

## **AIR QUALITY MANAGEMENT PLAN**

Wallerawang Quarry

**FINAL**

April 2019



## AIR QUALITY MANAGEMENT PLAN

Wallerawang Quarry

### FINAL

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

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### Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
V0*	Alex Irwin	21 February 2019	Alex Irwin	26 February 2019
V1	Alex Irwin	1 April 2019	Alex Irwin	1 April 2019

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 Air Quality Management Plan (AQMP) for the Wallerawang Quarry (the Quarry) has been reviewed and updated by Umwelt Pty Ltd on behalf of Walker Quarries Pty Ltd (Walker Quarries). The AQMP specifically addresses Condition 14 of Schedule 3 of Development Consent DA 344-11-2001 (DA 344-11-2001). The AQMP synthesises the recommendations made during the preparation of an Environmental Impact Statement (EIS) for development of the Quarry (Pacrim, 2001), an Environmental Assessment for a modification to DA 344-11-2001 (RWC, 2017) and approval of DA 344-11-2001 and Environment Protection Licence (EPL) 13172.

The Quarry is located approximately 8 kilometres (km) northwest of Lithgow in New South Wales (see **Figure 1.1**) and comprises a total disturbed area of approximately 11 hectares (ha). The Quarry is approved to produce 500 000 tonnes per year (tpa) of quartzite and rock aggregate material for use in the Wallerawang, Lithgow, Blue Mountains and Sydney regions.

Dust generating activities principally relate to the following operational activities:

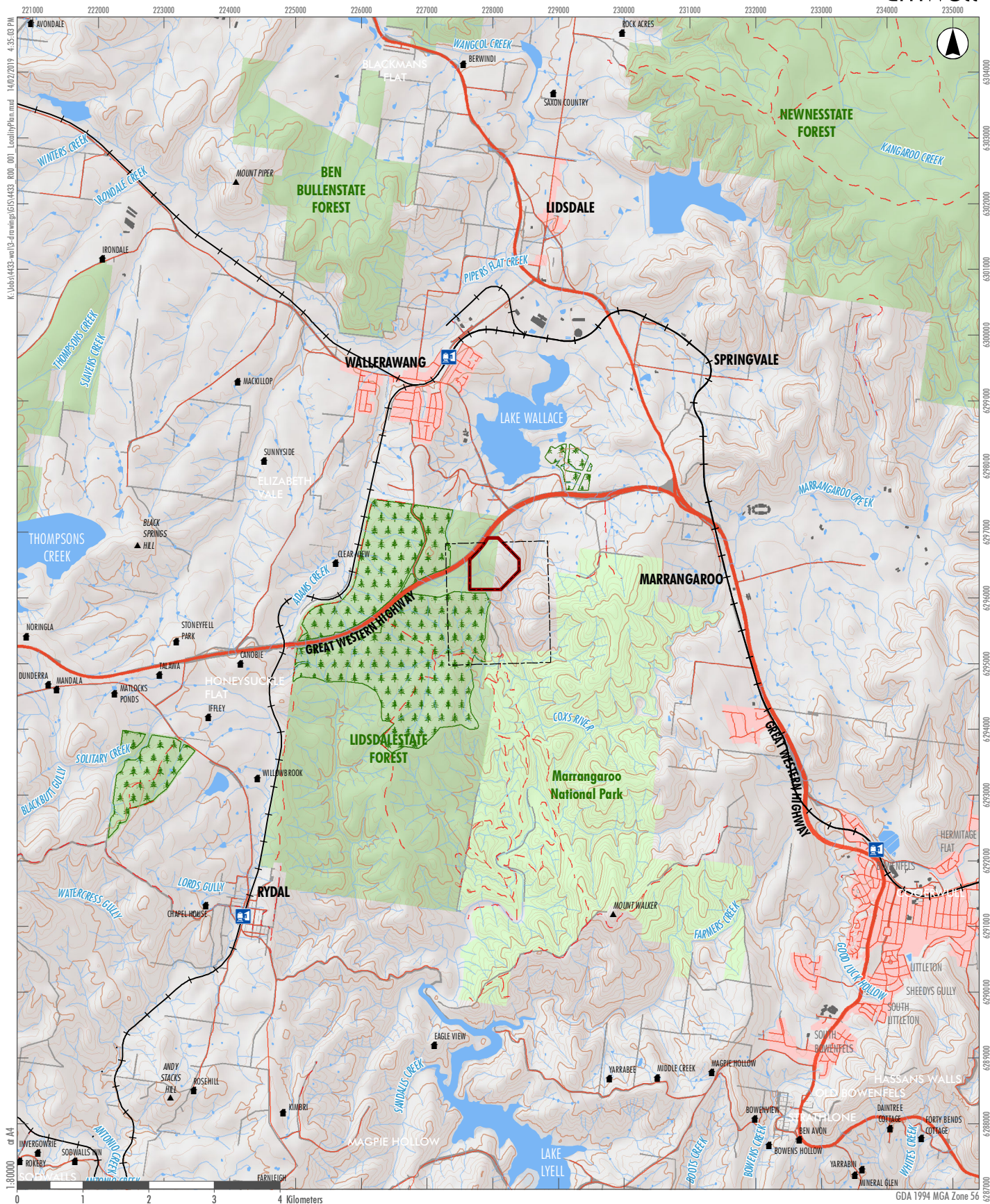
- Vegetation clearing and topsoil and subsoil stripping.
- Drill and blast extraction of raw materials.
- Load and haul of materials for processing through crushing and screening or emplacement of overburden.
- Vehicle movements on unsealed roads.

The previous version of this AQMP (Rev 4) incorporated the recommendations of an Independent Environmental Audit (IEA) completed in July 2018. This version of the AQMP (Rev V0) has been prepared following approval of a modification to DA 344 11 2001 on 7 December 2018 and is the first version of the AQMP prepared by Umwelt Pty Ltd. **Table 1.1** provides the full history of NMP revisions.

**Table 1.1 Document Status History**

Rev No.	Prepared by		Purpose
	Name	Date	
<b>0</b>	P. Hensley	October 2014	Draft submitted to department prior to commencement
<b>1</b>	RW Corkery & Co	September 2016	Updated and approved following first IEA
<b>2</b>	RW Corkery & Co	November 2017	Updated following Modification 1 (issued August 2017)
<b>3</b>	RW Corkery & Co	September 2018	Updated Following 2 <sup>nd</sup> IEA
<b>4</b>	RW Corkery & Co	November 2018	Updated following 2018 Annual Review
<b>V0</b>	Alex Irwin	February 2019	Updated following Modification 2 (issued December 2018)
<b>V1</b>	Alex Irwin	April 2019	Updated following DPE Review (March 2019)





- Legend**
- Quarry Site - ML1633
  - EL 4473
  - State Forest
  - NPWS Estate

Note:  
Image Source: Copyright: © 2014 Esri Data source:

**FIGURE 1.1**  
**Locality Plan**



## 2.0 Legal and Other Regulatory Requirements

### 2.1 Development Consent DA 344-11-2001

Conditions 3(11), 3(12), 3(13) and 3(15) of DA 344-11-2001 (as modified on 7 December 2018) provide instructions as to the requirements of Walker Quarries in relation to air quality management.

Condition 3(14) requires the preparation of an Air Quality 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 air quality management and identifies the section of this AQMP where each is addressed.

**Table 2.1 Air Quality-Related Conditional Requirements of DA 344-11-2001**

No	Condition	Section																		
<b>Air Quality Impact Assessment Criteria</b>																				
<b>3(11)</b>	The Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria in Table 4 at any residence on privately-owned land.	<b>6.1.2</b>																		
<b>3(12)</b>	<p><i>Table 4: Air quality criteria</i></p> <table border="1"> <thead> <tr> <th>Pollutant</th><th>Averaging Period</th><th>Criterion</th></tr> </thead> <tbody> <tr> <td>Particulate matter &lt; 10 µm (PM<sub>10</sub>)</td><td>Annual</td><td>a,d 25 µg/m<sup>3</sup></td></tr> <tr> <td>Particulate matter &lt; 10 µm (PM<sub>10</sub>)</td><td>24 hour</td><td>b 50 µg/m<sup>3</sup></td></tr> <tr> <td>Particulate matter &lt; 2.5 µm (PM<sub>2.5</sub>)</td><td>Annual</td><td>a,d 8 µg/m<sup>3</sup></td></tr> <tr> <td>Total suspended particulates (TSP)</td><td>Annual</td><td>a,d 90 µg/m<sup>3</sup></td></tr> <tr> <td><sup>c</sup> Deposited dust</td><td>Annual</td><td>b 2 g/m<sup>2</sup>/month      a,d 4 g/m<sup>2</sup>/month</td></tr> </tbody> </table> <p><i>Notes to Table 4:</i></p> <p>a Cumulative impact (ie increase in concentrations due to the development plus background concentrations due to all other sources).</p> <p>b Incremental impact (ie increase in concentrations due to the development alone, with zero allowable exceedances of the criteria over the life of the development).</p> <p>c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.</p> <p>d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Secretary.</p> <p>e "Reasonable and feasible avoidance measures" includes, but is not limited to, the operational requirements in conditions 11, 12 and 13 to develop and implement an air quality management system that ensures operational responses to the risks of exceedance of the criteria.</p>	Pollutant	Averaging Period	Criterion	Particulate matter < 10 µm (PM <sub>10</sub> )	Annual	a,d 25 µg/m <sup>3</sup>	Particulate matter < 10 µm (PM <sub>10</sub> )	24 hour	b 50 µg/m <sup>3</sup>	Particulate matter < 2.5 µm (PM <sub>2.5</sub> )	Annual	a,d 8 µg/m <sup>3</sup>	Total suspended particulates (TSP)	Annual	a,d 90 µg/m <sup>3</sup>	<sup>c</sup> Deposited dust	Annual	b 2 g/m <sup>2</sup> /month      a,d 4 g/m <sup>2</sup> /month	<b>5.0, 7.3</b>
Pollutant	Averaging Period	Criterion																		
Particulate matter < 10 µm (PM <sub>10</sub> )	Annual	a,d 25 µg/m <sup>3</sup>																		
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<sup>c</sup> Deposited dust	Annual	b 2 g/m <sup>2</sup> /month      a,d 4 g/m <sup>2</sup> /month																		

No	Condition	Section
<b>Operating Conditions</b>		
<b>3(13)</b>	<p>The Applicant must:</p> <ul style="list-style-type: none"> <li>(a) implement best practice management to minimise the dust emissions of the development;</li> <li>(b) regularly assess meteorological and air quality monitoring data and relocate, modify and/or stop operations on site to ensure compliance with the air quality criteria in this consent;</li> <li>(c) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see noted under Table 4);</li> <li>(d) monitor and report on compliance with the relevant air quality conditions in this consent; and</li> <li>(e) minimise the area of surface disturbance and undertake progressive rehabilitation of the site,</li> </ul> <p>to the satisfaction of the Secretary.</p>	<p><b>6.1</b></p> <p><b>7.2</b></p> <p><b>6.2, 8.2</b></p> <p><b>6.1.3, 7</b></p> <p><b>6.1.2</b></p>
<b>Air Quality Management Plan</b>		
<b>3(14)</b>	<p>The Applicant must prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must:</p> <ul style="list-style-type: none"> <li>(a) be submitted to the Secretary for approval within three months of the determination of Modification 1, unless otherwise agree by the Secretary;</li> <li>(b) describe the measures to be implemented to ensure: <ul style="list-style-type: none"> <li>• compliance with the air quality criteria and operating conditions of this consent;</li> <li>• best practice management is being employed; and</li> <li>• the air quality impacts of the development are minimised during adverse meteorological conditions and extraordinary events;</li> </ul> </li> <li>(c) describe the proposed air quality management system;</li> <li>(d) include an air quality monitoring program that: <ol style="list-style-type: none"> <li>1. is capable of evaluating the performance of the development;</li> <li>2. includes a protocol for determining any exceedances of the relevant conditions of consent;</li> <li>3. effectively supports the air quality management system; and</li> <li>4. evaluates and reports on the adequacy of the air quality management system.</li> </ol> </li> </ul> <p>The Applicant must implement the approved Air Quality Management Plan as approved from time to time by the Secretary.</p>	<p>This document</p> <p>No longer applicable</p> <p><b>6.0</b></p> <p><b>6.1</b></p> <p><b>6.2</b></p> <p><b>6.0</b></p> <p><b>7.0</b></p> <p><b>7.3.5</b></p> <p><b>7</b></p> <p><b>7.3.5</b></p> <p>Noted</p>
<b>Meteorological Monitoring</b>		
<b>3(15)</b>	<p>For the life of the development, the Applicant must ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the <i>Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales</i> guideline.</p>	<b>7.2</b>

No	Condition	Section
<b>Management Plan Requirements</b>		
	The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include: (a) detailed baseline data;	<b>4.0</b>
	(b) a description of: <ul style="list-style-type: none"> <li>the relevant statutory requirements (including any relevant approval, licence or lease conditions);</li> </ul>	<b>2.0</b>
	<ul style="list-style-type: none"> <li>any relevant limits or performance measures/criteria; and</li> </ul>	<b>5.0</b>
	<ul style="list-style-type: none"> <li>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;</li> </ul>	<b>6.2, 7.5</b>
	<ul style="list-style-type: none"> <li>a description of the measures that to be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;</li> </ul>	<b>6.0</b>
	(c) a program to monitor and report on the: <ul style="list-style-type: none"> <li>impacts and environmental performance of the development; and</li> <li>effectiveness of any management measures (see (c) above);</li> </ul>	<b>7.0</b>
	(d) a 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;	<b>7.5, 9.1</b>
	(e) a program to investigate and implement ways to improve the environmental performance of the development over time;	<b>7.5, 9, 12</b>
	(f) a protocol for managing and reporting any: <ul style="list-style-type: none"> <li>incidents;</li> <li>complaints;</li> <li>non-compliances with statutory requirements; and</li> <li>exceedances of the impact assessment criteria and/or performance criteria; and</li> <li>a protocol for periodic review of the plan.</li> </ul>	<b>12.0</b>
<b>5(4)</b>	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.	<b>10.3</b>
<b>5(5)</b>	Within 3 months of the submission of an: (a) incident report under condition 9 below; (b) Annual Review under condition 11 below; (c) audit report under condition 12 below; and (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.	<b>App 1</b>

## 2.2 Environment Protection Licence 13172

EPL 13172 contains a number of conditional requirements relating to air quality. **Table 2.2** identifies each of these conditional requirements and identifies the section of this AQMP where each is addressed.

**Table 2.2 Air Quality-Related Conditional Requirements of EPL 13172**

No	Condition	Section
O3.1	All operations and activities occurring at the premises must be carried out in a manner that will minimize the emission of dust from the premises.	6.0
O3.2	Trucks entering and leaving the premises that are carrying loads must be covered at all times, except during loading and unloading.	6.1.2

## 2.3 Work Health and Safety (Mines and Petroleum Sites) Regulation 2014

Relevant clauses that relate to air quality from the *Work Health and Safety (Mines and Petroleum Sites) Regulation 2014* (WHS Regulation 2014) are listed in **Table 2.3**.

**Table 2.3 Air Quality-Related Requirements WHS Regulation 2014**

No.	Condition	Comment
<b>Schedule 1 Clause 5 - Air quality or Dust or Other Airborne Contaminants</b>		
<b>1</b>	<p>The following matters must be considered in developing the control measures to manage the risks of air quality or dust or other airborne contaminants:</p> <ul style="list-style-type: none"> <li>(a) the types of dust and other chemical and biological contaminants likely to be in the air from both natural sources, including naturally occurring asbestos, and introduced sources,</li> <li>(b) the levels of oxygen, dust and other contaminants in the natural or supplied air of a mine,</li> <li>(c) the temperature and humidity of the air</li> <li>(d) the length of exposure, having regard to extended shifts and reduced recovery periods.</li> </ul>	<p>Respirable Dust &amp; Inhalable Dust. See <b>Section 7.4</b></p> <p>Surface Operation. See <b>Sections 4.0, 6.2 and 7.3.</b></p> <p>Operator's Cabins are Air-Conditioned.</p> <p>See <b>Section 6.1.2</b> and Fatigue Management Policy in Health Control Plan &amp; Safety Management System (<b>Appendix 2</b>)</p>
<b>Clause 9 - Management of Risks to Health and Safety (cl 617 model WHS Regs)</b>		
<b>1</b>	A person conducting a business or undertaking at a mine or petroleum site must manage risks to health and safety associated with mining operations or petroleum operations at the mine or petroleum site in accordance with Part 3.1 of the WHS Regulations.	See Risk Assessment ( <b>Appendix 3</b> )
<b>2</b>	A person conducting a business or undertaking at a mine or petroleum site must ensure that a risk assessment is conducted in accordance with this clause by a person who is competent to conduct the particular risk assessment having regard to the nature of the hazard.	

No.	Condition	Comment
<b>3</b>	In conducting a risk assessment, the person must have regard to: <ul style="list-style-type: none"> <li>(a) the nature of the hazard, and</li> <li>(b) the likelihood of the hazard affecting the health or safety of a person, and</li> <li>(c) the severity of the potential health and safety consequences.</li> </ul>	
<b>4</b>	Nothing in subclause (3) limits the operation of any other requirement to conduct a risk assessment under this Regulation.	
<b>Clause 38 - Temperature and Moisture Content of Air (cl 635 model WHS Regs)</b>		
<b>1</b>	In complying with clause 9, the operator of a mine or petroleum site must: <ul style="list-style-type: none"> <li>(a) manage risks to health and safety associated with extremes of either or both the temperature and moisture content of air, and</li> <li>(b) if risks associated with extreme heat exist at an underground mine—implement control measures (including monitoring) to manage heat stress in places at the mine where: <ul style="list-style-type: none"> <li>(i) persons work or travel, and</li> <li>(ii) the wet bulb temperature exceeds 27° Celsius.</li> </ul> </li> </ul>	<p>Surface Operation. All operators' cabins are air-conditioned.</p> <p>This sub-clause is not applicable.</p>
<b>Clause 39 - Ensuring Exposure Standards for Dust not exceeded (cl 636 model WHS Regs)</b>		
<b>1</b>	The operator of a mine or petroleum site must, so far as is reasonably practicable, minimise the exposure of persons at the mine or petroleum site to dust and must ensure that no person at the mine or petroleum site is exposed to 8-hour time-weighted average atmospheric concentrations of airborne dust that exceed: <ul style="list-style-type: none"> <li>(a) for respirable dust—3 milligrams per cubic metre of air, or in the case of a coal mine, 2.5 milligrams per cubic metre of air, or</li> <li>(b) for inhalable dust—10 milligrams per cubic metre of air.</li> </ul>	<p>See <b>Table 7.3</b>.</p> <p>Testing is conducted annually, and the results are extrapolated for an 8-hour-time-weighted-average.</p>
<b>2</b>	The Workplace Exposure Standards for Airborne Contaminants apply in relation to a concentration referred to in subclause (1) as if that concentration were an exposure standard referred to in that document.	
<b>3</b>	In this clause:  8-hour time-weighted average has the same meaning as in the Workplace Exposure Standards for Airborne Contaminants.	



