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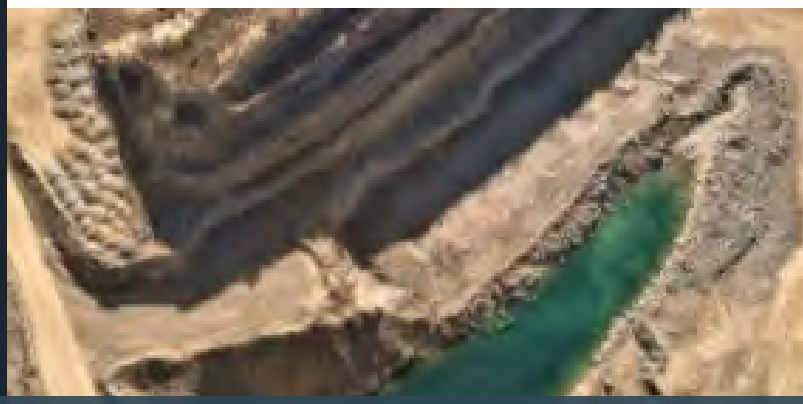
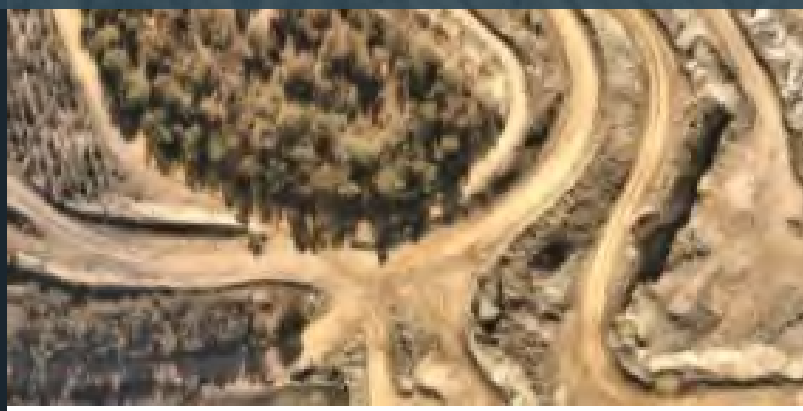


Year Ending
30th June 2024

Annual Review
for
Austen Quarry Extension
Adbri Quarries Sydney Pty Ltd



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Title Block	
Name of Project	Austen Quarry Extension
Name of Operator	Adbri Quarries Sydney Pty Ltd
Development Application Number	SSD-6084
Land	Lots 1 and 2 DP 1000511 Lot 31 DP 1009967 Lot 4 DP 876394
Address	391 Jenolan Caves Rd, Hartley NSW 2790
Application Grant Date	15th July 2015
Modification Date	Mod 2 – July 2019
AR Commencement Date	1st July 2023
AR Completion Date	30th June 2024
Water Licence Number	WAL 37423: HY-TEC Industries Pty Ltd WAL 25616: AUS-10 RHYOLITE Pty Limited
Environment Protection Licence Number	12323
Name and Contact Details of the Quarry Manager	Craig McDonald Craig.McDonald@adbri.com.au 02 6355 0268 0405 123 700

Revision Table

Date	Version	Author	Reviewed	Approved
20/09/2024	F0	LT / SK	Jilu John, Adbri	
24/09/2024	F1	LT / SK	Jilu John, Adbri	
25/09/2024	F2	LT / SK/	Jilu John, Adbri	

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1 Executive Summary

Adbri Quarries Sydney Pty Ltd is a subsidiary of ADBRI Limited. The Austen hard rock quarry (the site) is located at 391 Jenolan Caves Rd, Hartley NSW 2790, approximately 100km west of Sydney. Operating since the mid-1990s, a State Significant Development Consent number 6084 was issued on 15th July 2015 for the continued extraction of hard rock material and the extension of the quarry into additional reserve areas. The quarry extracts and crushes rhyolite principally for concrete production but also for roadworks, asphalt, rail and landscaping uses. Extraction is undertaken using drill and blast methods.

This report was prepared to satisfy Schedule 5, Condition 4 of the SSD6084 consent regarding preparation and submission of an Annual Review covering the period 1st July 2023 to 30th June 2024.

During the report period 1,154,640 tonnes of product was transported off the site (consent limit is 1,600,000 T). The quarry remains above the depth limit of 685 m AHD, and no further land was cleared during the report period.

Additional planting was undertaken this report period.

Modification 3, Biodiversity offsetting remains undetermined and is at the Response to Submissions stage.

There are 4 non-compliances reported against the SSD6084 consent conditions, and 2 against the EPL for this report period:

- Schedule 2, Condition 2A: not all conditions of consent are compliant;
- Schedule 3 Condition 13, EPL 12323 M8.1: Weather station not continuously sending data
- Schedule 3, Condition 25: Biodiversity credits not retired
- Schedule 3, Condition 31a, b, c: Review of Rehabilitation Bond calculation not undertaken within three months of Independent Environmental Audit
- EPL12323 P1.2 and M2.3 Water sampling not undertaken at Monitoring Point 3

2 Statement of Compliance

The client reports two non-compliances with the Consent conditions for SSD-6084 Mod 2, and two non-compliance with the Environmental Protection Licence 12323 within the report period. Non-compliances are summarised below.

Table 1. Statement of Compliance at 30/06/2024

Relevant Approval	All Conditions Compliant?
Development Consent SSD-6084 Mod 1	No – 4 non compliances
EPL 12323	2 non compliances
Water Access Licence 37423	Yes
Water Access Licence 25616	Yes

A full list of conditions and compliance status is included in *Appendix A*.

Table 2. Non-Compliances for Year Ending 30 June 2024

Ref.	Condition Description	Comment	Where addressed in Annual Review
Schedule 3, 2A	The Applicant must carry out the development in accordance with the conditions of this consent.	No material harm caused.	*Section 10*
Schedule 3, 13	For the life of the development, the Applicant must ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline.	Not transmitting due to Telstra outage. No material harm caused.	*Section 6.1*
Schedule 3, 31a, b, c	Within 3 months of each Independent Environmental Audit (see condition 8 of Schedule 5), the Applicant must review, and if necessary revise, the sum of the Conservation and Rehabilitation Bond to the satisfaction of the Secretary. This review must consider the: effects of inflation; likely cost of implementing any land based offset and rehabilitating the site (taking into account the likely surface disturbance over the next 3 years of the development); and performance of the implementation of any land based offset and rehabilitation of the site to date.	Rehabilitation Bond is currently under review, no material harm caused.	*Section 8*
EPL 12323 P1.3	The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.	Samples taken from alternate alternate location due to flooding 20/12/2023 to 22/12/2023 and 05/01/2024	*Section 7.1*
EPL 12323 M 8.1	Requirement to Monitor Weather The applicant must monitor (by sampling and obtaining results by analysis) the parameters	Not monitored continuously due to Telstra outage	*Section 6.1*

Ref.	Condition Description	Comment	Where addressed in Annual Review
	specified in Column 1. The applicant must use the sampling method, units of measure, averaging period and sample at the frequency specified opposite in the other columns unless otherwise approved by the EPA:		
Schedule 3, Cond 25	Within 12 months of the approval of Modification 1, or other timeframe agreed by the Secretary, the Applicant must retire the biodiversity credits specified in Table 4A below.	Subject of Modification 2. No material harm caused.	*Section 6.9*

3 Introduction

3.1 BACKGROUND

The Austen hard rock quarry (the site) is located at Hartley, approximately 100km west of Sydney. Operating since the mid-1990s, a State Significant Development Consent number 6084 (*Appendix B*) was issued on 15th July 2015 for the continued extraction of hard rock material and the extension of the quarry into additional reserve areas.

The quarry extracts and crushes rhyolite principally for concrete production but also for roadworks, asphalt, rail and landscaping uses. Extraction is undertaken using drill and blast methods, fragmenting the material into smaller manageable pieces. The fragmented material is then loaded into a primary crusher. Crushed material is then passed through a scalping plant and transferred to the processing area via a conveyer system.

Once at the processing area, the material is passed through further crushers and screens to produce a variety of quarry products. The different products are then stockpiled and moved offsite via tipper trucks to the regional and Sydney markets.

3.2 LOCATION

The site is located at 391 Jenolan Caves Rd, Hartley NSW 2790, on freehold land privately owned by Hartley Pastoral Corporation (HPC) and is contained within Lot 4 DP 876394, Lots 1, 2 DP1005511 and Lot 31 DP 1009967. The site is bounded by remnant natural bushland to the south and pastoral land to the north (see *Figure One*). According to Lithgow City Council Local Environmental Plan, the quarry is situated on land zoned as RU1: Primary Production. Access to the Austen site is via the sealed site access road which intersects Jenolan Caves Road.

3.3 SCOPE

This report has been prepared by VGT Environmental Compliance Solutions Pty Ltd (VGT) to satisfy condition 4 in schedule 5 of the Development Consent conditions for application number SSD-6084:

> *4. By the end of September each year, or other timing as may be agreed by the Secretary, the Applicant must review the environmental performance of the development to the satisfaction of the Secretary. This review must:*
>
> *(a) describe the development (including any rehabilitation) that was carried out in the previous financial year, and the development that is proposed to be carried out over the current financial year;*
>
> *(b) include a comprehensive review of the monitoring results and complaints records of the development over the previous financial year, which includes a comparison of these results against the:*
> - *relevant statutory requirements, limits or performance measures/criteria;*
> - *requirements of any plan or program required under this consent;*
> - *monitoring results of previous years; and*
> - *relevant predictions in the documents listed in Condition 2 of Schedule 2;*
>
> *(c) identify any non-compliance over the past financial year, and describe what actions were (or are being) taken to rectify the non-compliances and avoid reoccurrence;*
>
> *(d) identify any trends in the monitoring data over the life of the development;*
>
> *(e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and*
>
> *(f) describe what measures will be implemented over the current financial year to improve the environmental performance of the development.*

This Annual Review summarises all site activities, condition compliance, environmental performance and rehabilitation progression during the reporting period 1st July 2023 to 30th June 2024.

