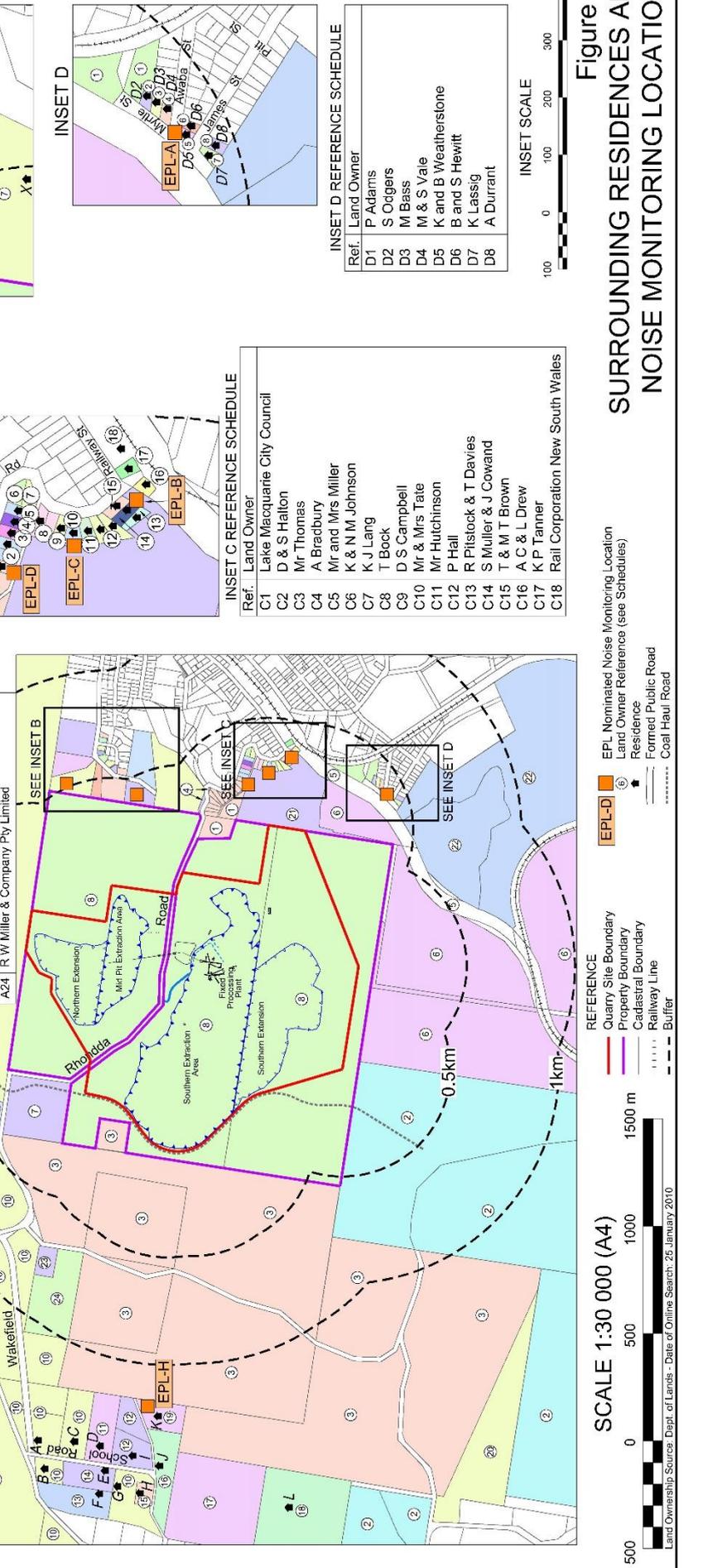
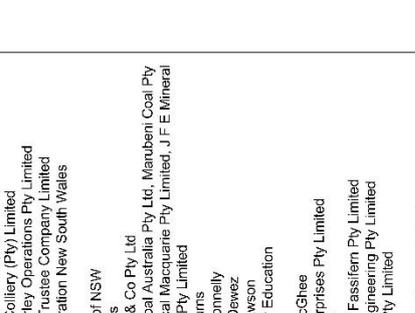
INSET B REFERENCE SCHEDULE