No.	Condition	Comment
<b>Clause 40 - Monitoring Exposure to Airborne Dust (cl 637 model WHS Regs)</b>		
	Clause 50 of the WHS Regulations applies to the operator of a mine or petroleum site in relation to airborne dust as if the concentration of airborne dust referred to in clause 39 (1) (a) or (b) of this Regulation were an exposure standard to which clause 50 of the WHS Regulations applies.	This sub-clause is not applicable
<b>Clause 41 - Air Monitoring - Use of Devices (cl 638 model WHS Regs)</b>		
<b>1</b>	<p>The operator of a mine or petroleum site who uses air monitoring devices to comply with air monitoring requirements under clause 50 of the WHS Regulations and under this Regulation must ensure that:</p> <p>(a) the devices are suitable and effective having regard to:</p> <p>(i) the nature of the monitoring being carried out, and</p> <p>(ii) the substance being monitored, and</p> <p>(b) the devices are positioned to ensure that they work to best effect.</p>	This sub-clause is not applicable
<b>Clause 42 - Air Monitoring - Signage (cl 639 model WHS Regs)</b>		
<b>1</b>	<p>The operator of a mine or petroleum site, in complying with air monitoring requirements under clause 50 of the WHS Regulations and under this Regulation, must ensure that signs are erected at the mine or petroleum site that explain:</p> <p>(a) the meaning of any warning produced by an air monitoring device, and</p> <p>(b) what persons must do in response to the warning</p>	This sub-clause is not applicable
<b>Clause 50 - Dust Explosion (cl 646 model WHS Regs)</b>		
<b>1</b>	In complying with clause 9, the mine operator of an underground mine must manage risks to health and safety associated with an explosion associated with dust at the mine.	This sub-clause is not applicable
<b>2</b>	<p>In managing risks to health and safety associated with dust at the mine, the mine operator must implement control measures that, so far as is reasonably practicable:</p> <p>(a) minimise the generation of potentially explosive dusts, and</p> <p>(b) suppress, collect and remove potentially explosive airborne dusts, and</p> <p>(c) suppress any dust explosion, and</p> <p>(d) restrict the propagation of any dust explosion so that other areas are not affected.</p>	

## 3.0 Objectives and Outcomes

**Table 3.1** presents the objectives and key performance outcomes relating to air quality management for the AQMP and the Quarry.

**Table 3.1 Air Quality Management Objectives and Key Performance Outcomes**

Objectives	Key Performance Outcomes
To implement appropriate air quality management and mitigation measures during all stages of Quarry operation so as to minimise harm to the environment.	All identified air quality management and mitigation measures implemented.
To implement a 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 implement an appropriate complaint handling and response protocol.	Complaints (if any) handled and responded to in an appropriate manner.
To implement appropriate corrective and preventative actions, if required.	Corrective and preventative actions implemented, if required.
To implement an appropriate incident reporting program, if required.	Incidents (if any) reported in an appropriate manner.

## 4.0 Baseline Air Quality

Monitoring of background dust deposition levels was undertaken for the original EIS in 1999 at four locations on or surrounding the Quarry Site (Pacrim, 2001). The average deposited dust levels in 1999 varied between 0.6 g/m<sup>2</sup>/month and 1.0 g/m<sup>2</sup>/month.

## 5.0 Air Quality Criteria

In accordance with *Condition 3(12)* of DA 344-11-2001, the air quality criteria for all operations undertaken on the Quarry site are provided by **Table 5.1**.

**Table 5.1 Quarry Air Quality Criteria**

Pollutant	Averaging Period	Criterion
Total suspended particulates (TSP)	Annual	90 µg/m <sup>3</sup>
Particulate matter < 10 µm (PM <sub>10</sub> )	24 hour	50 µg/m <sup>3</sup>
Particulate matter < 10 µm (PM <sub>10</sub> )	Annual	25 µg/m <sup>3</sup>
Particulate matter < 2.5 µm (PM <sub>2.5</sub> )	Annual	8 µg/m <sup>3</sup>
Deposited dust <sup>1</sup>	Annual Incremental Increase	2 g/m <sup>2</sup> /month
Deposited dust <sup>1</sup>	Annual Average Total Deposited Dust	4 g/m <sup>2</sup> /month
Note 1: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS 3580.10.1-1991: Methods for Sampling and Analysis of Ambient Air – Determination of Particulates – Deposited Matter – Gravimetric Method		

## 6.0 Air Quality Management System

### 6.1 Proactive Management Measures

#### 6.1.1 Operating Hours

All operations will be undertaken in accordance with the approved hours of operation presented in **Table 6.1**.

**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; and At no time on Sundays or public holidays.
Loading and Despatch of Trucks	Will be conducted at any time, provided these activities comply with the noise criteria in Table 2 of DA 344-11-2001.
Blasting	9:00am to 5:00pm Monday to Friday; 9:00am to 1:00pm Saturday; and At no time on Sundays or public holidays.
Maintenance	Will be conducted at any time, provided that these activities are not audible at any privately-owned residence.
Source: DA 344-11-2001 – Condition 3(1)	

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

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

In such circumstances prior notification shall be provided to the Department of Planning & Environment (DPE) 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.

#### 6.1.2 Operational Designs and Controls

To limit the generation of dust from potential sources of air contaminants, Walker Quarries will implement the following design features, dust minimisation and impact mitigation practices:

- Surface disturbance activities have been planned to limit the total surface disturbance at any one time.
- The seal on the Quarry Access Road between the Great Western Highway and the wheel wash (including the Surface Facilities Area) will be maintained to reduce dust tracking, degradation and surface dust lift-off.
- Progressive rehabilitation will include initial revegetation to provide a suitable groundcover that limits surface disturbance and the potential for dust lift-off.

- Blasting will be scheduled to avoid higher wind conditions, especially when winds from the south or southeast prevail (which may result in a plume of particulate matter towards the most affected receiver to the north and northwest).
- During periods of extended dry weather and/or high winds, when dust emissions have the potential to occur as a result of quarrying activities, dust is managed through the use of a water truck to suppress emissions.
- Exposed areas that are not covered in gravel will be watered under dry and windy conditions (visible dust plumes being the trigger for this action).
- All vehicles travelling on internal unsealed roads are limited to a speed appropriate for the conditions and safety, i.e. less than 40 km/hr.
- Load sizes will be limited to ensure product does not extend above truck sidewalls.
- Care will be taken to avoid spillage during loading.
- Dump heights from trucks, front-end loaders and conveyors will be minimised.
- Trucks entering and leaving the premises that are carrying loads will be covered at all times, except during loading and unloading.
- All trucks leaving the Quarry will make use of the wheel wash facility to limit dust tracking on the sealed Quarry Access Road and the Great Western Highway.
- Truck queuing and unnecessary idling of trucks and unnecessary trips will be reduced through logistical planning, where possible.

The Company will continue to implement the following measures to minimise the emissions of greenhouse gases during the ongoing life of the Quarry:

- Optimise quarry design to minimise:
  - travel distances for equipment; and
  - rehandling of overburden, products and by-products.
- Use mobile equipment which is regularly maintained and serviced to maximise efficiency.
- Minimise the quarry footprint to reduce land disturbance and travel distances for mobile equipment.

### 6.1.3 Air Quality Monitoring

A program of air quality monitoring will be undertaken at nominated locations and the results and performance of the site operations discussed with local residents and landholders. Monitoring is further discussed in **Section 7**.

## 6.2 Reactive Management Measures

### 6.2.1 Triggers

Four triggers for reactive management will be applied.

1. Air Quality Complaint. Any complaint received, either directly or via Council, Environmental Protection Authority (EPA) or other regulatory agency, will trigger the implementation of the response and corrective action measures described in **Section 6.2.2.1**.
2. Exceedance of air quality criteria established through emissions monitoring. Any record of dust exceeding the criteria nominated in **Section 5.0** will trigger the response and corrective action measures described in **Section 6.2.2.2**.
3. Extraordinary events or conditions. Extraordinary events relevant to the Quarry include events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Secretary of the DPE. Adverse weather conditions such as high winds and excessively dry periods will be considered as triggers for reactive management (refer to **Section 6.2.2.3**).
4. Elevated Deposited Dust Monitoring. Should the 12 monthly rolling average for deposited dust results trend at a monthly level that exceeds 4.0 g/m<sup>2</sup>/month Walker Quarries will trigger the response measures described in **Section 6.2.2.4**.

### 6.2.2 Response and Corrective Actions

#### 6.2.2.1 Air Quality Complaint

A Complaints Management Procedure is provided in *Section 6.2* of the Environmental Management Strategy (EMS). 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 dust-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 remediate this 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.

Complaints of a general nature, e.g. “dust from the Quarry” will be investigated and an appropriate response provided to the complainant.

### 6.2.2.2 Air Quality Criteria Exceedance

If monitoring (completed as described in **Section 7.0**) indicates that the approved criteria has been exceeded, the following response and action plan will be implemented:

1. After obtaining exceedance information, the Quarry Manager (or delegated representative) will review meteorological conditions to assess whether these were a factor in the result.
2. The Quarry Manager will immediately investigate the source of the emissions, review the activities undertaken at the time and, if necessary, amend operations to reduce emissions.
3. Following a confirmed exceedance of air quality criteria<sup>1</sup>, the Quarry Manager will immediately<sup>2</sup> notify the DPE and the EPA of the exceedance and actions being taken to remediate the source of excessive dust.
4. Within 7 days of the date of confirming the exceedance, and notification of the DPE and EPA (Step 3), the Quarry Manager will provide a detailed report on the incident to DPE and the EPA which includes:
  - (a) the time and date of the incident;
  - (b) relevant details of the incident; and
  - (c) measures taken to (or to be taken) prevent re-occurrence.
5. Within 2 weeks of obtaining any data showing an exceedance of air quality criteria, the Quarry Manager will notify (in writing) any affected landowners or tenants. The notification will include a copy of the most recent version of the NSW Health fact sheet entitled “Mine Dust and You”.
6. Any exceedance of the approved air quality criteria will be reported to the EPA in the Annual Return and to DPE in the Annual Review.

If an exceedance of air quality criteria is confirmed, Walker Quarries will request the laboratory to complete a more detailed analysis of the particulate matter to better understand the source of the dust and any risks which could be associated with this.

### 6.2.2.3 Extraordinary Events or Conditions

Extraordinary events include any of the following, relevant to operations at the Quarry:

- Bushfires.
- Prescribed burning.
- Dust storms.
- Fire incidents.
- Any other activity agreed by the Secretary.

During times when these conditions are forecast or observed it would be at the Quarry Manager’s discretion to limit or modify operational activities to ensure that air quality impacts are limited. This may

<sup>1</sup> It is noted that dust deposition, while monitored monthly, is assessed against an annual average criteria. Therefore, only rolling 12 month average dust deposition level is assessed against compliance criteria (refer to Section 5).

<sup>2</sup> Immediately being the first opportunity following identification of the exceedance and establishment of initial actions to reduce emissions (and within 24-hours of the incident).



require shutting down the operation completely during extraordinary events or conditions, to limit potential dust impacts.

An exceedance of the air quality criteria during a period that is coincident with extraordinary events or conditions, will not be considered a non-compliance against the criteria where it can be determined that the exceedance relates to emissions recorded during the extraordinary events or conditions. The recorded emissions will be considered anomalous in these cases.

#### **6.2.2.4 High Levels of Monitored Deposited Dust**

Compliance with the deposited dust criteria described in **Section 5.0** is measured as an annual average of monthly monitoring results. *Condition 3(12)* of DA 344-11-2001 requires monthly monitoring of deposited dust, however, it is acknowledged that elevated deposited dust levels (i.e. approaching the criteria level) may also indicate the possibility of an exceedance of approved particulate matter levels.

Any monthly deposited dust result that exceeds  $4.0 \text{ g/m}^2/\text{month}$  will be investigated by the Company on receipt of the results from the laboratory. If the result is assessed to be anomalous due to factors beyond the control of Walker Quarries, and Walker Quarries proposes to exclude from calculation of the rolling 12 month average, the DPE will be notified of the investigation, outcome and request to exclude within 10 working days of the conclusion of the investigation. Unless advised otherwise by the relevant authorities', the anomalous result will then be excluded from the calculation of the 12 monthly rolling average of deposited dust results.

Should the 12 monthly rolling average of monthly deposited dust monitoring results exceed  $4.0 \text{ g/m}^2/\text{month}$ , Walker Quarries would implement a program of particulate matter monitoring to ensure that particulate matter levels (i.e. TSP and  $\text{PM}_{10}$ ) remain within the levels approved in DA 344-11-2001. The particulate matter monitoring would be consistent with Australian Standards and records would be kept, published and reported in accordance with **Section 9.0** of this AQMP.

## 7.0 Air Quality Monitoring Program

### 7.1 Introduction

This sub-section describes the air quality monitoring program that will be implemented to meet the conditions of consent and assist Walker Quarries to protect the local environment and amenity of the surrounding rural setting and to minimise the likelihood of air quality-related complaints.

### 7.2 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
Sigma theta	°	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

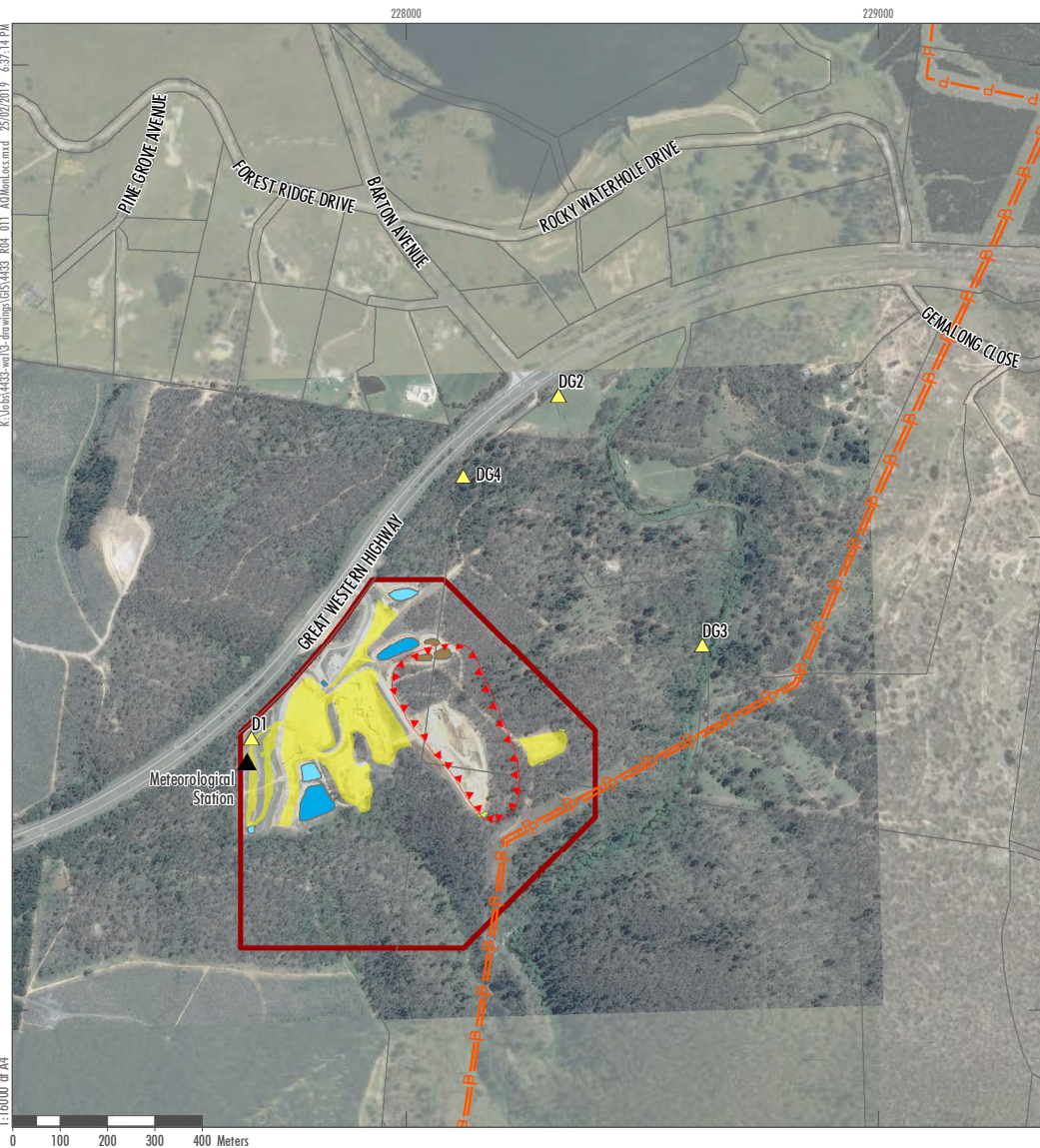
### 7.3 Ambient Air Emissions Monitoring

#### 7.3.1 Introduction

In order to demonstrate compliance with the air quality criteria described in **Section 5.0**, Walker Quarries will implement an air emissions monitoring program as described in **Table 7.2**. The following subsections describe the methodology, frequency, analysis and evaluation of monitoring results.