Plan of:	**Annual Review for the Austen Quarry Extension July 2023 to June 2024 - Site Location**	**Location:**	Off Jenolan Caves Road, Hartley, NSW	**Source:**	Google Maps April 2020 via QGIS, GoogleStreetMaps & Client 10/03/2022 & NSW Clip & Ship Cadastral.	**Plan By:**	SK/JD
Figure:	**ONE**	**Council:**	Lithgow City Council	**Survey:**	Not Applicable	**Project Manager:**	LT
Version/Date:	V0 01/07/2024	**Tenure:**	Not Applicable	**Projection:**	GDA2020/MGA Zone 56 EPSG:7856	**Office:**	Thornton
Our Ref:	12637_HY_H_AR2023-24_Q001_V1_F1	**Client:**	Adbri Quarries Sydney Pty Ltd	**Contour Interval:**	Not Applicable		

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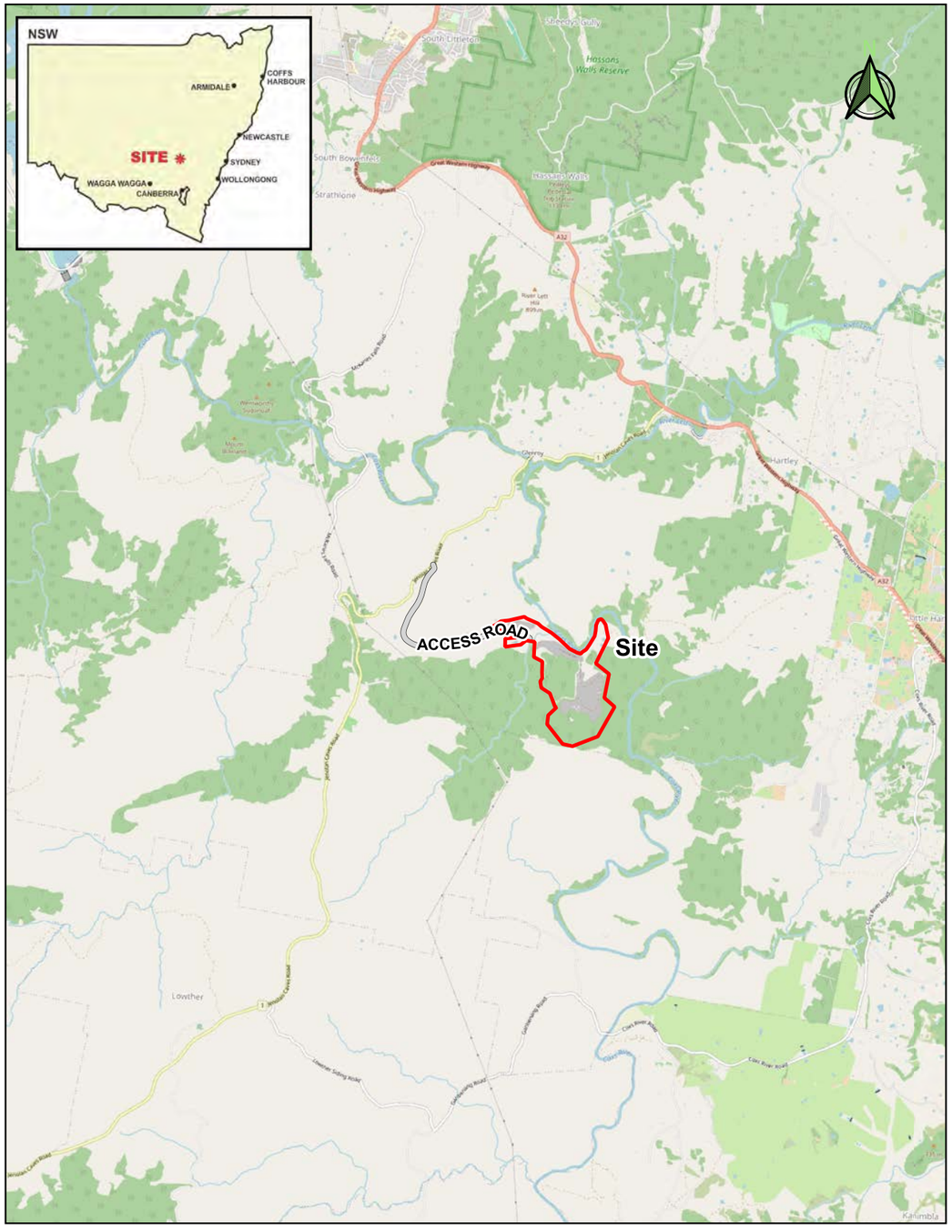

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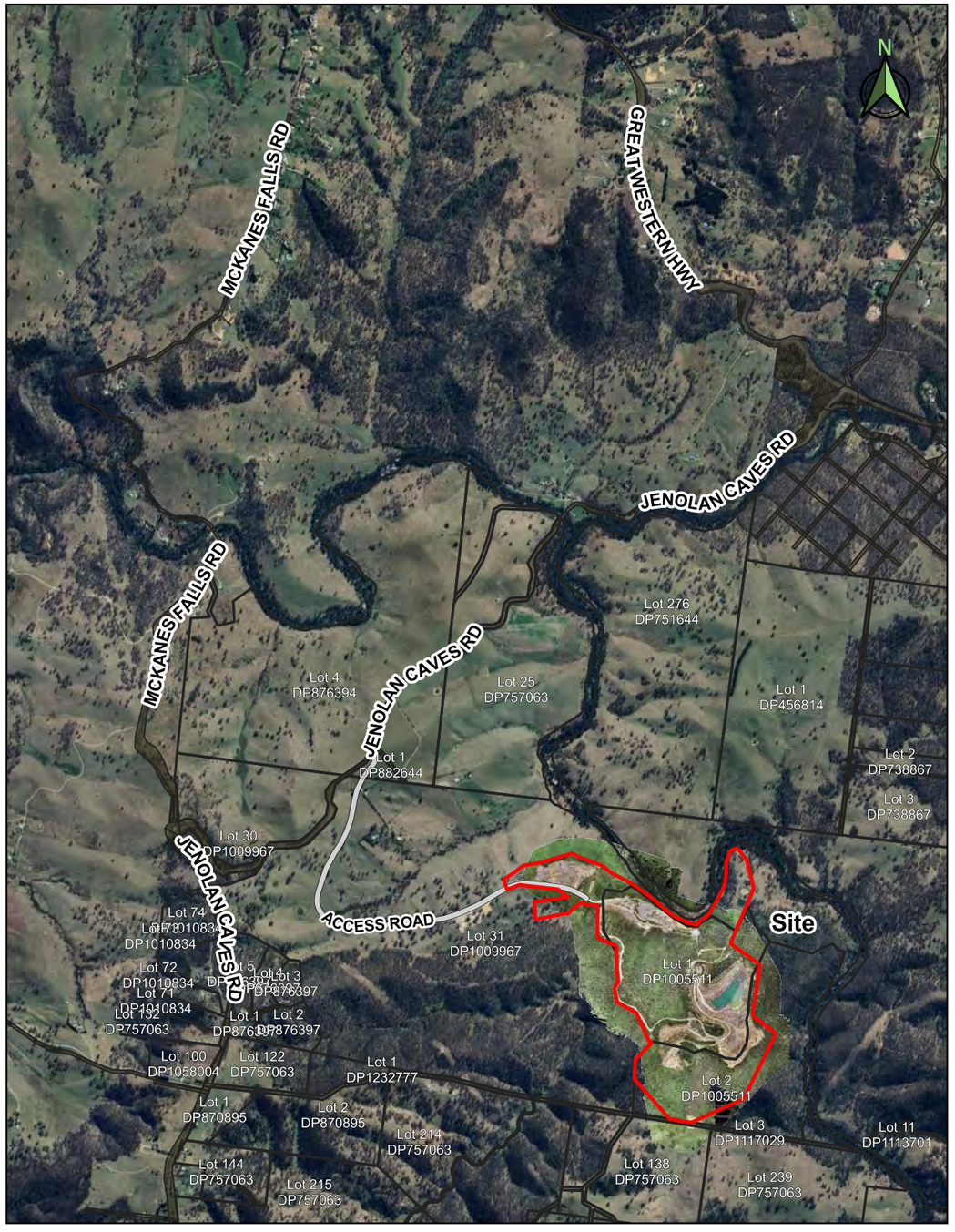

0 0.5 1 1.5 2 km

Legend

- Quarry Site Boundary^
- Cadastral Information
- Road Corridor
- Access Road

^ = Provided by Client Dated July 2019

3.4 SITE CONTACTS

Table 3. Site Contacts

Contact	Lee Attard	Craig McDonald
Title	Manager – Quarry Operations NSW	Austen Quarry Manager
Address	PO Box 6770, Silverwater NSW, 1811	391 Jenolan Caves Road, Hartley NSW 2790
Mobile	0497 603 401	0405 123 700
Phone	N/A	02 6355 0268
Email	lee.attard@adbri.com.au	Craig.McDonald@adbri.com.au

4 Approvals

4.1 SSD 6084

On the 15th of July 2015, State Significant Development 6084 was granted to Hy-Tec Industries. The consent allows for the continued extraction of hard rock material and the extension of the quarry. An application to modify the consent was approved with modified conditions on the 15th August 2018, and an additional modification was approved on 15th July 2019. SSD 6084 has been summarised below in *Table 4* and included in *Appendix B*.

Table 4. State Significant Development Summary

Consent Number	Approved	Expiry	Notes
SSD 6084	15/7/2015	30/6/2050	Extension of quarrying activities into stage 2 reserves. Quarrying to be completed by 30th June 2050. Rehabilitation activities may continue.
SSD 6084 Mod 1	15/8/2018	30/6/2050	Modification for the ongoing operation of the existing quarry and an extension to the existing extraction area and overburden emplacement.
SSD 6084 Mod 2	15/7/2019	30/6/2050	Overburden emplacement location modification

All associated strategies and plans have been reviewed during the report period. Current copies can be found here: https://adbriquarries.com.au/nsw/ .

4.1.1 Proposed Modification

The operators are in the process of seeking modification to SSD 6084 consent with DPHI.

'Hy-Tec is seeking the following modifications to SSD 6084.

1. *Modify Condition 25 of Schedule 3 of SSD 6084 to remove the species credit obligations associated with planted individual Silver-Leaved Mountain Gum - Eucalyptus pulverulenta (SLMG). That is, a reduction of 87% of credits generated as a result of planned removal of the 611 plants planted by Hy-Tec in the Stage 2 expansion area (as modified).*
2. *Modify Condition 25 of Schedule 3 of SSD 6084 to permit the staging of offsetting obligations to align with the progressive schedule of native vegetation clearing.*
3. *Allow for the installation and operation of a pre-coat plant and pugmill within the existing* Secondary Processing Area.'

The operators are currently in the process of finalising a response to Government agency submissions regarding the proposed modification. There were no public submissions regarding the proposed modification.

4.2 ENVIRONMENT PROTECTION LICENCE

The NSW EPA has issued Environment Protection Licence (EPL) number 12323. The licensee is AUS-10 Rhyolite Pty Limited, and the scheduled activity is Land-based Extraction 500,000 – 2,000,000 tonnes annual capacity to extract, process or store. A summary of licenced discharge or monitoring points is given below, and the conditions of the EPL are included in *Appendix C*.

Table 5. Environment Protection Licence Summary

Licence Number	Anniversary Date	Monitoring Point Number	Type of Monitoring
12323	01-July	1	Discharge to waters: Dam 1
		2	Ambient water monitoring: upstream of processing area
		3	Ambient water monitoring: downstream of processing area
		4	Ambient air monitoring: AQD-1
		5	Ambient air monitoring: AQD-2
		6	Ambient air monitoring: AQD-3
		8	Discharge to waters: Dam 2
		9	Discharge to waters: Dam 3
		10	Discharge to waters: Dam 4
		11	Discharge to waters: Dam 5
		12	Weather Analysis

There are also conditions with limits on noise and blast impacts and operating hours. Conditions of EPL12323 that describe operational limits are aligned with those presented in the SSD 6084 consent.

4.3 WATER LICENCES

There are two water access licences relevant to the operations. The licences are summarised in *Table 6* and the conditions included in *Appendix D*.

