UNITED WAMBO
JOINT VENTURE

GLENCORE

Blast Management Plan

Executive Summary

This Blast Management Plan (BMP) has been developed to address blasting related requirements of SSD 7142 and Environment Protection Licence (EPL) 3141 as relevant to open cut mining operations associated with the United Wambo Open Cut Coal Mine Project (United Wambo).

The key management and mitigation measures contained within the BMP are included in ***Table 1-1***.

Table 1-1: Blast Management and Mitigation Measures

No.	Mitigation/Management Measure	Timing	Responsibility
General management measures			
1	A detailed Blast Design and loading to be undertaken for each blast to meet the required criteria and minimise impact on the environment. Blast Design to take into consideration local geology/geotechnical aspects and imposed blasting limits/limitations including ground vibrations, airblast overpressure, fume and flyrock.	Every blast event	Technical Services Drill & Blasting Team (D&B Team)
2	Implement the Pre-Blast Assessment Protocol including various meteorological assessments and notification procedures. All to be documented including a checklist signoff in a blast pack (for each blast), see **Appendix E** for minimum requirements**.**	Every blast event	D&B Team D&B Supervisor E&C Manager
3	Notification – notify general public about the blast date and time via a mine sign and specific community members via agreed notification methods (SMS, email or phone calls) on the day of the blast.	Every blast event	D&B Team D&B Supervisor E&C Manager
4	Implement the ***Road Closure Management Plan*** where blasting is to occur within 500 m of a public road.	As required	D&B Supervisor
5	Coordinate blast times between the United and Wambo pits and HVO to avoid concurrent blasting.	Every blast event	D&B Supervisor
6	Detailed liaison and risk management between United Wambo, Wambo UG and HVO when blasting will occur within 500 m boundary or when potentially affecting by flyrock, fumes, dust or others areas beyond the 500m zone (e.g. equipment movement).	As required	D&B Supervisor
Control Measures for Ground Vibration			
7	Use appropriate blast design and loading in accordance with the ground vibration predictive model	Every blast event	D&B Team
8	Apply an appropriate initiation sequence for each blast to minimise the possibility of hole interaction, i.e. avoiding	Every blast event	D&B Team D&B Supervisor

No.	Mitigation/Management Measure	Timing	Responsibility
	reinforcing effect and aim for a single hole initiation at the respective critical monitoring points.		
Control Measures for Airblast			
9	Use the airblast predictive model to estimate potential overpressure levels to aide with blast design.	Every blast event	D&B Team
10	Use appropriate charge mass design in accordance with the airblast predictive model. Avoid overcharging holes.	Every blast event	D&B Team D&B Supervisor
11	Use of a suitable initiation sequence to avoid build-up in wavefront reinforcement, i.e. minimise the possibility of hole interaction	Every blast event	D&B Team D&B Supervisor
12	Undertake an alternative blast design around identified geological features to avoid face burst and excessive airblast emission	As required	D&B Team D&B Supervisor
13	Use an appropriate quality stemming material and stemming height to enable correct confinement of explosive charges	Every blast event	D&B Supervisor
14	Maintain appropriate burden specification especially for the front row holes (to avoid face burst)	Every blast event	D&B Team D&B Supervisor
Control Measures for Flyrock			
15	Ensure compliance with a blast design to avoid face burst and related flyrock incidents through stemming failure	Every blast event	D&B Team D&B Supervisor
16	Use a modified blast design around identified geological features (including geological faults, series of joints, dykes etc) to avoid potential flyrock incidents	As required	D&B Team D&B Supervisor
17	Use a modified blast design when blasting through old underground workings, accounting for potential soft strata and the presence of cracks/voids. Follow only a proven blast design when blasting through goaf and between underground pillars.	As required	D&B Team D&B Supervisor
18	Use minimum 500 m exclusion zone to manage potential flyrock occurrence. When within 500 m of a public road apply ***Road Closure Management Plan***.	Every blast event	D&B Team D&B Supervisor Road Sentries
Control Measures for Misfire			

No.	Mitigation/Management Measure	Timing	Responsibility
19	Develop safe management system for location and handling of misfires, including: • method for location and misfire identification • communication and exclusion zone • removal/treatment of misfires • reporting	When misfire encountered	Shotfirers D&B Supervisor
Additional Management Measures			
20	United Wambo will undertake a structural assessment of the property prior to any blasting associated with the Montrose Property and, in particular, the Shearing Shed, which may be susceptible to damage from ground vibration. United Wambo will undertake photographic/archival recording of the shearing shed in accordance with Heritage Division, OEH guidelines Photographic Recording of Heritage Items Using Film or Digital Capture (2006) prior to any blasting being undertaken as part of the Project that may exceed 5 mm/s.	Prior to blasting within 500 m of the Montrose Property	E&C Manager
21	The Hunter Valley Gliding Club (HVGC) and Warkworth Shooting Complex will be notified of all blasting activity in the United Wambo Pit. United Wambo will also consult with HVGC on blasting procedures and schedules to determine an appropriate strategy to minimise impacts to HVGC as far as practicable.	Prior to blasting in the United Pit	E&C Manager

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1. Project Description

The United Wambo Open Cut Coal Mine (United Wambo) is situated approximately 15 kilometres west of Singleton, near the village of Warkworth, New South Wales (***Figure 1-1***). United Wambo is a 50:50 joint venture between neighbouring mines operated by United Collieries Pty Limited (United) and Wambo Coal Pty Limited (Wambo).

United is owned 95 per cent by Abelshore Pty Limited, a wholly owned subsidiary of Glencore Coal Pty Limited (Glencore) and 5 per cent by the Construction, Forestry, Mining and Energy Union (CFMEU), which is managed by Glencore. Wambo Coal Pty Limited (Wambo) is a subsidiary of Peabody Energy Australia Pty Limited.

United Wambo combines the existing open cut operations at Wambo with a new open cut coal mine at United. United Wambo has approval to extract up to 10 million tonnes per annum (mtpa) of Run of Mine (ROM) coal from the combined Wambo Open Cut (Wambo Pit) and United Open Cut (United Pit). All coal is transported and processed through the Wambo Coal Handling and Processing Plant (CHPP) and transported by rail from Wambo to the Port of Newcastle for export.

Open cut mining is managed by United on behalf of the joint ventures, whilst Wambo manages the CHPP and train loading facilities as well as Wambo's continued underground operations.

Figure 1-1: Locality Plan

2. Purpose

The purpose of this Blast Management Plan (BMP) is to ensure that blast related impacts, including ground vibration, airblast overpressure, flyrock, fume, dust and misfire are minimised on the local community, infrastructure and heritage sites to the extent required by SSD 7142 and Environmental Protection Licences (EPL 3141 and EPL 529).

3. Scope

This BMP applies to all Phase 1A and 1B blasting activities at United Wambo and addresses the relevant conditions of SSD 7142 and EPL 3141 as detailed in **Section 4**. Blasting during Phase 1A and 1B for United Wambo consists of blasting operations within the United Open Cut under SSD 7142, and excludes all Wambo operations, including the Wambo open cut, underground, CHPP and train loading facility.

The BMP has been prepared to manage blast related impacts including ground vibration, airblast overpressure, flyrock, fume, dust and misfire. Blast fume management is detailed separately in the Appendix A -***Blast Fume Management Procedure*** and the approved Appendix B -***Road Closure Management Plan***.

This BMP applies to all United Wambo employees, and contractors working for, or on behalf of, United Wambo within the project approval boundary. This BMP forms part of United Wambo's Environmental Management System (EMS).

This BMP excludes the operations at the Wambo mine, incorporating the Wambo open cut mine, CHPP, train loading facility and underground mine. These activities will continue to be managed by Wambo in accordance with the relevant development consent conditions and associated management plans for Phase 1A and 1B. The BMP will be updated prior to the commencement of Phase 2 to incorporate the Wambo open cut operations.

4. Objectives of the Blast Management Plan

The objectives of this BMP are to:

- outline operational/blasting boundaries and, hence, implement a blast monitoring system to assess ground vibration and airblast overpressure impacts on the surrounding environment;
- specify control measures to be implemented to minimise blasting impacts on the surrounding environment;
- detail blast impact assessment criteria and an evaluation procedure to assess monitoring results and compliance;
- outline a data reporting procedure; and
- address blast-related community complaints effectively and in a timely manner.

5. Statutory Requirements

This BMP has been prepared to fulfil the requirements of SSD 7142 and EPL 3141.

5.1 Development Consent

United Wambo received Development Consent (SSD 7142) in accordance with Part 4 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) from the NSW Independent Planning Commission (IPC) on 29 August 2019. Conditions within SSD 7142 relating to blast management and where these are addressed within this document are provided in ***Table 5-1***.

Table 5-1: SSD 7142 Requirements for Blast Management

<table>
<tr><th>Condition</th><th>Condition Details</th><th>AQMP Section</th></tr>
<tr><td>B8</td><td>• The Applicant must ensure that blasting on the site does not cause exceedances of the criteria at the locations a shown in Table 2.
<table>
<tr><th>Location</th><th>Airblast overpressure (dB(Lin Peak))</th><th>Ground vibration (mm/s)</th><th>Allowable exceedance</th></tr>
<tr><td rowspan="2">Residence on privately-owned land</td><td>120</td><td>10</td><td>0%</td></tr>
<tr><td>115</td><td>5</td><td>5% of the total number of blasts over a calendar year</td></tr>
<tr><td>St Phillips Church</td><td></td><td>5</td><td>0%</td></tr>
<tr><td>Wambo Homestead</td><td>120</td><td>5</td><td>0%</td></tr>
<tr><td>All other heritage items (beyond those predicted in the document/s listed in condition A2(c))</td><td>133</td><td>5</td><td>0%</td></tr>
<tr><td>Hunter Valley Gliding Club
Warkworth Shooting Complex
HVO infrastructure - occupied</td><td>133</td><td>25</td><td>0%</td></tr>
<tr><td>HVO surface infrastructure - unoccupied</td><td>133</td><td>100</td><td>0%</td></tr>
<tr><td>Transmission suspension towers
Transmission tension towers</td><td></td><td>100
50</td><td>0%</td></tr>
<tr><td>Prescribed dams</td><td></td><td>50
(unless otherwise directed by the DSC)</td><td>0%</td></tr>
<tr><td>Public Roads
Telecommunication infrastructure and cables</td><td></td><td>100</td><td>0%</td></tr>
<tr><td>All other public infrastructure</td><td></td><td>50
(or a limit determined by the structural design methodology in AS 2187.2 - 2006, or its latest version, or other alternative limit for public infrastructure, to the satisfaction of the Planning Secretary)</td><td>0%</td></tr>
</table></td><td>Section 10.1</td></tr>
<tr><td>B9</td><td>• The blasting criteria in Table 2 do not apply if the Applicant has an agreement with the owner/s of the relevant residence or infrastructure to exceed the blasting criteria, and the Applicant has advised the Department in writing of the terms of this agreement.</td><td>Section 10.2</td></tr>
<tr><td>B10</td><td>• The Applicant must only carry out blasting on the site between 9 am and 5 pm (Monday to Saturday inclusive). No blasting is allowed</td><td>Section 11.1.1</td></tr>
</table>

Condition	Condition Details	AQMP Section
	on Sundays, public holidays or any other time without the prior written approval of the Planning Secretary.	
B11	• The Applicant may carry out a maximum of:	
B11 (a)	• 3 single blast events a day; and	**Section 11.1.1**
B11 (b)	• 15 single blast events a week, averaged over a calendar year.	**Section 11.1.1**
B12	• Condition B11 does not apply to single blast events that generate ground vibration of 0.5 mm/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	
B13	• If the Applicant receives a written request from the owner of any privately-owned land within 3 kilometres of any approved open cut mining pit on the site for a property inspection to establish the baseline condition of any buildings and structures on their land, or to have a previous property inspection updated, then within 2 months of receiving this request the Applicant must:	**Section 11.3**
B13 (a)	• commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties to:	**Section 11.3**
B13 (a) (i)	• establish the baseline condition of any buildings and other structures on the land, or update the previous property inspection report; and	**Section 11.3**
B13 (a) (ii)	• identify measures that should be implemented to minimise the potential blasting impacts of the development on these buildings and structures; and	**Section 11.3**
B13 (b)	• give the landowner a copy of the new or updated property inspection report.	**Section 11.3**
B14	• 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 Planning Secretary for resolution.	**Section 11.3**
B15	• If the owner of any privately-owned land within 3 kilometres of any approved open cut mining pit on the site or any other landowner where the Planning Secretary is satisfied an investigation is warranted, claims in writing that buildings or structures on their land have been damaged as a result of blasting on the site, then within 2 months of receiving this written claim the Applicant must:	**Section 11.3**

Condition	Condition Details	AQMP Section
B15 (a)	• commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties to investigate the claim; and	**Section 11.3**
B15 (b)	• give the landowner a copy of the property investigation report.	**Section 11.3**
B16	• 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 Planning Secretary.	**Section 11.3**
B17	• 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 independent property investigation, then either party may refer the matter to the Planning Secretary for resolution.	**Section 11.3**
B18 (a)	• The Applicant must: • take all reasonable steps to:	
B18 (a) (i)	• ensure the safety of people and livestock from blasting impacts of the development;	**Section 11.1.2**
B18 (a) (ii)	• protect public and private infrastructure and property in the vicinity of the site from blasting damage associated with the development; and	**Section 11.1.2**
B18 (a) (iii)	• minimise the dust and fume emissions of any blasting;	**Section 11.1.2**
B18 (b)	• ensure that blasting on the site does not damage heritage items, beyond those predicted in the document/s listed in condition A2(c), and develop specific measures to protect heritage items outside the approved disturbance areas from any blasting damage associated with the development;	**Section 11.1.2**
B18 (c)	• minimise the frequency and duration of any public road closures for blasting, and use all reasonable efforts to avoid road closures during peak traffic periods;	**Appendix B -**
B18 (d)	• operate a suitable system to enable interested members of the public to get up-to-date information on the proposed blasting schedule on the site and associated public road closures, including notification via SMS message of the blasting schedule and associated road closures for that day and any variations to that schedule and closures;	**Appendix B -**
B18 (e)	• use all reasonable efforts to co-ordinate the timing of blasting at the site with nearby mines to minimise cumulative blasting impacts;	**Appendix B -**

Condition	Condition Details	AQMP Section
B18 (f)	• consult with HVO prior to undertaking any blasting within 500 metres of its operations; and	**Section 11.2.4.2**
B18 (g)	• carry out regular blast monitoring to determine whether the development is complying with the relevant conditions of this consent.	**Section 12.3**
B19	• The Applicant must not undertake blasting on the site within 500 metres of any public road or any land outside the site not owned by the Applicant, unless the blast generates ground vibration of 0.5 mm/s or less, or the Applicant has:	
B19 (a)	• a written agreement with the relevant infrastructure owner or landowner to allow blasting to be carried out closer to the public road or land, and the Applicant has advised the Department in writing of the terms of this agreement; or	**Appendix B - Section 11.2.4.2**
B19 (b)	• demonstrated, to the satisfaction of the Planning 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.	
B20	• The Applicant may not close the Golden Highway more than once per day due to blasting, except where required for blast misfires or blasts required to ensure the safety of the mine, its workers or the general public.	**Appendix B -**
B21	The Applicant must prepare a Blast Management Plan for the development to the satisfaction of the Secretary. This plan must:	This document
B21 (a)	• be prepared by a suitably qualified and experienced person/s;	**Section 8**
B21 (b)	• be prepared in consultation with the EPA;	**Section 7**
B21 (c)	• describe the measures that will be implemented to ensure compliance with the blasting criteria and conditions of this consent;	**Section 11**
B21 (d)	• include a Blast Fume Management Strategy for:	**Appendix A**
B21 (d) (i)	• minimise blast fume emissions;	**Appendix A**
B21 (d) (ii)	• rate in accordance with *Visual NOx Fume Rating Scale* (AEISG, 2011), or equivalent, and recording blast fume events; and	**Appendix A**

Condition	Condition Details	AQMP Section
B21 (d) (iii)	• report significant blast fume events to the Department;	**Appendix A**
B21 (e)	• describe the proposed blast fume trial for investigating alternative monitoring equipment and how the results would be implemented on the site;	**Section 12.5**
B21 (f)	• include a Road Closure Management Plan for any blasting within 500 metres of a public road, that has been prepared in consultation with relevant roads authorities and includes provisions for:	**Appendix B**
B21 (f) (i)	• minimise the duration of closures, both on a per event basis and weekly basis;	**Appendix B**
B21 (f) (ii)	• avoid peak traffic periods as far as reasonable; and	**Appendix B**
B21 (f) (iii)	• coordinate closures with nearby mines to minimise the cumulative effect of road closures;	**Appendix B**
B21 (g)	• identify any agreed alternative ground vibration limits for public or private infrastructure in the vicinity of the site (if relevant);	**Section 10.1.2**
B21 (h)	• include a strategy to manage potential blast interactions with nearby mines, including identifying appropriate blast criteria for nearby underground workings to ensure structural integrity and the safety of underground workers;	**Section 10.1**
B21 (i)	• include a communication protocol with Hunter Valley Gliding Club and Warkworth Shooting Complex to notify the clubs of upcoming blasts which may impact their activities;	**Section 11.2.2**
B21 (j)	• include a strategy to monitor, mitigate and manage the effects of blasting on heritage items, particularly those identified in the figure in Appendix 5 of SSD 7142, including undertaking baseline (i.e. pre-blasting) and ongoing risk-based dilapidation surveys (subject to landowner access arrangements); and	**Section 12** **Section 11.3**
B21 (k)	• include a monitoring program for evaluating and reporting on compliance with the relevant conditions of this consent.	**Section 12** **Section 15**

5.2 Environmental Protection Licence

United Wambo operates under Environmental Protection Licence 3141 (EPL 3141), issued by the NSW Environment Protection Agency (EPA) under the authority of the *Protection of the Environment Operations Act 1997*. Conditions within EPL 3141 that regulate blasting activities undertaken at the United are provided in ***Table 5-2***.

A ***Pollution Incident Response Management Plan*** (PIRMP) has been prepared by United Wambo as holder of EPL 3141 in accordance with Part 5.7A of the *Protection of the Environment* Operations *Act 1997* (POEO Act) and Part 3A of the *Protection of the Environment Operations (General) Regulation 2009* (Regulation). For more information regarding United Wambo's protocol for reporting environmental incidents please refer to ***Section 14.2***.

Table 5-2: EPL 3141 Requirements for Blast Management

Schedule	Condition	Section Addressed
L4.1	The airblast overpressure level from blasting operations in or on the premises must not exceed 115 dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period; at either monitoring point 18, 19, 20, 21 and 22 in Condition P1.3.	**Section 10.1**
L4.2	The airblast overpressure level from blasting operations in or on the premises must not exceed 120 dB (Lin Peak) at any time; at either monitoring 18, 19, 20, 21 and 22 in Condition P1.3.	**Section 10.1**
L4.3	The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed: 5 mm/second for more than 5% of the total number of blasts during each reporting period; at either monitoring 18, 19, 20, 21 and 22 in Condition P1.3	**Section 10.1**
L4.4	The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed 10 mm/second at any time; at either monitoring 18, 19, 20, 21 and 22 in Condition P1.3.	**Section 10.1**
L4.5	Offensive blast fume must not be emitted from the premises-. Definition: Offensive blast fume means post-blast gases from the detonation of explosives at the premises that by reason of their nature, duration, character or quality, or the time at which they are emitted, or any other circumstances: 1. are harmful to (or likely to be harmful to) a person that at is outside the premises from which it is emitted, or 2. interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted.	Appendix A

6. Glencore Coal Assets Australia Requirements

The GCAA ***Blast Protocol*** (CAA HSEC PCL 0002) outlines the following principles, which focus on effective blast management critical to supporting operations. Blast management planning assists in managing a number of aspects, such that:

- blast objectives and targets are consistent with regulatory and internal requirements;
- blasting hours and frequency are conducted in accordance with the site's environmental approvals;
- blast mitigation measures are implemented, referencing relevant site operating procedures with documented controls and, where relevant, automated control systems. The suitability of blast management controls is to be assessed on an annual basis as part of the EC operational risk assessment conducted for the site;
- consultation process/procedures are in place to minimise the potential for simultaneous blasting with nearby operations;
- where applicable, details regarding road closure planning are maintained;
- a provision for general blast awareness training is in place, which identifies site specific objectives and targets for blast management, potential blast impacts, environmental commitments and the site's obligations in respect of blast management;
- provision for job training/retraining for:
  - operators, referencing site operational procedures which incorporate blast management measures.
  - personnel tasked with the operation of blast monitoring, dust monitoring and meteorological monitoring systems.
- monitoring and reporting systems including:
  - blast monitoring and compliance reporting;
  - meteorological monitoring to detect favourable/unfavourable conditions for blasting, to be conducted as a component of the Pre-Blast Assessment Procedures;
  - calibration/servicing requirements for blast monitoring equipment;
  - where required by legislation or other regulatory requirement, rating and recording of blast fume generation;
  - incident logging, review and reporting;
  - complaints logging, review and reporting;
  - internal and external audits of the operational blast management plan.
- a Roles and Responsibilities matrix, with responsibilities being clearly defined, for communication through all levels within the operation.

The requirements of the GCAA Protocol have been included in the ***Blast Management Plan*** and in site blasting practices.

7. Stakeholder Consultation

As required by Condition B24 of SSD 7142, this BMP has been prepared in consultation with DPIE and the EPA, and submitted to the Secretary for approval.

The EPA was contacted and provided with the opportunity to provide comment and feedback on management plans prepared for SSD 7142, the EPA noted that they do not undertake consultation for management plans and as such offered no comment in relation to these plans apart from ensuring

that the plans consider the conditions of any Environment Protection Licence conditions in force at the time. The EPA was contacted on 26 March 2020 regarding the Blast Management Plan and in accordance with communication received 11 September 2019 declined to provide comment. The EPL 3141 conditions relating to blasting are described in ***Section 5.2***.

The Appendix B -***Road Closure Management Plan*** for blasting within 500 m of the Golden Highway and Comleroi Road has been prepared in consultation with the RMS and Singleton Council and approval was received for the period 25 March 2020 to 25 September 2020 from RMS and 25 March 2020 to 24 March 2021 from Singleton Council.

Feedback and correspondence in relation to the BMP is attached as **Appendix C**. A copy of the approval by the DPIE is attached in **Appendix D**.

8. Preparation of the BMP

In recognition of the requirements of Condition B59 (a) of SSD 7142, the draft BMP prepared by a suitably experienced and qualified person, Thomas Lewandowski B.E. (Mining) M.M.Mgt, M.Aus.I.M.M., M.I.S.E.E., M.EFEE of Enviro Strata Consulting conducted the Blast Impact Assessment for the Environmental Impact Statement (EIS) for the United Wambo Open Cut Coal Mine Project and has 29 years' experience in Mining Engineering specialising in Drilling and Blasting.

9. Baseline Data

9.1 Assessment of the Environmental Aspects

A comprehensive list of environmental impact assessments undertaken for United Wambo is provided in the ***United Wambo Environmental Impact Statement***. The most recent blasting assessment undertaken is the *United Wambo Open Cut Coal Mine Project – Blast Impact Assessment* (Enviro Strata Consulting, 2016), included as Appendix 10 of *United Wambo Open Cut Coal Mine Project – Environmental Impact Statement* (EIS) (Umwelt 2016b) and summarised in Section 6.7 of the EIS.

These documents are available at:
http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=7142

9.2 Blast Monitoring Data

Blast monitoring has been undertaken at the Wambo Open Cut since February 2004 at the monitoring locations shown in ***Figure 9-1***. In addition, all blasts at Wambo have been assessed based on their blast fume ranking since 2 July 2012.