INSET C REFERENCE SCHEDULE



INSET D REFERENCE SCHEDULE



Ref.	Land Owner
C1	Lake Macquarie City Council
C2	D & S Hallon
C3	Mr Thomas
C4	A Bradbury
C5	Mr and Mrs Miller
C6	K & N M Johnson
C7	K J Lang
C8	T Bock
C9	D S Campbell
C10	Mr & Mrs Tate
C11	Mr Hutchinson
C12	P Hall
C13	R Plitstock & T Davies
C14	S Muller & J Cowand
C15	T & M T Brown
C16	A C & L Drew
C17	K P Tamer
C18	Rail Corporation New South Wales

Ref.	Land Owner
D1	P Adams
D2	S Odgers
D3	M Bass
D4	M & S Vale
D5	K and B Weatherstone
D6	B and S Hewitt
D7	K Lassig
D8	A Durrant

INSET B REFERENCE SCHEDULE

INSET C REFERENCE SCHEDULE

INSET D REFERENCE SCHEDULE

Figure 8.1
SURROUNDING RESIDENCES AND
NOISE MONITORING LOCATIONS

8.2 POTENTIAL NOISE-RELATED IMPACTS

8.2.1 On-site Noise

Noise is generated within the Teralba Quarry by:

- short-term blast events;
- the mobile earthmoving equipment operating within the active extraction area, around the processing plant and product stockpile areas;
- the processing plant and pug mill;
- product trucks travelling on site; and
- maintenance activities within the workshop.

The extent to which these noise sources influence noise levels at surrounding residences is dependent upon the sound power level or source noise for each item of equipment or activity and their location/elevation. Noise levels in excess of those nominated in Section 4.1 may cause annoyance to occupants or residences around Teralba Quarry, particularly at night (10:00pm to 6:00am) when the 45dB(A) sleep disturbance criterion applies.

8.2.2 Off-site Noise

The transportation of quarry products to the Metromix's customers has the potential to cause impacts upon the occupants or residences adjacent to the approved transport routes to and from the Quarry. The noise level experienced at the road-side residences is influenced by:

- the source noise level from trucks (beyond Metromix's control);
- the frequency of truck movements;
- the use or non-use of exhaust brakes; and/or
- the state of repair of the road adjacent to a residence (particularly noticeable for empty trucks).

Noise levels in excess of the criteria discussed in Section 4.4 can cause annoyance to occupants of road-side residents, although it is recognised that noise levels at many road-side residences throughout NSW are already in excess of this level without substantive adverse impacts. It is also noted that the trucks travelling to and from Teralba Quarry represent only a proportion of the vehicles along the approved transport routes. Furthermore, there is unlikely to be any noticeable change in road-side noise levels, as the approved maximum level of loaded truck movements from the Quarry are comparable with those experienced over a number of years given the Teralba Quarry has been operational since the mid-1960s.

9 CONTROL MEASURES

9.1 INTRODUCTION

PA Condition 3(8)(b) of PA 10_0183 MOD 1 requires that this Plan describes the noise mitigation measures that will be adopted to ensure compliance with *PA Condition 3(6)* and *3(7)* of PA 10_0183 MOD 1. This section has been prepared in satisfaction of that requirement.

The mitigation measures required for the on-going operation of the Teralba Quarry centre around the retention of natural topographic barriers, construction of acoustic bunds and controls on equipment noise and hours of operation. The nominated mitigation measures are relevant under both calm and adverse weather conditions. Winds <3m/s from any direction are not a feature of the local climate (Spectrum Acoustics, 2012). Notwithstanding this, Metromix recognises that noise levels could be enhanced within periods when winds are blowing from the Quarry towards residences in Teralba. However, based upon its experience over many years, and the fact that the separation distance between the extraction activities and the residences, will not change substantially Metromix is confident noise exceedances during the adverse weather conditions will not occur.