Table 6. Water Licences Summary

Water Licence Number	Work Approval Number	Issued	Expiry	Notes
WAL37423	10WA119180	25/03/2015	24/03/2025	Coxs River Fractured Rock Groundwater Source, Lots 1&2 DP1005511, 20.00 ML
WAL25616	10WA103330	1/07/2011	24/11/2025	Upper Nepean and Upstream Warragamba Water Source, Lot 31 DP1009967, 20.00 ML

4.4 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT APPROVAL

In October 2015, Hy-Tec Industries Pty Ltd was granted approval EPBC2013/6967 by the then Department of Environment (see *Appendix E*). An annual audit of compliance with the conditions of the EPBC 2013/6967 was undertaken by R.W. Corkery in the reporting period. The only conditions that are not compliant or not triggered are relating to the Mod 3 application.

5 Operations Summary

5.1 QUARRY PRODUCTION AND PROGRESS

Table 7. Production Summary

Report Period	Annual Tonnes Transported	Financial Year Limit	Compliant?
1/7/19 – 30/6/20	867,000	1,600,000	Yes
1/7/20 - 30/6/21	925,000	1,600,000	Yes
1/7/21 – 30/6/22	1,024,000	1,600,000	Yes
1/7/22 – 30/6/23	1,431,823	1,600,000	Yes
1/7/23 – 30/6/24	1,154,640	1,600,000	Yes

The Extractive Minerals Return for the financial year ending 30th June 2023 and 30th June 2024 is submitted online .

During the report period extraction occurred in the southern area of stage one and northern area of stage 2, as shown on *Figure Two*. The lowest depth within the quarry remains within the stage 1 area under water and is currently 706.2m AHD as surveyed on 09/08/2023. This is above the limit of 685 m AHD. The latest spot height survey is shown on *Figure Three* dated 17th April 2024.

Plan of:	**Annual Review for the Austen Quarry Extension July 2023 to June 2024 - Activites During Reporting Period (with Aerial)**	**Location:**	Off Jenolan Caves Road, Hartley, NSW	**Source:**	Google Earth accessed via QGIS & Client 10/03/2022. NSW Clip & Ship Cadastral. Groundwork Plus Jan 2019 Quarry Site Boundary georeferenced. Biodiversity areas EIS 2013 Schedule 2.	**Plan By:**	SK/JD
Figure:	**TWO**	**Council:**	Lithgow City Council	**Survey:**	NSW Spatial Services cadastral.	**Project Manager:**	LT
Version/ Date:	V0 01/07/2024	**Tenure:**	Not Applicable	**Projection:**	GDA2020/MGA Zone 56 EPSG:7856		
Our Ref:	12637_HY_H_AR2023-24_Q002_V2_F2	**Client:**	Adbri Quarries Sydney Pty Ltd	**Contour Interval:**	Not Applicable		

N

0 100 200 300 400 500 m

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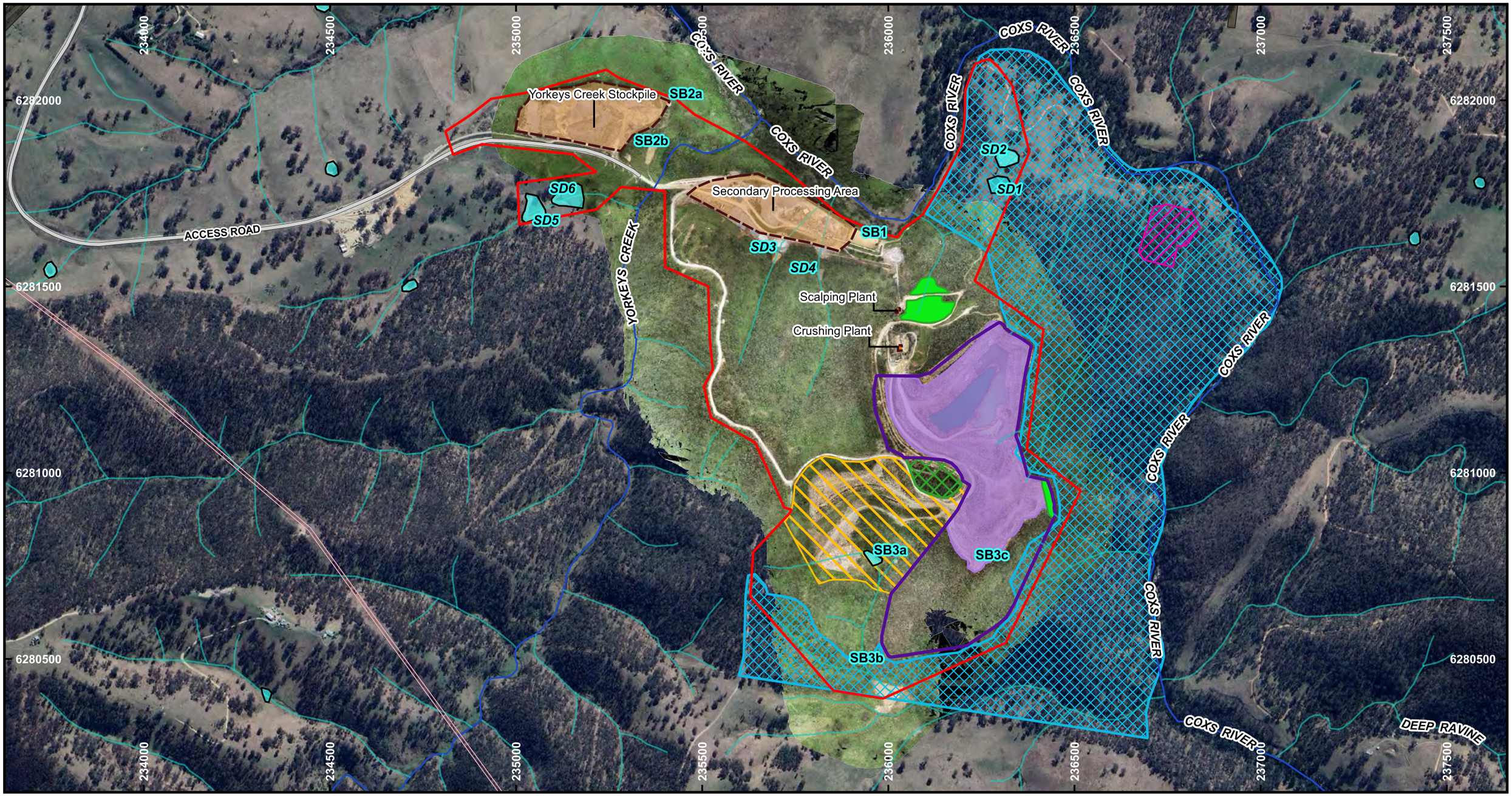

Legend

- Quarry Site Boundary^
- Access Road
- Electricity Transmission Line Easement

Drainage Line

- Major Drainage Line
- Coxs River
- Deep Creek
- Yorkeys Creek

- Dam/Sediment Dam or Basin
- Conservation Area H^
- Rehabilitated Area^
- Biodiversity Offset Area^
- Limit of Extraction Area^

- Extraction Area
- Overburden Emplacement Area^
- Plants (Crushing/Scalping)
- Stockpile-Processing
- Planting Spring 2023

^ = Provided by Client Dated July 2019

Plan of:	Annual Review for the Austen Quarry Extension July 2023 to June 2024 - Spot Survey	***Location:***	Off Jenolan Caves Road, Hartley, NSW	***Source:***	Client - Skycatch DataHub - Pit Limits & Spot Heights Survey Date 17/04/2024	***Plan By:***	JD
Figure:	THREE	***Council:***	Lithgow City Council	***Survey:***	Client - Skycatch DataHub Survey Date 17/04/2024	***Project Manager:***	LT
Version/Date:	V0 26/08/2024	***Tenure:***	Not Applicable	***Projection:***	MGA 94 ZONE 56	***Office:***	Thornton
Our Ref:	12637_HY_H_AR2023-2024_C001_V1_F3	***Client:***	Adbri Quarries Sydney Pty Ltd	***Contour Interval:***	Not Applicable		

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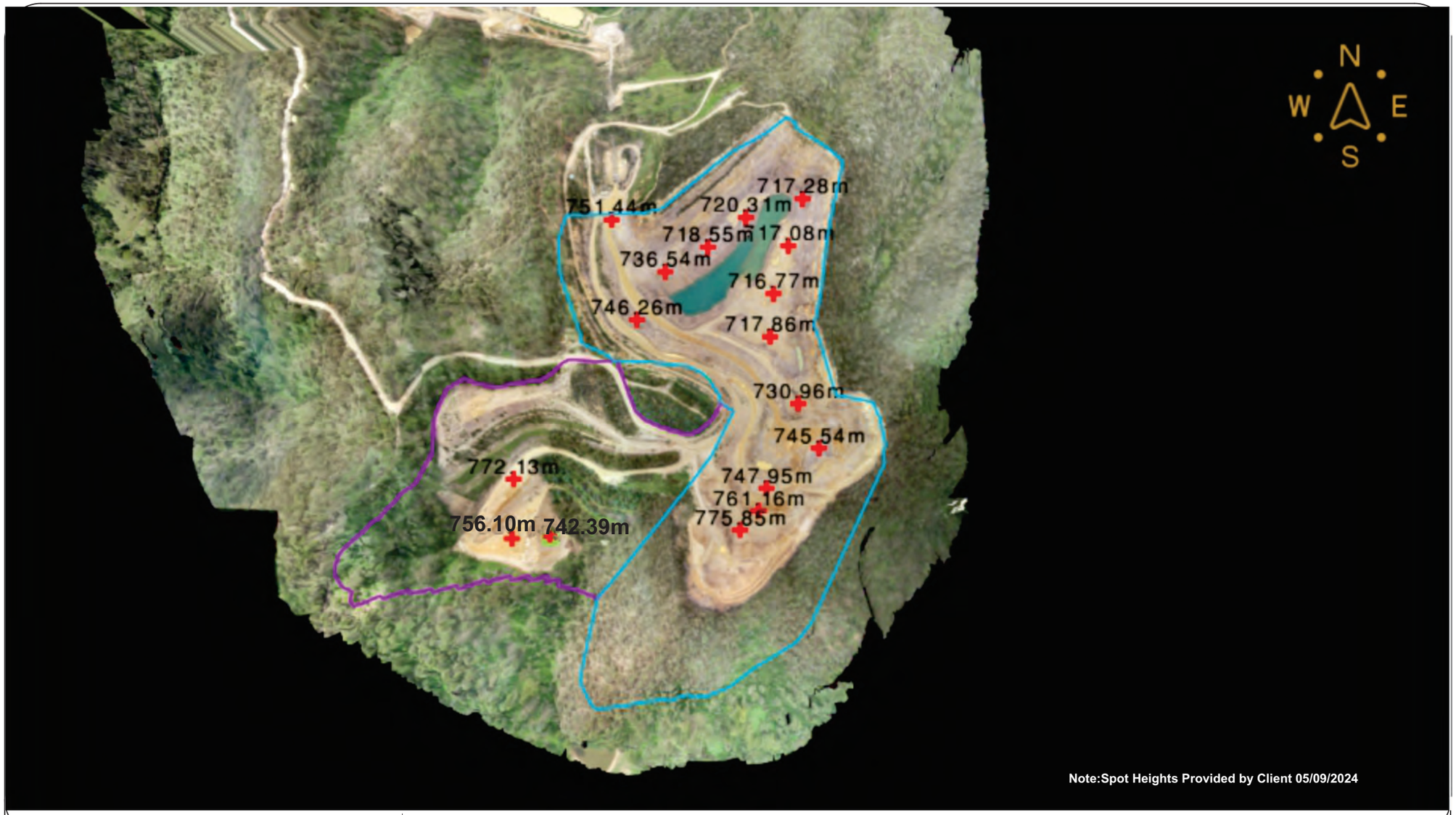