A summary of the airblast overpressure and ground vibration results for the period 2012 to 2018 and their performance against respective blasting criteria is presented in ***Table 9-1*** and ***Table 9-2,*** respectively. Blast Fume Ranking results since 2012 are presented in ***Table 9-3.***

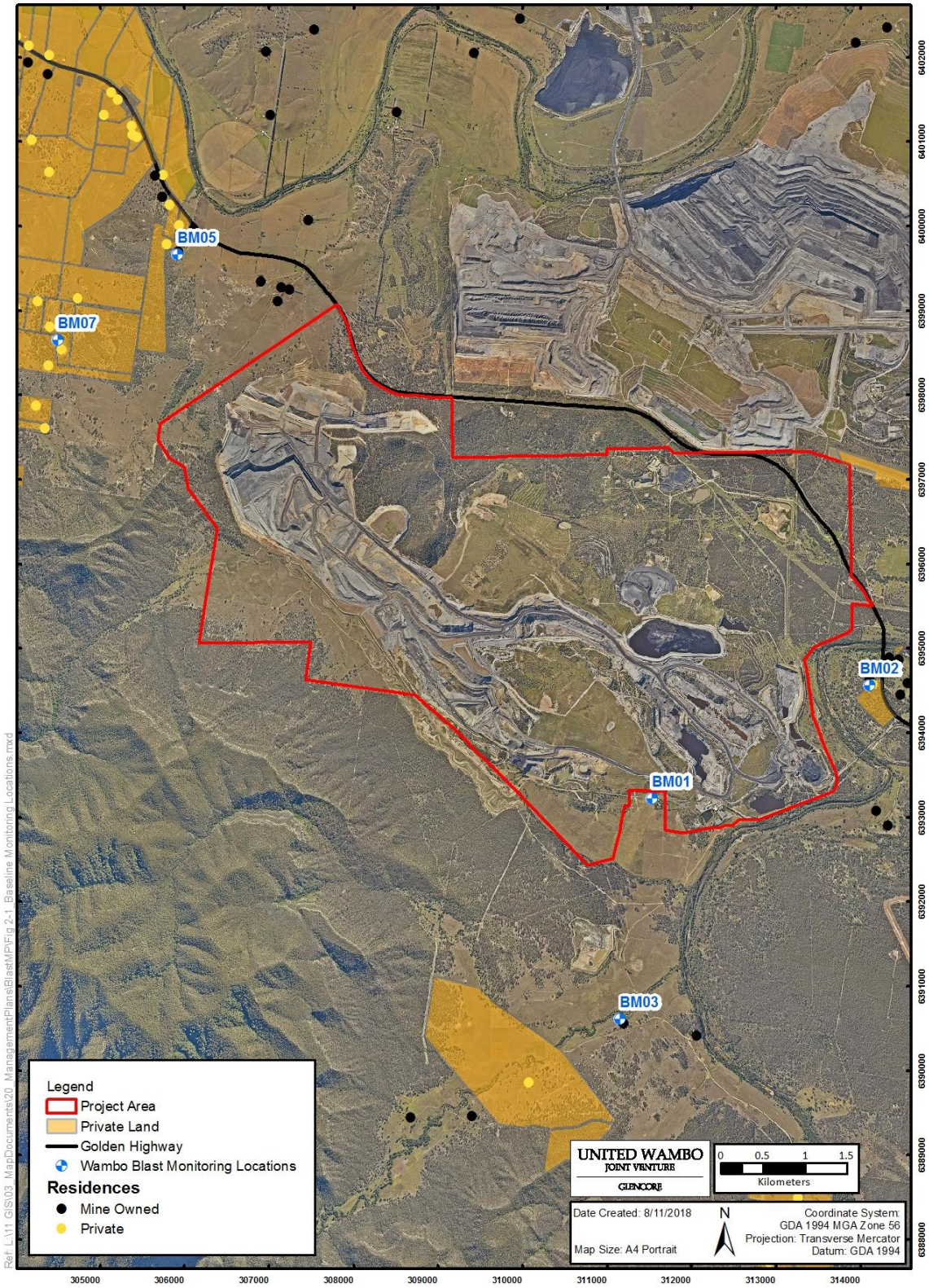

Figure 9-1: Wambo Blast Monitoring Locations

Table 9-1: Review of Airblast Overpressure Results for Wambo Open Cut, 2012 – 2018

Period	No. Blasts for Period	Monitoring Location	>115dBL (<5% Target)	>120dBL (0% Target)	Airblast Overpressure (dBL)	
			%	%	Ave	Max
01/01/2012 – 31/12/2012	70	BM02	3.3%	1.6%	99.9	120.6
		BM05	0%	0%	103.5	114.6
		BM07	1.4%	0%	103.3	115.2
01/01/2013 – 31/12/2013	73	BM02	0%	0%	98.4	109.5
		BM05	1.7%	0%	103.2	114.4
		BM07	1.7%	0%	101.8	111.5
01/01/2014 – 31/12/2014	78	BM02	0%	0%	99.9	113.1
		BM05	0%	0%	100.9	113.0
		BM07	0%	0%	102.3	110.8
01/01/2015 – 31/12/2015	79	BM02	0%	0%	100.9	113.4
		BM05	0%	0%	104.4	113.3
		BM07	0%	0%	102.4	112.4
01/01/2016 – 31/12/2016	106	BM02	1.0%	0%	96.4	118.6
		BM05	1.9%	0%	103.7	115.8
		BM07	1.0%	0%	99.8	115.7
01/01/2017 – 31/12/2017	96	BM02	2.1%	0%	99.9	119.3
		BM05	3.1%	0%	104.2	118.5
		BM07	0%	0%	92.4	110.5
01/01/2018 – 31/12/2018	96	BM02	1.0%	0.0%	97.5	117
		BM05	2.1%	0.0%	104.3	116.5
		BM07	0.0%	0.0%	98.2	111.4

There have been no exceedances of the 5 per cent allowable over the 115 dBL of the total number of blasts during a twelve month period since monitoring began in 2004. There were two overpressure exceedances above 120dBL including one in 2010 and one in 2012 (i.e. due to minor face burst). No blasts have exceeded the 120dBL airblast overpressure limit since 2012. ***Table 9-1*** shows the airblast overpressure monitoring results collected at BM02, BM05 and BM07 from 2012 to 2018.

There has not been an exceedance for either the >5 mm/s or >10 mm/s ground vibration limits recorded by Wambo external blast monitoring units at a private residence since DA305-7-2003 approval was granted, confirming fully controlled ground vibration impacts. ***Table 9-2*** shows the ground vibration monitoring results collected at BM02, BM05 and BM07 from 2012 to 2018.

Table 9-2: Review of Ground Vibration Results for Wambo Open Cut, 2012 – 2018

Period	No. Blasts for Period	Monitoring Location	>5mm/s (<5% Target)	>10mm/s (0% Target)	Ground Vibration (mm/s)	
			%	%	Ave	Max
01/01/2012 – 31/12/2012	80	BM02	0%	0%	0.16	0.55
		BM05	0%	0%	0.48	1.38
		BM07	0%	0%	0.55	1.40
01/01/2013 – 31/12/2013	62	BM02	0%	0%	0.15	0.53
		BM05	0%	0%	0.40	1.83
		BM07	0%	0%	0.39	1.86
01/01/2014 – 31/12/2014	75	BM02	0%	0%	0.16	0.65
		BM05	0%	0%	0.38	1.37
		BM07	0%	0%	0.43	1.44
01/01/2015 – 31/12/2015	79	BM02	0%	0%	0.14	0.52
		BM05	0%	0%	0.43	1.72
		BM07	0%	0%	0.44	1.44
01/01/2016 – 31/12/2016	106	BM02	0%	0%	0.15	1.79
		BM05	0%	0%	0.43	1.43
		BM07	0%	0%	0.41	1.84
01/01/2017 – 31/12/2017	96	BM02	0%	0%	0.19	2.09
		BM05	0%	0%	0.56	2.75
		BM07	0%	0%	0.47	1.87
01/01/2018 – 31/12/2018	96	BM02	0%	0%	0.11	1.82
		BM05	0%	0%	0.60	2.81
		BM07	0%	0%	0.54	3.25

Table 9-3: Blast Fume Rankings Results for Wambo Open Cut, 2012 - 2018

NOx Fume Ranking	2012	2013	2014	2015	2016	2017	2018	Total
0	61.5%	85.5%	85.3%	81.0%	88.9%	79.6%	72.7%	79.4%
1	15.4%	4.8%	10.7%	16.7%	8.3%	19.4%	23.2%	15.4%
2	17.9%	6.5%	2.7%	2.4%	2.8%	0.0%	4.0%	3.9%
3	2.6%	3.2%	1.3%	0.0%	0.0%	0.0%	0.0%	1.1%
4	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Since blast fume monitoring commenced on 2 July 2012, all blasts at Wambo have been assessed based on their blast fume ranking. For the 2012 – 2018 monitoring period, 98.3 per cent of all blasts have been assessed as Category 2 or below, another 1.4 per cent of blasts assessed as Category 3 and only one assessed as Category 4 blast fume event, which occurred in 2012. No blast fume Category 5 has been generated.

9.3 Blast Sensitive Receiver Locations

Blast sensitive receiver locations were identified and assessed in the *United Wambo Open Cut Coal Mine Project Blasting Impact Assessment* (Enviro Strata Consulting, 2016). Blast sensitive receiver locations are shown in ***Figure 9-1*** and include:

- private residences;
- infrastructure including:
  - public roads and bridges, including the Golden Highway, proposed Golden Highway realignment and Comleroi Road;
  - power transmission lines;
  - prescribed dams within Wambo;
  - Hunter Valley Gliding Club and Warkworth Shooting Complex; and
  - telecommunications infrastructure;
- historic sites including;
  - St Philips Church, Warkworth;
  - Wambo Homestead Complex;
  - the former Warkworth Public School;
  - Piggery and Butcher's Hut;
  - former Queen Victoria Inn;
  - Springwood Homestead;

- the Montrose Property (including the shearing shed); and
- Dog-leg Fence.

10. Planning

10.1 Blast Criteria

SSD 7142 and EPL 3141 specify ground vibration and airblast overpressure criteria for the sensitive receiver locations outlined in ***Section 9.3***. 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. Blast criteria are presented in ***Table 10-1*** to ***Table 10-3***.

10.1.1 Privately Owned Residences

The relevant limits for residence on privately-owned land from SSD 7142 and EPL 3141 in relation to both ground vibration and airblast overpressure are summarised in ***Table 10-1***.

Table 10-1: Impact Assessment Criteria at Privately Owned Residences

Location	Ground Vibration Criteria (mm/s)	Allowable Exceedance Vibration	Airblast Overpressure Criterion (dB Linear Peak)	Allowable Exceedance - Airblast Overpressure
Residence on privately-owned land	5	5% of the total number of blasts over a 12 month period	115	5% of the total number of blasts over a 12 month period
	10	0%	120	0%

10.1.2 Infrastructure

Impact assessment criteria for infrastructure items have been developed through consultation with regulatory authorities with consideration to research undertaken and in consultation with the relevant infrastructure owners.

The impact assessment criteria for private and publicly owned infrastructure in proximity to United Wambo are provided in ***Table 10-2***.

Table 10-2: Impact Assessment Criteria for Infrastructure

Infrastructure	Ground Vibration Criterion (mm/s)	Airblast Overpressure Criterion (dB Linear Peak)
Electricity Transmission suspension towers	100	-
Electricity Transmission tension towers	50	

Infrastructure	Ground Vibration Criterion (mm/s)	Airblast Overpressure Criterion (dB Linear Peak)
Wambo Tailings Dam (North East Tailings Dam)	50 (progressive limit) - currently set at 40 [1]	-
HVO Riverview Void Inpit Water Storage [2] United Tailings Dam 2 Wambo Hunter Pit Tailings Dam	50	-
Public roads and bridges (including the Golden Highway)	100	-
HVO surface infrastructure - unoccupied	100	133
HVO infrastructure - occupied Hunter Valley Gliding Club Warkworth Shooting Complex	25	133
Telecommunication infrastructure and cables	100	-

1. The vibration limit imposed by the Dam Safety NSW on Wambo Open Cut applicable to the Wambo Tailings Dam wall is currently set at 40 mm/s (i.e. progressive ground vibration limits from 20, 30, 40 and up to 50 mm/s) pending six blasts for each allowable vibration range and dam condition assessment, and approval by Dam Safety NSW, as stated in the conditions imposed by Dam Safety NSW (Annexure "D" Standard Mining Conditions, 2007) and the variation to the approval (2008) endorsed by DPI (2008). In addition, when blasting within the notification area of the dam wall (i.e. within a 1 kilometre radius) Dam Safety NSW requires that additional monitoring of blast vibrations be undertaken on the embankment crest. On this basis, the current 40 mm/s vibration criterion has been used for the tailings dam and is applicable to the Project.

2. The Maximum PPV limit for the prescribed Riverview Pit Dam wall is 50mm/s with results from blasts occurring within the notification zone needing to be reviewed within 2hrs of the blast being fired, United Wambo will consult with HVO to ensure appropriate dam inspections are undertaken.

10.1.3 Historical Heritage Structures

Impact assessment criteria for heritage structures within the project area are detailed in ***Table 10-3***.

Table 10-3: Impact Assessment Criteria for Heritage Structures

Site	Ground Vibration Criterion (mm/s)	Airblast Overpressure Criterion (dB Linear Peak)
St Phillips Church	5	-
Former Warkworth Public School, Piggery and Butcher's Hut, Former Queen Victoria Inn, Springwood Homestead)	5	133
Wambo Homestead Complex [1]	5 [1]	120

Site	Ground Vibration Criterion (mm/s)	Airblast Overpressure Criterion (dB Linear Peak)
Montrose Property	NA [2]	-
Dog-leg Fence	No limits specified [3]	-

1. Ground vibration and air blast levels experienced at the Wambo Homestead Complex (WHC) blast monitoring station are not to exceed the structural damage assessment criteria prescribed by Australian Standard AS 2187.2-2006 'Explosives—Storage and use Part 2: Use of explosives' to prevent damage to the heritage items. The latest version of AS 2187.2-2006 no longer has reference to Sensitive and Heritage Structures which previously placed a PPV at 5mm/s criteria for the WHC. United will continue to apply this conservative PPV limit but will continue to undertake further monitoring and assessments if there is a need to modify this criteria in the future.
2. Montrose Property is predicted to experience vibration impacts up to 14mm/s as per the Blasting Impact Assessment (Enviro Strata Consulting, 2016). As a result of the predicted impact, heritage archival recording will be undertaken on the Montrose Property, including the shearing shed, prior to blasting within 500m, to mitigate impacts on the structure.
3. The Dog-leg Fence is in a state of disrepair and is structurally unsound. No vibration limits are specified. The Dog-leg Fence will be managed in accordance with the Historic Heritage Management Plan.

10.2 Revision of Blasting Criteria

The criteria presented in ***Table 10-1*** to ***Table 10-3*** have been developed in consideration of Project Approval requirements and also through the completion of research in relation to the impacts of vibration on particular structures. United Wambo may therefore alter the vibration criteria based on the results of further detailed assessments and/or through further consultation with relevant government agencies and infrastructure providers. United Wambo will advise DPIE in writing of any agreements reached with relevant service providers or surrounding mining operations regarding the revision of the criteria contained within ***Table 10-1*** to ***Table 10-3***. United Wambo has no current blasting agreements in place with owners of any residence or infrastructure to exceed blasting criteria.

11. Implementation

Over the life of the operation, United Wambo will implement a number of management controls. These controls measures are specified in the following sections, including specification for accountabilities for implementation of these measures.

11.1 Operational Controls

United Wambo will implement the following blast management measures and practices.

11.1.1 Blast Timing and Frequency

Approved blast timing and frequency, as specified in SSD 7142 and EPL 3141, are summarised in ***Table 11-1***.

Table 11-1: Approved Blast Timing and Frequency

	United Wambo
Approved Blasting Hours[a]	Monday to Saturday (inclusive) - 9 am – 5 pm (EST[b])

	United Wambo
Approved Blasting Frequency[c,d,e]	Maximum of three blasts per day and no more than 15 blasts per week

Notes:

a) No blasting will be undertaken on Sundays, public holidays or at any other time, unless written approval is obtained from the Secretary of DPIE.

b) EST = Eastern Standard Time,

c) The total number of blasts 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 blast misfires or blasts required to ensure the safety of the mine or its workers or the general public.

d) 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 (for the purposes of counting blasts per day or per week).

e) Blasting related closures of the Golden Highway will be limited to a maximum of one per day.

11.1.2 Blast Management and Control Measures

United Wambo will implement best practice blast management procedures to minimise ground vibration, airblast overpressure, flyrock, fume, dust, and misfire to protect the safety of people and livestock. In addition, the control measures will be undertaken to minimise impacts to private and public infrastructure, historic sites and minimise the dust and fume emissions of blasting for the duration of the Project.

Specific blast management and control measures that will be implemented are included in ***Table 11-2***. Additional detail on consultation, structural inspections and investigations and management of the Wambo Homestead Complex are provided in ***Section 11.2*** to ***Section 11.4***.

Table 11-2: Blast Management and Control Measures

No.	Management and Control Measure	Timing	Responsibility
General management measures			
1	A detailed Blast Design and loading to be undertaken for each blast to meet the required criteria and minimise impact on the environment. Blast Design to take into consideration local geology/geotechnical aspects and imposed blasting limits/limitations including ground vibrations, airblast overpressure, fume and flyrock.	Every blast event	Technical Services Drill & Blasting Team (D&B Team)
2	Implement the Pre-Blast Assessment Protocol including various meteorological assessments (such as wind speed and direction in regards to sensitive receivers, temperature inversions and fume plume predictions) and notification procedures. All to be documented including a checklist signoff in a blast pack (for each blast), see **Appendix E** for minimum requirements**.**	Every blast event	D&B Team D&B Supervisor E&C Manager
3	Notification – notify general public about the blast date and time via a mine sign and specific community members via	Day prior to every blast event	D&B Team D&B Supervisor

No.	Management and Control Measure	Timing	Responsibility
	agreed notification methods (SMS, email or phone calls) on the day before and on day of the blast.		E&C Manager
4	Implement the ***Road Closure Management Plan*** where blasting is to occur within 500 m of a public road.	As required	D&B Supervisor
5	Coordinate blast times between the United and Wambo pits and HVO to avoid concurrent blasting.	Every blast event	D&B Supervisor
6	Detailed liaison and risk management between United Wambo, Wambo UG and HVO when blasting will occur within 500m boundary or when potentially affecting by flyrock, fumes, dust or other areas beyond the 500 m exclusion zone (e.g. people and equipment movement) to manage the safety of workers.	As required	D&B Supervisor
Control Measures for Ground Vibration			
7	Use appropriate blast design (i.e. reducing the blast pattern size and maximum charge per hole when blasting closer to sensitive receivers) and loading in accordance with the ground vibration predictive model.	Every blast event	D&B Team
8	Apply an appropriate initiation sequence for each blast to minimise the possibility of hole interaction, i.e. avoiding reinforcing effect and aim for a single hole initiation at the respective critical monitoring points.	Every blast event	D&B Team D&B Supervisor
9	Adoption of more conservative decking designs and initiation sequences when undertaking blasts of a greater size and/or duration than previous blasts.	As required	D&B Team
Control Measures for Airblast			
10	Use the airblast predictive model to estimate potential overpressure levels to aide with blast design.	Every blast event	D&B Team
11	Use appropriate charge mass design in accordance with the airblast predictive model. Avoid overcharging holes.	Every blast event	D&B Team D&B Supervisor
12	Use of a suitable initiation sequence to avoid build-up in wavefront reinforcement i.e. minimise the possibility of hole interaction.	Every blast event	D&B Team D&B Supervisor
13	Undertake an alternative blast design around identified geological features or in broken or previously blasted ground to avoid face burst and excessive airblast emission.	As required	D&B Team D&B Supervisor

No.	Management and Control Measure	Timing	Responsibility
14	Use stemming gravel to a designed stemming height to enable correct confinement of explosive charges	Every blast event	D&B Supervisor
15	Maintain designed and calculated burden specification especially for the front row holes (to avoid face burst).	Every blast event	D&B Team D&B Supervisor
Control Measures for Flyrock			
16	Ensure compliance with a blast design to avoid face burst and related flyrock incidents through stemming failure.	Every blast event	D&B Team D&B Supervisor
17	Use a modified blast design around identified geological features (including geological faults, series of joints, dykes, etc) to avoid potential flyrock incidents.	As required	D&B Team D&B Supervisor
18	Use a modified blast design when blasting through old underground workings, accounting for potential soft strata and the presence of cracks/voids. Follow only a proven blast design when blasting through goaf and between underground pillars.	As required	D&B Team D&B Supervisor
19	Use minimum 500m exclusion zone to manage potential flyrock occurrence. When within 500 m of a public road apply ***Road Closure Management Plan***.	Every blast event	D&B Team D&B Supervisor Road Sentries
Control Measures for Misfire			
20	Develop safe management system for location and handling of misfires, including: • method for location and misfire identification; • communication and exclusion zone; • removal/treatment of misfires; and • reporting.	When misfire encountered	Shotfirers D&B Supervisor
Additional Management Measures			
21	United Wambo will undertake a structural assessment of the property prior to any blasting associated with the Montrose Property, and in particular the Shearing Shed, which may be susceptible to damage from ground vibration. United Wambo will undertake photographic/archival recording of the shearing shed in accordance with Heritage Division, OEH guidelines Photographic Recording of Heritage Items Using	Prior to blasting within 500 m of the Montrose Property	E&C Manager

No.	Management and Control Measure	Timing	Responsibility
	Film or Digital Capture (2006) prior to any blasting being undertaken as part of the Project that may exceed 5mm/s.		
22	The Hunter Valley Gliding Club (HVGC) and Warkworth Clay Target Club will be notified of all blasting activity in the United Pit. United Wambo will also consult with HVGC on blasting procedures and schedules to determine an appropriate strategy to minimise impacts to HVGC as far as practicable. This strategy will be developed prior to commencement of Phase 2.	Prior to all blasts in the United Pit Prior to Phase 2	E&C Manager

11.2 Blast Consultation and Notification

11.2.1 Road Closure

Appendix B -***Road Closure Management Plan*** is designed based on the consultation and agreement with RMS and Singleton Council and includes notification requirements.

Where blasting is to be undertaken within 500 metres of a public road, the following notifications will be required:

- an advertising campaign will commence on 1 April 2020 in the Singleton Argus to inform the public about blasting commencing at United Wambo, given that road closures will be required for every blast for the first few years, this communication will form part of the advertisement and the requirement for notification will be reviewed in consultation with Singleton Council;
- permanent signage will be erected on the Golden Highway and Comleroi Road. Signage will be updated as early as practicable the day prior to blasting to advise regular users of the likely time, date and duration of road closure;
- United Wambo will contact all interested parties (including Singleton Council, Emergency Services, Hunter Valley Gliding Club, Warkworth Clay Target Club and neighbouring mines) of a scheduled road closure as early as practicable the day prior to blasting;
- United Wambo will update the Community Enquiries Line 24 hours prior to the scheduled blast event and advise of the road closure;
- traffic control will be notified at least two days prior to blasting; and
- all parties will be punctually notified in the event that a blast is postponed.

11.2.2 Community Pre-Blast Notification

United Wambo will operate a Community Response Line and email address to enable the public to get up-to-date information on blasting operations at the Mine. United Wambo also provides a blast SMS notification service to members of the community who have registered for the service. The SMS message with blasting details is sent out the day before the scheduled blast event.

Registering for the Blast SMS service involves calling the Community Response Line or emailing the email address detailed below and requesting a mobile number be added to the list.

The Drill & Blast (D&B) Superintendent (or delegated authority), updates the Community Response Line 24 hours prior to the scheduled blast event. If a blast event is rescheduled, a revised schedule is posted.

- 24-hr Community Response Line: 1800 801 440
- E-mail Enquiries – UnitedEnvironmental@glencore.com.au

United Wambo also undertake the following notifications on an annual basis:

- advertise the Community Response Line in local newspapers; and
- notify the occupants of any land within three kilometres of the site Community Response Line.

11.2.2.1 Hunter Valley Gliding Club and Singleton Clay Target Club

United Wambo will notify the Hunter Valley Gliding Club and Singleton Clay Target Club at the start of each week of the blast dates and times for the upcoming week. Should a planned blast date aligned with days that activities are being undertaken at either location, then further consultation will be undertaken regarding specific management measures such as exclusion areas, forecast meteorological conditions and predicted impacts.

Suitable representatives from each organisation will also be included on the blast SMS services described in Section 11.2.1.

United Wambo are currently negotiating an agreement with Hunter Valley Gliding Club Cooperative Limited, this agreement encompasses blasting notification, adjustment of operations where practicable and impact mitigation. The agreement is required to be finalised prior to the commencement of Phase 2 of the Project.

