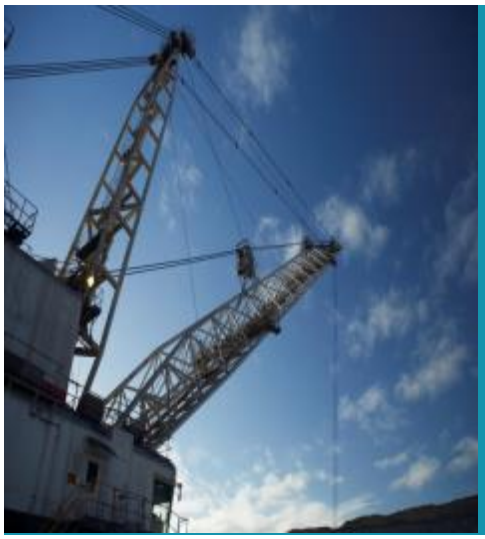
HUNTER VALLEY OPERATIONS



Blast Management Plan

DOCUMENT CONTROL

Version	Date	Revision Description	Author	Approver	Secretary Approval Date
1.0	27/09/2013	Original	Kelly O'Mullane Approvals Specialist	Gerard Gleeson Environment Specialist	-
1.1	26/03/2014	Revised following feedback from DP&I on original submission	Kelly Adamthwaite Approvals Specialist	Gerard Gleeson Environment Specialist	-
1.2	04/04/2014	Document finalised for publish	Gerard Gleeson Environment Specialist	Andrew Speechly Environment Manager	4/04/2014
1.3	30/05/2017	Revised following modification to HVO North Consent and to update Blast Fume Protocol. Monitoring Programme revised to include minor changes to blast monitoring locations on included map.	Doug Fenton Environment Advisor	Andrew Speechly Environment Manager	-
2.0	30/11/2017	Revision to align with new ownership management practices. Review following HVO North Mod. 7	Dominic Brown Environment Specialist	Andrew Speechly Environment Manager	-
3.0	25/05/2018	Revision following Modification 5 of HVO South Consent and Submission of 2017 Annual Review.	Dominic Brown Environment Specialist	Andrew Speechly Environment Manager	-
3.1	08/02/2019	Revision following feedback from DP&E on Version 3.0.	Dominic Brown Environment & Community Coordinator	Andrew Speechly Environment & Community Manager	-
3.2	27/02/2019	Revision following feedback from DP&E on Version 3.1	Dominic Brown Environment & Community Coordinator	Andrew Speechly Environment & Community Manager	-
3.3	28/03/2019	Revision following feedback from DP&E on Version 3.2	Dominic Brown Environment & Community Coordinator	Andrew Speechly Environment & Community Manager	3/04/2019

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1 PREFACE

1.1 Introduction

Hunter Valley Operations (HVO) is an open cut mining complex located approximately 24 kilometres north-west of Singleton, New South Wales (NSW) and geographically divided by the Hunter River into HVO North and HVO South. While HVO is managed as one operation, HVO North and HVO South each have separate planning approvals.

This Blast Management Plan (BMP) applies to the whole HVO complex (the Project).

The Project is generally bounded by Lemington Road and Jerrys Plains Road alongside its western boundary. The New England Highway is located to the north and east of the Project area with the Golden Highway and Wallaby Scrub Road to the south.

HVO North was granted approval on 12 June 2004 (DA 450-10-2003) for HVO North by the Minister for Infrastructure and Planning and the Minister for Natural Resources (the HVO North Approval). The most recent modification was approved on 28 July 2017.

HVO South operates in accordance with the Project Approval granted on 24 March 2009 (DA 06_0261) by the Minister for Planning (the HVO South Approval). The most recent modification was approved on 28 February 2018.

The HVO North Approval and the HVO South Approval are jointly referred to herein as 'the Approvals'.

The Project is described in detail in:

- the EIS titled '*Hunter Valley Operations – West Pit Extension and Minor Modifications*', dated October 2003, and prepared by Environmental Resources Management Australia;
- the section 96(1A) modification application for the 'Hunter Valley Loading Point', dated 30 June 2005, and prepared by Matrix Consulting;
- the 'Carrington Pit Extended Statement of Environmental Effects', dated October 2005, and prepared by Environmental Resources Management Australia;
- the 'Carrington West Wing Environmental Assessment', dated 1 October 2010, and prepared by EMGA Mitchell McLennan (CWW EA);
- the Environmental assessment titled 'Hunter Valley Operations South Coal Project Environmental Assessment Report', Volumes 1, 2 and 3, dated January 2008, including the response to submissions;
- the Environmental Assessment titled 'Raising of Lake James Dam', dated October 2009, and the response to submissions (including its Statement of Commitments) dated November 2009;
- the Environmental Assessment titled 'Proposed Modification to HVO South Project', dated May 2010, and the response to submissions dated August 2010;
- the Environmental Assessment titled 'Hunter Valley Operations South Project Approval – Modification 4 – Administrative Omissions and Clarifications' [sic], dated 26 September 2012;
- the Environmental Assessment titled 'Hunter Valley Operations North Project Approval – Modification 4' – Dedication of Lands for Offsets [sic], dated 26 September 2012;
- The Environmental Assessment titled 'Hunter Valley Operations North Modification 5' – HVLP Sediment Basin and HVO North Communication Towers, dated November 2016; and

- The Environmental Assessment titled 'Hunter Valley Operations South - Modification 5 February 2017.

The Project will occur in an area where mining is already a feature of the landscape. HVO is located in the Hunter Valley coalfields with surrounding mines and infrastructure including Mount Thorley Warkworth (MTW), Wambo and Ravensworth.

A blasting study was prepared as part of the CWW EA (EMGA Mitchell McLennan dated 1 October 2010) to assess potential blasting impacts.
Similarly, a blasting assessment was undertaken as part of the HVO South Modification 5 Environmental Assessment (EMM February 2017).

This BMP is the primary tool that will be utilised to reduce potential blasting impacts related to the Project.

1.2 Scope of the Blast Management Plan

This BMP was prepared by suitably qualified and experienced persons on behalf of HVO in accordance with Condition 19, Schedule 3, of the HVO North Approval and Condition 18, Schedule 3 of the HVO South Approval
This AQMP was submitted for approval on 28 March 2019.
This BMP applies to the area within HVO North and HVO South boundaries, including:

- Operating Pits;
- Coal Preparation Plants (CPPs); and
- Loading Points.

This BMP is to be applied from the time of approval of this plan, during construction and operation of the Project and incorporates mitigation measures and strategies that HVO will employ to comply with the relevant blasting conditions of the Approvals and Environment Protection Licence (EPL).

Table 1 below highlights the consent conditions required to be covered by this BMP and the sections within this document in which they are addressed.

Table 2 highlights where items in the Statement of Commitments (SOC) related to air quality impacts are addressed in this BMP.

Table 3 below highlights the EPL conditions required to be covered by this BMP and the sections within this document in which they are addressed.

1.3 Objectives

The purpose of this BMP is to provide reasonable and feasible measures to address potential blasting impacts of the Project as identified in the Approvals and satisfy the relevant conditions of the Approvals.

This BMP describes procedures required to help achieve compliance with the Approval conditions relating to blasting impacts. This BMP also provides a mechanism for assessing blast monitoring results against the relevant blast impact assessment criteria.

The key elements of the mitigation strategies will be,

- to utilise blast design which incorporates controls so that blasting-induced vibration is within acceptable limits (this will also be addressed through monitoring); and
- managing key environmental issues associated with air blast overpressure and vibration impacts as a result of operational activities that may affect:
    - Communities (Warkworth, Maison Dieu, Jerrys Plains);
    - Residences within zone of affectation;
    - Residences beyond zone of affectation;
    - Neighbouring mines; and

- Sensitive infrastructure.

The objectives of this BMP are to:

- meet the requirements of the Approval;
- set out the notification procedure;
- describe the process for assessing real-time weather conditions prior to blasting;
- set out the hours of blasting;
- outline good blast design and evacuation procedures are in place to allow for safety from fly rock;
- set out a Road Closure Management Plan (see Appendix C);
- describe the monitoring programme and how it will be implemented and maintained;
- detail the controls to be implemented to minimise blasting impacts off site;
- manage community complaints in a timely and effective manner; and
- detail the procedure for reporting blast criteria exceedances to relevant stakeholders.

Table 1: Consent Conditions Addressed

<table>
<tr><th>Consent Condition</th><th>Environmental Performance Conditions</th><th>Section of BMP which addresses this requirement</th></tr>
<tr><td colspan="3">HVO NORTH CONSENT (DA 450-10-2003)</td></tr>
<tr><td>Sch. 3, Cond. 12</td><td>Airblast Overpressure Limits
The Applicant must ensure that the airblast overpressure level from blasting at the development does not exceed the criteria in Table 14 [sic] at any residence on privately-owned land.
Table 12: Airblast overpressure impact assessment criteria
<table><tr><th>Airblast overpressure level (dB(Lin Peak))</th><th>Allowable exceedance</th></tr><tr><td>115</td><td>5% of the total number of blasts in a 12 month period</td></tr><tr><td>120</td><td>0%</td></tr></table></td><td>Sections 4.2.1 and 6.2</td></tr>
<tr><td>Sch. 3, Cond. 13</td><td>Ground Vibration Impact Assessment Criteria
The Applicant must ensure that the ground vibration level from blasting at the development does not exceed the criteria in Table 15 [sic] at any residence on privately-owned land.
Table 13: Ground vibration impact assessment criteria
<table><tr><th>Peak particle velocity (mm/s)</th><th>Allowable exceedance</th></tr><tr><td>5</td><td>5% of the total number of blasts in a 12 month period</td></tr><tr><td>10</td><td>0%</td></tr></table></td><td>Section 4.2.1</td></tr>
<tr><td>Sch. 3, Cond. 14</td><td>Blasting Hours
The Applicant must only carry out blasting at the development between 7 am and 6 pm Monday to Saturday inclusive. No blasting is allowed on Sundays, Public Holidays or any other time without the written approval of the EPA.</td><td>Section 6.2</td></tr>
<tr><td>Sch. 3, Cond. 14A</td><td>Blasting Frequency
The Applicant may carry out a maximum of:
(a) 3 blasts a day, unless an additional blast is required following a blast misfire; and
(b) 12 blasts a week,
for all open cut mining operations at the HVO North mine.
This condition does not apply to blasts that generate ground vibration of 0.5 mm/s or less at any residence on privately-owned land, or to blasts required to ensure the safety of the mine or its workers.</td><td>Section 6.2</td></tr>
<tr><td>Sch. 3, Cond. 15</td><td>Interactions With Adjoining Mines
Prior to carrying out any mining or associated development within 500 metres of active mining areas at Ravensworth Operations, the Applicant must enter into an agreement with Ravensworth Operations Pty Ltd (or its assigns or successors in title) to address the potential interactions between the two mines. If during the course of entering into this agreement, or subsequently implementing this agreement, there is a dispute between the parties about any aspect of the agreement, then either party may refer the matter to the Secretary for resolution.</td><td>Section 6.8</td></tr>
<tr><td>Sch. 3, Cond. 16</td><td>Prior to carrying out any mining or associated development within 500 metres of active mining areas at Cumnock No. 1 Colliery, the Applicant must enter into an agreement with Cumnock No. 1 Colliery Pty Ltd (or its assigns or successors in title) to address the potential interactions between the two mines. If during the course of entering into this agreement, or subsequently implementing this agreement, there is a dispute between the parties about any aspect of the agreement, then either party may refer the matter to the Secretary for resolution.</td><td>Section 6.8</td></tr>
<tr><td>Sch. 3, Cond. 16A</td><td>Property Inspections
If the Applicant receives a written request from the owner of any privately-owned land within 2 kilometres of the approved open cut mining pit/s on site for a property inspection to establish the baseline condition of any buildings and/or structures on his/her land, or to have a previous property inspection updated, then within 2 months of receiving this request the Applicant must:
(a) provide the Secretary with a report that:
• establishes the baseline condition of any buildings and other structures on the land, or updates the previous property inspection report; and</td><td>Section 7.1</td></tr>
</table>

Consent Condition	Environmental Performance Conditions	Section of BMP which addresses this requirement
	• identifies measures that should be implemented to minimise the potential blasting impacts of the development on these buildings and/or structures; and (b) provide the landowner a copy of the new or updated property inspection report. The report is to be prepared by a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties. If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Applicant or the landowner disagrees with the findings of the property inspection report, either party may refer the matter to the Secretary for resolution. If the Applicant considers that an extension of time is required to complete the report, the Applicant may apply in writing to the Secretary for an extension. The Applicant must provide a copy of the request and of the Secretary's decisions to the landowner.	
Sch. 3, Cond. 16B	If the owner of any privately-owned land within 3 kilometres of any approved open cut mining pit on the site or any other privately owned land where the Secretary is satisfied that an investigation is warranted, claims that buildings and/or structures on his/her land have been damaged as a result of blasting on the site, then within 2 months of receiving this claim the Applicant must: (a) provide the Secretary with a report that: • investigates the claim; and • identifies measures or works that should be implemented to rectify any blasting impacts of the development on these buildings and/or structures; and (b) provide the landowner a copy of the claim inspection report and recommendations. If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Applicant must repair the damage to the satisfaction of the Secretary. The report must be prepared by a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties. If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Applicant or the landowner disagrees with the findings of the claim inspection report, either party may refer the matter to the Secretary for resolution. If the Applicant considers that an extension of time is required to complete the report, the Applicant may apply in writing to the Secretary for an extension. The Applicant must provide a copy of the request and of the Secretary's decision to the landowner.	Section 7.2
Sch. 3, Cond. 17	**Blasting Operating Conditions** During mining operations on site, the Applicant must: (a) implement best management practice to: • protect the safety of people and livestock in the surrounding area; • protect public or private infrastructure/property in the surrounding area from any damage; and • minimise the dust and fume emissions of any blasting; (b) minimise the frequency and duration of any road closures, and avoid road closures during peak traffic periods; (c) co-ordinate the timing of blasting on site with the timing of blasting at nearby mines (including the Mt Thorley Warkworth, Wambo, Ravensworth and HVO South mines) to minimise the cumulative blasting impacts of these mines and HVO North mine; and (d) operate a suitable system to enable the public to get up-to-date information on the proposed blasting schedule on site, to the satisfaction of the Secretary.	Sections 6.2 and 6.3 Section 4.2.2 Section 6.2 and Appendix D Sections 6.7 and 6.8, Appendix E Sections 3.2 and 6.8 Section 9.1.2
Sch. 3, Cond. 18	The Applicant must not undertake blasting on site within 500 metres of: (a) any public road without the approval of the appropriate road authority; or (b) any land outside the site that is not owned by the Applicant; unless • the Applicant has a written agreement with the relevant landowner to allow blasting to be carried out closer to the land, and the Applicant has advised the Department in writing of	Sections 6.2 and 6.7

Consent Condition	Environmental Performance Conditions	Section of BMP which addresses this requirement

	the terms of this agreement, or
	• the Applicant has:
	  • demonstrated to the satisfaction of the Secretary that the blasting can be carried out closer to the land without compromising the safety of the people or livestock on the land, or damaging the buildings and/or structures on the land; and
	  • updated the Blast Management Plan to include the specific measures that would be implemented while blasting is being carried out within 500 metres of the land.	

Sch. 3, Cond. 19(a)	**Blast Management Plan** be submitted to the Secretary for approval by the end of September 2013 unless otherwise agreed;	Section 1.1
Sch. 3, Cond. 19(b)	propose and justify any alternative ground vibration limits for any public infrastructure in the vicinity of the site;	Section 4.2.2
Sch. 3, Cond. 19(c)	describe the measures that would be implemented to ensure: • best management practice is being employed; • compliance with the relevant conditions of this consent; • that blasting will not cause damage to the Carrington West Wing Groundwater Barrier (LPB) as described in Condition 23 of Schedule 4; And • that blasting in the Carrington West Wing does not cause damage or instability to the Carrington In Pit Fine Reject Emplacement embankment;	Section 5.2 Table 1Sections 6.5 and 6.6
Sch. 3, Cond. 19(d)	include a road closure management plan for blasting within 500 metres of a public road, that has been prepared in consultation with the RMS and Council	Section 6.7, Appendices A and D
Sch. 3, Cond. 19(e)	include a specific blast fume management protocol to demonstrate how emissions will be minimised including risk management strategies if blast fumes are generated	Section 6.2 and Appendix D
Sch. 3, Cond. 19(f)	include a monitoring program for evaluating the performance of the development, including: • compliance with the applicable criteria; • minimising the fume emissions from the site	Appendix E
Sch. 3, Cond. 19(g)	include a protocol that has been prepared in consultation with the owners of nearby mines (including the Mt Thorley Warkworth, Wambo, Ravensworth and HVO South mines) to minimise the cumulative blasting impacts of these mines and the HVO North mine	Sections 3.2 and 6.8
Sch. 3, Cond. 40A	**Aboriginal Heritage Site 37-2-1877 (CM-CD1)** The Applicant must ensure that mining operations (including blasting) and associated activities do not cause any impact to Aboriginal heritage site 37-2-1877 (CM-CD1) and the Older Stratum.	Sections 4.3 and 6.4
Sch. 5, Cond. 2(a)	**Management Plan Requirements** include detailed baseline data	NA
Sch. 5, Cond. 2(b)	a description of: • the relevant statutory requirements (including any relevant consent, licence or lease conditions); • any relevant limits or performance measures/criteria; • 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	Section 2 Section 4.2
Sch. 5, Cond. 2(c)	a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	Appendix E
Sch. 5, Cond. 42(d)	a program to monitor and report on the: • impacts and environmental performance of the development; and • effectiveness of any management measures (see (c) above)	Sections 9.1, 9.2 and Appendix E

Consent Condition	Environmental Performance Conditions	Section of BMP which addresses this requirement
Sch. 5, Cond. 2(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;	Section 6.9
Sch. 5, Cond. 2(f)	a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 6.10
Sch. 5, Cond. 2(g)	a protocol for managing and reporting any: • incidents; • complaints; • non-compliances with statutory requirements; and • exceedances of the impact assessment criteria and/or performance criteria	Sections 9.2 and 9.4
Sch. 5, Cond. 2(h)	include a protocol for periodic review of the plan;	Section 10
Sch. 5 Cond 2(i)	A document control table that includes version numbers, dates when the management plan was prepared and reviewed, names and positions of the people who prepared and reviewed the management plan, a description of any revisions made and the date of the Secretary's approval.	Document Control
Sch. 5, Cond. 4	**Revision of Strategies, Plans and Programs** Within 3 months of: (a) the submission of an incident report under Condition 7 below; (b) the submission of an annual review under Condition 9 below; (c) the submission of an audit report under Condition 10 below; and (d) approval of a modification to this consent, the Applicant must review, and if necessary revise, the strategies, plans, and programs required under this consent to the satisfaction of the Secretary. Within 6 weeks of conducting any such review, the Applicant must advise the Secretary of the outcomes of the review, and provide any documents that have been revised to the Secretary for review and approval. *Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the development.*	Section 10
Sch. 5, Cond. 7	**Incident Reporting** 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.	Section 9.2
Sch. 5, Cond. 8	**Regular Reporting** The applicant must provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent.	Section 9.1
Sch. 5, Cond. 9	**Annual Review** By the end of March each year, or other timing as may be agreed by the Secretary, the Applicant must submit a report to the Department reviewing the environmental performance of the development to the satisfaction of the Secretary. This review must: (a) describe the development (including any rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year; (b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, which includes a comparison of these results against the: • the relevant statutory requirements, limits or performance measures/criteria;	Section 9.3

Consent Condition	Environmental Performance Conditions	Section of BMP which addresses this requirement
	• requirements of any plan or program required under this consent; • the monitoring results of previous years; and • the relevant predictions in the documents listed in condition 2 of Schedule 3; (c) identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance; (d) identify any trends in the monitoring data over the life of the development; (e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and (f) describe what measures will be implemented over the current calendar year to improve the environmental performance of the development. The applicant must ensure that copies of the Annual Review are submitted to Council and are available to the Community Consultative Committee (see condition 6 of Schedule 6) and any intended person upon request.	
HVO SOUTH CONSENT (PA 06_0261)		
Sch. 2 Cond. 15	**Evidence of Consultation** Where conditions of this approval require a document to be prepared in consultation with an identified party, the proponent must; a) consult with the relevant party prior to submitting the subject document to the Secretary for approval; and b) provide details of the consultation undertaken including: • a description of how matters raised by those consulted have been resolved to the satisfaction of both the Proponent and the party consulted; and details of any disagreement remaining between the party consulted and the Proponent, and how the Proponent has addressed the matters not resolved.	App. C App. F
Sch. 3, Cond. 7	**Airblast Overpressure Impact Assessment Criteria** The Proponent must ensure that the airblast overpressure level from blasting at the project does not exceed the criteria in Table 6 at any residence on privately-owned land. *Table 6: Airblast overpressure impact assessment criteria* ***Airblast overpressure level (dB(Lin Peak))*** | ***Allowable exceedance*** 115 | 5% of the total number of blasts over a period of 12 months 120 | 0% However, if the Proponent has a written negotiated blast agreement with the owner of the relevant residence on privately-owned land, and a copy of this agreement has been forwarded to the Department and EPA, then the Proponent may exceed the airblast overpressure level in Table 6 in accordance with the negotiated agreement.	Sections 4.2.1 and 6.2
Sch. 3, Cond. 8	**Ground Vibration Impact Assessment Criteria** The Proponent must ensure that the ground vibration level from blasting at the project does not exceed the criteria in Table 7, at any residence on privately-owned land.	Section 4.2.1

Consent Condition	Environmental Performance Conditions	Section of BMP which addresses this requirement
	Table 7: Ground vibration impact assessment criteria ***Peak particle velocity (mm/s)*** | ***Allowable exceedance*** 5 | 5% of the total number of blasts over a period of 12 months 10 | 0% *Note: Vibration must be measured in accordance with applicable guidelines, including EPA's Assessing Vibration: A Technical Guideline (2006).* However, if the Proponent has a written negotiated blast agreement with the owner of the relevant residence on privately-owned land, and a copy of this agreement has been forwarded to the Department and EPA, then the Proponent may exceed the airblast overpressure level in Table 7 in accordance with the negotiated agreement.	
Sch. 3, Cond. 9	For St Philip's Church and the outbuildings at Archerfield, the Proponent must ensure that ground vibration peak particle velocity generated by the project does not exceed 5 mm/s, or as otherwise approved by the Secretary.	Section 4.2.2
Sch. 3, Cond. 10	**Blasting Hours** The Proponent must only carry out blasting on site between 7 am and 6 pm Monday to Saturday inclusive. No blasting is allowed on Sundays, public holidays, or at any other time without the written approval of the Secretary.	Section 6.2
Sch. 3, Cond. 11	**Operating Conditions** During mining operations on site, the Proponent must implement best blasting practice to: (a) protect the safety of people, property, public infrastructure, and livestock; (b) minimise the dust and fume emissions from blasting at the project; (c) minimise the frequency and duration of any road closures for blasting, and use all reasonable efforts to avoid closures during peak traffic periods; (d) use all reasonable efforts to co-ordinate the timing of blasting at the site with any nearby mines to minimise cumulative blasting impacts; and (e) carry out regular blast monitoring to determine whether the project is complying with the relevant conditions of this approval, to the satisfaction of the Secretary.	Sections 6.2 and 6.3 Section 4.2.2
Sch. 3, Cond. 12	The Proponent may carry out a maximum of: (a) 3 blasts a day; and (b) 15 blasts a week, on the site. This condition does not apply to blasts that generate ground vibration of 0.5mm/s or less at any residence on privately-owned land, or to blast misfires or blasts required to ensure the safety of the mine, its workers or the general public. Notes: • 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. • For the avoidance of doubt, should an additional blast be required after a blast misfire, this additional blast and the blast misfire are counted as a single blast.	Section 6.2
Sch. 3, Cond. 13	The Proponent must not undertake blasting within 500 metres of any public road or any land outside the site not owned by the Proponent, unless the Proponent has: (a) a written agreement with the owner/s of the relevant public road or land to allow blasting to be carried out closer to the public road or land, and the Proponent has advised the Department in writing of the terms of this agreement; or (b) demonstrated, to the satisfaction of the Secretary, that the blasting can be carried out closer to the public road or land without compromising the safety of people or livestock or damaging the road or other buildings and structures, and updated the Blast Management Plan to include specific mitigation measures to be implemented while blasting is being carried out within 500 metres of the road or land.	Sections 6.2 and 6.7
Sch. 3, Cond. 15	**Public Notice** During mining operations on site, the Proponent must:	Sections 6.2 and

Consent Condition	Environmental Performance Conditions	Section of BMP which addresses this requirement
	(a) notify the landowner/occupier of any residence within 2 kilometres of the mining area who registers an interest in being notified about the blasting schedule at the mine, or any other landowner nominated by the Secretary; (b) operate a blasting hotline, or alternate system agreed to by the Secretary, to enable the public to get up-to-date information on the blasting schedule at the project; (c) advertise the blasting hotline number in a local newspaper at least 4 times each year; and (d) publish an up-to-date blasting schedule on its website to the satisfaction of the Secretary.	9.1.2
Sch. 3, Cond. 16	**Property Inspections** At least 3 months prior to blasting within 2 kilometres of any privately-owned land, or any other landowner nominated by the Secretary, the Proponent must advise applicable landowners that they are entitled to a structural property inspection. If the Proponent receives a written request for a structural property inspection from the landowner, the Proponent must within 2 months of receiving this request and prior to blasting within 2 kilometres of the property: (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to inspect the condition of any building or structure on the land, and recommend measures to mitigate any potential blasting impacts; and (b) give the landowner a copy of the property inspection report. *Note: This condition does not operate so as to prevent blasting within the first 3 months of this approval as consents applying to the site contain similar provisions for the inspection or residences potentially affected by blasting operations.*	Section 7.1
Sch. 3, Cond. 17	**Property Investigations** If any landowner of privately-owned land within 2 kilometres of blasting operations, or any other landowner nominated by the Secretary, claims that buildings and/or structures on his/her land have been damaged as a result of blasting at the project, the Proponent must within 3 months of receiving this claim: (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to investigate the claim; and (b) give the landowner a copy of the property investigation report. If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Proponent must repair the damages to the satisfaction of the Secretary. If the Proponent or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Secretary for resolution. If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Proponent or the landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Secretary for resolution.	Section 7.2
Sch. 3, Cond. 18	**Blast Management Plan** The Proponent must prepare a Blast Management Plan for the project to the satisfaction of the Secretary. This plan must: (a) be submitted to the Secretary for approval within 3 months of the determination of Modification 5, unless otherwise agreed by the Secretary; (b) be prepared in consultation with the EPA by a suitably qualified and experienced person/s; (c) describe the measures to be implemented to ensure compliance with the blasting criteria and conditions of this approval; (d) include a Road Closure Management Plan for any blasting within 500 metres of a public road, that has been prepared in consultation with relevant road authorities and includes provisions for: • minimising the duration of closures, both on a per event basis and a weekly basis; • avoiding peak traffic periods as far as reasonable; and • co-ordinating with nearby mines to minimise the cumulative of road closures; (e) propose and justify any agreed alternative ground vibration limits for public or private	App. E

Consent Condition	Environmental Performance Conditions	Section of BMP which addresses this requirement
	infrastructure in the vicinity of the site (if relevant); and (f) include a monitoring program for evaluating and reporting on compliance with the relevant conditions of this approval. The Proponent must implement the Blast Management Plan as approved by the Secretary.	
Sch.4 Cond. 4	**Independent Review** If a landowner considers the project to be exceeding the impact assessment criteria in Schedule 3, then he/she may ask the Secretary in writing for an independent review of impacts of the project on his/her land. If the Secretary is satisfied that an independent review is warranted, the Proponent must within 3 months of the Secretary's decision: a) consult with the landowner to determine his/her concerns; b) commission a suitably qualified, experience and independent person, whose appointment has been approved by the Secretary, to conduct monitoring on the land, to: • determine whether the project is complying with the relevant impact assessment criteria in Schedule 3; and • identify the source(s) and scale of any impact on the land, and the project's contribution to this impact; and give the Secretary and landowner a copy of the independent review.	Section 7.3
Sch.5 Cond. 1A (a)	**Management Plan Requirements** The Proponent must ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include: a) a summary of relevant background or baseline data;	Section 2.1
Sch.5 Cond. 1A (b)	b) a description of: • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; and the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;	Table 1, App. D
Sch.5 Cond. 1A (c)	c) a description of the measures that would be implemented to comply with the relevant statutory requirement, limits, or performance measures/criteria;	Section 6
Sch.5 Cond. 1A (d)	d) a program to monitor and report on the: • impacts and environmental performance of the project; and effectiveness of any management measures (see paragraph (c) above);	App. D Section 9.1
Sch.5 Cond. 1A (e)	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;	Section 6.9
Sch.5 Cond. 1A (f)	f) a program to investigate and implement ways to improve the environmental performance of the project over time	Section 6.10
Sch.5 Cond. 1A (g)	g) a protocol for managing and reporting any: • Incidents; • Complaints;	Section 9.

