



**Hy-Tec Industries Pty Limited**

ABN: 90 070 100 702

**Austen Quarry**

**Blast Management Plan**

August 2019

*Prepared by:*



**R.W. CORKERY & CO. PTY. LIMITED**



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# Hy-Tec Industries Pty Limited

ABN: 90 070 100 702

## Austen Quarry

# Blast Management Plan

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## **LIST OF ACRONYMS**

dB(A)	Decibel A-weighting
DPIE	Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EPL	Environment Protection Licence
LEP	Local Environmental Plan
RWC	R.W. Corkery & Co. Pty Limited
SSD	State Significant Development

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## 1. INTRODUCTION

The Austen Quarry Blast Management Plan (“the Plan”) has been prepared, in satisfaction of *Condition 9* of Schedule 3 of Development Consent SSD 6084 (SSD-6084), as an operational tool to assist in the management of blasting-related issues during the operation of the Austen Quarry (“the Quarry”). It will be used by Hy-Tec Industries Pty Limited (Hy-Tec) personnel as the first point of reference for blasting-related issues.

This plan synthesises the recommendations made during the assessments undertaken for the Stage 2 development of the Quarry which was approved in July 2015 and a subsequent modification to SSD 6084 approved in August 2018. The most recent assessment of predicted blast-related impacts associated with the Stage 2 development of the Quarry is provided in the Statement of Environmental Effects (RWC, 2018) and Noise and Blasting Impact Assessment (Todoroski, 2018).

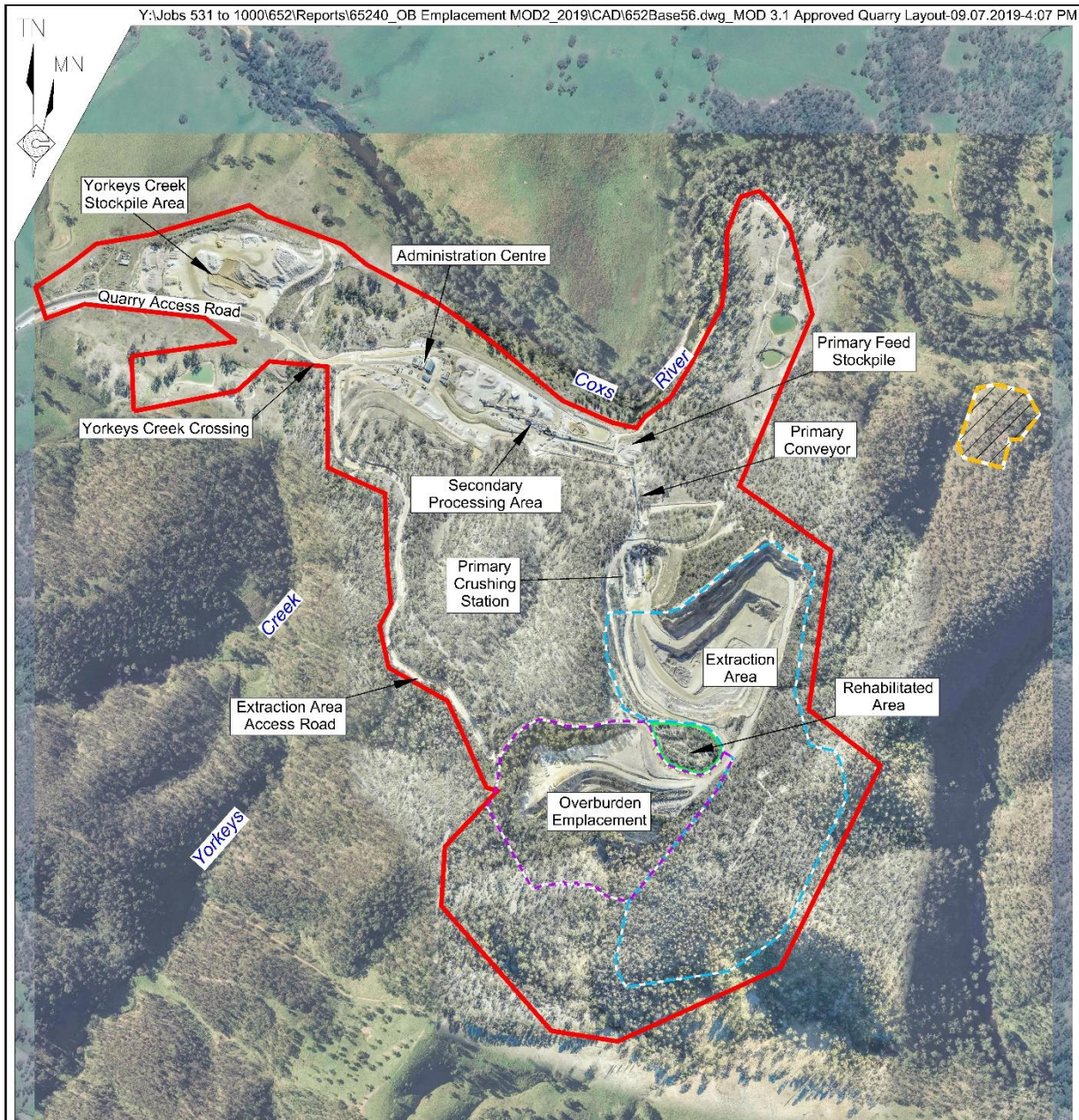
The approved layout is displayed in **Figure 1**. The land within the approved site boundary is referred to as the Quarry Site. The construction and development of Stage 2 of the Quarry will involve an increase in depth and lateral extension of the Stage 1 extraction area along an adjacent southwest-northeast trending ridge and a lateral extension and elevation of the existing overburden emplacement. SSD 6084 was modified in August 2018 and in July 2019.

