

NOISE MANAGEMENT PLAN

WALLERAWANG QUARRY

VERSION 2.4

September 2020





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Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Walker Quarries Pty Ltd

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Report No. 4433/R03
Date: September 2020



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Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
V0*	Alex Irwin	22 February 2019	Alex Irwin	26 February 2019
V1	Alex Irwin	1 April 2019	Alex Irwin	1 April 2019
V2.1	Alex Irwin	24 April 2020	Johann van der Merwe (Walker Quarries)	24 April 2020
V2.2	Alex Irwin	3 August 2020	Johann van der Merwe (Walker Quarries)	4 August 2020
V2.4	Alex Irwin	02 September 2020	Luke Bettridge	03 September 2020

Note * V0 represents the first version of this plan prepared by Umwelt Pty Ltd. This follows from Rev 4 produced by RW Corkery & Co. Pty Limited

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1.0 Scope

This Noise Management Plan (NMP) for the Wallerawang Quarry (the Quarry) has been reviewed and updated by Umwelt (Australia) Pty Ltd (Umwelt) on behalf of Walker Quarries Pty Ltd (Walker Quarries) in accordance with Condition 5 of Schedule 3 of Development Consent DA 344-11-2001 (DA 344-11-2001). This version of the NMP (V2.3) follows the approval of a modification to Quarry operations (DA 344-11-2001-MOD3) on 26 February 2020.

The Quarry is located approximately 8 kilometres (km) northwest of Lithgow (**Figure 1.1**) and is approved to produce 500 000 tonnes per annum (tpa) of hard rock aggregate material and sand. DA 344-11-2001 approves disturbance up to a maximum of 28.6 ha for the purpose of hard rock extraction, processing, stockpiling, management and on-site disposal of non-saleable (overburden) materials, and ancillary infrastructure (**Figure 1.2**).

Noise generating activities at the Quarry principally relate to the following operational activities:

- vegetation clearing and topsoil and subsoil stripping
- drill and blast extraction of raw materials
- load and haul of materials for processing through crushing and screening or emplacement of overburden
- stockpiling and transport of final products, and
- miscellaneous equipment use within the Quarry.

The NMP has been prepared with reference to previous noise impact assessments (Atkins, 2001, RWC, 2017 and MAC 2019c), as well as monitoring and audits of the acoustic setting at the Quarry (Atkins, 2014 and 2016, MAC, 2017a, 2017b, 2018a, 2018b, 2019a, 2019b and 2020) in order to identify key risk factors as well as appropriate noise management and monitoring measures. The Environment Protection Authority (EPA) was consulted in the preparation of the original NMP. The EPA was consulted again in the preparation of this version of the NMP with an email inviting the EPA to provide any requirements for the update of the NMP (refer to **Appendix 1**).

Figure 1.1 **Locality Plan**

Figure 1.2 **Approved Quarry Site Layout**

2.0 Regulatory Requirements

2.1 Development Consent DA 344-11-2001

Conditions 3(1) to 3(4) of DA 344-11-2001 (as modified on 26 February 2020) provide instruction as to the requirements of Walker Quarries in relation to noise management. Condition 3(5) requires the preparation of a Noise Management Plan. Conditions 5(3) to 5(5) provide instruction on the preparation, review and amendment to consent required management plans.

Table 2.1 identifies each of these conditional requirements relating to noise management and identifies the section of this NMP where each requirement is addressed.

Table 2.1 Noise-Related Conditional Requirements of DA 344-11-2001

No.	Condition	Section												
Hours of Operation														
3(1)	<p>The Applicant must comply with the operating hours set out in Table 1.</p> <p><i>Table 1: Operating Hours</i></p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Permissible Hours</th> </tr> </thead> <tbody> <tr> <td>Quarrying operations</td> <td> <ul style="list-style-type: none"> 7 am to 6 pm Monday to Friday 8 am to 1 pm Saturday At no time on Sundays or public holidays </td> </tr> <tr> <td>Loading and dispatch of trucks</td> <td> <ul style="list-style-type: none"> May be conducted at any time, provided these activities comply with the noise criteria in Table 2 </td> </tr> <tr> <td>Blasting</td> <td> <ul style="list-style-type: none"> 9 am to 5 pm Monday to Friday 9 am to 1 pm on Saturdays At no time on Sundays or public holidays </td> </tr> <tr> <td>Maintenance</td> <td> <ul style="list-style-type: none"> May be conducted at any time, provided that these activities are not audible at any privately-owned residence </td> </tr> </tbody> </table>	Activity	Permissible Hours	Quarrying operations	<ul style="list-style-type: none"> 7 am to 6 pm Monday to Friday 8 am to 1 pm Saturday At no time on Sundays or public holidays 	Loading and dispatch of trucks	<ul style="list-style-type: none"> May be conducted at any time, provided these activities comply with the noise criteria in Table 2 	Blasting	<ul style="list-style-type: none"> 9 am to 5 pm Monday to Friday 9 am to 1 pm on Saturdays At no time on Sundays or public holidays 	Maintenance	<ul style="list-style-type: none"> May be conducted at any time, provided that these activities are not audible at any privately-owned residence 	6.1		
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Quarrying operations	<ul style="list-style-type: none"> 7 am to 6 pm Monday to Friday 8 am to 1 pm Saturday At no time on Sundays or public holidays 													
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Maintenance	<ul style="list-style-type: none"> May be conducted at any time, provided that these activities are not audible at any privately-owned residence 													
3(2)	<p>The following activities will be carried out outside the hours specified in condition 1 above:</p> <p>(a) delivery or dispatch of materials as requested by Police or other public authorities; and</p> <p>(b) emergency work to avoid the loss of lives, property or to prevent environmental harm.</p> <p>In such circumstances, the Applicant must notify the Secretary and affected residents prior to undertaking the activities, or as soon as is practical thereafter.</p>	6.1												
Operational Noise Criteria														
3(3)	<p>The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 2 at any residence on privately-owned land.</p> <p><i>Table 2: Operational noise criteria dB(A)</i></p> <table border="1"> <thead> <tr> <th>Noise Assessment Location</th> <th>Day</th> <th>Evening</th> <th>Night</th> </tr> <tr> <td></td> <td>$L_{Aeq}(15\text{ min})$</td> <td>$L_{Aeq}(15\text{ min})$</td> <td>$L_{Aeq}(15\text{ min})$</td> </tr> </thead> <tbody> <tr> <td>All privately-owned residences</td> <td>43</td> <td>39</td> <td>35</td> </tr> </tbody> </table>	Noise Assessment Location	Day	Evening	Night		$L_{Aeq}(15\text{ min})$	$L_{Aeq}(15\text{ min})$	$L_{Aeq}(15\text{ min})$	All privately-owned residences	43	39	35	
Noise Assessment Location	Day	Evening	Night											
	$L_{Aeq}(15\text{ min})$	$L_{Aeq}(15\text{ min})$	$L_{Aeq}(15\text{ min})$											
All privately-owned residences	43	39	35											
3(3A)	Noise generated by the development must be monitored and measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the <i>NSW Noise Policy for Industry</i> (EPA, 2017).	5.0, 7.2												
3(3B)	The noise criteria in Table 2 do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement.	5.0												