Consent Condition	Environmental Performance Conditions	Section of BMP which addresses this requirement
	• Non-compliances with statutory requirements; and • Exceedances of the impact assessment criteria and/or performance criteria;	
Sch.5 Cond. 1A (h)	h) a protocol for periodic review of the plan; and	Section 10.
Sch.5 Cond. 1A (i)	i) a document control table that includes version number, dates when the management plan was prepared and reviewed, names and positions of the person/s who prepared and reviewed the management plan, a description of any revisions made and the date of the Secretary's approval.	Document Control Table
Sch. 5, Cond 2	**Incident Reporting** As soon as practicable after the Proponent becomes aware of any incident associated with the project, the Proponent must notify the Secretary and any other relevant agencies of the incident. Within 7 days of becoming aware of the incident, the Proponent shall provide the Secretary and any relevant agencies with a detailed report on the incident.	Section 9.2
Sch. 5, Cond 3	**Regular Reporting** The Proponent must provide regular reporting on the environmental performance of the project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval.	Section 9.1
Sch. 5, Cond 4	**Annual Review** By the end of March each year, the Proponent must review the environmental performance of the project to the satisfaction of the Secretary This review must: (a) describe the development that was carried out in the previous calendar year, and the development that is proposed to be carried out over the next year; (b) include a comprehensive review of the monitoring results and complaints records of the project over the previous calendar year, which includes a comparison of these results against: • the relevant statutory requirements, limits or performance measures/criteria; • the requirements of any plan or program required under this approval; • the monitoring results of previous years; and • the relevant predictions in the documents listed in condition 2 of Schedule 2; (c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance; (d) identify any trends in the monitoring data over the life of the project; (e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; (f) describe what measures will be implemented over the next year to improve the environmental performance of the project; and g) evaluate and report on the effectiveness of environmental management of the project.	Section 9.3
Sch. 5, Cond 9	**Access to Information** The Proponent must, for the life of the project: (a) make the following information publicly available on its website: • the documents listed in condition2 of Schedule 2; • current statutory approvals for the project; • approved strategies, plans or programs required under the conditions of this approval; • a comprehensive summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under the conditions of this approval; • a summary of the current stage and progress of the project; • contact details to enquire about the project or to make a complaint; • a complaints register, which is to be updated on a monthly basis; • minutes of CCC meetings; • the last five annual reviews; • any independent environmental audit, and the Proponent's response to the recommendations in any audit; • any other matter required by the Secretary; and	Section 9.1

Consent Condition	Environmental Performance Conditions	Section of BMP which addresses this requirement
	(b) keep this information up to date, to the satisfaction of the Secretary.	

Table 2: Statement of Commitments Addressed

SOC reference	Commitments	Where Commitment is addressed
HVO NORTH - Carrington West Wing Statement of Commitments, dated 4 March 2013		
Air quality	Blasting will be restricted during unfavourable weather conditions, where practicable	Section 6.2
Traffic & transport	Blasting-related road closures will be managed in accordance with the relevant Coal & Allied procedures and a Road Closure Management Plan and Traffic Control Plan to be developed for Lemington Road	Section 6.4, Appendices A and E.
Noise and vibration	Consultation and arrangements will be made with Receptor No. 10 in advance of any blasts within 900m of the residence.	NA – property now owned by HVO.
Noise and vibration	To achieve 10mm/s peak particle velocity at the Lemington road bridge (due to blasting), the charge mass must be approximately 5,400kg MIC or less, given a minimum separation distance of approximately 2,500m for the closest mining area in Year 1 of the proposal.	Section 4.2.2

Table 3: EPL Blasting Conditions

<table>
<tr><th>EPL 640 reference</th><th>Environmental Performance Condition</th><th>Where Condition is addressed</th></tr>
<tr><td>P1.4</td><td>The following points referred to in the table below are identified in the licence for the purposes of weather and/or noise monitoring and/or setting limits for the emissions of noise from the premises.
Noise/Weather
<table><tr><th>EPA identification no.</th><th>Type of monitoring point</th><th>Location description</th></tr><tr><td>9</td><td>Air blast overpressure & ground vibration peak particle velocity monitoring</td><td>Blast monitor located at E303673 N6402722 defined as Jerrys Plains on Plan titled "Hunter Valley Operations Blast Monitoring Locations" Dated 18/1/17 EPA Ref DOC17/103071</td></tr><tr><td>11</td><td>Air blast overpressure & ground vibration peak particle velocity monitoring</td><td>Blast monitor located at E314312 N6394908 defined as Warkworth on Plan titled "Hunter Valley Operations Blast Monitoring Locations" Dated 18/1/17 EPA Ref DOC17/103071</td></tr><tr><td>12</td><td>Air blast overpressure & ground vibration peak particle velocity monitoring</td><td>Blast monitor located at E317967 N6399746 defined as Maison Dieu on Plan titled "Hunter Valley Operations Blast Monitoring Locations" Dated 18/1/17 EPA Ref DOC17/103071</td></tr><tr><td>18</td><td>Air blast overpressure & ground vibration peak particle velocity monitoring</td><td>Blast monitor located at E305929 N6399602 defined as Moses Crossing on Plan titled "Hunter Valley Operations Blast Monitoring Locations" Dated 18/1/17 EPA Ref DOC17/103071</td></tr></table></td><td>App. E</td></tr>
<tr><td>L4.1</td><td>Blasting in or on the premises must only be carried out between 0700 hours and 1800 hours, Monday to Saturday. Blasting in or on the premises must not take place on Sundays or Public Holidays without the prior approval of the EPA.</td><td>Section 6.2</td></tr>
<tr><td>L4.2</td><td>The airblast overpressure level from blasting operations in or on the premises must not exceed: 115dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period; at either monitoring point 9,11,12 or 18 in Condition P1.4</td><td>Sections 4.2.1 and 6.2</td></tr>
<tr><td>L4.3</td><td>The airblast overpressure level from blasting operations in or on the premises must not exceed; 120dB (Lin Peak) at any time; at either monitoring point 9,11,12 or 18 in Condition P1.4</td><td>Sections 4.2.1 and 6.2</td></tr>
<tr><td>L4.4</td><td>The ground vibration peak particle velocity from the blasting operations carried out in or on the premises must not exceed: 5mm/sec for more than 5% of the total number of blasts during each reporting period; at either monitoring point 9,11,12 or 18 in Condition P1.4.</td><td>Section 4.2.1</td></tr>
<tr><td>L4.5</td><td>The ground vibration peak particle velocity from the blasting operations carried out in or on the premises must not exceed: 10mm/sec at any time; at either monitoring point 9,11,12 or 18 in Condition P1.4.</td><td>Section 4.2.1</td></tr>
<tr><td>L4.6</td><td>Offensive blast fume must not be emitted from the premises.</td><td></td></tr>
<tr><td>M1.2</td><td>All records required to be kept by this licence must be:
a) in a legible form, or in a form that can readily be reduced to a legible form;
b) kept for at least 4 years after the monitoring or event to which they relate took place; and
c) produced in a legible form to any authorised officer of the EPA who asks to see them.</td><td>Section 9.1.2</td></tr>
<tr><td>M1.3</td><td>The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
a) the date(s) on which the sample was taken;
b) the time(s) at which the sample was collected;
c) the point at which the sample was taken; and
d) the name of the person who collected the sample.</td><td>Section 9.1.2</td></tr>
<tr><td>M8.1</td><td>To determine compliance with condition(s) L4.2, L4.3, L4.4and L4.5:
(a) Airblast overpressure and ground vibration levels must be measured and electronically recorded for monitoring points 9,11,12 and 18 for the parameters specified in Column 1 of the table below; and
(b) The Licensee must use the units of measure, sampling method and sample at the frequency specified opposite in the other columns.</td><td>Section 9.1.2</td></tr>
</table>

Parameter	Units of Measure	Frequency	Sampling Method
Airblast Overpressure	Decibels (Linear Peak)	All blasts	Australian Standard A 2187.2-2006
Ground Vibration Peak Particle Velocity	millimetres/second	All blasts	Australian Standard A 2187.2-2006

REGULATORY REQUIREMENTS

2.1 Background

This BMP has been prepared to fulfil the requirements of relevant legislation, the Approvals, EA commitments, EPL conditions and relevant standards and guidelines.

2.2 Project Approvals

The Approvals and subsequent amendments were assessed under the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act.).

The current HVO North Approval was granted on 12 June 2004 and subsequently modified on 28 July 2017.

The current HVO South Approval was granted on 24 March 2009, and was subsequently modified on
28 February 2018.

The Approvals stipulate criteria that blasting activities at HVO must comply with. The blasting criteria under the Approvals are reproduced in Table 1.

The requirement for this BMP arises from Condition 19, Schedule 3 of the HVO North Approval and Condition 18, Schedule 3 of the HVO South Approval. A list of the relevant conditions of the Approval and where they are addressed in this BMP is found in Section 1.2 (Table 1).

2.3 Environment Protection Licence

The *Protection of the Environment Operations Act 1997* (NSW) (PoEO Act) is the principal piece of legislation regulating pollution emissions in NSW. EPL 640 for HVO was issued on 29 September 2000 by the Environmental Protection Authority (EPA) under the PoEO Act.

Blast related conditions under EPL 640 are provided in Table 2.

2.4 Dangerous Goods

Dangerous goods are regulated under the *Work Health and Safety Act 2011* (NSW) and *Explosives Act 2003* (NSW). HVO will endeavour to meet all regulatory requirements in relation to dangerous goods management. The storage of explosives or explosive precursors, are to be managed in accordance with HVO's work instructions and site procedures such as *Shotfiring & Explosives Handling Hazard Management Plan*. These are internal documents which are regularly updated.

3. CONSULTATION

3.1 Government Agencies

Condition 19(d), Schedule 3, of the HVO North Approval and Condition 18(d), Schedule 3, of the HVO South Approval requires a Road Closure Management Plan (which forms part of this BMP). The Road Closure Management Plan is required to be prepared in consultation with relevant road authorities including, Singleton Council and the NSW Roads and Maritime Services (RMS).

RMS and Council road closure approvals (where applicable) are included in The HVO Road Closure Management Plans (Appendix C).
Approval will be sought from Singleton Council to temporarily close roads for the purpose of blasting every 12 months.
Approval from RMS to temporarily close roads for the purpose of blasting will also be sought every six months.

On 26 March 2018 correspondence was forwarded to the EPA inviting consultation on this BMP.

On 18 June 2018, the EPA advised HVO in writing that consultation on the Blast Management Plan would not be required (see Appendix F).

3.2 Nearby Mines

HVO South and HVO North are managed as a single operation, with common controls implemented on a whole-of-site basis. As such, a formal communication protocol between HVO North and HVO South is not considered appropriate.

Liaison with Wambo mine to discuss cooperation options has been undertaken, HVO and Wambo mine communicate daily blasting plans where relevant.

A cooperation agreement with Ravensworth and Cumnock No. 1 mines has been prepared in conjunction with those sites (both managed by Glencore as a single complex).

At the time of submission of this BMP, no formal agreement exists between Hunter Valley Operations and United Colliery relating to blast co-operation, however potential safety risks related to ground vibration posed to United personnel is managed by provision of daily notifications to United personnel for all blasts occurring in the Riverview Pit. Blast fume migration risks are managed through the HVO Blasting Permissions process.

The neighbouring Mount Thorley Warkworth mine was formerly managed through the same shared services team as HVO, and as such access to relevant shared environmental monitoring data including real-time monitoring continues to be shared despite separation of site management. Given the large distance between the active mining areas of HVO and MTW, communication of blasting plans between the sites is not deemed necessary at this time.

Furthermore, HVO also maintains a blasting hotline any enquiries and daily blasting schedule (1800 888 733).

4. EXISTING CHARACTER & IMPACT ASSESSMENT CRITERIA

4.1 Existing Character

4.1.1 HVO North

The closest privately owned residences are west and south-west of the Project area and are located within the village of Jerrys Plains and along the Golden Highway.
There are no private residences located in close proximity to proposed blasting locations at HVO North which would ordinarily require precautionary consultation and arrangements prior to any blasts.

4.1.2 HVO South

Privately owned residences in the vicinity of HVO South are located in the rural community of Maison Dieu to the east, and further to the south and east in the communities of Warkworth and Long Point.

4.2 Impact Assessment Criteria

4.2.1 Residence on Privately Owned Land

The Approvals and EPL 640 specify airblast overpressure and ground vibration impact assessment criteria for residences on privately-owned land.

These criteria were developed in accordance with relevant guidelines, in consultation with the relevant service providers and in consideration of precedents set by other sites and regulatory agencies.

In recognition of the potential impacts of blasting practices, HVO have committed to designing and monitoring blasts so that predicted levels are within the vibration criteria outlined in the Approvals.

4.2.2 Public Infrastructure

Lemington bridge (also known as Moses bridge/crossing) is the only public infrastructure identified under the environmental noise and vibration study, prepared by EMGA Mitchell McLennan in 2010, as having the potential to be impacted upon by blasting at HVO North.

Since the assessment carried out in 2010 the crossing has been upgraded from a timber crossing to a concrete crossing which has increased its structural integrity.

The peak particle velocity at the crossing will be lower than 10mm/s as a natural consequence of measures that will be taken to protect other existing structures which are located in closer proximity to the mining area than the bridge.

Due to the distance between current active mining/blasting zones and St Philip's Church and the outbuildings at Archerfield there is currently no foreseeable risk of blast impacts at those sites. For that reason HVO does not currently make specific blast design considerations in respect of those sites. However, if HVO recommences operations in South Lemington Pit or Glider Pit, specific design rules considerate of impacts on St Phillips Church will be implemented to see that ground vibration peak particle velocity generated by the project does not exceed 5 mm/s unless varied with approval by the Secretary.

A review of HVO vibration measurements collected between July 2013 and October 2017 in the vicinity of the Archerfield Outbuildings (Maison Dieu monitoring location) demonstrates no impact to the outbuildings. A total of 1267 vibration measurements have been collected, with zero instances of ground vibration above 1.75mm/sec. Furthermore, 94.7% of measurements recorded ground vibration <0.5mm/sec (or 10% of the impact assessment criterion).

Similarly, a review of vibration measurements from the Warkworth monitoring location

demonstrates no impact at St. Phillips Church. A total of 1209 measurements have been collected, with zero instances of ground vibration above 2.5mm/sec (or half the impact assessment criterion). Further – 86.2% of measurements (1043 measurements) recorded ground vibration <0.5mm/sec (or 10% of the impact assessment criterion).

4.3 Heritage Features

Condition 40A of Schedule 3 of the HVO North Approval requires that HVO will endeavour to undertake mining operations (including blasting) and associated activities responsibly so as to not cause any impact to Aboriginal heritage site 37-2-1877 (CM-CD1) and the Older Stratum (CM-CD1). The location of this site is identified in Figure 2 of the Blast Monitoring Program.

Figure 4.1 shows the location of CM-CD1 with a 20m buffer zone and an additional 40m buffer or, “area of pit excluded due to CM-CD1”. Mining operations and associated activities (excluding heritage surveys and studies which are permitted) will not occur within this area in accordance with Condition 40.

In the event blasting occurs within 500 meters of CM-CD1 HVO will, if necessary, explore management measures to protect CM-CD1. This site will be monitored as indicated in the Blast Monitoring Programme.

4.4 Revision of Impact Assessment Criteria and Damage Criteria

The limits as outlined in Section 4.2 have been developed in consideration of existing requirements of the Approval and also through the completion of research in relation to the impacts of air blast overpressure and vibration on particular structures. On that basis, HVO may (in the future) alter the air blast overpressure and vibration criteria based on results of further detailed assessments and/or through further consultation with relevant government agencies and relevant infrastructure providers, which will then be provided to the DP&E in writing.

5. MANAGEMENT OPTIONS

5.1 Principles and framework

The Australian and New Zealand Environment and Conservation Council ANZECC. 1990. Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration is followed as a guide to blasting practices at HVO

5.2 Best Management Practice

Best management practice in this BMP is defined as practices used to manage blasting impacts that are consistent with the following:

- The measure should firstly aim to prevent blast and vibration impacts, and where that is not practicable, to generally reduce impacts to the environment as a whole;

- The measure is reasonably accessible and is developed on a scale which allows implementation in the Project, under economically and technically viable conditions, taking into consideration the costs and advantages; and

- Of the options available, it is the most effective in achieving a generally high level of protection of the environment as a whole.

This definition is derived from the European Union Directive 2008/1/EC definition of Best Available Techniques.

HVO aims to meet best management practice by implementing the control measures described in Section 6 of this Blast Management Plan.

6. BLAST MANAGEMENT CONTROLS

6.1 Introduction

In order to mitigate any potential impacts from blasting activities, a number of management controls will be implemented throughout the life of HVO operations. These controls are detailed in Section 6.2 below.

6.2 Operational controls

HVO will implement the following blast management practices over the life of the project:

- Blasting at HVO will occur within the hours of 7am and 6pm, Monday to Saturday. No blasting will be undertaken on Sundays, public holidays or any other time, unless written approval is obtained from the Environment Protection Authority and the Department of Planning and Environment;

- If blasting is deemed necessary outside of the hours of 7am and 6pm, Monday to Saturday, due to extraordinary circumstances such as safety or unfavourable meteorological conditions, , HVO will secure written approval from the Environment Protection Authority (EPA) and the Department of Planning & Environment as required by the relevant consents.;

- Any requests for variation to the Department must be in writing to compliance@planning.nsw.gov.au and identify the development (including the development application number and name), set out the condition of the consent and the reasons for the variation in blasting.

- Blasting will be undertaken at a maximum of three blasts per day (unless an additional blast is required following a blast misfire) and no more than 12 blasts per week at HVO North and 15 blasts per week at HVO South, averaged out over a calendar year. However, this total number of blasts does not apply to:

    - blasts that generate ground vibration of 0.5mm/s or less at any residence on privately owned land, or

    - blasts required to ensure the safety of the mine, its workers or the general public.

- Detailed design is undertaken for each blast in order to maximise the blast efficiency, minimise dust, fumes, ground vibration, airblast overpressure and the potential for flyrock and to meet compliance with site specific blasting conditions;

- Blasts will be undertaken in accordance with various work instructions on blasting, which are internal documents that are updated regularly. The assessment process for blasting includes:

    - Undertaking meteorological assessments prior to blasting to assess if weather conditions are acceptable. In the event that unfavourable meteorological conditions are observed prior to the blast the shot-firer will liaise with the appropriate senior official to determine whether to delay or postpone the blast;

    - review of the blasting permissions page (see example of typical permission page in Appendix A) which considers: time of blast, wind speed and direction;

    - daily notifications are issued to confirm the blast monitors are operating;

  - notification to neighbouring mines, where the mine falls within an exclusion zone for example; United will be notified of blasts in Riverview Pit and of the associated Golden Hwy road closure and Ravensworth will be notified where blasts are scheduled for within 500m of its operations or Lemington Road closures; and

  - documentation of the date, location of the blast and quantity of explosive used each day.

- Detailed monitoring of blasts over the life of HVO at relevant blast sensitive locations (refer to Section 6.11).

- In the event blasting occurs within 500 meters of the site CM-CD1, HVO North will consider what, if any, management measures to protect CM-CD1 may be necessary (CM-CD1 is shown on Figure 2 Appendix D)

- Training will be provided to all relevant personnel on environmental obligations in relation to blasting controls.

- Periodic internal reviews of blast management procedures to evaluate performance and identify corrective action if required.

- HVO will monitor blasts as mining progresses, in accordance with the existing blast monitoring system, so that blast prediction site laws can be further refined and future blast designs can be optimised based on more detailed site information. By adopting this approach, in conjunction with the adoption of improved blasting products and methods, as they are introduced, it is anticipated that blast emissions criteria can be met without imposing any significant constraints on the blast design throughout the operation of HVO.

- Land not owned by HVO and situated within 500 meters of planned blasting areas is shown in Appendix E. The only non-HVO owned land within that area are lands owned by Ravensworth and Cumnock, which are dealt with under Section 6.8 of this BMP, and a small part of Crown owned land dedicated as a travelling stock route (TSR 52974). A Long Term Grazing Permit (LTP) for TSR 52974 is held by a private permit holder through the Local Land Services. If the blast exclusion zone or blasting emissions are expected to impact the TSR then HVO will make notification to the permit holder, Crown Lands and Local Land Services in advance of blasting.

- Blast design allowing for adequate burden on all faces. Where necessary face surveying techniques may be employed to measure overburden between the blast face and blast holes to ensure sufficient burden is present to prevent blowouts and blast anomalies.

- There may be circumstances where blasts may need to be fired in less than ideal weather conditions to protect the health and safety of employees and the public. Such decisions will be elevated up the organisational hierarchy, demonstrating the seriousness of such decisions.

- Fume is managed in accordance with Management Plan, Hunter Valley Operations: Post Blast Fume Generation Mitigation and Management Plan to reduce fume on site, please refer to Appendix B.

- Controls for blasting within 500 metres of any public road are addressed in Section6.7.

- Notification procedures for nearby residents involving provision of the blast schedule and hotline number to enable the public to get up-to-date information on the blasting will be made available on HVO website (www.hvo.com.au).

- Landowner(s)/occupier(s) of any residence within 2 kilometres of the HVO South mining area who registers an interest in being notified about the blasting schedule at the mine will be advised individually of upcoming blasts.

- The blasting hotline number (1800 888 733) will be advertised in a local newspaper at least 4 times each year.

6.3 Management of Flyrock

The generation of fly rock is managed by incorporating appropriate controls in blast designs.

These controls include design of stemming lengths and stemming materials to minimise the potential for generating flyrock. Adequate burden, which is the distance from a charge to a free face, is maintained to minimise the risk of generating flyrock due to face bursting. These measures are used to control the risk to property, equipment or powerlines from flyrock.

Appropriate stemming will be used to improve stemming confinement and hence reduce the chance of flyrock and elevated airblast overpressure.

An appropriate exclusion zone will be established around each blast site in accordance with relevant mine safety regulations prior to firing a blast. Generally, the blast exclusion zone will be a minimum of 300 metres for equipment and 500 metres for personnel. The exclusion zone will be established beyond the expected range of any fly rock with an additional safety margin. The establishment of this zone will minimise the risk of any injuries to people or livestock due to flyrock.

Any unusual level of flyrock generated by blasting, with the potential to cause a safety risk, will be noted for each blast. This information will be used to continually re-assess the adequacy of blast design controls in reducing the generation of flyrock. The information will also be used to re-assess the size of the safety exclusion zone established for people and livestock in the vicinity of a blast.

6.4 Management of Aboriginal features

In accordance with Schedule 3 of Condition 40 of the HVO North Approval, regular visual monitoring to confirm that impacts have not been caused by blasting vibration, will be implemented for the management of the CM-CD1.

Although flyrock damage is considered a low risk, if necessary management measures to protect CM-CD1 will be explored.

6.5 Carrington West Wing Groundwater Barrier (LPB)

The LPB will be designed to the satisfaction of the New South Wales Office of Water and the Secretary of DP&E. A detailed design will be prepared and submitted for approval prior to construction in accordance with Schedule3, Condition 23. An LPB Monitoring and Management Plan will also be prepared.

When HVO begins the required design and plan preparation processes this BMP will be reviewed, and if necessary, updated to allow for appropriate measures to be put in place so that the prescribed performance objectives and performance measures are not at risk as a result of blasting activities on site.

6.6 Carrington West Wing Blasting Impacts to Carrington In Pit Fine Reject Emplacement

An assessment of blasting impacts from the Carrington West Wing on the Carrington In Pit

Fine Rejects Emplacement embankment will be undertaken prior to HVO commencing any activity in the Carrington West Wing.

6.7 Road closure

Blasting within 500 metres of a public road requires road closure during the blasting event. Approval will be sought from Singleton Council to temporarily close roads for the purpose of blasting every12 months.

Approval from RMS to temporarily close roads for the purpose of blasting will also be sought every six months.

6.8 Cooperation protocol

HVO South and HVO North are managed as a single operation, with common controls implemented on a whole-of-site basis. As such, a formal communication protocol between HVO North and HVO South is not considered appropriate.

Wambo mine will be advised to check HVO's website for blasting information including:

- HVO's up-to-date blasting information; and
- contact number for any enquiries and a blasting schedule (1800 888 733). .

Cumnock No. 1 Colliery and Ravensworth Operations Pty Ltd are both operated by Glencore. To mitigate potential impacts of blasting at HVO North within 500 metres of the active mining and associated development areas of these operations a communication protocol has been prepared.

The cooperative agreement covers blasting within 500 metres of active mining areas of Cumnock No. 1 Colliery and Ravensworth Operations Pty Ltd. For all other blasts planned on HVO the protocol to be followed is a notification of date and time via exchange of e-mail.

Glencore and HVO are also parties to a *Blast Protocol*' agreement which describes the controls to be implemented for the management of blasting activities at Ravensworth Surface Operations on part of HVO.

Given the large distance between the active mining areas of HVO and MTW, communication of blasting plans between the sites is not deemed necessary at this time.

6.9 Management of Unpredicted Impacts

HVO has a management plan, HVO Post Blast Fume Generation Mitigation and Management Plan, which sets out a protocol for the mitigation and management of post blast NOx fumes from blasting operations at HVO which is used as a contingency plan to manage any unpredicted impacts and their consequence .

In the event that a blast event registers airblast overpressure or ground vibration results greater than the allowable limits, or significantly different from the predicted results (airblast overpressure), HVO will undertake a detailed investigation into the event. Where corrective actions are identified to prevent a recurrence, these will be tracked to completion.

6.10 Continuous Improvement

HVO will look for ways to improve blasting performance, by way of :

- yearly review of the monitoring programme;
- Annual Review;periodic internal reviews of blast management procedures (Section 6.2); and
- investigation results from any blasting incident', with the potential to cause a safety risk (assessment of the adequacy of blast design controls) (section 6.3),

These will be used as a means of investigating and implementing ways to improve the environmental performance of the Project over time.

6.11 Monitoring Programme

Blast and vibration monitoring at HVO will be undertaken in accordance with the Blast Monitoring Programme set out in Appendix D.

7. PROPERTY INVESTIGATIONS AND INSPECTIONS

7.1 Property Inspections

In accordance with Condition 1(a) of Schedule 4 of the HVO North Approval HVO has notified all owners of privately-owned land within 2 kilometres of approved blasting operations that they are entitled to a structural property inspection to establish the baseline condition of any building or other structures on their property(ies). If a written request is received, HVO will undertake the works in accordance with Condition 16A of Schedule 3.

Similarly, In accordance with Condition 16 of Schedule 3 of the HVO South Approval, HVO has notified all landowners of privately-owned land within 2 kilometres of planned blasting, at least three (3) months in advance of the blasting taking place that they are entitled to a structural property inspection. If a written request is received HVO will undertake actions described in Condition 16 of Schedule 3 of the HVO South Approval.

7.2 Property Investigations

If HVO receives a written claim that buildings and/or structures on a landowners' land have been damaged as a result of blasting on site then HVO will investigate the claim and, where the property investigation confirms the landowner's claim, repair the damage in accordance with Condition 16B, Schedule 3 of the HVO North Approval or Condition 17,Schedule 3 of the HVO South Approval, whichever is relevant.

7.3 Independent Review and Land Acquisition Process

Where the owner of privately-owned land has reasonable grounds to believe that HVO is exceeding blast criteria, they may request an independent review from the Secretary, as per Conditions 4, 5 and 6 of Schedule 4 of the HVO North Approval or Conditions 4, 5 and 6 of Schedule 4 of the HVO South Approval.

If the independent review determines that HVO is not complying with the relevant project acquisition criteria, then upon receiving written request from the land owner, HVO will act in accordance with Conditions 7 and 8 of Schedule 4 of the HVO North Approval or Conditions 7, 8 and 9 of Schedule 4 of the HVO South Approval, whichever is relevant.

8. COMPLIANCE PROTOCOL

Exceedance of the criteria as outlined in the Approval will be determined in accordance with the HVO Protocol for Evaluating Blast and Vibration Compliance which is appended to the to the HVO Blast Monitoring Programme reproduced in Appendix D.

9. IMPLEMENTATION OF THE BMP

9.1 Reporting

9.1.1 Internal reporting

Determining exceedances of blasting criteria will be undertaken in accordance with the HVO Protocol for Evaluating Blast and Vibration Compliance which is appended to the HVO Blast Monitoring Programme reproduced in Appendix E.

The Environment and Community Manager (or Delegate) will report to the Mine Manager the results of investigations of any complaints and any exceedances of the blast overpressure or vibration assessment criteria

If there is a non-compliance with the blast impact assessment criteria an internal report dealing with the circumstances of the non-compliance and resulting actions will be developed.

External reporting of the non-compliance will be undertaken in accordance with Section 9.1.2 and Table 9.1.

9.1.2 External Reporting

A summary of the blast monitoring results at HVO, which have been reported in accordance with the various plans and programs approved under the conditions of the Approvals, will be made publicly available on the HVO website in accordance with Condition 12 of Schedule 5 of the HVO North Approval and Condition 9 of Schedule 5 of the HVO South Approval.

In accordance with the PoEO Act, HVO will also provide the monitoring data on the HVO website within 14 days of obtaining the data.
HVO will provide up-to-date information regarding the proposed blasting schedule via the process outlined below:

- notify neighbouring mining operations;
- advertisement in the Singleton Argus when a public road is to be closed, as well as identifying proposed blasting times on road signage established in the vicinity of HVO North;
- providing this Blast Management Plan on the HVO website which also includes a contact number for any community Complaints and Blasting schedule information 1800 888 733;
- Providing up-to-date information to the Complaints and Blasting Hotline 1800 888 733.
- Landowner(s)/occupier(s) of any residence within 2 kilometres of the HVO South mining area who registers an interest in being notified about the blasting schedule at the mine will be advised individually of upcoming blasts; and
- The blasting hotline number will be advertised in a local newspaper at least 4 times each year.