Blasting is limited to one blast per calendar week, although during quieter periods, blasting frequency may be reduced. The existing blasting schedule rarely triggers the blast monitor indicating that blast impacts remain negligible. Blasting activities are predicted to remain consistent with existing activities and therefore blasting impacts are expected to remain well below the approved criteria.

## 2. LEGAL AND OTHER REGULATORY REQUIREMENTS

### 2.1 DEVELOPMENT CONSENT SSD 6084

Blast management is guided by Conditions 6 to 9 of Schedule 3 of SSD 6084. More general requirements for the preparation of management plans are also provided by *Condition 2* of Schedule 5 of SSD 6084, while Condition 5 and Condition 6 of Schedule 3 relate to incidents and management and reporting requirements that influence blast management. **Table 1** identifies all blast-related conditional requirements and identifies where in the Plan individual requirements have been addressed.



Note: Some boundaries are coincident

- REFERENCE
- Quarry Site Boundary
  - - - Extraction Area Boundary
  - - - Overburden Emplacement Area Boundary
  - - - Rehabilitated Area (Offset for Clarity)
  - ▨▨▨▨ Conservation Area H

SCALE (A4)

200 0 200 400 600 m

Quarry Plan Source: Groundwork Plus - January 2019  
 Base Photograph Source: CEH Survey - May 2017 & Google Earth -  
 October 2016 (surrounds)

Figure 1  
 APPROVED QUARRY SITE LAYOUT

**Table 1**  
**Blast-Related Conditional Requirements of SSD-6084**

Page 1 of 2

Condition	Section											
<b>Schedule 3</b>												
<p>Condition 1 – Hours of Operation</p> <p>The Applicant must comply with the operating hours set out in Table 1.</p> <p>Table 1: Operating Hours</p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Permissible Hours</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> <li>• Extraction operations</li> <li>• Processing operations</li> <li>• Overburden Management</li> <li>• Stockpile Management</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>• 6:00am to 10:00pm Monday to Friday;</li> <li>• 6:00am to 3:00pm Saturday; and</li> <li>• At no time on Sundays or public holidays.</li> </ul> </td> </tr> <tr> <td> <ul style="list-style-type: none"> <li>• Blasting</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>• 10:00am to 3:00pm Monday to Friday (except public holidays).</li> </ul> </td> </tr> <tr> <td> <ul style="list-style-type: none"> <li>• Loading and dispatch</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>• 4:00am to 10:00pm Monday to Friday;</li> <li>• 5:00am to 3:00pm Saturdays; and</li> <li>• At no time on Sundays or public holidays.</li> </ul> </td> </tr> <tr> <td> <ul style="list-style-type: none"> <li>• Maintenance</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>• Anytime.</li> </ul> </td> </tr> </tbody> </table>	Activity	Permissible Hours	<ul style="list-style-type: none"> <li>• Extraction operations</li> <li>• Processing operations</li> <li>• Overburden Management</li> <li>• Stockpile Management</li> </ul>	<ul style="list-style-type: none"> <li>• 6:00am to 10:00pm Monday to Friday;</li> <li>• 6:00am to 3:00pm Saturday; and</li> <li>• At no time on Sundays or public holidays.</li> </ul>	<ul style="list-style-type: none"> <li>• Blasting</li> </ul>	<ul style="list-style-type: none"> <li>• 10:00am to 3:00pm Monday to Friday (except public holidays).</li> </ul>	<ul style="list-style-type: none"> <li>• Loading and dispatch</li> </ul>	<ul style="list-style-type: none"> <li>• 4:00am to 10:00pm Monday to Friday;</li> <li>• 5:00am to 3:00pm Saturdays; and</li> <li>• At no time on Sundays or public holidays.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• Anytime.</li> </ul>	6.2.1	
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<ul style="list-style-type: none"> <li>• Maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• Anytime.</li> </ul>											
<p>Condition 6 – Blasting Impact Assessment Criteria</p> <p>The Applicant must ensure that blasting on site does not cause any exceedance of the criteria in Table 3.</p> <table border="1"> <thead> <tr> <th>Receiver</th> <th>Airblast overpressure (dB(Lin Peak))</th> <th>Ground vibration (mm/s)</th> <th>Allowable exceedance</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Any residence on privately-owned land</td> <td>120</td> <td>10</td> <td>0%</td> </tr> <tr> <td>115</td> <td>5</td> <td>5% of the total number of blasts over a period of 12 months</td> </tr> </tbody> </table> <p>However, these criteria do not apply if the Applicant has a written agreement with the relevant owner to exceed the limits in Table 3, and the Applicant has advised the Department in writing of the terms of this agreement.</p>	Receiver	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance	Any residence on privately-owned land	120	10	0%	115	5	5% of the total number of blasts over a period of 12 months	6.1
Receiver	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance									
Any residence on privately-owned land	120	10	0%									
	115	5	5% of the total number of blasts over a period of 12 months									
<p>Condition 7 – Blasting Frequency</p> <p>The Applicant may carry out a maximum of 1 blast per calendar week, unless an additional blast is required following a blast misfire. This condition does not apply to blasts required to ensure the safety of the quarry or workers on site.</p> <p><i>Note: For the purposes of this condition, a blast refers to a single blast event, which may involve a number of individual blasts fired in quick succession in a discrete area of the mine.</i></p>	6.2.2											
<p>Condition 8 – Operating Conditions</p> <p>During blasting operations, the Applicant must:</p>												
<p>a) implement best practice management to:</p> <ul style="list-style-type: none"> <li>– protect the safety of people and livestock in the areas surrounding blasting operations;</li> </ul>	7.1.3											
<ul style="list-style-type: none"> <li>– protect public or private infrastructure/property in the surrounding area from damage from blasting operations and</li> </ul>	7.1.3											
<ul style="list-style-type: none"> <li>– minimise the dust and fume emissions of blasting</li> </ul>	7.1.3											
<p>b) operate a suitable system to enable the local community to get up-to-date information on the proposed blasting schedule on site; and</p>	7.1.1											
<p>c) carry out regular monitoring to determine whether the development is complying with the relevant conditions of this consent,</p> <p>to the satisfaction of the Secretary.</p>	8											