9.2 OPERATING HOURS AND CONDITIONS

Metromix will ensure the operating hours and conditions identified in *Condition 3(6)* of PA 10_0183 MOD 1 are strictly complied with. All operating hours will be recorded on a register.

The Quarry Manager will be responsible for ensuring the operating hours are included in the site induction.

9.3 QUARRY OPERATIONS

The Southern Extension will be extracted in a manner that the active extraction face is retained on the eastern side to provide a topographic barrier between operating earthmoving equipment and the residences to the east.

The Northern Extension has been designed to ensure all extraction occurs on the western side of the prominent north-south ridge north of Rhondda Road. The retained natural topography will provide significant acoustic attenuation between the Northern Extension and the residences to the east.

In accordance with *Condition 3(7)(c)* of PA 10_0183 MOD 1 the effectiveness of any noise suppression equipment on plant will be maintained at all times and ensure defective plant is not operated until it is fully repaired.

The following best practice operational noise management measures will be adopted:

- Mobile plant will be fitted with high efficiency mufflers, when required. These will be maintained to the manufacturer's specifications. Any malfunctions of mufflers or any other noise control equipment should be reported to the Quarry Manager.
- The sound power levels of all mobile earthmoving equipment and fixed plant on site will be comparable to those levels listed in **Table 9.1**.

Table 9.1: Sound Power Levels of Major Noise Sources L_{Aeq} (15 min)

Noise Source	L_{Aeq} Octave Band Linear Sound Power Level
Mobile Earthmoving Equipment	
Cat D11 Tracked Bulldozer	114
Komatsu WA500 FEL	110
Komatsu PC 850 Excavator	114
CAT 972 FEL	110
CAT 360 Excavator	112
CAT 775 B Dump Truck	101
Komatsu 405 Dump Truck	101
Komatsu Water Cart	100
Atlas Copco D7 Drill Rig	114
Fixed Plant	
Crushers	120
Re-locatable Crushers	115
Pug Mill	111
Sand Plant	96
Conveyor	97
Road Registered Vehicles	
Road Truck	95

- Regular and effective maintenance of all equipment including vehicles travelling on and off the Quarry Site will be conducted. Prompt attention will be given to repair of loose or rattling parts of broken equipment. All maintenance work will be carried out by a qualified person with reference to the original manufacturing standards.
- All Metromix personnel, contractors and their employees will be made aware of their obligations and responsibilities with regard to minimising noise emissions.
- Earthmoving equipment must not be operated in elevated areas of the quarry before 9:00am and/or during gentle breezes from the west.
- Approved operating hours must be adhered to.

9.4 TRANSPORT OPERATIONS

The following measures will be undertaken to ensure noise attributed to trucks travelling to and from the Teralba Quarry is acceptable.

- All trucks under the control of Metromix, comply at all times with the RTA's noise limits.
- Only those trucks under the control of Metromix, its shareholders and approved contractors, and fitted with airbag suspension, are used to transport products from the quarry between 6:00pm and 6:00am Monday to Saturday.
- All drivers sign a Code of Conduct to ensure high standard of driver performance including the need to avoid use of exhaust brakes in built-up areas and to travel at required speeds.

9.5 ADVERSE WEATHER CONDITIONS

The key adverse meteorological condition that influences the propagation of noise from on-site operations towards the residences in Teralba is a gentle breeze <3m/s from the west and northwest and more specifically, 260° - 290° and 290° - 320°. A review of the wind data calculated as part of the Teralba Quarry's 2011 air quality modelling assessment suggests that winds of this strength between 260° - 290° are likely to occur significantly less than 15% of the time (being less than 6 hours per month in any given time period). The percentage of winds occurring more than 6 hours per month between 260° - 290°, occurs only five times throughout the year, equating to 3.5% of the total time these winds occur and only occurs during the morning periods (7:00am – 10:00am). Similarly, the percentage of potential noise propagating winds occurring between 290° - 320° for more than 6 hours per month occurs only twice during the 6:00pm – 7:00pm period, equating to a total of 1.4% of the total time of winds occurring between 0.5m/sec and 3m/sec.