HVO will undertake record keeping and reporting as required under EPL 640.

9.2 Incident reporting

In accordance with the *Protection of the Environment Operations Act 1997* (NSW) (PoEO Act), HVO is required to report pollution incidents immediately to all relevant authorities.

In accordance with Condition 2, Schedule 5 (HVO South) and Condition 7 in Schedule 5 (HVO North), HVO will notify the Secretary (or delegate) as soon as practicable following receipt and confirmation of monitoring results in non-compliance with the relevant blasting limits in the Approvals. For required actions please refer to Table 9.1.

Notifications will also be made to the EPA following any measured non-compliance with blasting criteria.
In addition, in accordance with Condition 7, Schedule 5 of the HVO North Approval and Condition 2, Schedule 5 of the HVO South Approval, within seven days of becoming aware of the incident, HVO will provide the Secretary and any relevant agencies with a detailed report of the incident.
The report will include the following details:

- The date, time and nature of exceedance/incident;
- Identify the likely cause of exceedance/incident;
- Describe the response action that has been undertaken to date; and
- Describe the proposed measures to address the exceedance/incident.

HVO will implement mitigation measures for future blasts as necessary and will monitor future blasts for effectiveness and improvement opportunities.

In accordance with Condition 3 of Schedule 4 of the HVO North Approval and Conditions 2 and 3 of Schedule 4 of the HVO South Approval, as soon as practicable after obtaining monitoring results showing an exceedance of the criteria, HVO will notify the affected landowner and/or tenants in writing of the exceedance, and provide regular monitoring results to each of these parties until the project is complying with the relevant criteria again.

9.3 Annual Assessment

The Annual Review, prepared each year for HVO will include all blast monitoring results for the corresponding year, in accordance with Condition 9, Schedule 5, of the HVO North Approval and Condition 4, Schedule 5of the HVO South Approval.

The Annual Review will also include an assessment of the blast monitoring results against the blast impact assessment criteria and any trends over the period. In addition, any complaints relating to blasting received at HVO and response actions taken will also be reported in the Annual Review.

A summary of blast monitoring results will also be presented to the HVO Community Consultative Committee (CCC) meetings which are held four times per calendar year.

9.4 Complaints Management

Community Complaints are lodged via the Complaints and Blasting Hotline (1800 888 733). The hotline number will be prominently displayed on the HVO website, and regularly advertised in the local newspaper.

The Community Complaints Line will be in operation 24 hours per day, seven days a week. Complaints will be recorded and investigated by HVO staff. All other complaints lodged via letter, in person or by fax, will also be recorded and investigated by the Environment & Community Officer.

All complaints will be investigated, and, where the investigation identifies potential non-compliance with a consent or licence condition, mitigating action will be taken. Investigation into blast complaints will generally involve a visual inspection of operating areas and/or a check of blast monitoring data to confirm dust levels at nearby sensitive receptors.

The details of all complaints, and any mitigating actions taken, will be circulated to senior management. Where requested, follow-up correspondence with the complainant will be provided.

9.5 Roles and Responsibilities

Table 9.1: Roles and Responsibilities

General Manager
• Provide adequate resources for the implementation of the BMP
• Authorize the implementation of specific management measures to minimise blast impacts in accordance with this BMP
Manager – Environment & Community
• Oversee the implementation of the BMP
• Co-ordinate blast monitoring in accordance with this BMP
• Evaluate results of monitoring and report to relevant personnel
• Notify regulatory authorities and affected landholders of any blasting related exceedance and undertake associated reporting
• Manage all internal and external reporting requirements
• Publish copies of the BMP on the HVO website
• Develop and maintain a protocol to minimise the potential for simultaneous blasting with other nearby mines
• Co-ordinate periodic reviews of the BMP
Environment & Community Officer
• Co-ordinate investigations of blasting exceedances, incidents or complaints with the Drill and Blast Engineer
• Co-ordinate and manage records and reporting of blast monitoring results
• Manage blasting related complaints in accordance with complaints management procedure
• receive daily notifications to confirm the blast monitors are operating
Environment & Community Coordinator
• Implement and maintain the blast monitoring and real time environmental monitoring network
• Coordinate periodic review of monitoring data and subsequent reporting
• Coordinate weekly upload of HVO's blasting schedule to the HVO website
• Implement and maintain blasting permissions pages and predictive forecast tools
Drill and Blast Specialist Engineer
• Assist the Environmental officer with investigations into blasting exceedances, incidents or complaints
Drill and Blast Engineer
• Regularly review blast design parameters on the basis of blast monitoring records
• Design and undertake blasts to comply with the requirements of this BMP
• Advise the relevant personnel of weekly blasting schedule
• Maintain records for blasts initiated
Dragline, Drill and Blast Superintendent
• Liaise with the shot-firers to confirm blasting is being conducted under favourable metrological conditions.
Shot-firers
• Notify the Drill and Blast Engineer and Blasting Supervisor of any factors that may lead to non-compliance with this BMP
• Load and fire blasts in accordance with design supplied by the Drill and Blast Engineer
• Assess meteorological conditions prior to blasting to determine whether conditions are appropriate for blasting
• Update of the blasting hotline
Drill & Blast Supervisor
• Advise relevant personnel of daily blasting schedule
• Confirm that the blast is loaded with the correct quantity and quality of explosive and stemmed in accordance with the blast design
• Assess meteorological conditions prior to blasting to determine whether conditions are appropriate for blasting
• Confirm drill pattern is drilled in accordance with the blast design
Drillers
• Record drill status, including hole depths, pattern and relevant information

10. REVIEW

The BMP will be reviewed within three months of the submission of the Annual Review and updated to the satisfaction of the Secretary of the DP&E where necessary.

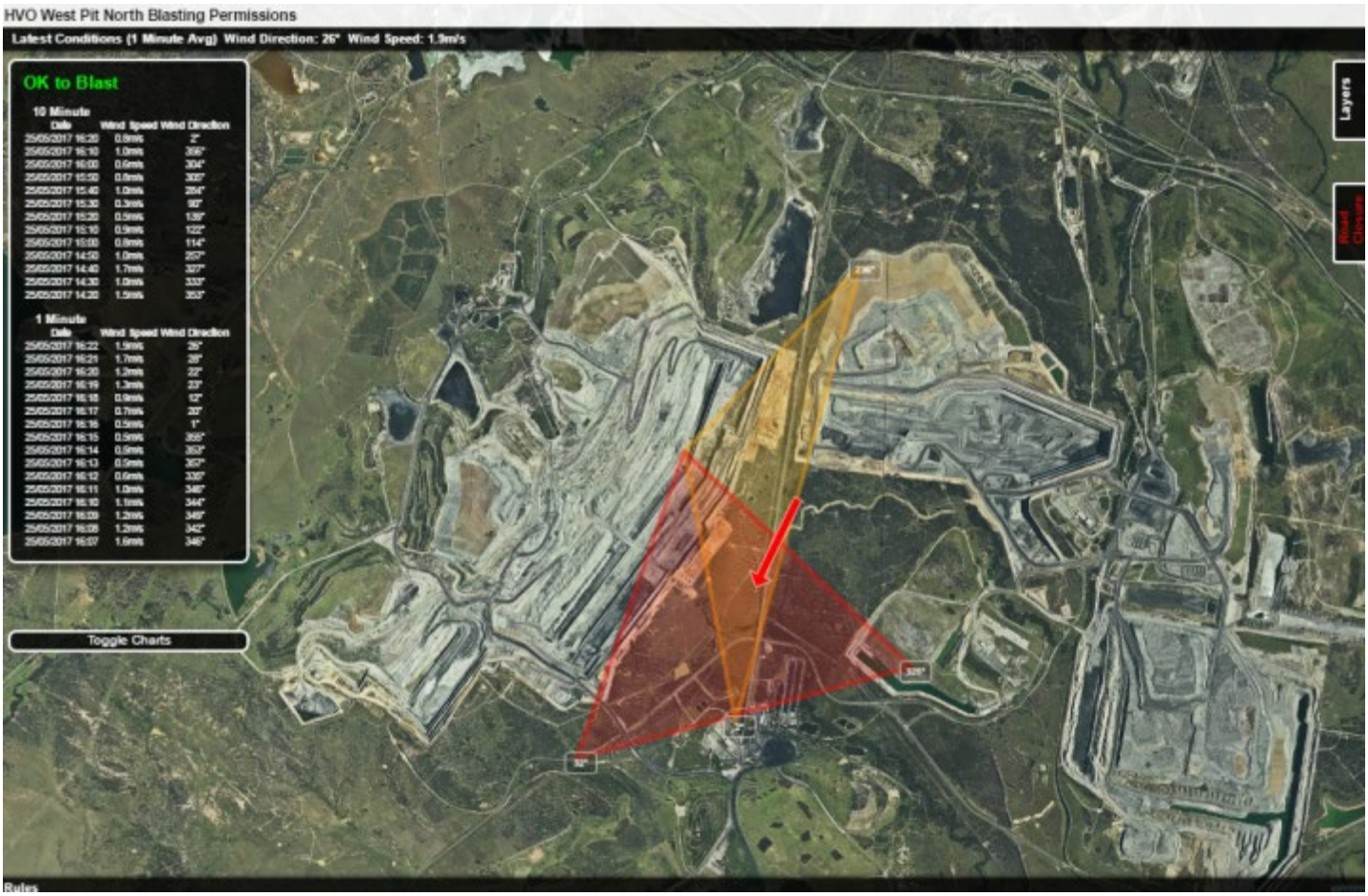
The BMP will also be reviewed within three months of the completion of an independent environmental audit, any exceedance of the Approvals' criteria or any modification to the conditions of the Approvals.
Within 6 weeks of conducting any such review, HVO will advise the Secretary of the outcomes and provide revised documents (where required) to the Secretary for review and approval.

Any major amendments to the BMP that affect its application will be undertaken in consultation with the appropriate regulatory authorities and stakeholders. Minor changes that don't affect performance criteria such as formatting, administrative edits, revision to road closure management plans and changes to supporting documents may be made with version control on the Project website.

REFERENCES

- HVO North Development Consent DA 450-10-2003
- HVO South Coal Project Approval PA 06_0261
- The Environmental Impact Statement 'Hunter Valley Operations West Pit Extension and Minor Modifications', Environmental Resource Management Australia, October 2003
- The Statement of Environmental Effects 'Carrington Pit Extended', Environmental Resource Management Australia, October 2005
- The Environmental Assessment 'Hunter Valley Operations South Coal Project', Environmental Resource Management Australia, January 2009
- The Environmental Assessment 'Hunter Valley Operations South- Modification 5', EMM February 2017
- The Environmental Assessment 'Carrington West Wing', EMGA Mitchell McLennan, October 2010
- Environment Protection Licence - EPL 640
- Environmental Planning and Assessment Act 1979 (NSW)
- Work Health and Safety Act 2011 (NSW)
- Explosives Act 2003 (NSW)
- Protection of Environmental Operations Act 1997 (NSW)
- Australian and New Zealand Environment and Conservation Council ANZECC. 1990. Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration.
- Pre Blast Environmental Checklist
- HVO Road Closure Management Plan Golden Highway
- HVO Road Closure Management Plan Lemington Road
- HVO Post Blast Fume Generation Mitigation and Management Plan

Appendix A – Typical Blasting Permission Page



Appendix B - Post Blast Fume Generation Mitigation and Management Plan

Hunter Valley Operations:

Post Blast Fume Generation

Mitigation and Management Plan

HUNTER VALLEY OPERATIONS

Edition: Fourth Edition Date: 28 March 2019

Table of Contents

Introduction

This document has been prepared to provide a protocol for the mitigation and management of post blast NOx fumes from blasting operations at Hunter Valley Operations (HVO) and is based on the AEISG Code of Practice (2011). This provides the basis on which to make blasting decisions to minimise the incident and severity of post blast fume events at HVO.

Figure 1: HVO Overview

1. NOx Fume

All blasting explosives produce large volumes of gas in very short time spans (milliseconds).

The application of ammonium nitrate based blasting explosives in the field, under variable conditions, can lead to non-ideal explosive reactions and the production of Nitric oxide (NO) and Nitrogen dioxide (NO_2). Nitric oxide is unstable in air and readily oxidises to nitrogen dioxide. Nitrogen dioxide is identifiable by the generation of orange/brown clouds.

2. The causes of fume in blasting

Fumes are generated as a result of an explosive not reacting with a full, high order, steady state detonation. The causes of this are many and variable. This protocol groups causes into categories and further identifies controls that are best able to control the variable. The seven main categories that contribute to post blast fume, these causes along with relevant controls are detailed in Section 4.

3. Identification of persons to prevent fumes

This section identifies the persons in the organisation and their role in relation to ensuring post blast fume from blasts as shown in Table 1.

Table 1: Roles and Responsibilities

Person	Role	Responsibilities/Remarks
Mine/Pit Planner	Plan the mine/pit operations to extract coal	Design extraction plan to minimise those blasting activities such as box cuts or blast areas that do not have a free face.
Geologist	Provide data on ground conditions to assist blast designer with shot design	Accurate provision of ground data across the proposed shot. Provide soil moisture index data for site.
Blast Designer	Design a blast to provide good extraction of material while manage blasting hazards	Blast design to consider: Geology & rock mass conditions. Explosive product selection appropriate to ground and water conditions. Historical blast performance for the current area. Weather conditions during loading and firing. Checking blasting permissions page prior to firing to ensure favourable
Drill and Blast Superintendent	Manage all drill and blast operations for the site.	On bench water management. Competence of blast team. Adequate resourcing of blasting activities.
Drill Supervisor	Supervise drill activities on the bench.	Conduit between drill activity and blast designer. Bench preparation prior to drilling.
Driller	To provide drilled holes for the loading of explosives for a shot.	Accurately drill the shot plan and report variations. Report anomalous ground conditions to drill supervisor. Collar protection of holes.

Blast Supervisor	Manage day to day blasting operations.	Review the use of products appropriate to conditions. Review actual loaded condition of blast prior to shot being fired. Compliance check of on bench activity.
Shotfirer	Manage all explosives activities on bench.	Compliance with design. Notify any variations from design. Recording explosive use data. Supervision of loading technique; • Preventing contamination of the explosive column. • Stemming. • Accurate placement of gas bags. Manage MMU's on bench operations; • Ensuring QC density checks completed. • Hose handling for pumped products. Conduit between on-bench and blast supervisor.
Trainee Shotfirer	Support shotfiring activities On bench activities as directed by the Shotfirer	Measuring the depth of holes. Identifying water conditions down hole. Positioning of primers in blast holes. Accurate placement of gas bags. Identifying hole slumping
MMU Operator	Manufacture blasting explosives On bench activities as directed by the Shotfirer	Compliance with shotfirers loading instructions. MMU Calibration. Adequate and correct process chemicals. Manufacture QC checks. Generate delivery/production records.

Explosives manufacturer / Supplier	Provide explosives fit for purpose	Manufacturing equipment compliance. Provision of precursors and formulation to ensure minimum amount of fume. Change management of formulation to ensure fumes are minimised in product. Design, calibration and operation of explosives manufacturing equipment to deliver consistent explosives within specification. Provide recommendations for product use and training as required.

4. Causes & Control Matrix

The following matrix covers each potential causes and situations that may contribute to fume generation, identified in section 2 of this protocol. For each potential cause, a likely indicator and control measure is outlined.

Primary Cause 1: Geological conditions		
Potential Cause	**Likely indicators**	**Control measures**
Blasting in weak/soft strata (Incorrect Timing and Pattern Design)	• Specific areas known to contain weak/soft strata only • Excessive Powder Factor	Understand geology of each shot and design blast (timing and explosive product) to ensure adequate relief in weak/soft strata, for example incorporation of a free face, reduction of powder factor, modified timing.
Explosive product seeping into cracks	• Slumping • Specific areas known to contain a high incidence of faulted/fractured ground only • Not achieving designed collar height when loading as per load sheet	Follow manufacturer's recommendations on explosive product selection
		Consider the use of blast hole liners, or, bag off above cracking
		Record and monitor blast holes which have slumped or require excessive explosive product to reach stemming height, but where water is not present

Primary Cause 1: Geological conditions		
Potential Cause	**Likely indicators**	**Control measures**
Dynamic water in holes	• Slumped blast holes • Usually when using non water-resistant explosive products	Minimise sleep time of shot
		Consider manufacturer's recommendations on explosive product selection
		Understand hydrology of pit and plan blasting to avoid interaction between explosives and dynamic water (either natural or from other pit operations) Check after pumping to understand recharge rate of the drill hole.
Moisture in clay	• When clay or clay rich strata present	If the drill holes are defined as wet, then water resistant explosive products with appropriate energy will be used in the loading of these holes.
Blast hole deterioration between drilling and loading	• Traceable to specific geological areas • Dipped depth inconsistent with drilled depth indicating hole collapse	Minimise time between drilling and loading
		Use hole savers
		Drill & Blast Engineer to ensure benches are unaffected by backbreak from earlier blasts, for example presplits, buffers etc.
		Optimise drilling practices to minimise hole damage.
Ground movement	• Horizon offset (bench, etc.) • Area previously known for misfires	Design sequence timing to prevent hole movement and dislocation of explosives columns.

Primary Cause 2: Climate / seasonality		
Potential Cause	**Likely indicators**	**Control measures**
Rainfall on a sleeping shot.	• Excessive rainfall • Slumping of holes • Ponding of water on pattern	Review rainfall forecasts for planned sleep time of shot and select explosive products according to manufacturer's recommendations.
		Minimise sleep time for dry blast hole explosive products if rain is predicted. Consider early firing of blast.
		Bench design for water runoff with appropriate bunding &drainage.
		If a large rain event is predicted to impact on a live shot, then the top of blast holes will be protected to prevent water ingress by constructing contour drains to divert water away from hole collars with an excavator.
		Consider removing water affected product
		Loaded drill holes are to be inspected for slumping prior to initiation after a rainfall event.

Primary Cause 3: Blast Design		
Potential Cause	**Likely indicators**	**Control measures**
Explosive desensitisation due to the blast hole depth	• In deep holes only	Reduce bench height
		Ensure adequate relief in deep holes
		Consider manufacturer's recommendations on explosive product selection and blast design for deep holes.
Inappropriate priming and/or placement	• Residue product	Consider manufacturer's recommendations on explosive product initiation, in general, top and bottom priming in holes greater than 18m deep.
Inter-hole explosive desensitisation	• Blast holes drilled close r together than planned • Blast hole deviation differs greatly from planned	Review the design and adjust for actual drilling.
		Review product selection and adjust for new design

Intra-hole explosive desensitisation in decked blast	• When using decks only	Appropriate separation of explosive decks. Initiator timing.
Excessive confinement (Incorrect Timing and Pattern Design)	• Specific to blasts known to be confined • No free face present • Excessive Powder Factor	Understand geology of each shot and design blast (timing and explosive product) to ensure adequate relief in all strata. Consider incorporation of a free face, reduction of powder factor, modified timing, depth of blast, etc.

Primary Cause 4: Explosive product selection		
Potential Cause	**Likely indicators**	**Control measures**
Non water-resistant explosive products loaded into wet or dewatered holes	• Blasts containing wet/dewatered blast holes only	Consider manufacturer's recommendations on explosive product selection.
		Education of bench crew on explosive product recommendations from current supplier.
		Discipline in on-bench practices Follow load sheet.
Excessive energy in strata desensitising adjacent explosive product columns	• Specific to areas known to contain weak/soft strata only	Understand geology of each shot and design blast (timing and explosive product) to match, for example reduction of powder factor.
		Consider manufacturer's recommendations on explosive product selection
		Obtain appropriate technical assistance if required to ensure optimal result.
Primer of insufficient strength to initiate explosive column	• For blasts using a particular primer type / size	Consider manufacturer's recommendations on compatibility of initiating systems with explosives
Desensitisation of explosive column from in-hole detonating cord initiation	• In areas where in-hole cord initiation is used	Consider manufacturer's recommendations on compatibility of initiating systems with explosives

Primary Cause 5: Explosive quality		
Potential Cause	**Likely indicators**	**Control measures**
Explosive product incorrectly formulated	• All areas associated with loading from a specific delivery system • Product appearance abnormal	Explosives formulated by supplier to an appropriate oxygen balance to minimise the likelihood of post-blast fume Development and maintenance of an explosive QA/QC programme.
Inadequate mixing of raw materials	• In all areas associated with loading from a specific delivery system • Product	Visual check Density check MMU Calibration check
Delivery system metering incorrectly (on bench incorrect manufacture of product)	• All blasts and all locations utilising explosive product(s) that incorporate a specific precursor	Regular calibration of MMU Quality control of explosive products conducted in accordance with manufacturer's recommendations
Explosive precursors not manufactured or supplied to specification or degradation during transport and storage	• Traceable to a precursor which has degraded between manufacture and use	Contractor Management System – regular Audits of supplier to ensure compliance with QA/QC systems.
Initiation explosives not manufactured to specification or degradation during transport and storage	• Damaged packing or out- of-date stock • Misfire	Rotating Stock in Explosives Magazine HVO-10-WI-Mine-090 Explosive Storage and Stock Control
Raw material changes	• All areas associated with loading from a specific delivery system • Product appearance changed	Change management procedures in place by suppliers Prior notification to suppliers from site change management systems where other raw materials are supplied by the customer, for example diesel fuels

Primary Cause 5: Explosive quality		
Potential Cause	**Likely indicators**	**Control measures**
Product Degradation	• Slumping of holes	Sleep time of 6 days maximum for all shots. Sleeping a shot more than 6 days requires the approval by the Manager of Mining Engineering. Any sleeping shot is inspected daily by the Shotfirer when in attendance.

Primary Cause 6: Contamination of explosives in the blast hole		
Potential Cause	**Likely indicators**	**Control measures**
Explosive product mixes with mud/sediment at bottom of hole.	• Blasts containing wet/dewatered blast holes only • Dipped depth inconsistent with drilled depth indicating hole collapse	Optimise drilling practices to minimise blast hole damage
		Ensure appropriate loading practices are followed during charging
		Ensure primer is positioned in undamaged explosive product
		Where mud or sediment is identified in a hole from dipping, a gas bag will be used to separate mud/sediment from explosive product.
		Use blast hole savers where appropriate
Penetration of stemming material into top of explosive column (fluid/pumpable explosive products only)	• Blasts charged with fluid/pumpable explosive products only	Use appropriate stemming material
		Ensure explosive product is gassed to manufacturers specifications before stemming

Water entrainment in explosive product	• Blasts containing wet/dewatered blast holes only • Dynamic water present • Historical groundwater information	Adjust explosive product selection according to manufacturer's recommendations depending on changing conditions.
		Ensure appropriate loading practices are followed during charging
		Eliminate, as much as practical, top loading into wet or dewatered blast holes
		Best endeavors to ensure all primers are positioned in undamaged explosive product
		Use of gas bags in dewatered blast holes where appropriate
		Best endeavors to protect top of explosives column to prevent water ingress
		Reduce excessive hose lubrication during charging
		Consider adjusting explosive product selection according to manufacturer's recommendations for wet environment.
		Verify correct hose handling practices are in place
		Consider loading in low lying areas last where practical
		Minimize sleep time where practical

Primary Cause 7: On bench practices		
Potential Cause	**Likely indicators**	**Control measures**
Hole condition incorrectly identified	• Slumping of holes • Unexpected material in drill cuttings	Assess all holes prior to loading
		Use number and location of wet holes as a basis for explosive product selection and determining loading sequence
		Minimise time between drilling and loading, especially in soft and clay strata. Note: Enough time should be allowed for any dynamic water in the hole to be identified
		Assess holes for slumping on any sleeping shots
		Minimise sleep time
Blast not drilled as per plan	• Can be correlated with incorrectly drilled patterns	Drillers to report holes not complying with plan. Verify drill hole accuracy in areas considered critical using drill hole positioning and recording system. Adjust design as necessary.
Dewatering of holes diverts water into holes previously loaded with dry hole explosive products	• Visual inspections of water on bench. • Bench setup, understanding gradient of bench for water runoff	Load wet holes in a sequence that ensures other holes are not impacted. Adjust explosive product selection according to manufacturer's recommendations.

5. Management of Fume

Due to the close proximity of the Golden Highway, Lemington Road and Hobden Reserve to Hunter Valley Operations lease boundaries, blasting restrictions detailed in HVO Blast Monitoring Programme such as wind speeds and directions, are strictly observed. Any shot expected to produce fume that is in close proximity to the aforementioned public areas require a road closure as per HVO-10-ENVMP-E6-004 Blast Management Plan

Within site boundaries, the blasting exclusion zone and sentry procedure takes into account the location of mine personnel on the lease at the time of detonation. A minimum 500 m exclusion zone is the standard for HVO, however may be extended to any distance at the Shotfirers discretion. This includes reducing the risk of exposure to personnel downwind of a blast with the potential for fume.

The health and safety risks of Post Blast Fume and information for treatment by medical staff, is outlined in

Appendix 3 & 4. In the event that a post-load risk rating indicates the likelihood of fume the following protocol is to apply.

Report / Record	Responsibility	Content
Identify factors contributing to potential fume	Drill and Blast Engineer	• Horizon history • Clay / weak material • Rain during loading • Holes slumping • Product selection issues • Product delivery issues • Excessive sleep time • Dynamic water
Defining Fume Management Zone	Competent group consisting of Superintendent, Supervisor, Engineer and Shotfirer – all persons inside the FMZ to be evacuated and area sentried prior to blast	Extent of zone based on Likely fume level at blast to be assessed by group based on above factors Wind speed and direction Inversions Cloud cover Time of day Atmospheric stability Temperature Humidity Dispersion model
Fume management zone notifications	D&B Engineer D, D & B Supervisor D&B Engineer / D,D & B Supervisor EnvironmentOfficer	A hardcopy plan with FMZ clearly marked on current aerial photo along with any sensitive sites (Roads, United Colliery, Ravensworth Surface Operations) Daily blast schedule email Internal notifications ▪ Time permitting – TBT fume ▪ protocols - windows up, a/c on recirculation ▪ ESO to be on standby for high potential events Road closure notifications - As per Road Closure Management Plan External Stakeholders such as DP&E, EPA, Community, etc.

Firing Blast – as per HVO-10-WI-Mine-049 Closing Public Roads	Traffic Road runner All Shotfirer D&B Engineer	Fume level measurements as part of road inspection Fume protocol for vehicle occupants – verbal or document - Windows up and a/c on recirculation Fume observation - Warning message to potentially impacted parties if required – • Windows up and a/c on recirculation To utilize fume monitor when conducting post blast inspection Video blast Fume level measurements (monitoring)
Fume Emergency	All	Shotfirer, supervisor or sentry or any witness to raise emergency based on observations. ESO and OCE to coordinate response. Advice for anyone potentially affected by fume • Get out of the cloud. • Seek fresh air. • Use water to reduce the amount of exposure to wash out eyes and clear nose and throat See Appendix 3 & 4 for health and safety risks of fume and advice for treating medical staff

Reporting	Shotfirer	HVO-10-FRM-MINE-001 Shotfiring Report.
	D&B Engineer	Assess Fume Management Zone against forecast Notify Explosives Supplier of fume event to aid in investigation and communication
	Supervisor	The following fume events shall be raised as incidents: Any blast fume required to be reported to external stakeholders (see below); the visible fume cloud travels beyond the blast exclusion zone; when any person has been directly exposed to fumes Note that a road closed for the purpose of blasting is considered part of the site The following factors should be considered for inclusion in any post-blast incident report: • date and time of blast; • explosives type, quantity, initiation type; • ground geology (soft, faults, wet); • post-blast NOx gas rating, eg 0 – 5 & A-C; • duration of any post-blast NOx gas event (measure of time to disperse); • direction of movement of any post-blast NOx plume; • movement of any post-blast NOx gas plume relative to the established exclusion zone and any established management zone (i.e. maintained within, exceeded); • climate conditions, including temperature, humidity, wind speed and direction, cloud cover, rain; • results/readings of any NOx monitoring equipment employed for the blast • video results of blast where relevant.
	Environment Manager (or Delegate)	Notify the Department of Planning and Environment of any blast producing post blast fume that rates 3 (at its greatest extent) which leaves the site to a public area or non-mine area, and any blast that rates 4 or 5. Where the fume leaves the site and has the potential to cause material harm (to the public/environment), immediately notify the

	Superintendent Mining Manager	following as per the Pollution Incident Response Management Plan:: • **EPA Environmental Line (131 555)** • **DP&E (02 6575 3402)** • **Ministry of Health (Newcastle Public Health Unit (02 4924 6477)** • **SafeWork NSW (13 10 50)** • **Singleton Council (02 6578 7290, a/h 02 6572 1400)** • **Fire and Rescue NSW (000)** Escalate fume events to Mining Manager & Environment Manager Reporting of fume events to Mines Inspectorate as appropriate.