**Table 1 (Cont'd)**  
**Blast-Related Conditional Requirements of SSD-6084**

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Condition	Section
<b>Schedule 5</b>	
<p>Condition 2 – Management Plan Requirements</p> <p>The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:</p> <p>a) a summary of relevant background or baseline data;</p> <p>b) a description of:</p> <ul style="list-style-type: none"> <li>– the relevant statutory requirements (including any relevant approval, licence or lease conditions);</li> <li>– any relevant limits or performance measures/criteria; and</li> <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> <p>c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;</p> <p>d) a program to monitor and report on the:</p> <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> <p>e) 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;</p>	<p>4</p> <p>2</p> <p>6</p> <p>6</p> <p>7</p> <p>8</p> <p>7.2.2</p>
<p>f) a program to investigate and implement ways to improve the environmental performance of the development over time;</p> <p>g) a protocol for managing and reporting any:</p> <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> </ul> <p>h) a protocol for periodic review of the plan.</p> <p><i>Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.</i></p>	<p>14</p> <p>10</p> <p>7.2</p> <p>10.1.2, 10.2</p> <p>7.2.2</p> <p>14</p>
<p>Condition 5 – Revisions of Strategies, Plans &amp; Programs</p> <p>Within 3 months of the submission of an:</p> <ul style="list-style-type: none"> <li>a) annual review under condition 4 above;</li> <li>b) incident report under condition 6 below;</li> <li>c) audit report under condition 8 below; and</li> <li>d) any modifications to this consent,</li> </ul> <p>the Applicant must review the strategies, plans and programs required under this consent, to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted for the approval of the Secretary.</p> <p><i>Note: The purpose of this condition is to ensure that strategies, plans and programs are regularly updated to incorporate any measures recommended to improve environmental performance of the development.</i></p>	<p>14</p>
<p>Condition 6 – Incident Reporting</p> <p>The Applicant must immediately notify the Secretary and any other relevant agencies of any incident. Within 7 days of the date of the incident, the Applicant must provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.</p>	<p>10</p>

## 2.2 ENVIRONMENT PROTECTION LICENCE 12323

Environment Protection Licence (EPL) 12323 provides limits on blasting operations as follows.

### L5 Blasting

*L5.1 Blasting in or on the premises must only be carried out between 1000 hours and 1500 hours Monday to Friday. Blasting in or on the premises must not take place on Saturdays, Sundays or Public Holidays without the prior approval of the EPA.*

*L5.2 The airblast overpressure level from blasting operations in or on the premises must not exceed:*

- a) 115 dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period; and*
- b) 120 dB (Lin Peak) at any time.*

*At the most affected noise-sensitive location not under the ownership or control of the licensee.*

*L5.3 The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed:*

- c) 5mm/s for more than 5% of the total number of blasts carried out on the premises during each reporting period; and*
- d) 10 mm/s at any time.*

*At the most affected sensitive location not under the ownership or control of the licensee.*

*L5.4 The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed 2 mm/s at the most sensitive location within Hartley Village.*

It is noted that the blast limit conditions are consistent with those provided in *Condition 6* of Schedule 3 in SSD-6084. Blasting criteria are discussed in Section 6.