No.	Condition	Section
Operating Conditions		
3(4)	The Applicant must:	
	(a) implement best practice management to minimise the construction, operational and road transportation noise of the development	6.5
	(b) minimise the noise impacts of the development during meteorological conditions when the noise criteria in this consent do not apply (see Appendix 3)	6.4
	(c) carry out noise monitoring (at least every 3 months or as otherwise agreed with the Secretary) to determine whether the development is complying with the relevant conditions of this consent	7.2
	(d) regularly assess noise monitoring data and modify and/or stop operations on site to ensure compliance with the relevant conditions of this consent, to the satisfaction of the Secretary.	7.4
Noise Management Plan		
5(3)	The Applicant must prepare a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:	
	(a) be prepared in consultation with the EPA	Appendix 1
	(b) be submitted to the Secretary within three months of the determination of Modification 1, unless otherwise agreed by the Secretary	1.0
	(c) describe the measures to be implemented to ensure: <ul style="list-style-type: none"> compliance with the noise criteria and operating conditions of this consent best practice management is being employed the noise impacts of the development are minimised during meteorological conditions under which the noise criteria in this consent do not apply (see NPfI). 	5.0, 6.0, 6.4
	(d) describe the proposed noise management system	6.0
	(e) include a monitoring program to be implemented to measure noise from the development against the noise criteria in Table 2, and which evaluates and reports on the effectiveness of the noise management system on site.	7.0
	The Applicant must implement the Noise Management Plan as approved from time to time by the Secretary.	Noted
Management Plan Requirements		
5(3)	Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:	
	(a) a summary of relevant background or baseline data;	4.0
	(b) details of: <ul style="list-style-type: none"> the relevant statutory requirements (including any relevant approval, licence or lease conditions) 	2.0
	<ul style="list-style-type: none"> any relevant limits or performance measures/criteria 	5.0
	<ul style="list-style-type: none"> the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures. 	6.4, 8.0
	(c) any relevant commitments or recommendations identified in the document/s listed in condition 2(c) of Schedule 2	2.3
(d) a description of the measures that to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria	7.0, 6.0	

No.	Condition	Section
	(e) a program to monitor and report on the: <ul style="list-style-type: none"> • impacts and environmental performance of the development • effectiveness of any management measures set out pursuant to condition 2(c) of Schedule 2; 	7.0
	(f) contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible	8.0
	(g) a program to investigate and implement ways to improve the environmental performance of the development over time	6.4, 7.2, 8.0, 9.0, 12.0
	(h) a protocol for managing and reporting any: <ul style="list-style-type: none"> • incident, non-compliance or exceedance of the impact assessment criteria or performance criteria • complaint; or • failure to comply with statutory requirements; 	8.0
	(i) public sources of information and data to assist stakeholders in understanding environmental impacts of the development	4.0
	(j) a protocol for periodic review of the plan. Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.	12.0
5(3A)	The Applicant must ensure that management plans prepared for the development are consistent with the conditions of this consent and any EPL issued for the site.	2.0
5(4)	The Applicant must continue to apply existing approved management plans, strategies or monitoring programs that have most recently been approved under this consent, until the approval of a similar plan, strategy or program under this consent.	12.0
5(5)	Within 3 months of the submission of an: <ol style="list-style-type: none"> (a) incident report under condition 9 below (b) Annual Review under condition 11 below (c) audit report under condition 14 below (d) any modifications to this consent, the Applicant must review the strategies, plans and programs required under this consent, to the satisfaction of the Secretary. The applicant must notify the Department in writing of any such review being undertaken. Where this review leads to revisions in any such document, then within 6 weeks of the review the revised document must be submitted for the approval of the Secretary.	12.0, Appendix 1

2.2 Environment Protection Licence 13172

Environment Protection Licence 13172 (EPL 13172) contains a number of conditional requirements related to the prevention of noise pollution. **Table 2.2** identifies each of these conditional requirements and identifies the section of this NMP where each requirement is addressed.