11.2.3 Cumulative Blasting Impact Management

United Wambo will liaise with the operators of Wambo Mine and Hunter Valley Operations in relation to the coordination of blasts to avoid concurrent blasting and, therefore, cumulative airblast and vibration impacts. To prevent cumulative blasting impacts with surrounding mines, United Wambo includes the Drill & Blast Supervisors from Wambo Mine, Mount Thorley Warkworth Operations and Hunter Valley Operations (HVO) on all blast email notifications. Should blasting activities be scheduled to be fired simultaneously by United Wambo and another operation, blasts will be rescheduled in consultation with the other operation.

The assessment of concurrent blasts is included in the Pre-Blast Assessment Procedure.

In the event of a blast event being rescheduled, further email notification is made alerting neighbouring mining operations of the change.

11.2.4 Management of Blast Impacts for HVO South and Wambo Underground

Due to close locations of HVO South and Wambo Underground, United Wambo has introduced an additional level of interaction with these mines to minimise impact on both sides. United Wambo will continue liaise with the adjacent Wambo Underground and manage potential fume, dust ingress and vibration impact into underground workings. United Wambo and adjacent HVO South will require more advanced interaction as both operations can impact on each other (i.e. road closures, vibrations, dust and fumes). Relevant internal procedures will be developed.

11.2.4.1 Wambo Underground

As a Joint Venture partner United Wambo has liaised with Wambo Mine regarding the impacts of the United Wambo Open Cut. United Wambo will utilise the existing Wambo Coal blast criteria for the Wambo Underground Mine and CHPP in the design of blasts. Blast vibration predictions will be calculated using a site law calculator. If vibration is predicted to be above existing Wambo Coal criteria, the blast design will be amended until it satisfies the nominated criteria. Blast hole loading practices will include recording the mass of explosives loaded in each last hole that is then available to be verified against the blast design criteria. Any significant observed exceptions will be remodelled to determine compliance with the blast criteria for the Wambo Underground Mine and CHPP. If re-modelling indicates an exceedance of blast criteria, remedial action will be taken on the blast which may include removing explosives from blast holes prior to firing.

United Wambo will provide email notice three days in advance of blasting to Wambo operations (open cut, underground and CHPP) nominated representatives. In exceptional circumstances where a blast must be fired ahead of schedule without three days notification (e.g. spontaneous combustion adjacent to blast hole loading), United Wambo will liaise directly with nominated Wambo operations representatives to prioritise the safety of personnel and coordinate firing the blast safely in consideration of all operations.

In the initial blast notification, United Wambo will provide the location of the blast and the predicted vibration at the underground entry and CHPP. On the day of the blast a United Wambo representative will confirm the blast time with nominated Wambo operations representatives. The Wambo Underground Mine and CHPP will utilise the information provided to determine the appropriate action to be taken at the time of the blast in accordance with their own Safety Management Systems. The Wambo Underground Mine entry and CHPP are both outside of the Phase 1A and 1B United Open Cut pit shell 500m blast exclusion zone.

11.2.4.2 Hunter Valley Operations

As Glencore is a Joint Venture partner with Yancoal in ownership of Hunter Valley Operations (HVO), United Wambo has landholder permission and an 'in principle' agreement with HVO to blast adjacent to HVO land. Prior to Phase 2 United Wambo will enter into an agreement with HVO that will include processes to manage advance blast notifications, placement of blast sentries on HVO land when the blast exclusion zone encroaches HVO land, monitoring of vibration limits on critical HVO infrastructure, process to manage exceedance of the blast criteria and mitigation methods.

11.3 Structural Property Inspections and Investigations

In accordance with Condition D4 (a) (iii) of SSD 7142, United Wambo has notified in writing, all private landholders located within three kilometres of the approved open cut mining pits, that they are entitled to ask for an inspection to establish the baseline condition of any buildings or structures on their land, or to have a previous property inspection report updated.

In accordance with Conditions B13 and B14, if United Wambo receives a written request for a property inspection from any landowner within three kilometres then, within two months of receiving this request, the Applicant must:

- commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties to:
  - establish the baseline condition of any buildings and other structures on the land, or update the previous property inspection report; and

- identify measures that should be implemented to minimise the potential blasting impacts of the development on these buildings and structures; and

- give the landowner a copy of the new or updated property inspection report.

If there is a dispute over the selection of the suitably qualified, experienced and independent person, or if United Wambo or the landowner disagrees with the findings of the property inspection report, either party may refer the matter to the Planning Secretary for resolution.

In accordance with Conditions B15 to B17, if the owner of any privately-owned land within three kilometres of any approved open cut mining pit on the site, or any other landowner where the Planning Secretary is satisfied an investigation is warranted, claims in writing that buildings or structures on their land have been damaged as a result of blasting on the site, then within two months of receiving this written claim, United Wambo must:

- commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties to investigate the claim; and

- 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 United Wambo must repair the damage to the satisfaction of the Planning Secretary.

If there is a dispute over the selection of the suitably qualified, experienced and independent person, or United Wambo or the landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Planning Secretary for resolution.

11.4 Historic Heritage Items

United Wambo will manage blasting vibration and overpressure predictions for sensitive receivers including historic heritage items as required by SSD 7142.

11.4.1 Wambo Homestead Complex

United Wambo will monitor and report on potential ground vibration impacts on the Wambo Homestead Complex (WHC). The following mitigation measures are implemented:

- monitoring is undertaken at the WHC for all blasts within two kilometres of the Complex;

- a suitably qualified and experienced structural engineer, with expertise in vibration and blast monitoring, has been appointed to examine all monitoring records from the WHC blast monitoring station. The appointment of the structural engineer was approved in writing by the Director of the NSW Heritage Branch (formally the NSW Heritage Office) in November 2005;

- the structural engineer reports to United on the monitoring results each month for blasting within two kilometres of the WHC, and six monthly for the remainder of the Mine. Recommendations are made to ensure ongoing conservation and damage prevention. Copies of these reports are forwarded to the NSW Heritage Branch;

- the structural engineer will inspect the WHC structures annually and, as soon as practical, but no later than three days after blasting, monitoring which exceeds the ground vibration level of 5mm/s; and

- in the case of an unforeseen event (i.e. earthquake, cyclone, deluge or other damage), the structural engineer will make an assessment of whether blasting within two kilometres of the WHC is to cease or be managed in order to stabilise or repair the damage, and so advise the

applicant and the Director of the NSW Heritage Branch. If blasting has been required to cease, it is not to resume until the damage has been stabilised or repaired, and the written approval for resumption has been issued by the Director of the NSW Heritage Branch.

11.4.2 Montrose Shearing Shed, Shearing Shed and Creamery and Warkworth School

As per commitments made in the **United Wambo Historic Heritage Management Plan,** United Wambo has undertaken pre-blasting surveys of the Montrose Shearing Shed, Shearing Shed and Creamery and Warkworth School. The surveys of the Montrose Property Shearing Shed and the Shearing Shed and Creamery involved detailed archival recording due to the large impacts approved for these structures.

The survey of the Warkworth Public School was a baseline condition assessment undertaken prior to blasting. This assessment will be updated in consultation with the asset owner when blasting occurs within two kilometres of this item. Blast sizes will be managed to 5 mm/s for this building via the application of lower charge masses, except where agreed otherwise with the owner and/or based on a structural assessment that identifies an alternate acceptable vibration level. Ongoing blast vibration monitoring will be undertaken as part of the Project to monitor compliance with the relevant criteria.

11.4.3 Other Heritage Sites

Blast impacts at the other heritage sites shown in Appendix 5 of SSD 7142 are predicted to be negligible and therefore no further measures are proposed.

12. Blast Monitoring Program

The United Wambo Blast Monitoring Program has incorporated the existing Wambo Mine BMP and will include monitoring of airblast overpressure and ground vibration for all blasts at locations as close as reasonably practical to the nearest private residential receivers.

Monitoring will also be undertaken at relevant public/private infrastructure, heritage sites and the Wambo Homestead Complex.

The objective of the monitoring program is to obtain assurance that ground vibration and airblast overpressure limits are being achieved at private residential receivers and that damage criteria are being achieved for public/private infrastructure, heritage sites and the Wambo Homestead Complex.

12.1 Meteorological Monitoring

United Wambo maintains a continuous onsite meteorological monitoring station that comply with the requirements of the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007). The location of this meteorological monitoring station is identified on ***Figure*** 12-1.

The meteorological station is routinely calibrated and maintained by appropriately accredited technicians. The following parameters are monitored:

- rainfall;
- temperature – measured at two and 10 metres above ground level;
- wind speed

- wind gust
- wind direction – measured at 10 metres above ground level;
- sigma theta;
- pasquil stability classification (i.e. method categorising the amount of atmospheric turbulence);
- temperature lapse rate.

Meteorological based constraints on blasting are in use at United Wambo As discussed in **Table 11-2**, a pre-blast assessment protocol has been established so that the implications of adverse meteorological conditions are considered prior to blasting. The adverse meteorological conditions may have the potential to exacerbate dust, fume and overpressure impacts.

A weather forecast assessment is made on a daily basis and constraints are determined based on wind speed and direction and the potential for temperature inversions that may influence the impact of blasts on the community in accordance with the pre-blast assessment protocol. Constraints with regard to wind speed, wind direction and temperature inversions will be reviewed on an as required basis and modified where appropriate.

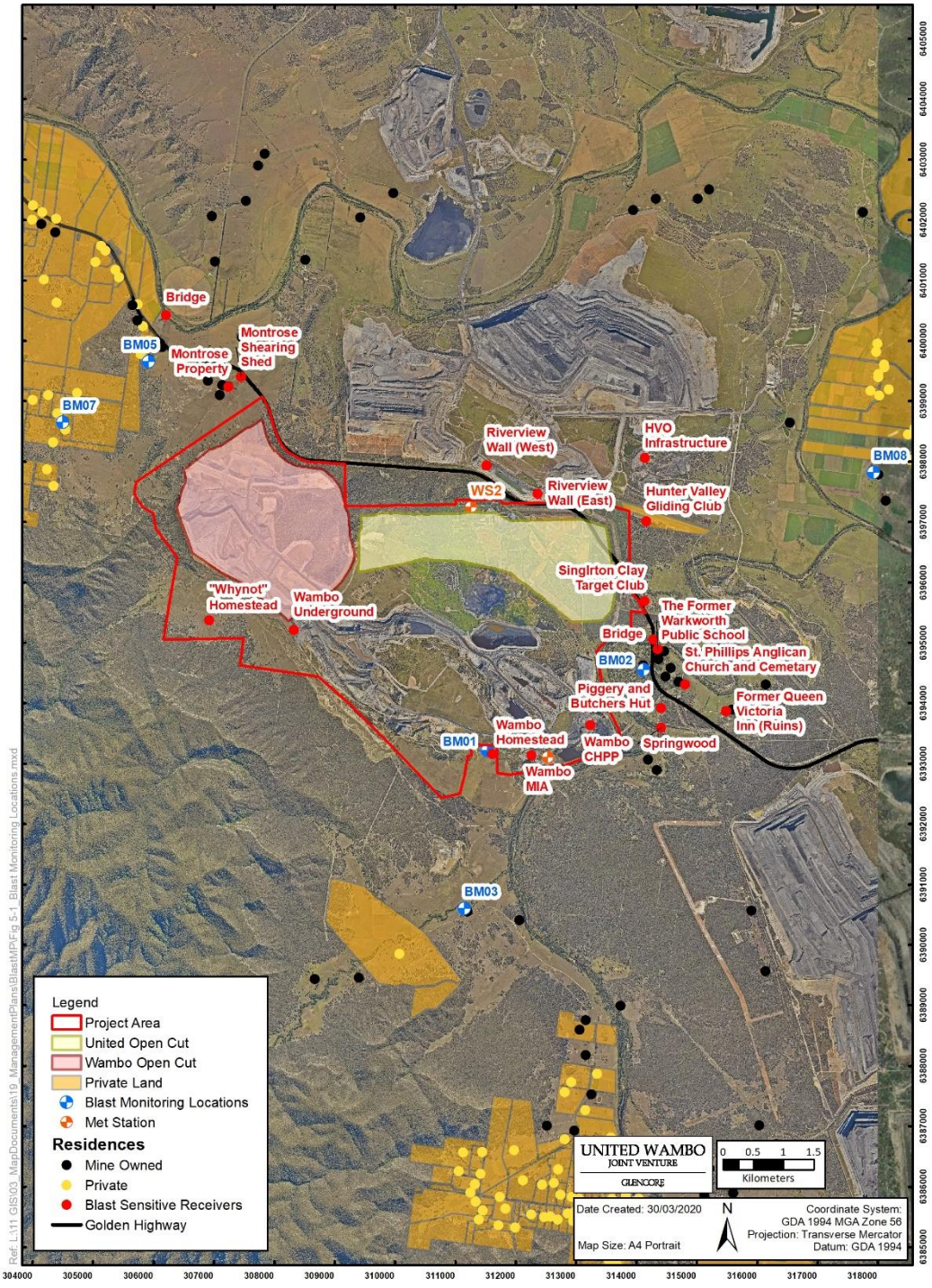

Figure 12-1: Blast Monitoring Locations

12.2 Blast Monitoring Locations

Monitoring locations for airblast overpressure and ground vibration are shown in ***Table 12-1*** and also highlighted in ***Figure 12-1***.

Table 12-1: Blast Monitoring Sites

Location	Site ID	Purpose	Easting	Northing	Justification
Wambo Homestead	BM01	Structural	311539	6393221	Data used to assess damage in accordance with *Australian Standard AS 2187.2-1993 "Explosives – Storage Transport and Use" for Sensitive and Heritage Structures*
Warkworth Village	BM02	Compliance	314120	6394560	Representative of the nearest sensitive receiver to south-east of the Mine
South Wambo	BM03	Performance	311155	6390609	Performance based monitoring on United owned land to the south of the Mine
Moses Crossing	BM05	Compliance	305919	6399662	Representative of the nearest sensitive receiver to north-west of the Mine
Redmanvale Road	BM07	Compliance	304496	6398655	Representative of the nearest sensitive receiver to north-west of the Mine
Maison Dieu[1]	BM08	Compliance	317931	6397825	Representative of the nearest sensitive receiver to north-east of the Mine

1 – To be installed prior to commencement of blasting

In preparation for when blasting commences in the United Open Cut Pit, an additional blast monitoring location (BM08) has been established to the north east of the site, in the vicinity of residences 485, 495 and 496.

Periodic monitoring of infrastructure, including the transmission towers, will be required when blasting is undertaken within 500m of the infrastructure.

12.3 Monitoring Methodology

Instrumentation used to measure and record the airblast overpressure and ground vibration levels will meet the requirements of *Australian Standard AS 2187.2-2006 (Explosives – Storage, Transport and Use* - Use *of Explosives).*

Monitoring equipment used onsite will typically include a geophone (e.g. standard 2 – 250 hertz geophone with a range of up to 254 mm/s) and microphone (e.g. with a range of between 80 - 140 decibels). The monitoring equipment will display the due date of upcoming calibration. Calibration of the monitoring units will be undertaken at a minimum of once per annum.

All blasts will be video-recorded to enable a post blast assessment of blast performance including potential flyrock, high airblast overpressure emission, dust and fume impacts.

12.4 Data Collection

United Wambo utilise both permanent fixed and temporary roaming blast monitoring units to collect relevant blast monitoring data. Fixed units utilise a radio transmitter to enable instantaneous transfer of data to relevant personnel. This data can be immediately accessed to enable an initial compliance assessment. Data from the roaming units is collected and stored within the unit and is available for download upon return to the office. All blast monitoring data is retained in a consolidated data base maintained by Environmental and Community Department.

Recording of all loading and blast details e.g. completed blast pack (see Appendix E), documented by blast crew and other production personnel will be stored and made available if required for blast investigation and/or blast review purposes.

12.5 Blast Fume Monitoring Trial

United Wambo have committed to undertake an assessment and trial of potential methods for monitoring post blast fume within two years of the commencement of Phase 2 of the Project, including the use of fixed and mobile gas monitoring equipment. The trial will determine the feasibility and benefit of utilising the monitoring equipment in comparison to using the AESIG (2011) Visual NOx Fume Rating Scale to determine offsite impacts. The trial will include:

- review of the outcomes of other fume monitoring trials, including the trial undertaken at the nearby Ravensworth Open Cut;
- investigation of available fume monitoring technology;
- trailing of fume monitoring technology, including:
  - fixed monitors located at onsite and offsite locations, and
  - mobile technology, including drones;
- a review of the monitoring trial results, assessing whether there are benefits provided by the use of the monitoring technology over the current visual monitoring using the AESIG (2011) Visual NOx Fume Rating Scale; and
- implementation of any outcomes that will improve the Project blast model and/or pre-blast procedure (such as more accurate predictions of fume impacts).

The assessment and trial would be completed within two years of the commencement of Phase 2 of the Project and any proposed changes to the fume monitoring system resulting from this trial will be implemented within this same timeframe. Progress on the fume monitoring trial will be reported on in the Annual Review.

As the details of the trial are confirmed, the BMP will be revised to provide specific details and the measures to be implemented for the management of blast fume at United Wambo.

12.6 Evaluation of Impacts and Performance

All blast monitoring results, video recordings of the blast and visual assessments made by relevant personnel, will be evaluated following the blast to determine compliance with the blast criteria and performance indicators in ***Section 10.1***, and to determine whether the proposed blast management and control measures in ***Section 11*** have been successful.

United Wambo will be deemed in non-compliance when airblast overpressure or ground vibration results exceed the blast criteria in ***Table 10-1*** when monitored at locations representative of privately owned residence/s or other monitoring sites.

United Wambo will record an incident where a 'Rating 3' blast fume event is observed leaving the Project Area or closed portion of a public road, or in the event of a 'Rating 4' or 'Rating 5' fume event generated.

If a blast fume event is observed leaving the Project Area towards a sensitive receiver location, the Blast Fume Incident Notification Procedure will be initiated in accordance with the Appendix A -Blast Fume Management Strategy.

Notification of reportable incidents to the relevant government authorities will be in accordance with **Section 14.2**.

12.7 Corrective Actions

In the event of a reportable environmental incident, all corrective actions identified through an investigation process will be implemented to mitigate the potential for a reoccurrence. Blasting mitigation and corrective management measures will consider:

- proximity of future blast activities to sensitive receivers;
- appropriate meteorological conditions;
- a review of the Pre-Blast Assessment Procedure; and
- a review of blast design and planning protocols.

12.8 Change Management

United Wambo's Change Management Procedure will be used to identify any proposed changes to existing activities that have the potential to exceed the blast criteria.

United Wambo will assess potential blasting impacts due to mining through the annual review of the environment and community broad brush risk assessment. The risk assessment will review whether the mine layout for the next budget period will result in any additional blast management impacts which are required to be managed.

13. Adaptive Management

13.1 Contingency Plan to Manage Unpredicted Impacts

Blast Management and Control Measures (**Section 11.1.2**) and Blast Monitoring Program (**Section 12**) have been implemented to minimise blast related impacts and monitor for, ground vibration, airblast overpressure, flyrock, fume and dust at neighbouring properties and other sensitive locations.

In the event that unpredicted impacts occur as a result of blasting activities United Wambo will:

- initiate Fume Incident Notification Procedure (as indicated in the Blast Fume Management Procedure, in regards to a fume event leaving the Project Area in the direction of adjacent neighbouring properties;
- implement Fume Incident Notification Procedure to clarify the immediate post-incident responsibilities in regards to a blast fume event leaving the Project Area;
- review the current blast controls and monitoring, to ensure it is effective and Blast Criteria is being met;

- if the system is effective and Blast Criteria is being met, continue implementation of blast controls and monitoring;
- if the system is not effective and Blast Criteria is being exceeded, undertake reporting in accordance with ***Section 14***;
- develop and implement additional blast management or mitigation measures in consultation with the affected landowners or infrastructure owners; and
- undertake follow-up blast monitoring to assess the effectiveness of the additional measures.

United Wambo have identified several applicable blasting scenarios that pose a potential risk to achieving the outcomes of the BMP. The Trigger Action Response Plans (TARPs) provided in **Table 6-1** to **Table 6-3** outlines contingency measures, responsibilities and management for unforeseen impacts as a result of blasting activities.

Table 13-1: Generation of Excessive Fume TARP

Unpredicted Impacts	TARP Code	BMP 'Achieved'	BMP 'Not Achieved'
Generation of excessive fume	**Trigger**	• No detectable blast fume	• Any blast fume verified leaving the Project Area in the direction of adjacent neighbouring properties • Blast fume verified **Level 3** or above and/or leaving Project Area
	Action	• No immediate action required other than monitor fume for changes	• Implement the Blast Fume Management Strategy (**Appendix A**) • Fume Incident Notification Procedure • Implement PIRMP • Record incident as required by **Section 14**
	Response	• Implement mitigation strategies to prevent reoccurrence after completion of investigation	
	Responsible Persons	• E&C Manager • D&B Engineer • D&B Superintendent	

Table 13-2: Exceedance of Criteria TARP

Unpredicted Impacts	TARP Code	BMP 'Achieved'	BMP 'Not Achieved'
Exceedance of blast	**Trigger**	• Blast monitoring reports confirm blast specific criteria were achieved at:	• Blast monitoring reports confirm specific criteria was exceeded at: - A Private Residence;

Unpredicted Impacts	TARP Code	BMP 'Achieved'	BMP 'Not Achieved'
specific criteria		- Private Residences - Wambo Homestead Complex (WHC) - Infrastructure	- Infrastructure; - Confirms results are in the reportable range (**Section 10.1**); and/or • Ground vibration and air blast levels at the WHC exceed the structural damage assessment criteria (**Section 10.1**)
	Action	• No immediate action required	• Report exceedances over 120dBL and 10mm/s at privately owned as required by **Section 14.2** and in accordance with the **PIRMP** • Inform property owner/s within 14 days in accordance with **Section 7** Initiate property inspections at the formal request of property owner/s in accordance with **Section 7** • E&C Manager to engage approved structural engineer to inspect the WHC structures as soon as practical, but no later than 3 days after blast monitoring results (**Section 10.1)** • Advise if action is required to repair damage to WHC in consultation with NSW Heritage Branch • Record incident as required by **Section 7**
	Response	• Implement mitigation strategies to prevent reoccurrence after completion of investigation	
	Responsible Persons	• E&C Manager • D&B Engineer • D&B Superintendent	

Table 13-3: Excessive Flyrock or Blast Dust TARP

Unpredicted Impacts	TARP Code	BMP 'Achieved'	BMP 'Not Achieved'
Failure of Blasting Mitigation Measures	**Trigger**	• Project specific blast criteria achieved and other blast mitigation measures working to control flyrock and dust generation in accordance with BMP	• Project specific blast criteria achieved however other mitigation measures did not adequately control flyrock and/or excessive dust generation in accordance with BMP
	Action	• No immediate action required	• Implement **PIRMP** if dust poses threatening material harm to the environment or community • Record incident as required by **Section 7**
	Response	• Implement mitigation strategies to prevent reoccurrence after completion of investigation	
	Responsible Persons	• E&C Manager • D&B Engineer • D&B Superintendent	

13.2 Continuous Improvement

United Wambo will implement all reasonable and feasible best practice blast management measures during the life of the operation. The basis for continuous improvement will consider implementation of new management measures and new technologies. Any new blast management measures that are implemented as a result of these reviews will be reported in the Annual Review as required by Condition E10 of SSD 7142.

United Wambo must assess and manage development-related risks to ensure that there are no exceedances of the criteria and performance measures in SSD 7142. Any exceedance of the criteria or performance measures constitutes a breach of SSD 7142.

14. Complaint and Incident Management

14.1 Community Enquiries and Complaints

United Wambo manages community complaints as per the complaints procedure outlined in the United Wambo Community Complaints Management Procedure.

United Wambo operate a 24 hour Community Response Line. E&C personnel are responsible for acknowledging complaints and commencing a complaint investigation within 24 hours of receiving the complaint and identifying any necessary preventative or corrective actions.

Complaints are recorded in the site's complaints database and forwarded to GCAA in accordance with the complaints procedure outlined in the United Wambo EMS.

Complainants are provided with a response within 24 hours, where practicable, outlining the findings of the complaint investigation and any preventative or corrective actions implemented.

A review of the effectiveness of the corrective or preventative actions will be conducted within a month of the complaint and the relevant work procedures updated, if required.

United Wambo will attempt to address the complainant's concerns, such that a mutually acceptable outcome is achieved. However, if required, an Independent Dispute Resolution Process would be referred to.

In the event that exceedances of the blasting criteria are detected, details of the exceedance will be provided to any affected landowner, tenants and the CCC within seven days.