## 3. OBJECTIVES AND OUTCOMES

The primary objectives of blast management at the Quarry are to ensure that blasting activities are undertaken in a manner that minimises annoyance, amenity and any adverse impacts resulting from the impact of airblast overpressure and ground-borne vibration at surrounding rural residences or buildings. **Table 2** details the objectives and outcomes with respect to blast management of the Quarry Site.

**Table 2**  
**Objectives and Outcomes**

Page 1 of 2

<b>Objectives</b>	<b>Outcomes</b>
(a) To ensure compliance with the criteria of SSD-6084, EPL 12323 and reasonable community expectations.	(i) Compliance with all relevant criteria and reasonable community expectations, as determined in consultation with the relevant government agencies.
(b) To implement blast management and mitigation measures during all stages of Quarry operation.	(ii) All identified blast management and mitigation measures implemented.
(c) To implement a blast monitoring program to establish compliance or otherwise with relevant criteria during all stages of Quarry operation.	(iii) All identified monitoring undertaken in accordance with the Plan.

**Table 2 (Cont'd)**  
**Objectives and Outcomes**

Page 2 of 2

Objectives	Outcomes
(d) To implement a complaints handling and response protocol.	(iv) Complaints (if any) are handled and responded to. (v) All complaints are recorded and reported in accordance with annual reporting requirements.
(e) To implement corrective and preventative actions, if required.	(vi) Corrective and preventative actions implemented, if required.
(f) To implement an incident reporting program, if required.	(vii) Incidents (if any) reported.

## 4. LOCAL SETTING

### 4.1 CLIMATIC CONDITIONS

Moderate wind and relatively high temperature may increase the likelihood of dust lift off from disturbed surfaces and carry dust plumes further from the Quarry Site than under calm conditions. Rainfall periods influence management of dust-related impacts and movement of fine sediment that when dry is more likely to create wind-blown dust impacts. A summary of the climatic conditions relevant for blast management are presented in this subsection.

#### Wind

**Figure 2** presents a summary of wind patterns generated from meteorological data collected during the 2014 calendar year at the Quarry. The wind roses indicate that on an annual basis, prevailing winds are from the west-southwest with light winds from the south-southwest and south persistent throughout the year. The west-southwest winds are more commonly experienced in winter and spring and autumn with winds from the northeast more prevalent during summer. Only sporadic winds from the north, east and southeast are experienced locally throughout the year.

### 4.2 AMBIENT (BACKGROUND) CONDITIONS

#### 4.2.1 Noise

The ambient (background) noise levels surrounding the Quarry Site are described in detail in *Section 5.3.2* of the SoEE (RWC, 2018). In summary, the ambient noise levels are influenced by a range of sources including traffic on Jenolan Caves Road and local roads, agricultural equipment, flow of the Coxs River, stock, wind in trees, wildlife, as well as noise associated with the Quarry.

#### 4.2.2 Vibration

There are no sources of significant ground vibration in the local setting.



### 4.3 RESIDENTIAL AND OTHER SENSITIVE RECEIVERS

The Quarry Site is located on the large land holding of the Hartley Pastoral Corporation which provides a significant buffer to privately-owned residences. The majority of land in the vicinity of the Quarry Site is land zoned RU1 Primary Production under the Lithgow *Local Environmental Plan* (LEP). The land owned by the Hartley Pastoral Corporation is operated as pastoral property and used primarily for cattle grazing, sheep grazing, cereal and fodder crops. Other nearby land uses include conservation areas, small rural holdings and limited recreation and tourism associated with Coxs River.

## 5. POTENTIAL BLASTING IMPACTS AND RISKS

Potential blasting impacts include the following:

- Air blast overpressure affecting nearby residents or livestock.
- Excessive ground vibration resulting in structural damage to nearby residences or infrastructure or that affects livestock.
- Dust impact on nearby residents and livestock.
- Fume impact on nearby residents and livestock.
- Fly rock received at nearby residences, public roads or affecting livestock.

MAC (2018) assessed predicted blasting impacts and concluded that airblast overpressure and vibration levels would continue to meet the standard criteria at all assessed residences for blasts up to 170kg Maximum Instantaneous Charge in the extraction area.

The existing and ongoing blast monitoring program is described in detail in Section 8, however it is noted that blast monitoring has been conducted historically for the operation. Annual blasting results are presented in the Annual Review document with a summary of results from 2016 to 2018 provided in **Table 3**. It is noted that the majority of blast events have not triggered the blast monitor (for 2018 the trigger was set to 0.51mm/s and 88dB(A)).

**Table 3**  
**Blast Monitoring Results Summary (2016 to 2018)**

Year*	Airblast Overpressure	Ground Vibration
2016	Maximum 95.9 dB(A)	Maximum 1.36mm/s
2017	No triggers	Maximum 0.62mm/s
2018	No triggers	No triggers

\* Financial Year to match reporting timelines

## 6. BLASTING CRITERIA AND LIMITS

### 6.1 BLASTING CRITERIA

The criteria for all on-site blasting activities are presented in **Table 4**.