Table 2.2 Noise-Related Conditional Requirements of EPL 13172

No	Condition	Section																																			
L4.1	Noise from the premises must not exceed: (a) 43 dB(A) $L_{Aeq(15\text{ minute})}$ during the day (7am to 6pm) Monday to Friday and 7.00am to 1.00pm Saturday (b) 43 dB(A) $L_{Aeq(15\text{ minute})}$ during the evening (6.00pm to 10.00pm) Monday to Friday (c) at all other times 39 dB(A) $L_{Aeq(15\text{ minute})}$, except as expressly provided by this license. Where L_{Aeq} means the equivalent continuous noise level – the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.	5.0																																			
L4.2	Noise from the premises is to be measured at the nearest or most affected residence to determine compliance with this condition.	7.2																																			
L4.3	The noise emission limits identified in this license apply under all meteorological conditions except: (a) during rain and wind speeds (at 10m height) greater than 3m/s (b) under "non-significant weather conditions". Note: Field meteorological indicators for non-significant weather conditions are described in the NSW Industrial Noise Policy, Chapter 5 and Appendix E in relation to wind and temperature inversions.	5.0¹																																			
M1.1	Monitoring Records The results of any monitoring required to be conducted by this license or a load calculation protocol must be recorded and retained as set out in this condition.	9.1																																			
M1.2	All records required to be kept by this license must be: (a) in a legible form, or in a form that can readily be reduced to a legible form (b) kept for at least 4 years after the monitoring or event to which they relate took place (c) produced in a legible form to any authorised officer of the EPA who asks to see them.	9.1																																			
M4.1	For each monitoring point specified in the table below the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency, specified opposite in the other columns.	7.1																																			
	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Units of Measure</th> <th>Frequency</th> <th>Averaging Period</th> <th>Sampling Method</th> </tr> </thead> <tbody> <tr> <td>Air temperature</td> <td>°C</td> <td>Continuous</td> <td>1 hour</td> <td>AM-4</td> </tr> <tr> <td>Wind direction</td> <td>°</td> <td>Continuous</td> <td>15 minute</td> <td>AM-2 & AM-4</td> </tr> <tr> <td>Wind speed</td> <td>m/s</td> <td>Continuous</td> <td>15 minute</td> <td>AM-2 & AM-4</td> </tr> <tr> <td>Sigma theta</td> <td>°</td> <td>Continuous</td> <td>15 minute</td> <td>AM-2 & AM-4</td> </tr> <tr> <td>Rainfall</td> <td>mm</td> <td>Continuous</td> <td>15 minute</td> <td>AM-4</td> </tr> <tr> <td>Relative humidity</td> <td>%</td> <td>Continuous</td> <td>1 hour</td> <td>AM-4</td> </tr> </tbody> </table>	Parameter	Units of Measure	Frequency	Averaging Period	Sampling Method	Air temperature	°C	Continuous	1 hour	AM-4	Wind direction	°	Continuous	15 minute	AM-2 & AM-4	Wind speed	m/s	Continuous	15 minute	AM-2 & AM-4	Sigma theta	°	Continuous	15 minute	AM-2 & AM-4	Rainfall	mm	Continuous	15 minute	AM-4	Relative humidity	%	Continuous	1 hour	AM-4	
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Rainfall	mm	Continuous	15 minute	AM-4																																	
Relative humidity	%	Continuous	1 hour	AM-4																																	

No	Condition	Section
R2.1	Notification of Environmental Harm Notifications must be made by telephoning the Environment Line service on 131 555.	8.1
R2.2	The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.	8.1

Note 1: The applicable meteorological conditions differ between the EPL and Condition 3(3A) of DA 344-11-2001-MOD3. Condition 3(3A) of DA 344-11-2001-MOD3 refers to the Noise Policy for Industry specifically and are therefore taken as the applicable meteorological conditions.

2.3 Environmental Assessment Commitments

Neither the most recent Statement of Environmental Effects (SEE) prepared to assess the environmental impacts of the modified Quarry operations (as approved by DA 344-11-2001-MOD3) (Umwelt, 2019), nor previous environmental assessments prepared to support the Quarry, include a formal 'Statement of Commitments'.

Noise management measures were nominated in Umwelt (2019) and these have been included as part of the Quarry noise management system described in **Section 6.0**.

3.0 Objectives and Outcomes

Table 3.1 presents the objectives and key performance outcomes relating to noise management for the NMP and the Quarry.

Table 3.1 Noise Management Objectives and Key Performance Outcomes

Objectives	Key Performance Outcomes
To ensure compliance with the conditions of DA 344-11-2001-MOD3 and EPL 13172.	Compliance with all relevant criteria and reasonable community expectations, as determined in consultation with the relevant government agencies.
To implement appropriate noise management and mitigation measures during all stages of Quarry operation to ensure that harm to the environment is minimised.	All identified noise management and mitigation measures implemented. Confirmation of implementation provided in Annual Review and each Independent Environmental Audit.
To implement an appropriate noise monitoring program to establish compliance or otherwise with relevant criteria during all stages of Quarry operation.	All identified monitoring undertaken in accordance with the relevant procedures and at the relevant intervals.
To undertake operations, including transport, which minimises noise and meets all reasonable community expectations	Noise related complaints are minimised (Target 0).
To implement an appropriate complaint handling and response protocol.	Complaints (if any) handled and responded to in an appropriate manner. All complaints recorded and reported in accordance with annual reporting requirements.
To implement appropriate corrective and preventative actions, if required.	Corrective and preventative actions implemented, if required, and recorded.
To implement an appropriate incident reporting program, if required.	Incidents (if any) reported in an appropriate manner.

4.0 Baseline Noise Levels

To establish contemporary background noise levels, referred to as the Rating Background Level (RBL), in accordance with the NSW Noise Policy for Industry (EPA, 2017) (NPfI), unattended noise monitoring was completed by Muller Acoustic Consulting (MAC, 2019c) at two representative locations adjacent to the Project (**Figure 4.1**). The RBL is measured as the L_{90} noise level, being noise level that is exceeded 90% of the time during the day, evening and night time periods and the results summarised in **Table 4.1**.

Table 4.1 Background Noise Levels

Location	Period ¹	Measured Rating Background Level (RBL) (dB L_{A90})
NM1 987 Great Western Highway	Day	38
	Evening	34
	Night	30 (29) ²
NM2 1B Cypress Place	Day	40
	Evening	35
	Night	30 (27) ²

Note 1: Day = 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays

Evening = 6pm to 10pm

Night = the remaining periods

Note 2: Where the measured RBL (denoted by the bracketed value) is less than 30 dB(A), the RBL is taken to be 30 as noise levels <30 dB(A) are considered inaudible.