6. Documentation and records

The documentation and records used for the preparation and firing of a blast are retained for a period of 4 years in accordance with Environment Protection Licence 640 by the Drill and Blast Engineer The records contain:

Report / Record	Responsibility	Content

Blast design and performance record	Blast Designer	• Blast Design
		• Design Checklist
		• Drill Pattern Plans
		• Load Sheet
		• Blasting Schedule
		  ○ Location of Blast
		  ○ Type of Blast
		  ○ Weather Forecast
		• Video of blast
		  ○ Operator is to ensure that filming continues post detonation, to ensure any potential fume or dust clouds are captured.
		• Environmental records
		  ○ Air Blast
		  ○ Vibration
		• Monthly reconciliation of blasted volumes

Explosives stock control	Shot Firer	• Quantity (weight/numbers of units) of explosives delivered • Quantity (weight/numbers of units) of explosives used on a shot basis □
Shotfiring Report	Shotfirer in charge	• Date/time of firing • Name, type and location of shot • Explosives type, tonnages delivered of explosives used • Number of holes charged (for day/total) • Pattern Size • Hole Diameter • Average Hole Depth • Numbers of holes fired • General comment on blast loading progress or results. • Environmental comments

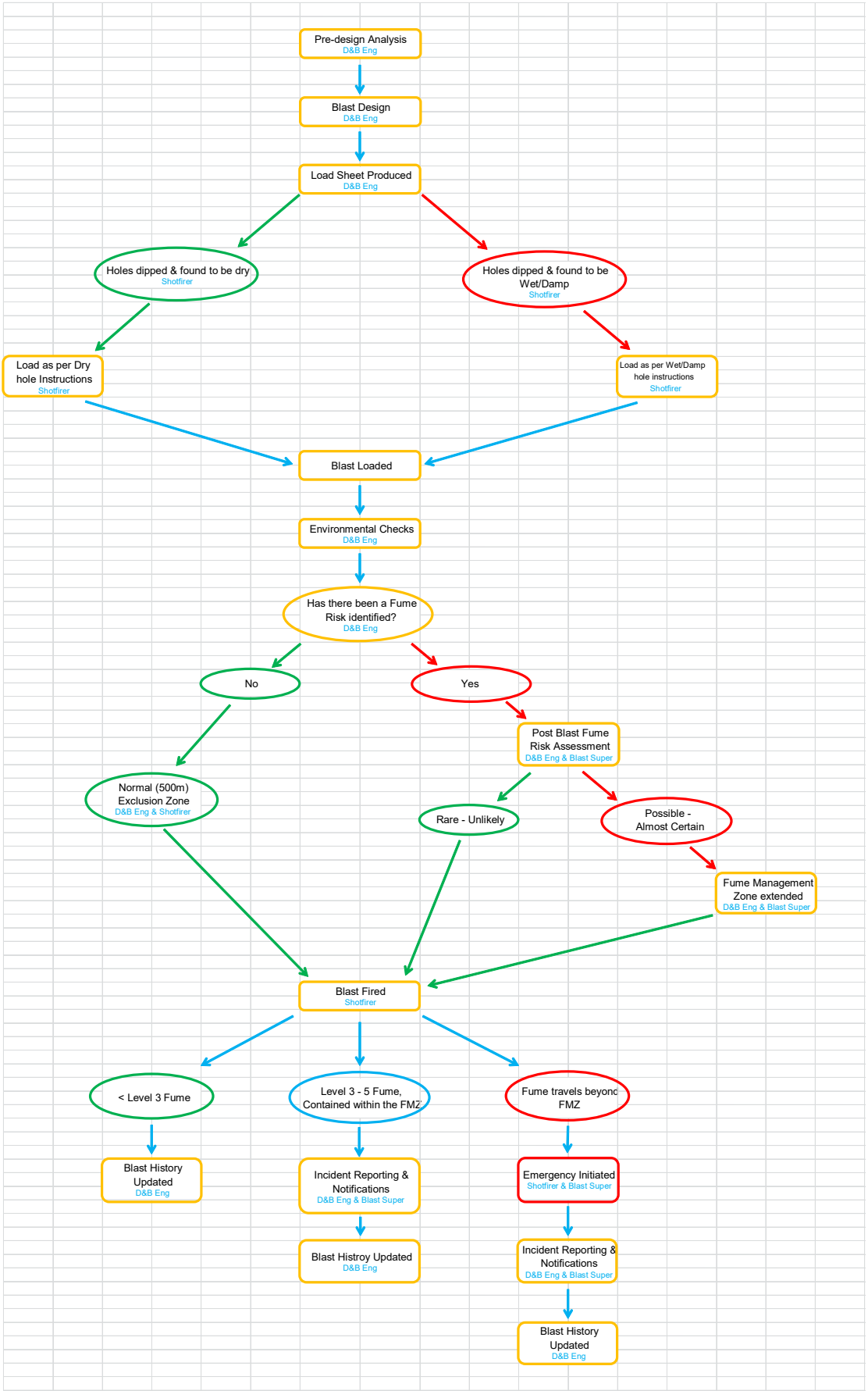
		○ Fume Category (if required) ○ Noise Results ○ Vibration Results
Drill Shift Report	Drill Operator	• Drill Number • Location/Pattern No. • Burden & Spacing • Operator Name • Bit Size • Date/Time/Shift • Drilling task by the Hour • Hole Number • Hole Depth • Comments and/or defects • Total Summary for shift

7. Glossary

Wet Hole – A wet hole is defined as any drill hole containing more than 1 metre of water at the bottom of the hole and/or having wet sides anywhere down the hole. Any hole that has been dewatered is classified as a wet hole.

Dry Hole – A dry hole is defined as any drill hole having less than 1 metre of static water at the bottom of the hole. Should water be detected through the dipping process, a gas bag is used to close off the bottom of the hole, with drill hole cuttings shoveled back on top of the gas bag, prior to the loading of any explosive product.

APPENDIX 1 – GENERALISED FLOWCHART FOR FUME EVENT



APPENDIX 2 – VISUAL NOx GASES RATING SCALE

The following table, together with the Field Colour Chart on the next page, details how NOx gases from a surface blast can be assessed

Level	Typical Appearance
Level 0 No NOx gas	
Level 1 Slight NOx gas	
1A Localised	
1B Medium	
1C Extensive	
Level 2 Minor yellow/orange gas	
2A Localised	
2B Medium	
2C Extensive	
Level 3 Orange gas	
3A Localised	
3B Medium	
3C Extensive	
Level 4 Orange/red gas	
4A Localised	
4B Medium	
4C Extensive	
Level 5 Red/purple gas	
5A Localised	
5B Medium	
5C Extensive	

Field Colour Chart.

Assessing the amount of NOx produced from a blast will depend on the distance the observer is from the blast and the prevailing weather conditions. The Field Colour Chart can be used to assess the level of NOx that is produced in a surface blast.

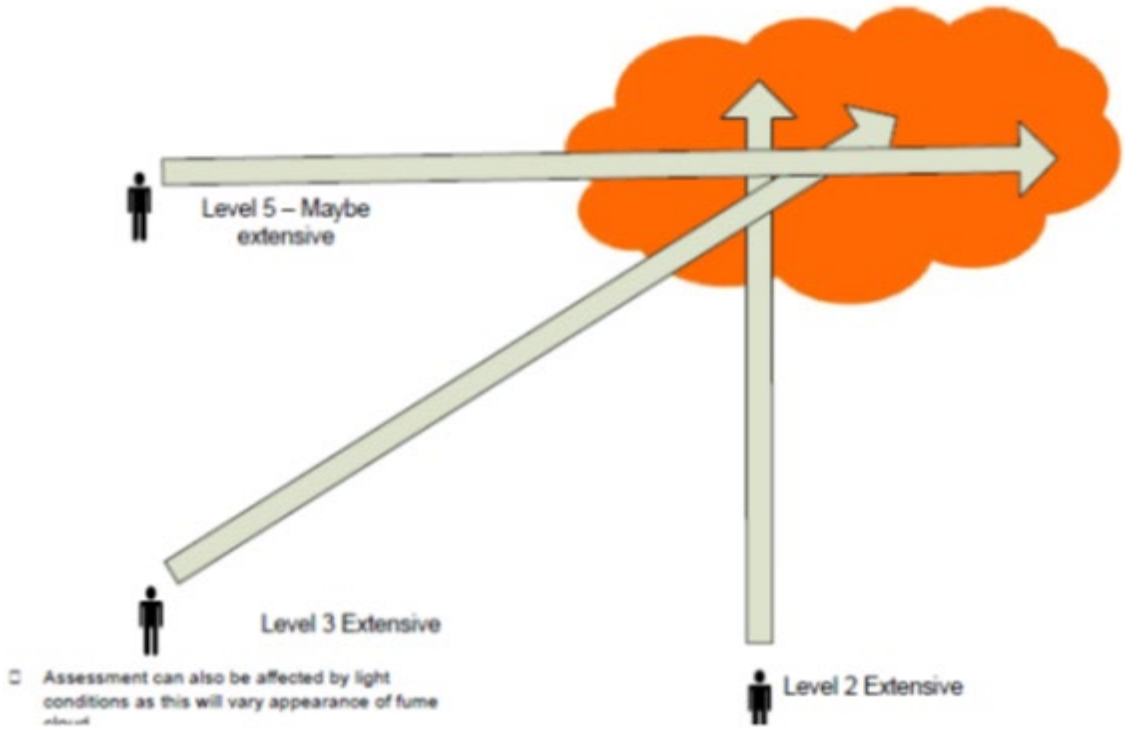
Pantone colour numbers have been included in the Field Colour Chart to ensure colours will always be produced correctly thereby ensuring a reasonable level of standardization in reporting fume events across the mining industry.

Level	Colour	Pantone Number
Level 0 No NOx gas		Warm Grey 1C (RGB 244, 222, 217)
Level 1 Slight NOx gas		Pantone 155C (RGB 244, 219, 170)
Level 2 Minor yellow/orange gas		Pantone 157C (RGB 237, 160, 79)
Level 3 Orange gas		Pantone 158C (RGB 232, 117, 17)
Level 4 Orange/red gas		Pantone 1525C (RGB 181, 84, 0)
Level 5 Red/purple gases		Pantone 161C (RGB 99, 58, 17)

Observation Issues

The angle of the person to the fume event will influence the assessment. Where possible and without placing persons in the path of the fume cloud there, should be a number of observers to record the level. This can be moderated to give a more accurate indication of the cloud.

The issue is that the observer position and fume cloud orientation may influence the rating given.



APPENDIX 3 – *HEALTH AND SAFETY RISKS OF BLAST FUMES*

NIOSH Pocket Guides

The US National Institute for Occupational Safety and Health (NIOSH) produces the *NIOSH Pocket Guide to Chemical Hazards* (NPG)... "intended as a source of general industrial hygiene information on several hundred chemicals/classes for workers, employers, and occupational health professionals. The NPG does not contain an analysis of all pertinent data, rather it presents key information and data in abbreviated or tabular form for chemicals or substance groupings (e.g. cyanides, fluorides, manganese compounds) that are found in the work environment. The information found in the NPG should help users recognize and control occupational chemical hazards."

The NIOSH Pocket Guides for NO, NO_2 and CO are reproduced with authority of the US Centers for Disease Control and Prevention, 1600 Clifton Rd, Atlanta, GA 30333, USA.

The guides can be accessed through the NIOSH Pocket Guide to Chemical Hazards homepage: http://www.cdc.gov/niosh/npg/default.html

Note that the exposure limits do not necessarily match the Australian STEL and TWA.

Health and Safety Risks of Blast Fumes

Nitrogen Dioxide (NO_2)

NO_2 is a toxic gas that irritates the eyes and mucous membranes, primarily by dissolving on contact with moisture and forming a mixture of nitric and nitrous acids.

Inhalation can result in respiratory tract irritation and pulmonary oedema. Onset of pulmonary oedema can be delayed and can cause death, so personnel who have been exposed to NO_2 must be observed in hospital for at least 12 hours. Changes in pulmonary function are evident at exposures levels of 2 to 3 ppm NO_2 [Ref 9]; asthmatics are particularly sensitive, potentially suffering significant bronco-spasm at very low concentrations.

NO_2 varies in colour from light orange through to reddish-brown, depending on the concentration and the light conditions. NO_2 is visible in concentrations above 2.5 ppm [Ref 5], although from a distance (such as viewing a blast) the concentrations may need to be above 30 ppm to be observed [Ref 2].

NO_2 has a sharp, biting odour and can be detected by smell at low concentrations (< 0.5 ppm), but the sense of smell can be subdued above 4 ppm. It has a higher molar mass (46) than air (28.8) and consequently tends to travel across the ground, dispersing over distance.

The STEL for NO_2 is 5 ppm (9.4 mg/m³), TWA is 3 ppm (5.6 mg/m³), and 20 ppm is considered IDLH (immediately dangerous to life or health).

The US National Institute for Occupational Safety and Health (NIOSH) recommended short term exposure limit is 1 ppm

Concentration	Symptoms
~ 800 ppm	15 seconds exposure lethal by reflex choking if not rescued. Extremely irritating to the eyes, nose and throat.
~ 350 ppm	5 minutes exposure lethal by reflex choking if not rescued. Extremely irritating to the eyes, nose and throat
~ 250 ppm	Lethal to man 15 minutes by reflex choking. Airway reactivity and resistance makes breathing more difficult with time. Less than 5 minutes exposure causes potentially fatal pulmonary oedema
~ 200 ppm	Lethal to man in 30 minutes by reflex choking. Airway reactivity and resistance makes breathing difficult.
150 ppm	For 10 minutes or less causes coughing; eye, nose and throat irritation; headache; nausea and vomiting. Longer exposure can cause permanent eye damage and potentially fatal delayed pulmonary oedema
90 ppm	For 40 minutes has caused moderate irritation to the eyes and mucous membranes and potentially fatal delayed pulmonary oedema. The delay may be up to 70 hours when symptoms of cyanosis (turning blue), shortness of breath, restlessness, headache and frothy yellow or brown sputum appear. If untreated, fluids or froth can flood the lungs (i.e. drowning) or can be infected by viruses or bacteria resulting in bronchitis or pneumonia which may be fatal to a weakened patient.
50 ppm	Moderately irritating to the eyes and mucous membranes within 10 minutes and long exposure can cause permanent eye damage.
4-5 ppm:	For 15 minutes will cause increased airway reactivity (constriction of airways), airway resistance (more effort needed to breathe), and decreased diffusion of gases in the lungs
4 ppm	For 10 minutes anaesthetises the nose so it can no longer smell
0.1 ppm	For 2 hours can result in increased airway reactivity for asthmatics or people with chronic bronchitis.

Symptoms of nitrogen dioxide exposure [Ref 1]

Nitric Oxide (NO)

NO is a colourless gas, with a slightly irritating odour. It is slightly soluble in water and forms nitrous and nitric acid. Mild exposure can cause shortness of breath, coughing and chest pains, but more severe exposure (above 100 ppm) can lead to pulmonary oedema, cyanosis, or respiratory failure [Ref 8].

The TWA is 25 ppm (31 mg/m³), and 100 ppm is IDLH (immediately dangerous to life or health).

Concentration	Symptoms
~ 8,000 ppm (0.8%)	Sudden unconsciousness followed by death in 1 minute by chemical asphyxiation. Higher concentrations may be fatal in less time
~ 3,000 ppm (0.3%)	Dizziness or drowsiness in minutes quickly followed by unconsciousness and death in 5 Minutes
~ 1,600 ppm	Muscular tremors, loss of coordination, faster breathing, faster heart rate, drowsiness, dizziness, excess salivation and vomiting may occur in 5 minutes with unconsciousness in 10 minutes and death in 15 minutes
~ 400 ppm	First symptoms, similar to 1,600 ppm above, appear within 2 hours when Methemoglobin concentration reaches 30-40%. Vomiting may cease and unconsciousness may occur within 3 hours. Still has the potential to be fatal if Methemoglobin concentration of blood reaches 70- 90%
0.3 – 0.9 ppm	Pungent odour

Symptoms of nitric oxide exposure [Ref 1]

Carbon Monoxide (CO)

CO is a colourless, odourless and tasteless gas. It is readily absorbed through the lungs, where it displaces oxygen in blood through the formation of CO-haemoglobin, leading to headache, fatigue, dizziness, drowsiness and nausea. Large amounts of CO can lead to rapid loss of consciousness and death.

Atmospheric CO (ppm)	CO-Hb in Blood (%)	Symptoms
1950	80	Rapidly fatal.
800-1220	60-70	Unconsciousness; intermittent convulsions; respiratory failure; death if exposure is prolonged.
350-520	40-50	Headache; confusion; collapse; fainting upon exertion.
220	30	Decided headache; irritability; easy fatigability; disturbed judgment; possible dizziness; dimness of vision.
120	20	Shortness of breath with moderate exertion; occasional headache with throbbing in the temples.
70	10	Shortness of breath upon vigorous exertion; possible tightness across the forehead.

Symptoms of carbon monoxide exposure. The table gives the levels of COHb in the blood which tend to form at equilibrium with various concentrations of CO in the air and the clinical effects observed [Ref 10].

The TWA is 30 ppm (34 mg/m³). Short-term excursions should never exceed 400 ppm [Ref 12].

Sulphur Dioxide (SO_2)

SO_2 is a colourless gas with a characteristic pungent and irritating odour. It is a severe irritant of the eyes, mucous membranes and skin, due to the rapid formation of sulphurous acid on contact with moist membranes. High concentrations can cause respiratory paralysis or pulmonary oedema.

Concentration	Symptoms
80 – 100 ppm	May cause an increased incidence of nasopharyngitis, shortness of breath on exertion (dyspnea), and chronic fatigue
10 – 50 ppm	For 5 to 15 minutes: irritation of the eyes, nose and throat; rhinorrhea (discharge of thin nasal mucus), choking, cough, and in some instances reflex broncoconstriction with increase pulmonary resistance.
10 ppm	Upper respiratory irritation; nose bleeds
5 ppm	Coughing after 5 minutes
3 ppm	Odour threshold
0.3 – 1 ppm	Detectable by taste

Symptoms of sulphur dioxide exposure [Ref 15]

The STEL for SO_2 is 5 ppm (13 mg/m³), TWA is 2 ppm (5.2 mg/m³), and 100 ppm is considered IDLH (immediately dangerous to life or health) [Ref 15].

Hydrogen Sulphide (H_2S)

H_2S is a colourless gas with a strong 'rotten egg' odour. It is irritating to the eyes and the respiratory tract, and may cause effects on the central nervous system. Inhalation may lead

to pulmonary oedema, and as with NO_2, the effects may be delayed by several hours.

Concentration	Symptoms
400 – 700 ppm	Loss of consciousness and possible death after 30 – 60 minutes
50 – 200 ppm	Severe respiratory tract irritation; eye irritation
100 ppm	Loss of sense of smell due to olfactory fatigue
20 ppm	Neurological effects including memory loss and dizziness
5 – 10 ppm	Minor metabolic effects
2 ppm	Bronchial restriction in some asthmatics
0.008 ppm	Odour threshold

Symptoms of hydrogen sulphide exposure [Ref 16, 17]

The STEL for H_2S is 15 ppm (21 mg/m³), TWA is 10 ppm (14 mg/m³), and 100 ppm is considered IDLH (immediately dangerous to life or health).

APPENDIX 4 - INFORMATION FOR TREATING MEDICAL STAFF

Those exposed to NOx gases should seek immediate medical treatment and consideration should be given to placing those exposed under observation for at least 24 hours after exposure.

To assist medical staff the following guide should be provided.

Advice to Medical Staff in the Treatment of Those Who Have Been Exposed to NOx Gases.

The patient may have been exposed to NOx. This is a gas usually produced on mines after the use of explosives. NOx consists of multiple combinations of nitrogen and oxygen (N2O, NO, NO2, N2O4, N2O3, N2O5). Nitrogen dioxide (NO2) is the principle hazardous nitrous gas. NOx irritates the eyes and mucous membranes primarily by dissolving on contact with moisture and forming a mixture of nitric and nitrous acids. But this is not the only mechanism by which injury may occur. Inhalation results in both respiratory tract irritation and pulmonary oedema. High level exposure can cause methhaemoglobinaemia. Some people, particularly asthmatics, can experience significant broncospasm at very low concentrations.

The following effects are commonly encountered after NOx exposure:

ACUTE
- Cough
- Shortness of breath
- Irritations of the mucous membranes of the eyes, nose and throat

SHORT TERM
- Pulmonary oedema which may be delayed for up to 4-12 hours

MEDIUM TERM
- R.A.D.S. (Reactive Airways Dysfunction Syndrome
- In rare cases bronchiolitis obliterans which may take from 2-6 weeks to appear

LONG TERM
- Chronic respiratory insufficiency

High level exposure particularly associated with methhaemoglobinaemia can cause chest pain, cyanosis, and shortness of breath, tachapnea, and tachycardia. Deaths have been reported after exposure and are usually delayed. Even non-irritant concentrations of NOx may cause pulmonary oedema. Symptoms of pulmonary oedema often don't become manifest until a few hours after exposure and are aggravated by physical effort. Prior to transfer to you the patient should have been advised to rest and if any respiratory symptoms were present should have been administered oxygen. The patient will need to be treated symptomatically but as a base line it is suggested that the following investigations are required:
- Spirometry
- Chest x-ray
- Methheamoglobin estimation

Because of the risk of delayed onset pulmonary edema it is recommended that as a precaution the patient be observed for up to 12 hours. As no specific antidote for NOx exists, symptoms will have to be treated on their merits.

References

AEISG, 2011, *Code of Practice – Prevention and Management of Blast Generated NO_x Gases in Surface Blasting*, Edition 2, August 2011.

Environmental Procedure ATT09-02-11

Environmental Procedure EP9.2

HVO-10-ENVMP-SITE-E6-004 Hunter Valley Operations Blast Management Plan

HVO-10-PMHMP-SITE-002 Explosives Principal Mining Hazard Management Plan

HVO-10-WI-MINE-049 Closing Public Roads

HVO-10-WI-MINE-013 Preparing Bench and Access Roads for Drilling & Blasting Activities

HVO-10-WI-MINE-052 Dealing with Misfires

HVO-10-WI-MINE-088 Blasting activity in elevated temperatures (Hot excessive holes) or reactive ground

HVO-10-WI-MINE-090 Explosives Storage Stock Control

HVO-10-WI-MINE-043 Securing, Demarcating and Accessing Blast Areas

HVO-10-WI-MINE-052 Dealing with Misfires

HVO-10-WI-MINE-051 Tying and Firing a Shot

HVO-10-WI-MINE-045 Priming, Loading and Stemming Blast Holes

HVO-10-WI-MINE-110 Removing Stemming Material and or Explosives from a Blast Hole

HVO-10-WI-MINE-089 Drilling and Blasting Activity in Gaseous Areas

HVO-10-WI-MINE-092 Filming a Blast

HVO-10-WI-MINE-036 Measuring (Dipping) and Dewatering Blast Holes

HVO-14-ENVMP-SITE-057 Hunter Valley Operations Pollution Incident Response Management Plan

Coal Australia, Mine Operations Improvement - Blast Fume Management Guidelines

Orica Mining Services, 2010, *Orica Product Selection Guide October 2010*, Orica Australia Pty Ltd.

Queensland Government, 2011, *Queensland Guidance Note QGN 20 v2 Management of oxides of nitrogen in open cut blasting*. Department of Employment, Economic Development and Innovation, Queensland.

Safe Work Australia, Exposure Standard for Carbon Monoxide, http://hsis.ascc.gov.au/DocumentationES.aspx?ID=111

US National Institute for Occupational Safety and Health (NIOSH), *Pocket Guide to Chemical Hazards – Nitrogen Dioxide*, http://www.cdc.gov/niosh/npg/npgd0454.html

US National Institute for Occupational Safety and Health (NIOSH), *Documentation for Immediately Dangerous to Life or Health Concentrations (IDLHs)*, http://www.cdc.gov/niosh/idlh/idlhintr.html

US National Institute for Occupational Safety and Health (NIOSH) and US Occupational Safety and Health Administration, *Occupational Safety and Health Guideline for Sulfur Dioxide*, 1978, http://www.cdc.gov/niosh/docs/81-123/pdfs/0575.pdf

US Occupational Safety & Health Administration, *Nitric Oxide in Workplace Atmospheres* (ID190), http://www.osha.gov/dts/sltc/methods/inorganic/id190/id190.html US Occupational Safety & Health

Administration, *Nitric Dioxide in Workplace Atmospheres* (ID182), http://www.osha.gov/dts/sltc/methods/inorganic/id182/id182.html

US Occupational Safety & Health Administration, *Carbon Monoxide in Workplace Atmospheres*, http://www.osha.gov/dts/sltc/methods/inorganic/id209/id209.html

National Occupational Health and Safety Commission, *Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment*, (NOHSC:1003), Australian Government Publishing Service, Canberra, 1995.

Appendix C- Road Closure Management Plans

HUNTER VALLEY OPERATIONS

Road Closure Management Plan Golden Highway (Jerrys Plains Rd)

Document Number: HVOOC-1797567310-2159
Status: Approved
Version: 1.0
Effective: 07/01/2019
Review: 07/01/2022
Owner: Superintendent - Dragline, Drill & Blast

1 Purpose

To safely manage temporary road closures when blasts are within 500m of a public road or when it is considered a blast may adversely affect that road.

2 Scope

HVO – Temporary Road Closure of Jerry's Plains Road.

3 Requirements

3.1 Key Issues

Disruption to traffic on Jerrys Plains Road during temporary road closures due to blasting.

3.2 Performance Criteria

Ensure the public are well informed of any temporary road closures on Jerrys Plains Road due to blasting at Hunter Valley Operations and ensure minimal disturbance to traffic during blasting periods.

3.3 Control Measure

3.3.1 Prior to Road Closure

- **Singleton Argus**

  Notification will be given to the Singleton Argus such that a public notice is placed in the local newspaper edition. This notification will be shown in the Singleton Argus at least one day before the blast.

- **United Collieries Pty. Limited**

  Notification to United Collieries will be by at least 12 noon on the day prior to the closure of the road for the purposes of blasting.

  All road closures on Jerrys Plains Road will be performed at a time to minimise impact on United Collieries (outside shift change). If United Collieries have any issues with the proposed road closure time, contact should be made with the Drill & Blast Engineer in the first instance.

  Hunter Valley Operations will periodically review the impact of the road closures on United Collieries and discuss any adjustments in timing as the need arises.

- **Travelling Stock Route (TSR) (Hobden Reserve)**

  When firing in Riverview West, the exclusion zone may impact Hobden Reserve. If this is the case, Notification will be given to Local Lands Services & the lessee as per Local Land Services Reserve Use Application & Permit (P16001).

- **Road Closure Notification Boards**

  The road closure notification boards will be updated to show the date and time of prosed firing.

3.3.2 At the time of Road Closure

- **Emergency Services**

  Should any emergency services approach a road closure point and be required to pass to attend an emergency the traffic controller will arrange for the emergency services vehicles to be escorted through the road closure station as soon as the route can be made safe. This may include contacting the blast controller to temporarily delay the firing of the blast.

- **United Collieries Main Entrance**

  Should any emergency services approach a road closure point and be required to pass to attend an emergency the traffic controller will arrange for the emergency services vehicles to be escorted through the road closure station as soon as the route can be made safe. This may include contacting the blast controller to temporarily delay the firing of the blast.

- **Traffic Control**

  Traffic Control stations will be established on the affected road in accordance with Appendix 4. These locations will remain relatively constant, however may require some modification due to prevailing conditions on the day of blasting.

  As a minimum the Traffic Control stations will include sufficient suitably qualified staff for the purpose of traffic control, together with all equipment necessary for the safe control of the road. All road control personnel will be in two-way radio contact with the blast controllers.

  All traffic controllers and road sentries will travel to the road closure points and open all necessary signage in accordance with Appendix B. There is to be a Stop/Slow controller situated on the United mine entrance road for each blast. Once all signage is in position, the sentries will await direction from the blast controller.

  Signage to be in accordance with Appendix B, and situated adjacent to the road, or a Traffic Control Plan (TCP) to be written by an qualified, licensed person & signage to be as per this Traffic Control Plan (TCP).

  Once the blast is ready to be fired, the traffic controllers will be directed to close the road. The road sweeper (s) shall drive the entire route to ensure all vehicles are clear of all road closure points. Once the area has been confirmed to be clear of vehicles the road sentry will notify the blast controller and the blast will be fired in accordance with the Work Instruction *HVOOC-1797567310-1965 Tying and Firing a Shot*.

  Once the blast has been fired, the road sweeper(s) will drive the entire route to confirm the road has not been impacted by the blast (fly rock or damage). The road sweeper(s) will remove any fly rock that impacts on the road. At the conclusion of this process, the road will then be reopened to traffic.

  All necessary signage will be closed/removed at the conclusion of the road closure and be padlocked shut by the traffic controllers, if used. Any portable signage shall be picked up & stored appropriately.

  All roads and approaches that may provide access to the blast area are controlled and coordinated by Hunter Valley Operations as necessary. Typically these access points are fenced and secured using a padlocked gate (company owned land).

3.4 Frequency

When blasting in these mining areas it is expected that a number of road closures will be required within a week due to blasting within 500m of the road, or when it is considered a blast may adversely affect that road. The timing of these periods maybe scheduled sporadically throughout the year according to the mine plan.

- Jerry's Plains Road: typically three (3) closures per week with a maximum of four (4) road closures per week.
- There will be a maximum of two (2) road closure of Jerry's Plains Road on any day.
- In each instance the road will be closed for up to approximately 20 minutes.

Blasting operations within 500m of the Jerry's Plains Road is expected to continue for the life of mine.

3.5 Incident Management

Incident Reporting

Incident reporting as per *HVOOC-1797567310-445 Incident Reporting and Investigation Procedure.*

Complaints Management

Complaints management as per *HVOOC-1797567310-66 Community Complaints Management Work Instruction.*

Incident Response – Exceedance or Complaint

Investigate event and identify operational location, timing and climatic conditions to determine if additional management measures are required.