A summary of complaints received and actions taken will be presented to the United Wambo Community Consultative Committee (CCC) as part of the operational performance review and reported in the Annual Review. A complaint register will be made available on the United Wambo website in accordance with Condition E15 of SSD 7142.

14.2 Incident Review and Reporting

All reportable incidents will be reported by the E&C Manager in accordance with the Pollution Incident Response Management Plan (PIRMP).

In accordance with the PIRMP, United Wambo must notify all relevant authorities DPIE of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of *Part 5.7* of the *POEO Act*, for example:

- fume generation: the reporting of fume events is discussed in the Appendix A -Blast Fume Management Strategy;
- exceedance of blast specific criteria: all blast overpressures exceeding 120 dBL and ground vibration levels exceeding 10 mm/s recorded at any of the external blast monitors located at private residences shall be reported. Internal investigations will be undertaken when blast overpressures exceed 115 dBL or ground vibration levels exceed 5 mm/s; and
- public safety and infrastructure damage: A blast event that causes damage to public/private infrastructure, poses a risk to safety of people or livestock in the surrounding area.

For all other incidents, exceedance of criteria or performance measures that do not cause threatening material harm to the environment associated with the Project, United Wambo will notify DPIE and any other relevant agencies as soon as practicable after United Wambo becomes aware of the incident.

United Wambo will take all reasonable and feasible steps to ensure that the any exceedance ceases and does not recur. United Wambo will consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action

The notification will be in writing to *compliance@planning.nsw.gov.au* and identify the development (United Wambo Open Cut Coal Mine Project (SSD 7142)) and set out the location and nature of the incident or exceedance.

Within seven days of becoming aware of a non-compliance with any of the conditions of SSD 7142, United Wambo must notify DPIE of the non-compliance. The notification must be in writing to *compliance@planning.nsw.gov.au* and identify the development (United Wambo Open Cut Coal Mine Project (SSD 7142)), set out the condition SSD 7142 that the development is non-compliant with, why

it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

15. Review and Improvement

15.1 Reporting

15.1.1 Annual Review

Environmental monitoring result summaries, compliance with SSD 7142 and EPL 3141 conditions and any required modifications to the blast monitoring will be reported in the Annual Review presented to the DPIE.

Details of continuous improvement measures will be reported in the Annual Review. Summaries will also be made available to the public via the United Wambo website in accordance with the EPA requirements for publishing monitoring data.

15.1.2 EPL Reporting

United Wambo will prepare and submit an Annual Return comprising a certified Statement of Compliance and a signed Monitoring and Complaints Summary to the EPA at the end of the EPL 3141 reporting period.

United Wambo will include the results of all blast monitoring required by EPL 3141 as a Blast Monitoring Report with the Annual Return. The Blast Monitoring Report will include the following information relating to each blast carried out within the premises during the reporting period covered by the Annual Return:

- the date and time of each blast;
- the assessment criteria;
- the location of each blast on the premises;
- the blast monitoring results (airblast overpressure and ground vibration) and at each blast monitoring location;
- identification of any non-compliance;
- capture rate of the monitoring system including an explanation for any missing blast monitoring results.

The Annual Return for the reporting period will be supplied to the EPA not later than 60 days after the end of each reporting period. United Wambo will retain a copy of the Annual Return for a period of at least four years after the Annual Return was due to be supplied to the EPA.

15.2 Plan Review

This BMP and associated documents will be reviewed in accordance with SSD 7142 and the United Wambo EMS that states that this must occur within three months of:

- the submission of an Annual Review under Condition E10 of SSD 7142;
- the submission of an environmental incident report under Condition E10 of SSD 7142;

- the submission of an Independent Environmental Audit under Condition E11 of SSD 7142; or
- the approval of any modification of the conditions of SSD 7142 .

The review process is also to reflect changes in environmental legislation and guidelines and changes in technology or operational procedures. If any significant modifications to the BMP are required as an outcome of the review, relevant government agencies will be consulted regarding the changes and the revised Plan will be submitted to DPIE for approval by the Secretary within 4 weeks.

15.3 Audits

In accordance with Condition E11 of SSD 7142, within 12 months of commencement of operations, and every three years thereafter, United Wambo will commission an Independent Environmental Audit to the satisfaction of DPIE. The Audit will include an assessment of the adequacy of the BMP, including the blast monitoring program. Where necessary following the audit, the BMP and monitoring program will be updated and action taken to improve performance and management practices.

15.4 Training

Personnel, including employees and contractors, operating at United Wambo will be required to undertake generic blast management training through the GCAA Generic Surface Induction followed up by the Site Familiarisation.

In addition, toolbox talks and other workforce communication measures will be utilised to ensure the workforce is continuously updated with any changes to the Blast Management Plan, and any arising issues are discussed and knowledge is disseminated.

For the operating personnel, besides certain ticket requirements* (e.g. shotfirer ticket), personnel involved directly in the drill and blasting processes will undertake blast awareness training (or when there is a change in personnel) at time intervals as specified by United Wambo management. The training will incorporate safety aspects of drill and blasting processes, environmental obligations, environmental monitoring in relation to blast controls to ensure minimal impacts on the surrounding environment, and/or updates regarding any changes in the industry or technological changes.

Note, Ticket requirements*: All blast personnel will require training in certain blasting requirements and equipment operation. There are nationally accredited courses pitched at various levels and units of competence.

16. Document Information

Relevant legislation, standards and other reference information must be reviewed and monitored for updates and should be included in the site management system. Related documents and reference information in this section provides the linkage and source to develop and maintain site compliance information.

16.1 Related Documents

Related documents, listed in ***Table 16-1*** below, are internal documents directly related to or referenced from within this document. Some of these documents have not been reviewed or endorsed by the DPIE.

Due to the sensitive nature of some of these internal documents and procedures, these documents are not made publically available and are strictly for United Wambo personnel only.

Table 16-1: Related Documents

Title
Pre-Blast Assessment Procedure
Change Management Procedure
Pollution Incidence Response Management Plan

16.2 Reference Information

Reference information, listed in ***Table 16-2*** below, is information that is directly related to the development of this document or referenced from within this document.

Table 16-2: Reference information

Title
Standards Australia (2006) Australian Standard (AS) 2187.2-2006:
Explosives – Storage and Use – Use of explosives
Coal Mine Health and Safety Act 2002
Coal Mine Health and Safety Regulation 2006
Environmental Impact Statement (Umwelt 2016b)
Blasting Impact Assessment for United Wambo (see EIS Umwelt - Appendix 8)
SSD 7142 Conditions of Consent (United Wambo)
United Environmental Protection Licence EPL 3141
Work Health and Safety Act 2011
Work Health and Safety Regulations 2011
Explosives Act 2003
The Manufacture and Storage of Explosives Regulations 2005
MDG 1012 Use of explosives in underground coal mines

Title
AS 2187.1 - 1998: Explosives – Storage, Transport and Use, Part 1 - Storage
AS 2187.2 – 2006: Explosives – Storage, Transport and Use, Part 2 – Use of Explosives
AS 2187.0 –1983: Storage transport and use – Terminology
Australian Explosives Industry and Safety Group Inc (2011) Code of Practice; Prevention and Management of Blast Generated NOx Gases in Surface Blasting

16.3 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 16-3*** below.

Table 16-3: Change information

Version	Date	Review Team/Consultation	Change Summary
1.0	November 2018	United Wambo and Enviro Strata Consulting	Blast Management Plan prepared
1.1	February 2020	United Wambo Drill & Blast Superintendent and Environment & Community Manager	Updated in line with SSD 7142 and EPL 3141
2.0	March 2020	United Wambo Drill & Blast Superintendent, Mine Manager and Environment & Community Department	Incorporated review comments from DPIE.

17. Accountabilities

The key accountabilities associated with the BMP are highlighted below.

Role	Responsibilities
Operations Manager	Approve the Blast Management Plan
Drill & Blast Engineer	Undertake blast design accounting for all geological information Facilitate and/or implement blast management controls in accordance with the blast management system Consult with neighbouring mines to minimise cumulative impacts from blasting Coordinate the infrastructure monitoring program Undertake blast fume monitoring in accordance with Blast Fume Management Procedure
Drillers	Record relevant drilling information and report any environmental issues
Shotfirers	Load and fire according to the blast design Comply with blast checklist Notify of any abnormalities that may lead to non-compliance
Drill & Blast Superintendent	Ensure that the drill pattern is drilled according to the design Ensure that the blasting pattern is loaded with explosives and stemming according to the blast design Facilitate and/or implement blast management controls in accordance with the blast management system
Environment & Community Manager	Coordinate blast monitoring according to the BMP Manage and report blast incidents Review the performance of the blast management plan in meeting the objectives/targets
Environment & Community Coordinator	Coordinate the vibration/overpressure monitoring program Coordinate structural assessments on heritage items Manage blast related complaints. Evaluate monitoring results and compliance with approval conditions/blast management plan commitments Undertaken blast management reporting Train relevant personnel in the requirements of the plan Review the performance of the blast management plan in meeting the objectives/targets

Role	Responsibilities
All Persons	Comply with the requirements of this BMP

Appendix A - Blast Fume Management Strategy

UNITED WAMBO
JOINT VENTURE

GLENCORE

Blast Fume Management Strategy

Number: UWOC-1796953183-5
Owner: Drill & Blast Superintendent
Status: Draft
Version: 1.0
Effective: 28 February 2020
Review: 28 February 2022

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1. Purpose

The purpose of this procedure is to outline prevention and mitigation strategies to manage the potential health and environmental impacts of blast fume at the United Wambo Open Cut Coal Mine (United Wambo). It defines the accepted categories for post blast NOx categorisation, reporting requirements and provides information on how to respond to a situation where it is believed that personnel have been exposed to NOx.

2. Scope

This procedure applies to all United Wambo employees, contractors and sub-contractors, undertaking surface blasting activities at United Wambo. This procedure also details the relevant roles and responsibilities for personnel involved in blast fume management across the site.

This procedure should be read in conjunction with the Explosives Principal Control Plan.

3. Procedure

3.1 Background

Fume is the group of gases known as Oxides of Nitrogen or NOx, a combination of post blast gases which are predominantly nitrogen dioxide, but may also include small amounts of nitrous oxide, nitric oxide, carbon monoxide and carbon dioxide. The two main gases, nitric oxide (NO) and nitrogen dioxide (NO2) are often found as by-products in the post-blast gases of ammonium nitrate-based explosives. Nitric oxide is invisible, but nitrogen dioxide ranges from yellow to dark red / purple depending on the concentration and size of the gas cloud. These gases are harmful to humans if inhaled in large quantities.

3.2 Factors Impacting NOx Generation

Factors which will influence the generation of NOx during blasting include:

a) explosive formulation and quality assurance;

b) explosive product selection;

c) on-bench practices;

d) rainfall;

e) blast design;

f) geological conditions;

g) contamination of explosive in the blast-hole; and

h) sleep time.

3.3 Planning and Prevention

3.3.1 Blast Designs

All blasts designs will be as per site Drill & Blast Design procedure for varying overburden, interburden and coal strata and loaded in accordance with Loading Bulk Explosive. Sleep times are not permitted to exceed the manufacturer's recommendations unless unforeseen exceptional circumstances arise in which case the Manager of Mining Engineering, in consultation with relevant personnel, will make a risk based determination regarding the necessity to delay firing the blast.

Following the completion of drilling, United Wambo will dip drill holes in advance of loading when practicable to verify drill hole depth and presence of water. Blast loading designs will be updated to reflect the most accurate information from drill hole dip records when available i.e. explosive product selection, explosive volume, stemming height.

3.3.2 Product Selection

Product selection for wet or dry holes and various geological conditions will be in consideration of factors outlined in ***Appendix A - Blast Fume Mitigating Factors***, using the most accurate information from drill hole dip records when available.

Where evidence of water is present, both in hole and strata moisture, United Wambo will utilise emulsion based bulk explosive product to reduce the potential adverse effects water has on Amonium Nitrate, however, this product adds significant cost to drill and blast activities. Therefore, to minimise mining costs where United Wambo considers conditions are suitable, as determined by the Drill & Blast Engineer, in consultation with the Shotfirer, United Wambo will use alternative explosive products.

3.3.3 Environmental Factors

Consideration of meteorological conditions will be in accordance with United Wambo's Pre Blasting Meteorological Assessment. A pre-blast assessment protocol has been established so that the implications of adverse meteorological conditions that may have the potential to exacerbate dust, fume and overpressure impacts are considered prior to blasting.

A weather forecast assessment is made on a daily basis and constraints are determined based on wind speed and direction in accordance with the pre-blast assessment protocol. Constraints with regard to wind speed and direction will be reviewed on an as required basis and modified where appropriate.

3.4 Pre-Blast Fume Risk Assessment

United Wambo will adopt blasting practices that balance both safety and environmental performance. To enable the most efficient blast performance, United Wambo utilise the ***AEISG NOx Risk Assessment Proforma Tool*** to assess specific influences on post blast fume in consideration of the overall blast performance. The ***AEISG NOx Risk Assessment Proforma Tool*** was completed prior to the commencement of blast design at United Wambo resulting in the development of a flowchart for the selection of appropriate products in all geology at varying depths see ***Figure 3-1***.

Pre-blast assessments for each individual blast will be undertaken in accordance with ***Appendix E – Minimum Requirements for a Blast Pack*** of the ***Blast Management Plan.***

The ***AEISG NOx Risk Assessment Proforma Tool*** will be reviewed and updated annually, or in response to a fume incident.

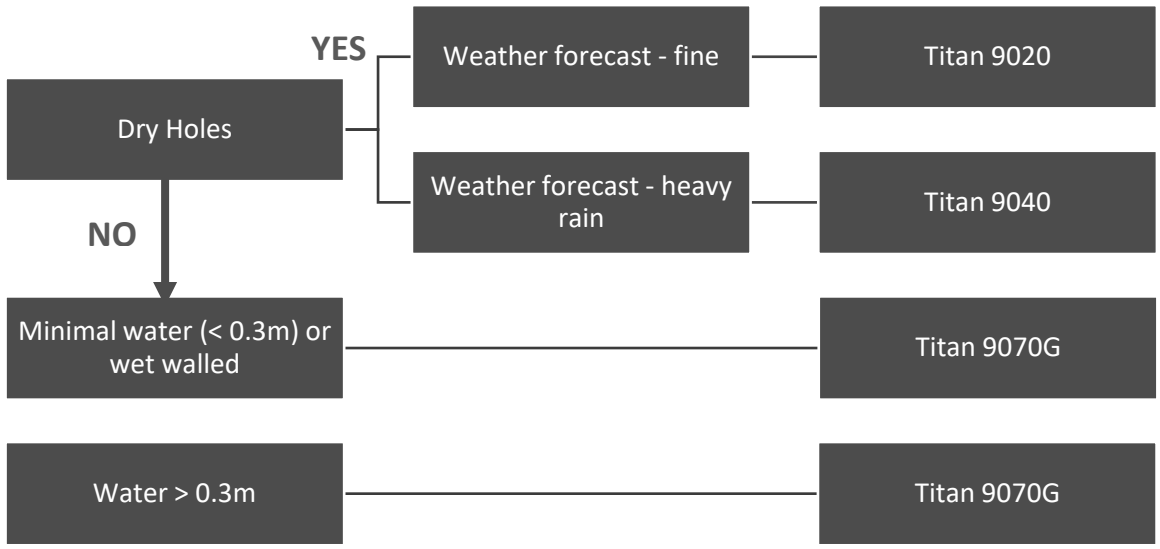

Figure 3-1: Explosives Product Selection Matrix

3.5 Fume Mitigation Controls

There are many contributing factors to consider when designing a blast that minimises the potential for a fume event. Over a period of time United Wambo will develop experience drilling and blasting the seams in the United Open Cut (seams which are not all currently mined at the Wambo Open Cut). The Drill & Blast Engineer is responsible for all blast designs at United Wambo. Blast designs will be influenced by varying geological conditions of seams, conditions that will be identified during production drilling operations prior to loading explosives. United Wambo will utilise a continuous improvement philosophy based on drill and blast experience in each seam to adjust design parameters for optimal performance. Blast design parameters to be considered based on information obtained during production drilling operations include:

- Explosives product selection suitable to the moisture content of various strata;
- Powder factor selection to sufficiently fragment the strata for the safety of mining operations;
- Blast pattern timing that protects adjacent blast holes, but does not confine the explosive product reaction; and
- Explosives sleep time minimised in weathered material (nominally 1 week when practicable)

More details on contributing factors, their characteristics and mitigation measures are detailed in ***Appendix A - Blast Fume Mitigation Factors.***

3.6 Rating and Recording of Blast Fume Events

All blasts will be video recorded to capture the post blast environment. The video camera will be manned where possible in order to follow the path of any fume generated. All videos will be a minimum duration of one minute following the blast event or until the fume dissipates or leaves the view of the camera. Video footage will be stored for a minimum of one year on site.

All blasts at United Wambo will be fume-rated applying the AESIG (2011) Visual NOx Fume Rating Scale in ***Appendix A - Blast Fume Mitigation Factors***. In the case of a fume event, video recording of the

blast events is utilised to assist in the determination of an appropriate fume ranking for reporting purposes.

Each blast will be ranked when fume is at its greatest extent using the AEISG ranking provided in ***Appendix A - Blast Fume Mitigation Factors*** and all written records kept for a minimum of two years.

Meteorological monitoring will be used to determine the likely, if any, offsite impact of NOx fume events post blasting.

It is important to note that the visual appearance of a post-blast NOx gas plume will depend on both the concentration of NOx gases and the size of the plume, therefore, the visual rating is approximate and therefore provides a mechanism for categorising NOx fume development only.

3.7 Reporting of Significant Blast Fume Events

The Environment & Community Manager or delegate will notify the Department of Planning, Industry and Environment (DPIE) for an post blast fume event which is a:

- Rating three at its highest extent and leaves the Project Approval boundary; or
- Rating four or five, whether it leaves site or not.

Any contact with the community or government regulators relating to fume events should be made through the Environment & Community Manager or delegate.

3.8 Fault Tree Analysis of Post-Blast Fume

Should NOx be produced in a surface blast, the following fault tree (***Figure 3-2***) can be used to identify which of the fundamental causes was the significant contributor to the generation of NOx. Once the likely causes have been identified, appropriate action plans can then be put in place to mitigate and reduce the generation of NOx from future surface blasts. The fault tree can also be used to educate those responsible for surface blasts as to their responsibilities in ensuring appropriate steps are taken in the design, loading and firing of the blast to minimise the likelihood of generating NOx from the blast.

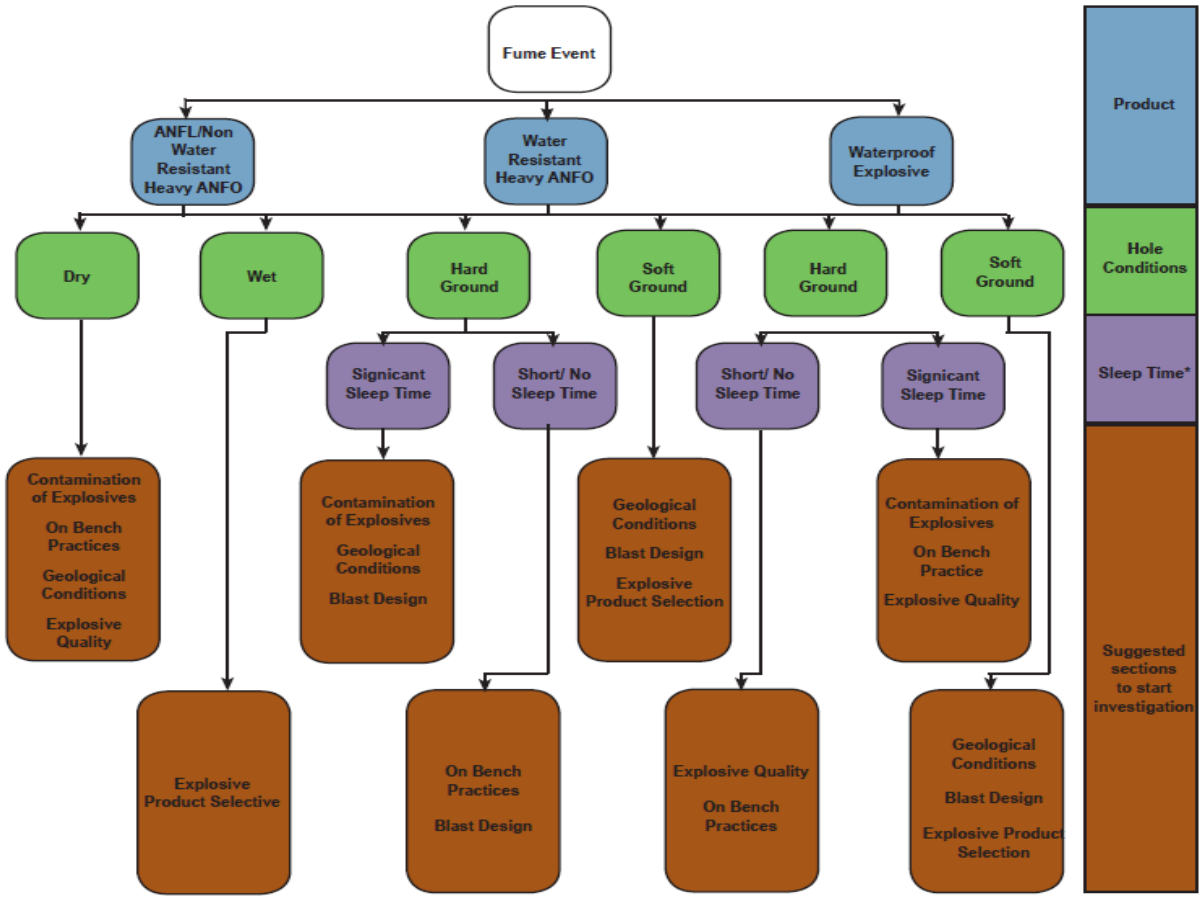

Figure 3-2: Fume Event Fault Tree Analysis (AEISG Code of Practice)

4. Emergency Response and Exposure Management

4.1 Fume Emergency

Generally, post-blast fume will dissipate to background levels in a relatively short time. Dissipation is highly dependent on local atmospheric conditions. However, in cases where the post-blast fume does not dissipate and has the potential to result in the exposure to people a fume event emergency shall be managed as per ***UWOC-1689771511-30 – Emergency Management***.

Immediate response includes:

- Shotfirer, Supervisor or sentry or any witness to raise emergency based on observations. Advice for anyone potentially affected by fume;
- do not enter the plume;
- move away from the path of the plume;
- seek fresh air;
- use water to reduce the amount of exposure to wash out eyes and clear nose and throat;
- if indoors, close all windows and doors and stay inside; and
- for vehicle occupants, stay inside with windows up and air conditioning on recirculate.

4.2 Notification of Sensitive Receptors

In the event that blast fume is observed leaving the site towards private or tenanted residences, the Environment & Community Manager or delegate will notify the affected residents of the potential fume event approaching their property and to proceed with measures to avoid potential exposure to the blast fume. Current contact details for landholders who may potentially be impacted by a blast fume event, are detailed in the ***Fume Incident Notification Procedure***.

4.3 Incident Response

In the event of a level three or higher blast fume leaving the Project Approval boundary, in accordance with the Pollution Incident Response Management Plan (PIRMP), immediate action will also be taken to determine whether the incident can be classified as a 'material harm incident', i.e. considered to be causing or threatening material harm. As defined by Section 147 of the POEO Act, a material harm incident has occurred if the incident:

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

The determination of a material harm incident will be made by the Operations Manager in consultation with the Environment & Community Manager. If the Operations Manager is not available immediately, the determination will be made by the Environment & Community Manager.

In the event that a fume event is considered to have caused material harm (as defined above), immediate notification will be provided to the agencies listed in ***Table 4-1***.

Table 4-1: PIRMP Notification Details

Agency	Contact Details
Fire and Rescue	000 (To be contacted first if the incident presents an immediate threat to human health or property and emergency services are required, or contacted last if emergency response is not required)
EPA	131 555
Ministry of Health	(02) 4924 6477 (ask for Public Health Officer on call)
WorkCover	13 10 50
Singleton Council	(02) 6578 7290 (office hours) or (02) 6572 1400 (after hours)
Extra reporting requirements required by Project Approval and Mining Lease	
Department of Planning and Environment	02 6575 3400 and also send an email to: compliance@planning.nsw.gov.au
Division of Resources and Geosciences	(02) 4931 6605

In addition to this, a record of blast time, wind conditions and the video captured shall be forwarded to the Environment & Community Manager for consideration and the PIRMP will be implemented.