Note 3: 'Equivalent (eq)' is average value of the received sound energy (noise) over the period, i.e. day, evening or night.

For the purpose of establishing the background noise environment, the noise levels of NM1 were used (being the lower RBL of the two monitored locations). The adopted RBL was therefore:

- Day: 38dB(A).
- Evening: 34dB(A).
- Night: 30dB(A).

Figure 4.1 Background Noise Monitoring Locations

5.0 Noise Criteria

In accordance with *Condition 3(3)* of DA 344-11-2001 and *Condition L4.1* of EPL 13172, the noise criteria for all operations undertaken on the Quarry Site are provided by **Table 5.1**.

Table 5.1 Quarry Noise Criteria

Location	Day (dB(A) L _{Aeq} (15 min))	Evening (dB(A) L _{Aeq} (15 min))	Night (dB(A) L _{Aeq} (15 min))
All privately owned residences ¹	43	39	35

Note 1 The criteria do not apply where an agreement is negotiated with a landowner to exceed the noise criteria, and the DPIE has been advised in writing of the terms of this agreement.

Walker Quarries does not currently hold any agreements with residents for noise levels exceeding the noise criteria of Condition 3(3) (Table 2) of DA 344-11-2001.

The noise criteria is applicable under the following meteorological conditions.

Day / Evening Time (7:00am to 10:00pm)

- Calm conditions or light winds (up to 3 m/s at 10 m above ground level (AGL)).

Night Time (10:00pm to 7:00am)

- Calm conditions or light winds (up to 3 m/s at 10 m AGL).
- Inversion conditions¹ (with a temperature gradient of up to 4°) with winds up to 2 m/s at 10 m AGL.

Under conditions where the noise criteria do not apply, i.e. strong winds (exceeding 3 m/s) or inversion conditions continuing beyond 7am (exemplified by ongoing fogs and frosts), Walker Quarries implements management measures to reduce noise levels as far as reasonably possible (refer to **Section 6.3**).

¹ An inversion occurs where the temperature is cooler closer to the ground surface than 100 m above it. Where the temperature gradient of the inversion exceeds 1.5° this typically results in fog or frost conditions (depending on the surface temperature).

6.0 Noise Management System

6.1 Risk of Noise Related Impacts from the Quarry

The results of historical noise monitoring programs undertaken at the Quarry have identified compliance with the relevant noise criteria applicable at the time.

Complaints associated with noise from the Quarry have been limited to two complaints over five years. Both complaints related to traffic noise. In each case, the matter was successfully resolved with the complainant.

The most recent noise modelling completed for Quarry, which considered highly conservative scenarios with noise emitting equipment operating at surface as opposed to behind extraction area walls and stockpiles, predicted compliance with the noise criteria at all receivers. The rate of production modelled represented the maximum approved both DA 344-11-2001.

These results demonstrate that the Quarry has maintained compliance with statutory noise criteria and received very limited complaints over a number of years.

6.2 Hours of Operation

All operations will be undertaken in accordance with the approved hours of operation presented in Error! Reference source not found..

Table 6.1 Approved Hours of Operation

Activity	Permissible Hours
Quarrying Operations	7:00am to 6:00pm Monday to Friday 8:00am to 1:00pm Saturday At no time on Sundays or public holidays.
Loading and Despatch of Trucks	Any time provided it meets the criteria set out in Table 5.1.
Blasting	9:00am to 5:00pm Monday to Friday 9:00am to 1:00pm Saturday At no time on Sundays or public holidays.
Maintenance.	Any time provided it is inaudible at all residential premises surrounding the Quarry Site.

Source: DA 344-11-2001 – Condition 3(1)

It is noted that under *Condition 3(2)* of DA 344-11-2001 the following activities can be carried out outside the hours specified in Condition 1 above:

- delivery or despatch of materials as requested by Police or other public authorities
- emergency work to avoid the loss of lives, property or to prevent environmental harm.

In such circumstances prior notification shall be provided to the DPIE and affected residents prior to undertaking the activities. Where prior notification is not possible, this will be undertaken at the first safe opportunity following the works.

6.3 Noise Management Measures

The Quarry Site has been designed with an objective to minimise the noise generated by extraction, processing and transport activities. The design features and operational noise controls to meet this objective are presented in Table 6.2.

Table 6.2 Operational Designs and Controls

Design	Control
Design Features	<ul style="list-style-type: none"> The extraction area is oriented to provide noise mitigation throughout the life of the Quarry. A highwall will be maintained in order to limit sound promulgation to the northeast, toward sensitive receptors. Stockpiles on the Western Stockpile Area, which are more elevated than on the Main or Southern Stockpile Areas, are positioned against the east and northeast perimeter. As a result truck loading, tipping and movements will predominantly occur behind these stockpiles (with reference to sensitive receptors to the northeast). All drilling (for blasting) will be undertaken within the extraction area and therefore behind the northern and eastern extraction walls (with reference to sensitive receptors to the northeast). Blast management controls are described in the Blast Management Plan.
Operational Safeguards	<p>Operations</p> <ul style="list-style-type: none"> All approved operating hours will be strictly adhered to. All site personnel, subcontractors and suppliers shall undergo an induction that includes requirements in relation to the mitigation and management of potential noise impacts. The operation of crushing equipment will be retained within the extraction area, behind the northern and eastern faces of the pit. No crushing will be undertaken in elevated or exposed locations (with direct line of sight to sensitive receivers to the north and northeast). Loading of trucks will be undertaken from the southern aspect of stockpiles (to retain the remaining stockpile as a noise barrier to receivers to the north) wherever feasible. All relevant equipment will be regularly serviced to ensure sound power levels of each item remains as low as possible. An annual audit of SPLs is completed (refer to Section 7.3). The internal road network will be maintained to the current standard and if any new roads are proposed these will be constructed to similar standards to limit body noise from empty trucks.
	<p>Blasting</p> <ul style="list-style-type: none"> Blast monitoring is undertaken using real time blast monitors to measure the air blast overpressure (noise) (dB(L)) (refer to the Blast Management Plan). Historical blast monitoring results indicate that no air blast overpressure non-compliances have been recorded, therefore the risk of a noise non-compliance or complaint for blasting is low.