4 Accountabilities

Roles	Accountabilities
Tech Services Manager	*Ensure the engineers have the tools in place to complete the tasks associated with a road closure within the agreed standards and in a timely manner.* *Prompt the regular review of procedures to ensure that the most up to date information is being used.*
Senior Engineer	*Ensure the Drill & Blast engineer(s) follows the standards in-place (Best Practices) for the purpose of closing a public road.* *Conducts regular reviews of the Road Closure Management Plan to ensure it is current and enable enhancements be made to standards.*
Drill & Blast Engineer	*Ensure the output for the drill & blast operations conforms to the standards required for safe and effective closure of a public road.*
Designated Road Closure Supervisor	*Co-ordinate the closure of a public road for the purpose of blasting, ensuring it conforms to the standards required for safe and effective closure of a public road*

5 Document Information

5.1 Reference Information

Reference	
Approvals	• *HVO West Pit Extension DC DA 450-10-2003* • *HVO South Coal Project DC PA 06-0261* • *RTA Road Occupancy Licence #782686* • *Local Land Services Reserve Use Application & Permit P16001*
Hunter Valley Operations Standards/Procedures /Registers/Forms	• *HVOOC-1797567310-1559 Closing Public Roads Work Instruction* • *HVOOC-1797567310-1954 Road Closure Form* • *HVOOC-1797567310-2158 Shotfiring Pre-Blast Post-Blast Checklist* • *HVOOC-1797567310-1965 Tying and Firing a Shot* • *HVOOC-1797567310-445 Incident Reporting and Investigation Procedure.* • *HVOOC-1797567310-66 Community Complaints Management Work Instruction.*

5.2 Change Information

Full details of the document history are recorded in the document control register, by version. A summary of the current change is provided in table below.

Version	Date	Review Team	Details of Change
2.6	11.12.2018	*E Martin, D Brown*	*6 Monthly review & renewal of RMS licence* *Road Occupancy Licence (ROL) NO: 981480* *Speed Zone Authorisation LIC/SZA NO: 981480/001*

New version numbers have been assigned due to documents being updated to align with Glencore management system, reformatted to the new HVO template and being migrated to the new SharePoint electronic platform.

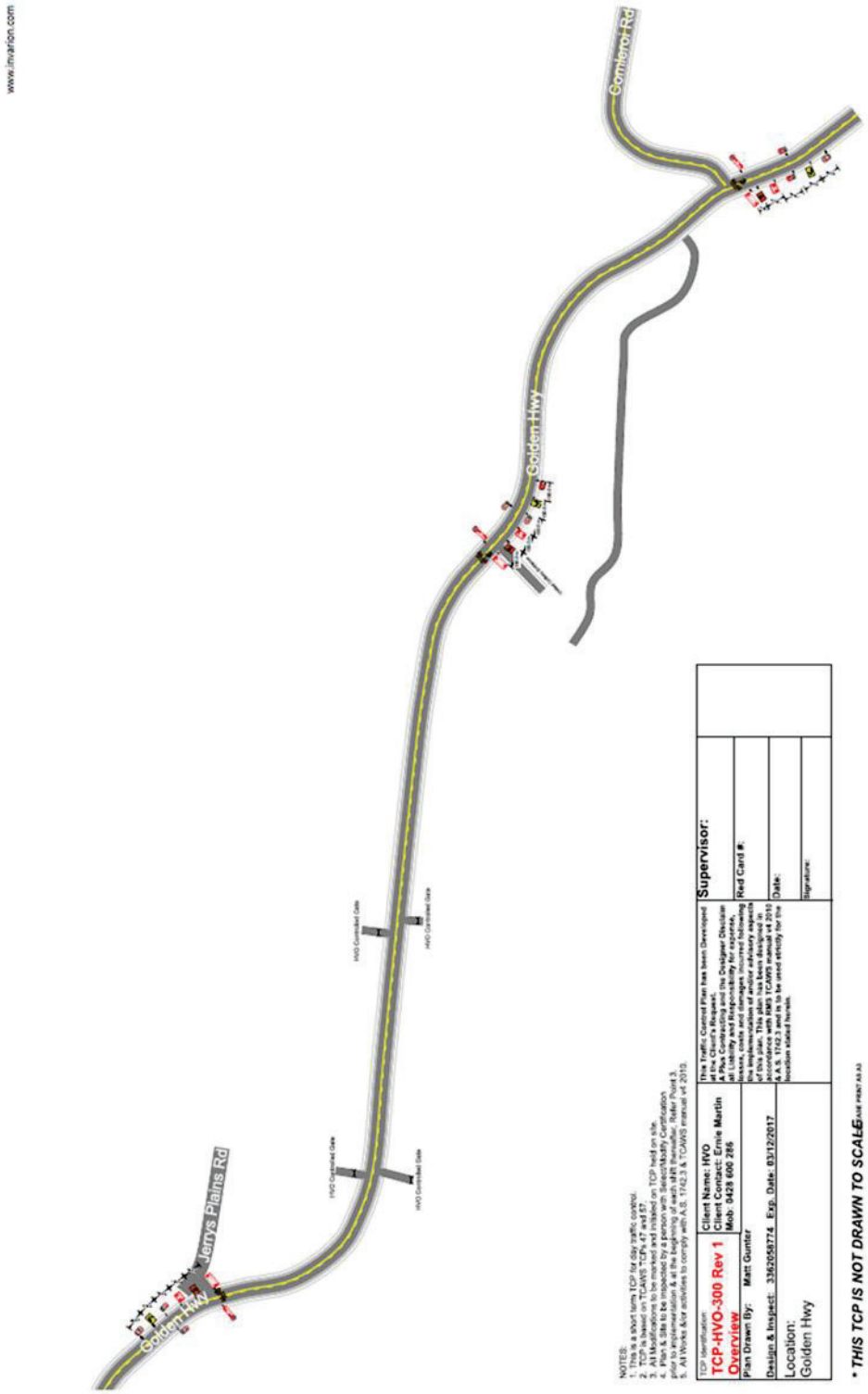
The last previous document version number, name and date of last review are shown in the row so this information can be used to recall the document from archive.

Version	Date	Review Team	Details of Change
1.0	2.08.2018		*Uploaded to SharePoint*
2.0	[Effective Date]	*E Martin, M Cameron, S Leary, D Brown*	*6 Monthly review & renewal of RMS licence* *Road Occupancy Licence (ROL) NO: 1091770* *Updated HVO Template and referring document numbers*

Appendix A - Road Closure Procedure Flowchart

Appendix B - Riverview Pit 500m Exclusion Zone – Jerry's Plains Road

Appendix C - Riverview Pit 500m Exclusion Zone – Jerry's Plains Road



Appendix D - Advertising Examples Temporary Road Closure

HUNTER VALLEY OPERATIONS

TEMPORARY ROAD CLOSURE

- Golden Highway (Jerrys Plains Road)

Hunter Valley Operations wishes to advise the **Jerrys Plains Road** will be closed on **Thursday 7th, Friday 8th, Tuesday 12th and Wednesday 13th of June 2018** between 9:00am and 3:00pm for the purpose of blasting. The road is likely to be closed for 15 mins and will affect the road between Lemington Road and Comleroi Road. If weather conditions are poor, blasting will be delayed until the first day of suitable weather.

Hunter Valley Operations apologise for any inconvenience caused. For further information contact the blasting Hotline on

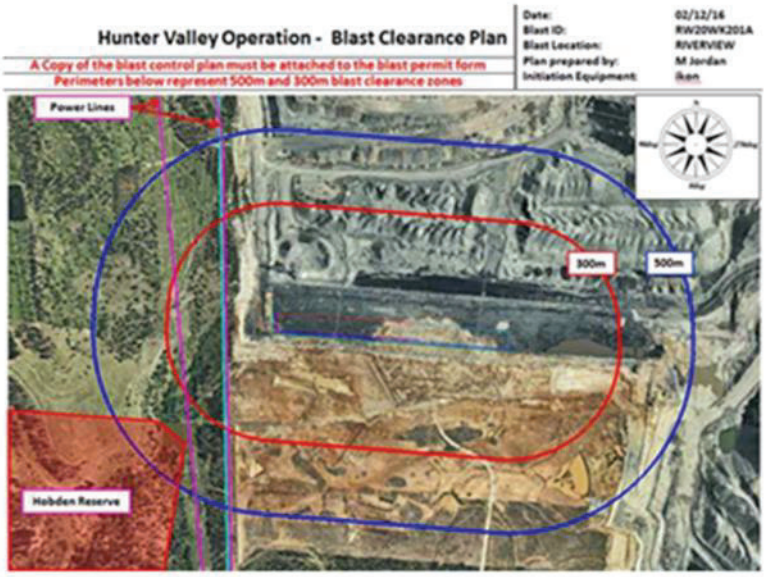
1800 888 733

Appendix E - Example of Correspondence Informing Road Closure

From:
To:
Cc:
Subject: HVO blasting in Riverview West, Wednesday 07/12/16

All,

HVO intend to fire one (1) blast in Riverview Pit Wednesday, 7th December at 1pm.
This blast will not affect United Collieries other than a temporary road closure.
This blast contains 500t of explosives and will take 20secs.



If circumstance change and rescheduling of the shot is required, notification will be sent via this distribution list.

Regards

Appendix F - Photos

Photo 1: Photo from West

Photo 2: Photo from East

Appendix G - Road Occupancy Licence and Speed Reduction Licence

ROAD OCCUPANCY LICENCE

Transport NSW | Roads & Maritime Services

LICENCE NO : 1091770

ROADS & MARITIME SERVICES (RMS)

Phone: 1300 656 371 Monday To Friday 8.30 AM - 4.30 PM

To activate and deactivate your approved work shift(s) on your Road Occupancy Licence, please visit: myrol.transport.nsw.gov.au. This licence is for the occupation of the road space only. If you are unable to access myrol.transport.nsw.gov.au, please call TMC on 1800 679 782. For further assistance, please refer to the proponent's user manual here: myrol.transport.nsw.gov.au/help.pdf

NON DEVELOPMENT - INVESTIGATION

Project:	Not Applicable
This Activity :	Temporary road closure for blasting purposes

LOCATION

Subject Road:	GOLDEN HWY
From:	COMLEROI RD, WARKWORTH
To:	LEMINGTON RD, JERRYS PLAINS
Council:	SINGLETON

LICENSEE

Organisation:	Hunter Valley Operations
Ref No:	
Name:	Ernest Martin
Phone:	0428600286

ONSITE CONTACT

Name:	Ernie Martin
Phone:	0428600286

TRAFFIC MANAGEMENT

Flow Management:	Stop / Slow Control
Closure Type:	1 lane of 1
Closure Lane(s):	Lane 1 (kerb lane/s); Shoulder
Direction(s):	Eastbound and Westbound

LICENCE DURATION

From:	01-Jan-2019
To:	28-Jun-2019

LICENCE CONDITIONS

1 YOU MUST USE SHIFT ACTIVATION WEB ADDRESS https://myrol.transport.nsw.gov.au TO ACTIVATE AND DEACTIVATE YOUR APPROVED ROAD OCCUPANCY LICENCE(S). (TO CHANGE TRAFFIC CONTROL SIGNALS TO FLASHING YELLOW OR TO ACTIVATE PERMANENT VARIABLE MESSAGE SIGNS DIAL 1800 679 782)

2 THIS LICENCE IS NOT AN APPROVAL OF THE PROPONENT'S TRAFFIC CONTROL PLAN. PLEASE NOTE WORKCOVER REQUIRES THAT TRAFFIC CONTROL PLANS COMPLY WITH AS1742.3

3 ALL MATTERS RELATING TO NOISE GENERATION OR OTHER ENVIRONMENTAL FACTORS ON SITE ARE UNDER THE JURISDRICTION OF THE LOCAL COUNCIL AND/OR THE ENVIRONMENTAL PROTECTION AUTHORITY.

4 SHOULD THE PROPOSED WORKS INVOLVE UNDERBORING OR EXCAVATION OF STATE ROAD ASSETS OR THE REMOVAL OF KERB AND GUTTER, DETAILS OF WORKS MUST BE APPROVED BY THE RMS'S ASSEST MANAGEMENT BRANCH.

5 NOTIFICATION TO AFFECTED BUSINESSES, RESIDENTS AND OTHER STAKEHOLDERS MUST BE UNDERTAKEN AT LEAST 5 BUSINESS DAYS PRIOR TO WORKS COMMENCING

6 A SHOULDER CLOSURE, THAT IS AT NO TIME A TRAFFICABLE LANE, MAY BE CLOSED DURING THE LICENSED PERIOD(S) ON THE CONDITION THAT THERE IS NEGLIGIBLE IMPACT ON ADJACENT TRAFFIC FLOW AND THAT THE LICENSEE ENSURES THAT WORKSITE TRAFFIC ARRANGEMENTS PROVIDE ADEQUATE FACILITIES FOR PEDESTRIANS AND BICYCLISTS INCLUDING A ROUTE AND/OR SIGNAGE THROUGH OR AROUND THE WORKSITE IN ACCORDANCE WITH THE RMS TRAFFIC CONTROL AT WORKSITES MANUAL.
* SHORT TIME INTERMITTENT TRAFFIC STOPPAGES MAY OCCUR DURING THE LICENSED PERIOD ON THE CONDITION THAT NO STOPPAGE OCCURS WHILE ANY TRAFFIC IS DELAYED BY GENERAL CONGESTION OR ANY TRAFFIC IS STILL DELAYED BY A PREVIOUS STOPPAGE.

7 COMPLIANT PERMANENT SIGNAGE AT THE DESIGNATED CLOSURE POINTS MUST BE INSTALLED AND MUST INDICATE THE DATE AND TIME OF THE NEXT PROPOSED TRAFFIC STOPPAGE AND A CONTACT TELEPHONE NUMBER FOR PUBLIC INQUIRIES.

8 SHOULD SIGNIFICANT TRAFFIC DELAYS OR QUEUES OCCUR AS A RESULT OF THE WORKSITE TRAFFIC CONTROL, THE TRAFFIC CONTROL SUPERVISOR MUST IMMEDIATELY INFORM THE TMC AND ADDRESS THE ISSUE TAKING ACTION TO ALLEVIATE TRAFFIC DELAY.
* TRAFFIC CONTROL ARRANGEMENTS MUST SPECIFICALLY ADDRESS END OF QUEUE MANAGEMENT TO ENSURE THAT MOTORISTS ARE ADEQUATELY WARNED BEFORE ARRIVAL AT THE END OF ANY QUEUE ARISING FROM THE TRAFFIC CONTROL.

APPROVED DATES & TIMES

From Shift					To Shift			
From	D	M	Time	-	To	D	M	Time
Tue	01	Jan	08:00	-	Tue	01	Jan	16:00
Wed	02	Jan	08:00	-	Wed	02	Jan	16:00
Thu	03	Jan	08:00	-	Thu	03	Jan	16:00
Fri	04	Jan	08:00	-	Fri	04	Jan	16:00
Mon	07	Jan	08:00	-	Mon	07	Jan	16:00
Tue	08	Jan	08:00	-	Tue	08	Jan	16:00
Wed	09	Jan	08:00	-	Wed	09	Jan	16:00
Thu	10	Jan	08:00	-	Thu	10	Jan	16:00
Fri	11	Jan	08:00	-	Fri	11	Jan	16:00
Mon	14	Jan	08:00	-	Mon	14	Jan	16:00
Tue	15	Jan	08:00	-	Tue	15	Jan	16:00
Wed	16	Jan	08:00	-	Wed	16	Jan	16:00
Thu	17	Jan	08:00	-	Thu	17	Jan	16:00
Fri	18	Jan	08:00	-	Fri	18	Jan	16:00
Mon	21	Jan	08:00	-	Mon	21	Jan	16:00
Tue	22	Jan	08:00	-	Tue	22	Jan	16:00
Wed	23	Jan	08:00	-	Wed	23	Jan	16:00
Thu	24	Jan	08:00	-	Thu	24	Jan	16:00
Fri	25	Jan	08:00	-	Fri	25	Jan	16:00
Mon	28	Jan	08:00	-	Mon	28	Jan	16:00
Tue	29	Jan	08:00	-	Tue	29	Jan	16:00
Wed	30	Jan	08:00	-	Wed	30	Jan	16:00
Thu	31	Jan	08:00	-	Thu	31	Jan	16:00
Fri	01	Feb	08:00	-	Fri	01	Feb	16:00
Mon	04	Feb	08:00	-	Mon	04	Feb	16:00
Tue	05	Feb	08:00	-	Tue	05	Feb	16:00
Wed	06	Feb	08:00	-	Wed	06	Feb	16:00
Thu	07	Feb	08:00	-	Thu	07	Feb	16:00
Fri	08	Feb	08:00	-	Fri	08	Feb	16:00
Mon	11	Feb	08:00	-	Mon	11	Feb	16:00
Tue	12	Feb	08:00	-	Tue	12	Feb	16:00

All pages of this Road Occupancy Licence and associated Speed Zone Authorisation(s) must be available on site at all times and must be produced for inspection when requested by representatives of NSW Police, Roads & Maritimes Services, Transport for NSW and other Government Agencies.

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ROAD OCCUPANCY LICENCE

LICENCE NO : 1091770

ROADS & MARITIME SERVICES (RMS)

Phone: 1300 656 371 Monday To Friday 8.30 AM - 4.30 PM

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NON DEVELOPMENT - INVESTIGATION

Project:	Not Applicable
This Activity :	Temporary road closure for blasting purposes

LOCATION

Subject Road:	GOLDEN HWY
From:	COMLEROI RD, WARKWORTH
To:	LEMINGTON RD, JERRYS PLAINS
Council:	SINGLETON

LICENSEE

Organisation:	Hunter Valley Operations
Ref No:	
Name:	Ernest Martin
Phone:	0428600286

ONSITE CONTACT

Name:	Ernie Martin
Phone:	0428600286

TRAFFIC MANAGEMENT

Flow Management:	Stop / Slow Control
Closure Type:	1 lane of 1
Closure Lane(s):	Lane 1 (kerb lane/s); Shoulder
Direction(s):	Eastbound and Westbound

LICENCE DURATION

From:	01-Jan-2019
To:	28-Jun-2019

LICENCE CONDITIONS

9 THE LICENSEE MUST HAVE ALL DEVELOPMENT, ENVIRONMENTAL AND STATUTORY APPROVALS PRIOR TO THE ACTIVITY COMMENCING. * EMERGENCY SERVICES MUST BE ASSISTED TO PASS THROUGH THE CLOSED PORTION OF ROAD.

10 ADVERSE TRAFFIC IMPACTS CAUSED BY LANE CLOSURES THAT AFFECT THE TRADE, INGRESS OR EGRESS OF TRAFFIC TO BUSINESS OR RESIDENTIAL PREMISES WITHIN THE LICENSED AREA ARE THE RESPONSIBILITY OF THE LICENSEE. PRIOR TO IMPLEMENTING A CLOSURE THE LICENSEE MUST LIAISE WITH AND SUCCESSFULLY NEGOTIATE ACCESS ISSUES WITH THE OWNERS OR OCCUPANTS OF ANY BUSINESS OR RESIDENTIAL PREMISES SO AFFECTED.

APPROVED DATES & TIMES

	From Shift				To Shift			
From	D	M	Time	-	To	D	M	Time
Wed	13	Feb	08:00	-	Wed	13	Feb	16:00
Thu	14	Feb	08:00	-	Thu	14	Feb	16:00
Fri	15	Feb	08:00	-	Fri	15	Feb	16:00
Mon	18	Feb	08:00	-	Mon	18	Feb	16:00
Tue	19	Feb	08:00	-	Tue	19	Feb	16:00
Wed	20	Feb	08:00	-	Wed	20	Feb	16:00
Thu	21	Feb	08:00	-	Thu	21	Feb	16:00
Fri	22	Feb	08:00	-	Fri	22	Feb	16:00
Mon	25	Feb	08:00	-	Mon	25	Feb	16:00
Tue	26	Feb	08:00	-	Tue	26	Feb	16:00
Wed	27	Feb	08:00	-	Wed	27	Feb	16:00
Thu	28	Feb	08:00	-	Thu	28	Feb	16:00
Fri	01	Mar	08:00	-	Fri	01	Mar	16:00
Mon	04	Mar	08:00	-	Mon	04	Mar	16:00
Tue	05	Mar	08:00	-	Tue	05	Mar	16:00
Wed	06	Mar	08:00	-	Wed	06	Mar	16:00
Thu	07	Mar	08:00	-	Thu	07	Mar	16:00
Fri	08	Mar	08:00	-	Fri	08	Mar	16:00
Mon	11	Mar	08:00	-	Mon	11	Mar	16:00
Tue	12	Mar	08:00	-	Tue	12	Mar	16:00
Wed	13	Mar	08:00	-	Wed	13	Mar	16:00
Thu	14	Mar	08:00	-	Thu	14	Mar	16:00
Fri	15	Mar	08:00	-	Fri	15	Mar	16:00
Mon	18	Mar	08:00	-	Mon	18	Mar	16:00
Tue	19	Mar	08:00	-	Tue	19	Mar	16:00
Wed	20	Mar	08:00	-	Wed	20	Mar	16:00
Thu	21	Mar	08:00	-	Thu	21	Mar	16:00
Fri	22	Mar	08:00	-	Fri	22	Mar	16:00
Mon	25	Mar	08:00	-	Mon	25	Mar	16:00
Tue	26	Mar	08:00	-	Tue	26	Mar	16:00
Wed	27	Mar	08:00	-	Wed	27	Mar	16:00

All pages of this Road Occupancy Licence and associated Speed Zone Authorisation(s) must be available on site at all times and must be produced for inspection when requested by representatives of NSW Police, Roads & Maritimes Services, Transport for NSW and other Government Agencies.

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ROAD OCCUPANCY LICENCE

Transport Roads & Maritime Services

LICENCE NO : 1091770

ROADS & MARITIME SERVICES (RMS)

Phone: 1300 656 371 Monday To Friday 8.30 AM - 4.30 PM

To activate and deactivate your approved work shift(s) on your Road Occupancy Licence, please visit: myrol.transport.nsw.gov.au. This licence is for the occupation of the road space only. If you are unable to access myrol.transport.nsw.gov.au, please call TMC on 1800 679 782. For further assistance, please refer to the proponent's user manual here: myrol.transport.nsw.gov.au/help.pdf

NON DEVELOPMENT - INVESTIGATION

Project:	Not Applicable
This Activity :	Temporary road closure for blasting purposes

LOCATION

Subject Road:	GOLDEN HWY
From:	COMLEROI RD, WARKWORTH
To:	LEMINGTON RD, JERRYS PLAINS
Council:	SINGLETON

LICENSEE

Organisation:	Hunter Valley Operations
Ref No:	
Name:	Ernest Martin
Phone:	0428600286

ONSITE CONTACT

Name:	Ernie Martin
Phone:	0428600286

TRAFFIC MANAGEMENT

Flow Management:	Stop / Slow Control
Closure Type:	1 lane of 1
Closure Lane(s):	Lane 1 (kerb lane/s); Shoulder
Direction(s):	Eastbound and Westbound

LICENCE DURATION

From:	01-Jan-2019
To:	28-Jun-2019

APPROVED DATES & TIMES

	From Shift				To Shift			
From	D	M	Time	-	To	D	M	Time
Thu	28	Mar	08:00	-	Thu	28	Mar	16:00
Fri	29	Mar	08:00	-	Fri	29	Mar	16:00
Mon	01	Apr	08:00	-	Mon	01	Apr	16:00
Tue	02	Apr	08:00	-	Tue	02	Apr	16:00
Wed	03	Apr	08:00	-	Wed	03	Apr	16:00
Thu	04	Apr	08:00	-	Thu	04	Apr	16:00
Fri	05	Apr	08:00	-	Fri	05	Apr	16:00
Mon	08	Apr	08:00	-	Mon	08	Apr	16:00
Tue	09	Apr	08:00	-	Tue	09	Apr	16:00
Wed	10	Apr	08:00	-	Wed	10	Apr	16:00
Thu	11	Apr	08:00	-	Thu	11	Apr	16:00
Fri	12	Apr	08:00	-	Fri	12	Apr	16:00
Mon	15	Apr	08:00	-	Mon	15	Apr	16:00
Tue	16	Apr	08:00	-	Tue	16	Apr	16:00
Wed	17	Apr	08:00	-	Wed	17	Apr	16:00
Thu	18	Apr	08:00	-	Thu	18	Apr	16:00
Fri	19	Apr	08:00	-	Fri	19	Apr	16:00
Mon	22	Apr	08:00	-	Mon	22	Apr	16:00
Tue	23	Apr	08:00	-	Tue	23	Apr	16:00
Wed	24	Apr	08:00	-	Wed	24	Apr	16:00
Thu	25	Apr	08:00	-	Thu	25	Apr	16:00
Fri	26	Apr	08:00	-	Fri	26	Apr	16:00
Mon	29	Apr	08:00	-	Mon	29	Apr	16:00
Tue	30	Apr	08:00	-	Tue	30	Apr	16:00
Wed	01	May	08:00	-	Wed	01	May	16:00
Thu	02	May	08:00	-	Thu	02	May	16:00
Fri	03	May	08:00	-	Fri	03	May	16:00
Mon	06	May	08:00	-	Mon	06	May	16:00
Tue	07	May	08:00	-	Tue	07	May	16:00
Wed	08	May	08:00	-	Wed	08	May	16:00
Thu	09	May	08:00	-	Thu	09	May	16:00

All pages of this Road Occupancy Licence and associated Speed Zone Authorisation(s) must be available on site at all times and must be produced for inspection when requested by representatives of NSW Police, Roads & Maritimes Services, Transport for NSW and other Government Agencies.

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ROAD OCCUPANCY LICENCE

LICENCE NO : 1091770

ROADS & MARITIME SERVICES (RMS)

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NON DEVELOPMENT - INVESTIGATION

Project:	Not Applicable
This Activity :	Temporary road closure for blasting purposes

LOCATION

Subject Road:	GOLDEN HWY
From:	COMLEROI RD, WARKWORTH
To:	LEMINGTON RD, JERRYS PLAINS
Council:	SINGLETON

LICENSEE

Organisation:	Hunter Valley Operations
Ref No:	
Name:	Ernest Martin
Phone:	0428600286

ONSITE CONTACT

Name:	Ernie Martin
Phone:	0428600286

TRAFFIC MANAGEMENT

Flow Management:	Stop / Slow Control
Closure Type:	1 lane of 1
Closure Lane(s):	Lane 1 (kerb lane/s); Shoulder
Direction(s):	Eastbound and Westbound

LICENCE DURATION

From:	01-Jan-2019
To:	28-Jun-2019

APPROVED DATES & TIMES

	From Shift				To Shift			
From	D	M	Time	-	To	D	M	Time
Fri	10	May	08:00	-	Fri	10	May	16:00
Mon	13	May	08:00	-	Mon	13	May	16:00
Tue	14	May	08:00	-	Tue	14	May	16:00
Wed	15	May	08:00	-	Wed	15	May	16:00
Thu	16	May	08:00	-	Thu	16	May	16:00
Fri	17	May	08:00	-	Fri	17	May	16:00
Mon	20	May	08:00	-	Mon	20	May	16:00
Tue	21	May	08:00	-	Tue	21	May	16:00
Wed	22	May	08:00	-	Wed	22	May	16:00
Thu	23	May	08:00	-	Thu	23	May	16:00
Fri	24	May	08:00	-	Fri	24	May	16:00
Mon	27	May	08:00	-	Mon	27	May	16:00
Tue	28	May	08:00	-	Tue	28	May	16:00
Wed	29	May	08:00	-	Wed	29	May	16:00
Thu	30	May	08:00	-	Thu	30	May	16:00
Fri	31	May	08:00	-	Fri	31	May	16:00
Mon	03	Jun	08:00	-	Mon	03	Jun	16:00
Tue	04	Jun	08:00	-	Tue	04	Jun	16:00
Wed	05	Jun	08:00	-	Wed	05	Jun	16:00
Thu	06	Jun	08:00	-	Thu	06	Jun	16:00
Fri	07	Jun	08:00	-	Fri	07	Jun	16:00
Mon	10	Jun	08:00	-	Mon	10	Jun	16:00
Tue	11	Jun	08:00	-	Tue	11	Jun	16:00
Wed	12	Jun	08:00	-	Wed	12	Jun	16:00
Thu	13	Jun	08:00	-	Thu	13	Jun	16:00
Fri	14	Jun	08:00	-	Fri	14	Jun	16:00
Mon	17	Jun	08:00	-	Mon	17	Jun	16:00
Tue	18	Jun	08:00	-	Tue	18	Jun	16:00
Wed	19	Jun	08:00	-	Wed	19	Jun	16:00
Thu	20	Jun	08:00	-	Thu	20	Jun	16:00
Fri	21	Jun	08:00	-	Fri	21	Jun	16:00

All pages of this Road Occupancy Licence and associated Speed Zone Authorisation(s) must be available on site at all times and must be produced for inspection when requested by representatives of NSW Police, Roads & Maritimes Services, Transport for NSW and other Government Agencies.