It has been Metromix's experience to date that under these meteorological conditions, noise levels during the day have not been in excess of the nominated criteria. Notwithstanding this experience, Metromix will review the on-site meteorological data, once a full year of data has been collected, to better understand the likely months when these adverse conditions would occur and reduce, to the extent necessary, the operations in the elevated sections of the extraction areas during these periods. Future noise monitoring would also target those meteorological conditions to establish noise levels in Teralba.

Based upon Metromix's experience to date, it is unlikely that operations within the active extractive area will need to be reduced, relocated or stopped. However, if monitoring does indicate that the noise compliance criteria are being approached under these meteorological conditions, the Quarry Manager will instruct that those activities are relocated to topographically lower areas.

Since regular noise monitoring under this Plan commenced in 2014, there have been no instances where a non-compliance has been identified or exacerbated by adverse meteorological conditions. Two substantiated noise-related complaints have been received at the Quarry, both relating to traffic noise. No substantiated complaints have been received regarding operational noise impacts.

10 NOISE MONITORING PROTOCOL AND EVALUATION OF COMPLIANCE

Metromix proposes to adopt a noise monitoring protocol that provides feedback on the effectiveness of the noise control measures and demonstrate compliance with the conditions within the Project Approval 10_0183 MOD 1 and Environment Protection Licence 0536.

The approach to monitoring compliance is based substantially upon Metromix's experience to date which has identified the on-site activities have not been the source of noise complaints or any recorded non-compliance. Hence, it is considered the monitoring program needs to reflect this fact.

Although PA 10_0183 MOD 1 nominates noise criteria at nine locations, EPL 0536 nominates only seven locations for noise monitoring. Metromix recognises that meaningful monitoring data will be collected from the closest locations to the active operational areas and that for two locations in close proximity it is reasonable to assume compliance at a location if compliance has been demonstrated at another location that is in the same area but closer to potential noise sources. Metromix has received written permission from two landowners to cease noise monitoring at the landowner's property (see **Appendix 1**). Correspondence regarding the ongoing noise program was sent to the EPA on 28 July 2014 and again on 1 February 2015. For periods when operations are confined to areas south of Rhondda Road, noise monitoring will be undertaken at Locations EPL-A, B, D, E and H. Once development of the Northern Extension is commenced, the noise monitoring program will be reviewed and updated to reflect compliance at residences likely to experience noise from that extraction location. **Table 10.1** lists the address and coordinates of each noise monitoring location. It is noted that during the period when monitoring is undertaken at Location B, Metromix will ensure a spotter is present to record the number of trucks departing from the Quarry and not the Teralba Business Park.

Table 10.1
Noise Monitoring Locations

Noise Monitoring Locations*	Address	Easting	Northing
EPL-A (Point 12)	Awaba Street, Teralba	369080	3651470
EPL-B (Point 13) ¹	Rhondda Road, Teralba	369250	6351915
EPL-C (Point 14) ²	Rhondda Road, Teralba	369205	6352015
EPL-D (Point 15)	Rhondda Road, Teralba	369150	6352135
EPL-E (Point 16)	Victoria Avenue, Teralba	369060	6352620
EPL-F (Point 17) ²	Victoria Avenue, Teralba	369130	6352945
EPL-H (Point 18)	School Road, Wakefield	366210	6352520
* See Figure 7.1			
1 During monitoring on 30 August 2017, the landowner requested that monitoring be undertaken away from this property. Monitoring was undertaken at easting 369247 and northing 6351878 (approximately 30m south of the property)			
2 Metromix has obtained permission for this monitoring location to be omitted as other monitoring locations are nearby and closer to quarry related noise			

Independent noise monitoring has been undertaken since operations commenced under PA 10_0183. It was originally proposed that for the first 2 years of operations monitoring would occur at 6 monthly intervals coinciding with wind blowing in a predominantly eastern and western direction. Monitoring at

6 monthly intervals has continued until 2018 (i.e. over five years). There have been no non-compliance issues identified in monitoring activities to date. Ongoing monitoring will occur on an annual basis, preferably during a period of wind blowing from the western quadrant towards residences in Teralba.