Design	Control
Operational Safeguards (Cont'd)	<p>Maintenance</p> <ul style="list-style-type: none"> • Maintenance work on all plant and equipment will only be undertaken outside the standard hours of operation if these are inaudible at all residential premises surrounding the Quarry. • Maintenance after 6pm will only be undertaken if these works cannot be completed within the standard operating hours. <ul style="list-style-type: none"> ○ Maintenance activities will be undertaken within the extraction area, i.e. behind the northern and eastern Quarry face. ○ Low noise emitting activities such as vehicle servicing and welding will proceed with the Quarry Manager or delegate checking noise levels at the Quarry Site boundary to confirm these as inaudible. ○ Activities with the potential for higher noise emissions (for example grinding or cutting), will only commence once a quarry operator is positioned near sensitive receivers and can confirm there is no audible noise at the receiver. ○ If noise from the Quarry is audible at residential receivers, the activity will be ceased. <p>Assessment of weather conditions</p> <ul style="list-style-type: none"> • At the commencement of each shift, the Quarry Manager will review weather conditions and make note of: <ul style="list-style-type: none"> ○ Fog or frost conditions. If present, the duration of the weather conditions will be noted. ○ Wind speed and direction. ○ rainfall • These observations will allow the Quarry Manager to assess the potential for noise enhancement at sensitive receivers to the north and northeast and apply supplementary noise management measures as described in Section 6.3.

6.4 Noise Management TARPS

The following triggers, responses and corrective actions are outlined in **Table 6.3**. The below measures are to be implemented in the event of a noise complaint being received, elevated noise levels being observed or at times where noise criteria do not apply as a result of weather conditions.

Table 6.3 Triggers, Responses and Corrective Actions

Trigger	Response and Corrective Actions
Noise Complaint	Any complaint received, either directly or via Lithgow City Council, EPA or other regulatory agency, will trigger the implementation of the response and corrective action measures described in Section 8.1 .
Exceedance of Noise Criteria	Any record of noise exceeding the criteria, identified by attended monitoring, nominated in Section 5.0 will trigger the response and corrective action measures described in Section 8.1 .
Emergency Works	In the event deliveries or dispatch are requested during an emergency, at unusual times, by Police or other authorities or in the event of an emergency, the Quarry Manager will act appropriately to ensure noise is minimized as far as practicable without jeopardizing the general safety of employees and the local community.

Trigger	Response and Corrective Actions
<p>Meteorological conditions (as observed by the Quarry Manager) including:</p> <ul style="list-style-type: none"> • Fog or frost • Wind blowing towards sensitive receivers <p>Which may indicate meteorological conditions where noise criteria do not apply.</p>	<p>The Quarry Manager will review operations and implement measures which may include:</p> <ul style="list-style-type: none"> • advise operating personnel to moderate activities to reduce noise, i.e. switch off idling engines if not required, avoid reversing where practicable, avoid excessive revving of engines. • restrict crushing operations to the use of one crushing plant until inspections confirm, by inspection, that the Quarry is not audible at sensitive receptors. • turning off or limiting operations of mobile equipment or fixed plant • redirecting operations to more sheltered areas within the extraction area • moving equipment to lower elevations to reduce the potential for noise to be carried over long distances. • complete a check of nearby sensitive receptors to determine if the operations are audible.

6.5 Best Practice Management

Conditions 3(4)(a) and 5(3)(c) of DA 3444-11-2001-MOD3 require the application of best practice noise management at the Quarry. The noise management measures described in **Section 6.2** and **6.3** demonstrate consideration of both design and operational controls to reduce noise levels. Noise modelling undertaken for the Quarry identified compliance with noise criteria could be achieved even in scenarios where all noise sources were operating concurrently in exposed surface locations.

Walker Quarries are committed to implementing the controls in **Section 6.2** to **Section 6.4** and will include an assessment in the Wallerawang Quarry Annual Review of whether there are any revised best practice management controls which have become available during the previous 12 months which could be utilised at Wallerawang Quarry and will update this NMP accordingly.

7.0 Monitoring

This section describes the attended noise monitoring program that will be implemented at the Quarry. The results of noise monitoring conducted between 2014 and 2020 has consistently returned the results which either confirm the Quarry as generally inaudible or below the noise criteria of **Table 5.1**, and there have been few complaints relating to noise (refer to **Section 6.1**). There is also no intent to operate during the evening or night time at the Quarry.

On this basis, real time monitoring is not considered necessary at this time. Walker Quarries have also identified a range of design and operational controls to be implemented to manage ongoing operations and these are included in **Section 6.0**.

7.1 Meteorological Monitoring

Figure 7.1 identifies the location of a meteorological station installed in accordance with *Condition 3(15)* of DA 344-11-2001 and *Condition M4.1* of EPL 13172. The meteorological station is located away from natural or artificial obstructions and areas with the potential to influence local thermodynamics, e.g. concrete or bitumen surfaces, generally in accordance with the *Approved Methods for Sampling of Air Pollutants in New South Wales*.

The parameters, units of measure, averaging period and frequency recorded by the meteorological station are specified in **Table 7.1** (and are in compliance with *Condition M4.1* of EPL 13172).