**Table 7.2 Ambient Air Quality Monitoring Program**

Pollutant	Units of Measure	Averaging period	Frequency	Sampling Method <sup>1</sup>
Deposited Dust	g/m <sup>2</sup> /month	Month, Annual	Continuous	AM-19
Particulate matter < 10µm (PM <sub>10</sub> ) <sup>2</sup> / Particulate matter < 2.5µm (PM <sub>2.5</sub> ) <sup>2</sup>	µg/m <sup>3</sup>	24 Hour	Continuous	AM-18
<p>Note 1: For more information refer to DEC (now EPA) 2007, Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (guideline has been superseded by DEC, 2007)</p> <p>Note 2: To be implemented should the rolling average of monthly deposited dust monitoring results reach a trigger level of 3.5g/m<sup>2</sup>/month.</p>				



### Legend

- Quarry Site - ML1633
- Stockpile Area
- Sediment Basin
- Silt Cell
- Storage Dam
- Cadastral boundary
- ▲ Air Quality Monitoring Locations
- ▲ Meteorological Station
- P— Power Line

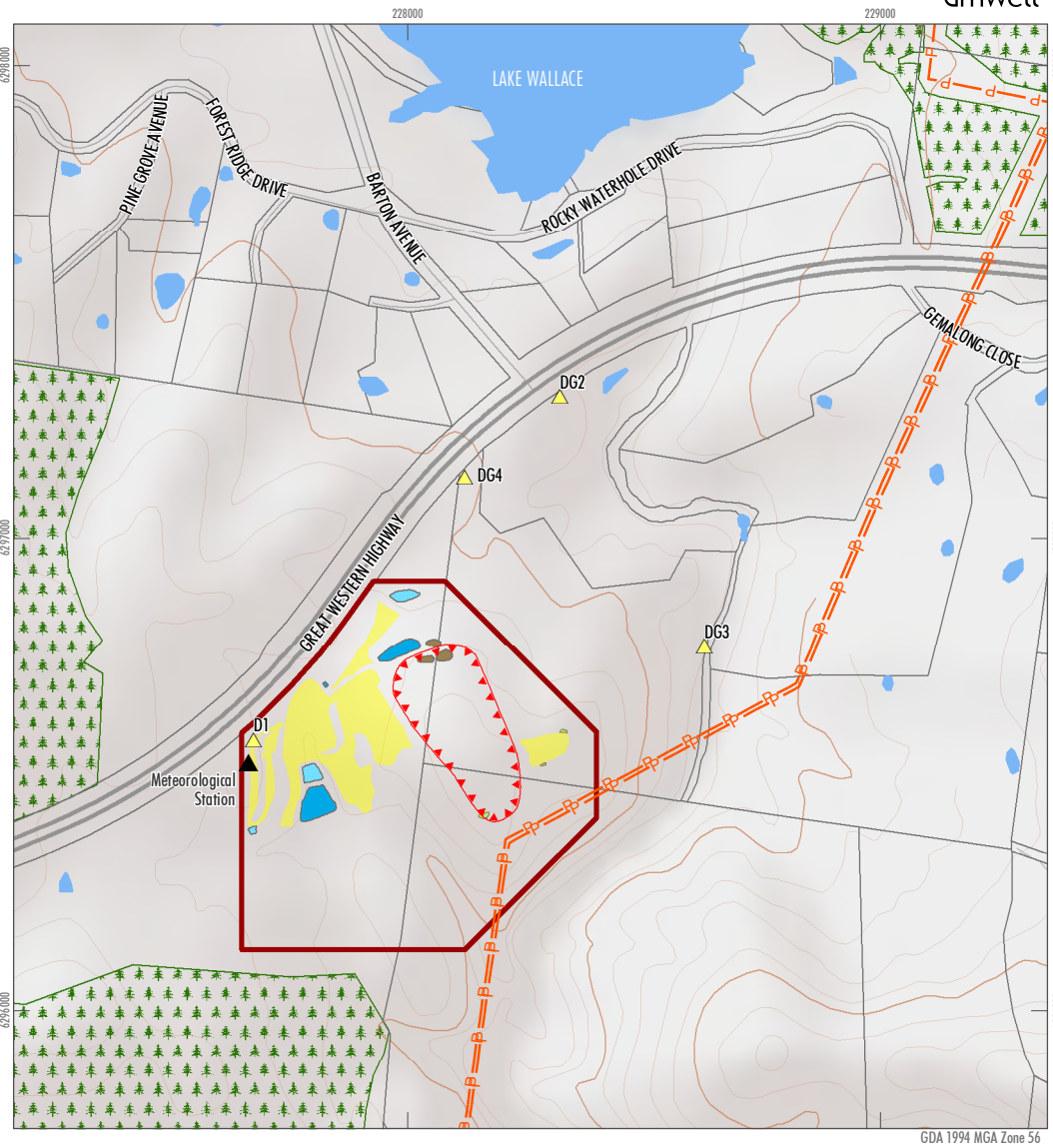


FIGURE 7.1  
Air Quality Monitoring Locations

As described in **Section 6.2.2.4**, the monitoring program will commence with a continuation of monthly monitoring of deposited dust.

Should the results of deposited dust monitoring indicate elevated air emissions, Walker Quarries will implement a program of particulate matter monitoring to ensure that particulate matter levels (i.e. TSP and PM<sub>10</sub>) remain within the levels approved in DA 344-11-2001. Elevated air emissions will be indicated where the rolling 12 month average of deposited dust (refer to **Section 7.3.3**) exceeds el of 4.0 g/m<sup>2</sup>/month.

The following sub-sections:

- identify the air quality monitoring location;
- described the methods for sampling and analysing deposited dust and (if required) airborne particulate matter emissions; and
- provide the procedure for evaluation of results.

### 7.3.2 Air Quality Monitoring Locations

Four dust deposition gauges have been established to monitor ambient air quality (see **Figure 7.1**). The locations have been chosen to allow for an assessment of the levels discharging from the Quarry Site or land owned by the Company. This version of the AQMP identifies a relocation of dust gauges D2, D3 and D4 as follows:

- D2 has been relocated to the north to provide a better indication of dust levels which could be received at the residential receivers of Rocky Waterhole Drive to the north of the Great Western Highway. The owner and resident of 987 Great Western Highway (Lot 1 DP 872230), on which the dust gauge is located, has agreed to this position (see **Appendix 4**).
- D3 has been relocated to the northeast as this is in a more direct line between the quarrying operations and residential receivers to the northeast. The location also improves access and safety for personnel collecting and replacing the gauge each month.
- D4 has been relocated to a cleared easement on the Company owned property to the direct north of the quarry operations. This will allow for dust levels which could affect property owners of Cypress Place to the north to be monitored and also improves access and safety for personnel collecting and replacing the gauge each month.

D1 has been established at the north western perimeter of the Quarry Site to assess dust leaving the Quarry in this direction (which could potentially affect traffic on the Great Western Highway).

If airborne particulate matter monitoring is triggered, this would be undertaken at D4 (as identified on **Figure 7.1**).

### 7.3.3 Deposited Dust

#### 7.3.3.1 Equipment

Each deposited dust gauge comprises the following components:

- A metal post and holder.
- A glass flagon (4 litre).
- A 150mm diameter glass funnel (and rubber stopper).



Deposited dust gauges have been installed in accordance with Australian Standard (AS) AS 3580.10.1-1991 which requires the top of the glass funnel to be 2.0m + 0.1m above the surrounding ground level.

### 7.3.3.2 Methodology

Deposited dust monitoring will be undertaken in accordance with the following documents:

- AS 2922:1987 Ambient Air – Guide for the Siting of Sampling Units (AM-1).
- NSW DEC Approved methods for the sampling and analysis of air pollutants in NSW (DEC, 2005).
- AS/NZS 3580.10.1:2003 Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method (AM-19).

### Site Office Procedures

The following procedures are to be undertaken by site personnel involved in the collection of deposited dust gauges prior to leaving the office:

1. Check all new sample bottles have the required quantity of copper sulphate added.
2. Check all equipment for use in the sample collection / changeover is present and functional.

### Field Procedures

The following procedure is to be adopted by site personnel for the collection/changeover of sample bottles:

1. Carefully remove the sample bottle and funnel from the sample holder (be careful of spiders etc.).
2. Wash down the inside surface of the funnel with approximately 50mL of distilled water into the sample bottle, brushing using the bottle brush.
3. Remove the stopper and funnel from the sample bottle, taking care not to break the funnel and immediately place a cap on the sample bottle.
4. Complete the labelling of the sampling period on the sample bottle (see example below).

Site:

Sampling Location:

Sample Number:

Sampling Period:

5. Place the stopper and cleaned funnel on the new bottle.
6. Ensure that the new bottle is properly numbered and the commencement date of the sampling period is recorded on the bottle.
7. Replace the new bottle and funnel in the sample holder ensuring the top of the funnel is horizontal.
8. Ensure all relevant data and comments are written on the deposited dust monitoring sheet and chain of custody form before leaving each site. It is a requirement of EPL 13172 (*Condition M1.3*) that the following elements are recorded for each sample.
  - The date on which the sample was taken.
  - The time at which the sample was taken.
  - The point at which the sample was taken.

- The name of the person who collected the sample.

Any changes in land use immediately adjacent to the gauge since the last collection period will be documented. These might include any work on local roads or changes to nearby vegetation. Any contamination by extraneous material including vegetation, bird droppings, insects, etc. will be recorded on the deposited dust monitoring sheet and chain of custody.

### Sample Despatch

All surface dust samples are carefully packed and despatched via courier to ALS laboratories in Lithgow for analysis.

The samples are accompanied by the dust monitoring sheet and laboratory submission sheet. Copies of both sheets are to be retained for Walker Quarries' records.

### 7.3.3.3 Frequency

Deposited dust will be measured and documented on a monthly basis. Exposed gauges will be replaced on a three-monthly basis with analysis conducted at a National Association of Testing Authorities (NATA) accredited laboratory for insoluble solids.

### 7.3.3.4 Analysis

Deposited dust levels will need to be analysed by a NATA registered laboratory in accordance with AS 3580.10.1 – 2003 and yield data on:

- total insoluble solids ( $\text{g}/\text{m}^2/\text{month}$ );
- ash fraction ( $\text{g}/\text{m}^2/\text{month}$ ); and
- percentage ash (an indication of organic/inorganic component of dust).

## 7.3.4 Particulate Matter

### 7.3.4.1 Trigger

As noted in **Section 6.2.2.4**, should the results of deposited dust monitoring indicate that the rolling annual average for deposited dust is exceeding  $4.0 \text{ g}/\text{m}^2/\text{month}$ , Walker Quarries would implement a three-month program of particulate matter monitoring at D4 (see **Figure 7.1**).

### 7.3.4.2 Methodology

If required, monitoring will be undertaken using a High Volume Air Sampler (HVAS) or equivalent equipment with an inlet to exclude particulate matter larger than  $10\mu\text{m}$  in diameter.

Monitoring will be undertaken in accordance with the following documents:

- AS 29221987 Ambient Air – Guide for the Siting of Sampling Units (NSW DECCW Method AM-1).
- NSW DECCW Approved methods for the sampling and analysis of air pollutants in NSW (DECC, 2005).
- AS/NZS 3580.9.6:2015 Methods for sampling and analysis of ambient air Determination of suspended particulate matter –  $\text{PM}_{10}$  high volume sampler with size selective inlet – Gravimetric method.

Compliance with annual average  $\text{PM}_{10}$  criteria will be indicative of compliance with the criterion for Total Suspended Particulates (TSP) (noting  $\text{PM}_{10}$  generally represents greater than 35% of TSP). In the event that

PM<sub>10</sub> concentrations approach (within 20%) or exceed criteria, additional monitoring of TSP will be commenced. Under these circumstances, the inlet will be modified to allow for the collection of data of data on TSP.

#### 7.3.4.3 Frequency

Monitoring will occur for a 24-hour period, set to an automatic rotation of every 6 days. The filter paper will be collected between sampling days. The filters will be stored individually prior to despatch to a NATA registered laboratory for analysis.

The program of monitoring will occur over an initial period of three months with the results reviewed at the end of this initial period to determine if the monitoring needs to continue. Should particulate matter monitoring results indicate minor particulate matter levels and the rolling average of monthly deposited dust monitoring results has fallen below the trigger level, the program of particulate matter monitoring will cease.

#### 7.3.4.4 Analysis

Particulate matter will need to be analysed by a NATA registered laboratory in accordance with AS 3580.9.6 – 2015 and yield data. On receipt of the 24-hour monitoring results, immediate comparison to 24-hour criterion can be undertaken. The data will be averaged annually for assessment against the annual average criterion.

#### 7.3.5 Evaluation of Results

A copy of monthly dust monitoring results will be reviewed internally, and periodically by an external environmental consultant, and a rolling 12-month average compared against dust deposition criteria. A 12-monthly (rolling) average exceeding 4.0 g/m<sup>2</sup>/month will trigger the consideration of the reactive management measures of **Section 6.2**.

### 7.4 Respirable and Inhalable Dust Monitoring

An assessment of a deposited dust sample from the Quarry using stereomicroscopy and scanning electron microscopy (UQMP, 2016) has identified that airborne dust contains aluminium and silicon with minor amounts of organic matter and traces of metals and black rubber dust. These results are consistent with the quartzite material approved for extraction.

Silica (SiO<sub>2</sub>) exists as crystalline and amorphous forms and is a component of quartzite. Prolonged or excessive exposure to airborne crystalline silica through dust can result in accumulation in the lungs causing the respiratory disease silicosis.

The Gazetted limit for the concentration of respirable quartz-containing dust for open cut mines was established in the NSW Government Gazette No. 185 on December 21 20073 as 0.1 mg/m<sup>3</sup> (as it related to coal mines).

Gazette No. 185 specified the frequency of sampling, places and persons to be sampled for any program of sample collection and analysis from the breathing zone of people whose health will be affected by the dust. **Table 7.3** displays the required monitoring program.

<sup>3</sup> <http://www.resourcesandenergy.nsw.gov.au/miners-and-explorers/safety-and-health/legislation/gazettals/coal-mine-health-and-safety-act-gazette-notices>

**Table 7.3 Quartzite Dust Sampling**

Location	Frequency of sampling respirable quartz –containing dust	Persons to be sampled
In any place in or about an open cut mine where dust is be present.	Not greater than 12 months.	Samples to be collected from the breathing zone of at least five persons including, where possible. <ul style="list-style-type: none"> <li>– Drill operators, shot-firers and stemmers.</li> <li>– Mobile equipment operators.</li> </ul>
Source: Modified after NSW Government Gazette No. 185 December 21 2007		

Dust sampling within the breathing zone of personnel will be undertaken in accordance with the AS 2985 - Workplace Atmospheres – Method for sampling and gravimetric determination of respirable dust.

If a concentration of airborne dust in a sample exceeds the gazetted limit then the person from whom the sample was taken shall be informed of the failed result and action taken to reduce the concentration of dust exposure to that person. Arrangement shall then be made for a resample of that person in similar circumstances. If the second sample fails, further action shall be taken to reduce the concentration of dust exposure to that person and the relevant Government agencies will be notified.

Records will be kept of all samples taken and the results of the analysis of those samples as well as any actions required in response to the results of samples.



## 8.0 Incident Management, Notification and Reporting

### 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 *NSW Protection of the Environment Operations Act, 1997* (POEO Act), harm to the environment is deemed to be material if:

- a) it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial; or
- b) 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 causes or threatens to cause material harm to the environment (and an exceedance of air quality criteria) is referred to as a **Pollution Incident**.

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

In accordance with Section 14 of the *Work Health and Safety (Mines and Petroleum Sites) Act 2013 No 54* (WHS Act 2013), a **Notifiable Incident** means:

- the death of a person, or
- a serious injury or illness of a person that is prescribed by the regulations, or
- a dangerous incident prescribed by the regulations.

### 8.2 Incident Management and Notification

#### 8.2.1 Non-compliance Incident

On identification of non-compliance against air quality criteria, following a receipt of a complaint, the Quarry Manager will be notified, who will immediately notify the Secretary of DPE as required by *Condition 5(9)* of DA 344-11-2001. An investigation will then be commenced into the source of the non-compliance or complaint commenced in accordance with the response and corrective actions described in **Section 6.2.2**. Within 7 days of the incident, Walker Quarries will submit a detailed report on the incident to the Secretary of DPE, as required by *Condition 5(10)* of DA 344-11-2001. This report will include the time and date of the incident, details of the incident, measures implemented to prevent re-occurrence, and identification of any non-compliance with DA 344-11-2001.

### 8.2.2 Pollution Incident

In the event of an air quality-related incident which is deemed a **Pollution Incident**, the Quarry Manager will be notified who will initiate the Quarry Pollution Incident Response Management Plan (PIRMP) notification and management procedures. This will include reporting to the EPA (via the Environmental Line 131 555), and to the Secretary of DPE, at the first opportunity (and within 24-hours of the incident).

An investigation into the cause of the exceedance will be immediately commenced and once identified the Quarry Manager or delegate will implement one or more of the corrective measures identified in **Section 6.2.2**.

Within 7 days of the incident, Walker Quarries will submit a detailed report to the EPA, in accordance with *Condition R2.2* of EPL 13172, and to the Secretary of the DPE in accordance with *Condition 5(10)* of DA 344-11-2001, that describes the time and date of the incident, details of the incident, the cause of the incident, actions taken and ongoing management to prevent re-occurrence, and identification of any non-compliance with DA 344-11-2001.

### 8.2.3 Notifiable Incident (WHS Act 2013)

In the event of a notifiable air-quality incident under the WHS Act 2013, the Quarry Manager will ensure that the regulator and the Secretary of the DPE are notified after becoming aware the incident has occurred. The regulator and the Secretary of the DPE will be notified by telephone or by writing (email or facsimile) within 48 hours of the incident occurring.

### 8.2.4 Complaint

Refer to **Section 6.2.2.1**.

## 8.3 Incident Reporting

Following implementation and review of the corrective measures, a short description of the incident, actions taken and results of the corrective actions will be documented by the Quarry Manager.

Within three months of the submission of an incident report, the Quarry Manager will review this AQMP and any other relevant strategies, plans and programs required under DA 344-11-2001 and revise them if required. Walker Quarries will notify the DPE in writing that this review is being undertaken. If the review does lead to revision, the Company will submit the revised AQMP to the DPE within 3 months of the incident for approval.

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 the DPE.

## 9.0 Data Management and Reporting

### 9.1 Review and Recording of Monitoring Data

Walker Quarries will retain records of meteorological monitoring and air quality 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 air quality monitoring reports as appendices to the Annual Review. That document, once approved by the relevant government agencies, would be published on the company's website.

In accordance with the requirements of Section 66(6) of the *Protection of the Environment Operations Act 1997*, each month Walker Quarries will publish a meaningful summary of all ambient pollution monitoring data on the company's website. The summary will be published within 14 days of the last sample for that period being collected. In addition, Walker Quarries will provide a copy of obtained data (the value of each individual monitoring sample) 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).

A summary of all monitored data will be included in the Annual Return submitted to the EPA.