It is proposed that the independent noise consultant who undertakes the monitoring will provide an annual report (for inclusion in the Annual Review) that evaluates and reports upon the effectiveness of the noise management system on site throughout the reporting period.

The monitoring results assembled after each monitoring event will be compared against the criteria identified in *Condition 3(5)* of PA 10_0183. Should an exceedance of noise criteria be identified, the Quarry Manager or Quarry Supervisor will review:

- i. the meteorological data for the corresponding period;
- ii. the locations and duration of activities on site during the corresponding period; and
- iii. data on activities at the nearby asphalt plant.

In the event that i and ii suggest the Quarry is the source of the elevated noise levels, the Quarry Manager will initiate its corrective and preventative action plan.

11 CORRECTIVE AND PREVENTATIVE ACTIONS

In the event that noise monitoring identifies an exceedance of the noise criteria identified in *Condition 3(5)* of PA 10_0183, the exceedance(s) will be investigated to determine the likely cause. It is noted that any noise complaints will be handled in accordance with the Community Complaints and Enquires Procedures (see Section 11.4).

All corrective and preventative actions are entered into the Rapid Online Reporting Database. An investigation will then follow to determine:

- what immediate action(s) shall be taken to fix the problem in the short term, if applicable;
- the root causes of the problem (i.e. management system, human factors/behaviour, work environment, training);
- corrective actions required to eliminate the root cause(s);
- action(s) taken to verify effectiveness of corrective action(s) (i.e. what measures and checks are taken to ensure the corrective actions that are in place are effective to prevent any further exceedance).

On completion of the investigation, an electronic copy will be forwarded to Metromix's Risk Manager for review/approval of corrective and preventative actions.

In accordance with Metromix's SHE procedures, if an event or activity occurs within the Quarry Site that has caused, is causing, or is likely to cause harm to the environment, whether the harm occurs

on or off the premises, Metromix will report the event to the EPA after it becomes known to any employee or contractor. The reporting will be undertaken in accordance with the Company's Pollution Incident Response Management Plan, i.e. DPE and EPA will be notified by Metromix as soon as practicable after the incident and a report will be prepared and submitted to the DPE and EPA within 7 days of the exceedance in accordance with *Condition 5(7)* of PA 10_0183 (see Section 11.2).

The investigation will focus principally on the meteorological conditions at the time of an exceedance of the noise criteria and the location/elevation of the offending item(s) of equipment. Any other factors contributing to the exceedance will also be identified.

The key actions to correct the non-compliance and/or to prevent a recurrence of the exceedance will focus on identifying areas where mobile equipment can operate under the identified weather conditions.

Where possible, the activity causing the exceedance will cease immediately and actions will be formulated to reduce the emitting potential of the source of the elevated noise levels. It is noted the actions formulated and their timeframe for implementation will be dependent on the type of activity and nature of the exceedance.

In accordance with *Condition 4(1)* of PA 10_0183, any affected landowner(s) will be notified of the exceedance as soon as practicable after obtaining the monitoring results. Subsequent monitoring results will be provided to the identified landowner(s) until such time as the monitoring shows compliance with the relevant criteria.

If needed, any additional specific mitigation measure(s) to minimise the potential for future exceedances will be adopted and ongoing monitoring, at appropriate intervals will be undertaken to assess the effectiveness of the additional mitigation measures.

In the event of ongoing exceedances of the noise criteria identified in *Condition 3(5)* of PA 10_0183 or that the landowner is not satisfied that the noise criteria is being met, the Company will submit to an independent review as directed by *Condition 4(2)* and *4(3)* of PA 10_0183.

12 INFORMATION AND COMMUNICATION

12.1 INTERNAL INFORMATION AND COMMUNICATION

Key avenues for internal communication on environmental and community aspects/concerns of the Quarry operations are maintained mainly through toolbox meetings. In addition, Metromix has the following methods of communication with its employees and contractors.