HY-TEC

TITLE : Pit Limits and Spot Heights

SURVEY DATE : 17/04/2024 Report Date:16/08/2024

DRAWN BY : Joshua Smith

DRAWING #

DATUM : AHD71

PROJECTION : MGA2020 Zone56

NOTE : Pit limits supplied by Hytec Quarry Supervisor in MGA94.
Australian Government Geodetic Calculator used to convert to MGA2020
*Denote. RL:706.2m Level at bottom of pit under water & unchanged from previous measurement

PROJECT: HYTEC AUSTEN
LITTLE HARLEY

SMART CONSTRUCTION

KOMATSU
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5.2 EXTRACTIVE MATERIAL TRANSPORTATION

5.2.1 Performance and Management

The site has implemented the measures described in the approved Traffic Management Plan. The plan was updated and approved by the then DPE in August 2019 to accommodate the modification to the overburden emplacement area as a result of the Mod 2 consent approval.

All product transport contractors are requested to slow to 40km/hr on the approach to and when crossing the Glenroy Bridge where it is deemed by the driver to be safe and reasonable to do so. Adbri Quarries acknowledges that noise generated by trucks crossing the Glenroy Bridge may have impacted the nearby residents in the past and this voluntary commitment is intended to reduce potential noise generation at this location. Additional signage has been installed at the quarry to remind heavy vehicles to minimise speed over the bridge near neighbouring property.

There were no non-compliances relating to truck movements or tonnage limits in the report period.

5.2.2 Monitoring Data

5.2.2.1 Truck Movements

Truck movements are monitored hourly, daily, weekly, monthly and annually, and reported on the website: https://adbriquarries.com.au/nsw/ and summarised below.

Table 8. Transportation Monitoring Trends

Material	1/7/19 – 30/6/20	1/7/20 - 30/6/21	1/7/21 - 30/6/22	1/7/22 - 30/6/23	1/7/23 – 30/6/24	Approved limit	Compliant?
Total movements during report period	26,078	27,805	32,256	43,053	**31,473**	-	
Maximum laden trucks per weekday	185	167	251	250	**157**	**300**	Yes
Maximum laden trucks per Saturday	90	70	81	111	**70**	**167**	Yes
Maximum average laden trucks per weekday averaged over the total number of dispatch weekdays in any calendar month	119	117	193	188	**139**	**200**	Yes

Detailed sheet included in *Appendix N*.

5.2.2.2 Intersection Performance Monitoring

The performance of the intersection between Jenolan Caves Road and Great Western Highway was monitored in accordance with Schedule 3 condition 22A on 19th June 2024.

The report concluded:

"SIDRA modelling has been undertaken as part of the traffic monitoring and the results indicate that the Great Western Highway / Jenolan Caves Road / Blackmans Creek Road intersection currently operate at LoS C in the AM and PM peak hours, with spare capacity to cater for the future traffic growth at the intersection."

Monitoring is required next in 2026.

5.3 OPERATION OF PLANT AND EQUIPMENT

The operating plant used at the site are summarised in *Table 9*.

Table 9. Plant and Equipment

Plant	Number	Purpose
PC 850 Excavator	1	Loading of haul trucks with extracted material.
HD325 Dump Truck	1	Haul extracted material to crusher and overburden to the emplacement areas.
HD605 Dump Truck	2	Haul extracted material to crusher and overburden to the emplacement areas.
155 Dozer	1	Overburden stripping and emplacement formation, Stockpile management
Komatsu HM400-5 Water Truck	1	Dust suppression
WA500 Front End Loader	4	Loading of product into highway haul trucks and used in the creation of product stockpiles
Blast Drill Rig	1	Drilling of blast holes

Maintenance is managed through Gearbox maintenance system with schedules set in accordance with OEM requirements and operated in accordance with ABL SMS (Safety Management System). Plant maintenance records are available on request.

Overburden material is now screened using a mobile screen to make better use of site deposit material. Most of this screened material is sold, with a small percentage (~2%) use in rehabilitation.

5.4 OPERATING HOURS

The site reports no non-compliances with the operating hours described in the table below. There were no emergency works, or deliveries or dispatches of materials requested by Police or other authorities. All site visitors, staff and contractors are informed of the conditions through inductions and toolbox talks.

Table 10. Operating Hours

Activity	Permissible Hours (SSD-6084 & EPL12323 L6)
Extraction operations **Processing Operations** **Overburden Management** **Stockpile Management**	6 am to 10 pm Monday to Friday 6 am to 3 pm Saturday At no time on Sundays or Public Holidays
Blasting	10 am to 3 pm Monday to Friday (except Public Holidays)
Loading and dispatch	4 am to 10 pm Monday to Friday 5 am to 3 pm Saturday At no time on Sundays or Public Holidays
Maintenance	Anytime

5.5 OTHER OPERATIONS

There were no new buildings or structures, alterations or additions to existing building or demolitions during the report period.

6 Environmental Performance

This section summarises the performance in environmental management against the limits, predictions and commitments in the consent and environmental management plans. The monitoring locations are shown on *Figure Four* and *Figure Five*. All management plans are available at https://adbriquarries.com.au/nsw/ .

Plan of:	**Annual Review for the Austen Quarry Extension July 2023 to June 2024 - Environmental Monitoring Locations**	**Location:**	Off Jenolan Caves Road, Hartley, NSW	**Source:**	Google Earth accessed via QGIS & Client 10/03/2022. NSW Clip & Ship Cadastral. Groundwork Plus Jan 2019 Quarry Site Boundary georeferenced. Biodiversity areas EIS 2013 Schedule 2.	**Plan By:**	SK/JD
Figure:	**FOUR**	**Council:**	Lithgow City Council	**Survey:**	Not Applicable	**Project Manager:**	LT
Version/ Date:	V0 01/07/2024	**Tenure:**	Not Applicable	**Projection:**	GDA2020/MGA Zone 56 EPSG:7856		
Our Ref:	12637_HY_H_AR2023-24_Q004_V1_F4	**Client:**	Adbri Quarries Sydney Pty Ltd	**Contour Interval:**	Not Applicable		

N

0 100 200 300 400 500 m

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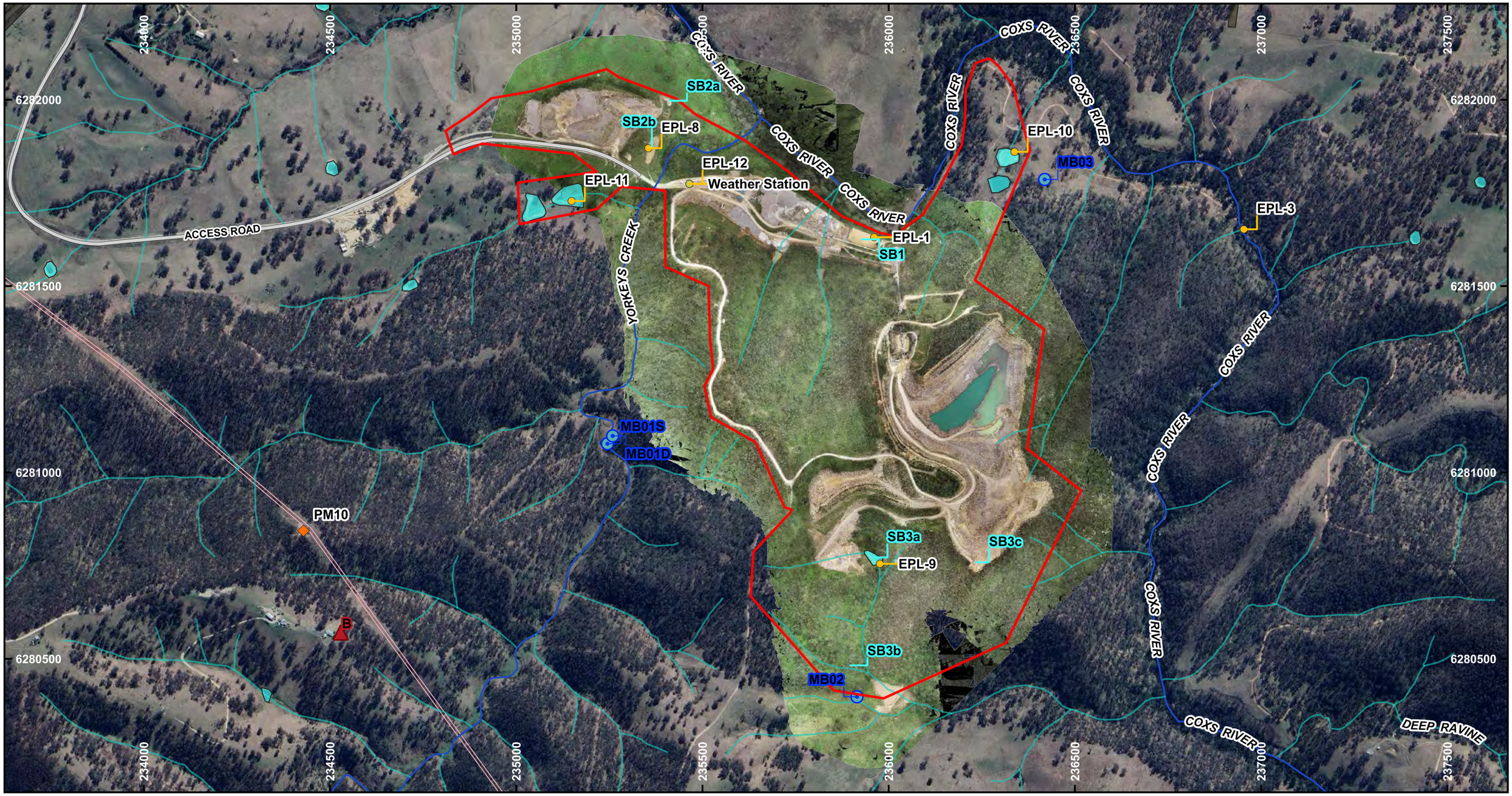

Legend

- Quarry Site Boundary^
- Access Road
- Dam/Sediment Dam or Basin
- Electricity Transmission Line Easement

Drainage Line

- Major Drainage Line
- Coxs River
- Deep Creek
- Yorkeys Creek

Monitoring Locations

- EPL Monitoring Points
- Monitoring Bore
- Noise Monitoring Location
- PM10

Note:
Monitoring Locations positioned form coordinates from Client Plan "Monitoring Locations" 04/09/2019 Job No.531/1000/652/Reports/65240 OB Emplacement MOD2.