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ROAD OCCUPANCY LICENCE

LICENCE NO : 1091770

ROADS & MARITIME SERVICES (RMS)

Phone: 1300 656 371 Monday To Friday 8.30 AM - 4.30 PM

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NON DEVELOPMENT - INVESTIGATION

Project:	Not Applicable
This Activity :	Temporary road closure for blasting purposes

LOCATION

Subject Road:	GOLDEN HWY
From:	COMLEROI RD, WARKWORTH
To:	LEMINGTON RD, JERRYS PLAINS
Council:	SINGLETON

LICENSEE

Organisation:	Hunter Valley Operations
Ref No:	
Name:	Ernest Martin
Phone:	0428600286

ONSITE CONTACT

Name:	Ernie Martin
Phone:	0428600286

TRAFFIC MANAGEMENT

Flow Management:	Stop / Slow Control
Closure Type:	1 lane of 1
Closure Lane(s):	Lane 1 (kerb lane/s); Shoulder
Direction(s):	Eastbound and Westbound

LICENCE DURATION

From:	01-Jan-2019
To:	28-Jun-2019

APPROVED DATES & TIMES

	From Shift				To Shift			
From	D	M	Time	-	To	D	M	Time
Mon	24	Jun	08:00	-	Mon	24	Jun	16:00
Tue	25	Jun	08:00	-	Tue	25	Jun	16:00
Wed	26	Jun	08:00	-	Wed	26	Jun	16:00
Thu	27	Jun	08:00	-	Thu	27	Jun	16:00
Fri	28	Jun	08:00	-	Fri	28	Jun	16:00

All pages of this Road Occupancy Licence and associated Speed Zone Authorisation(s) must be available on site at all times and must be produced for inspection when requested by representatives of NSW Police, Roads & Maritimes Services, Transport for NSW and other Government Agencies.

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SPEED ZONE AUTHORISATION

LIC/SZA NO : 1091770/001

ROADS & MARITIME SERVICES (RMS)

Phone: 1300 656 371 Monday To Friday 8.30 AM - 4.30 PM

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NON DEVELOPMENT - INVESTIGATION

Project: Not Applicable

This Activity : Temporary road closure for blasting purposes

SPEED LIMIT REDUCTION

Existing: 100 Km/h

Reduced To : 60 Km/h

This Speed limit is ONLY to be applied during the approved time periods listed. Signs are to be covered or removed outside the approved time periods. The Organisation is to maintain accurate records of when the speed limit signs were installed and removed, including the location of the signs, the date and times. The existing posted speed limit is to be reinstated at the completion of each of the approved time periods as detailed herein.*

LOCATION

Subject Road: GOLDEN HWY

From: COMLEROI RD, WARKWORTH

To: LEMINGTON RD, JERRYS PLAINS

Council:

TRAFFIC MANAGEMENT

Distance(m): 1000

Direction: Eastbound and Westbound

LICENSEE

Organisation: Hunter Valley Operations

Ref No:

Name: Ernest Martin

Phone: 0428600286

ONSITE CONTACT

Name: Ernie Martin

Phone: 0428600286

APPROVED DATES & TIMES

From Shift					To Shift			
From	D	M	Time	-	To	D	M	Time
Tue	01	Jan	08:00	-	Tue	01	Jan	16:00
Wed	02	Jan	08:00	-	Wed	02	Jan	16:00
Thu	03	Jan	08:00	-	Thu	03	Jan	16:00
Fri	04	Jan	08:00	-	Fri	04	Jan	16:00
Mon	07	Jan	08:00	-	Mon	07	Jan	16:00
Tue	08	Jan	08:00	-	Tue	08	Jan	16:00
Wed	09	Jan	08:00	-	Wed	09	Jan	16:00
Thu	10	Jan	08:00	-	Thu	10	Jan	16:00
Fri	11	Jan	08:00	-	Fri	11	Jan	16:00
Mon	14	Jan	08:00	-	Mon	14	Jan	16:00
Tue	15	Jan	08:00	-	Tue	15	Jan	16:00
Wed	16	Jan	08:00	-	Wed	16	Jan	16:00
Thu	17	Jan	08:00	-	Thu	17	Jan	16:00
Fri	18	Jan	08:00	-	Fri	18	Jan	16:00
Mon	21	Jan	08:00	-	Mon	21	Jan	16:00
Tue	22	Jan	08:00	-	Tue	22	Jan	16:00
Wed	23	Jan	08:00	-	Wed	23	Jan	16:00
Thu	24	Jan	08:00	-	Thu	24	Jan	16:00
Fri	25	Jan	08:00	-	Fri	25	Jan	16:00
Mon	28	Jan	08:00	-	Mon	28	Jan	16:00
Tue	29	Jan	08:00	-	Tue	29	Jan	16:00
Wed	30	Jan	08:00	-	Wed	30	Jan	16:00
Thu	31	Jan	08:00	-	Thu	31	Jan	16:00
Fri	01	Feb	08:00	-	Fri	01	Feb	16:00
Mon	04	Feb	08:00	-	Mon	04	Feb	16:00
Tue	05	Feb	08:00	-	Tue	05	Feb	16:00
Wed	06	Feb	08:00	-	Wed	06	Feb	16:00

All pages of this Speed Zone Authorisation(s) must be available on site at all times and must be produced for inspection when requested by representatives of NSW Police, Roads & Maritimes Services, Transport for NSW and other Government Agencies.

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SPEED ZONE AUTHORISATION

LIC/SZA NO : 1091770/001

ROADS & MARITIME SERVICES (RMS)

Phone: 1300 656 371 Monday To Friday 8.30 AM - 4.30 PM

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NON DEVELOPMENT - INVESTIGATION

Project: Not Applicable

This Activity : Temporary road closure for blasting purposes

SPEED LIMIT REDUCTION

Existing: 100 Km/h

Reduced To : 60 Km/h

This Speed limit is ONLY to be applied during the approved time periods listed. Signs are to be covered or removed outside the approved time periods. The Organisation is to maintain accurate records of when the speed limit signs were installed and removed, including the location of the signs, the date and times. The existing posted speed limit is to be reinstated at the completion of each of the approved time periods as detailed herein.*

LOCATION

Subject Road: GOLDEN HWY

From: COMLEROI RD, WARKWORTH

To: LEMINGTON RD, JERRYS PLAINS

Council:

TRAFFIC MANAGEMENT

Distance(m): 1000

Direction: Eastbound and Westbound

LICENSEE

Organisation: Hunter Valley Operations

Ref No:

Name: Ernest Martin

Phone: 0428600286

ONSITE CONTACT

Name: Ernie Martin

Phone: 0428600286

APPROVED DATES & TIMES

	From Shift				To Shift			
From	D	M	Time	-	To	D	M	Time
Thu	07	Feb	08:00	-	Thu	07	Feb	16:00
Fri	08	Feb	08:00	-	Fri	08	Feb	16:00
Mon	11	Feb	08:00	-	Mon	11	Feb	16:00
Tue	12	Feb	08:00	-	Tue	12	Feb	16:00
Wed	13	Feb	08:00	-	Wed	13	Feb	16:00
Thu	14	Feb	08:00	-	Thu	14	Feb	16:00
Fri	15	Feb	08:00	-	Fri	15	Feb	16:00
Mon	18	Feb	08:00	-	Mon	18	Feb	16:00
Tue	19	Feb	08:00	-	Tue	19	Feb	16:00
Wed	20	Feb	08:00	-	Wed	20	Feb	16:00
Thu	21	Feb	08:00	-	Thu	21	Feb	16:00
Fri	22	Feb	08:00	-	Fri	22	Feb	16:00
Mon	25	Feb	08:00	-	Mon	25	Feb	16:00
Tue	26	Feb	08:00	-	Tue	26	Feb	16:00
Wed	27	Feb	08:00	-	Wed	27	Feb	16:00
Thu	28	Feb	08:00	-	Thu	28	Feb	16:00
Fri	01	Mar	08:00	-	Fri	01	Mar	16:00
Mon	04	Mar	08:00	-	Mon	04	Mar	16:00
Tue	05	Mar	08:00	-	Tue	05	Mar	16:00
Wed	06	Mar	08:00	-	Wed	06	Mar	16:00
Thu	07	Mar	08:00	-	Thu	07	Mar	16:00
Fri	08	Mar	08:00	-	Fri	08	Mar	16:00
Mon	11	Mar	08:00	-	Mon	11	Mar	16:00
Tue	12	Mar	08:00	-	Tue	12	Mar	16:00
Wed	13	Mar	08:00	-	Wed	13	Mar	16:00
Thu	14	Mar	08:00	-	Thu	14	Mar	16:00
Fri	15	Mar	08:00	-	Fri	15	Mar	16:00

All pages of this Speed Zone Authorisation(s) must be available on site at all times and must be produced for inspection when requested by representatives of NSW Police, Roads & Maritimes Services, Transport for NSW and other Government Agencies.

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SPEED ZONE AUTHORISATION

Transport Roads & Maritime Services

LIC/SZA NO : 1091770/001

ROADS & MARITIME SERVICES (RMS)

Phone: 1300 656 371 Monday To Friday 8.30 AM - 4.30 PM

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NON DEVELOPMENT - INVESTIGATION

Project: Not Applicable

This Activity : Temporary road closure for blasting purposes

SPEED LIMIT REDUCTION

Existing: 100 Km/h

Reduced To : 60 Km/h

This Speed limit is ONLY to be applied during the approved time periods listed. Signs are to be covered or removed outside the approved time periods. The Organisation is to maintain accurate records of when the speed limit signs were installed and removed, including the location of the signs, the date and times. The existing posted speed limit' is to be reinstated at the completion of each of the approved time periods as detailed herein.

LOCATION

Subject Road: GOLDEN HWY

From: COMLEROI RD, WARKWORTH

To: LEMINGTON RD, JERRYS PLAINS

Council:

TRAFFIC MANAGEMENT

Distance(m): 1000

Direction: Eastbound and Westbound

LICENSEE

Organisation: Hunter Valley Operations

Ref No:

Name: Ernest Martin

Phone: 0428600286

ONSITE CONTACT

Name: Ernie Martin

Phone: 0428600286

APPROVED DATES & TIMES

From Shift					To Shift			
From	D	M	Time	-	To	D	M	Time
Mon	18	Mar	08:00	-	Mon	18	Mar	16:00
Tue	19	Mar	08:00	-	Tue	19	Mar	16:00
Wed	20	Mar	08:00	-	Wed	20	Mar	16:00
Thu	21	Mar	08:00	-	Thu	21	Mar	16:00
Fri	22	Mar	08:00	-	Fri	22	Mar	16:00
Mon	25	Mar	08:00	-	Mon	25	Mar	16:00
Tue	26	Mar	08:00	-	Tue	26	Mar	16:00
Wed	27	Mar	08:00	-	Wed	27	Mar	16:00
Thu	28	Mar	08:00	-	Thu	28	Mar	16:00
Fri	29	Mar	08:00	-	Fri	29	Mar	16:00
Mon	01	Apr	08:00	-	Mon	01	Apr	16:00
Tue	02	Apr	08:00	-	Tue	02	Apr	16:00
Wed	03	Apr	08:00	-	Wed	03	Apr	16:00
Thu	04	Apr	08:00	-	Thu	04	Apr	16:00
Fri	05	Apr	08:00	-	Fri	05	Apr	16:00
Mon	08	Apr	08:00	-	Mon	08	Apr	16:00
Tue	09	Apr	08:00	-	Tue	09	Apr	16:00
Wed	10	Apr	08:00	-	Wed	10	Apr	16:00
Thu	11	Apr	08:00	-	Thu	11	Apr	16:00
Fri	12	Apr	08:00	-	Fri	12	Apr	16:00
Mon	15	Apr	08:00	-	Mon	15	Apr	16:00
Tue	16	Apr	08:00	-	Tue	16	Apr	16:00
Wed	17	Apr	08:00	-	Wed	17	Apr	16:00
Thu	18	Apr	08:00	-	Thu	18	Apr	16:00
Fri	19	Apr	08:00	-	Fri	19	Apr	16:00
Mon	22	Apr	08:00	-	Mon	22	Apr	16:00
Tue	23	Apr	08:00	-	Tue	23	Apr	16:00

All pages of this Speed Zone Authorisation(s) must be available on site at all times and must be produced for inspection when requested by representatives of NSW Police, Roads & Maritimes Services, Transport for NSW and other Government Agencies.

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SPEED ZONE AUTHORISATION

Transport Roads & Maritime Services

LIC/SZA NO : 1091770/001

ROADS & MARITIME SERVICES (RMS)

Phone: 1300 656 371 Monday To Friday 8.30 AM - 4.30 PM

To activate and deactivate your approved work shift(s) on your Road Occupancy Licence, please visit: myrol.transport.nsw.gov.au. This licence is for the occupation of the road space only. If you are unable to access myrol.transport.nsw.gov.au, please call TMC on 1800 679 782. For further assistance, please refer to the proponent's user manual here: myrol.transport.nsw.gov.au/help.pdf

NON DEVELOPMENT - INVESTIGATION

Project:	Not Applicable
This Activity :	Temporary road closure for blasting purposes

SPEED LIMIT REDUCTION

Existing:	100 Km/h
Reduced To :	60 Km/h

This Speed limit is ONLY to be applied during the approved time periods listed. Signs are to be covered or removed outside the approved time periods. The Organisation is to maintain accurate records of when the speed limit signs were installed and removed, including the location of the signs, the date and times. The existing posted speed limit is to be reinstated at the completion of each of the approved time periods as detailed herein.*

LOCATION

Subject Road:	GOLDEN HWY
From:	COMLEROI RD, WARKWORTH
To:	LEMINGTON RD, JERRYS PLAINS
Council:	

TRAFFIC MANAGEMENT

Distance(m):	1000
Direction:	Eastbound and Westbound

LICENSEE

Organisation:	Hunter Valley Operations
Ref No:	
Name:	Ernest Martin
Phone:	0428600286

ONSITE CONTACT

Name:	Ernie Martin
Phone:	0428600286

APPROVED DATES & TIMES

	From Shift				To Shift			
From	D	M	Time	-	To	D	M	Time
Wed	24	Apr	08:00	-	Wed	24	Apr	16:00
Thu	25	Apr	08:00	-	Thu	25	Apr	16:00
Fri	26	Apr	08:00	-	Fri	26	Apr	16:00
Mon	29	Apr	08:00	-	Mon	29	Apr	16:00
Tue	30	Apr	08:00	-	Tue	30	Apr	16:00
Wed	01	May	08:00	-	Wed	01	May	16:00
Thu	02	May	08:00	-	Thu	02	May	16:00
Fri	03	May	08:00	-	Fri	03	May	16:00
Mon	06	May	08:00	-	Mon	06	May	16:00
Tue	07	May	08:00	-	Tue	07	May	16:00
Wed	08	May	08:00	-	Wed	08	May	16:00
Thu	09	May	08:00	-	Thu	09	May	16:00
Fri	10	May	08:00	-	Fri	10	May	16:00
Mon	13	May	08:00	-	Mon	13	May	16:00
Tue	14	May	08:00	-	Tue	14	May	16:00
Wed	15	May	08:00	-	Wed	15	May	16:00
Thu	16	May	08:00	-	Thu	16	May	16:00
Fri	17	May	08:00	-	Fri	17	May	16:00
Mon	20	May	08:00	-	Mon	20	May	16:00
Tue	21	May	08:00	-	Tue	21	May	16:00
Wed	22	May	08:00	-	Wed	22	May	16:00
Thu	23	May	08:00	-	Thu	23	May	16:00
Fri	24	May	08:00	-	Fri	24	May	16:00
Mon	27	May	08:00	-	Mon	27	May	16:00
Tue	28	May	08:00	-	Tue	28	May	16:00
Wed	29	May	08:00	-	Wed	29	May	16:00
Thu	30	May	08:00	-	Thu	30	May	16:00

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SPEED ZONE AUTHORISATION

Transport Roads & Maritime Services

LIC/SZA NO : 1091770/001

ROADS & MARITIME SERVICES (RMS)

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LOCATION

Subject Road:	GOLDEN HWY
From:	COMLEROI RD, WARKWORTH
To:	LEMINGTON RD, JERRYS PLAINS
Council:	

TRAFFIC MANAGEMENT

Distance(m):	1000
Direction:	Eastbound and Westbound

LICENSEE

Organisation:	Hunter Valley Operations
Ref No:	
Name:	Ernest Martin
Phone:	0428600286

ONSITE CONTACT

Name:	Ernie Martin
Phone:	0428600286

APPROVED DATES & TIMES

From Shift					To Shift			
From	D	M	Time	-	To	D	M	Time
Fri	31	May	08:00	-	Fri	31	May	16:00
Mon	03	Jun	08:00	-	Mon	03	Jun	16:00
Tue	04	Jun	08:00	-	Tue	04	Jun	16:00
Wed	05	Jun	08:00	-	Wed	05	Jun	16:00
Thu	06	Jun	08:00	-	Thu	06	Jun	16:00
Fri	07	Jun	08:00	-	Fri	07	Jun	16:00
Mon	10	Jun	08:00	-	Mon	10	Jun	16:00
Tue	11	Jun	08:00	-	Tue	11	Jun	16:00
Wed	12	Jun	08:00	-	Wed	12	Jun	16:00
Thu	13	Jun	08:00	-	Thu	13	Jun	16:00
Fri	14	Jun	08:00	-	Fri	14	Jun	16:00
Mon	17	Jun	08:00	-	Mon	17	Jun	16:00
Tue	18	Jun	08:00	-	Tue	18	Jun	16:00
Wed	19	Jun	08:00	-	Wed	19	Jun	16:00
Thu	20	Jun	08:00	-	Thu	20	Jun	16:00
Fri	21	Jun	08:00	-	Fri	21	Jun	16:00
Mon	24	Jun	08:00	-	Mon	24	Jun	16:00
Tue	25	Jun	08:00	-	Tue	25	Jun	16:00
Wed	26	Jun	08:00	-	Wed	26	Jun	16:00
Thu	27	Jun	08:00	-	Thu	27	Jun	16:00
Fri	28	Jun	08:00	-	Fri	28	Jun	16:00

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HVO Road Closure Management Plan
Lemington Road

1 July 2018 – 30 June 2019

1. OBJECTIVES

To safely manage temporary road closures when blasts are within 500m of a public road or when it is considered a blast may adversely affect that road.

2. SCOPE

HVO – Temporary Road Closure of Lemington Road

3. ACCOUNTABILITY

Role	Accountability
Short Term Planning Superintendent	Ensure the engineers have the tools in place to complete the tasks associated with a road closure within the agreed standards and in a timely manner. Prompt the regular review of procedures to ensure that the most up to date information is being used.
Senior Dragline, Drill & Blast Engineer	Ensure the Drill & Blast engineer(s) follows the standards in-place (Best Practices) for the purpose of closing a public road. Conducts regular reviews of the Road Closure Management Plan to ensure it is current and enable enhancements to be made to standards.
Drill & Blast Engineer	Ensure the output for the drill & blast operations conforms to the standards required for safe and effective closure of a public road.
Designated Road Closure Supervisor	Co-ordinate the closure of a public road for the purpose of blasting, ensuring it conforms to the standards required for safe and effective closure of a public road

4. REQUIREMENTS

4.1. KEY ISSUES

Disruption to traffic on Lemington Road during temporary road closures due to blasting.

4.2. PERFORMANCE CRITERIA

Ensure the public are well informed of any temporary road closures on Lemington Road due to blasting at Hunter Valley operations and ensure minimal disturbance to traffic during blasting periods.

4.3. CONTROL MEASURES

Prior to Road Closure

- Singleton Argus

Notification will be given to the Singleton Argus such that a public notice is placed in the local newspaper edition. This notification will be shown in the Singleton Argus at least one day before the blast.

- Singleton Shire Council

Notification to the Singleton Shire Council will be to Council's Operations Division Management by at least 12 noon on the day prior to the closure of the road (for the purposes of blasting).

- Road Closure Notification Boards

The road closure notification boards will be updated to show the date and time of prosed firing.

At the time of Road Closure

- Emergency Services

Should any emergency services approach a road closure point and be required to pass to attend an emergency the traffic controller will arrange for the emergency services vehicles to be escorted through the road closure station as soon as the route can be made safe. This may include contacting the blast controller to temporarily delay the firing of the blast.

- Traffic Control

Traffic Control stations will be established on the affected road in accordance with Appendix 4. These locations will remain relatively constant, however may require some modification due to prevailing conditions on the day of blasting.

As a minimum the Traffic Control stations will include sufficient suitably qualified staff for the purpose of traffic control, together with all equipment necessary for the safe control of the road. All road control personnel will be in two-way radio contact with the blast controllers.

All traffic controllers and road sentries will travel to the road closure points and place/open all necessary signage in accordance with Appendix 4. There is to be a Stop/Slow controller situated on the Hunter Valley Operations mine entrance road. Once all signage is positioned the sentries will await direction from the blast controller.

Traffic control point signage will consist of fixed, or, non-permanent traffic control signs positioned in accordance with Appendix 4 and situated adjacent to the road.

Once the blast is ready to be fired the traffic controllers will be directed to close the road. The road sentry shall drive the entire route to ensure all vehicles are clear of all road closure points. Once the area has been confirmed to be clear of vehicles the road sentry will notify the blast controller and the blast will be fired in accordance with the Work Instruction procedure "HVO-10-WI-MINE-051 Tying and Firing a Shot". At the completion of the blast, the "all clear" is given by the Shotfirer.

Once the blast has been fired the road sentry will drive the entire route to confirm the road has not been impacted by the blast (fly rock or damage). The road sentry will remove any fly rock that impacts on the road. At the conclusion of this process the road will then be reopened to traffic.

All necessary signage will be closed/removed at the conclusion of the road closure and any permanent signage to be padlocked shut by the traffic controllers.

All roads and approaches that may provide access to the blast area are controlled and coordinated by Hunter Valley Operations as necessary. Typically these access points are fenced and secured using a padlocked gate (company owned land)

4.4. FREQUENCY

To safely manage temporary road closures when blasts are within 500m of a public road or when it is considered a blast may adversely affect that road.

When blasting in these mining areas it is expected that a number of road closures will be required within a week due to blasting within 500m of the road and/or environmental conditions. The timing of these periods may be scheduled sporadically throughout the year according to the mine plan.

Condition 3 of the approval letter from Singleton Council, Ref 17/41711, 17/45876 states

- The authority shall only extend to the temporary closure of Lemington Rd, for a maximum of five (5) blasting events per week in the period of Monday to Saturday 9.00am to 5.00pm, subject to notice being given to Council's Infrastructure Services Group on each occasion, in the approved format

Condition 11 of the approval letter from Singleton Council, Ref 17/41711, 17/45876 states

- The time of closures not to coincide with changes of shift workers from other mines. Blasting times should be co-ordinated such that they are either a maximum of 5 minutes or a minimum of 45 minutes apart. Further each closure is limited to a maximum of 15 minutes. The road shall be closed for periods no longer than is necessary for the purpose.

4.5. INCIDENT MANAGEMENT

Incident Reporting

Incident reporting as per Incident Management Procedure

Complaints Management

Complaints handling as per Complaints Management Procedure.

Incident Response – Exceedance or Complaint

Investigate event and identify operational location, timing and climatic conditions to determine if additional management measures are required.

5. DEFINITIONS

Fly rock: Material which is projected outside the declared clearance zone by a blast.

REFERENCES

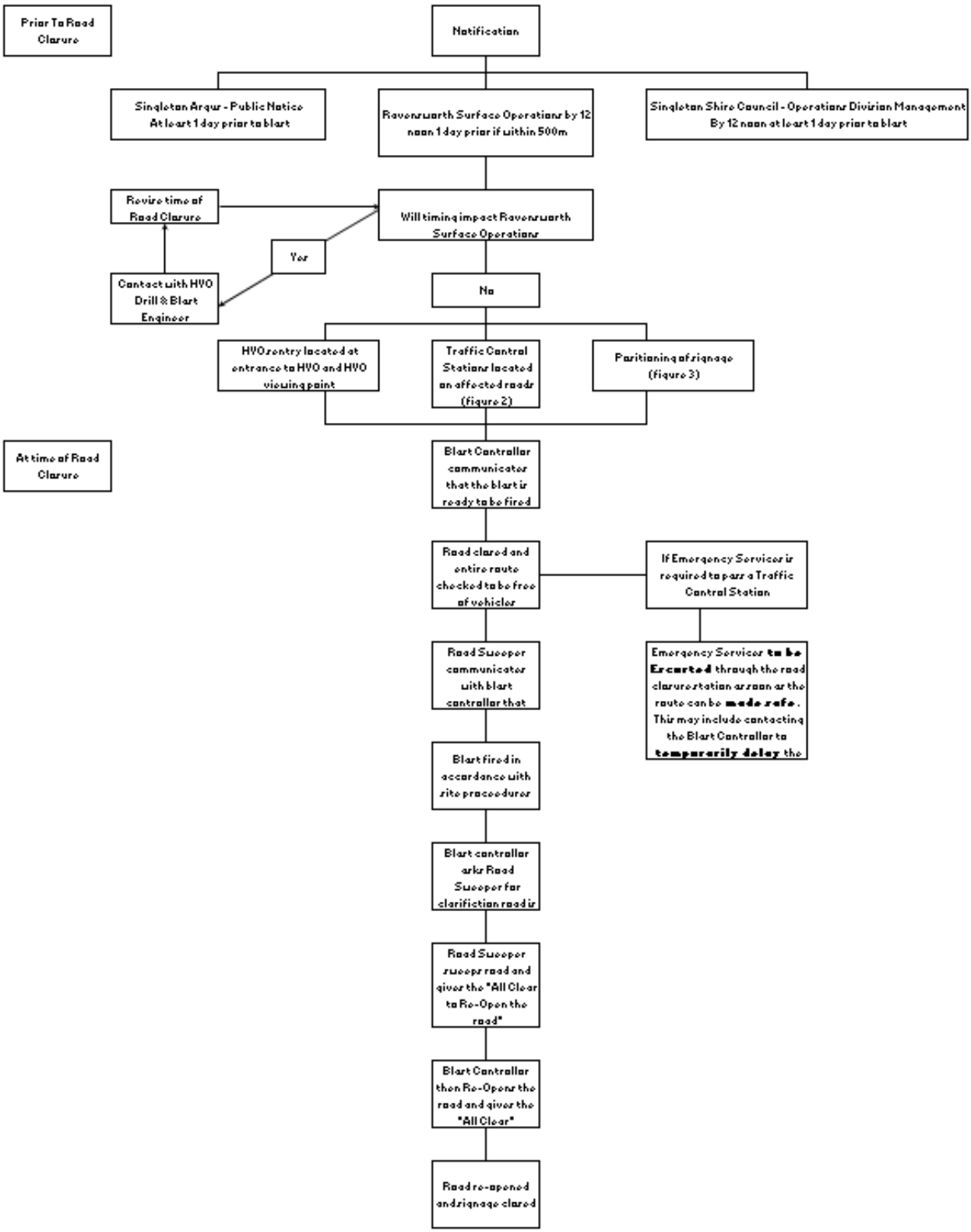
APPROVALS

- HVO North DC DA 450-10-2003 MOD 6
- HVO South DC PA 06-0261
- Temporary Road Closure for Purpose of Blasting – Singleton Council Approval 17/41711, 17/45876

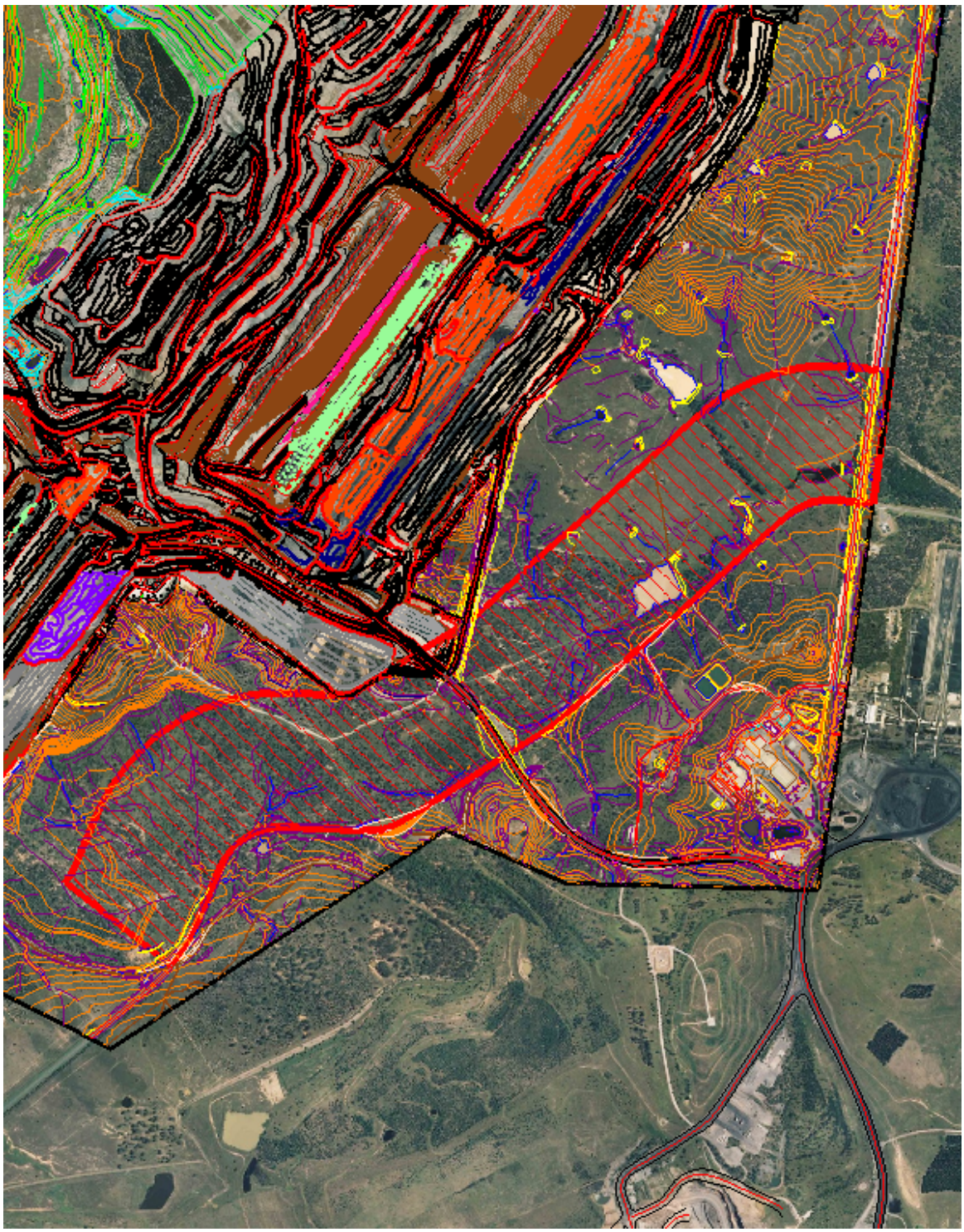
HUNTER VALLEY OPERATIONS POLICIES AND STANDARDS

- HVO-10-WI-Mine-049 Closing Public Roads
- HVO-10-FRM-MINE-010 Road Closure Form
- HVO-10-RA-MINE-003 Road Closure Risk Assessment
- HVO-10-CHK-MINE-001 Pre-Blasting Checklist
- HVO-10-WI-MINE-051 Tying and Firing a Shot