- Monthly Safety, Health and Environmental Meetings.
- Internal communiques.
- Distribution internally and externally of Metromix's newsletter "Metronews".
- Formal communication meetings approximately 4 times per year.

12.2 INCIDENT REPORTING

In the event of an exceedance of the noise conditions or a noise complaint, Metromix personnel are to attempt to stop the source of the noise or control the source of the noise. If they cannot control the incident, then they are to report the incident to their supervisor/manager.

The incident is to be recorded using the “Rapid Online Reporting System” that is available through the Metromix website. The Manager of Quarries and Risk Manager are to be notified as soon as possible to assist in determining corrective actions.

Incidents which may occur that relate to this Noise Management Plan include:

- noise complaints and enquiries;
- noise condition breaches e.g. Consent or Licences; and
- unplanned vibration caused by blasting.

In the event that an initial investigation identifies an exceedance of the noise conditions nominated in Section 4, within 7 days Metromix will submit a written report with regular updates on the status of the additional mitigation actions to the Secretary, EPA and where relevant, the complainant. In addition, a copy of all reports will be provided to the Community Consultative Committee, made publicly available on the Metromix website and included in the *Annual Review*.

12.3 EXTERNAL INFORMATION AND COMMUNICATION

This Plan will be made available on the Metromix website in accordance with *Condition 5(11)* PA 10_0183 MOD 1.

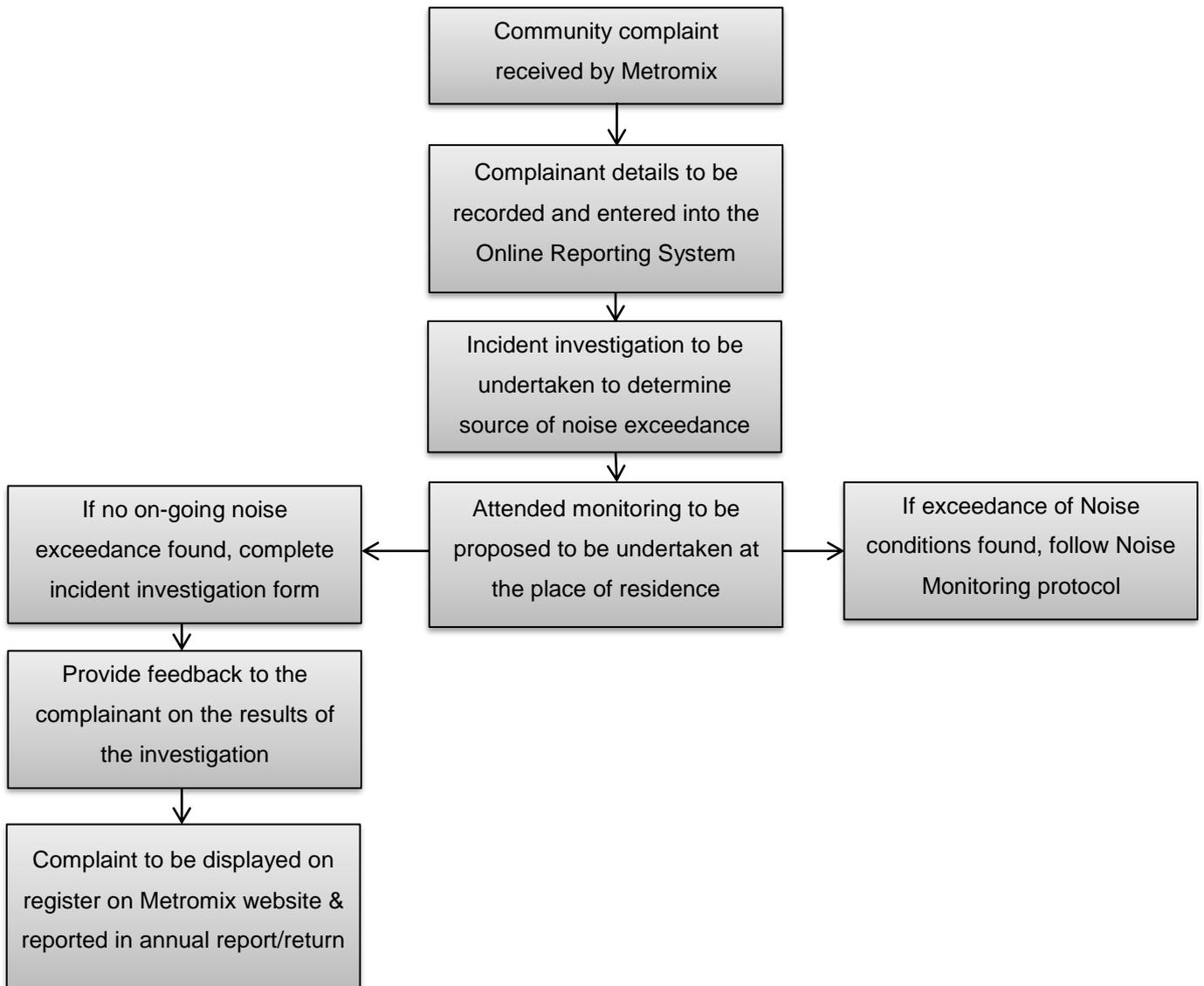
All monitoring data and any community complaints will also be placed on the Metromix website in accordance with *Condition 5(11)* PA 10_0183 MOD 1.