Table 7.1 Meteorological Monitoring

Parameter	Units of Measure	Frequency	Averaging Period
Rainfall	mm	Continuous	15 minute
Air Temperature	°C	Continuous	1 hour
Wind Direction at 10m	°	Continuous	15 minute
Wind Speed at 10m	m/s	Continuous	15 minute

The Quarry Manager will record weather conditions at the commencement of each shift, noting periods of potentially noise enhancing conditions, i.e. fog, frost, strong wind and heavy rain, and daytime fog events. By logging the periods, targeted analysis of meteorological station data for those periods may be undertaken, either on request or in response to complaint or noise exceedance as identified by attended monitoring.

7.2 Attended Noise Monitoring

Noise monitoring will be undertaken in accordance with the following guidelines:

- NSW Noise Policy for Industry (NPfI) (EPA, 2017).
- AS 1055-2018 “Acoustics – Description and Measurement of Environmental.

Condition 3(4)(c) of DA 344-11-2001 states that noise monitoring is to be undertaken at least every 3 months. It is noted the Quarry has recorded only two noise related complaints during the period 2015 to 2020 and not identified any noise related exceedance of approval requirements during attended monitoring in this time.

Consistent with previously approved version of the NMP and in consideration of the noise performance of the Quarry, Walker Quarries will undertake attended noise monitoring twice each year (nominally September/October and March/April) in order to evaluate compliance with the noise criteria described in **Section 5.0** (refer to **Table 5.1**).

Biannual noise monitoring will be undertaken as follows:

- As operations are restricted to the day period (7am to 6pm), two measurements, each of 15 minutes in duration, will be completed at each monitoring location (one morning and one afternoon).
 - Note that DA 344-11-2001 approves transportation activities during the evening (6pm to 10pm) and night (10pm to 7am) periods. Should this become a feature of operations, additional monitoring will be undertaken, with the permission of the landowner, during the evening or night.
- Wherever possible, the L_{A90} noise level (i.e. levels without contributions from Quarry activities) will be recorded to identify the prevailing background noise level.

The timing and frequency of noise monitoring may be modified where:

- It is identified that operational or meteorological conditions will affect the validity of the monitoring results. These may include:
 - Periods of reduced operational activity or shut down,
 - Periods of high rainfall or winds

Under these circumstances, and where there may be a significant delay in monitoring, the DPIE will be notified.

- Should operational activities be modified significantly, e.g. if the arrangement of the crushing and screening infrastructure is altered, should complaints over operational noise levels be received, or if attended noise monitoring identifies noise levels within 2 dB(A) of criteria, the frequency of monitoring will be reviewed against performance to determine if the monitoring frequency needs to be modified. If a variation to the monitoring frequency is warranted, the NMP will be updated and the approval of DPIE sought to modify the monitoring program.
- In the event of a noise-related complaint, Walker Quarries will review the results of the noise monitoring program and make the results of that monitoring and/or subsequent investigation available to the complainant, as outlined in **Section 8.3**.

The following monitoring locations have been chosen as the closest residential receivers to the Quarry Site to enable assessment against the noise criteria (of **Table 5.1**). If access to any of these locations is unavailable, the closest possible location will be chosen for the purpose of monitoring.

- N1: “Gemalong” property residence
- N2: “Cockatoo Pines” property boundary adjacent to residence
- N3: Cypress Place, Wallerawang.

Figure 7.1 identifies the three off-site monitoring locations.

Figure 7.1 Noise Monitoring Locations

A fourth monitoring location is included on the Quarry Site:

- RL1: Reference Location 1 adjacent to the Quarry office.

This location allows for the combined noise level of the operating Quarry to be measured, and through extrapolation and assessment of other relevant factors, the relative contribution of the Quarry at locations N1, N2 and N3 calculated.

7.3 Sound Power Level Audit

On an annual basis, Walker Quarries will monitor the sound power level (SWL) of active mobile and fixed plant operating at the Quarry. The SWL will be measured, using a calibrated hand-held noise meter at a distance of 10 m from the operating plant. The SWL audit will be used to inform necessary maintenance or equipment upgrade requirements to ensure noise generated by the Quarry remains equivalent to that predicted and compliance with noise criteria is achieved.

7.4 Evaluation of Results

A noise monitoring report will be prepared by the consultancy engaged to complete the monitoring within 28 days of each attended noise monitoring event and supplied to Walker Quarries for review. That report will include an assessment of the monitoring results against the criteria identified in **Section 5.0** and the effectiveness of the mitigation measures in place to reduce noise levels received. Recommendations for additional or improved noise mitigation will be provided where relevant.

The monitoring reports will be reviewed by the Quarry Manager with any recommendations for improved noise mitigation reviewed and implemented where reasonable and feasible. A copy of each Noise Monitoring Report will be placed on the Walker Quarries web page and summarised in, and appended to the Annual Review.

In the event that the noise monitoring report identifies an exceedance of the relevant criteria, the procedures identified in **Section 8.2** will be implemented.

8.0 Management of Incidents and Complaints

8.1 Incident Identification

Condition R2 of EPL 13172 requires that Walker Quarries must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident.

In accordance with the definition provided by Section 147 of the POEO Act, harm to the environment is deemed to be material if:

1. it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial; or
2. it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (or such other amount as is prescribed by the regulations).

An incident which is only as a result of an exceedance of noise criterion, is referred to as a **Non-compliance**.

An incident which causes or threatens to cause material harm to the environment is referred to as a **Pollution Incident**.

The EPA excludes noise pollution from the requirements of a Pollution Incident Response Management Plan.

8.2 Incident Management and Reporting

If attended noise monitoring (completed as described in **Section 7.2**) indicates that noise exceeds the approved criteria (refer to **Table 5.1**), the following actions will be undertaken:

1. The acoustic consultant will alert the Quarry Manager to the exceedance, confirm the meteorological conditions at the time, i.e. that the criteria apply, and identify the noise source most contributing to the elevated noise level.
2. The Quarry Manager will investigate the source of the noise, review the performance of equipment and if necessary, make arrangements to alter the configuration of equipment, or stand down specific equipment, so that the noise levels are reduced.
3. The Quarry Manager will schedule supplementary noise monitoring to confirm that the modified operations or remedial measures have reduced the noise levels to compliant levels.