4.4 Responding to Personal Exposure to Fume

If exposure to fume is believed to have or has the potential to impact sensitive receivers, United Wambo will contact these receivers. Typically, these will be the same receivers contacted regarding blasting times and provide instructions on how to manage, limit and mitigate exposure.

If employees have the potential to be impacted by exposure to fume, directions will be provided by sentries and/ or the Drill & Blast Superintendent to limit and mitigate exposure.

The steps below detail the protocol that is to be followed in the event that a person believes that they may have been exposed to post blast fume.

Step 1

A person who believes they are being exposed to post blast fume should move to a safe location into a fresh air environment and warn others in the area that may become exposed where possible.

Notify their Supervisor immediately or, if warranted, declare an emergency in accordance with the ***Emergency Response Plan***.

- D.R.S.A.B.C.D manage priorities
- Rest the patient to avoid anxiety
- Provide high concentration oxygen therapy to the patient
- The patient should not be given food or fluids
- Assess the patient and record baseline observation i.e. respiratory rate and effort, skin colour etc.

Step 2

- Call for an ambulance and advise of a suspected post blast fume exposure, the symptoms of the patient will determine if the ambulance is called using 000 or the ambulance bookings number.
- Notify the Health & Safety Department so a representative can attend the hospital and assist the patient as required.
- Obtain a copy of Blast Fume Doctor Information for the patient to take with them when they attend the hospital ***Appendix C - Blast Fume Doctor Information***.

Step 3

- The patient must not be left alone or allowed to drive themselves to the medical facility. Repeating baseline observations every 20-30 minutes should be maintained.

Step 4

- The patient or accompanying ambulance officer will hand over the Blast Fume Doctor Information to the attending medical officer for their reference and assessment. A medical check of the patient will be performed and, if considered necessary, the doctor may require the person to be admitted for observation if required. A United Wambo representative will then advise the injured person's family of the situation.

Step 5

- If, following the medical examination and investigations, the patient is not admitted they will be driven back to work.

Step 6

- Upon arrival back at work, the person should report to their supervisor and advise them of the results of the investigation.

5. Monitoring and Review

All employees will complete general blast fume awareness training in their GCAA generic induction and the site familiarisation induction. Additional education and awareness programs will be provided for relevant personnel outlining the relevant risks and control measures associated with blast fume, consistent with their roles and responsibilities as they are detailed in this document and the Blast Management Plan.

6. Document Information

Relevant legislation, standards and other reference information must be regularly reviewed and monitored for updates and should be included in the site management system. Related documents and reference information in this section provides the linkage and source to develop and maintain site compliance information.

6.1 Related Documents

Related documents, listed in ***Table 6-1*** below, are *documents* directly related to or referenced from within this document.

Table 6-1: Related documents

Title
Blast Signoff (Blast Pack) Procedure
Drill and Blast Quality Control Procedure
Explosives Principal Control Plan
Post Blast Fume Personnel Exposure Procedure
Pre Blasting Meteorological Assessment Procedure

6.2 Reference Information

Reference information, listed in ***Table 6-2*** below, is *information* that is directly referred to for the development of this document.

Table 6-2: Reference information

Reference	Title
Legislation	Work Health and Safety (Mines and Petroleum Sites) Act 2013
	Work Health and Safety (Mines and Petroleum Sites) Regulation 2014
	Work Health and Safety Act 2011
	Work Health and Safety Regulation 2017
	Explosives Act 2003
	Explosive Regulation 2013
	Environmental Planning and Assessment Act 1979
	Environmental Planning and Assessment Regulation 2000
	Protection of the Environment Legislation Amendment Act 2011
	Work Health and Safety (Mines and Petroleum Sites) Act 2013
	Work Health and Safety (Mines and Petroleum Sites) Regulation 2014
	Work Health and Safety Act 2011
	Work Health and Safety Regulation 2017
Australian Standards	AS/NSZ 4801 Occupational Health and Safety Management Systems
Industry	Towards Best Practice in the Mitigation & Management of Post-Blast Fume – Orica
	Blast Guarding in an Open Cut Environment - Edition 1 March 2011 - Australian Explosives Industry And Safety Group Inc.
	Prevention and Management of Blast Generated NOx Gases in Surface Blasting – Edition 2 August 2011 - Australian Explosives Industry And Safety Group Inc.
	Department of Employment, Economic Development and Innovation - Safety Alert No. 44 V2 15 March 2011
	Coal Mine Health and Safety Act & Regulations
	Work Health and Safety Act and Regulations

Reference	Title
	Department of Planning & Infrastructure Blast Fume Management Strategy letter from Chris Wilson 26 June 2012
	Towards Best Practice in the Mitigation & Management of Post-Blast Fume – Orica
	Blast Guarding in an Open Cut Environment - Edition 1 March 2011 - Australian Explosives Industry And Safety Group Inc.
	Prevention and Management of Blast Generated NOx Gases in Surface Blasting – Edition 2 August 2011 - Australian Explosives Industry And Safety Group Inc.
	Department of Employment, Economic Development and Innovation - Safety Alert No. 44 V2 15 March 2011
	Coal Mine Health and Safety Act & Regulations
GCAA	GCAA-625378177-9994: 8.0 Health and Hygiene

6.3 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 6-3*** below. Example detail shown below.

Table 6-3: Change information

Version	Date	Change Details
1.0	March 2020	New Document

Appendix A - Blast Fume Mitigation Factors

Contributing Factor	Sub Category	Characteristics of fume	Mitigation
Product Formulation	Product incorrectly formulated	• Persistent • All blasts and all locations utilising a specific product	Explosives formulated to manufacturer recommended oxygen balance to minimise the likely hood of post blast fume
	Delivery system metering incorrectly	• Persistent • All areas associated with loading from a specific delivery system	• Monthly calibration of metering systems (if a hole is overloaded it will be detected prior to stemming and rectified prior to blasting) • Quality control of explosives products conducted in accordance with manufacturer's recommendations
	Delivery systems settings for product delivery manually overridden		Do not override calibration settings on manufacturing systems
	Explosives precursors not manufactured to specification	• Increased frequency • All blasts and all locations utilising product(s) that incorporate a specific precursor	Confirm with supplier that precursors are within specification
	Precursor degradation during transport and storage	• Variable • Traceable to a precursor which has degraded between manufacture and use	• Secure storage location and stock rotation management • Secure transport and transfer precursors • Inspection and/or testing of precursors prior to use in accordance with manufacturer's recommendations

Contributing Factor	Sub Category	Characteristics of fume	Mitigation
			• Suitable storage of raw materials (e.g. protect stored AN bags from rain, ensure no water in diesel storage tank, etc)
	Raw material changes	• Persistent • All blast and locations utilising product(s) that incorporate a specific raw material	• Change management procedures in place by suppliers • Prior notification to suppliers from site management systems where precursors are supplied by sites, for example customer supplied fuels
	Inadequate product sensitivity for conditions of application	• If product is fundamentally insensitive, expect persistent post blast fume in all blasts and all locations • If product is insensitive for some applications on site, expect persistent post blast fume in specific locations only (e.g. small diameter/or deep blast holes)	• Follow manufacturer's recommendations on product selection specific to blasthole depth and diameter • On bench quality control conducted in accordance with manufacturer's recommendations • Ensure sufficient time for chemical processes (e.g. gassing) to complete prior to stemming
Product Selection	Non water resistant products loaded into wet or dewatered holes	• Variable • Blasts containing wet/dewatered blastholes only	• Use the Explosives Product Selection Matrix as provided in Figure 3-1 • Follow manufacturer's recommendations on product selection • Regular education of bench crew on product recommendations from the supplier • Discipline in on-bench practices (refer to section below)
	Excessive energy in weak/soft strata desensitising adjacent product columns	• Persistent • In specific areas known to contain weak/soft strata only	• Understand geology of each shot and design blast (timing and product) to match, for example reduction of powder factor

Contributing Factor	Sub Category	Characteristics of fume	Mitigation
			• Follow manufacturer's recommendations on product selection • Obtain technical assistance if required to ensure optimal result
	Primer of insufficient strength to initiate explosive column	• Persistent • All blasts using a particular primer type/size	• Follow manufacturer's recommendations on compatibility of initiating systems with explosives
	Desensitisation of explosive column from in-hole cord initiation	• Persistent • Only in areas where in-hole cord initiation is used	• Follow manufacturer's recommendations on compatibility of initiating systems with explosives
On-bench Practices	Hole conditions not understood	• Variable • Only when using non water resistant explosive products	• Dip all holes prior to loading • Record wet, dewatered and dry holes on blast pattern and use this information as a basis for product selection • Measure recharge rate of dewatered holes and choose products according to manufacturer's recommendations • Record load sheets for each hole • 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 • Use blasthole cameras to ascertain hole condition in critical areas • Minimise sleep time

Contributing Factor	Sub Category	Characteristics of fume	Mitigation
	Blast not drilled as per drill plan	• Variable • Can be correlated with inaccurately drilled patterns	• Maintenance of accurate drilling records and review of blast design if required to compensate for inaccuracies
	Dewatering of holes diverts water into holes previously loaded with dry hole products	• Variable • Only when using non water resistant explosive products	• Load wet holes first and dip remaining hoes prior to loading. Adjust product selection according to manufacturer's recommendations
Changes to Conditions after Loading	Dynamic water	• Variable • Preceded by the observation of slumped blast holes • Usually when using non water resistant explosive products	• Record slumped holes • Understand hydrology of pit and plan blasting to avoid interaction between explosives and dynamic water (either natural or from other pit operations) • Use hole liners • Minimise sleep time of shot
	Excessive sleep time leading up to deteriorated product	• Variable • Preceded by the observation of slumped blast holes	• Fire blasts within manufacturer's recommended sleep time
Meteorological Conditions	Rainfall on sleeping shot Strong Winds	• Variable • Following rainfall • Usually when using non water resistant explosive products • May be preceded by the observation of slumped blast holes	• Review rainfall forecasts for planned sleep time of shot and select products according to manufacturer's recommendations • Minimise sleep time for non-wet hole products if rain is predicted • Bench design for water runoff • Seal product column with water resistant product

Contributing Factor	Sub Category	Characteristics of fume	Mitigation
			• Seal top of stemmed holes with gas bags • Seal top of stemmed holes with drill cuttings to minimise water ingress • Consistent energy matched blast design for wet-hole products • Use hole savers to minimise runoff from bench entering holes • A pre-blast meteorological assessment will be completed leading up to the scheduled time of the blast. The pre-blast meteorological assessment will consider wind speed and direction and the potential for temperature inversions that may influence the impact of blasts on the community • Where conditions are determined to be unfavourable, the blast will be delayed, postponed or cancelled until favourable meteorological conditions are observed
Blast Design	Explosive desensitisation in deep holes	• Persistent • In deep holes only	• Reduce bench height • Ensure adequate relief in deep holes • Follow manufacturer's recommendations on product selection and blast design for deep holes, for example decking where appropriate • During Phase 1A and 1B, depth of drilled holes on the site does not exceed 40m and is therefore not considered a contributor to fume
	Intra-hole explosive desensitisation in decked holes	• Persistent • When using decks only	• Appropriate separation of explosives decks

Contributing Factor	Sub Category	Characteristics of fume	Mitigation
	Initiation of significant explosive quantities in a single blast event	• Intensity of post blast fume proportional to explosives quantity used	• Reduce blast size in order to reduce total explosive quantity being initiated in the one blast event • Reduce powder factor
Geological Conditions	Excessive confinement in weak/soft strata	• Persistent • In specific areas known to contain weak/soft strata only	• Free-dig where possible (drill holes often fail) • Understand geology of each shot and design blast (timing and product) to ensure adequate relief in weak/soft strata, for example incorporation of a free face, reduction of powder factor, modified timing, etc • Minimise blast size and depth
	Product seeping into cracks	• Variable • In specific areas known to contain a high incidence of faulted/fractured ground only	• General practice is to stand off faulted fractured ground where practicable • Follow manufacturer's recommendations on product selection • Use hole liners • Maintenance of accurate drill records which are used to map geological conditions • Record and monitor holes which are slumped or require excessive product to reach stemming height, but where water is not present
	Dynamic water in holes	• Variable • Preceded by the observation of slumped blast holes • Usually when using non-water resistant explosive products	• Use the Explosives Product Selection Matrix as provided in Figure 3-1 • Minimise sleep time of shot • Follow manufacturer's recommendations on product selection

Contributing Factor	Sub Category	Characteristics of fume	Mitigation
			• Measure recharge rates of if dewatering, and choose products according to manufacturer's recommendations • Record slumped holes and use this information to build understanding of pit hydrology • Understand hydrology of pit and plan blasting to avoid interaction between explosives and dynamic water (either natural or from other pit operations) • Use hole liners
	Moisture in clay	• Persistent • In clay strata only	• Maintain a low powder factor, giving consideration to the water resistance of the products used and how this may impact sleep time. Hole liners may be required for ANFO
	Blast hole deterioration between drilling and loading	• Variable • Traceable to specific geological areas	• Minimise time between drilling and loading • Use blast hole cameras to ascertain hole condition in critical areas • Use hole savers • Mine planning to ensure benches are unaffected by back break from earlier blasts, for example presplits, buffers, etc • Optimise drilling practices to minimise hole damage through rock cracking, etc • Use drilling mud to stabilise hole (confirm chemical compatibility with explosive first)
Contamination of Explosives in the Blast Hole	Product mixes with mud/sediment at the bottom of hole	• Variable	• Optimise drilling practices to minimise hole damage

Contributing Factor	Sub Category	Characteristics of fume	Mitigation
		• Blasts containing wet/dewatered holes only	• Ensure appropriate loading practices are followed during charging • Ensure primer is positioned in undiluted product • Insert gas bag to separate mud/sediment from explosive charge • Use hole savers
	Interaction of product with drilling muds	• Persistent • Blasts where drilling mud is used in conjunction with a given product	• Confirm compatibility of drilling mud with explosives before use • Ensure that drilling muds and other chemicals used on bench are managed through change management systems
	Penetration of stemming material into top of explosive column (fluid/pumpable products only)	• Variable • Blast charged fluid/pumpable explosive products only	• Use appropriate stemming material • Ensure product has gassed completely before stemming • Seal top of explosives prior to stemming
	Water entrainment in product	• Variable • Blast containing wet/dewatered blast holes and/or overloaded holes that have been washed out with water only	• Load wet holes first and dip remaining holes prior to loading. Adjust product selection according to manufacturer's recommendation. • Eliminate top loading into wet holes • Ensure primer is positioned in undiluted product • Use of gas bags in dewatered holes, ensuring water does not creep above the gas bag • Seal top of the explosives column to prevent water ingress

Contributing Factor	Sub Category	Characteristics of fume	Mitigation
			• Use hole liners • Reduce excessive hose lubrication during charging • Measure water recharge rate after dewatering and adjust product selection according to manufacturer's recommendations • Select products for wet holes according to manufacturer's recommendations • Ensure procedures exist around hose handling to eliminate water entrainment during loading • Load low holes last where practical • Use suitable, safe dewatering techniques

Appendix B - AEISG Post-Blast Fume Rating Guideline

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	

Assessing the amount of NOx gases produced from a blast will depend on the distance the observer is from the blast and the prevailing weather conditions. The intensity of the NOx gases produced in a blast should be measured on a simple scale from 0 to 5 based on the table above. The extent of the NOx gases also needs to be assessed and this should be done on a simple scale from A to C where:

A = Localised (i.e. NOx Gases localised across only a few blast holes)

B = Medium (i.e. NOx Gases from up to 50% of blast holes in the shot)

C = Extensive (i.e. Extensive generation of NOx Gases across the whole blast)

Pantone colour numbers have been included in the following Field Colour Chart to ensure colours will be produced correctly thereby ensuring a reasonable level of standardisation in reporting NOx gas events across the blasting industry. These are presented in ***Table 6-4***.

Table 6-4: Field Colour Chart for Blast Fume Category Assessment

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 gas		Pantone 161C (RGB 99, 58, 17)

Source: AEISG, 2011, 2nd Edition

Appendix C - Blast Fume Doctor Information

Dear Doctor,

This patient has 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 (N_2O, NO, NO_2, N_2O_4, N_2O_3, N_2O_5). Nitrogen Dioxide (NO_2) is the principal hazardous nitrous fume.

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 way injury can 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 from four to 12 hours

MEDIUM TERM

- RADS (Reactive Airways Dysfunction Syndrome)
- In rare cases, bronchiolitis obliterans, which may take from two to six weeks to appear

LONG TERM

- Chronic respiratory insufficiency

High-level exposure, particularly associated with methhaemoglobinaemia, can cause chest pain, cyanosis and shortness of breath, tachypnoea 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 show until a few hours after exposure and are aggravated by physical effort. Before 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 may be required:

- spirometry
- chest x-ray
- methaemoglobin estimation

Because of the risk of delayed onset of pulmonary oedema, 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.

For more information please contact the Health and Safety Department at United Wambo on (02) 6549 5500.

Source: Queensland Department of Employment, Economic Development and Innovation, 2011, Prevention and management of blast fumes, Explosives safety alert no. 44 | 15 March 2011 | Version 2

Appendix B - Road Closure Management Plan (United Wambo)

UNITED WAMBO
JOINT VENTURE

GLENCORE

Road Closure Management Plan

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Figures

Tables

1. Purpose

The purpose of this Road Closure Management Plan (RCMP) is to provide a management plan for the temporary closure of the Golden Highway and Comleroi Road, when blasting undertaken by the United Wambo Open Cut Coal Mine (United Wambo) is within 500m of the public road.

2. Scope

This plan applies to all blasts within 500 metres of the public roads for Phase 1A and Phase 1B of the Development (See SSD 7142). An updated Road Closure Management Plan will be completed when the Project progresses to Phase 2 of the Development.

3. Planning

In accordance with Part B, Condition B21(f) of Project Approval SSD 7142, United Wambo must prepare a Blast Management Plan for any blasting within 500 metres of a public road. United Wambo will close any public road within 500 metres of the boundary of a blast on the mine site while firing a blast. This radius may be increased if the risk of fly-rock is considered high, or where there is any other potential risk to road users, or any other environmental factor that requires road closure.

United Wambo will implement road closures for blasting within 500 metres of Golden Highway or Comleroi Road. The road will not be closed for periods longer than is necessary, delays of approximately 15 minutes are anticipated and no more than once per day, except where required for blast misfires or blasts required to ensure the safety of the mine, its workers or the general public.

Blasting will be conducted as per applicable drill and blast procedures and the United Wambo Blast Management Plan.

3.1 Road Occupancy Licence

United Wambo have been issued Road Occupancy Licence No. 1375018 ***Appendix A - Approval From Roads and Maritime Service*** (RMS) for the period 25 March 2020 to 25 September 2020. United Wambo will renew the licence as required to allow road closures of the Golden Highway.

3.2 Use of a Council Road – Works within a road reserve

United Wambo have been issued an Approval for Use of a Council Road Application No. 4640/2020 ***Appendix B - Approval from Singleton Council*** (SC) for the period 25 March 2020 to 24 March 2021. United Wambo will renew the approval as required to allow road closures of Comleroi Road.

4. Implementation

4.1 Major Hazards

Major hazards include:

- emergency vehicle access required along road during blasting;
- failure to maintain security of access points;
- public liability;
- dust/fume cloud leaving site perimeter;
- potential fly rock impact on Golden Highway/Comleroi Road and associated traffic delays;
- lack of communication of potential road delays to community;
- noxious cloud affecting personnel/public; and
- public refusing to recognize the roadblock.

4.2 Road Closure Management

This document provides a process for road closure management for United Wambo in accordance with United Wambo Blast Management Plan. Road closures are subject to approval by the Roads and Maritime Service (RMS) for the Golden Highway and Singleton Council (SC) for Comleroi Road. The key aspects of this document include:

a) the notification of affected parties;

b) procedures for road closure and traffic management;

c) modified shotfiring procedures; and

d) a protocol for the passage of emergency vehicles.

4.3 Notification

Where blasting is to be undertaken within 500 metres of a public road, the following notifications will be required:

a) an advertising campaign will be run in the Singleton Argus to inform the public about blasting commencing at United Wambo, given that road closures will be required for every blast for the first few years, this communication will form part of the advertisement and the requirement for notification every week will be reviewed in consultation with Singleton Council;

b) permanent signage will be erected on the Golden Highway and Comleroi Road. Signage will be updated as early as practicable the day prior to blasting to advise regular users of the likely time, date and duration of road closure;

c) United Wambo will contact all interested parties (including Singleton Council, Hunter Valley Gliding Club, Warkworth Clay Target Club and neighbouring mines) of a scheduled road closure as early as practicable the day prior to blasting;

d) United Wambo will update the Community Enquiries Line 24 hours prior to the scheduled blast event and advise of the road closure;

e) traffic control will be notified at least two days prior to blasting; and

f) all parties will be punctually notified in the event that a blast is postponed.

4.4 Permanent Blast Notification Signage

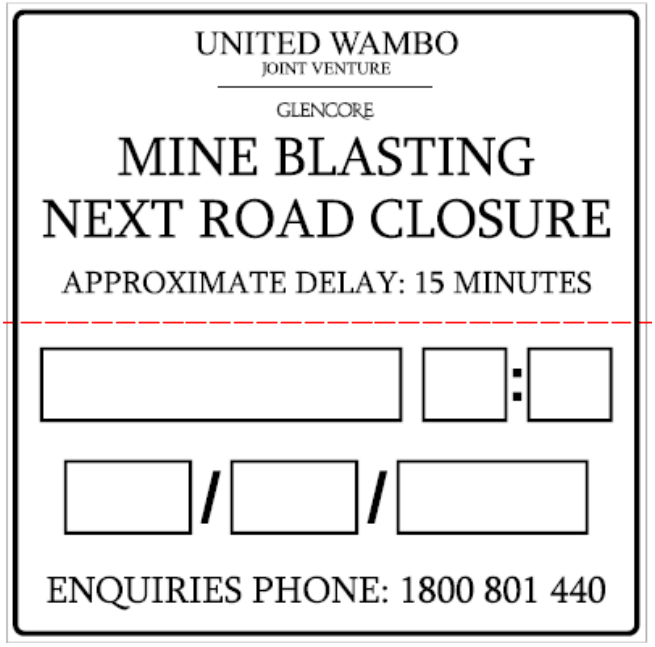

Figure 4-1: Permanent Blast Notification Signage

4.5 Blasting Restrictions

- Blasting will only be undertaken between 9:00 am and 5:00 pm Monday to Saturday (inclusive).
- There will be a maximum of three blasts a day and 15 blasts a week.
- Blasting related closures of the Golden Highway and Comleroi Road will be limited to one per day.
- Blasting will be restricted during adverse meteorological conditions in accordance with the Pre-Blast Assessment Procedure.
- Consultation will be undertaken with adjacent mines to avoid concurrent blasting.

4.6 Temporary Road Closure

United Wambo will comply with the requirements of the *Roads Act 1993* and ensure that traffic control is carried out in accordance with the RTA manual 'Traffic Control at Worksites'.

The impact of temporary road closures will be reduced by:

- minimising the duration of closures, both on a per event basis and weekly basis through good drill and blast planning practices;
- avoiding road closures during peak traffic periods such as shift changes as far as reasonable; and
- co-ordinating closures with Wambo Mine and HVO to minimise the cumulative effect of road closures through provision of road closure schedules between the mines

A Traffic Management Plan developed by Guardian Traffic Services Pty Ltd is provided in Appendix C - Traffic Management Plan.

Traffic controllers must be setup and in position 30 minutes prior to the anticipated firing time, and will be able to make radio contact with the Blast Controller, via an appointed supervising sentry, until the blast has been cleared. The supervising sentry will be stationed with the traffic controllers on the controlled section of public road throughout the blast event.

Experienced mine site sentries can be placed on private access roads, and must be familiar with the road closure and shotfiring procedures.

The traffic controllers and sentries must close the road prior to the blasting, when advised by the Blast Controller. An appointed supervising sentry must then clear all traffic and personnel from the affected area and advise the Blast Controller when this has been completed.

All traffic must be halted for the duration of the blast. In the case of emergency traffic, or other inadvertent access, refer to ***Section 4.8***.