^ = Provided by client dated July 2019

Plan of:	**Annual Review for the Austen Quarry Extension July 2023 to June 2024 - Perimeter Monitoring Locations**	**Location:**	Off Jenolan Caves Road, Hartley, NSW	**Source:**	Google Earth accessed via QGIS & Client 10/03/2022. NSW Clip & Ship Cadastral. Groundwork Plus Jan 2019 Quarry Site Boundary georeferenced. Biodiversity areas EIS 2013 Schedule 2.	**Plan By:**	SK/JD
Figure:	**FIVE**	**Council:**	Lithgow City Council	**Survey:**	NSW Clip & Ship Cadastral	**Project Manager:**	LT
Version/ Date:	V0 01/07/2024	**Tenure:**	Not Aplicable	**Projection:**	GDA2020/MGA Zone 56 EPSG:7856		
Our Ref:	12637_HY_H_AR2023-24_Q005_V1_F5	**Client:**	Adbri Quarries Sydney Pty Ltd	**Contour Interval:**	Not Applicable		

N

0 200 400 600 800 1000 m

vgt environmental compliance solutions and laboratories

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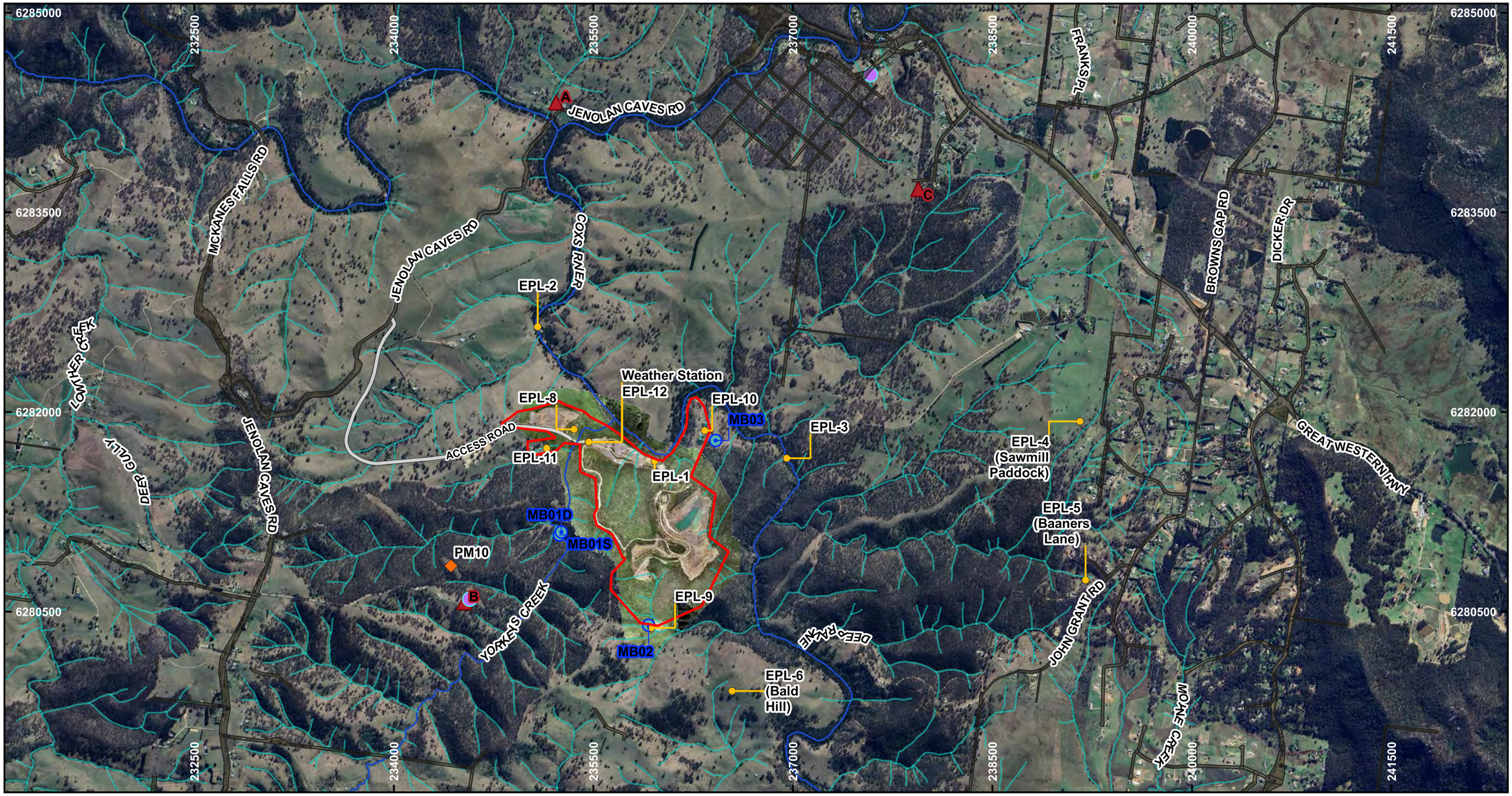


Legend

- Quarry Site Boundary^
- Access Road
- Cadastral Information
- Dam/Sediment Dam or Basin
- Electricity Transmission LIne Easement

Drainage Line

- Major Drainage Line
- Coxs River
- Deep Creek
- Yorkeys Creek

Monitoring Sites

- Blast Noise Monitoring Location
- PM10
- Noise Monitoring Location
- Monitoring Bore
- EPL Monitoring Point

Note:
Monitoring Locations positioned form coordinates from Client Plan "Monitoring Locations" 04/09/2019 Job No.531/1000/652/Reports/65240 OB Emplacement MOD2 and locations provided via email Sept 2023.

^ = Provided by client dated July 2019

6.1 CLIMATE

6.1.1 Performance and Management

Weather data is measured on the site at 15-minute intervals for temperature, rainfall, wind speed and wind direction, in accordance with the parameters and frequency required by EPL 12323 condition M8.1 and schedule 3, condition 13 of SSD-6084. The recorded data is summarised in the following graphs and tables. Historical averages are sourced from the Bureau of Meteorology site at Mt Boyce. The site reports no cessation of activities due to weather conditions.

During the period 1st to 13th June 2024, Telstra shut down the 3G service to convert to 4G, resulting in the logger being unable to record data during this time. Data recording recommenced from the 14th, once Telstra service resumed. Since the non-compliance was not due to site activities and resulted in no material harm, an incident was not recorded, however DPHI and EPA were notified (see *Appendix L*). DPHI has determined not to take any regulatory action.

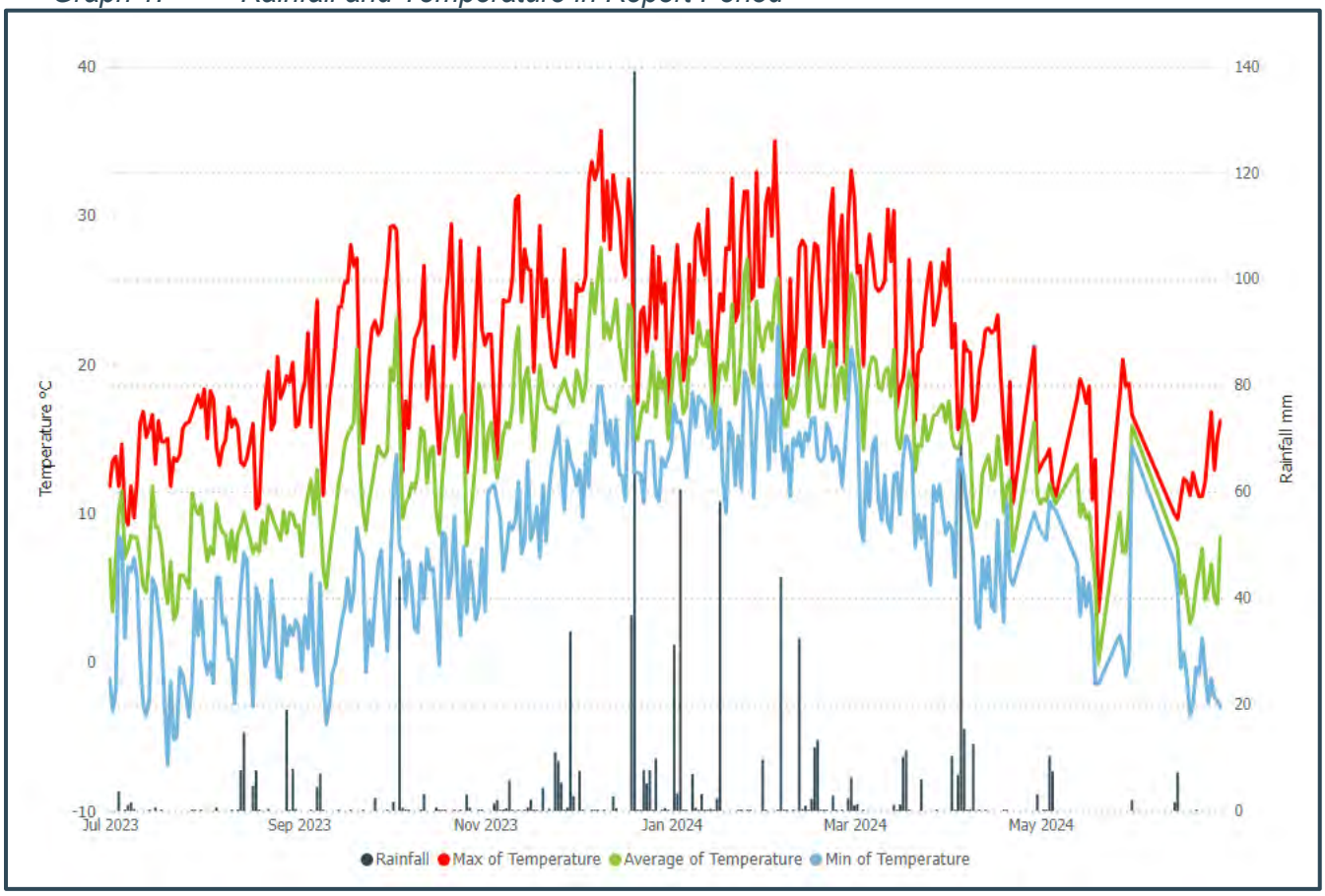
6.1.2 Monitoring

In summary, the site received close to average rainfall, minimum temperatures have been lower, and maximum temperatures have been lower than averages. Wind speeds have also been lower than averages.