12.4 COMMUNITY COMPLAINTS AND ENQUIRIES

Metromix will advertise the community inquiries/complaints line 02 4950 6640 as a minimum in the local phone directory and may also consider advertising the number through local media or on newsletters.

Metromix will respond to any registered community inquiries or complaints received by this number as described in the Rapid Online Reporting System.

The following flowchart shows the process that Metromix will follow in the event a noise complaint is received.



12.5 PUBLICATION OF MONITORING INFORMATION

Metromix will report on the performance of the Noise Monitoring Program in the Annual Review and provide regular updates to members of the Community Consultative Committee (CCC). All noise monitoring results will also be published regularly on the Metromix website. Each Annual Review will include:

- noise monitoring results and comparison to performance criteria;
- noise related complaints and management/mitigation measures undertaken;
- management/mitigation measures undertaken in the event of any confirmed exceedance of performance criteria; and
- review of the performance of management/mitigation measures and the monitoring program.

The Annual Review will also be submitted to the CCC and made available for public information on the Metromix website.

13 PLAN REVIEW

In accordance with *Condition 5(3)(h)* of PA 10_0183, this *Noise Management Plan* will be reviewed and, if required, revised within 3 months of an:

- a) annual review;
- b) incident report;
- c) independent audit report; or
- d) any modification Project Approval 10_0183 MOD 1.

As discussed in Section 3, Metromix will consult with the Community Consultative Committee prior to the review of the Noise Management Plan to establish whether any other issues need to be addressed in the updated document.

The Quarry Manager will be responsible for the review of this Plan.

Appendix 1

Landowner Correspondence 25 July 2014

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Mr B. Sanderson
Metromix Pty Ltd
Rhondda Road
TERALBA NSW 2284

63 Victoria Avenue
Teralba NSW 2284

Dear Mr Sanderson

Re: Noise Monitoring for Teralba Quarry

I am writing to agree with your proposition that Metromix does not need to continue to monitor noise at our residence at 63 Victoria Avenue. I do, however, reserve the right to request the re-instatement of noise monitoring in the event that I consider noise monitoring is required.

Yours sincerely

...DARYL BLACK

Dated ...D. Black 25/7/19

Mr B. Sanderson
Metromix Pty Ltd
Rhondda Road
TERALBA NSW 2284

8 Rhondda Road
Teralba NSW 2284

Dear Mr Sanderson

Re: Noise Monitoring for Teralba Quarry

I am writing to agree with your proposition that Metromix does not need to continue to monitor noise at our residence at 8 Rhondda Road. I do, however, reserve the right to request the re-instatement of noise monitoring in the event that I consider noise monitoring is required.

Yours sincerely



Dated 25/07/2014

Gianpiero
Goniglio