The appointed supervising sentry must not re-open the road until advised by the Blast Controller that it is safe to do so and the road has been inspected by the appointed supervising sentry to ensure it is in a safe and trafficable condition.

Any damage, fly-rock, or other problems must be rectified, with personnel available on standby for immediate road clearing purposes if deemed necessary. The RMS and/or Singleton Council must be notified of any damage to the road and remedial work undertaken by qualified road repair personnel, in consultation with RMS and Singleton Council, in a timely manner so as to minimise disruption to public thoroughfare.

When the blast has been cleared, normal traffic can be resumed and signage removed.

4.7 Shotfiring Procedure

The Blast Controller must fire the blast in accordance with the United Wambo Blast Management Plan (BMP) and other applicable blasting and environmental procedures, with the following exceptions:

- blasting will not take place at times when adverse environmental conditions (or other prevailing conditions) make road closure hazardous;
- blasts requiring the closure of public roads will not be tied up if environmental conditions are expected to prevent blasting within the required timeframe; and
- if a misfire is idenfied during the post blast inspection while the Golden Highway is closed, the following process will be triggered. If it needs to be immediately re-fired for safety reasons, the road may be re-opened after appropriate inspection to allow traffic flow for the duration of the reset period and closed again to fire the secondary shot, or, if the misfire is not a threat to safety, it will be treated as a separate blast in order to prevent lengthy road delays. If the Blast Controller deems it necessary, the road may remain closed until the misfire event is addressed.

After firing, the Blast Controller must advise the traffic controllers (via the appointed supervising sentry) when it is safe to check the road for damage/fly rock. If road conditions are deemed satisfactory, traffic flow may be permitted (under supervision of traffic controllers). Traffic controllers will remain in position until the Blast Controller has provided final clearance for the blast.

4.8 Access for Emergency Vehicles or Inadvertent Access

If traffic controllers or sentries encounter emergency vehicles (police, ambulance, fire, mines rescue, etc) requiring immediate access to the closed road(s), it may be necessary to abort the blast. This may also apply if other parties refuse to stop or ignore signage.

Traffic controllers and/or sentries must break radio silence and inform the Blast Controller if access is required (or has occurred) once shotfiring is in progress. If the blast can be halted, emergency vehicles can be allowed to pass with an escort and the shotfiring procedure recommenced once the road is clear and resecured.

Alternatively, emergency services vehicles will be escorted through the road closure section post-blast, as soon as the route is made safe.

5. Review and Improvement

Road closures discussed in this plan are subject to approval by the Roads and Maritime Service and Singleton Council.

This plan will be reviewed every two years (or as required) as part of the Blast Management Plan. This procedure will also be reviewed if unexpected blast performance/behaviour indicates that changes to road closure practices or clearance distances are required.

6. Document Information

Relevant legislation, standards and other reference information must be reviewed and monitored for updates every two years in line with the document review and should be included in the site management system. Related documents and reference information in this section provides the linkage and source to develop and maintain site compliance information.

6.1 Related Documents

Related documents, listed in ***Table 6-1*** below, are *documents* directly related to or referenced from within this document.

Table 6-1: Related Information

Title
Blast Management Plan
Principal Control Plan for Explosives
Blast Fume Management
Blast Sentries
Loading Bulk Explosives
Blasting Firing
Pre-Blasting Meteorological Assessment

6.2 Reference Information

Reference information, listed in ***Table 6-2*** below, is *information* that is directly referred to for the development of this document.

Table 6-2: Reference Information

Title
RMS Traffic Control at Work Sites Manual
AS 1742.1:2014 - Manual of uniform traffic control devices - General introduction and index of signs
AS 1743:2018 – Road signs - Specifications
AS 1742.2: 2009 – Manual of uniform traffic control devices - Traffic control devices for general use
AS 1906.1:2007 - Retroreflective materials and devices for road traffic control purposes - Retroreflective sheeting

6.3 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 6-3*** below. Example detail shown below.

Table 6-3: Change Information

Version	Date	Change Details
1.0	March 2020	New Document

7. Accountabilities

The key accountabilities associated with the RCMP are highlighted below.

Role	Responsibilities
Drill & Blast Engineer	Ensure the correct road closure and road occupancy permits and licences are valid and in place for blasting Design blasting activities to minimise impacts on surrounding infrastructure and minimise the number of road closures Ensure that all the required road closure notifications have been undertaken prior to blasting
Drill & Blast Superintendent	Ensure that the drill pattern is drilled according to the design Ensure that the blasting pattern is loaded with explosives and stemming according to the blast design Facilitate and/or implement blast management controls in accordance with the blast management system
Designated Road Closure Supervisor	Coordinate the closure of the Golden Highway and Comleroi Road for the purposes of blasting, ensuring it conforms to the standards required for the safe and effective closure of a public road
Environment & Community Manager	Coordinate blast monitoring according to the BMP Manage and report blast incidents Review the performance of the road closure management plan in meeting the objectives/targets

Appendix A - Approval from Roads and Maritime Service

ROAD OCCUPANCY LICENCE

LICENCE NO : 1375018

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: WATT ST, WARKWORTH

To: LEMINGTON RD, JERRYS PLAINS

Council: SINGLETON

LICENSEE

Organisation: United Wambo Joint Venture

Ref No:

Name: Aislinn Farnon

Phone: 0429306208

ONSITE CONTACT

Name: Aislinn Farnon

Phone: 0429306208

TRAFFIC MANAGEMENT

Flow Management: Stop / Slow Control

Closure Type: All lanes both directions

Closure Lane(s): Shoulder

Direction(s): Eastbound and Westbound

LICENCE DURATION

From: 25-Mar-2020

To: 24-Sep-2020

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 ASSET MANAGEMENT BRANCH.

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

APPROVED DATES & TIMES

From Shift					To Shift			
From	D	M	Time	-	To	D	M	Time
Wed	25	Mar	08:00	-	Wed	25	Mar	18:00
Thu	26	Mar	08:00	-	Thu	26	Mar	18:00
Fri	27	Mar	08:00	-	Fri	27	Mar	18:00
Sat	28	Mar	08:00	-	Sat	28	Mar	18:00
Mon	30	Mar	08:00	-	Mon	30	Mar	18:00
Tue	31	Mar	08:00	-	Tue	31	Mar	18:00
Wed	01	Apr	08:00	-	Wed	01	Apr	18:00
Thu	02	Apr	08:00	-	Thu	02	Apr	18:00
Fri	03	Apr	08:00	-	Fri	03	Apr	18:00
Sat	04	Apr	08:00	-	Sat	04	Apr	18:00
Mon	06	Apr	08:00	-	Mon	06	Apr	18:00
Tue	07	Apr	08:00	-	Tue	07	Apr	18:00
Wed	08	Apr	08:00	-	Wed	08	Apr	18:00
Thu	09	Apr	08:00	-	Thu	09	Apr	18:00
Fri	10	Apr	08:00	-	Fri	10	Apr	18:00
Sat	11	Apr	08:00	-	Sat	11	Apr	18:00
Mon	13	Apr	08:00	-	Mon	13	Apr	18:00
Tue	14	Apr	08:00	-	Tue	14	Apr	18:00
Wed	15	Apr	08:00	-	Wed	15	Apr	18:00
Thu	16	Apr	08:00	-	Thu	16	Apr	18:00
Fri	17	Apr	08:00	-	Fri	17	Apr	18:00
Sat	18	Apr	08:00	-	Sat	18	Apr	18:00
Mon	20	Apr	08:00	-	Mon	20	Apr	18:00
Tue	21	Apr	08:00	-	Tue	21	Apr	18:00
Wed	22	Apr	08:00	-	Wed	22	Apr	18:00
Thu	23	Apr	08:00	-	Thu	23	Apr	18:00
Fri	24	Apr	08:00	-	Fri	24	Apr	18:00
Sat	25	Apr	08:00	-	Sat	25	Apr	18:00
Mon	27	Apr	08:00	-	Mon	27	Apr	18:00
Tue	28	Apr	08:00	-	Tue	28	Apr	18:00
Wed	29	Apr	08:00	-	Wed	29	Apr	18:00

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.

ROAD OCCUPANCY LICENCE

LICENCE NO : 1375018

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: WATT ST, WARKWORTH

To: LEMINGTON RD, JERRYS PLAINS

Council: SINGLETON

LICENSEE

Organisation: United Wambo Joint Venture

Ref No:

Name: Aislinn Farnon

Phone: 0429306208

ONSITE CONTACT

Name: Aislinn Farnon

Phone: 0429306208

TRAFFIC MANAGEMENT

Flow Management: Stop / Slow Control

Closure Type: All lanes both directions

Closure Lane(s): Shoulder

Direction(s): Eastbound and Westbound

LICENCE DURATION

From: 25-Mar-2020

To: 24-Sep-2020

LICENCE CONDITIONS

6 A SHOULDER CLOSURE THAT IS AT NO TIME A TRAFFICABLE LANE, FOR THE PLACEMENT OF ADVANCE WARNING SIGNAGE, MAY OCCUR DURING THE LICENSED PERIOD, 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 SIGNAGE, 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.
* EMERGENCY SERVICES MUST BE INFORMED IN ADVANCE, ON EVERY OCCASION THIS LICENSE IS ACTIVATED AND GIVEN PRIORITY ACCESS THROUGH THE CLOSED PORTION OF ROAD IN THE EVENT OF AN EMERGENCY.
* 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.
* SHOULD SIGNIFICANT TRAFFIC DELAYS OR QUEUES OCCUR AS A RESULT OF THE WORKSITE TRAFFIC CONTROL OR THE ACTIVITY, THE TRAFFIC CONTROL SUPERVISOR MUST IMMEDIATELY INFORM THE TRANSPORT FOR NSW TRANSPORT MANAGEMENT CENTRE ON 1300 725 886 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.
* EQUIPMENT TO CLEAR POTENTIAL FLYROCK FROM ROADWAYS MUST ALWAYS BE PROXIMATE TO THE CLOSED PORTION OF ROAD.

APPROVED DATES & TIMES

From Shift					To Shift			
From	D	M	Time	-	To	D	M	Time
Thu	30	Apr	08:00	-	Thu	30	Apr	18:00
Fri	01	May	08:00	-	Fri	01	May	18:00
Sat	02	May	08:00	-	Sat	02	May	18:00
Mon	04	May	08:00	-	Mon	04	May	18:00
Tue	05	May	08:00	-	Tue	05	May	18:00
Wed	06	May	08:00	-	Wed	06	May	18:00
Thu	07	May	08:00	-	Thu	07	May	18:00
Fri	08	May	08:00	-	Fri	08	May	18:00
Sat	09	May	08:00	-	Sat	09	May	18:00
Mon	11	May	08:00	-	Mon	11	May	18:00
Tue	12	May	08:00	-	Tue	12	May	18:00
Wed	13	May	08:00	-	Wed	13	May	18:00
Thu	14	May	08:00	-	Thu	14	May	18:00
Fri	15	May	08:00	-	Fri	15	May	18:00
Sat	16	May	08:00	-	Sat	16	May	18:00
Mon	18	May	08:00	-	Mon	18	May	18:00
Tue	19	May	08:00	-	Tue	19	May	18:00
Wed	20	May	08:00	-	Wed	20	May	18:00
Thu	21	May	08:00	-	Thu	21	May	18:00
Fri	22	May	08:00	-	Fri	22	May	18:00
Sat	23	May	08:00	-	Sat	23	May	18:00
Mon	25	May	08:00	-	Mon	25	May	18:00
Tue	26	May	08:00	-	Tue	26	May	18:00
Wed	27	May	08:00	-	Wed	27	May	18:00
Thu	28	May	08:00	-	Thu	28	May	18:00
Fri	29	May	08:00	-	Fri	29	May	18:00
Sat	30	May	08:00	-	Sat	30	May	18:00
Mon	01	Jun	08:00	-	Mon	01	Jun	18:00
Tue	02	Jun	08:00	-	Tue	02	Jun	18:00
Wed	03	Jun	08:00	-	Wed	03	Jun	18:00
Thu	04	Jun	08:00	-	Thu	04	Jun	18:00

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.

ROAD OCCUPANCY LICENCE

LICENCE NO : 1375018

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: WATT ST, WARKWORTH

To: LEMINGTON RD, JERRYS PLAINS

Council: SINGLETON

LICENSEE

Organisation: United Wambo Joint Venture

Ref No:

Name: Aislinn Farnon

Phone: 0429306208

ONSITE CONTACT

Name: Aislinn Farnon

Phone: 0429306208

TRAFFIC MANAGEMENT

Flow Management: Stop / Slow Control

Closure Type: All lanes both directions

Closure Lane(s): Shoulder

Direction(s): Eastbound and Westbound

LICENCE DURATION

From: 25-Mar-2020

To: 24-Sep-2020

APPROVED DATES & TIMES

From Shift					To Shift			
From	D	M	Time	-	To	D	M	Time
Fri	05	Jun	08:00	-	Fri	05	Jun	18:00
Sat	06	Jun	08:00	-	Sat	06	Jun	18:00
Mon	08	Jun	08:00	-	Mon	08	Jun	18:00
Tue	09	Jun	08:00	-	Tue	09	Jun	18:00
Wed	10	Jun	08:00	-	Wed	10	Jun	18:00
Thu	11	Jun	08:00	-	Thu	11	Jun	18:00
Fri	12	Jun	08:00	-	Fri	12	Jun	18:00
Sat	13	Jun	08:00	-	Sat	13	Jun	18:00
Mon	15	Jun	08:00	-	Mon	15	Jun	18:00
Tue	16	Jun	08:00	-	Tue	16	Jun	18:00
Wed	17	Jun	08:00	-	Wed	17	Jun	18:00
Thu	18	Jun	08:00	-	Thu	18	Jun	18:00
Fri	19	Jun	08:00	-	Fri	19	Jun	18:00
Sat	20	Jun	08:00	-	Sat	20	Jun	18:00
Mon	22	Jun	08:00	-	Mon	22	Jun	18:00
Tue	23	Jun	08:00	-	Tue	23	Jun	18:00
Wed	24	Jun	08:00	-	Wed	24	Jun	18:00
Thu	25	Jun	08:00	-	Thu	25	Jun	18:00
Fri	26	Jun	08:00	-	Fri	26	Jun	18:00
Sat	27	Jun	08:00	-	Sat	27	Jun	18:00
Mon	29	Jun	08:00	-	Mon	29	Jun	18:00
Tue	30	Jun	08:00	-	Tue	30	Jun	18:00
Wed	01	Jul	08:00	-	Wed	01	Jul	18:00
Thu	02	Jul	08:00	-	Thu	02	Jul	18:00
Fri	03	Jul	08:00	-	Fri	03	Jul	18:00
Sat	04	Jul	08:00	-	Sat	04	Jul	18:00
Mon	06	Jul	08:00	-	Mon	06	Jul	18:00
Tue	07	Jul	08:00	-	Tue	07	Jul	18:00
Wed	08	Jul	08:00	-	Wed	08	Jul	18:00
Thu	09	Jul	08:00	-	Thu	09	Jul	18:00
Fri	10	Jul	08:00	-	Fri	10	Jul	18:00

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This Activity : Temporary road closure for blasting purposes

LOCATION

Subject Road: GOLDEN HWY

From: WATT ST, WARKWORTH

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Council: SINGLETON

LICENSEE

Organisation: United Wambo Joint Venture

Ref No:

Name: Aislinn Farnon

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ONSITE CONTACT

Name: Aislinn Farnon

Phone: 0429306208

TRAFFIC MANAGEMENT

Flow Management: Stop / Slow Control

Closure Type: All lanes both directions

Closure Lane(s): Shoulder

Direction(s): Eastbound and Westbound

LICENCE DURATION

From: 25-Mar-2020

To: 24-Sep-2020

APPROVED DATES & TIMES

From Shift					To Shift			
From	D	M	Time	-	To	D	M	Time
Sat	11	Jul	08:00	-	Sat	11	Jul	18:00
Mon	13	Jul	08:00	-	Mon	13	Jul	18:00
Tue	14	Jul	08:00	-	Tue	14	Jul	18:00
Wed	15	Jul	08:00	-	Wed	15	Jul	18:00
Thu	16	Jul	08:00	-	Thu	16	Jul	18:00
Fri	17	Jul	08:00	-	Fri	17	Jul	18:00
Sat	18	Jul	08:00	-	Sat	18	Jul	18:00
Mon	20	Jul	08:00	-	Mon	20	Jul	18:00
Tue	21	Jul	08:00	-	Tue	21	Jul	18:00
Wed	22	Jul	08:00	-	Wed	22	Jul	18:00
Thu	23	Jul	08:00	-	Thu	23	Jul	18:00
Fri	24	Jul	08:00	-	Fri	24	Jul	18:00
Sat	25	Jul	08:00	-	Sat	25	Jul	18:00
Mon	27	Jul	08:00	-	Mon	27	Jul	18:00
Tue	28	Jul	08:00	-	Tue	28	Jul	18:00
Wed	29	Jul	08:00	-	Wed	29	Jul	18:00
Thu	30	Jul	08:00	-	Thu	30	Jul	18:00
Fri	31	Jul	08:00	-	Fri	31	Jul	18:00
Sat	01	Aug	08:00	-	Sat	01	Aug	18:00
Mon	03	Aug	08:00	-	Mon	03	Aug	18:00
Tue	04	Aug	08:00	-	Tue	04	Aug	18:00
Wed	05	Aug	08:00	-	Wed	05	Aug	18:00
Thu	06	Aug	08:00	-	Thu	06	Aug	18:00
Fri	07	Aug	08:00	-	Fri	07	Aug	18:00
Sat	08	Aug	08:00	-	Sat	08	Aug	18:00
Mon	10	Aug	08:00	-	Mon	10	Aug	18:00
Tue	11	Aug	08:00	-	Tue	11	Aug	18:00
Wed	12	Aug	08:00	-	Wed	12	Aug	18:00
Thu	13	Aug	08:00	-	Thu	13	Aug	18:00
Fri	14	Aug	08:00	-	Fri	14	Aug	18:00
Sat	15	Aug	08:00	-	Sat	15	Aug	18:00

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NON DEVELOPMENT - INVESTIGATION

Project: Not Applicable

This Activity : Temporary road closure for blasting purposes

LOCATION

Subject Road: GOLDEN HWY

From: WATT ST, WARKWORTH

To: LEMINGTON RD, JERRYS PLAINS

Council: SINGLETON

LICENSEE

Organisation: United Wambo Joint Venture

Ref No:

Name: Aislinn Farnon

Phone: 0429306208

ONSITE CONTACT

Name: Aislinn Farnon

Phone: 0429306208

TRAFFIC MANAGEMENT

Flow Management: Stop / Slow Control

Closure Type: All lanes both directions

Closure Lane(s): Shoulder

Direction(s): Eastbound and Westbound

LICENCE DURATION

From: 25-Mar-2020

To: 24-Sep-2020

APPROVED DATES & TIMES

From Shift					To Shift			
From	D	M	Time	-	To	D	M	Time
Mon	17	Aug	08:00	-	Mon	17	Aug	18:00
Tue	18	Aug	08:00	-	Tue	18	Aug	18:00
Wed	19	Aug	08:00	-	Wed	19	Aug	18:00
Thu	20	Aug	08:00	-	Thu	20	Aug	18:00
Fri	21	Aug	08:00	-	Fri	21	Aug	18:00
Sat	22	Aug	08:00	-	Sat	22	Aug	18:00
Mon	24	Aug	08:00	-	Mon	24	Aug	18:00
Tue	25	Aug	08:00	-	Tue	25	Aug	18:00
Wed	26	Aug	08:00	-	Wed	26	Aug	18:00
Thu	27	Aug	08:00	-	Thu	27	Aug	18:00
Fri	28	Aug	08:00	-	Fri	28	Aug	18:00
Sat	29	Aug	08:00	-	Sat	29	Aug	18:00
Mon	31	Aug	08:00	-	Mon	31	Aug	18:00
Tue	01	Sep	08:00	-	Tue	01	Sep	18:00
Wed	02	Sep	08:00	-	Wed	02	Sep	18:00
Thu	03	Sep	08:00	-	Thu	03	Sep	18:00
Fri	04	Sep	08:00	-	Fri	04	Sep	18:00
Sat	05	Sep	08:00	-	Sat	05	Sep	18:00
Mon	07	Sep	08:00	-	Mon	07	Sep	18:00
Tue	08	Sep	08:00	-	Tue	08	Sep	18:00
Wed	09	Sep	08:00	-	Wed	09	Sep	18:00
Thu	10	Sep	08:00	-	Thu	10	Sep	18:00
Fri	11	Sep	08:00	-	Fri	11	Sep	18:00
Sat	12	Sep	08:00	-	Sat	12	Sep	18:00
Mon	14	Sep	08:00	-	Mon	14	Sep	18:00
Tue	15	Sep	08:00	-	Tue	15	Sep	18:00
Wed	16	Sep	08:00	-	Wed	16	Sep	18:00
Thu	17	Sep	08:00	-	Thu	17	Sep	18:00
Fri	18	Sep	08:00	-	Fri	18	Sep	18:00
Sat	19	Sep	08:00	-	Sat	19	Sep	18:00
Mon	21	Sep	08:00	-	Mon	21	Sep	18:00

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ROAD OCCUPANCY LICENCE

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NON DEVELOPMENT - INVESTIGATION

Project: Not Applicable

This Activity : Temporary road closure for blasting purposes

LOCATION

Subject Road: GOLDEN HWY

From: WATT ST, WARKWORTH

To: LEMINGTON RD, JERRYS PLAINS

Council: SINGLETON

LICENSEE

Organisation: United Wambo Joint Venture

Ref No:

Name: Aislinn Farnon

Phone: 0429306208

ONSITE CONTACT

Name: Aislinn Farnon

Phone: 0429306208

TRAFFIC MANAGEMENT

Flow Management: Stop / Slow Control

Closure Type: All lanes both directions

Closure Lane(s): Shoulder

Direction(s): Eastbound and Westbound

LICENCE DURATION

From: 25-Mar-2020

To: 24-Sep-2020

APPROVED DATES & TIMES

From Shift					To Shift			
From	D	M	Time	-	To	D	M	Time
Tue	22	Sep	08:00	-	Tue	22	Sep	18:00
Wed	23	Sep	08:00	-	Wed	23	Sep	18:00
Thu	24	Sep	08:00	-	Thu	24	Sep	18:00

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Appendix B - Approval from Singleton Council

SINGLETON COUNCIL

Enquiries: **David Griffin**
02 6578 7271

Our Ref: **4640/2020**

13 March 2020

United Wambo OC Operations Pty Limited
134 Jerrys Plains Road
WARKWORTH NSW 2330

Subject:	**Application for the use of a Council Road**
Applicant:	**United Wambo OC Operations Pty Limited**
Application No:	**4640/2020**
Benefiting Property:	**Closure of Comleroi Road for the purposes of blasting.**

Reference is made to your application received on 13 March 2020 for the closure of Comleroi Road for the sole purpose of Blasting as described in your application.

Comleroi 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

Damian Morris
Manager Infrastructure Services

1) 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.

2) Who has consent?

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

3) 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.

4) When will the Consent commence?

The Consent commences on the date in Item 7.

5) 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.

6) 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.

7) 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 the Applicant proposes to take to meet the terms and condition of the consent as outlined in the consent and specified in the Warning Notice; or
(b) the Applicants reasons for disagreement with the Waning Notice

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.

8) 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.

9) 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.

10) 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.

11) 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.

12) 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.

13) 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.

14) 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

15) 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 21 and the bank guarantee referred to in clause 22 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.

16) 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.

17) 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.

18) 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.

19) 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.

20) 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.

21) 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.

22) 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.

23) 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.

24) 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.

25) 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.

26) 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 noncompliance does not constitute a waiver of such conduct.

A reference to an Item is attached in Schedule 1.

Signed for and on behalf of
SINGLETON COUNCIL

Signed for and on behalf of
THE APPLICANT

(Signature)

13 March 2020

Date

Date

Damian Morris

(Name)

Manager Infrastructure Services

(Position Held – if applicable)

SCHEDULE 1

Item 1 – The Applicant
United Wambo OC Operations Pty Limited

Item 2 – The Structure
Mine Blasting Road Closure

Item 3 – The Benefiting Organisation
United Wambo OC Operations Pty Limited

Item 4 – The Public Road
Comleroi Road

Item 5 – The Works
Carry out 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
25/03/2020

Item 8– The End Date
24/03/2021

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: Miller Insurance Services,
Policy Number: B0621CGLAU000119
Insurance Policy Expiry Date: 31/10/2020.