**Table 4**  
**Blasting Criteria**

Location	Air Blast Overpressure (dB(Lin Peak))	Ground Vibration (mm/s)	Allowable Exceedance
Any residence on privately-owned land	120	10	0%
	115	5	5% of the total number of blasts over a period of 12 months
The most sensitive location within Hartley Village.	NA	2	None

In accordance with *Condition 6* of Schedule 3 of SSD-6084, the criteria of **Table 4** also do not apply if Hy-Tec has a written agreement with the owner of a residence for alternative criteria. Currently, no such agreements are held, with the Department of Planning, Industry and Environment (DPIE) to be advised in writing of the terms of any agreement, as negotiated.

## 6.2 OTHER LIMITS

### 6.2.1 Blasting Hours of Operation

Operational hours for blasting will be limited to 10:00am to 3:00pm Monday to Friday (excluding public holidays). Blasting outside these hours may be undertaken only in the event of a misfire or where blasting is required to ensure the safety of the Quarry or Quarry personnel and visitors.

### 6.2.2 Blasting Frequency

Blasting frequency will be limited to a maximum of one blast per calendar week, unless an additional blast is required following a misfire.

The nominated frequency limits do not apply to blasts required to ensure the safety of the Quarry or Quarry personnel and visitors.

## 7. BLAST MANAGEMENT SYSTEM

### 7.1 PROACTIVE MANAGEMENT

#### 7.1.1 Blasting Schedule Notification

A site blast notification board will be in place to inform all site personnel of blast activity on site. Blast notifications include blast time, location and contact information and will be the responsibility of the blast supervisor and/or the shot firer.

Residents of properties within a 2km radius of the Quarry will be contacted to determine their preferred method to be notified of scheduled blasting events. It is anticipated that this may require a blast notification letter, personal phone call or text message or notification via the Hy-Tec website.

Unless required for safety management reasons, blast notifications will be issued a minimum of 24 hours prior to any blast.

### 7.1.2 Meteorological Forecasting

Regional weather forecasts are available from the Bureau of Meteorology (BoM). These data will be reviewed by the Quarry Production Manager and/or blasting contractor who will check weather conditions for coming blast events and plan accordingly for adverse weather.

Adverse weather in terms of blasting impacts relates to either:

- winds in the direction of the closest sensitive receivers, i.e. from the northwest to southwest quadrants; or
- conditions likely to be indicative of temperature inversion, i.e. fog or frost conditions.

Seasonal conditions will be reviewed annually with a view to modifying long-term forecasting and planning of blasts on the Site.

### 7.1.3 Proactive Mitigation Measures

Hy-Tec will implement the following additional blast impact mitigation measures to ensure the safety of people, livestock, public and private infrastructure, equipment and vehicles in the surrounding areas.

- Long-term (annual) scheduling of activities to limit blasting activities during the daily periods when adverse conditions are most likely to occur.
- Short-term modification of blasting activities in response to forecasting of adverse conditions in the short-term.
- Blast contractors, in conjunction with the Quarry Production Manager, will review blast monitoring records to enable continuous improvement and quality control, resulting in continual development of optimum blast parameters.
- Quality control practices are to be implemented on the ground to ensure blasts are kept within design tolerances.
- Adequate burden is to be maintained on all faces to prevent blowouts and blast anomalies.
- Blast energies are to be minimised as far as possible.
- Adequate exclusion / clearance zones are to be maintained to ensure that the safety of people, equipment, vehicles or livestock on nearby land will not be affected by blasting.
- Best practice methodology is used to ensure fly-rock and fumes as low as reasonably practicable levels.

- Blasts are only planned to be fired in optimal weather conditions. In the event that unfavourable meteorological conditions are identified, the shot-firer will liaise with the Quarry Production Manager to determine whether to postpone a blast.
- Each blast will be monitored to confirm compliance with air blast overpressure and ground vibration criteria.
- Training will be provided to all relevant personnel on environmental obligations in relation to blasting controls.

Hy-Tec will implement the following quality control measures to minimise the dust emissions of blasting.

- Monitoring of blast performance with improvements to be made in response to elevated ground vibration or air overpressure.
- Restricting blast firing to times of optimal weather conditions, where practical.
- Use of high quality stemming products.
- Minimising blast energies.

Hy-Tec will implement the following measures to minimise fume emissions generated from blasting.

- Monitoring and calibration of the explosive manufacturing unit to ensure explosive mixing is in the correct proportions. This will ensure that noxious fuming is kept to a minimum.
- Use of emulsion based explosive products, minimising the effects of wet holes on ammonium nitrate and thus reducing the potential for fuming.

## **7.2 REACTIVE MANAGEMENT**

### **7.2.1 Triggers**

Two triggers for reactive management will be applied.