Following a confirmed exceedance of noise criteria, the Quarry Manager will immediately² notify DPIE and EPA of the exceedance and actions being taken to remediate the source of excessive noise.

1. Within 7 days of confirming the exceedance, and notification of the DPIE (by email to compliance@planning.nsw.gov.au) and EPA, the Quarry Manager will provide a detailed report on:
 - a. the time and date of the incident
 - b. relevant details of the incident
 - c. measures taken to (or to be taken) prevent re-occurrence.

² Immediately being the first opportunity following identification of the exceedance and establishment of initial actions to reduce noise.

2. If required, noise monitoring will be repeated to confirm compliance with the approved noise criteria.
3. Written notification of a non-compliance will:
 - a. identify the development and application number,
 - b. out the condition of this consent that the development is non-compliant with,
 - c. why it does not comply and the reasons for the noncompliance (if known), and
 - d. what actions have been, or will be, undertaken to address the non-compliance.
4. Within 2 weeks of obtaining any data showing an exceedance of noise criteria, the Quarry Manager will notify in writing any affected landowners or tenants.

Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Secretary, the Applicant must provide the Secretary and any relevant public authorities (as determined by the Secretary) with a detailed report on the incident ("Incident Report") addressing all requirements below, and such further reports as may be requested.

The Incident Report must include:

- a. a summary of the incident,
- b. outcomes of an incident investigation, including identification of the cause of the incident,
- c. details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence, and
- d. details of any communication with other stakeholders regarding the incident.

If the incident was identified following receipt of complaint, the complainant will also be provided with the same information included in the Incident Report.

A summary of all incidents, including dates of occurrence, corrective measures taken, and success of these measures will be compiled and reported in the Annual Return to the EPA and the Annual Review to DPIE.

8.3 Noise Related Complaints

A Complaints Management Procedure is provided in *Section 6.2* of the Environmental Management Strategy. Following receipt of a complaint appropriate action will be taken within two working days to determine the cause of the complaint and identify appropriate actions to remediate the complaint source. The following details will be recorded following receipt of any noise-related complaint.

1. The date and time of the complaint.
2. The method by which the complaint was made.
3. Any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect.
4. The nature of the complaint.

Within 48 hours of receipt of a complaint, action to identify the cause of the complaint and identify appropriate actions to respond to the complaint will be commenced. On completion of actions to address the complaint, the following information will be added to the complaint register.

5. The action taken in relation to the complaint, including any follow-up contact with the complainant.
6. If no action was taken, the reasons why no action was taken.

9.0 Data Management and Reporting

9.1 Review and Recording of Monitoring Data

Walker Quarries will retain records of meteorological monitoring and noise monitoring for a minimum period of four years. Monitoring records will be made available to relevant government authorities following a written request.

9.2 Reporting and publication of monitoring data

Walker Quarries will include all attended noise monitoring reports as appendices to the Annual Review. That document, once approved by the relevant government agencies, will be published on the Quarry website.

In accordance with the requirements of Section 66(6) of the *PoEO Act 1997*, each month Walker Quarries will publish all monitoring data on their website. The information will be published within 28 days of receipt of a final noise monitoring report. In addition, Walker Quarries will provide a copy of noise reports, free of charge, to a member of the public when requested in writing. The data will be provided in a format that includes raw data values if requested, is comprehensible by the general public and also includes all accompanying necessary information. These requirements are presented in detail in Requirements for Publishing Pollution Monitoring Data (EPA, 2013).

10.0 Roles and Responsibilities

Table 10.1 outlines the roles and responsibilities of personnel with reference to management of noise.

Table 10.1 Roles and Responsibilities of Personnel with Respect to Management of Noise

Role	Responsibilities
Managing Director	<p>Ensure adequate resources are available to implement the Noise Management Plan.</p> <p>Ensure suitably trained personnel are available to implement the responsibilities of the Quarry Manager during any time of the Quarry Manager’s absence from site.</p>
Quarry Manager, or his/her nominee	<p>Ensure implementation and compliance with the Noise Management Plan.</p> <p>Ensure noise monitoring results are regularly reviewed/evaluated and entered into the environmental database.</p> <p>Ensure reviews of meteorological forecasts are undertaken on a daily basis prior to the commencement of operations.</p> <p>Implementation of the Noise Management System (Section 6.0).</p> <p>Relocate or postpone relevant activities in the event of adverse weather conditions, where practical.</p> <p>Provide primary contact for complaints and supply follow-up information to any complainant.</p> <p>Initiate investigations of complaints as received from the public or government agency.</p> <p>Prepare a report to government agencies or neighbours following a notifiable pollution incident (Section 8.0).</p> <p>Inform the Managing Director of identified causes of elevated noise and any alterations to site operations that has influenced the noise environment.</p> <p>Ensure employees are competent through training and awareness programs.</p> <p>Coordinate the review of the Noise Management Plan (Section 12.0).</p>
All On-site Personnel	<p>Operate in manner that minimises risks of incidents to themselves, fellow workers or the surrounding environment.</p> <p>Fully implement the relevant control measures within the Noise Management Plan.</p> <p>Report any anomalous noise or extraordinary events to the Quarry Manager.</p> <p>Follow any instructions provided by the Quarry Manager.</p>
All Truck Drivers	<p>Follow any instructions provided by any on-site personnel.</p>

11.0 Competence Training and Awareness

All personnel and contractors working at the Quarry undergo an induction. This induction includes information on the management of noise while working on site.

Regular toolbox meetings are held to discuss whole-of-site production, management, safety and environmental issues. Matters relating to managing and mitigating noise are raised during these meetings, when necessary.