# 10.0 Plan Implementation

## 10.1 Roles and responsibilities

**Table 10.1** outlines the roles and responsibilities of personnel with reference to management of air quality.

**Table 10.1 Roles and Responsibilities of Personnel with Respect to Management of Air Quality**

Role	Responsibilities
Managing Director	<p>Ensure compliance with the AQMP.</p> <p>Ensure adequate resources are available to implement the AQMP.</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 the implementation of the AQMP.</p> <p>Ensure quartzite monitoring requirements are adhered to (in accordance with legislation).</p> <p>Ensure air quality 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 Air Quality Management System (see <b>Section 6.0</b>).</p> <p>Relocate or postpone relevant activities in the event of adverse weather conditions.</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 (see <b>Section 8.0</b>).</p> <p>Inform the Managing Director of identified causes of elevated dust and any alterations to site operations that has influenced dust levels.</p> <p>Coordinate the review of the AQMP (see <b>Section 10.3</b>).</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 AQMP.</p> <p>Report any anomalous dust plumes 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>

## 10.2 Competence training and awareness

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

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

## 10.3 Plan Review

In accordance with the EMS, this AQMP will be reviewed within three months of any significant modifications to operations that will influence air quality management, any internal or external audits undertaken of the Quarry and following any notifiable incident.

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

- a) incident as defined by **Section 8.1**;
- b) Annual Review<sup>4</sup>;
- c) an Independent Environmental Audit completed in accordance with *Condition 5(13)* of DA 344-11-2001; and
- d) any modifications to this consent.

This will ensure the adequacy of the AQMP and allow for opportunities for adaptive management and continual improvement. This will include a review of monitored dust levels and monitoring frequency and methods, as necessary. Each review will also evaluate the effectiveness of the overall air quality monitoring program and whether it should be modified or scaled back.

---

<sup>4</sup> The Annual Review is due by 30 September each year.

## 11.0 References

Department of Environment and Conservation (DEC) (2007). Approved Methods for Sampling of Air Pollutants in New South Wales.

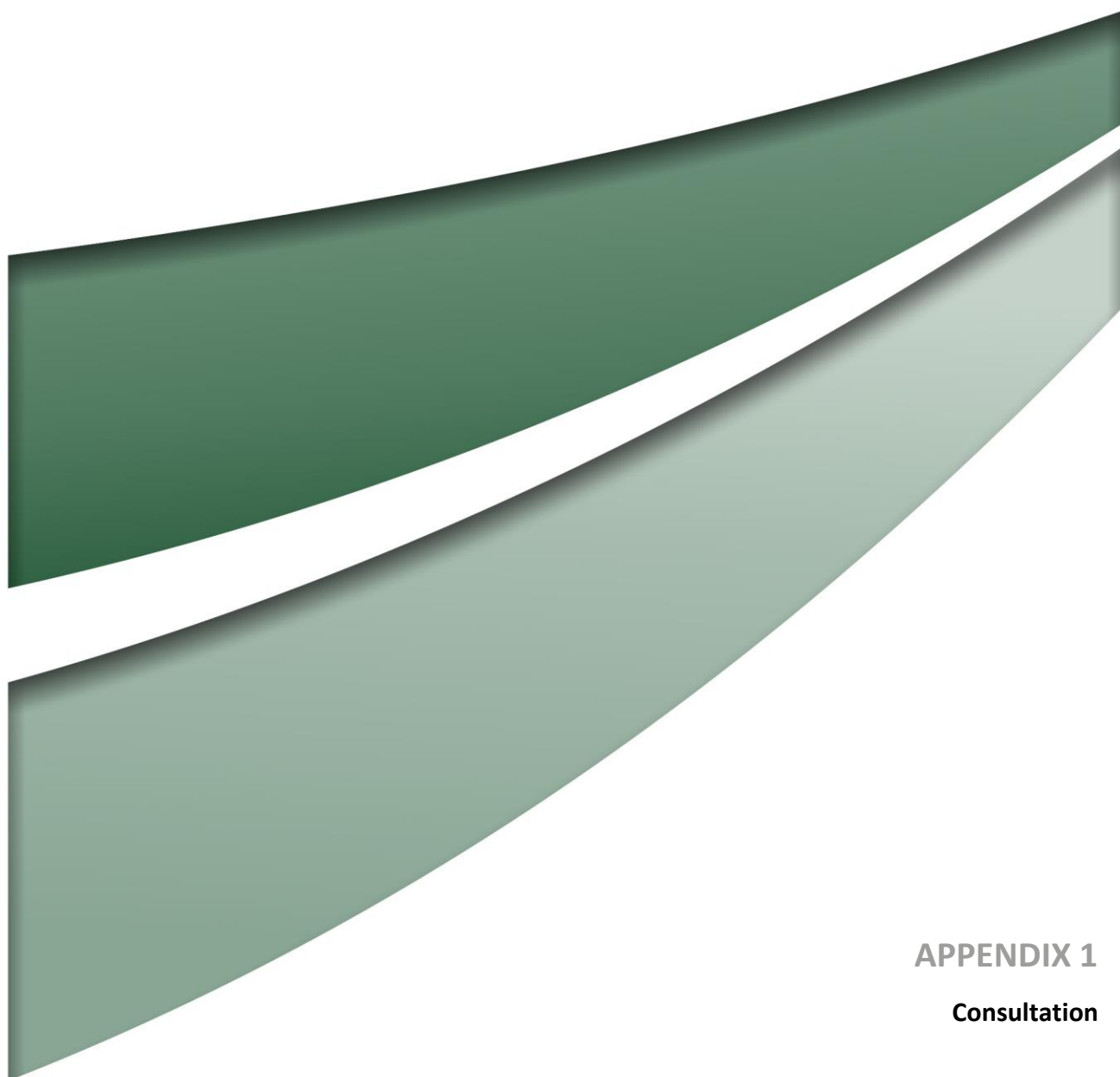
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Pacrim Environmental (Pacrim) (2001). Environmental Impact Statement Proposed Wallerawang Quarry. Prepared for Sitegoal Pty. Limited, November 2001 (report 01/206.1).

RW Corkery & Co. Pty Limited (RWC) (2017). Environmental Assessment for Modification to Operations at the Wallerawang Quarry (DA 344-11-2001). Prepared on behalf of Walker Quarries Pty Ltd (Report No. 949/05).

UQ Material Performance (UQMP) (2016). Examination of Dust Fallout Gauge Deposit By Stereomicroscopy and Scanning Electron Microscopy. Prepared for Walker Quarries Pty Ltd, May 2016 (report C02202.37).



## APPENDIX 1

### Consultation

---

**From:** Alex Irwin  
**Sent:** Thursday, 10 January 2019 1:29 PM  
**To:** 'Jack.Murphy@planning.nsw.gov.au'  
**Cc:** 'Chris Schultz'; 'genevieve.seed@planning.nsw.gov.au'; Paul Hensley; Kerry Burke; Chelsea Balcomb  
**Subject:** 4432B\_Wallerawang Quarry\_Review of Management Plans

Jack,

This email is provided to inform the Department (in accordance with Condition 5 of Schedule 5 of DA 344-11-2001) that Walker Quarries has engaged Umwelt (Australia) Pty Ltd to review the management strategies, plans and programs of DA 344-11-2001. The strategies, plans and programs to be reviewed are as follows.

- Noise Management Plan.
- Blast Management and Explosives Control Plan.
- Soil and Water Management Plan.
- Biodiversity Management Plan.
- Bushfire Management Plan.
- Air Quality Management Plan.

Any updates to these will be submitted to the Department of approval by 21 February 2019.

The Quarry Rehabilitation Plan, incorporated into the Quarry Mining Operations Plan, has been reviewed with no changes proposed. A letter was submitted to the Resources Regulator (by RW Corkery & Co Pty Limited on 11 December 2018) requesting a 12 month extension to the period covered by this document.

Please let me know if the Department requires any other information at this stage.

Regards,

**Alex Irwin**  
Principal Environmental Consultant

**Umwelt (Australia) Pty Limited**  
Office 1, 3 Hampden Avenue  
Orange, NSW 2800

Phone: (02) 4950 5322  
Mobile: 0436 606 529

[www.umwelt.com.au](http://www.umwelt.com.au)

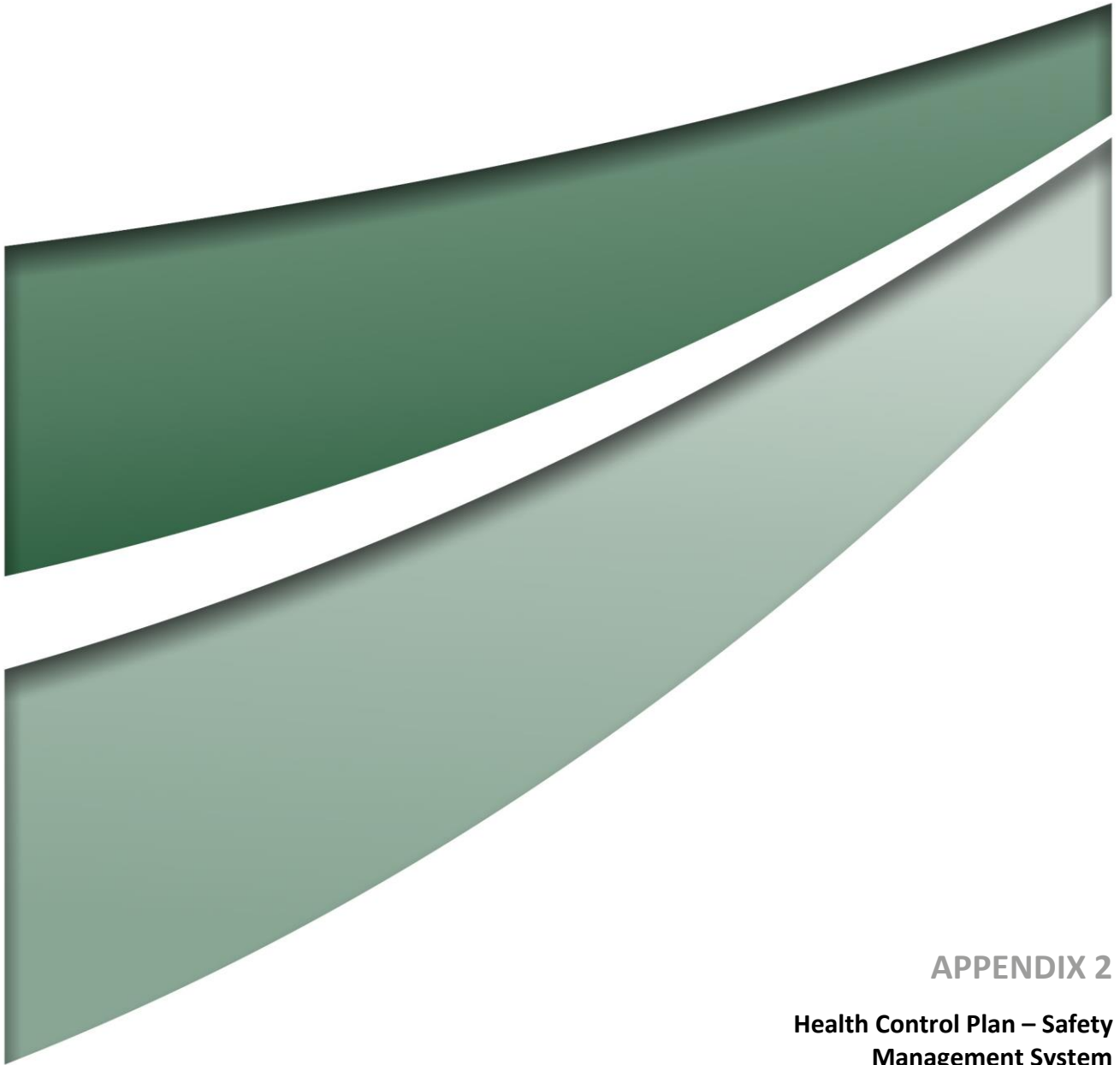
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## APPENDIX 2

### Health Control Plan – Safety Management System



# **HEALTH CONTROL PLAN & SAFETY MGMT SYSTEM**

<b>Document No:</b>	<b>WQ-SMS-001</b>
<b>Revision:</b>	<b>Three</b>
<b>Prepared by:</b>	<b>Howard Domsalla</b>
<b>Authorised By:</b>	<b>Ray Sharwood</b> Quarry Manager
<b>Reviewed By:</b>	<b>Trevor Hoffmann</b> <b>Ross Brownlow</b> <b>Paul Hensley</b>
<b>Re-Issue Date:</b>	<b>November 2018</b>
<b>Next Review Date:</b>	<b>November 2020</b>

WALLERAWANG QUARRY		Date: November 2018	
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## 1. INTRODUCTION

The former Hoskins Quarry was located adjacent to the Wallerawang Quarry and last operated in 1927, although the current owners collected a small sample from this quarry for testing purposes in 1994. Also, a surface gravel quarry was in operation to the east and across the Cox's River from the Wallerawang Quarry until recent years, when it was rehabilitated and incorporated into the Riverfront Acres Subdivision.

A resource of quartzite (and small amount of overburden material) in excess of 12.4 Mt has been proven at the site and Walker Quarries Pty Ltd is producing quartz/aggregate from this hard rock quarry with a life expectancy exceeding 20 years. It will be developed over three stages, resulting in a total disturbed area of approximately 11 hectares. Production will vary between approximately 150,000 T/pa to a maximum of 500,000 T/pa, dependent upon market demand.

## 2. PURPOSE

The Walker Quarries Health Control Plan & Safety Management System, states how the health and safety of people who work at the Quarry or who are directly affected by the Quarry will be protected.

This Health Control Plan & Safety Management System defines the arrangements by which Walker Quarries Pty Ltd will provide the resources and other requirements to establish an assurance that all Principal Mining Hazard Management Plan and risks arising out of site activities are effectively managed and controlled.

- The Walker Quarries Health Control Plan & Safety Management System intent is to meet, in principal, the aims and objectives with the following Clauses of the Work Health and Safety (Mines & Petroleum) Regulations 2014
  - Clause 9 Management of Risks to Health and Safety
  - Clause 13 Duty to establish Safety Management System
  - Clause 14 Content of Safety Management System
  - Clause 28 (3) Health Control Plan
- To meet, in principal, the aims and objectives of the Work Health and Safety Policy
- Provide systems, standards, procedures, processes, information and communication relevant for the control of risks.
- Ensure that personnel are sufficiently aware of their authority and responsibility under this system and all Work Health and Safety legislation.
- Provide effective measurement and monitoring of the control measures to ensure the Health Control Plan continued adequacy and effectiveness.
- Provide a means for auditing to ensure the safety of all workers.
- Provide a system for employees and contractors to assess risks.
- Provide a means of accident and incident reporting and investigation.
- To provide a consultation and communication protocol for all people working on site as required in the Work Health and Safety (Mines & Petroleum) Regulations 2014.

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### 3. SCOPE

This Health Control Plan & Safety Mgmt System will apply to the Wallerawang Quarry and will include and not limited to:

- Principal Mining Hazard Management Plan
- Principal Control Plans

This Health Control Plan & Safety Mgmt System shall provide:

- Identification of Hazards.
- Development of Controls.
- Implementation of Controls though:
  - Procedures.
  - Standards
  - Reports

This Health Control Plan & Safety Mgmt System will apply to all persons at the Wallerawang Quarry Mining Operation and includes employees, contractors and visitors.

### 4. OBJECTIVES AND TARGETS

Walker Quarries Pty Ltd has set out performance standards and audits and measures its performance against these indicators as required in the Work Health and Safety (Mining & Petroleum) Regulations Part 2 clause 15.

The following table shows the planned Key Performance Indicator percentages for 2019.

Key Performance Indicators	Q1	Q2	Q3	Q4	2019 Target
Monthly Communication Meetings	Complete 1 meetings	Complete 1 meetings	Complete 1 meetings	Complete 1 meetings	100%
Principal Mining Hazard Management Plan Audits	Satisfactory evidence of consistent application each Quarter.	Satisfactory evidence of consistent application each Quarter.	Satisfactory evidence of consistent application each Quarter.	Satisfactory evidence of consistent application each Quarter.	100%
Principal Control Plans	Satisfactory evidence of consistent application each Quarter	Satisfactory evidence of consistent application each Quarter	Satisfactory evidence of consistent application each Quarter	Satisfactory evidence of consistent application each Quarter	100%
Alcohol and Other Drug Testing	Compliance	Compliance	Compliance	Compliance	100%
Safety Toolbox Meeting	Complete 2 meetings	Complete 2 meetings	Complete 2 meetings	Complete 2 meetings	100%

## **5. Walker Quarries Policies**

Work Health and Safety Policy

Drug & Alcohol Policy

Fatigue Policy

Environmental Policy

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## Work Health and Safety Policy

Walker Quarries is committed to delivering industry-leading Work Health and Safety standards throughout its operation.

Walker Quarries is fully committed to providing for the health and safety of its employees, contractors, service providers and visitors.

This will be achieved through effective Health, Safety Management Industry Systems and Practices that will allow work activities to be carried out safely and efficiently.

To deliver on this commitment, Walker Quarries will:

- Comply with the requirements of relevant Work Health and Safety (Mines and Petroleum) Legislation, Codes of Practice, Standards and where applicable, recognised industry best practice;
- Through consultation with all stakeholders, develop, implement and maintain a Health, Safety Management System as required by Work Health and Safety (Mines and Petroleum) Act and Regulations, including Hazard Identification and Risk so that potential hazards are identified, risk assessed and controlled to eliminate the risk, or to minimise the risk to as low as reasonably practicable (ALARP);
- Establish measurable Work Health and Safety objectives and targets which will facilitate continuous elimination or reduction of work related injury and illness;
- Continually strive towards a target of zero injuries or illnesses;
- Confirm that the Walker Quarries Management demonstrates leadership in Work Health and Safety, through their behaviour and support of the systems that are in place at all times;
- Continuously improve on the Safety Management Systems and work practices through regular audit, review and consultation with all stakeholders;
- Confirm that this Work Health and Safety Policy is prominently displayed throughout the Workplace and is communicated to all employees, contractors, service providers and visitors;
- Investigate all incidents and near misses and take corrective action to prevent recurrence; and
- Provide an effective injury management and rehabilitation for all employees.

In accordance with the requirements of the Walker Quarries Health & Safety Management System, all employees, contractors, service providers and visitors are expected to comply with our systems when working or visiting site, follow safe work practices where applicable, observe all safety rules and report hazards, incidents and near misses to a Wallerawang Quarry Supervisor.