1. Blast Complaint. Any complaint received, either directly or via Council, EPA or other regulatory agency, will trigger the implementation of the response and corrective action measures described in Section 7.2.2.
2. Exceedance of blasting criteria established through monitoring. Any record of blasting exceeding the criteria nominated in Section 6 will trigger the response and corrective action measures described in Section 7.2.2.

### **7.2.2 Response and Corrective Action**

#### **Blasting Complaint**

A Complaints and Incidents Procedure for the Austen Quarry is provided the Environmental Management Strategy. In summary, following receipt of a complaint, action will be taken

within two working days to determine the cause of the complaint and identify actions to remediate the complaint source. The following details will be recorded following receipt of any blast-related complaint.

- a) The date and time of the complaint.
- b) The method by which the complaint was made.
- c) Any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect.
- d) The nature of the complaint.
- e) The action taken in relation to the complaint, including any follow-up contact with the complainant.
- f) If no action was taken, the reasons why no action was taken.

All complaints will be investigated a response provided to the complainant. The investigation will consider the following.

- What activities (and / or equipment) were being carried out or operated at the time of the complaint.
- Whether at the time of the complaint, normal day-to-day activities were being conducted.
- Whether equipment or activities on-site were the potential source of complaint (or whether other activities in the locality may have contributed to the complaint).
- What actions may be carried out to resolve the complaint and / or minimise the likelihood of further complaints.

If monitoring is undertaken to investigate a complaint, the Quarry Production Manager will make the results of the monitoring available for viewing by the complainant, on request.

### **Blasting Monitoring Exceedance**

If monitoring indicates that air blast overpressure or ground vibration exceeds criteria as a result of blasting, the following response and action plan will be implemented.

1. Immediately after obtaining exceedance information, the Quarry Production Manager (or delegated representative) will review the monitoring results and if necessary make arrangements to alter the blasting design, so that the airblast overpressure or ground vibration levels are reduced.
2. Immediately (or at the very least within 24 hours) following a confirmed exceedance of blast criteria, the Quarry Production Manager will notify DPIE and EPA of the exceedance and actions being taken to remediate the cause of the exceedance. This timing is consistent with that nominated in Condition 6 of Schedule 5 of SSD-6084.
3. Within 7 days of the date of the incident the Quarry Production Manager will provide a detailed report on the incident to DPIE and EPA.

4. Within two weeks of obtaining any data showing an exceedance of blast criteria, the Quarry Production Manager will notify in writing any affected landowners or tenants.
5. Any exceedance of the approved blast criteria will be reported to EPA in the Annual Return and to DPIE in the Annual Review.

## 8. MONITORING

### 8.1 METEOROLOGICAL MONITORING

A meteorological station has been operated at the Quarry Site since 2003. *Condition 13* of Schedule 3 of SSD-6084 requires that a suitable meteorological station be operating in the vicinity of the Quarry Site in accordance with the requirements described in the *Approved Methods for Sampling of Air Pollutants in New South Wales*. In addition, Condition M8.1 of EPL 12323 requires monitoring of the parameters, units of measure, averaging period and frequency specified in **Table 5**.

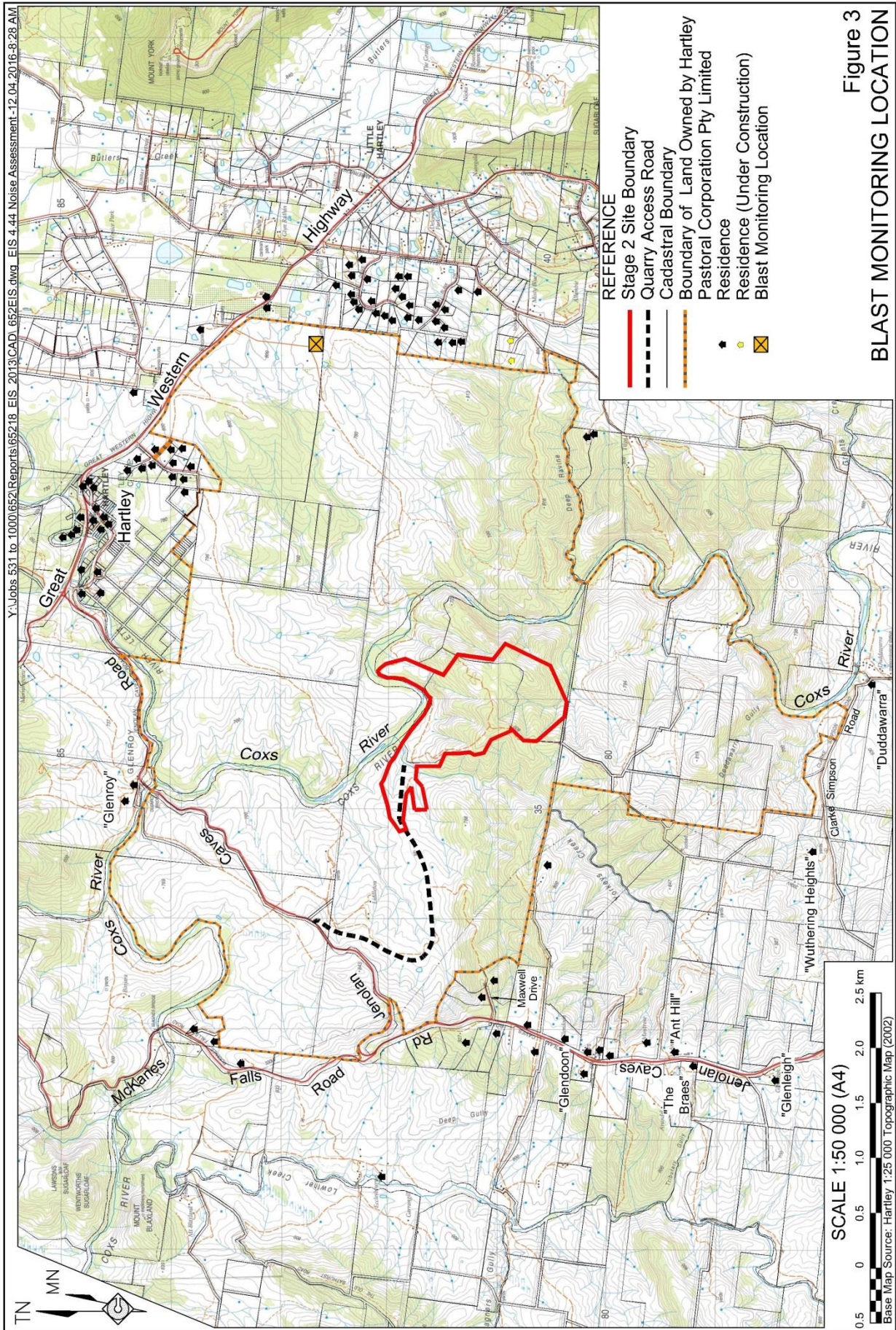
**Table 5**  
**Meteorological Monitoring**