12.0 Plan Review

In accordance with the Environmental Management Strategy, and *Condition 5(5)* of DA 344-11-2001, the NMP will be reviewed within three months of the submission of an:

- a) incident as defined by **Section 8.1**
- b) Annual Review³
- c) an Independent Environmental Audit completed in accordance with *Condition 5(14)* of DA 344-11-2001
- d) any modifications to this consent.

Walker Quarries will notify the DPIE in writing of any review being undertaken and if this review results in any revisions to the NMP, submit a copy to the Secretary of the DPIE for approval (within 6 weeks of the review). The reviews will ensure the adequacy of the NMP and allow for opportunities of adaptive management and continual improvement. This will include a review of monitored noise levels and monitoring frequency and methods, as necessary. Each review will also evaluate the effectiveness of the overall noise monitoring program and whether it needs to be modified or scaled back.

³ The Annual Review is due by 30 September each year.

13.0 Glossary of Terms

Table 13.1 outlines the glossary of terms and abbreviations referenced throughout the NMP.

Table 13.1 Glossary of terms and abbreviations

Term or Abbreviation	Meaning
'A' Weighting	Weighting applied to instrument levels to account for the relative loudness perceived by the human ear
AGL	Above ground level
AS	Australian Standard
DA	Development Consent
dB	Decibel
DPIE	Department of Industry, Planning and Environment
EPA	Environmental Protection Authority
EPL	Environmental Protection Licence
Eq	'Equivalent' – the value of received sound energy over a period of time
L	Noise level
IEA	Independent Environmental Audit
m	metres
m/s	Metres per second
MAC	Muller Acoustic Consulting
NMP	Noise Management Plan
NPfi	Noise Policy for Industry
NSW	New South Wales
PoEO	Protection of the Environment Operations
Quarry	Wallerawang Quarry
RBL	Rating background Level
Walker Quarries	Walker Quarries Pty Ltd

14.0 References

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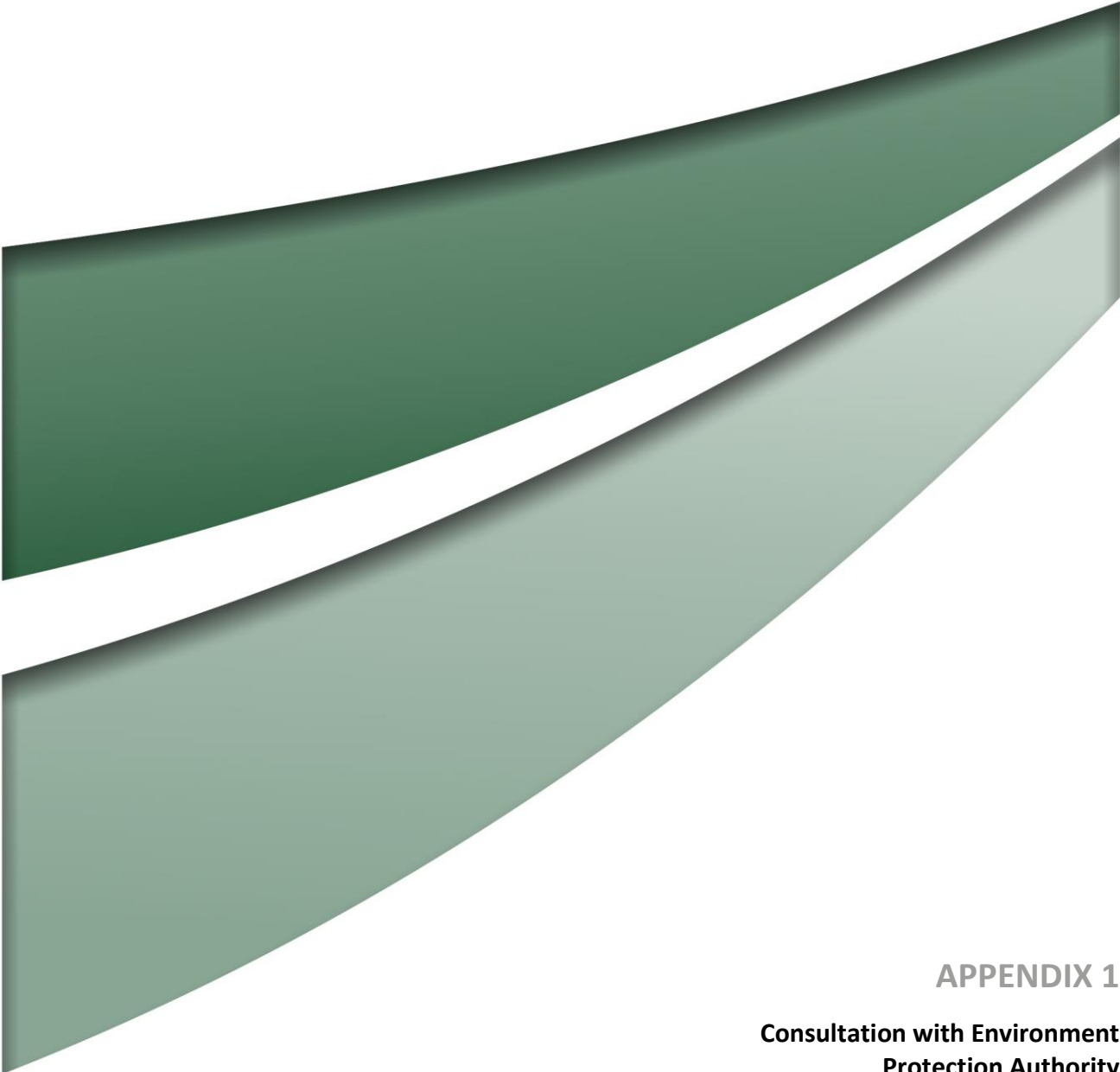
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APPENDIX 1

**Consultation with Environment
Protection Authority**