Table 11. Weather Summary versus Historical Averages

Measurement	*1994 – 2018 Mean (BOM-Mt Boyce)*	1/07/18 to 30/06/19	1/07/19 to 30/06/20	1/07/20 to 30/06/21	1/07/21 to 30/06/22	1/07/22 to 30/06/23	1/07/23 to 30/06/24
Annual rainfall (mm)	*972.9*	362	648.7	907.0	1249.4	984.4	**930.3**
Minimum temperature (°C)	*-3.6*	-7.0	-6.1	-4.0	-5.2	-7.5	**-6.9**
Maximum temperature (°C)	*37.2*	37.7	39.2	36.4	30.7	36.8	**35.7**
Mean 9am wind speed (m/s)	*4.1*	1.9	2.1	1.88	1.8	1.84	**1.65**
Mean 3pm wind speed (m/s)	*4.8*	3.0	3.3	2.75	2.7	2.9	**2.70**

Graph 1. Rainfall and Temperature in Report Period



Graph 2. Wind Roses

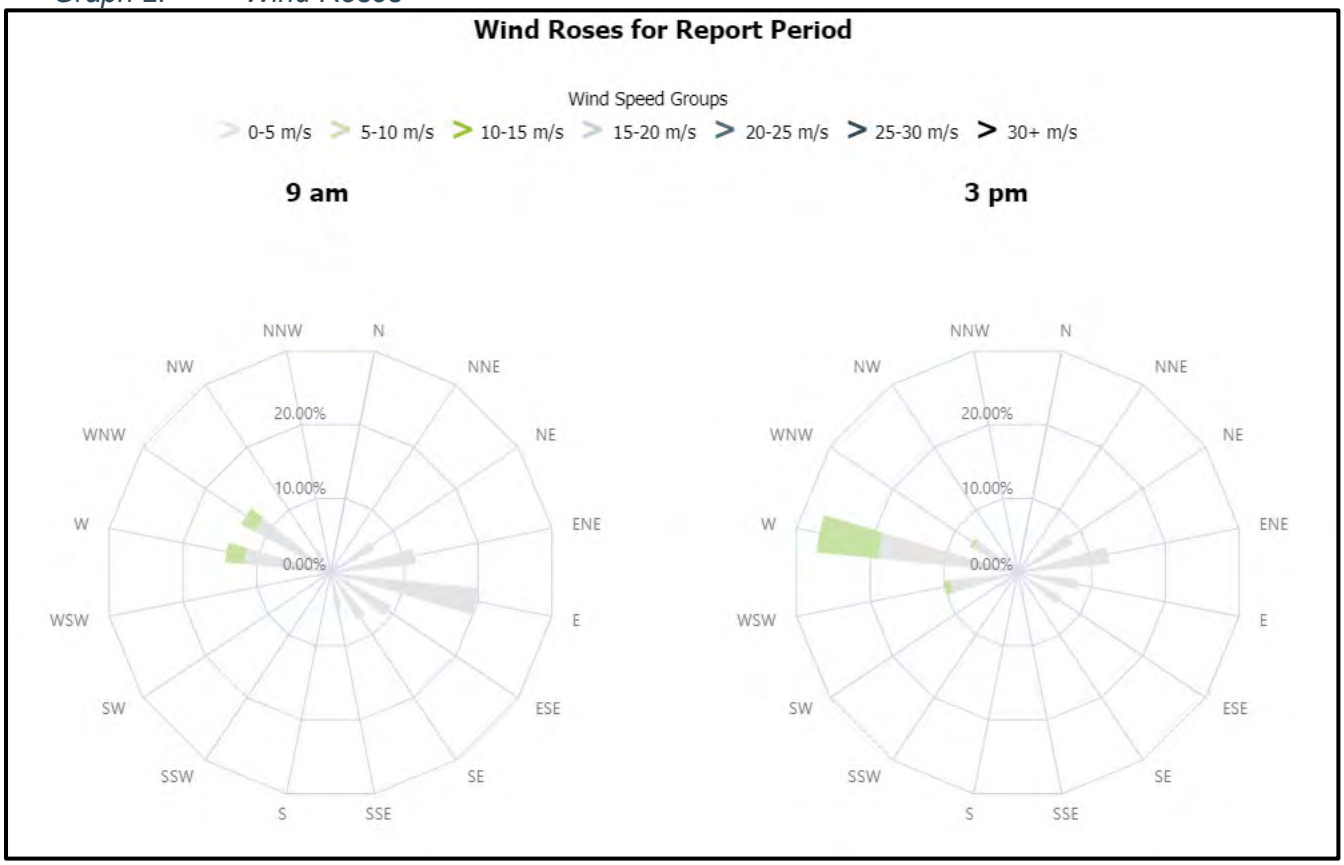


Table 12. Weather Summary in Report Period

Year	Month	Rainfall (mm)	Min of Temperature °C	Max of Temperature °C	Average of Temperature °C
2023	July	7.6	-6.9	17.9	7.3
2023	August	63.1	-3.0	20.5	8.7
2023	September	14.3	-4.2	28.0	11.7
2023	October	54.6	-0.2	29.4	14.2
2023	November	81.0	3.4	31.3	17.0
2023	December	218.1	9.7	35.7	20.3
2024	January	176.8	10.0	32.9	20.4
2024	February	117.5	11.1	35.0	19.9
2024	March	32.3	5.2	31.2	17.6
2024	April	118.6	1.3	27.7	12.6
2024	May	34.8	-1.5	20.3	9.8
2024	June	26.5	-3.6	16.8	5.7
Total		**945.1**	**-6.9**	**35.7**	**14.1**

Wind Speed at 9am

Year	Month	Average of Wind Speed (m/s)
2023	July	1.34
2023	August	1.25
2023	September	1.66
2023	October	3.09
2023	November	2.05
2023	December	2.38
2024	January	1.88
2024	February	1.17
2024	March	1.28
2024	April	1.15
2024	May	0.97
2024	June	0.52
Total		**1.61**

Wind Speed at 3pm

Year	Month	Average of Wind Speed (m/s)
2023	July	3.05
2023	August	2.84
2023	September	3.02
2023	October	3.92
2023	November	2.87
2023	December	3.04
2024	January	2.20
2024	February	2.32
2024	March	2.17
2024	April	1.94
2024	May	1.66
2024	June	2.51
Total		**2.64**

6.2 NOISE

6.2.1 Performance and Management

Activities on the site have been undertaken in accordance with the EIS, statement of commitments and Noise Management Plan (NMP). No new types of equipment have been commissioned on the site in the current report period, and therefore all sound power levels of equipment are unchanged from those measured previously.

6.2.2 Monitoring

Two noise monitoring assessments were undertaken during the report period. Muller Acoustic Consulting (MAC) undertook assessments in accordance with the NSW EPA noise policy, schedule 3 conditions 3 and 4 of the consent, EPL 12323, and the site's Noise Management Plan in August 2023 and April 2024. The results are included in *Appendix F*, and summarised below. Monitoring locations are shown on *Figure Five*.

Table 13. Noise Monitoring Summary

Location	Round	Quarry Noise Contribution	Noise Criteria SSD-6084 Mod 2
A	Day 17/8/2023 Evening 17/8/2023 Morning Shoulder 25/8/2023	<29 dB $LA_{eq\ (15\ min)}$ <32 dB $LA_{eq\ (15\ min)}$ <34 dB $LA_{eq\ (15\ min)}$	35 dB $LA_{eq\ (15\ min)}$
	Morning Shoulder (Sleep Disturbance)	<34 dB LA_{max}	52 LA_{max}
A	Day 8/4/2024 Evening 8/4/2024 Morning Shoulder 9/4/2024	<35 dB $LA_{eq\ (15\ min)}$ <35 dB $LA_{eq\ (15\ min)}$ <35 dB $LA_{eq\ (15\ min)}$	35 dB $LA_{eq\ (15\ min)}$
	Morning Shoulder (Sleep Disturbance)	<35 dB LA_{max}	52 LA_{max}
Location A 2020		**Compliant**	
Location A 2021		**Compliant**	
Location A 2022		**Compliant**	
Location A 2023		**Compliant**	
Location A 2024		**Compliant**	
B	Day 17/8/2023 Evening 17/8/2023 Morning Shoulder 25/8/2023	<28 dB $LA_{eq\ (15\ min)}$ 30 dB $LA_{eq\ (15\ min)}$ <32 dB $LA_{eq\ (15\ min)}$	35 dB $LA_{eq\ (15\ min)}$
	Morning Shoulder (Sleep Disturbance)	<32 dB LA_{max}	52 LA_{max}
B	Day 8/4/2024 Evening 8/4/2024 Morning Shoulder 9/4/2024	<35 dB $LA_{eq\ (15\ min)}$ <35 dB $LA_{eq\ (15\ min)}$ <35 dB $LA_{eq\ (15\ min)}$	35 dB $LA_{eq\ (15\ min)}$
	Morning Shoulder (Sleep Disturbance)	<35 dB LA_{max}	52 LA_{max}
Location B 2020		**Compliant**	
Location B 2021		**Compliant**	
Location B 2022		**Compliant**	
Location B 2023		**Compliant**	
Location B 2024		**Compliant**	
C	Day 17/8/2023 Evening 17/8/2023 Morning Shoulder 25/8/2023	<25 dB $LA_{eq\ (15\ min)}$ <24 dB $LA_{eq\ (15\ min)}$ <27 dB $LA_{eq\ (15\ min)}$	35 dB $LA_{eq\ (15\ min)}$
	Morning Shoulder (Sleep Disturbance)	<27 dB LA_{max}	52 LA_{max}
C	Day 8/4/2024 Evening 8/4/2024 Morning Shoulder 9/4/2024	<35 dB $LA_{eq\ (15\ min)}$ <35 dB $LA_{eq\ (15\ min)}$ <35 dB $LA_{eq\ (15\ min)}$	35 dB $LA_{eq\ (15\ min)}$
	Morning Shoulder (Sleep Disturbance)	<35 dB LA_{max}	52 LA_{max}
Location C 2020		**Compliant**	
Location C 2021		**Compliant**	
Location C 2022		**Compliant**	
Location C 2023		**Compliant**	
Location C 2024		**Compliant**	

6.2.3 Interpretation of Results

Operator attended noise surveys were conducted twice per year in accordance with requirements.

The type of monitoring is compliant with the consent, EPL and NMP requirements.

The results of all monitoring concluded that quarry noise contributions were compliant when compared against the Mod 2 consent conditions. The Noise Management Plan (R.W. Corkery 2019) and the Noise Assessment (MAC), which can be found on the website, both predict that the noise levels at all times of day, evening, night and morning shoulder periods are predicted to remain within the existing noise limit of 35dB(A) at all privately-owned residences surrounding the Quarry. The monitoring results are consistent with the predictions. Detailed discussions of results are given in the reports in *Appendix F*.

The monitoring results show that the site noise management controls and practices are effective.

6.3 BLASTING

6.3.1 Performance and Management

To ensure the safety of personnel and the public, measures in the Blast Management Plan (BMP) have been implemented. There were 23 blasts during the reporting period. There were no monitoring exceedances. Condition 7 of Schedule 3 states that:

> *'The Applicant may carry out a maximum of 1 blast per calendar week, unless an additional blast is required following a blast misfire. This condition does not apply to blasts required to ensure the safety of the quarry or workers on site.*
>
> *Note: For the purposes of this condition, a blast refers to a single blast event, which may involve a number of individual blasts fired in quick succession in a discrete area of the mine.'*

6.3.2 Monitoring Data

No results measured are greater than the relevant limit. No additional blasts occurred in the same calendar week. No blasts occurred outside regulated hours. The third monitor south east of the quarry was not required during the report period.