Parameter	Units of Measure	Frequency	Averaging Period
Rainfall	mm	Continuous	24 hour
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

Meteorological monitoring will be accompanied by a quantitative record of weather conditions during the monitoring period together with a qualitative description of weather conditions, including cloud cover, fog etc. Where relevant, this data may be used to record environmental conditions during blasting events and derive any relevant relationship between air blast overpressure and ground vibration monitoring records.

### 8.2 BLAST MONITORING LOCATIONS

Blast monitoring is undertaken adjacent to the village of Little Hartley. The blast monitoring location is displayed in **Figure 3**. This location has been selected to give a reasonable approximation of expected ground vibration and air blast overpressure for residences located within the villages of Little Hartley and Hartley.



### **8.3 METHODOLOGY**

Blast monitoring is currently undertaken using an InstanTel Minimate Blaster. The unit is calibrated annually in accordance with the manufacturer's instructions for use on site.

All monitoring instrumentation and procedures will be undertaken in accordance with AS 2187.2-2006 *Explosives – Storage and use Part 2: Use of Explosives*. Microphones used for airblast overpressure monitoring have a lower cut-off frequency of 2Hz or less.

Monitoring will be used to capture and record all blast events. The following information will be recorded as part of the monitoring procedure.

- Blast noise overpressure (dBL<sub>peak</sub>) and peak particle velocity (ppv) (mm/s) in a radial, vertical and transverse direction.
- The time and duration of monitoring for each location.
- License limits, where appropriate.
- Wind speed and direction.
- The type of monitoring being undertaken.
- The monitoring location.

The results of all blasts will be documented by the blasting contractor and records maintained by the Quarry Production Manager.

## **9. COMPLAINTS HANDLING AND RESPONSE**

Hy-Tec has established a complaints management system for the Quarry to ensure that any complaints are recorded, investigated and the feedback provided to the appropriate parties.

Complaints made be made via the following channels.

- Via phone directly to the Quarry on 02 6355 0268.
- Via the online 'Contact Us' portal on the Hy-Tec website ([www.hy-tec.com.au/](http://www.hy-tec.com.au/)).
- Via a Government agency such as Lithgow City Council or the EPA.

The management of blast-related complaints is incorporated into the Noise Management System for the Quarry. The procedure for recording, investigating and responding to a noise related complaint is described in Section 7.2.2.

## **10. INCIDENT MANAGEMENT, NOTIFICATION AND REPORTING**

SSD 6084 defines an incident as:

*“An occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance”*

Further to this, SSD 6084 defines material harm as follows.

*Material harm.....Is harm that:*

- *involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial, or*
- *results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment)*

*This definition excludes “harm” that is authorised under either this consent or any other statutory approval’*

An incident which is causes of threatens to cause material harm to the environment (and may or may not result in an exceedance of blasting criteria) is referred to as a **Pollution Incident**.

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

## **10.1 INCIDENT MANAGEMENT AND NOTIFICATION**

### **10.1.1 Pollution Incident**

It is considered unlikely that a blast-related incident will classify as a Pollution Incident and notably, the EPA excludes noise pollution from the requirements of a Pollution Incident Response Management Plan.