Dave Murray:

  
Managing Director

Date: .....20<sup>th</sup> October 2017

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# *Walker Quarries Pty Ltd*

## *Fatigue Management Policy*

**The Fatigue Management Policy provides a framework for managing and understanding fatigue and minimising and controlling the risks associated with fatigue in the workplace.**

### **AIMS**

- Individuals are fit for work
- The Company meets its obligations to employees, contractors and the community by carrying out its operations safely;
- A safe work environment by minimising hazards and managing risks associated with fatigue;
- Informed decisions are made in relation to hours of work, working arrangements and shift roster systems;
- Ongoing assessment and monitoring of fatigue risks
- Assistance through risk assessment is offered including education and training strategies to help manage fatigue and related risks;

## **Code Of Behaviour**

- No restrictions working up to 14 hours per day;
- No individual to work more than 16 hours per day (inclusive of travel time)
- Total hours works worked not to exceed an average of 60 hours per week over a 4 week period;
- A minimum break of 10 hours between consecutive shifts worked;
- No more than one call back in any 24 hour period

  
David Murray  
Managing Director

Clause 43 Work Health and Safety (Mines and Petroleum) Regulation 2014

*Fatigue Management Policy*

*September 2017*

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*Walker Quarries Pty Ltd*

**DRUG AND ALCOHOL POLICY**

Walker Quarries Pty Ltd insists on a drug and alcohol free workplace as an essential element of achieving Occupational Health, Safety and Welfare aims.

This policy covers all permanent and non-permanent employees, Contractors and visitors performing work at or visiting the site.

The scope of this policy covers the following:

- All illicit drugs, including marijuana, amphetamines, heroin, LSD, etc.
- All alcoholic drinks and beverages
- Prescribed drugs and medications known to cause adverse mental and / or physical effects when used in either prescribed or in excess of prescribed dosages
- Non-prescribed (over-the-counter) drugs and medications known to cause adverse mental and / or physical effects when used either in recommended or in excess of recommended doses, including some common cough and cold medicines, pain killers, etc.
- Any chemical misused illicitly as a drug, e.g. petrol, aerosols, glues, etc.

Walker Quarries Pty Ltd Limited insists on the following acceptable drug and alcohol levels for persons at work:


- A maximum 0.02% Blood Alcohol Limit (BAL) for general work and a zero% BAL for persons operating plant and or equipment, while strongly encouraging an at-work 'zero' BAL
- Zero levels of any illicit drug or any substance misused illicitly as a drug
- Zero levels for any other substance known to or likely to cause adverse mental and / or physical effects, unless sanctioned in writing, along with any conditions, by Senior Management

A person whose test result shows a non-acceptable level for a substance will not be allowed to resume work until a further test shows an acceptable level.

**Code Of Behaviour**

- Persons will not bring any alcoholic beverage or drink or illicit drug onto the site without firstly gaining the permission of the Area Manager.
- No person will take or consume any drug or alcohol at work other than medications which are prescribed or available over the counter and have been sanctioned by medical authorities for use while working, using the recommended dosages.
- It is the responsibility of all persons to inquire as to the affect of any prescribed or over the counter medication (from, doctors, pharmacists, etc.). Where the effects of any medication will or is likely to have adverse affects on the work safety, welfare or productivity of themselves and others at the workplace, it will be the responsibility of the person to notify workplace management or face Disciplinary Procedures. It will be at the discretion of workplace management as to whether suitable duties may or may not be made available.
- Any person reporting to work in an apparent intoxicated or drug affected state will be tested and if found to be intoxicated to an extent which is likely to impair safe work performance that person will be immediately suspended pending the outcome of Disciplinary Procedures.
- Any employee distributing illicit drugs at a workplace will be instantly dismissed and reported to the Police.

**NOTE: It will be mandatory that persons involved in a reportable incident/accident will be tested for drugs and alcohol.**

  
David Murray  
Managing Director

Clause 44 Work Health and Safety (Mines and Petroleum) Regulation 2014

*DRUG and ALCOHOL POLICY*

*September 2017*

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## Environmental Safety Policy

The environmental policy of Walker Quarries Pty Limited is to carry out the mining activities at Walker Quarry in a manner that complies with relevant environmental legislation and is environmentally responsible. The company is committed to ongoing improvements in its environmental management and aims to undertake reviews of this environmental policy to ensure that it remains relevant and appropriate for the existing and future operations.

In recognition of the corporate environmental policy, the Company will endeavour at all times to:

- ☐ comply with all applicable Commonwealth and State Government legislation to protect the environment;
- ☐ establish effective working relationships with Government agencies responsible for land management within the Walker Quarries Pty Ltd/Sitegoal Pty Ltd leases;
- ☐ develop and maintain environmental performance in line with industry standards by implementing an Environmental Management System (EMS) appropriate to the scale of the operation;
- ☐ establish a reporting process and verification procedure for any non-conformances within the EMS;
- ☐ carry out environmental training to ensure that the workforce on site are aware of their environmental responsibilities;
- ☐ undertake appropriate reviews and audits of the operation to measure progress and to ensure compliance with the environmental policy.

This Environmental Policy have been endorsed by the Company's Board of Directors and therefore commit the Company to achieving its objectives of environmental excellence.

Dave Murray:

Managing Director

Date: .....20<sup>th</sup> July 2017

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## 6. MANAGEMENT STRUCTURE

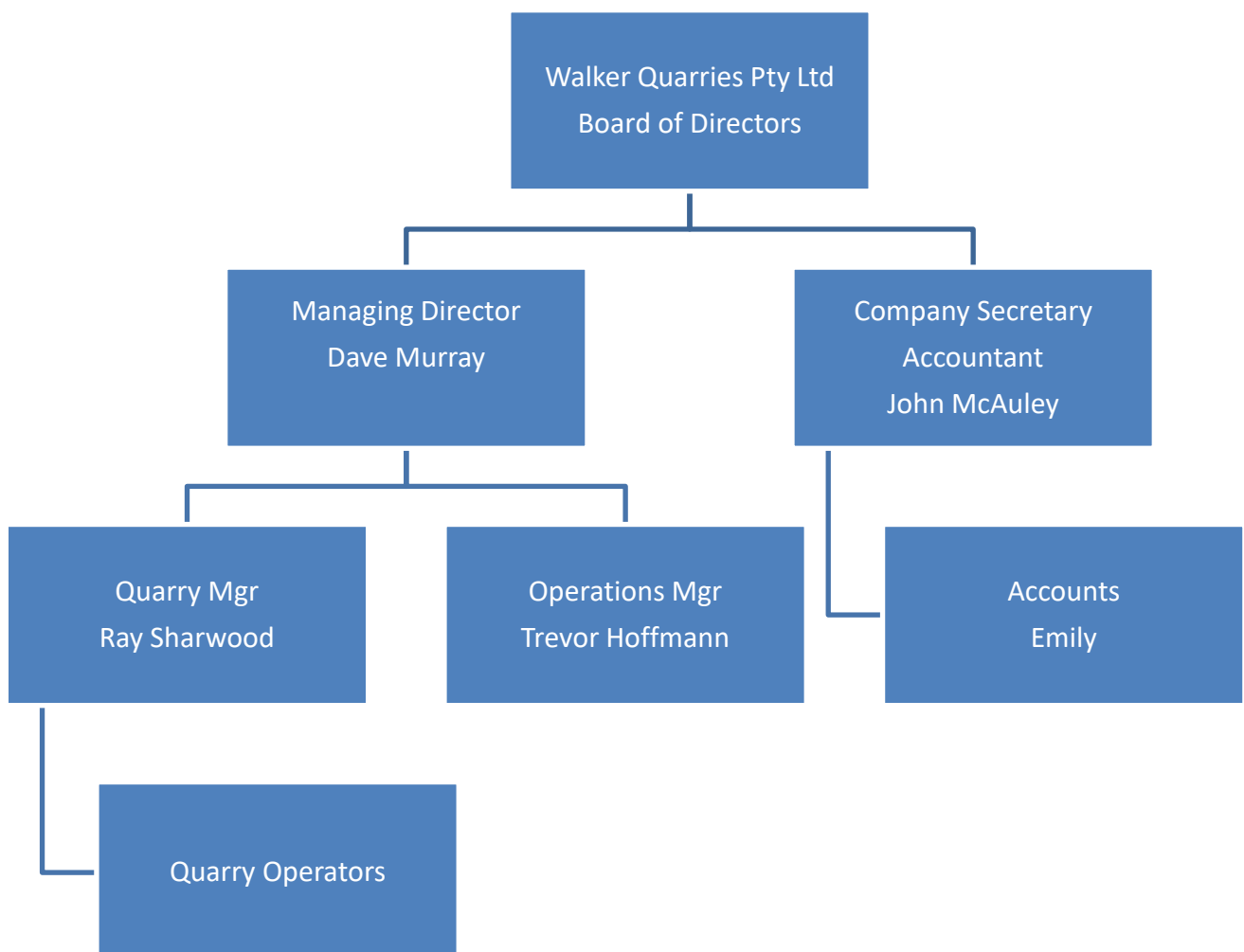
Wallerawang Quarry is required to have a Management Structure as part of the Health Control Plan & Safety Mgmt System under Work Health and Safety (Mines & Petroleum) Regulations 2014 - Clause 14 (d)

Other prescribed matters for the Health Control Plan & Safety Mgmt System are listed in the Work Health and Safety (Mines & Petroleum) Regulations 2014 – Clause 14.

The Management Structure at Wallerawang Quarry is detailed below

# WALLERAWANG QUARRY

## Management Structure



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## **7. COMMUNICATION**

Information, communication and supervision arrangements in place at Wallerawang Quarry ensure that any person who may be exposed to a risk to health and safety is:

- Informed of the risk
- Provided with any information, instruction and training necessary to ensure the person's health and safety.

The weekly Management meeting/arrangements control all relevant communication processes within the Health Control Plan & Safety Mgmt System.

## **8. INFORMATION, TRAINING AND INSTRUCTION**

The participation of employees and their input to the Health Control Plan & Safety Mgmt System is fundamental to the successful implementation and sustainability of the system. All employees shall be given adequate opportunity and encouragement to express their opinion relating to the Health Control Plan & Safety Mgmt System as required in the Work Health and Safety (Mining & Petroleum) Regulations 2014 Part 4 clause 121.

Employees will be given the opportunity to acquaint themselves with weekly meeting minutes, audit results and changes to the Health Control Plan & Safety Mgmt System. All information will be readily accessible to employees on site in main office.

## **9. TRAINING AND COMPETENCY**

Wallerawang Quarry in conjunction with employees has identified the training needs in relation to performing work activities competently.

The Quarry Manager will ensure that training records are in place to ensure competencies are developed and maintained. Persons are assessed as competent on the basis of skills achieved through education, training or experience.

The Training Records controls all relevant training processes and competencies within the Health Control Plan & Safety Mgmt System and the Emergency Management.

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## 10. ACCIDENT/INCIDENT INVESTIGATION

To determine the root cause or source of accidents and incidents and to establish the necessary control measures to prevent a recurrence of the accidents and incidents a systematic approach for the investigation of accidents and incidents is required.

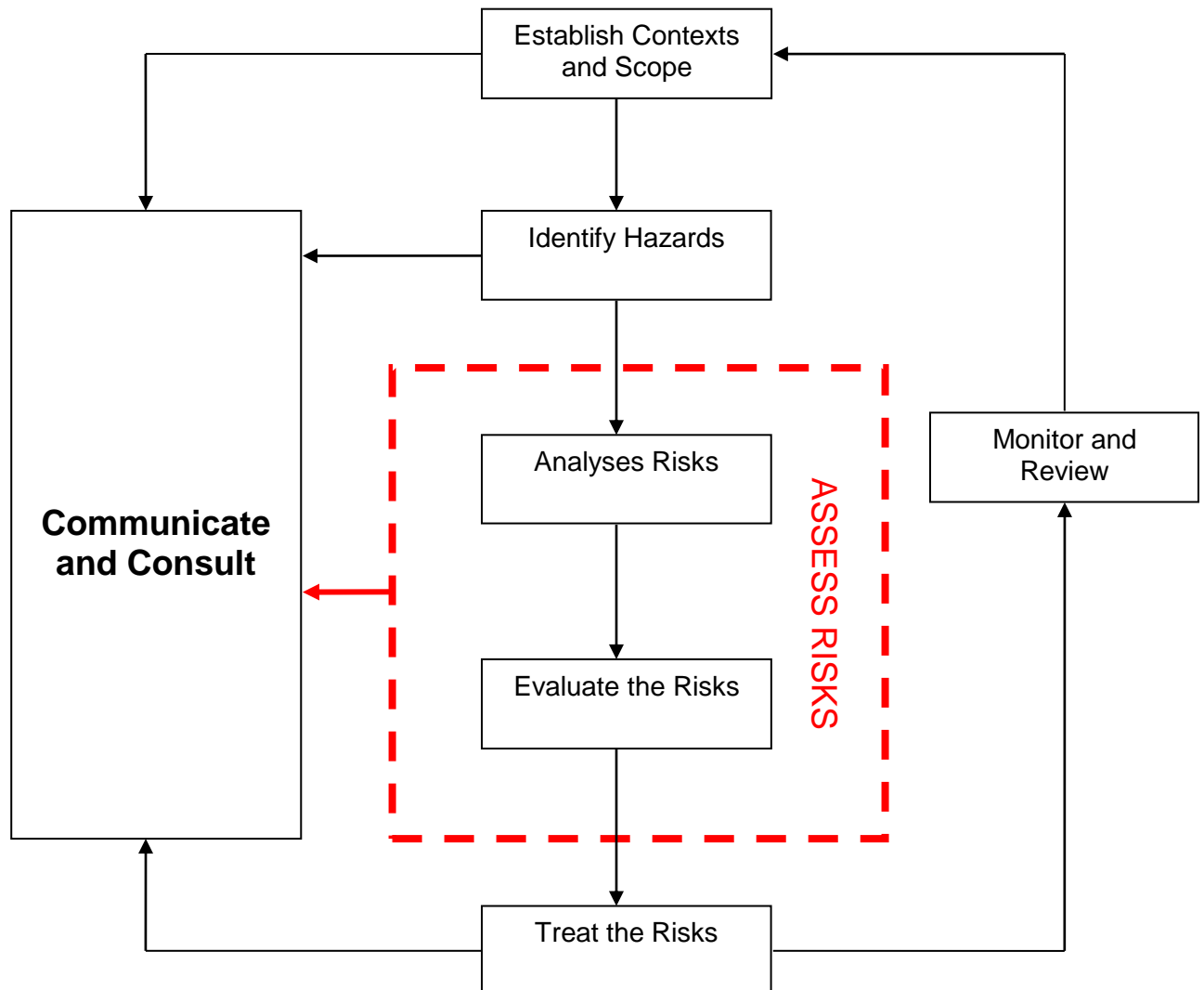
Corrective Action resulting from incident investigation will be evaluated to determine their effectiveness.

Details of how Walker Quarries accident and incidents are investigated, reported and corrective action control measures established are documented by the Quarry Manager.

## 11. RISK MANAGEMENT

The purpose of applying a risk management process attempts to proactively and systematically reduce losses.

### 11.1 Risk Management Process (AS4360)



## **11.2 Risk Management Standard**

Risk Management Standard - 1010 has been developed to apply Risk Management Methodology into Walker Quarries decision making processes.

The intent of this Standard is to integrate risk management into all aspects of the Wallerawang Quarry and comply with this standard.

## **12. LEGAL AND OTHER REQUIREMENTS**

Access to legal and other requirements that are directly attributable to Work Health and Safety issues related to Wallerawang Quarry activities are up dated and current on the Internet under the titles of:

- Government and Regulatory
- Work Health and Safety Links

## **13. PURCHASING GOODS AND SERVICES**

To ensure work Health and Safety requirements are met by the suppliers of goods and services, Walker Quarries shall dictate the terms and condition of supply.

The Purchase or use of hazardous substances shall be controlled by the Hazardous Substances Management. The Hazardous Substances Management provides practical guidance for the Purchase, Storage, Use, Handling and Disposal of hazardous substances at Wallerawang Quarry. It will assist in complying with relevant Legislation and help ensure the health and safety of all persons on site, the public, the community, and the protection of the environment.

Wallerawang Quarry shall comply with the above requirements.

## **14. AMENITIES**

Appropriate amenities shall be made available for all employees and contractors while they are at work. Amenities means facility provided for the welfare or personal hygiene needs of persons, and includes toilets, bathrooms, dining rooms, change rooms, provision of drinking water, lockers and washing facilities. Amenities shall be maintained in a safe and healthy condition.

Amenities Standards will be used for the maintenance of appropriate facilities for the welfare or personal hygiene needs of persons at Wallerawang Quarry.

## **15. REPORTING**

Statutory reporting required under WHS Mines (Mines & Petroleum) Regulations 2014:

- Work Health and Safety (Mines & Petroleum) Regulations Part 6 clause 128 (Notification of certain incidents)
- Work Health and Safety (Mines & Petroleum) Regulations Part 6 clause 130 (quarterly reports of injuries)

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## **16. INSPECTION & SUPERVISION ARRANGEMENTS**

No employee or contractor shall have their health and safety put at risk through inadequate supervision. The Supervision Arrangements set out the requirements and detail for Wallerawang Quarry supervision in accordance with Work Health and Safety (Mines & Regulations) Regulation 2014 Part 2 Clause 14 (k), together with Clause 37 Quarry Inspection.

This Management System shall make provisions so that all employees and contractors at Wallerawang Quarry have adequate supervision.

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## Wallerawang Quarry

Record of Inspection as per **Work Health and Safety (Mines and Petroleum Sites) Regulation 2014 Part 2 Managing risks - Division 1 General requirements Subdivision 1 Control of risk - Clause 37 Quarry Inspection**

I ..... here by record that I have inspected all areas of the Wallerawang Quarry as per Clause 37 (3) and sign that Quarry Operations are safe to proceed. Additionally, arrangements in place for the supervision needed to protect workers and other persons at the mine or petroleum site from risks to their health and safety from work carried out at the mine or petroleum site (Clause 14(k))

SIGNED .....

Date: .....

### 37 Inspections

- (1) The mine operator of a mine must ensure that arrangements are in place for the regular inspection of the working environment of the mine for the purposes of the WHS laws.
- (2) The mine operator must ensure that, in the making of the arrangements, the following are taken into account:
  - (a) the procedures for conducting inspections,
  - (b) when inspections are to be carried out,
  - (c) the persons competent to conduct inspections,
  - (d) the number of competent persons required to conduct each inspection.
- (3) The mine operator of a mine is to ensure that a risk assessment is conducted on all areas of the mine when taking account of the matters set out in subclause (2) (a)–(d).