Item 13 – Bond/Bank Guarantee
Not Applicable.

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) New policy documentation must be provided to Singleton Council before the above expiry date.

12) The authority shall only extend to the temporary closure for a maximum of four (4) blasting events per week in the period of Monday to Friday 9.00am to 5:00pm and 9.00am to 2:00pm Saturday, subject to notice being given to Singleton Council on each occasion, in the approved format.

13) Notification is provided to Singleton Council by email, for any blast after 7:00am, by 12 noon on the previous working day.

14) The temporary road closure in the local newspaper 'Singleton Argus' in the paper issue prior to blasting by the applicant. Roads Act 1993 Page 12 of 12 Terms and Conditions of Approval for Use of a Council Road Works within a road reserve 4640/2020 – Comleroi Road

15) Prior to re-opening the road, United Wambo OC Operations Pty Limited shall inspect and repair any damage thereto and shall not re-open the road until such time as the road has been restored to a safe and trafficable condition

16) 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.

17) Any sign must be maintained while the work is being carried out and must be removed when the work has been completed.

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

Appendix C - Traffic Management Plan

Click to enter text

Guardian Traffic Services Pty Ltd
ABN 74 946 558 803
Unit 3/33 Pendlebury Rd
Cardiff NSW 2285
PO Box 547 Wallsend NSW

Project: United Wambo Joint Venture UWJV Road Closure Management Plan (BLASTING)

Project Document Number: UWJVB001

Traffic Management Plan
Job Site: Golden Highway (Jerrys Plains Rd)

Revision: 3
Date: 24/02/2020

REVIEW AND APPROVAL		
	Name	**Signature**
Prepared By:	Kelly Groen	
Checked By:	Troy Robertson	
Approved By:	Ryan McCormack	

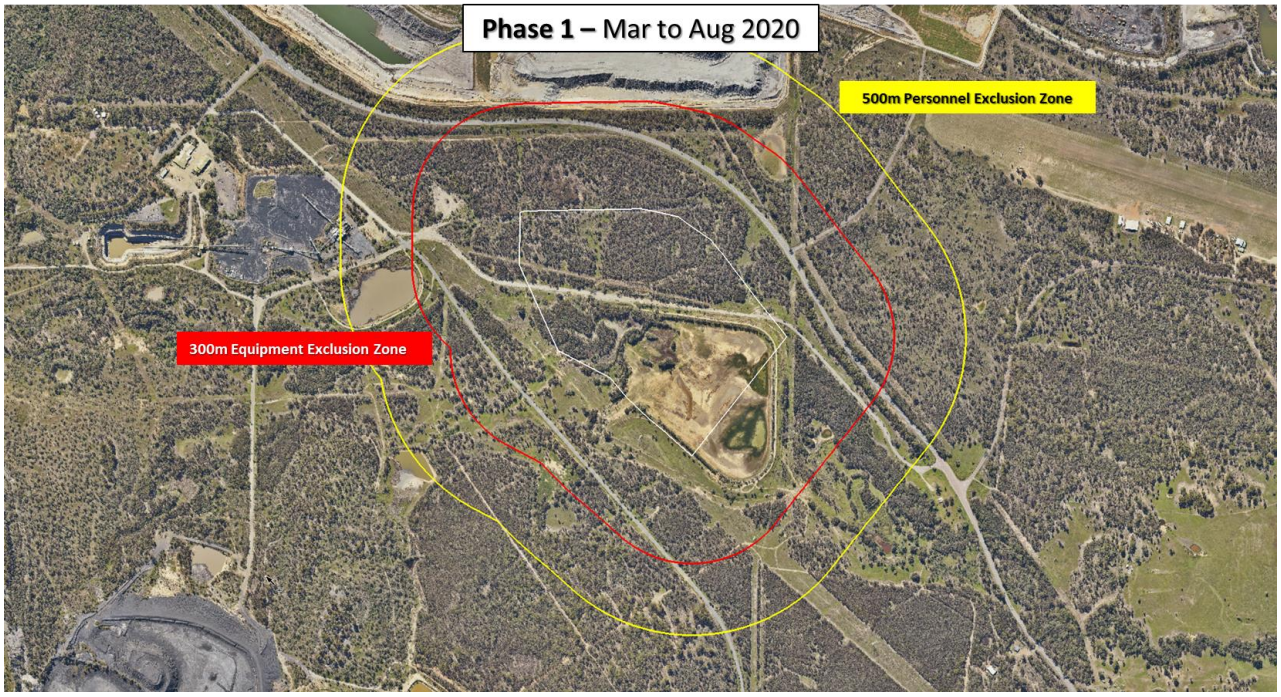
REVISION HISTORY					
Revision	**Date**	**Description**	**Prep**	**Chk**	**App**
0	01/08/19	Submission of traffic management plan	KG	TR	TZ
1	27/08/19	Information updated	KG	TR	TZ
2	12/02/2020	UWJV Review	KG	RM	
3	24/02/2020	Information updated	KG	RM	
4	28/2/2020	Glencore Review	AF	RM	

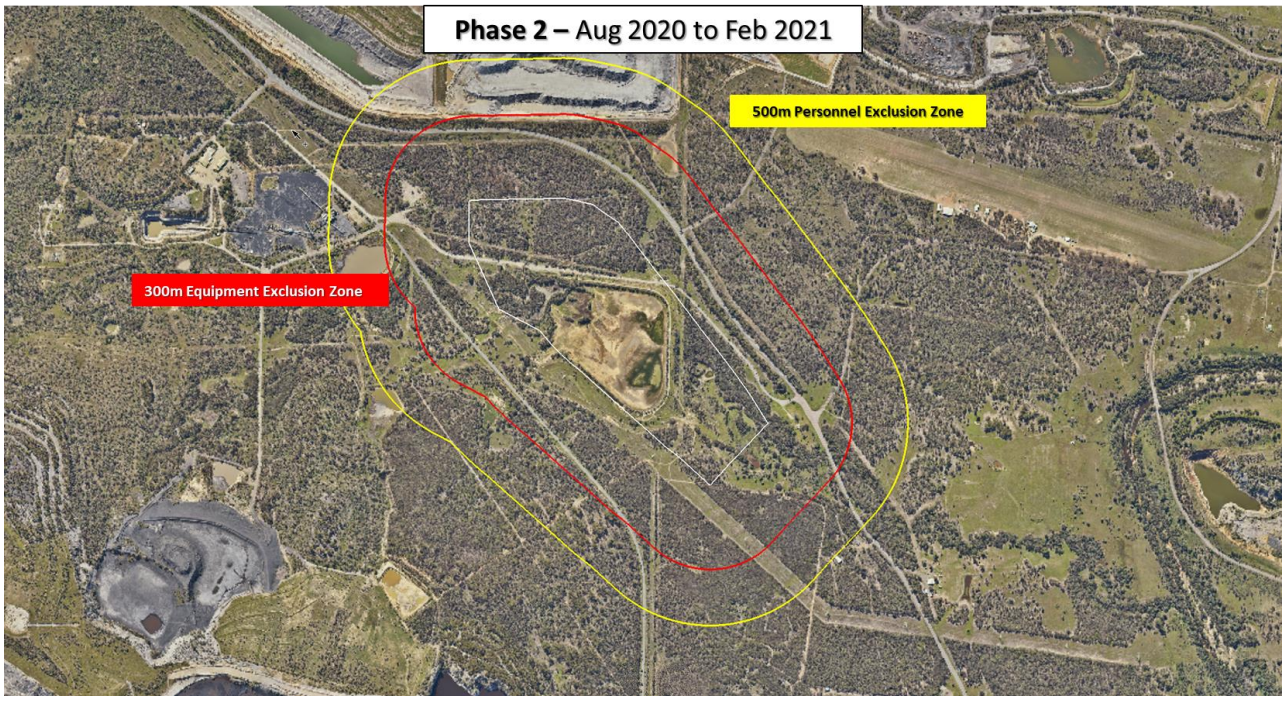
TABLE OF CONTENTS

1. INTRODUCTION

This Traffic Management Plan is required to safely manage temporary road closures when blasting is within 500m of the Golden Highway or Comleroi Road adjacent to the United Wambo Open Cut Coal Mine (United Wambo) or when it is considered a blast may adversely affect the aforementioned roads.

United Wambo blasting personnel exclusion zones for the United Open Cut encompass a section of the Golden Highway and Comleroi Road and these roads will be required to be closed to allow for blasting.





Submitted By: Ryan McCormack Position: D&B Superintendent

Company: United Wambo Joint Venture Glencore Date: 24/02/2020

Figure 1-1 Blasting Exclusion Zones for Phases of the Development

The project will be operational from March 2020 through to August 2042.

2. DEVELOPMENT CONSENT CONDITIONS

In accordance with Development Consent SSD 7142 for United Wambo:Blasting Hours

B10. The Applicant must only carry out blasting on the site between 9 am and 5 pm (Monday to Saturday inclusive). No blasting is allowed on Sundays, public holidays or any other time without the prior written approval of the Planning Secretary.

Blasting Frequency

B11. The Applicant may carry out a maximum of:

(a) 3 single blast eventsa a day; and

(b) 15 single blast eventsa a week, averaged over a calendar year.

Blast Operating Conditions

B20. The Applicant may not close the Golden Highway more than once per day due to blasting, except where required for blast misfires or blasts required to ensure the safety of the mine, its workers or the general public.

3. CONTACT DETAILS

Name	Position	Phone Number
Kelly Groen	Guardian Traffic - Director	0409 385 478
Troy Robertson	Guardian Traffic Services – Traffic Manager	0431 034 014
Ryan McCormack	UWJV D&B Superintendent	[redacted]
Daniel Brogan	UWJV Mine Manager	0429 456 969
Aislinn Farnon	UWJV Environment & Community Manager	0429 306 208

4. SITE ENTRY AND EXIT

Worksite entry is 134 Jerrys Plains Rd Warkworth. (Map Below)

Figure 4-1 Worksite Entry

5. SITE PARKING

All site vehicles required to enter site to park in allocated parking spots (Map Below)

Figure 5-1 Site Parking

6. INCIDENT MANAGEMENT

Incident Reporting

Incident reporting as per document United Wambo Incident Management System

Complaints Management

Any complaints received are to be managed in accordance with *UWOC-1689771511-359 - 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.

7. CONTROL MEASURES

7.1 Prior to Road Closure

Public Notification

An advertising campaign will be run in the Singleton Argus to inform the public about blasting commencing at United Wambo, given that road closures will be required for every blast for the first few years, this communication will form part of the advertisement and notification every week there after will not be required.

Hunter Valley Operations (HVO)

Notification to Hunter Valley Operations 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 Golden Highway will be performed at a time to minimise impact on Hunter Valley Operations (outside shift change). If Hunter Valley Operations have any issues with the proposed road closure time, contact should be made with the Drill & Blast Engineer in the first instance.

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

Road Closure Notification Boards

The road closure notification boards located on the Golden Highway and Comleroi Road will be updated where required to show the date and time of proposed firing.

7.2 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.

UWJV Main Entrance

Signage to be placed in accordance with the Traffic Control Plan (TCP) provided in Section 18.

Traffic Control

Traffic Control stations will be established on the affected road in accordance with The Traffic control plan (TCP). 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. There is to be a Stop/Slow controller situated on the UWJV 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 Traffic control at worksite manual version 5, 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 United Wambo "Blast Management Plan"

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 United Collieries Pty as necessary. Typically these access points are fenced and secured using a padlocked gate (company owned land).

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.

- There will be a maximum of one (1) road closure of Golden Hwy (Jerry's Plains Road) on any day, except where required for blast misfires or blasts required to ensure the safety of the mine, its workers or the general public
- 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.

8. INSTALLATION OF SIGNS AND DEVICES

The site specific TCP's are based on RMS traffic control at worksites manual, version 5.0 and A.S 1743.3 manual of uniform devices for works on road and shall be setup/packed up by qualified traffic controllers who hold current Apply Traffic Control Plans Certification (Yellow Card).

If site specific traffic control plans (TCP) needs to be modified it shall be done by a qualified person who holds a current Prepare a Workzone Traffic Management Plan and co approved by original TCP designer, TCP must be signed off and modifications noted on TCP.

9. TRAFFIC CONTROL REQUIREMENTS

Traffic Controllers shall be qualified, having passed the RMS approved Traffic Controllers training course (Blue Card), and shall be authorised.

Traffic Controllers shall not be positioned where the sight distance between them and oncoming traffic is less than 1.5D (speed limit times 1.5)

Traffic Controllers normal duty is to remain at the head of the queue while traffic is stopped. If there is a possibility of vehicles colliding with the end of queue because of restricted sight distance, or of drivers' queue jumping because they cannot see the traffic controller at the end of queue, then additional traffic controllers and or signage shall be placed at the end of queue.

10. SPEED LIMITS

Current Speed Limit is 100 km/hr which will be reduced to zero at control points outside of exclusion zones. Speed reduced to 40kph on approach to closed roads for the duration of works.

11. PLANT & EQUIPMENT MOVEMENTS

No plant movements will take place in the exclusion zone whilst Blasts are in progress.

Plant movements onsite outside of Blast times are to be done within the designated work zone where possible. Safe clearance to plant must be adhered to at all times and any reversing of plant must be done under the supervision of a spotter. For movements outside designated work zone, where live traffic is affected, traffic control must be contacted for all traffic to be stopped whilst movements take place until plant is safely back into work zone.

12. RADIO CHANNELS

Mining Channel 43 used on this site for all communications. Work area need to be able to contact traffic control at all times for blasting activities.

13. EMERGENCY MUSTER AREA

Emergency muster area (Map Below)

Figure 13-1 Emergency Muster Area

14. SIGNAGE

- Shall be placed out before work begins and removed when no longer required.
- Shall be regularly checked to ensure they are still relevant and in good mechanical condition, clean not faded and have good night time visibility if necessary.
- Shall be inspected to ensure they remain clearly visible to road users and are not obscured by vegetation, vehicles, plant or other signs and devices and are displayed in correct sequence.
- Signs shall be designed and manufactured in accordance with AS 1742.2. The retro reflective material used on signs shall be Class 1 material complying with AS 1906.1.
- B size signs to be used.

15. COMMUNICATION

Prior to initial set up of traffic control, site induction will be conducted by site manager to communicate all site requirements for workers and works to be undertaken.

Prior to each shift change, workers for next shift will attend a toolbox meeting for shift changeover.

16. ROLES & RESPONSIBILITES

Tech Services Manager

Tech Services Manager is responsible for:

- 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 Mining Engineer

Senior Mining Engineer is responsible for:

- 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

Drill & Blast Engineer is responsible for:

- Ensure the output for the drill & blast operations conforms to the standards required for safe and effective closure of a public road.

Site Manager

The Site Manager is responsible for:

- 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 Implements the principles and requirements of the TMP
- Ensure the effective traffic management controls are planned, reviewed, approved and established for pubic and construction traffic in accordance with the Contract
- Ensure the TCPs, VMPs, ROLs and SZAs are submitted to the Client and/or relevant authority for review and/or approval
- Ensuring that the approved traffic control measures are established, implemented and maintained in accordance with the approved plans
- Carry out regular inspections and auditing of the traffic control measures to ensure that they are effective and are being followed
- Particular attention shall be paid to prior to start and the conclusion of work each work shift.
- Revise the traffic control measures if observations show that the works impact on peak hour traffic flow or to address any other corrective actions
- Ensuring only appropriately trained (ticketed) and experienced personnel are assigned to prepare, implement, audit and maintain the traffic management controls
- Ensuring any traffic management issue or incident is reported to the project manager
- Amending and updating the plans, as required, to ensure that they remain current as the work progresses
- Identifying locations and times where traffic congestion or unsafe conditions for vehicles, cyclists, pedestrians and workers are occurring, and providing recommendations for improvement
- Maintaining current copies of the Traffic Management Plan, Traffic Control Plans, Vehicle Movement Plans, Road Occupancy Licences and Speed Zone Authorisations, and their controlled distribution
- Liaising with the Principal and other authorities such as Transport Management Centre (TMC), New South Wales Police and local Councils on traffic management matters for the construction site
- Facilitating traffic awareness and giving toolbox talks to site personnel
- The TC Supervisor has the authority to stop work on any activity if it is considered to be necessary to prevent traffic accidents, or to comply with the directions of the Principal, TMC or Police.
- Reference requirement for TC Supervisor to hold, as minimum, Prepare a Traffic Management Plan card.

Traffic Control Team (Guardian Traffic Services)

The Traffic Control Team is responsible for:

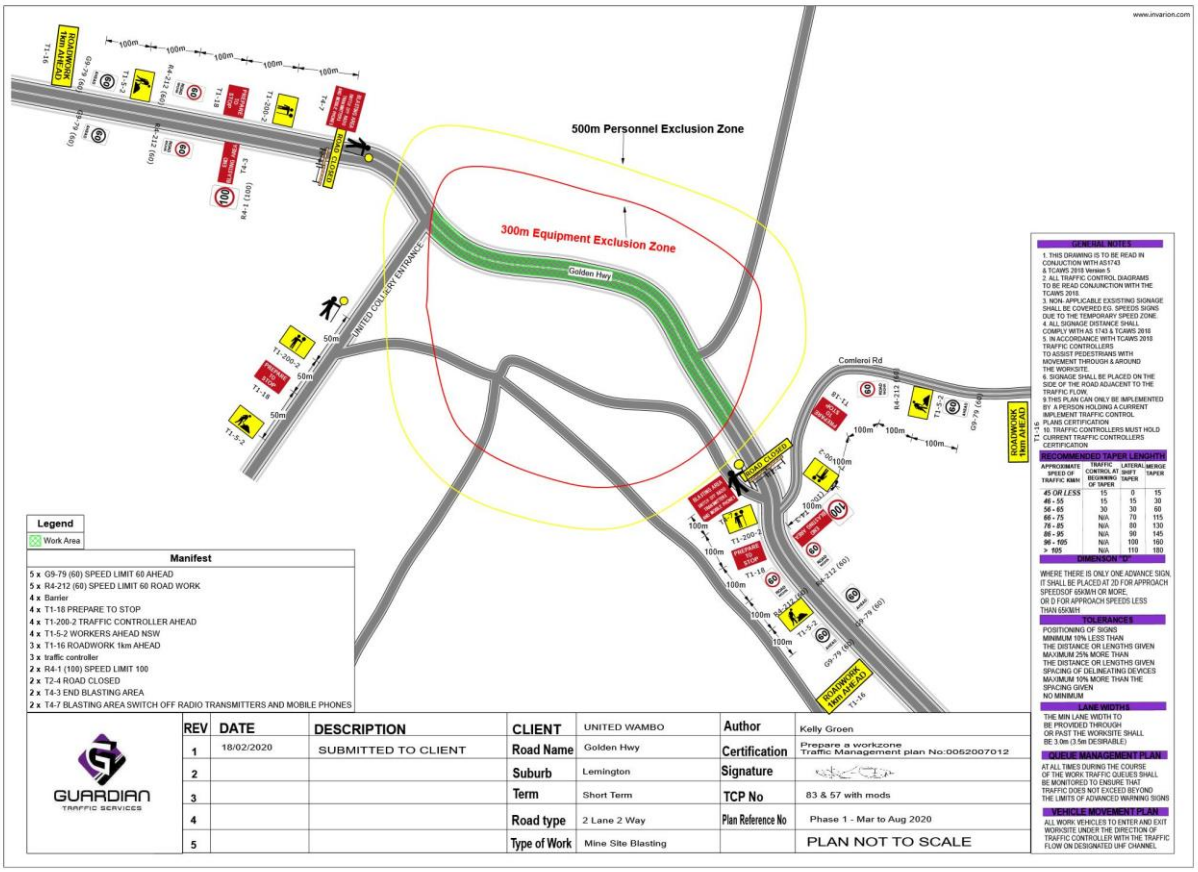
- Install and remove traffic control including speed zones, in strict accordance with a Traffic Control Plan and all relevant Guides and Manuals
- Carry out maintenance of all traffic control devices, line marking, signage, delineation and other equipment or areas as required
- Provide assistance as directed, as incident sites, including direction from emergency services, e.g. Police
- Relocate, repair and maintain traffic control plant, such as but not limited to: portable VMS, trailer mounted arrow boards, vehicle mounted arrow boards, crash cushions, flashing beacons
- Support construction staff in the planning, coordinating and monitoring of traffic management activities in timely and efficient manner

- Implement corrective actions and undertake duties as directed by the Traffic Control Supervisor
- Conduct field surveillance of the road network, with the aim to identify unusual congestion, incidents, non-conforming traffic control and unsafe road conditions
- Traffic Controllers shall not be positioned where the sight distance between them and oncoming traffic is not less than 1.5D (speed limit times 1.5)
- Traffic Controllers normal duty is remain at the head of the queue while traffic is stopped. If there is a possibility of vehicles colliding with the end of queue because of restricted sight distance, or of drivers queue jumping because they cannot see the traffic controller at the end of queue, then additional traffic controllers and or signage shall be placed at the end of queue.
- Traffic controllers are entitled by WHS legislation to have a rotating break every 2 hours
- Traffic Controllers to stand in a position where a clear escape path is available
- All Traffic Control Personnel to hold current Traffic Controller and Implement Traffic Control Plans Cards
-

17. EMERGENCEY CONTACT NUMBERS

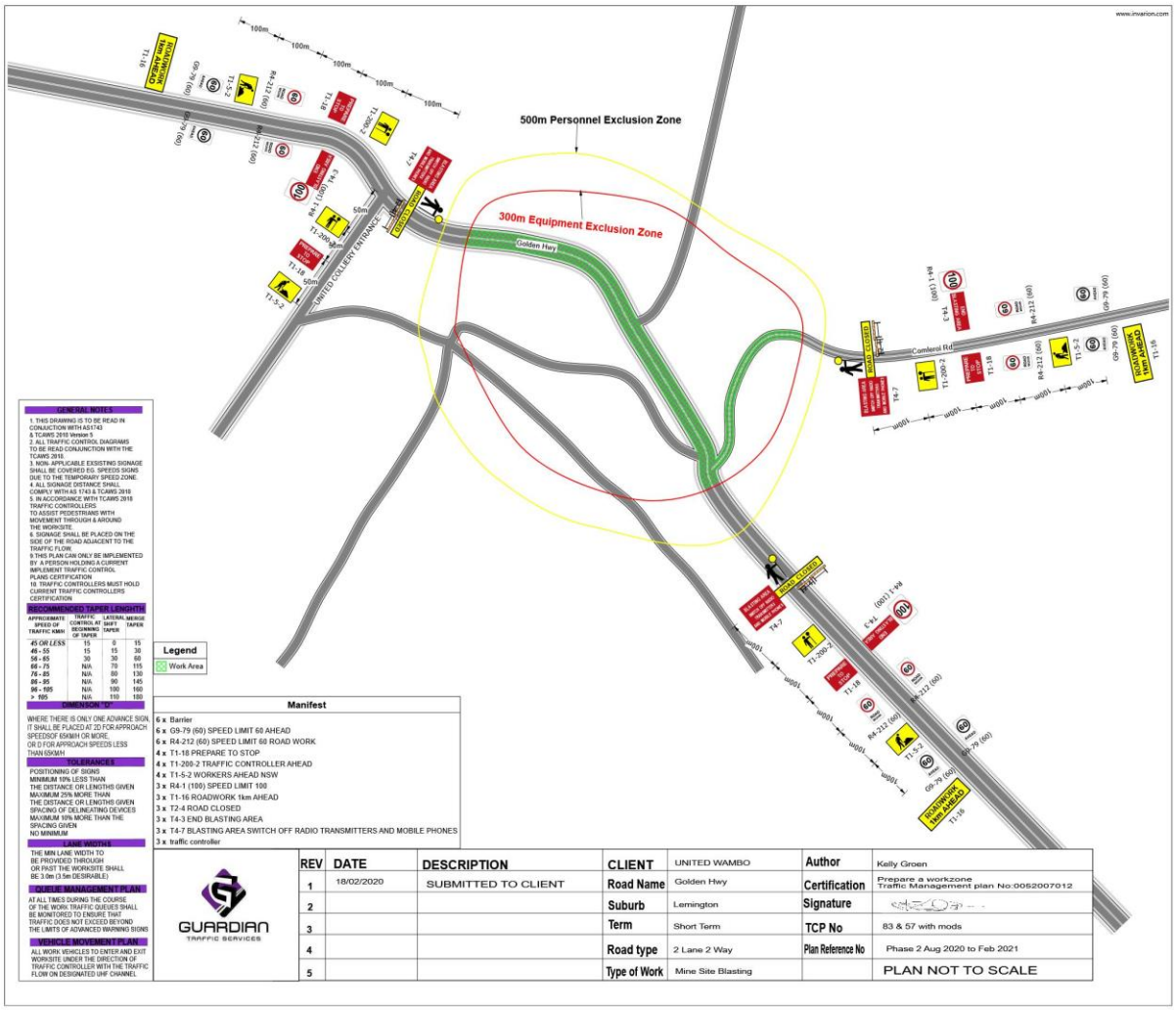
Emergency Numbers	Contact	Alternate Number
Kelly Groen – Guardian Traffic	0409 385 478	
Troy Robertson – Guardian Traffic	0431 034 014	
Gary Wills (UWJV) – Operations Manager	6578 9502	
Daniel Brogan (UWJV) - Mine Manager	6578 9500	0429 456 969
Aislinn Farnon (UWJV) E & C Manager	6578 9506	0429 306 208
Ryan McCormack (UWJV) Drill & Blast Superintendent	0417 364 251	
Fire	000/112 (mobiles only)	
Police	000	
Ambulance	000	
Environmental Protection Authority	131 555	
Poisons Information	131 126	
RMS – (Reporting Incidents)	131 700	
State Emergency Services	132 500	
Native Animal Trust Fund	0418 628 483	
WIRES- Wildlife Information, rescue and education services	1300 094 737	