In the event of a blast-related incident which is deemed a Pollution Incident, the Quarry Production Manager will be notified and the event will be reported to the EPA immediately at the first practical 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 Production Manager or delegate will implement one or more of the corrective measures identified in the Blast Management System (see Section 7).

Within 7 days of the incident, the Company will submit a report to DPIE confirming estimated cause of the exceedance, actions taken and ongoing management to prevent future incidents.

### **10.1.2 Non-Compliance Incident**

On identification of a non-compliance against blasting criteria, which may follow receipt of a complaint, the Quarry Production Manager will be notified and an investigation into the cause of the non-compliance or complaint causing emissions commenced in accordance with the response and corrective actions described in Section 7.2.2 including notification protocols.



## 10.2 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 Production Manager.

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 Review to the DPIE and Annual Return to the EPA.

## 11. DOCUMENTATION AND PUBLICATION OF MONITORING INFORMATION AND REPORTING

Hy-Tec will retain records of meteorological monitoring and blast monitoring for a minimum period of four years. Monitoring records will be made available to relevant government authorities following a written request.

Hy-Tec will include a summary of blast monitoring results within 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 Hy-Tec will publish a meaningful summary of all EPL required 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, Hy-Tec 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. The data will be published in a format that includes raw data values, 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).

## 12. ROLES AND RESPONSIBILITIES

**Table 6** outlines the roles and responsibilities of personnel with reference to management of blasting.

**Table 6**  
**Roles and Responsibilities of Personnel with Respect to Management of Blasting**

Page 1 of 2

Role	Responsibilities
NSW Quarry Operations Manager	<p>Ensure compliance with the Blast Management Plan.</p> <p>Ensure adequate resources are available to implement the Blast Management Plan.</p> <p>Ensure suitably trained personnel are available to implement the responsibilities of the Quarry Production Manager during any time of the Quarry Production Manager's absence from site.</p> <p>Coordinate the review of the Plan (see Section 14).</p>

**Table 6 (Cont'd)**  
**Roles and Responsibilities of Personnel with Respect to Management of Blasting**

Page 2 of 2

Role	Responsibilities
Quarry Production Manager, or his/her nominee	<p>Ensure the implementation of the Blast Management Plan.</p> <p>Ensure blast 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 Blast Management System (see Section 7).</p> <p>Relocate or postpone relevant activities in the event of adverse weather conditions, where practical.</p> <p>Provide primary contact for complaints and supply follow-up information to any complainant.</p> <p>Initiate investigations of complaints as received from the public or government agency.</p> <p>Prepare a report to government agencies or neighbours following a notifiable pollution incident (see Section 10).</p> <p>Inform the NSW Quarry Operations Manager of identified causes of any exceedance of air blast or overpressure exceedance and any alterations to site operations that may or have influenced the likelihood of future exceedances.</p> <p>Ensure employees are competent through training and awareness programs.</p>
Blasting Engineer / Contractor	<p>Design all blasts to ensure compliance.</p> <p>Review any reports of anomalous ground conditions or unaccounted for events and postpone the blast, modify the design or liaise with the Quarry Production Manager, as necessary.</p> <p>Review monitoring data following each blast.</p> <p>Advise the Quarry Production Manager of estimated causes for blasting incidents.</p>
All On-site Personnel	<p>Operate in manner that minimises risks of incidents to themselves, fellow workers or the surrounding environment.</p> <p>Follow any instructions provided by the Quarry Production Manager.</p>

### 13. COMPETENCE TRAINING AND AWARENESS

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

After completing the induction, workers will sign the statement of induction and a record of this is kept in the administration office.

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

## **14. PLAN REVIEW AND CONTINUAL IMPROVEMENT PROTOCOL**

The Plan will be reviewed every three years from the date of approval or (in accordance with *Condition 5* of Schedule 5 of SSD-6084) within 3 months of submission of an Annual Review, an incident report resulting from a notifiable incident, each independent environmental audit and any modification to SSD-6084. This will ensure the adequacy of the Plan and allow for opportunities of adaptive management and continual improvement. This will include a review of monitoring records and monitoring methods, as necessary. Each review will also evaluate the effectiveness of the overall blast monitoring program and whether it should be modified.

## 15. REFERENCES

**Muller Acoustic Consulting (2018).** Noise and Blasting Impact Assessment for the Austen Quarry Stage 2 Extension Project. Prepared on behalf of Hy-Tec Industries Pty Limited.

**R.W. Corkery & Co (2014).** *Environmental Impact Statement for the Austen Quarry Stage 2 Extension Project.* Prepared on behalf of Hy-Tec Industries Pty Limited.

**R.W. Corkery & Co (2018).** Austen Quarry Stage 2 Extension Project (MOD 1 – SSD 6084) Statement of Environmental Effects, March 2018. Prepared on behalf of Hy-Tec Industries Pty Limited.

**Standards Australia (2006).** AS 2187.2–2006 *Explosives – Storage and use Part 2: Use of Explosives*, February 2006.