Table 14. Blasting Results

Blasting	Date	Days Apart	Blast Number	Limits	Units of measure	Results - Hartley Village	2nd Monitor 781 Jenolan Caves Rd	Time
Ground Vibration	3/07/2023	19	244	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	1.10pm
Over-pressure	3/07/2023	19	244	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	1.10pm
Ground Vibration	28/07/2023	25	245	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	11.33am
Over-pressure	28/07/2023	25	245	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	11.33am
Ground Vibration	9/08/2023	12	246	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	12.02pm
Over-pressure	9/08/2023	12	246	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	12.02pm
Ground Vibration	1/09/2023	23	247	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	12.08pm
Over-pressure	1/09/2023	23	247	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	12.08pm
Ground Vibration	13/09/2023	12	248	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	1.32pm
Over-pressure	13/09/2023	12	248	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	1.32pm
Ground Vibration	11/10/2023	28	249	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	12.13pm
Over-pressure	11/10/2023	28	249	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	12.13pm
Ground Vibration	30/10/2023	19	250	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	1.55pm
Over-pressure	30/10/2023	19	250	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	1.55pm
Ground Vibration	9/11/2023	10	251	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	11.38am
Over-pressure	9/11/2023	10	251	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	11.38am
Ground Vibration	30/11/2023	21	252 A & B	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	1.08pm
Over-pressure	30/11/2023	21	252 A & B	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	1.08pm
Ground Vibration	6/12/2023	6	253	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	11.34am
Over-pressure	6/12/2023	6	253	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	11.34am
Ground Vibration	13/12/2023	7	254	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	1.19pm

Blasting	Date	Days Apart	Blast Number	Limits	Units of measure	Results - Hartley Village	2nd Monitor 781 Jenolan Caves Rd	Time
Over-pressure	13/12/2023	7	254	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	1.19pm
Ground Vibration	31/01/2024	49	255	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	11.45am
Over-pressure	31/01/2024	49	255	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	11.45am
Ground Vibration	15/02/2024	15	256	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	12.26pm
Over-pressure	15/02/2024	15	256	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	12.26pm
Ground Vibration	22/02/2024	7	257	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	12.17pm
Over-pressure	22/02/2024	7	257	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	12.17pm
Ground Vibration	21/03/2024	28	258	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	12.58pm
Over-pressure	21/03/2024	28	258	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	12.58pm
Ground Vibration	4/04/2024	14	259	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	1.15pm
Over-pressure	4/04/2024	14	259	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	1.15pm
Ground Vibration	10/04/2024	6	260	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	12.34pm
Over-pressure	10/04/2024	6	260	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	12.34pm
Ground Vibration	30/04/2024	20	261	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	12.39pm
Overpressure	30/04/2024	20	261	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	12.39pm
Ground Vibration	22/05/2024	22	262	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	2.54pm
Over-pressure	22/05/2024	22	262	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	2.54pm
Ground Vibration	16/05/2024	-6	263	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	11.58 am
Over-pressure	16/05/2024	-6	263	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	11.58 am
Ground Vibration	11/06/2024	26	264 A&B	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	2.50 pm
Over-pressure	11/06/2024	26	264 A&B	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	2.50pm
Ground Vibration	20/06/2024	9	265	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	2.47pm
Over-pressure	20/06/2024	9	265	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	2.47pm
Ground Vibration	27/06/2024	7	266	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	2.27pm
Over-pressure	27/06/2024	7	266	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	2.27pm

Table 15. Blast Monitoring Summary

Approval criteria / EIS Predictions	Performance during the period	Trend	Implemented / proposed actions
Blasting on the site does not exceed an Airblast overpressure (dB (L in Peak) of 120 at 0% allowable exceedance at any residence on privately owned land.	Compliant	No exceedances recorded – Blast Management practices are considered effective	Continue in accordance with EMP
Blasting on the site does not exceed an Airblast overpressure (dB (L in Peak) of 115 at 5% of the total number of blasts over a period of 12 months at any residence on privately owned land.	Compliant		
Blasting on the site does not exceed a Ground vibration (mm/s) of 10 at 0% allowable exceedance at any residence on privately owned land.	Compliant		
Blasting on the site does not exceed a Ground vibration (mm/s) of 5 at 5% of the total number of blasts over a period of 12 months at any residence on privately owned land	Compliant		
Hours of Operation – blasting must occur between 10am and 3pm Monday to Friday (except public holidays)	Compliant	Once in previous period	

6.4 AIR QUALITY

6.4.1 Performance and Management

Activities on the site have been undertaken in accordance with the EIS, statement of commitments and Air Quality Management Plan (AQMP).

Dust deposition is collected at three sites in accordance with the EPL and consent conditions. The parameters and frequency are in compliance with requirements. Annual averages are all below 4 g/m^2/month. The trends for this monitoring are steady and compliant. It is noted in the AQMP that:

> *'The incremental impact assessment criteria for deposited dust is considered to be the increase in concentrations due to the development alone while the cumulative impact assessment criteria is the criteria increase in concentrations due to the development plus background concentrations due to all other sources. For the purpose of assessing compliance, the results of deposited dust monitoring will be considered against the cumulative impact assessment criteria only, as it is not possible to separate the deposited dust generated by the Quarry-alone from other background deposited dust sources.'*

Particulate Matter less than 10 micron (PM_{10}) is measured at the nearest residence using a continuous real time monitor (E-Sampler). Monitoring commenced on 14th March 2017.

6.4.2 Monitoring Data

Air quality dust deposition results are available at https://adbriquarries.com.au/nsw/ and are summarised below. The monitoring sites are shown on *Figure Five*.

Table 16. Deposited Dust Results – Sawmill, AQD 1, EPL 4

Deposited Matter g/m2/month

Year	Month	Insoluble Solids	Insoluble Solids Annual Average	Limit-Annual Insol Solids
2023	July	0.0	0.86	4
2023	August	0.8	0.92	4
2023	September	0.6	0.93	4
2023	October	0.9	0.93	4
2023	November	1.6	0.67	4
2023	December	1.0	0.67	4
2024	January	1.0	0.72	4
2024	February	1.6	0.78	4
2024	March	1.3	0.87	4
2024	April	1.1	0.93	4
2024	May	0.2	0.91	4
2024	June	0.3	0.87	4

Graph 3. Deposited Dust Trends – Sawmill, AQD 1, EPL 4

Table 17. Deposited Dust Results – Baaners Lane, AQD 2, EPL 5

Deposited Matter g/m2/month

Year	Month	Insoluble Solids	Insoluble Solids Annual Average	Limit-Annual Insol Solids
2023	July	0.3	0.51	4
2023	August	0.7	0.51	4
2023	September	0.8	0.53	4
2023	October	0.2	0.47	4
2023	November	0.4	0.44	4
2023	December	0.8	0.45	4
2024	January	0.7	0.48	4
2024	February	0.8	0.53	4
2024	March	0.7	0.55	4
2024	April	0.2	0.55	4
2024	May	0.3	0.53	4
2024	June	0.1	0.50	4

Graph 4. Deposited Dust Trends – Baaners Lane, AQD 2, EPL 5

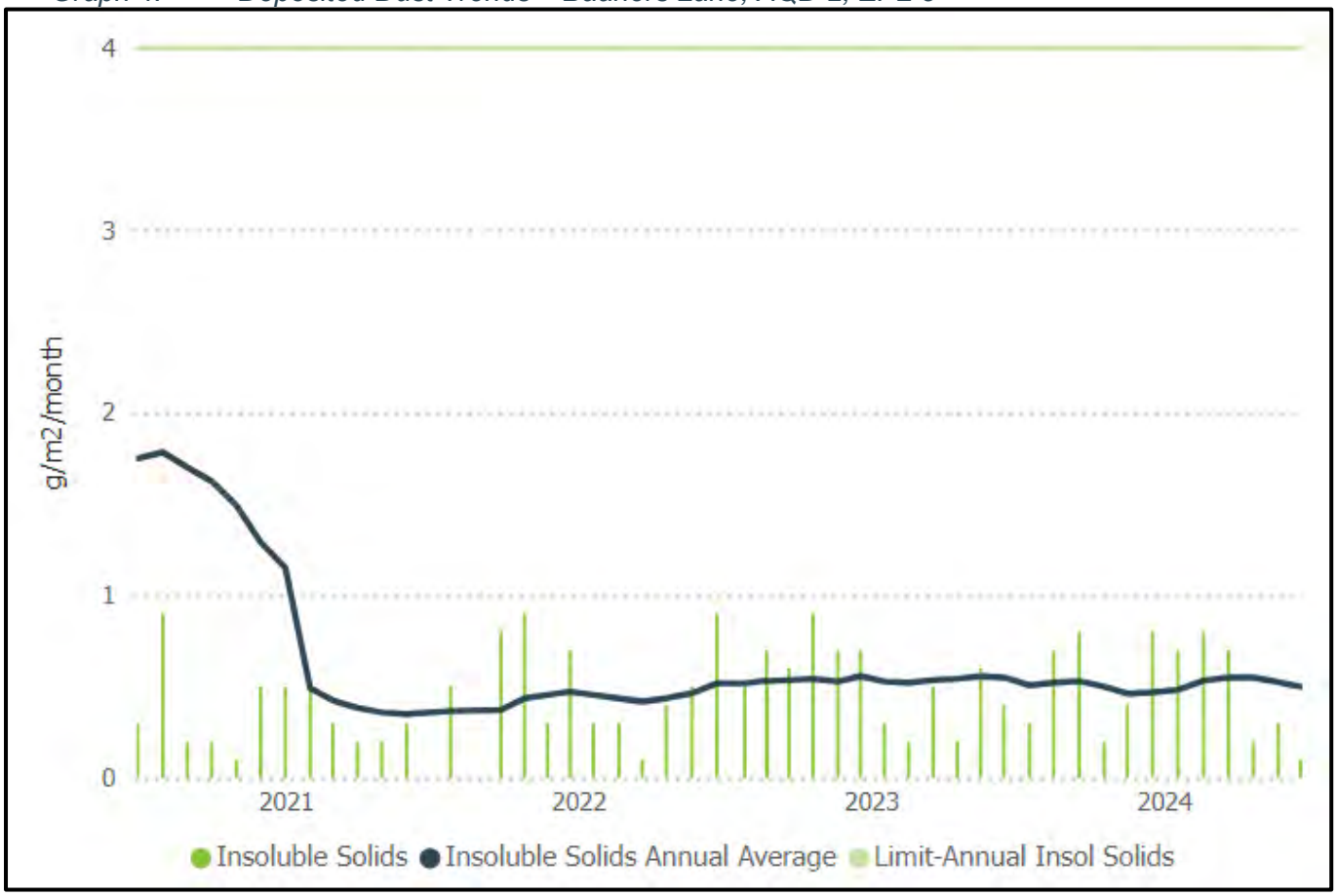


Table 18. Deposited Dust Results – Bald Hill, AQD 3, EPL 6

Deposited Matter g/m2/month

Year	Month	Insoluble Solids	Insoluble Solids Annual Average	Limit-Annual Insol Solids
2023	July	0.4	0.58	4
2023	August	0.6	0.58	4
2023	September	0.5	0.58	4
2023	October	0.5	0.54	4
2023	November	0.7	0.55	4
2023	December	0.5	0.53	4
2024	January	0.6	0.50	4
2024	February	1.2	0.57	4
2024	March	0.8	0.59	4
2024	April	0.1	0.56	4
2024	May	0.7	0.58	4
2024	June	0.3	0.58	4