APPENDIX 1 – ROAD CLOSURE PROCEDURE FLOWCHART

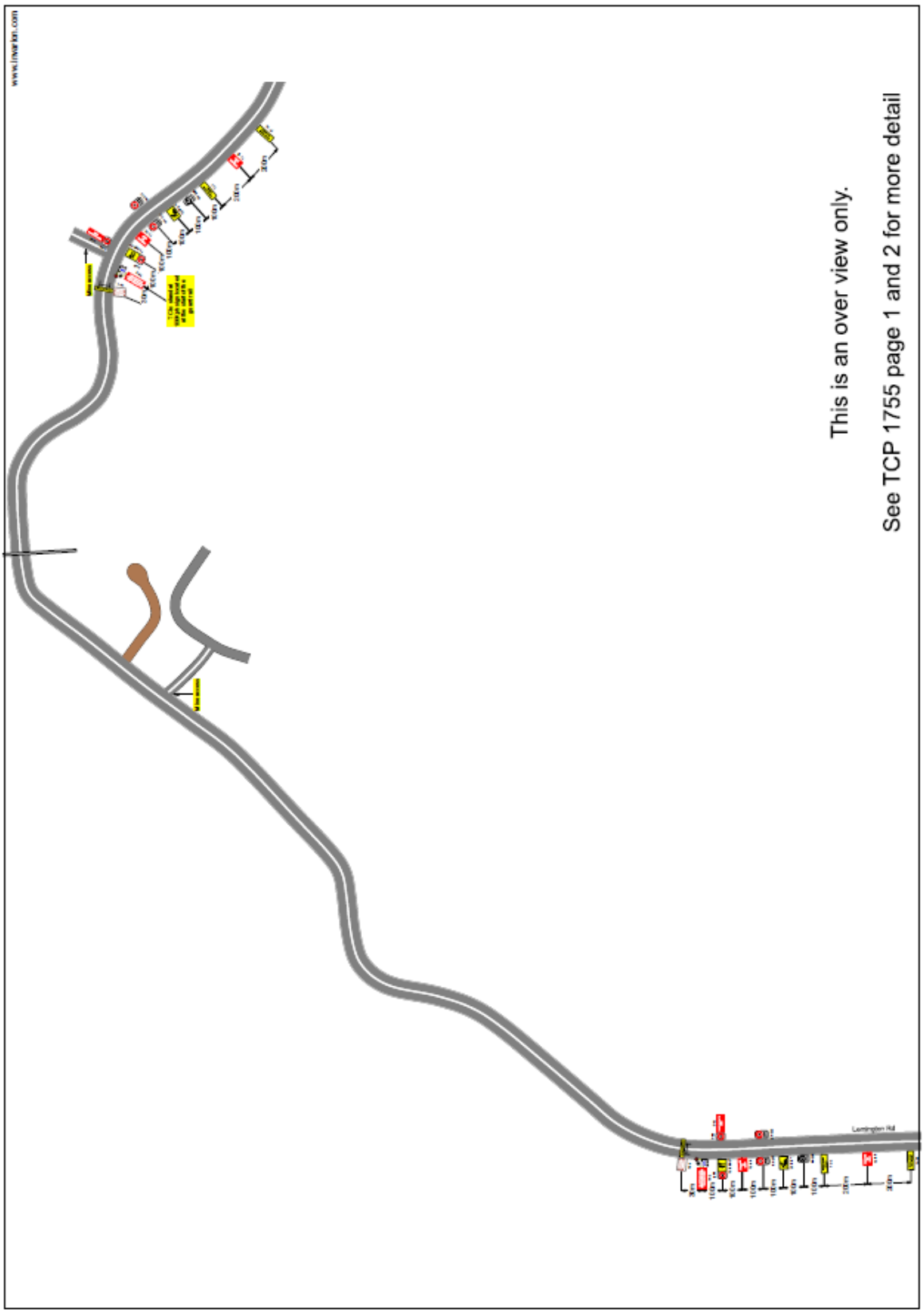


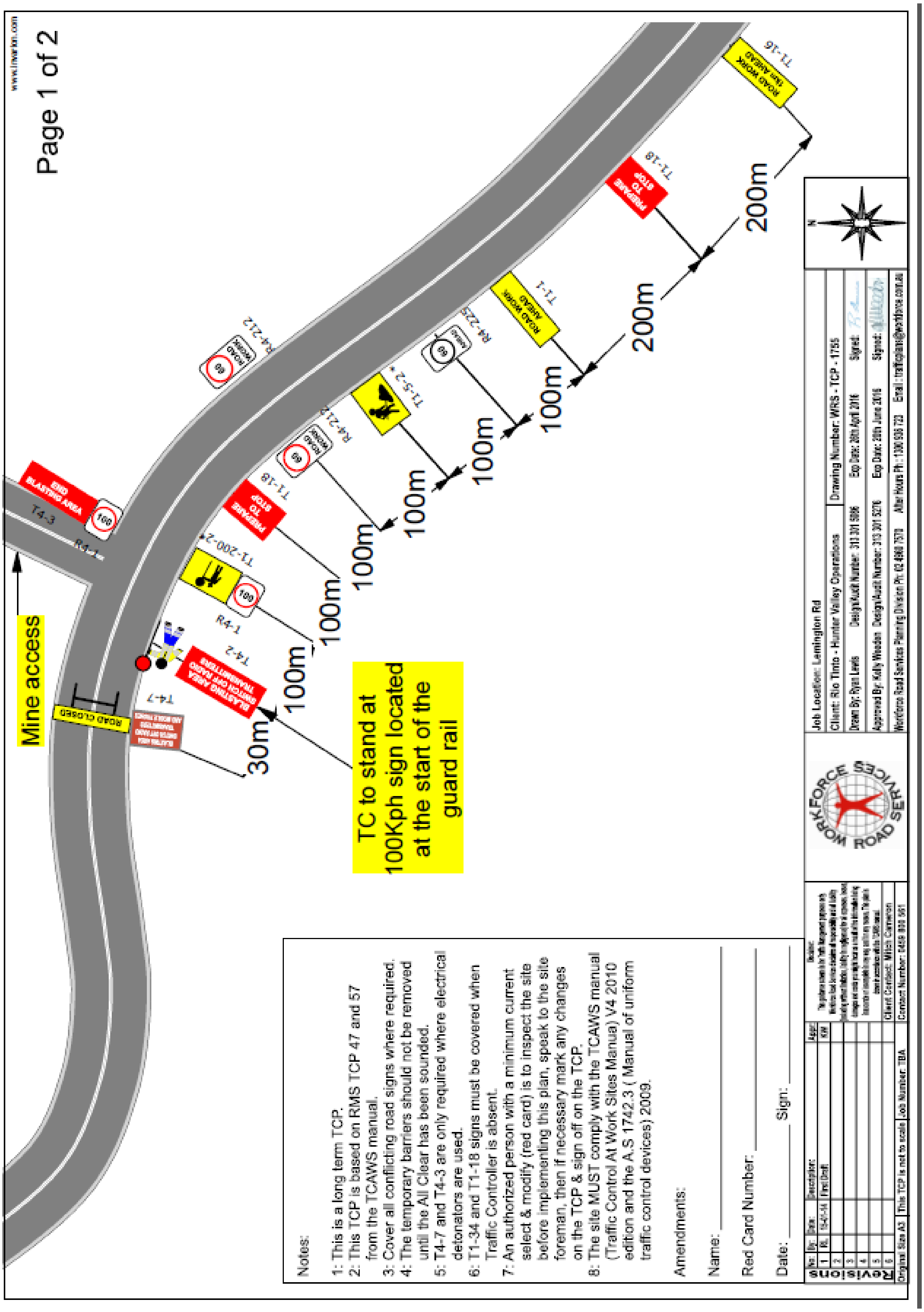
APPENDIX 2 – WEST PIT 500M EXCLUSION ZONE – LEMINGTON ROAD

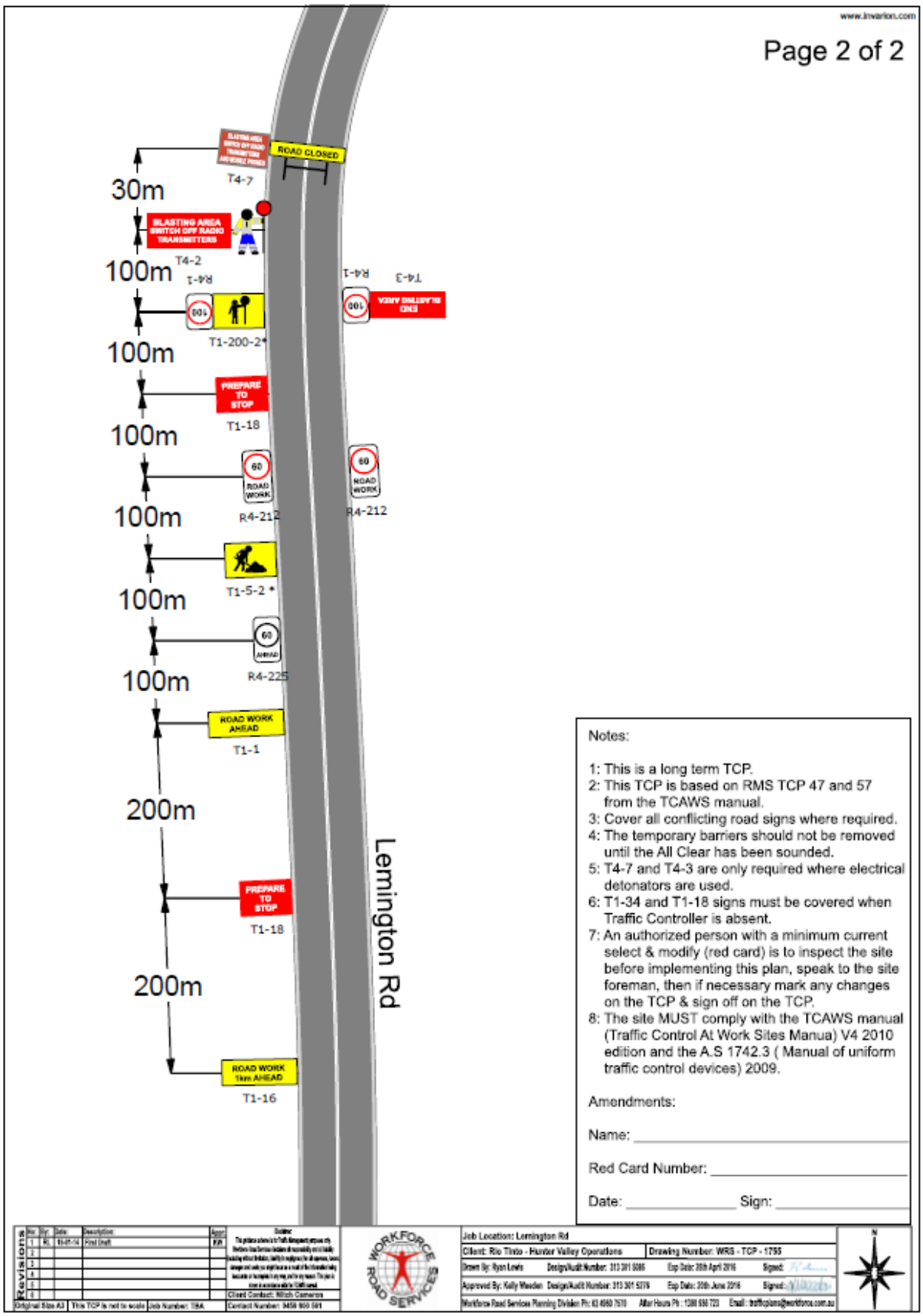


APPENDIX 3 – WEST PIT SENTRY AND ROAD SIGN POSITIONS

APPENDIX 4 – LEMINGTON ROAD TRAFFIC CONTROL PLAN




Page 1 of 2
Mine access
TC to stand at 100Kph sign located at the start of the guard rail
30m
100m
100m
100m
100m
100m
100m
200m
200m
ROAD CLOSED
T4-7
T4-2
R4-1
T1-200-2
R1-2
T4-3
T1-18
R4-212
T1-5-2
R4-225
T1-1
T1-18
T1-16
Notes:
1: This is a long term TCP.
2: This TCP is based on RMS TCP 47 and 57 from the TCAWS manual.
3: Cover all conflicting road signs where required.
4: The temporary barriers should not be removed until the All Clear has been sounded.
5: T4-7 and T4-3 are only required where electrical detonators are used.
6: T1-34 and T1-18 signs must be covered when Traffic Controller is absent.
7: An authorized person with a minimum current select & modify (red card) is to inspect the site before implementing this plan, speak to the site foreman, then if necessary mark any changes on the TCP & sign off on the TCP.
8: The site MUST comply with the TCAWS manual (Traffic Control At Work Sites Manual) V4 2010 edition and the A.S 1742.3 (Manual of uniform traffic control devices) 2009.
Amendments:
Name:
Red Card Number:
Date:
Sign:
Job Location: Lemington Rd
Client: Rio Tinto - Hunter Valley Operations
Drawing Number: WRS - TCP - 1755
Drawn By: Ryan Lewis
Approved By: Kelly Weeden
Workforce Road Services Planning Division


www.invarion.com
Page 2 of 2
ROAD CLOSED
T4-7
30m
BLASTING AREA SWITCH OFF RADIO TRANSMITTERS
T4-2
100m
T1-200-2*
100m
PREPARE TO STOP
T1-18
100m
R4-212
100m
T1-5-2 *
100m
R4-225
100m
ROAD WORK AHEAD
T1-1
200m
PREPARE TO STOP
T1-18
200m
ROAD WORK 1km AHEAD
T1-16
Lemington Rd
Notes:
1: This is a long term TCP.
2: This TCP is based on RMS TCP 47 and 57 from the TCAWS manual.
3: Cover all conflicting road signs where required.
4: The temporary barriers should not be removed until the All Clear has been sounded.
5: T4-7 and T4-3 are only required where electrical detonators are used.
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8: The site MUST comply with the TCAWS manual (Traffic Control At Work Sites Manua) V4 2010 edition and the A.S 1742.3 (Manual of uniform traffic control devices) 2009.
Amendments:
Name:
Red Card Number:
Date: Sign:
Revisions
Job Location: Lemington Rd
Client: Rio Tinto - Hunter Valley Operations
Drawing Number: WRS - TCP - 1755
WORKFORCE ROAD SERVICES

APPENDIX 5 – ADVERTISING EXAMPLES TEMPORARY ROAD CLOSURE

HUNTER VALLEY OPERATIONS

TEMPORARY ROAD CLOSURE - Lemington Road

Hunter Valley Operations wishes to advise the **Lemington Road** will be closed on **Thursday 7th, Friday 8th, Tuesday 12th and Wednesday 13th of June 2018** between 9:00am and 5:00pm for the purpose of blasting. The road is likely to be closed for 15 mins and will affect the road 5km in from the Golden Highway to 8km in from the New England Highway for a distance of 6.8km. If weather conditions are poor, blasting will be delayed until the first day of suitable weather.

Hunter Valley Operations apologise for any inconvenience caused. For further information contact the blasting Hotline on

1800 888 733

APPENDIX 6 – PHOTOS

APPENDIX 7 – SINGLETON COUNCIL APPROVAL 2018/2019

SINGLETON COUNCIL

Enquiries: **David Griffin**
02 6578 7271

Our Ref: **11631/2018, 18/41224, AD18/7492**

25 June 2018

Hunter Valley Operations Pty Ltd
PO Box 315
SINGLETON NSW 2330

Subject: **Application for the use of a Council Road**
Applicant: **Hunter Valley Operations Pty Ltd**
Application No: **11631/2018**
Benefiting Property: **Lemington Road LEMINGTON 2330**

Reference is made to your application received 22/06/2018 for works within the road reserve of Lemington Road for the sole purpose of temporary road closures due to blasting as described in your application.

Lemington Road is a classified local road and Singleton Council is the Roads Authority. Consent from Singleton Council is required within the provision of the Roads Act.

Consent is granted in accordance with the attached terms and conditions. A copy of the attached agreement should be signed by an authorised person and returned to Council for processing.

If you require any further information or wish to discuss the details contained within the approval please contact David Griffin on the above number.

Yours faithfully

Peter McMurray
Manager Infrastructure Strategy, Planning and Programming

12-14 Queen Street Singleton NSW 2330
PO Box 314 Singleton NSW 2330
T 02 6578 7290 E ssc@singleton.nsw.gov.au
F 02 6572 4197 W singleton.nsw.gov.au

This Document provides consent

This document provides, and sets out the terms and conditions of, the consent (the **Consent**) granted by Singleton Council (**Council**) as the appropriate roads authority under Division 3 of Part 9 of the *Roads Act 1993* (the **Roads Act**) in response to the application for consent filed by the applicant listed in Item 1 (the **Applicant**).

Consent granted is subject to the terms and conditions of the Consent, and any Annexure and Schedules to the Consent.

Who has consent?

The Consent is granted to the Applicant. The Consent cannot be assigned or transferred to any other person.

What does the Consent enable?

The Consent enables the Applicant to:

(a) Erect the Structure in, on or over the Public Road;

(b) Carry out the Works in, on or over the Public Road; and

(c) Use the Structure in accordance with the Permitted Use and the terms and conditions of the Consent.

The Structure is described in Item 2.

The Benefiting Property is described in Item 3.

The Public Road is described in Item 4.

The Works are described in Item 5.

The Permitted Use is described in Item 6.

When will the Consent commence?

The Consent commences on the date in Item 7.

When will the Consent end?

The Consent will end on the date in Item 8.

If there is no date in Item 8, the Consent will end on the earlier of the following occasions:

(a) when Council decides to revoke the Consent; or

(b) when the Applicant requests that Council revoke the Consent.

In which circumstances can Council revoke the Consent?

Council can revoke the Consent at any time and for any reason under section 140 of the Roads Act.

If section 140 of the Roads Act is repealed, the Consent is revoked when that repeal takes effect.

Without limiting the circumstances in which Council may revoke the Consent, Council may revoke or suspend the Consent in accordance with clauses 7-10.

Warning Notice

If, in Council's opinion, the Applicant is not complying with any of the terms and conditions of the Consent, Council may issue a written warning notice to the Applicant (the **Warning Notice**).

The Applicant must reply in writing to the Warning Notice (the **Applicant's Reply**), and the Applicant's Reply must be received by Council within 7 days of the date of the Warning Notice.

The Applicant's Reply must contain the following information:

(a) steps

(b) Council will respond to the Applicant's reply within 7 days of receipt of the Applicant's Reply (**Council's Response**).

Once the Applicant has received Council's Response, the Applicant must ensure all requirements in Council's Response are complied with immediately.

Suspension and revocation - events

Council may revoke or suspend the Consent, with or without issuing a Warning Notice, if any of the following events occurs:

(a) the Applicant does not comply with the requirements of the Consent;

(b) the Applicant's application for consent contains information that is untrue, incomplete or misleading;

(c) the Applicant does not reply to a Warning Notice in the manner required by clause 7;

(d) the Applicant's Reply does not set out the steps the Applicant will take to comply with the requirements of the Warning Notice;

(e) the Applicant does not comply with the requirements of Council's Response;

(f) the Applicant prevents or hinders, or attempts to prevent or hinder, Council from carrying out any inspections in relation to the Consent;

(g) any fees associated with the Consent are not paid by the due date;

(h) any approvals required to be obtained by the Applicant in clause 15 lapse, are not granted or are revoked; or

(i) the Applicant becomes insolvent and cannot fulfil its obligations under the Consent.

Suspension and revocation – the Structure

Council may suspend or revoke the Consent immediately, with or without a Warning Notice, if, in Council's opinion, the Structure:

(a) becomes unsafe; or

(b) is likely to cause environmental damage; or

(c) could harm any person or property.

Notice if the Consent is revoked or suspended

The Applicant may request Council to revoke the Consent, with such revocation to take effect 30 days after the date of the request.

Any request by the Applicant for Council to revoke the Consent is subject to the following conditions:

(a) the Applicant cannot request Council to revoke the Consent if the Applicant is in breach of any of the conditions of the Consent;

(b) while Council will consider any request to revoke the Consent, Council will not be bound to agree to revoke the Consent; and

(c) Council may agree to any request to revoke the Consent subject to conditions imposed by Council.

Notice if the Consent is revoked or suspended

If Council revokes or suspends the Consent, Council will inform the Applicant by way of written notice.

Effect of revocation or suspension of the Consent

If the Applicant receives a notice that Council is revoking or suspending the Consent, the Applicant must, in accordance with the notice:

In the case of suspension of the Consent:

(a) cease the Works (if the Works are still being carried out) and the Permitted Use of the Structure immediately.

In the case of revocation of the Consent:

(b) cease the Works (if the Works are still being carried out) and the Permitted Use of the Structure immediately in the case of revocation; and either

(c) remove the Structure immediately (where the removal of the Structure does not require the consent of any authority); or

(d) immediately apply to the relevant authority for consent to remove the Structure.

If the Applicant does not comply with the terms of the notice, and remove or cease use of the Structure (as the case may be), Council may remove the Structure.

Removal of the Structure by Council does not prevent Council from taking legal action against the Applicant, including recovering any costs incurred by Council to remove the Structure.

No compensation if the Consent is revoked or suspended

Nothing in the Consent renders Council liable to pay any compensation to the Applicant in circumstances where Council suspends or revokes the Consent.

Statutory restrictions

The Consent is limited in its operation by the provisions of the Roads Act and any Regulations made under the Roads Act, and is granted subject to the provisions of the Roads Act.

Prior to carrying out the Works

The Applicant must, prior to carrying out the Works, obtain any necessary approvals from Council for the Works, the Structure and the Permitted Use under the *Environmental Planning and Assessment Act 1979* and the *Local Government Act 1993*;

The Applicant must comply with all conditions imposed by any approvals of Council, the RMS, the Minister administering the Roads Act or any other authority.

The Applicant is required to give at least 7 days notice to the occupiers of properties adjoining any part of the Public Road in which the Works are to be carried out, of the intention to carry out those Works.

The Applicant must give at least 48 hours written notice to Council's Representative listed at Item 9 at the address listed at Item 10 prior to commencing the Works.

The Applicant is required to deliver to Council's Representative the insurance policy referred to in clause 22 and the bank guarantee referred to in clause 23 prior to commencing the Works, as well as copies of any approvals that the Applicant is required to obtain in respect of the Works, the Structure or the Permitted Use.

Condition of Site

Council gives no warranty (either present or future) as to the suitability of the Public Road or the use to which the Public Road may be put. The Applicant is deemed to have sought the Consent with full knowledge of and subject to any prohibitions or restrictions on the use of the Public Road from time to time under or in pursuance of any law.

Carrying out the Works

The Applicant must carry out the Works:

(a) in conformity with the description of the Works at Item 5;

(b) in accordance with the approvals listed in clause 15;

(c) to the reasonable satisfaction of Council's Representative;

(d) as expeditiously as practicable in a proper and workmanlike manner;

(e) proceed continuously with the Works until completion of the Works;

(f) with due regard to the safety and rights of the public and for that purpose comply with the requirements of:

  (1) Council's Representative;

  (2) the WorkCover Authority of New South Wales;

  (3) the Department of Industrial Relations and Employment;

  (4) the Police Service of New South Wales; and

  (5) any other authority;

(g) in a manner that does not unreasonably interfere with the use of the Public Road or any other land by other persons while carrying out the Works;

(h) in a manner that complies with Council's policies and procedures; and

(i) between the hours of 7.00am and 6.00pm on Mondays to Fridays, between 8.00am and 4.00pm on Saturdays and at other times only if previously approved by Council's Representative in writing.

Following completion of the Works

Following completion of the Works, the Applicant must:

(a) deliver, no later than 2 weeks before commencement of the Permitted Use of the Structure, to Council's Representative the Works as executed plans which must:

  (1) show the location of the Structure as erected in relation to property boundaries; and

  (2) show the road alignment; and

  (3) contain such other information as Council may require from time to time;

(b) restore the surface of the Public Road to its former condition immediately after carrying out the Works;

(c) repair any subsidence or other deterioration of the Public Road which occurs within 6 months after carrying out the Works;

(d) maintain the Structure in a satisfactory state of repair at all times to the reasonable satisfaction of Council's Representative;

(e) maintain the surface of the Public Road in a satisfactory state of repair at all times to the reasonable satisfaction of Council's Representative;

(f) promptly repair any damage caused to Council's property or to the property of any other person in the course of carrying out the Works and the Permitted Use;

(g) keep the Structure clean and well lit for safety purposes; and

(h) carry out all maintenance and repair work as expeditiously as practicable and in conformity with any reasonable requirement of Council's Representative and of any statute, regulation or direction by any authority.

Should the Applicant be required to undertake any maintenance, renewal, replacement or alteration of or to the Structure, the Applicant is required to obtain written consent from Council's Representative prior to carrying out such work.

A penalty may be imposed on the Applicant pursuant to section 142 of the Roads Act if the Applicant fails to undertake any maintenance, renewal, replacement or alteration of or to the Structure.

Amendments to the Works

If, in Council's opinion, it becomes necessary:

(a) to relocate or remove any portion of the Structure due to:

(1) any work in, on or over the Public Road; or

(2) widening or reconstruction of the Public Road which Council or any other authority wishes to carry out; or

(b) to carry out additional works to the Public Road or the Structure for the safety and protection of the public,

the Applicant must, at its own cost:

(c) relocate, carry out the removal or carry out any additional work; and

(d) pay to Council any additional cost or expenditure incurred by Council by reason of the existence, relocation or removal of the Structure.

If no representative of the Applicant is present at the Works site, or if Council's Representative determines an event of emergency has occurred, Council's Representative can take any action to prevent loss of or damage to the whole or any part of the Structure, the Public Road or property adjacent to the Structure, or to prevent personal injury to any person.

In such circumstances, where Council's Representative reasonably determines that the Applicant would have been liable to take such action, the cost of Council's action must be paid by the Applicant to Council as a debt due to Council. Any such action taken by Council's Representative will not relieve the Applicant of any liability or obligation under the Consent.

Council's inspection

Council reserves the right to inspect the Public Road, the Structure and the Works at any time with reasonable notice and at any time in an emergency.

Charges

The Applicant is required to pay to Council an annual charge for the Consent in accordance with section 611 of the *Local Government Act 1993* which is set out at Item 11 (the **Annual Charge**).

The Annual Charge must be paid prior to use of the Structure being commenced. The Annual Charge is to be paid in the manner advised by Council's Representative, as amended from time to time.

Council may amend the amount of the Annual Charge at any time.

Insurance and Indemnities

The Applicant indemnifies Council and keeps Council indemnified from and against all actions, claims and demands if any arising out of the granting of the Consent or anything done or purported to be done by the Applicant under the Consent or any damage to the Applicant's property in accordance with the Consent.

Council can pay, satisfy, defend, compromise or settle any claim arising out of the granting of the Consent or anything done or purported to be done by the Applicant under the Consent and any amount paid by Council in doing so is a debt due to Council by the Applicant and must be repaid on demand.

The Applicant indemnifies Council against any liability to pay taxes or charges payable now or in the future in respect of the Works, the Structure or the Consent.

The Applicant must obtain and keep current an insurance policy:

(a) noting Council's interest as the appropriate roads authority of the Public Road and listing Council as co-insured; and

(b) covering liability to the public for not less than the amount in Item 12 for each accident or event.

The insurance policy of the Applicant must be produced to Council's Representative prior to commencing the Works along with the receipt for the last premium. The Applicant must provide certificates of currency to Council on an annual basis while the Consent remains in force.

The Applicant must not void, reduce or cancel any insurance policy in respect of the Public Road, the Structure or the Works.