18. TCP's and TRAFFIC CERTIFICATION NUMBERS



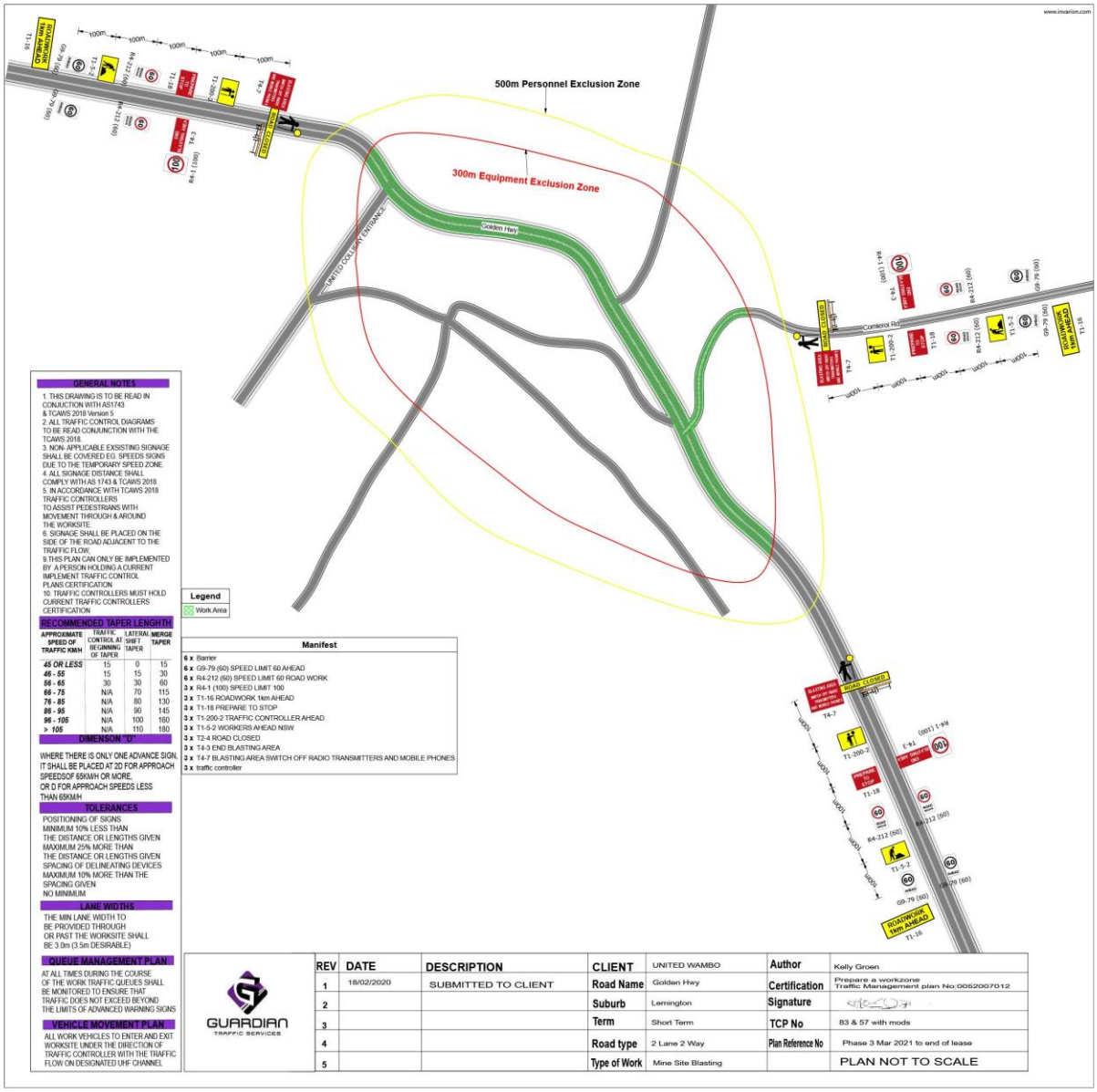
Submitted By: Ryan McCormack Position: D&B Superintendent

Company: United Wambo Joint Venture Glencore Date: 24/02/2020



Submitted By: Ryan McCormack Position: D&B Superintendent

Company: United Wambo Joint Venture Glencore Date: 24/02/2020



Submitted By: Ryan McCormack
Position: D&B Superintendent
Company: United Wambo Joint Venture Glencore
Date: 24/02/2020

19. TRAFFIC CERTIFICATION NUMBERS

Name	OH&S General Induction - White Card	Traffic Controller - Blue Card, Expiry & No	Implement Traffic Control Plans- Yellow Card Expiry & No	Prepare Workzone
Amos, Rana	CGI1431309SEQ02	17/11/2020 0047555779	17/11/2020 0047556590	
Barrack, Tracy	CGI0317135SEQ01	15/06/2020 0042066834	15/06/2020 0042066943	
Beesley, Christopher	CGI00451770SEQ1	03/10/2022 0052169088	03/10/2022 0052169092	07/06/2020 0042740973
Bevan, Jon	CG100600346SEQ1	21/04/2020 0040416971	21/04/2020 0040416983	05/06/2020 0041741141
Blenman, Jamie	CGI01333244SEQ1	18/03/2022 0051960086	18/03/2022 0051960090	
Brown, Chloe	1048545 QLD	04/05/2021 0051670807	11/05/2021 0051677182	
Burton, Samuel	1982254 QLD	19/08/2022 0052113124	19/08/2022 0052113129	
Calcagno, Carl	CGI01401384SEQ1	01/08/2021 0051753555	01/08/2021 0051753559	07/05/2021 0051679029
Campbell, Steven	CG11474300SEQ01	16/06/2020 0042130710	16/06/2020 0042130714	
Clarke, Kevin	CGI01146213SEQ1	05/06/2022 0052035836	05/06/2022 0052035852	29/12/2020 0049347391
Clayton, Sandy	CGI00435838SEQ1	10/07/2022 0052070059	16/08/2020 0044167630	06/09/2020 0044854057

Clayton, Stuart	CGI00542021SEQ1	26/10/2020 00466957 80	21/08/2020 00443790 89	09/05/2022 0052007178
Crossley, John	CGI00531466SEQ2	03/09/2022 00521300 10	03/09/2022 00521300 15	
Crossley, Vicky	CGI01307109SEQ1	22/08/2021 00517711 56	22/08/2021 00517711 64	15/03/2022 0051954160
Curry, Tracy	CGI1484635EQ01	8/11/2020 00479767 84	10/10/2020 00490492 97	06/12/2022 0052242632
Dawson, Mark	CGI01390322SEQ1	17/07/2020 00431355 0	17/07/2020 00431346 20	23/04/2022 0051991871
Dean, Gary	CGIOO587103SEQ1	5/10/2020 00456970 98	5/10/2020 00456971 04	08/02/2020 0039099026
Deigan, Jacinta	10606125 WA	00519173 64 04/02/2022	00520867 38 02/07/2022	
Devon, Emelina	CGI1519373SEQ01	13/04/2021 00516513 47	03/08/2021 00517546 64	
England, Jack	CGI0268902SEQ02	16/08/2020 00444573 40	16/08/2020 00441471 96	
Franks, Brendan	CGI00420973SEQ1	28/05/2021 00516883 14	28/05/2021 00516883 18	28/02/2022 0051938894
Gordon, Courtney	CGI149216SEQ01	13/10/2020 00461263 20	13/10/2020 00461263 24	
Groen, Kelly	CGI00628206SEQ1	28/05/2021 00516883 29	28/05/2021 00516883 35	09/05/2022 0052007012
Groen, Lachlan	981973	27/06/2020 00424209 96	27/06/2020 00424210 11	
Hart, Murray	CG11137877SEQ02	31/05/2020 00418533 12	30/06/2020 00429631 84	
Heaton - Lindus, Sherrie	2269580 QLD	27/03/2021 00512280	27/03/2021 00512280	06/12/2022 0052242616

Submitted By: Ryan McCormack Position: D&B Superintendent

Company: United Wambo Joint Venture Glencore Date: 24/02/2020

		54	59	
Hopkins, Troy	CGI01345748SEQ01	22/05/2021 00516833 04	22/05/2021 00516833 0	
Hugo, Chris	CGI00921192SEQ1	08/03/2020 00390821 43	08/03/2020 00390821 35	
Iceton, Glenn	CGI00557056SEQ1	27/06/2022 00520563 55	02/07/2021 00517227 87	
Magee, Craig	CGI01366330SEQ1	07/05/2022 00520045 15	07/05/2022 00520045 19	
Martin, Paul	CG1948109SEQ03	23/12/2022 00522574 68	23/12/2022 00522574 72	14/03/2021 0050861768
Morton, Janet	CGI01010170SEQ1	08/03/2022 00519585 78	22/03/2022 00519738 69	
Mostyn, Vicki	2026510	21/03/2020 00395187 74	21/03/2020 00395177 36	
McDonald, Trevor	CGI01415495SEQ1	11/02/2020 SOC2021 17	11/12/2020 SOC2021 18	31/10/2022 0052204018
McNamee, Connie	CGI1387812SEQ06	05/10/2021 00518248 74	5/10/2021 00518248 78	23/10/2021 0051833457
McMahon, Kyle	CGI0186595SEQ01	28/06/2020 00429625 19	29/09/2020 00462642 59	
Murgatroyd, Jake	2296166 QLD	13/04/2021 00516513 23	13/04/2021 00516513 29	
Neal, Rochelle	CGI1049551SEQ01	31/04/2020 SOC2022 03	31/04/2020 SOC2022 04	15/03/2022 0051954134
Notley, Kirra	2273411 QLD	16/01/2021 00489582 74	16/01/2021 00489585 21	
O'Brien, Robert	CGI01298712SEQ1	05/10/2021 00518248 39	05/10/2021 00518248 47	12/12/2022 0052243031

Submitted By: Ryan McCormack Position: D&B Superintendent

Company: United Wambo Joint Venture Glencore Date: 24/02/2020

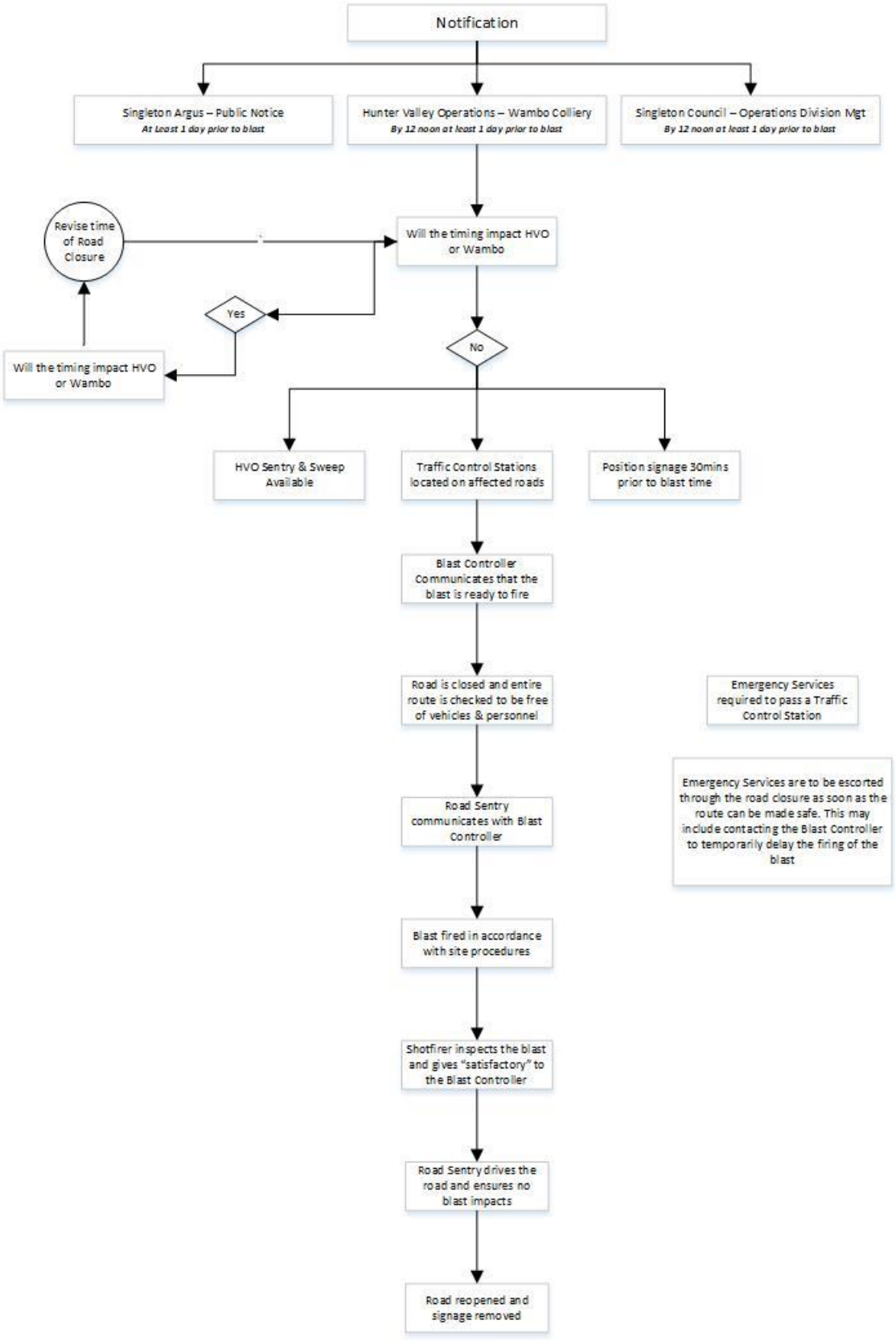
Price, Craig	CGI01288345SEQ1	22/09/2020 00453380 32	22/09/2020 00453380 36	
Rayner, Charles	CGI01137144SEQ1	05/10/2021 00518179 12	25/07/2020 00434640 04	
Rees, Kaylar	CG10379387SEQ01	28/08/2021 00517775 46	28/08/2021 00517775 42	
Robertson, David	CGI00982988SEQ1	12/07/2021 00517354 58	12/07/2021 00517354 62	14/03/2020 0039236592
Robertson, Troy	CGI00856399SEQ1	28/05/2021 00516885 12	28/05/2021 00516885 16	08/02/2022 0051918261
Rokicinski, Anne	CGI0218559SEQ01	21/11/2021 00518588 25	21/11/2021 00518588 31	
Ruse, Raylee	CGI1516624SEQ01	25/05/2021 00516888 55	25/05/2021 00516888 51	
Seque - Hines - Constance	CGI1557265SEQ01	20/09/2022 00521689 55	11/10/2022 00522088 78	
Seque-Hines, Genevieve	2829162	19/10/2021 00518322 63	25/10/2021 00518468 25	
Seque, Serena	CG10377214SEQ01	22/08/2021 00517713 82	22/08/2021 00517713 86	16/11/2020 0049386286
Taylor, David	CGI00439932SEQ02	12/05/2020 SOC 202233	12/05/2020 SOC 202234	
Thierry, Daniel	1982186	24/06/2022 00520514 20	24/06/2022 00520514 24	
Ure, Peter	CGI00562136SEQ1	18/07/2022 00520790 97	18/07/2022 00520791 01	05/09/2022 0052135912
Vest, Mitchell	CGI01364522SEQ1	04/05/2021 00516707 56	18/05/2021 00516837 07	
Ward, Steven	CG11219334SEQ03	23/08/2022 00319919	23/08/2022 00519019	24/08/2021 005180338

Submitted By: Ryan McCormack Position: D&B Superintendent

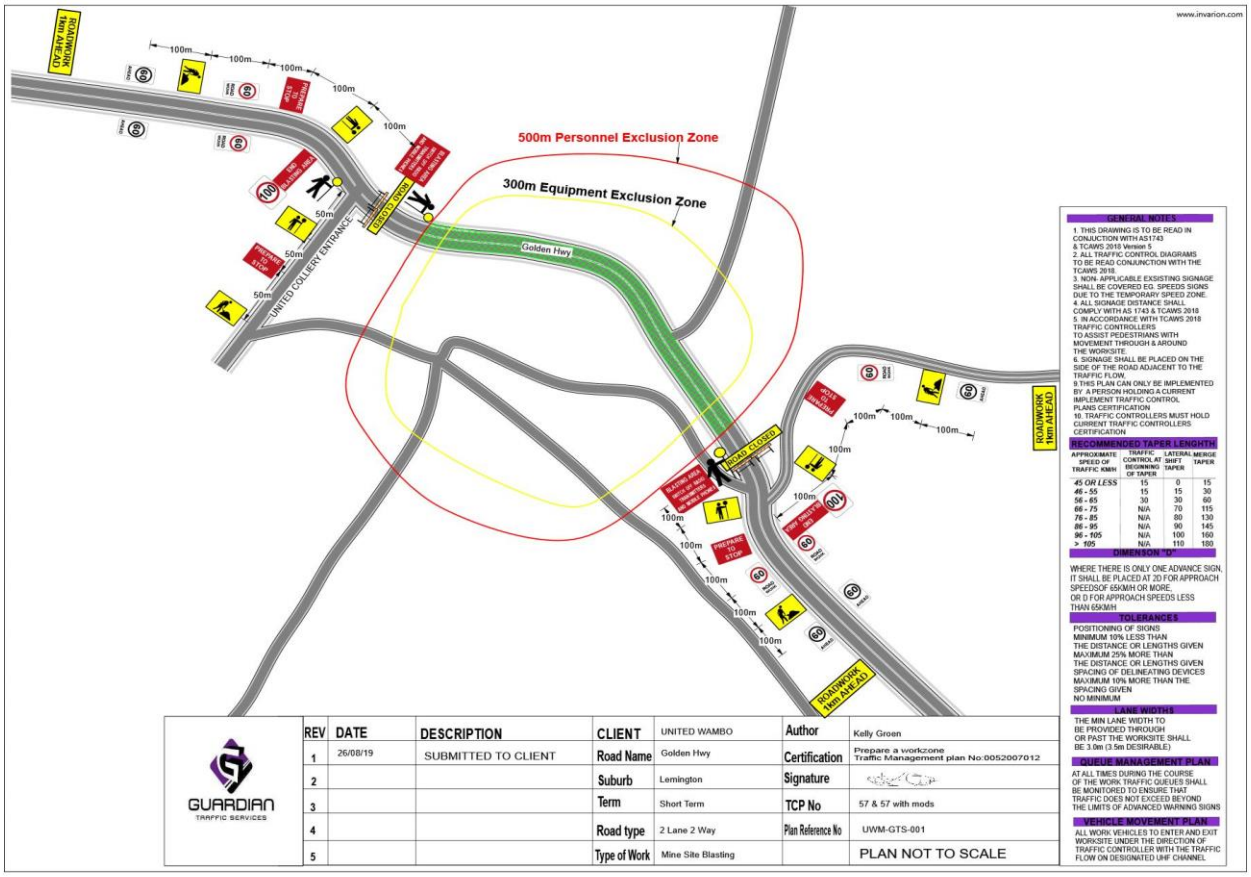
Company: United Wambo Joint Venture Glencore Date: 24/02/2020

		25	30	
Waud, Michael	CGI006796SEQ1	26/07/2020 00434206 57	13/03/2021 00507164 12	
Wellings, Daniel	CG100600421SEQ1	25/02/2022 00519332 11	25/02/2022 00519332 15	
Whiteley, Christy	991944	25/10/2020 00479667 79	27/10/2020 00480036 72	
Whiteley, Neil	CGI00902671SEQI	26/04/2020 00405624 04	26/04/2020 00405624 10	13/07/2021 0051736315
Woods, Ryan	CGI01299804SEQ1	08/12/2020 00478565 37	09/02/2021 00503193 15	
Zink, Ronald	CGI1435684Q01	26/06/2022 00520513 91	24/06/2022 00520513 95	

Appendix D - Road Closure Flow Chart



Appendix E - Traffic Control Plan – Phase 1A and 1B



REV	DATE	DESCRIPTION
1	26/08/19	SUBMITTED TO CLIENT
2		
3		
4		
5		

CLIENT	UNITED WAMBO
Road Name	Golden Hwy
Suburb	Lemington
Term	Short Term
Road type	2 Lane 2 Way
Type of Work	Mine Site Blasting
Author	Kelly Groen
Certification	Prepare a workzone Traffic Management plan No:0052007012
Signature	
TCP No	57 & 57 with mods
Plan Reference No	UWM-GTS-001

Appendix C - Correspondence Regarding BMP

DOC19/791288-2; EF13/3770

United Collieries Pty Ltd
Private Mail Bag 13
SINGLETON NSW 2330

11 September 2019

Email: Aislinn.Farnon@glencore.com.au
CC: Melanie.hollis@planning.nsw.gov.au

Attention: Aislinn Farnon

Dear Ms Farnon

UNITED WAMBO OPEN CUT COAL MINE PROJECT – ENVIRONMENTAL MANAGEMENT PLANS

Reference is made to your email dated 10 September 2019 to the Environment Protection Authority ("EPA") requesting consultation in relation to the preparation of the United Wambo Open Cut Coal Mine Project Environmental Management Plans. These include:

- Noise Management Plan;
- Air Quality and Greenhouse Gas Management Plan;
- Water Management Plan;
- Surface Water Management Plan;
- Erosion and Sediment Control Plan;
- Groundwater Management Plan; and
- Construction Environment Management Plan.

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 undertake consultation in regard 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 has not reviewed these reports and accordingly offers no comment in relation to them.

The EPA expects that Licensees comply with their Environmental Protection Licence.

Phone 131 555 **Fax** 02 4908 6810 PO Box 488G 117 Bull Street **info@epa.nsw.gov.au**
Phone 02 4908 6800 **TTY** 133 677 Newcastle Newcastle West **www.epa.nsw.gov.au**
ABN 43 692 285 758 NSW 2300 Australia NSW 2302 Australia

If you wish to discuss the matter further, please contact me on 02 4908 6833.

Yours sincerely

NATASHA RYAN
A/Head Regional Operations Unit
Environment Protection Authority

Appendix D - Approval Letter from DPIE

Appendix E - Minimum Requirements for a Blast Pack

A blast pack should contain information ensuring critical aspects of the blast are considered before drilling and blasting is executed. This also includes recording of critical information post-blast. The following list describes points to be included in the Blast Pack, but other considerations may be required.

PRE BLAST

- Design Checklist
- Drill Preparation Plan showing preparation requirements including physical pattern limits
- Drill and Blast Designs including Drill Plan, Dip Sheets, Explosive Load Sheets, and initiation design
- Shotfirers Pre-load Checklist
- Blast Exclusion Zone and Sentry Plan
- Environmental checklist with signoff sheet and including Pre-blast Meteorological Restrictions, such as:
  - wind speed and direction
  - temperature inversion
  - cloud cover
  - general weather conditions
- Fume Probability Predictor or fume and dust dispersion model

POST BLAST RECORDING

- Fume Rating
- Monitoring results from sensitive receptors
- Recording for misfire