Quarry Manager Inspection Record.docx

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## **17. AUDIT AND REVIEW PROCESS**

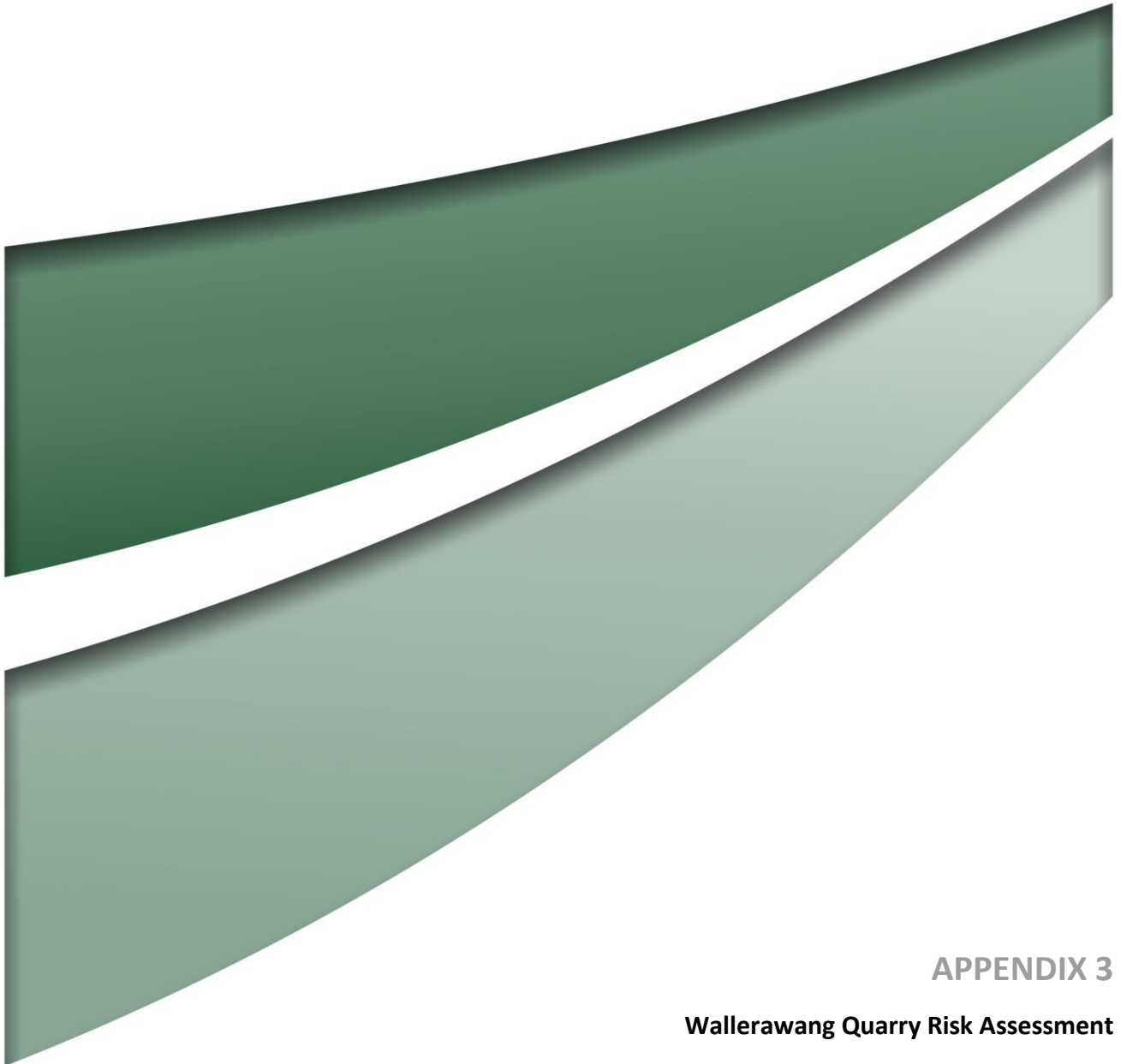
An audit is a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve Walker Quarries policies and objectives.

Audits required within this Health Control Plan & Safety Mgmt System and its associated sub-systems are to be completed audits are then relocated s as a controlled current document.

For the purpose of the Health Control Plan & Safety Mgmt System and its associated sub-systems the audit frequency shall be every 3 years unless otherwise defined as a more frequent audit.

Wallerawang Quarry shall comply with the above audit policy.

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## APPENDIX 3

### Wallerawang Quarry Risk Assessment

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**WALKER QUARRIES PTY LTD**

**WALLERAWANG QUARRY**

**HIGH RISK ASSESSMENT**

**FINAL REPORT**  
**Oct 2018**

---

**Client:** Mr John McAuley  
Director  
Walker Quarries Pty Ltd

**Author:** Paul Hensley

**Date:** 1<sup>st</sup> November 2018

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## 1 EXECUTIVE SUMMARY

This report details the methods used and the recommendations resulting from the High Risk Assessment conducted for Wallerawang Quarry during October 2018.

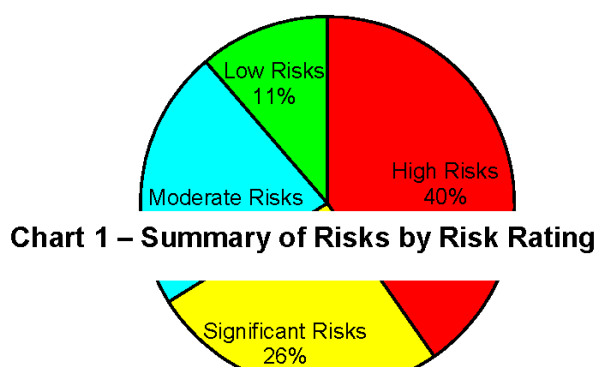
The workshop was a facilitated team exercise conducted in the Quarry Office at Wallerawang.

There were 62 Risks identified at Wallerawang Quarry. Forty percent of those were rated as “High” Risk. They are summarised in terms of their Risk Rating in Table 1 and Chart 1 below.

Risks	No.	%
High (1-9)	25	40
Significant (10-15)	16	26
Moderate Risks (16-19)	14	22
Low Risks (20-25)	7	12
<b>Total</b>	<b>62</b>	<b>100</b>

**Table 1 – Summary of Risks by Risk Rating**

16	20	Risks	No.	%
16	20	High Risks	25	40
16	20	Significant Risks	16	26
16	20	Moderate Risks	14	22
17	20	Low Risks	7	12
17	21		62	100





## **2 INTRODUCTION**

### **2.1 General**

A High Risk Assessment Workshop was conducted at Wallerawang Quarry to assist the Quarry in the formulation of appropriate management plans to address the potential risks associated with quarrying operations at Wallerawang.

The Risk Assessment was facilitated through a workshop team, comprising selected persons representing the operational and technical processes at the Mine and was conducted in accordance with the requirements of the Health and Safety (Mines and Petroleum) Regulation Act 2013, and Regulations 2014. In particular Clause 23.....

The Risk Assessment format complied with the Australian/New Zealand Standard – Risk Management 4360 and Risk Management Handbook for the Mining Industry MDG 1010.

#### **Clause 23 Identification of principal hazards and conduct of risk assessments**

- (1) The operator of a mine or petroleum site must identify all principal hazards associated with mining operations or petroleum operations at the mine or petroleum site.
- (2) The operator must conduct, in relation to each principal hazard identified, a risk assessment that involves a comprehensive and systematic investigation and analysis of all aspects of risk to health and safety associated with the principal hazard.
- (3) The operator, in conducting a risk assessment under subclause (2), must:
  - (a) use investigation and analysis methods that are appropriate to the principal hazard being considered, and
  - (b) consider the principal hazard individually and also cumulatively with other hazards at the mine or petroleum site.

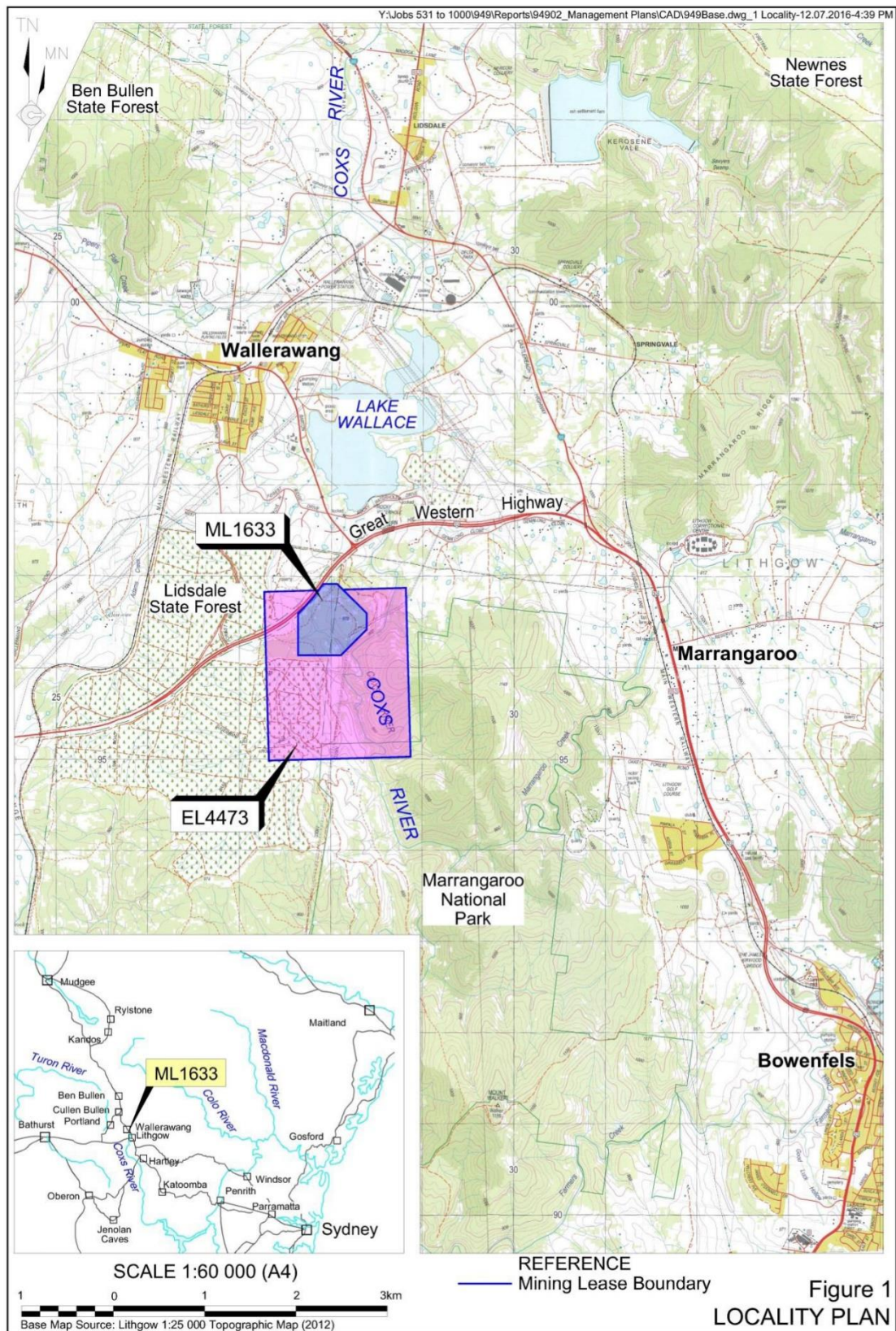
### **2.2 Background**

The Quarry is located approximately 8km northwest of Lithgow (see **Figure 1**) and comprises a total disturbed area of approximately 11ha. The Quarry is approved to produce 500 000t per year of quartzite, rock aggregate and sand products for use in the Wallerawang, Lithgow, Blue Mountains and Sydney regions.

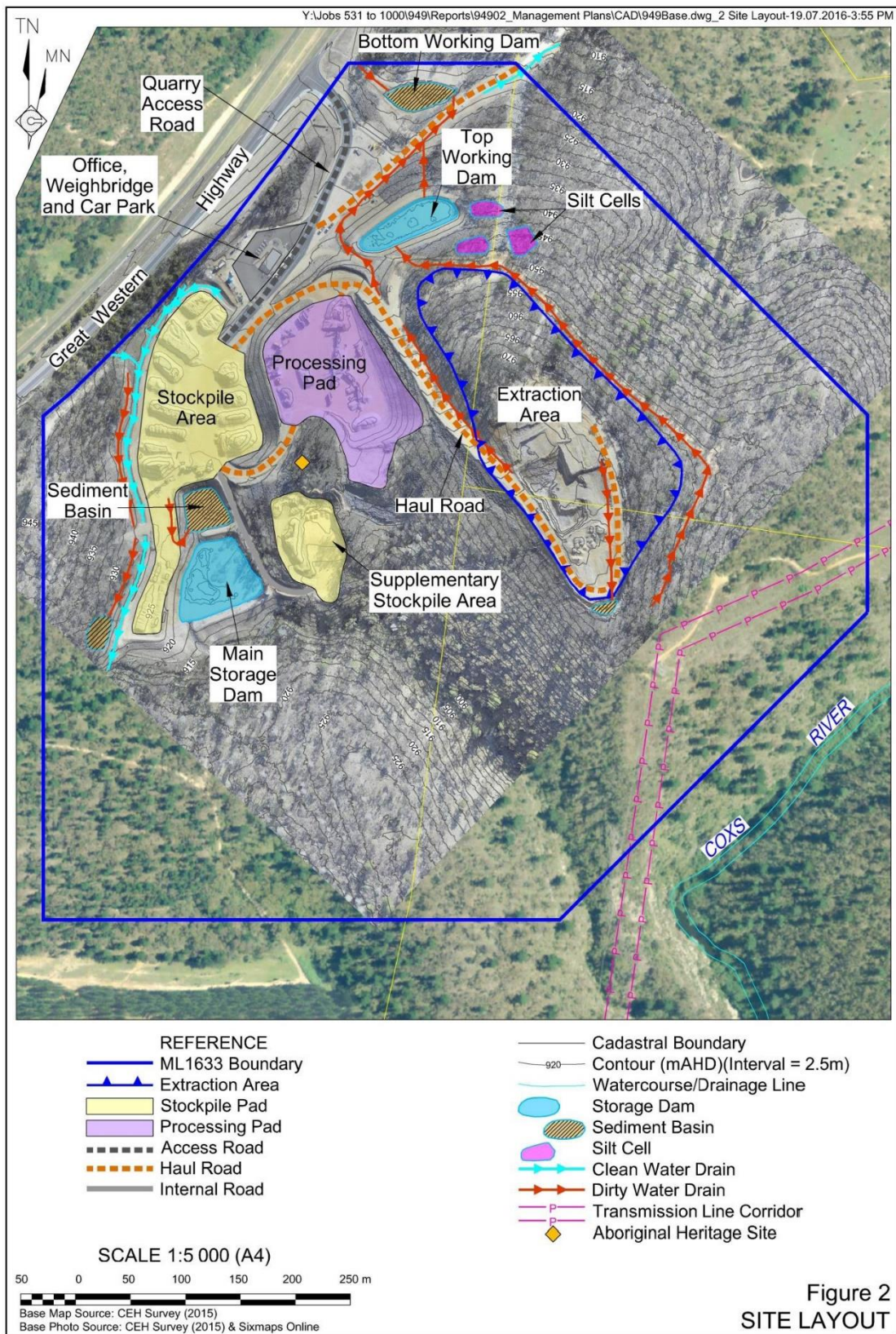
**Figure 2** presents the layout of the Quarry which includes the following features.

- A secured and signed entrance with the Great Western Highway and sealed access road to the main site office, weighbridge and wheel wash.
- Site amenities, workshop facilities and parking areas for staff, visitors and heavy vehicles.

- An excavation mining area and haul road.
- Crushing, screening and washing facilities, stockpile areas and water management infrastructure.
- Various internal roads and erosion and sediment control structures.







### 3 CONTEXT

#### 3.1 Scope

The Risk Assessment addressed the operational risks associated with design, construction, mining, haulage and crushing and screening operations at Wallerawang Quarry in terms of:

- ☐ Health & safety of personnel (S)
- ☐ Equipment/material damage (M)
- ☐ Business interruption (B)
- ☐ Environmental impact (E)
- ☐ Reputation (R)

The relevance and a measure of each of these consequences were determined prior to the workshop.

#### 3.2 Objective

The objective of the Risk Assessment was to:

- ☐ Provide Walker Quarries with a documented Risk Assessment in accordance with the Scope
- ☐ Satisfy their Occupational Health & Safety obligations
- ☐ Identify the highest risk areas and activities at Wallerawang Quarry
- ☐ Provide a basis for Walker Quarries to formulate plans and actions to control areas of concern

### 4 THE WORKSHOP TEAM

A key factor in the effectiveness of the exercise was the availability of relevant information and expertise. This was achieved by a workshop team selected to represent a vertical cross section of personnel at Wallerawang Quarry, in this case made up of management, technical staff, operational personnel, as well as an internal facilitator.

The role of team members was to provide their expertise, experience and technical knowledge, and to respect that provided by others. Outcomes were dependent upon group consensus.

The facilitator's role was to understand the Client's requirements and offer advice as to the best approach to meet the workshop objectives. He assisted the team by providing a systematic process and maintaining focus on the scope and objectives. The facilitator documented the workshop process and outcomes, and will offer post-workshop feedback to the Client and team.