Bank Guarantee

Before commencing the Works, the Applicant must deliver to Council's Representative a bank guarantee to secure the satisfaction of the Applicant's obligations under the Consent (the **Bank Guarantee**).

The Bank Guarantee must:

(a) be in a form acceptable to Council and for an amount not less than the amount specified in Item 13; and

(b) be payable to Council at any time while the Consent is in force.

If the Applicant fails to satisfy any of its obligations under the Consent, or if Council incurs any expense under any term of the Consent, Council may call on the Bank Guarantee and remedy the Applicant's failure or reimburse Council for that expense without prejudice to any other right Council may have against the Applicant.

Council will return the Bank Guarantee, or any remainder, to the Applicant when the Applicant's obligations under the Consent have been complied with to the reasonable satisfaction of Council's Representative.

End of the Consent

When the Consent ends or is revoked, any part of the Structure remaining within the Public Road will be deemed to be an obstruction or encroachment under section 107 of the Roads Act.

The Applicant or any other person using or capable of using the Structure after the Consent ends will be deemed to be a person who causes an obstruction or encroachment on a public road for the purposes of section 107(1)(a) of the Roads Act.

When the Consent ends the Applicant must, in any manner directed by Council and as quickly as practicable, remove the Structure and make good any damage caused by the removal. The Applicant must also pay any outstanding fees and charges due to Council under the Consent.

If the Applicant does not remove the Structure or make good any damage caused by the removal at the expiration of the Consent, Council may undertake such actions on behalf of the Applicant and the costs incurred by Council in doing so will be a debt due from the Applicant to Council, payable on demand.

Resolution of disputes

Council will endeavour to resolve any disputes with the Applicant by discussing them with the Applicant. However, in the absence of agreement, Council's decision will be final. Nothing in this clause precludes the Applicant from taking legal action against Council in respect of Council's decision.

Notices

Any notice given under or in accordance with the Consent can be given in the manner provided in sections 254 and 255 of the Roads Act.

General

Nothing contained in the Consent:

(a) prejudices or affects the rights of the public to pass along the Public Road;

(b) authorises any nuisance or permanent obstruction of the Public Road;

(c) confers on the Applicant any exclusive right or title to that part of the Structure within the boundaries of the Public Road; or

(d) in any way restricts or limits the powers of Council in respect of the Public Road.

A certificate signed by Council's Representative as to the cost of any work carried out by Council or on Council's behalf will be final and conclusive evidence of that cost.

The Applicant must pay all reasonable legal costs incurred by Council in connection with the preparation of the Consent and with remedying any breach of the requirements of the Consent.

The Applicant must comply with all laws relating to the Works, the Structure and the Public Road.

Commencement of the Works constitutes acceptance of all conditions of the Consent.

A waiver or indulgence granted by Council in respect of any non-compliance by the Applicant with the terms of the Consent does not constitute a future or past waiver of similar non-compliance. A failure to act by Council in response to any non-compliance does not constitute a waiver of such conduct.

A reference to the Item is attached as **Schedule 1**.

Signed for and on behalf of	Signed for and on behalf of
SINGLETON COUNCIL	**THE APPLICANT**
	E & H Martin
	(Signature)
25 June 2018	28 JUNE 2018
Date	Date
Peter McMurray	ERNIE MARTIN
	(Name)
Manager Infrastructure Strategy Planning and Programming	SENIOR DRILL & BLAST ENGINEER
	(Position Held – if applicable)

CRM – 11631/2018

SCHEDULE 1

Item 1 – The Applicant
Hunter Valley Operations Pty Ltd

Item 2 – The Structure
Other

Item 3 – The Benefiting Organisation
Lemington Road LEMINGTON 2330

Item 4 – The Public Road
Lemington Road

Item 5 – The Works
Installation of the structures identified in Item 2 above and in accordance with the special conditions shown on Appendix 1.

Item 6– Permitted Use
As identified in Item 2.

Item 7– The Commencement Date
1 July 2018

Item 8– The End Date
30 June 2019

Item 9– Council's Representative
David Griffin – Asset Commissioning Officer.

Item 10 - Council's Representative's Address
Civic Avenue
SINGLETON NSW 2330.

Item 11 – Annual Charge
To be advised

Item 12 – Insurance amount
Public Risk Insurance Policy to cover the Council. Policy cover of at least $20,000,000 evidence of such policy is to be provided to Council prior to commencement.

Insurance Underwriter: AON,
Policy Number: 372193296 LIA,
Insurance Policy Expiry Date: 30/11/2018.

Item 13 – Bond/Bank Guarantee
Not Applicable.

CRM – 11631/2018

Roads Act 1993
Terms and Conditions of Approval for Use of a Council Road
Works within a road reserve

Page 13 of 13

APPENDIX 1

1. The Applicant shall be responsible for investigating and locating the position and depth of any public utility service in particular Telstra cables, gas, electricity, water, sewer and stormwater and other private services such as irrigation pump lines before any works commence on site and ensure that no damage or conflict shall result.

2. No work shall be carried out during periods of adverse weather conditions or any other prevailing circumstances that make the work or traffic control hazardous.

3. Council shall be reimbursed by the Applicant when requested, for any expenses incurred in restoring the road pavement, or other sections of the site, within the road reservation.

4. The site shall be left in a safe condition cleared of debris when the works are completed.

5. The agreement cannot be assigned or transferred to another person. Council reserves the right to revoke this consent at any time.

6. This approval does not extend to the use of any other machinery or works within the road reserve.

7. Council is indemnified against any claims that may arise in regards to the works you will be undertaking.

8. Any Construction works are to be completed in accordance with Singleton Council's Development Construction Specification CQC Rev 3 – Quality Control Requirements available on Council's website www.singleton.nsw.gov.au

9. Traffic control is to be set out as per the plans supplied to council and installed by an appropriately qualified person.

10. Traffic stoppage to be limited to a maximum of 15 minutes.

11. Please advise council officer David Griffin on 02 6578 7271 or email dgriffin@singleton.nsw.gov.au once works have been completed.

CRM – 11631/2018

Rev	Date	Revision Description	Who Consulted
1.0	31/05/12	Original Document	E Martin, M Cameron, M Cronin
1.1	24/01/13	Revision of Document	M Cameron
1.2	5/06/13	6 Monthly review	E Martin, M Cameron,
1.3	26/06/13	Inclusion of Appendix 7 – Council Approval	M Cameron
1.4	05/06/14	Inclusion of Appendix 7 – Council Approval	M Cameron, E Martin.
1.5	30/06/15	6 Monthly review, Updated TCP, Renewal of Council Approval	E Martin, M Cameron
1.6	12/05/16	6 Monthly review, Updated TCP, Renewal of Council Approval	E Martin, M Cameron
1.7	10/10/16	Updated Council letter with approval to include closing of Lemington Rd on Saturdays	E Martin
1.8	28/06/17	6 Month review, Renewal of Council Approval	E Martin
1.9	30/08/17	Update Council letter with HVO Certificate of Currency	E Martin, M Cameron, B O'Brien, D Bennett
2.0	22/11/17	Update Singleton Shire Council approval letter. Revised to new ownership format	E Martin
2.1	22/05/2018	Format update	D.Brown
2.2	28/06/2018	Update Singleton Shire Council approval letter	E Martin, D Brown

Appendix D – Hunter Valley Operations Blast Monitoring Programme

Hunter Valley Operations

Blast Monitoring Programme

1 PURPOSE

This document provides a summary of the airblast overpressure and vibration monitoring programme for Hunter Valley Operations.

The monitoring locations are subject to change and will be updated periodically to align with management needs and to accommodate progression of mining.

A protocol for evaluating compliance with the blast impact assessment criteria is included in Section 3.

2 PROGRAMME

Blast monitoring is conducted at five locations around HVO as shown in Table 4 and represented in Figure 1. Monitoring is undertaken in accordance with Australian Standard AS 2187.2- 2006.

Real-time meteorological data will also be collected in relation to blast monitoring data. This information shall include wind speed, direction and temperature inversions (where applicable at the site).

Monitoring locations are selected to be representative of private residences surrounding the monitor, the representation of these monitors in relation to the surrounding private receptors is shown in Figure 2

Table 4: Blast Monitoring Programme

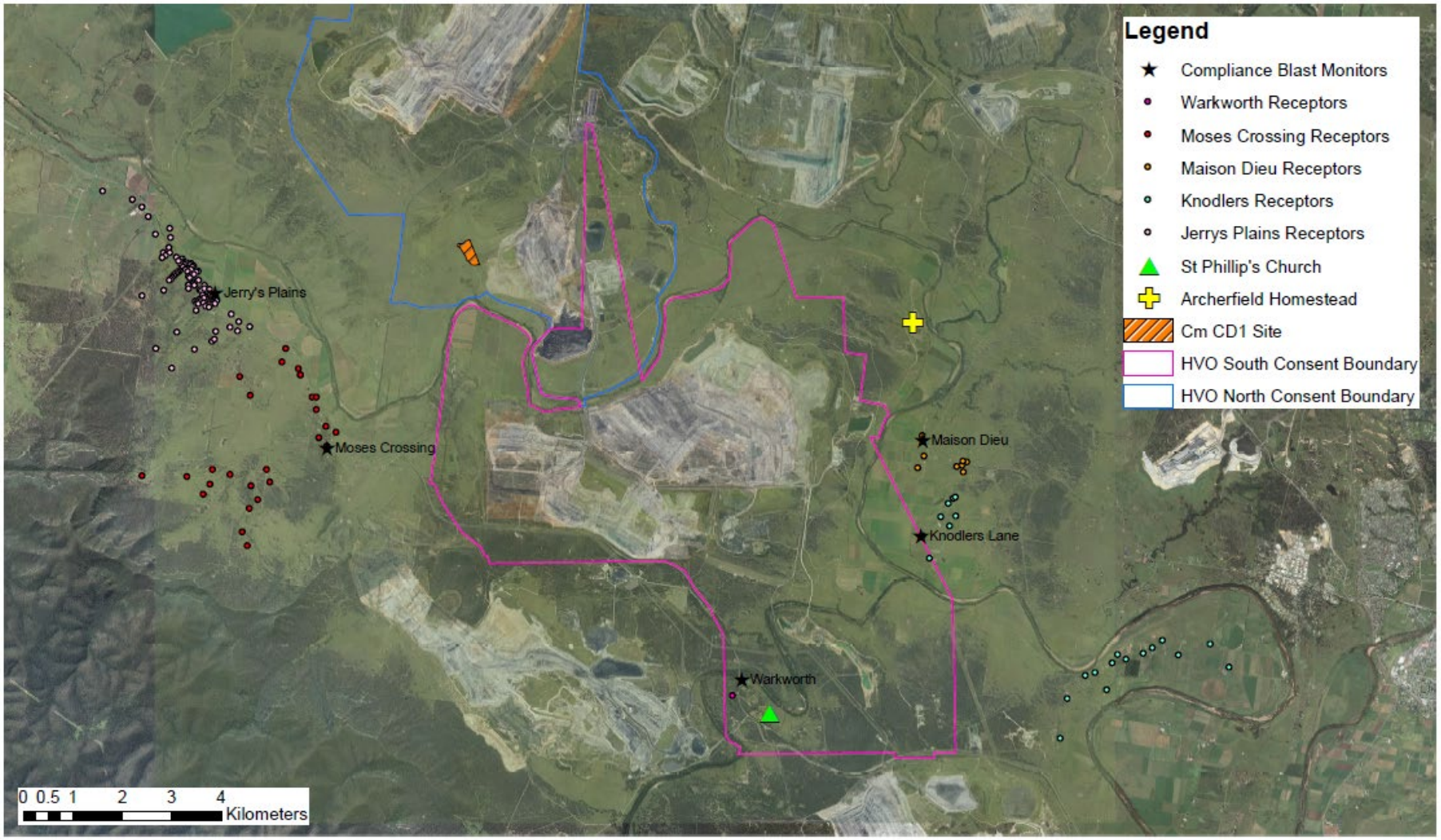
Parameter	Frequency	Monitor Location	Limit/Guideline	Sampling Method
Airblast Overpressure dB (Lin Peak)	All blasts	Jerrys Plains Knodlers Lane Maison Dieu Moses Crossing Warkworth	>115 dB (Lin Peak) (allowable exceedance of 5% over 12 months)[1] >120 dB (Lin Peak) (no allowable exceedance at any time)	Blast monitor. AS2187.2-2006
Ground Vibration (mm/s)	All blasts	Jerrys Plains Knodlers Lane Maison Dieu Moses Crossing Warkworth	>5 mm/s (ppv) (allowable exceedance of 5% over 12 months)[1] >10 mm/s (ppv) (no allowable exceedance at any time)	Blast monitor. AS2187.2-2006

[1] The 5% allowable exceedance criteria is assessed on a "per monitoring location" basis, and is calculated against the performance criteria listed in each of the Approvals (calendar year basis) and EPL 640 (year on year, commencing at the anniversary date of the licence).

An additional ground vibration impact assessment criterion applies to the HVO South Project: *"For St Phillip's Church and the outbuildings at Archerfield, the Proponent must ensure that ground vibration peak particle velocity generated by the project does not exceed 5mm/s, or as otherwise approved by the Secretary".*

Blasting impacts on St Phillip's Church will be assessed through routine monitoring in the Warkworth Village area (Warkworth monitoring location), while blasting impacts on the outbuildings at Archerfield will be assessed through routine monitoring in the Maison Dieu area (Maison Dieu monitoring location).

Figure 1: Blast Monitoring Locations



Date: 190208
Author: DW
Version:1.0

HUNTER VALLEY OPERATIONS

Blast Monitors & Sensitive Receptors

N

Figure 2: Representation of Receptors

3 PROTOCOL FOR EVALUATING COMPLIANCE

Condition 18 (f) in Schedule 3 of the HVO South Approval requires that the Blast Management Plan for the project includes;

- *"…a monitoring program for evaluating and reporting on compliance with the relevant conditions of this approval"*

Similarly, Condition 19(f), Schedule 3 of the HVO North approval requires that the Blast Management Plan:

- *"include a monitoring program for evaluating the performance of the project, including:*
  - *Compliance with the applicable criteria*
  - *Minimising the fume emissions from the site*

The following sections of this monitoring programme outlines the key considerations in evaluating compliance with the blasting impact assessment criteria.

Measures to reduce fume emissions from the site are detailed in the Post Fume Generation Mitigation and Management Plan, Appendix C of the HVO Blast Management Plan.

4 BLAST PARAMETERS AND COMPLIANCE ASSESSMENT

Each of the blast monitoring locations shown in Figure 1 and detailed in Table 4 will monitor for ground vibration and airblast overpressure from all blast events generated at HVO. Monitoring locations are selected to be representative of private residences surrounding the monitor, the representation of these monitors in relation to the surrounding private receptors is shown in Figure 2. Blast parameters and compliance assessment is detailed below in Section 4.1 and Section 4.2.

4.1 Ground Vibration

When an explosive detonates, it creates a compression wave that spherically radiates out into the rock mass. When used in a mining context, the compression wave, in conjunction with several other factors, fragments the rock mass while the high pressure gases fluidize and heave the rock mass to its final resting place ready for excavation by mining equipment.

The ground vibration resulting from the blast has components in 3 planes – longitudinal (L), transverse (T) and vertical (V). The vibration waves in these planes are termed the Compression wave, Horizontal Shear wave and Vertical Shear wave respectively.

The velocities in each plane are combined mathematically to produce a single term that represents the total ground velocity. This term is known as the 'Peak Particle Velocity' 'PPV' or 'Resultant'. PPV is measured in millimetres per second.

The PPV measure of blast induced ground vibration is universally used in the context of measurement, reporting, and compliance. The Resultant measure is expressed in millimetres per second (mm/s).

Each blast monitor at the monitoring locations shown in Table 4, will capture a peak ground vibration in (mm/s) for all blast events initiated. The HVO Drill & Blast Engineer will assess the validity of the captured results by confirming that blast time and duration align with the results recorded by the blast monitoring system. The peak ground vibration level (mm/s) will then be directly compared to the ground vibration

impact assessment criteria as specified in approvals and as detailed in Table 4. Monitoring results will be maintained for a period of 4 years as required by Environment Protection Licence 640.

Any blast exceeding the impact assessment criteria shall be referred for additional analysis and interpretation by an external specialist in blast consulting where the reason for the levels cannot be established by the Drill & Blast Engineer. This investigation will review blast monitoring results, blast parameters, location and prevailing weather conditions. The investigation analysis is specific to each individual exceedance but may include wavetrace inspection, wavefront pattern analysis, regression analysis, meteorological effect analysis etc.

The results of any blast exceeding the impact assessment criteria (0% Criteria) will be reported to the Secretary as soon as practicable following confirmation of exceedance.

An assessment blast results against the 5% allowable Criteria will be undertaken at the end of the calendar year and reported in the Annual Review. Any exceedance of this criteria will be reported to the Secretary as soon as practicable following confirmation of exceedance.

Any confirmed non-compliance will trigger an investigation of the cause/s of the non-compliance, adequacy of current controls and subsequent review of this Management Plan.
Where an investigation determines a measured result to be incorrect (wind affected, or not related to the blast event), an estimated result will be reported in place of the incorrect measurement.

4.2 Airblast

Airblast is an airborne shock wave resulting from the detonation of explosives. It may be caused by burden movement or the release of expanding gas into the air. Airblast may or may not be audible. Airblast can contain frequencies from below 2Hz to beyond 20KHz. Frequencies above approximately 20Hz are audible whilst those below 20 Hz are sub-audible. Generally, it is the sub-audible component of the airblast that causes effects such as rattling of windows, and shaking of ornaments on shelves.

Air Overpressure

Air overpressure is the pressure in excess (either above or below) of ambient atmospheric pressure that occurs when an air blast wave passes a given position. The maximum excess pressure is known as the peak overpressure.

Noise and air overpressure results are both measured in decibels (dB). However there is no frequency weighting applied to air overpressure measurements, which allows for assessment of the response of structures to air overpressure. Air overpressure is therefore measured in the linear weighting expressed as dB(L).

When air overpressure is presented graphically as a function of time, it is usual to present it in terms of absolute pressure or Pascals (Pa) rather than dB(L) because the physical dynamics of the air overpressure is more readily apparent when presented on a linear (Pa) rather than a logarithmic (dB) scale.

Each blast monitor at the monitoring locations shown in Table 4, will capture a peak overpressure result (dB(L)) for all blast events initiated. The HVO Drill & Blast Engineer will assess the validity of the captured results by confirming that blast time and duration align with the results recorded by the blast monitoring system. The peak overpressure result (dB(L)) will then be directly compared to the airblast overpressure

impact assessment criteria as specified in approvals and as detailed in Table 4. Monitoring results will be maintained for a period of 4 years as required by Environment Protection Licence 640.

Any blast exceeding the impact assessment criteria shall be referred for additional analysis and interpretation by an external specialist in blast consulting where the reason for the levels cannot be established by the Drill & Blast Engineer. An external report shall be issued as soon as practicable. This investigation will review blast monitoring results, blast parameters, location and prevailing weather conditions. The investigation analysis is specific to each individual exceedance but may include wavetrace inspection, wavefront pattern analysis, regression analysis, meteorological effect analysis etc.

The results of any blast exceeding the impact assessment criteria (0% Criteria) will be reported to the Secretary as soon as practicable following confirmation of exceedance.

An assessment of blast results against the 5% allowable Criteria will be undertaken at the end of the calendar year and reported in the Annual Review. Any exceedance of this criteria will be reported to the Secretary as soon as practicable following confirmation of exceedance.

Any confirmed non-compliance will trigger an investigation of the cause/s of the non-compliance, adequacy of current controls and subsequent review of this Management Plan.

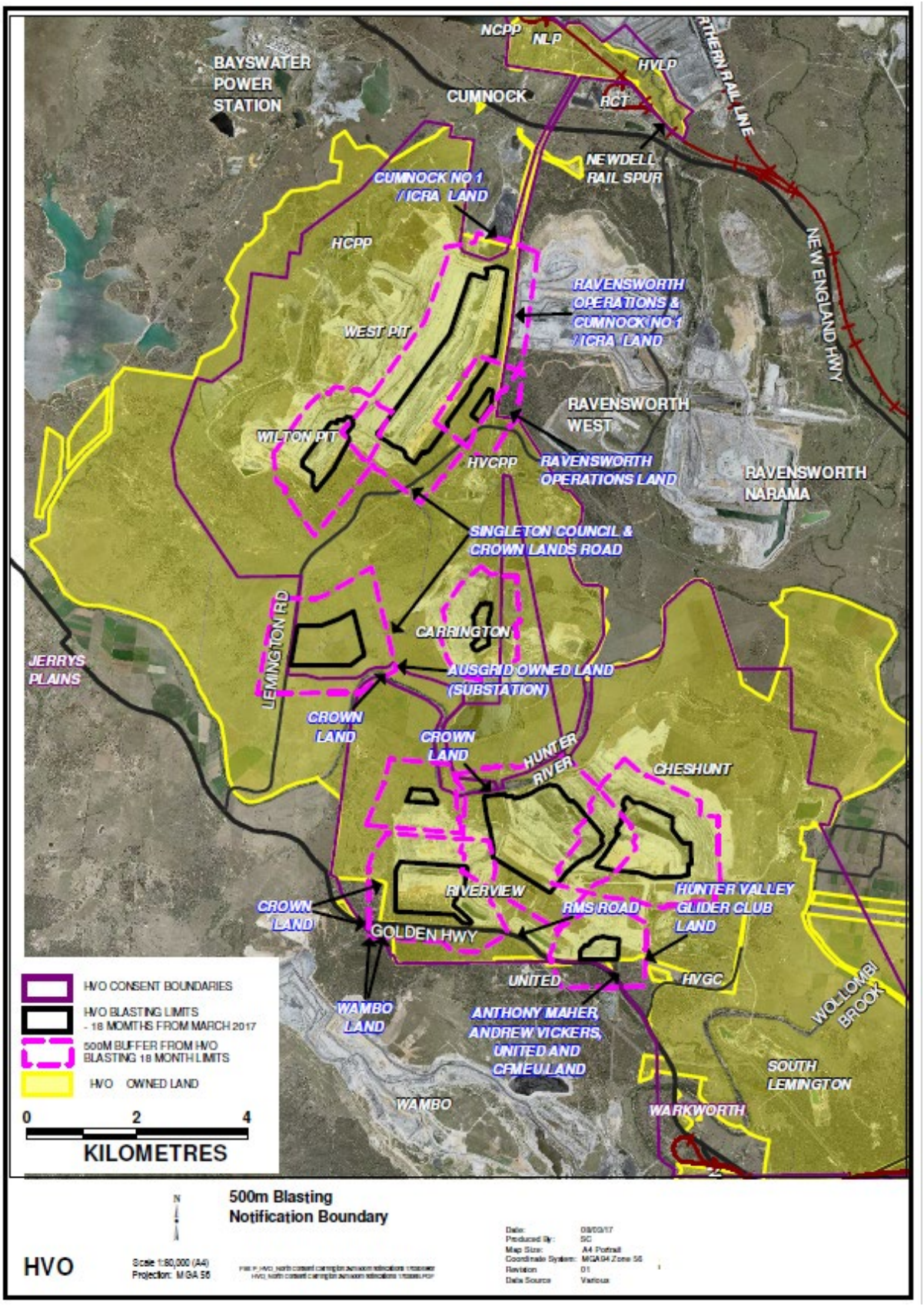
Where an investigation determines a measured result to be incorrect (wind affected, or not related to the blast event), an estimated result will be reported in place of the incorrect measurement.

5 REPORTING

Outcomes of validated blast monitoring results will be reported as follows:

- As soon as practicable to the Secretary and the EPA, , in the event of a non-compliance;
- Within 7 days of becoming aware of an incident/non-compliance, a report will be provided to the Secretary;
- Regular updates in accordance with the reporting requirements of the POEO Act and via the HVO Monthly Environmental Monitoring Report. These reports are published on the HVO Website, https://insite.hvo.com.au/;
- By the end of March each year, in the Annual Review;
- To relevant residents, by exception, in the event of exceedance; and
- Summarised and provided to the Community Consultative Committee.
-

Appendix E – 500m Blast Zone – Land Ownership


NCPP
NLP
HVLP
BAYSWATER POWER STATION
CUMNOCK
RCT
NEWDELL RAIL SPUR
CUMNOCK NO 1 / ICRA LAND
HCPP
RAVENSWORTH OPERATIONS & CUMNOCK NO 1 / ICRA LAND
WEST PIT
RAVENSWORTH WEST
WILTON PIT
HVCPP
RAVENSWORTH OPERATIONS LAND
RAVENSWORTH NARAMA
SINGLETON COUNCIL & CROWN LANDS ROAD
LEMINGTON RD
CARRINGTON
JERRYS PLAINS
AUSGRID OWNED LAND (SUBSTATION)
CROWN LAND
CROWN LAND
HUNTER RIVER
CHESHUNT
RIVERVIEW
RMS ROAD
HUNTER VALLEY GLIDER CLUB LAND
CROWN LAND
GOLDEN HWY
UNITED
HVGC
WOLLOMBI BROOK
WAMBO LAND
ANTHONY MAHER, ANDREW VICKERS, UNITED AND CFMEU LAND
SOUTH LEMINGTON
WAMBO
WARKWORTH
NEW ENGLAND HWY
HVO CONSENT BOUNDARIES
HVO BLASTING LIMITS - 18 MONTHS FROM MARCH 2017
500M BUFFER FROM HVO BLASTING 18 MONTH LIMITS
HVO OWNED LAND
0 2 4
KILOMETRES
500m Blasting Notification Boundary
HVO
Scale 1:60,000 (A4)
Projection: MGA 56

Appendix F – Consultation with the EPA

YANCOAL AUSTRALIA LTD
OFFICE: Level 26, 363 George Street Sydney NSW 2000
PHONE: +61 2 8583 5300
FAX: +61 2 8583 5399
EMAIL: info@yancoal.com.au
WEBSITE: www.yancoalaustralia.com.au
ABN 82 111 859 119

26 March 2018

Environmental Protection Authority NSW
PO Box 448G
NEWCASTLE NSW 2300

ATTN: Mark Hartwell

Dear Mark

RE: Hunter Valley Operations – EPA Consultation on Noise, Air Quality, Blasting and Water Management Plans

We refer to relevant conditions in contemporary Approvals granted under the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act), requiring Hunter Valley Operations to consult with the EPA during development of Environmental Management Plans for Noise, Air Quality and Greenhouse Gas, Blasting, and Water.

We note that the EPA has previously advised (including letter from the EPA to Hunter Valley Operations, reference DOC14/115042, EF13/2793), that "*the…EPA encourages the development of such plans…* [the] *EPA does not review these documents as our role is…not to be directly involved in the development of strategies to achieve those objectives*".

We therefore write seeking confirmation on whether EPA still maintains this position and no longer requires to be consulted on the drafting of such plans for Hunter Valley Operations.

We would be grateful if you could please advise of the EPA's position in this regard by 5 April 2018.

We look forward to hearing from you.

Yours sincerely

Andrew Speechly
Manager Environment & Community
Yancoal – Hunter Valley Operations

DOC18/180487-02, EF16/2461

Hunter Valley Operations
PO Box 267
SINGLETON NSW 2330

18 June 2018

Attention: Dominic Brown

Dear Mr Brown

HUNTER VALLEY (HVO) MANAGEMENT PLAN CONSULATION

Reference is made to your email dated 26 March 2018 to the Environment Protection Authority ("EPA") in relation to *Hunter Valley Operations Management Plan Consultation*.

The EPA encourages the development of such plans to ensure that proponents have met their statutory obligations and designated environmental objectives. However, the EPA does not review these documents, nor provide input to these documents as our role is to set environmental objectives for environmental/conservation management, not to be directly involved in the development of strategies to achieve those objectives.

The EPA does not require HVO to consult with it regarding the development of plans required under planning consents. The EPA provides its recommended conditions of approval to the Department of Planning and Environment during the development assessment and approvals process.

If you wish to discuss the matter further please contact Natasha Ryan on 02 4908 6833.

Yours sincerely

MARK HARTWELL
Head Regional Operations Unit - Hunter
Environment Protection Authority

Appendix G – Approval of Management Plan

Resource Assessments
Planning Services
Contact: Melissa Anderson
Phone: 8275 1392
Email: Melissa.anderson@planning.nsw.gov.au

Mr Dominic Brown
Environment and Community Coordinator
Hunter Valley Operations
PO Box 315
SINGLETON NSW 2330
Dominic.Brown@hvo.com.au

Dear Mr Brown

Hunter Valley Operations (DA 450-10-2003 and MP 06_0261)
Approval of Blast Management Plan

I refer to your email of 28 March 2019 submitting version 3.3 of the Hunter Valley Operations (HVO) Blast Management Plan (Plan) for approval, as required under condition 19 of Schedule 3 of HVO North (DA 450-10-2003) and condition 18 of Schedule 3 of HVO South (MP 06_0261).

The Department has reviewed the Plan and finds that it meets the requirements of both development approvals.

Consequently, the Secretary approves the Plan. Please place the final (untracked) version of the Plan on the HVO project's website at your earliest convenience.

Should you have any enquiries in relation to this matter, please contact Melissa Anderson at the details above.

Yours sincerely

JEvans 3/4/2019

Jessie Evans
A/Director
Resource Assessments
as nominee of the Secretary

cc: Andrew.Speechly@hvo.com.au