The team members were as follows:

Name	Position	Company	Years in Industry
Ray Sharwood	Quarry Manager	Walker Quarries	25
Trevor Hoffmann	Operations Manager	Walker Quarries	32
Ross Brownlow	Fitter/Operator	Walker Quarries	28
Paul Hensley	Facilitator	Walker Quarries	32

## 5 METHOD OF APPROACH

### 5.1 Risk Assessment Process

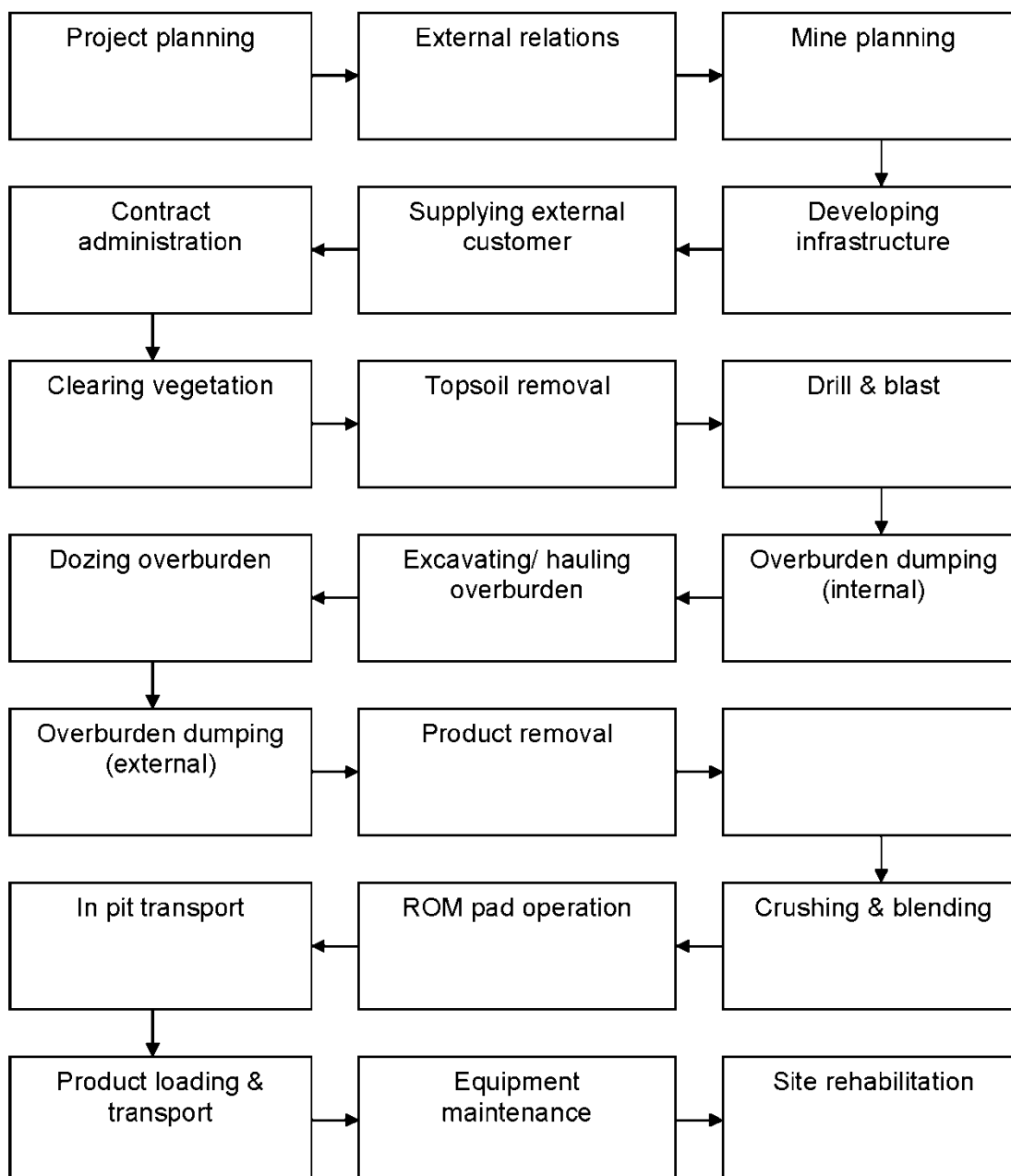
The Risk Assessment process identified the major hazards associated with areas and activities at Wallerawang Quarry, and assessed the risks in accordance with the Australian/ New Zealand Standard for Risk Management AS/ NZS 4360:1999 and MDG 1010 Risk Management Handbook for the Mining Industry.

This method included the following;

- ❑ A workshop team of management and operations personnel from a cross section of the workforce. The name and role of each team member was recorded
- ❑ The objectives and scope of the risk assessment was clearly identified and defined by the team
- ❑ The scales for risk ranking were discussed and explained to the team using definitions which are appropriate to the operation and the company
- ❑ The areas and activities at Wallerawang Quarry were identified and listed as a flow sequence (Section 5.2)

## 5.2 Method for Identifying Hazards

Analysing areas and activities at Wallerawang Quarry enabled hazards to be identified. The areas and activities have been listed as a flow sequence in Chart 2 following.



**Chart 2 – Hazard Identification Process**



### **5.3 Method for Risk Ranking**

Once the hazards associated with areas and activities at Wallerawang Quarry were identified, risks were assessed and prioritised.

Risks were ranked according to consequence and likelihood on the risk matrix in Table 3 – Risk Rating following.

Following prioritisation, controls for each high risk were identified, along with responsibilities and dates for completion.

<b>Consequence</b>						<b>Likelihood</b>				
Rating	Note: Consequence may consist of a single event or may represent a cumulative impact over a period of 12 months					A - Certain	B - Probable	C - Possible	D - Remote	E - Improbable
	Personal Injury	Material Damage/	Business Interruption	Environment	Reputation	Will occur – common or frequent occurrence	Likely to occur – is known to occur or “has happened”	Could occur – could occur or “have heard of it happening”	Unlikely to occur	Practically impossible
1 – Catastrophic	Multiple Fatalities	> \$5.0m	> 3 month	Massive leak/spill	International Impact	1 (H)	2 (H)	4 (H)	7 (H)	11 (S)
2 – Major	Fatality	\$1.0m to \$5.0m	1 month to 3 months	Major leak/spill	National Impact	3 (H)	5 (H)	8 (H)	12 (S)	16 (M)
3 – Moderate	Serious Bodily Injury	\$0.1m to \$1.0m	1 week to 1 month	Localised leak/spill	Regional Public Impact	6 (H)	9 (H)	13 (S)	17 (M)	20 (L)
4 – Minor	Lost Time Injury	\$10,000 to \$0.1m	1 day to 1 week	Minor leak/spill	Some Public Concern	10 (S)	14 (S)	18 (M)	21 (L)	23 (L)
5 – Insignificant	First Aid	Up to \$10,000	Up to 1 day	Slight leak/spill	No Public Concern	15 (S)	19 (M)	22 (L)	24 (L)	25 (L)

### Risk Matrix

Risk Matrix Result	Risk Rating		Rating Definitions
1 to 9	1	High Risk	Imperative to eliminate or reduce risk to a lower level by the introduction of control measures. Management planning required at senior levels
10 to 15	2	Significant Risk	Corrective action required, senior management attention needed
16 to 19	3	Moderate Risk	Corrective action to be determined, management responsibility must be specified
20 to 25	4	Low Risk	Corrective action where practicable, manage by routine procedures

**Table 3 – Risk Rating**

No.	Activities/ Process	No.	Hazard/ Threat	CS	PR	RR	Existing Controls	Potential Controls	Resp.	Notes
1	Communication	1.1	Changes are not effectively communicated to all persons	1	D	7	<ul style="list-style-type: none"> <li>Pre shift discussions</li> <li>Safety Meeting (Weekly)</li> <li>Safety Alerts</li> <li>Notice Boards</li> </ul>	<ul style="list-style-type: none"> <li>Develop and implement a Change Management Process</li> </ul>	Trevor Hoffmann	High Priority
2	Management Structure	2.1	Part Time Mechanical and Electrical Engineers				<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Risk Assessment to determine hazards associated with this scenario</li> </ul>	Trevor Hoffmann	
3	Contract administration	3.1	Failure to establish/ implement an employee/ visitor induction/ training/ education system resulting in injury	3	C	13	<ul style="list-style-type: none"> <li>Visitors/Induction Program</li> <li>Qualifications &amp; Insurances</li> <li>SWIMs</li> </ul>	<ul style="list-style-type: none"> <li>Audit and review</li> <li>Employee awareness</li> <li>Communications</li> <li>Contractor Management Plan</li> </ul>	Quarry Mgr Supervisor Operators	Ongoing
4	Contract administration	4.1	Failure to apply appropriate resources to safety/ training/ education systems resulting in injury	3	C	13	<ul style="list-style-type: none"> <li>Training Qualifications</li> <li>Induction program</li> <li>OHS Meetings</li> <li>PPE</li> </ul>	<ul style="list-style-type: none"> <li>Audit and review</li> <li>Monthly reports KPI's</li> <li>Contractor Management Plan</li> </ul>	Quarry Mgr Supervisor	Ongoing
5	Reporting of Incidents	5.1	Failure to maintain a safety incident & defect reporting management system resulting in injury/ material damage	3	B	9		<ul style="list-style-type: none"> <li>Auditing</li> <li>compliance monitoring</li> <li>Contractor Management Plan</li> </ul>	Quarry Mgr Supervisor	High Priority
6	Drug and Alcohol	6.1	Drugs and Alcohol is not managed	1	C	4	<ul style="list-style-type: none"> <li>Drug &amp; Alcohol Policy in place</li> </ul>	<ul style="list-style-type: none"> <li>Testing to be conducted</li> </ul>	Trevor Hoffmann Supervisor	High Priority
7	Operator Licences and Competencies	7.1	Failure to check Competencies	4	D	24	<ul style="list-style-type: none"> <li>Inductions</li> </ul>	<ul style="list-style-type: none"> <li>Employee awareness</li> <li>Operator Training</li> </ul>		
8	Confined Spaces	8.1	All work to be performed in a confined space must be in accordance with AS2865	3	B	9	<ul style="list-style-type: none"> <li>Follow AS2865</li> </ul>			

No.	Activities/ Process	No.	Hazard/ Threat	CS	PR	RR	Existing Controls	Potential Controls	Resp.	Notes
9	Drill & Blast	9.1	Failure to correctly design drill & blast	3	C	13	<ul style="list-style-type: none"> <li>Licensed External Contractor</li> </ul>	<ul style="list-style-type: none"> <li>Management approval of design</li> <li>Blasting Mgmt Plan</li> </ul>	Quarry Mgr Operations Mgr Blasting Contractor	
9	Drill & Blast	9.2	Explosives	3	C	13	<ul style="list-style-type: none"> <li>No Explosives stored on site</li> </ul>		Quarry Mgr	
10	Electrical Safety	10.1	All electrical equipment is to be tested (& tagged) to AS3760	2	C	8				
11	Emergency Response	11.1	Failure of Emergency Response Plan	1	D	7	<ul style="list-style-type: none"> <li>Testing of Emergency Response Plan by simulation</li> </ul>	<ul style="list-style-type: none"> <li>Review outcomes from simulations to provide continuous improvement</li> </ul>	Trevor Hoffmann	High Priority
11	Emergency Response	11.2	Emergency response equipment is not maintained in effective working order	1	D	7	<ul style="list-style-type: none"> <li>Inspection Program</li> <li>Fire Management Plan</li> <li>First Aid Management Plan</li> <li>Testing of Emergency Response Plan by simulation</li> </ul>			
11	Emergency Response	11.3	Failure to develop & implement an Emergency Response System	2	D	12	<ul style="list-style-type: none"> <li>Emergency Response Plan</li> <li>Training</li> <li>Appropriate equipment on site</li> </ul>	<ul style="list-style-type: none"> <li>Review Scheme</li> <li>Audit</li> <li>Make emergency groups. ie Fire, rescue aware of scheme.</li> <li>Site familiarisation for appropriate emergency groups</li> </ul>	Wallerawang Quarry	Ongoing
12	Topsoil & Tree removal	12.1	Failure to provide & follow a safe system of work for machine operator results in injury	2	C	8	<ul style="list-style-type: none"> <li>Work Procedure</li> <li>Training</li> <li>Skills Analysis</li> </ul>	<ul style="list-style-type: none"> <li>Skills auditing</li> <li>Procedure Review</li> </ul>	Wallerawang Quarry,	Ongoing
13	Machinery Guarding	13.1	Guards not installed or ineffective	2	C	8	<ul style="list-style-type: none"> <li>Equipment Introduction to Site</li> <li>Mechanical Engineer (part time)</li> </ul>	<ul style="list-style-type: none"> <li>Conduct Guard Audit</li> <li>Mechanical Engineering Management Plan</li> </ul>	Howard Domsalla	Moderate Priority

No.	Activities/ Process	No.	Hazard/ Threat	CS	PR	RR	Existing Controls	Potential Controls	Resp.	Notes
14	Cranage and Lifting	14.1	Cranage and Lifting is not managed	2	C	8	<ul style="list-style-type: none"> <li>Certified Crane Operator</li> <li>Lift SWIMS as required</li> </ul>	<ul style="list-style-type: none"> <li>Develop and Implement Cranage and Lifting Management Procedure</li> </ul>	Trevor Hoffmann Howard Domsalla	Moderate Priority
15	Site Security	15.1	Failure of site security resulting in injury to external personnel:	2	C	8	<ul style="list-style-type: none"> <li>External Security Co</li> <li>Visitors Procedures and Induction</li> <li>Gates</li> <li>Fences</li> <li>Signage</li> <li>Employee Awareness</li> <li>Community Awareness</li> </ul>	<ul style="list-style-type: none"> <li>Secure Machines when not in use</li> <li>Secure work sites and Buildings</li> </ul>	Wallerawang Quarry,	Ongoing
15	Site Security	15.2	Failure of site security resulting in injury to site personnel:	3	C	13	<ul style="list-style-type: none"> <li>External Security Co</li> <li>Visitors Procedures and Induction</li> <li>Signage</li> </ul>	<ul style="list-style-type: none"> <li>Visitors Procedures</li> </ul>	Quarry Mgr	Moderate Priority
16	Silica Dust Crushing & Screening	16.1	Failure to control dust generated	2	D	12	<ul style="list-style-type: none"> <li>Airborne Dust Rules</li> <li>PPE</li> <li>EPL#13172</li> <li>MOP Requirements</li> <li>Training</li> <li>Employee Awareness</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring</li> <li>Review Results</li> </ul>	Wallerawang Quarry, Quarry Mgr	Ongoing
16	Crushing & Screening	16.2	Failure to carry out appropriate energy isolation procedures in & around plant	1	B	2	<ul style="list-style-type: none"> <li>Isolation Procedures</li> <li>Training</li> <li>Supervision</li> <li>Electrical and Mechanical Safety Systems</li> <li>Auditing of System</li> <li>compliance monitoring</li> </ul>		Wallerawang Quarry, Supervisor, Operators	Ongoing

No.	Activities/ Process	No.	Hazard/ Threat	CS	PR	RR	Existing Controls	Potential Controls	Resp.	Notes
16	Crusher & Screening	16.3	Failure to control vehicle & heavy equipment movements on stockpile results in injury, damage	1	C	4	<ul style="list-style-type: none"> <li>Transport Rules</li> <li>Communication System</li> <li>Procedures SWP1</li> <li>Training</li> <li>Supervision</li> <li>Skills Assessments</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring</li> <li>Quarry Mgr Inspections</li> <li>Auditing</li> </ul>	Wallerawang Quarry, Supervisor, Operators	Ongoing
16	Crusher & Screening	16.4	Failure to control dust generated	2	C	8	<ul style="list-style-type: none"> <li>Airborne Dust Rules</li> <li>EIS Requirements</li> <li>MOP Requirements</li> <li>Training</li> <li>Employee Awareness</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring</li> <li>Review Results</li> </ul>	Wallerawang Quarry, Supervisor, Operators	Ongoing
16	Crusher & Screening	16.5	Failure to provide skilled machine operator results in injury	3	D	17	<ul style="list-style-type: none"> <li>Recruitment Procedure</li> <li>Skill Assessment</li> <li>Training Scheme</li> <li>Safety System</li> <li>Standards</li> </ul>	<ul style="list-style-type: none"> <li>Skills Audits</li> <li>System Review</li> </ul>	Wallerawang Quarry, Supervisor	In Place
16	Crusher & Screening	16.6	Failure to provide & maintain effective communication system between machine operator & site personnel results in injury	3	D	17	<ul style="list-style-type: none"> <li>Transport Rules</li> <li>Procedures which include SWP1 and Traffic Separation on Pad.</li> <li>2 way radio</li> <li>Training</li> </ul>	<ul style="list-style-type: none"> <li>Community awareness</li> <li>Reviews and audits</li> </ul>	Wallerawang Quarry, Supervisor, Operators	Ongoing
16	Crusher & Screening	16.7	Failure to provide & follow a safe system of work for machine operator results in injury	3	D	17	<ul style="list-style-type: none"> <li>Work Procedure</li> <li>Training</li> <li>Skills Analysis</li> <li>Safety System</li> <li>Procedures</li> <li>Standards</li> </ul>	<ul style="list-style-type: none"> <li>Skills auditing</li> <li>Procedure Review</li> </ul>	Wallerawang Quarry, Supervisor, Operators	Ongoing
16	Crusher & Screening	16.8	Failure to provide appropriate PPE and screening of health for operators	5	D	24	<ul style="list-style-type: none"> <li>PPE Rules</li> <li>Standards</li> <li>Safety System</li> <li>Training</li> <li>Quarry Rules</li> <li>Mines Regulations</li> <li>Recruitment Procedures</li> <li>OHSA</li> </ul>	<ul style="list-style-type: none"> <li>Supervision and monitoring</li> <li>Medical Assessments</li> </ul>	Wallerawang Quarry, Supervisor	Ongoing

No.	Activities/ Process	No.	Hazard/ Threat	CS	PR	RR	Existing Controls	Potential Controls	Resp.	Notes
16	Crusher & Screening	16.9	Failure to select appropriate equipment & protective devices results in personal injury or material damage	4	D	21	<ul style="list-style-type: none"> <li>Relevant Standards</li> <li>Purchasing Standards and Procedures</li> <li>Equipment Standards</li> <li>Safety System</li> </ul>	<ul style="list-style-type: none"> <li>Inspections</li> <li>Monitoring</li> </ul>	Wallerawang Quarry, Supervisor	In Place
17	Transport to product stockpiles	17.1	Failure to provide & follow a safe system of work for machine operator results in injury	2	C	8	<ul style="list-style-type: none"> <li>Work Procedure</li> <li>Training</li> <li>Skills Analysis</li> <li>Safety System</li> <li>Supervision</li> <li>Operator Assessment</li> </ul>	<ul style="list-style-type: none"> <li>Skills auditing</li> <li>Procedure Review</li> </ul>	Wallerawang Quarry, Ops Mgr Quarry Mgr Operators	Ongoing
17	Transport to product stockpiles	17.2	Failure to select appropriate equipment & protective devices results in personal injury or material damage	2	D	12	<ul style="list-style-type: none"> <li>Relevant Standards</li> <li>Purchasing Standards and Procedures</li> <li>Equipment Standards</li> <li>Safety System</li> </ul>	<ul style="list-style-type: none"> <li>Inspections</li> <li>Monitoring</li> </ul>	Wallerawang Quarry, Supervisor	In Place
17	Transport to product stockpiles	17.3	Failure to provide skilled machine operator results in injury	2	D	12	<ul style="list-style-type: none"> <li>Recruitment Procedure</li> <li>Skills Audits</li> <li>Training Scheme</li> <li>Safety System</li> <li>Standards</li> </ul>	<ul style="list-style-type: none"> <li>System Review</li> </ul>	Wallerawang Quarry,	In Place
17	Transport to product stockpiles	17.4	Failure to provide & maintain effective communication system between machine operator & site personnel results in injury	2	D	12	<ul style="list-style-type: none"> <li>Transport Rules</li> <li>Procedures which include 2 way radio</li> <li>Training</li> </ul>	<ul style="list-style-type: none"> <li>Community awareness</li> <li>Reviews and audits</li> </ul>	Wallerawang Quarry, Supervisor, Operators	Ongoing
17	Transport to product stockpiles	17.5	Failure to maintain haul roads to control dust/ noise generation	4	C	18	<ul style="list-style-type: none"> <li>Transport Rules</li> <li>Procedures</li> <li>EPA Requirements</li> <li>MOP Requirements</li> <li>Dust Control Scheme</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring</li> <li>Review Results</li> </ul>	Wallerawang Quarry, Supervisor, Operators	Ongoing
19	Water	19.1	Slippery Roads leading to vehicle accidents	2	C	8	<ul style="list-style-type: none"> <li>Quarry Mgr Inspections</li> <li>Procedure to stop mining during wet conditions</li> </ul>	<ul style="list-style-type: none"> <li>Water Truck Procedure</li> <li>Spot Watering</li> </ul>	Operators	
19	Water	19.2	Flooding in Pit Falling into Water whilst installing pumps	1	C	4		<ul style="list-style-type: none"> <li>Procedure for installation of pumps</li> </ul>	Quarry Mgr Supervisor	High Priority

No.	Activities/ Process	No.	Hazard/ Threat	CS	PR	RR	Existing Controls	Potential Controls	Resp.	Notes
20	Light Vehicles	20.1	Collisions with Mobile Plant	1	C	4	<ul style="list-style-type: none"> <li>Radio communication</li> <li>Flashing lights and flags on Vehicles</li> <li>Transport Rules</li> <li>Seat Belt Policy</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	All Persons	
21	Fatigue Management	21.1	Fatigue is not managed	1	C	4	<ul style="list-style-type: none"> <li>Hours of work monitored</li> <li>Only working Day Shift</li> </ul>	<ul style="list-style-type: none"> <li>Develop and Implement Fatigue Management Procedure</li> </ul>	Trevor Hoffmann	High Priority
22	Mine planning	22.1	Failure to design & apply a safe mining method resulting in injury & material damage	2	C	8	<ul style="list-style-type: none"> <li>Experience of mine design/ planning team</li> <li>Design &amp; mining system proven at other mine sites</li> <li>Mine Plan carried out to identify specific processes by initially identifying hazardous activities associated with specific tasks</li> <li>Geotechnical Consultant</li> </ul>	<ul style="list-style-type: none"> <li>Conduct further specific risk reviews of processes &amp; tasks involved in mine development</li> <li>Review &amp; amend existing standards/ procedures to ensure they address the identified hazards</li> <li>Further develop, document, train, audit &amp; review a MOP (operational management plan)</li> </ul>	Wallerawang Quarry, Geotechnical Consultant	Ongoing (audit annually)
24	Excavating-loading blasted material	24.1	Failure to select appropriate equipment & protective devices results in personal injury or material damage	2	C	8	<ul style="list-style-type: none"> <li>Relevant Standards</li> <li>Purchasing Standards and Procedures</li> <li>Equipment Standards</li> <li>Safety System</li> <li>Inspections</li> <li>Monitoring</li> </ul>		Wallerawang Quarry,	In Place
24	Excavating-loading blasted material	24.2	Failure to provide & maintain effective communication system between machine operator & site personnel results in injury	2	C	8	<ul style="list-style-type: none"> <li>Transport Rules</li> <li>Procedures which include <ul style="list-style-type: none"> <li>2 way radio</li> </ul> </li> <li>Training</li> <li>Procedure SWP1</li> </ul>	<ul style="list-style-type: none"> <li>Reviews and audits</li> </ul>	Wallerawang Quarry,	Ongoing

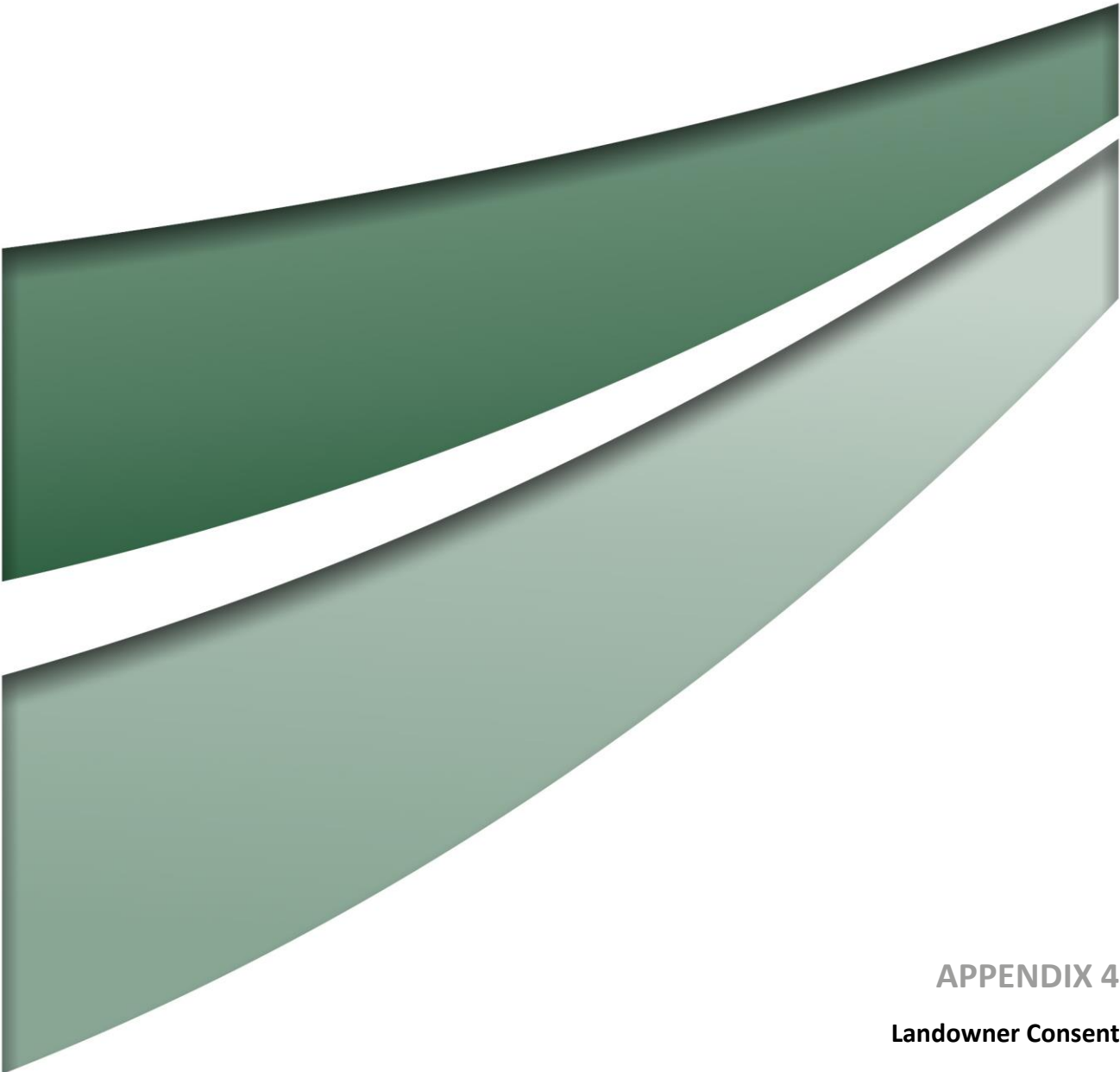


No.	Activities/ Process	No.	Hazard/ Threat	CS	PR	RR	Existing Controls	Potential Controls	Resp.	Notes
24	Excavating-loading blasted material	24.3	Failure to detect highwall failure results in personal injury or material damage	2	C	8	<ul style="list-style-type: none"> <li>Inspection System</li> <li>Procedures</li> <li>Operator Training</li> </ul>	<ul style="list-style-type: none"> <li>Audit and review</li> </ul>	Wallerawang Quarry, Supervisor	Ongoing
24	Excavating-loading blasted material	24.4	Failure to provide & follow a safe system of work for machine operator results in injury	2	C	8	<ul style="list-style-type: none"> <li>Work Procedure</li> <li>Training</li> <li>Skills Analysis</li> <li>Safety System</li> <li>Procedures</li> <li>Standards</li> </ul>	<ul style="list-style-type: none"> <li>Skills auditing</li> <li>Procedure Review</li> </ul>	Wallerawang Quarry, Supervisor, Operators	Ongoing
24	Excavating-loading blasted material	24.5	Failure to stabilise highwall adjacent to excavator/ dozer/ truck causing injury/ material damage	2	C	8	<ul style="list-style-type: none"> <li>Procedures</li> <li>Inspection System</li> <li>Transport Rules</li> <li>Monitoring</li> <li>Supervision</li> <li>Training</li> </ul>	<ul style="list-style-type: none"> <li>Slope Stability Plan</li> </ul>	Supervisor, Operators	Ongoing
24	Excavating-loading blasted material	24.6	Failure to provide skilled machine operator results in injury	3	D	17	<ul style="list-style-type: none"> <li>Recruitment Procedure</li> <li>Skill Assessment</li> <li>Training Scheme</li> <li>Safety System</li> <li>Standards</li> <li>Skills Audits</li> <li>System Review</li> </ul>		Wallerawang Quarry,	In Place
24	Excavating-loading blasted material	24.7	Failure to provide appropriate PPE and screening of health for operators	4	D	21	<ul style="list-style-type: none"> <li>PPE Procedure</li> <li>Standards</li> <li>Safety System</li> <li>Training</li> <li>Supervision and monitoring</li> </ul>		Wallerawang Quarry,	Ongoing
25	Fire	25.1	Vehicle Fires	2	D	12	<ul style="list-style-type: none"> <li>Fire Extinguishers on Mobile Plant</li> <li>Inspection Scheme</li> <li>Bush Fire Mgmt Plan</li> <li>Emergency Management Plan</li> </ul>		Operators	

No.	Activities/ Process	No.	Hazard/ Threat	CS	PR	RR	Existing Controls	Potential Controls	Resp.	Notes
25	Fire	25.2	Fire at Fuel Farm	2	D	12	<ul style="list-style-type: none"> <li>Fire Extinguishers at installation</li> <li>Inspection Scheme</li> <li>Bush Fire Mgmt Plan</li> <li>Water Truck</li> <li>Emergency Management</li> </ul>		Operators	
25	Fire	25.3	Fire at Crusher	3	D	17	<ul style="list-style-type: none"> <li>Fire Extinguishers at installation</li> <li>Water Truck</li> <li>Inspection Scheme</li> <li>Bush Fire Mgmt Plan</li> <li>Emergency Management</li> </ul>		Operators	
25	Fire	25.4	Fire in Office Complex	3	D	17	<ul style="list-style-type: none"> <li>Fire Extinguishers at Office Complex</li> <li>Inspection Scheme</li> <li>Bush Fire Mgmt Plan</li> <li>Emergency Management</li> </ul>	<ul style="list-style-type: none"> <li>Install Fire Alarms</li> </ul>	Quarry Mgr	Moderate Priority
25	Fire	25.5	Bushfire	3	D	17	<ul style="list-style-type: none"> <li>Water Truck</li> <li>Bush Fire Mgmt Plan</li> <li>Emergency Management</li> </ul>		All personnel	
26	Equipment maintenance	26.1	Failure to develop & implement safe work procedures	2	D	12		<ul style="list-style-type: none"> <li>Electrical and Mechanical Management Plans</li> </ul>	Wallerawang Quarry,	Ongoing
26	Equipment maintenance	26.2	Failure to carry out appropriate inspections & provide documentation of results (defects)	3	C	13	<ul style="list-style-type: none"> <li>Inspection System</li> <li>Defect Management System</li> <li>Maintenance Procedures</li> <li>Safety System</li> </ul>	<ul style="list-style-type: none"> <li>Audits and Inspections</li> <li>Records</li> <li>Training</li> </ul>	Wallerawang Quarry, Supervisor, Fitters	Ongoing
26	Equipment maintenance	26.3	Failure to correct defects on equipment resulting in injury, damage	3	C	13	<ul style="list-style-type: none"> <li>Defect Management System</li> <li>Maintenance Procedures</li> <li>Safety System Out of Service Tags</li> </ul>	<ul style="list-style-type: none"> <li>Audits and Inspections</li> <li>Records</li> <li>Training</li> </ul>	Wallerawang Quarry, Supervisor, Fitters	Ongoing

No.	Activities/ Process	No.	Hazard/ Threat	CS	PR	RR	Existing Controls	Potential Controls	Resp.	Notes
26	Equipment maintenance	26.4	Failure to control hazardous substances	3	D	17	<ul style="list-style-type: none"> <li>Hazardous Substance Management Plan</li> <li>Procedures</li> <li>Safety System</li> <li>Purchasing Procedures</li> <li>Material Safety Data Sheets</li> <li>Training</li> <li>EPL#13172 Requirements</li> </ul>	<ul style="list-style-type: none"> <li>Auditing and review</li> </ul>	Wallerawang Quarry, Supervisor, Fitters	Ongoing
26	Equipment maintenance	26.5	Failure to monitor & control elements impacting upon the environment (dust, vibration, noise, visual)	4	C	18	<ul style="list-style-type: none"> <li>Monitoring Program</li> <li>Relevant standards</li> <li>EPL#13172 requirements</li> </ul>	<ul style="list-style-type: none"> <li>Review results and compliance.</li> </ul>	Wallerawang Quarry,	Ongoing
27	Overburden dumping (internal)	27.1	Failure to select appropriate equipment & protective devices results in personal injury or material damage	3	D	17	<ul style="list-style-type: none"> <li>Relevant Standards</li> <li>Purchasing Standards and Procedures</li> <li>Equipment Standards</li> <li>Safety System</li> </ul>	<ul style="list-style-type: none"> <li>Inspections</li> <li>Monitoring</li> </ul>	Wallerawang Quarry, Supervisor, Operators	In Place
27	Overburden dumping (internal)	27.2	Failure to provide skilled machine operator results in injury	4	D	21	<ul style="list-style-type: none"> <li>Recruitment Procedure</li> <li>Skill Assessment</li> <li>Training Scheme</li> <li>Safety System</li> <li>Standards</li> </ul>	<ul style="list-style-type: none"> <li>Skills Audits</li> <li>System Review</li> </ul>	Wallerawang Quarry,	In Place
27	Overburden dumping (internal)	27.3	Failure to monitor & control elements impacting upon the environment (dust, vibration, noise, visual)	5	C	22	<ul style="list-style-type: none"> <li>Monitoring Program</li> <li>Relevant standards</li> <li>EPL#13172 requirements</li> </ul>	<ul style="list-style-type: none"> <li>Review results and compliance.</li> </ul>	Wallerawang Quarry,	Ongoing
28	Product loading & transport	28.1	Failure to control traffic at loadout facility results in injury, damage	4	C	18	<ul style="list-style-type: none"> <li>Transport Rules</li> <li>Procedures</li> <li>Communication</li> <li>Training</li> <li>Supervision</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring</li> <li>Auditing</li> </ul>	Wallerawang Quarry, Supervisor	Ongoing

No.	Activities/ Process	No.	Hazard/ Threat	CS	PR	RR	Existing Controls	Potential Controls	Resp.	Notes
28	Product loading & transport	28.2	Failure to provide & follow a safe system of work for machine operator results in injury	3	C	13	<ul style="list-style-type: none"> <li>Work Procedure</li> <li>Training</li> <li>Skills Analysis</li> <li>Safety System</li> <li>Procedures</li> <li>Standards</li> </ul>	<ul style="list-style-type: none"> <li>Skills auditing</li> <li>Procedure Review</li> </ul>	Wallerawang Quarry, Supervisor, Operators	Ongoing
28	Product loading & transport	28.3	Failure to select appropriate equipment & protective devices results in personal injury or material damage	3	E	20	<ul style="list-style-type: none"> <li>Relevant Standards</li> <li>Purchasing Standards and Procedures</li> <li>Equipment Standards</li> <li>Safety System</li> <li>Road Registered Vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Inspections</li> <li>Monitoring</li> </ul>	Wallerawang Quarry, Supervisor	In Place
28	Product loading & transport	28.4	Failure to provide skilled truck operator results in injury	3	D	17	<ul style="list-style-type: none"> <li>Recruitment Procedure</li> <li>Skill Assessment</li> <li>Training Scheme</li> <li>Appropriate Licence to Drive</li> </ul>	<ul style="list-style-type: none"> <li>Skills Audits</li> <li>System Review</li> </ul>	Wallerawang Quarry,	In Place
28	Product loading & transport	28.5	Failure to provide & maintain effective communication system between machine operator & site personnel results in injury	3	D	17	<ul style="list-style-type: none"> <li>Transport Rules</li> <li>Procedures which include                             <ul style="list-style-type: none"> <li>2 way radio</li> <li>Pre-shift briefs/ feedback</li> </ul> </li> <li>Training</li> </ul>	<ul style="list-style-type: none"> <li>Community awareness</li> <li>Reviews and audits</li> </ul>	Wallerawang Quarry, Supervisor, Operators	Ongoing



## APPENDIX 4

### Landowner Consent

Walker Quarries  
963 Great Western Highway  
Wallerawang NSW 2845

20<sup>th</sup> February 2019

Dear Trevor,  
Operations Manager

**Re: Dust Gauge Relocation**

The following confirms that as owner of 987 Great Western Highway (Lot 7 DP 872230) I agree/support the relocation of the dust gauge identified as D2 (as per the Wallerawang Quarry Air Quality Management Plan) onto the northern portion of my property.

I note that Walker Quarries have agreed to reposition the dust gauge (D2) in the future should I request this.

It is noted that Walker Quarries will require access to the Dust Gauge Site on an (ongoing) monthly basis.

Yours sincerely



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