Graph 5. Deposited Dust Trends – Bald Hill, AQD 3, EPL 6

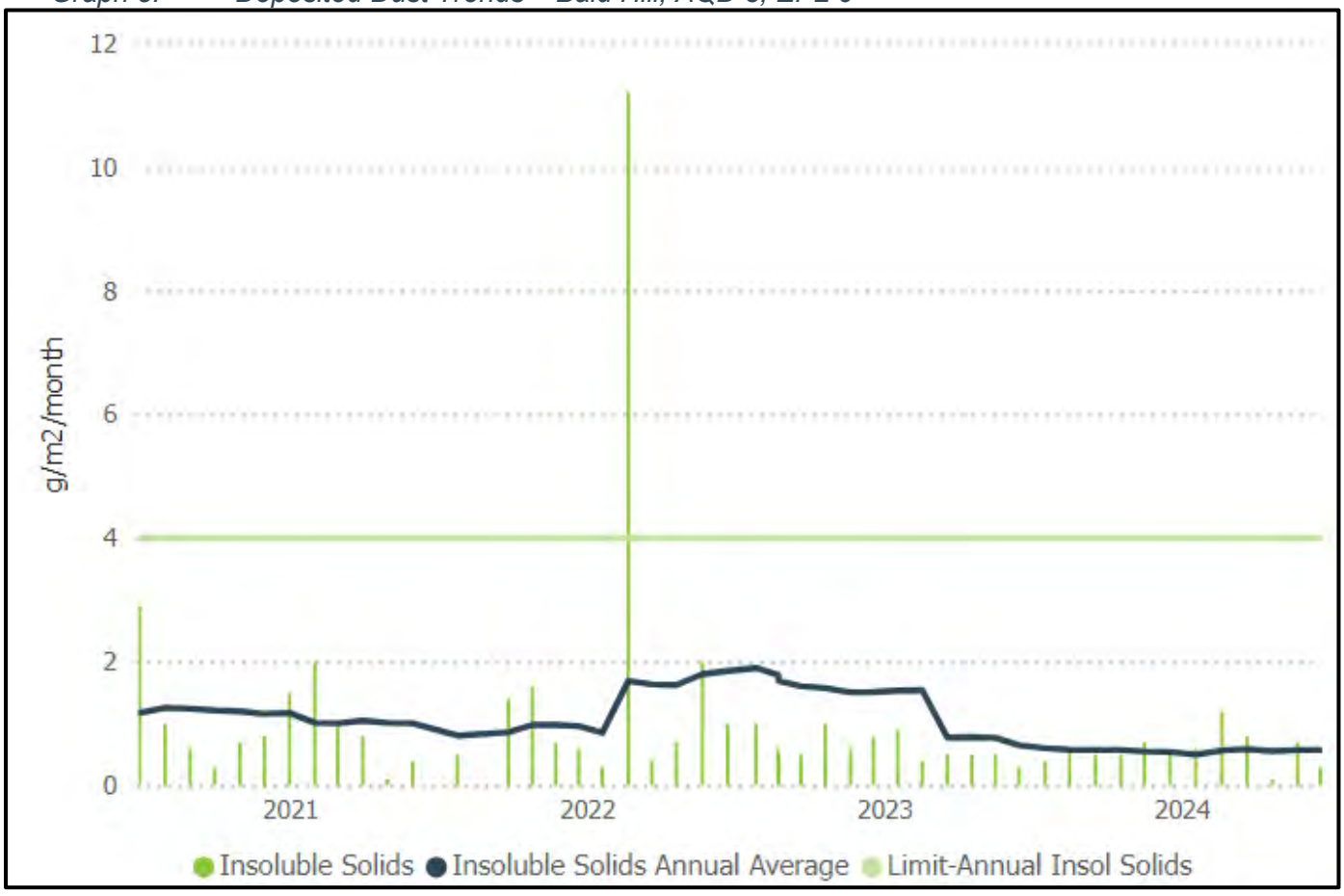


Table 19. Particulate Matter Less than 10 Micron Annual Averages

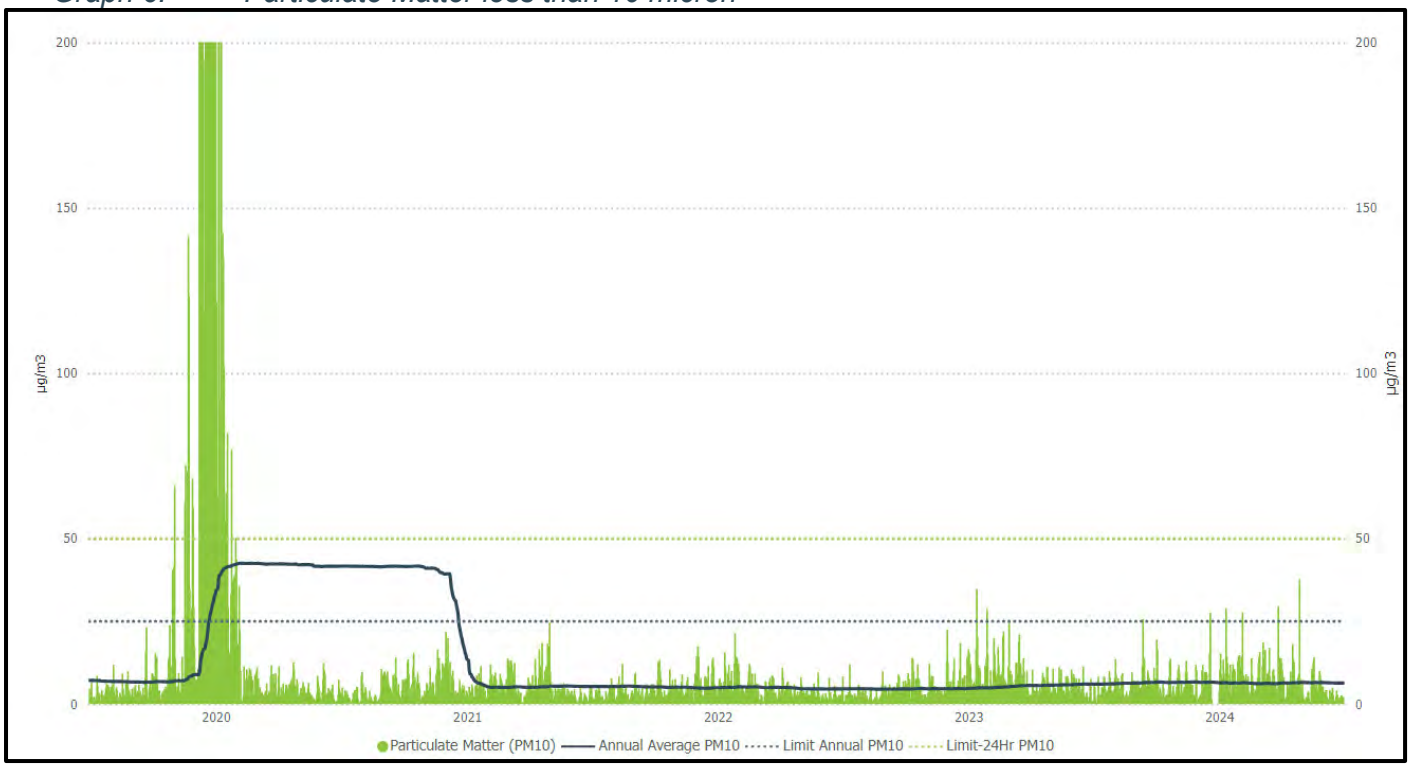
Annual Averages	PM_{10} µg/m³
1/07/2019 – 30/06/2020	5.4
1/07/2020 – 30/06/2021*	5.3
1/07/2021 – 30/06/2022	4.6
1/07/2022 – 30/06/2023	6.0
1/07/2023 – 30/06/2024	**6.3**
Compliant with DA	Yes
Limit	*25*

*Excluding results from extraordinary events 2/11/2020 and between 17/11/2019 and 31/01/2020 as per Condition 10-Note d)

Table 20. 24 Hour Maximum Particulate Exceedances

Date of Exceedance	PM_{10} µg/m³
Nil exceedances	
Compliant with DA	Yes
Limit	*50*

Graph 6. Particulate Matter less than 10 micron



6.4.3 Interpretation of Results

There were no PM_{10} results that showed an exceedance of the 24-hour or Annual average. The results measured indicate that the site is managing the air quality effectively.

6.5 HERITAGE

The Austen Quarry is situated within the tribal boundaries of the Wiradjuri people. The Wiradjuri were more dependent on terrestrial and freshwater food sources than aboriginal tribes situated within the Sydney basin. With the site's proximity to the Coxs River, it is assumed that the area surrounding the Austen Quarry was of high importance to the local aboriginal people.

The Indigenous Heritage Assessment conducted by Niche Environmental and Heritage Pty Ltd (2014) concluded that the development is unlikely to impact aboriginal cultural heritage values due to the lack of discoveries of aboriginal artefacts within the Stage 2 development area. Activities on the site have continued in accordance with the Indigenous Heritage Assessment.

During the reporting period, there were no items of Aboriginal heritage significance discovered during quarrying activities.

If items of Aboriginal heritage significance are discovered, the management measures listed in the Indigenous Heritage Assessment will be implemented.

6.6 VISUAL

6.6.1 Performance and Management

The site is visible from a number of local viewpoints including Jenolan Caves Road, the Great Western Highway, Hassan Walls Lookout to the north of the site and Mt York Lookout. Visual impact monitoring has been included in the AQ Environmental Inspection Checklist.

Lighting impacts are managed by directing light sources inwards and are monitored visually on a monthly basis.

Yorkeys Creek stockpile and the secondary processing area retain their vegetation screening. The visual screen on the northern ridge has been augmented by additional tree plantings, in previous report periods. The western and northern quarry faces have been previously sprayed with bitumen emulsion to reduce visual impacts. Further bitumen spraying will occur as required.

6.6.2 Monitoring Data

The view from Hassans Walls lookout is monitored annually using photography. Results are presented in *Appendix G*, with the most recent given below.

Photoplate 1. Visual from Hassans Walls Lookout, August 2024 – 55mm Focal Length

6.7 WASTE, LIQUID STORAGE AND DANGEROUS GOODS

6.7.1 Performance and Management

Wastes produced at the Austen Quarry consist of domestic wastes, scrap steel, trackable wastes (batteries, oils, tyres etc.) and domestic wastewaters. Schedule 3 condition 33 requires the management and minimisation of waste on the site to be reported on within the Annual Review.

Adbri Quarries has implemented the following environmental performance measures to mitigate the potential impacts of Wastes, Liquid Storage and Dangerous Goods:

- Appropriate wastewater management systems are maintained;
- The storage, handling and transport of dangerous goods is conducted in accordance with the relevant Australian standards;
- Sewage produced onsite is removed by Williams Liquid Waste Services for transport to the Lithgow Sewage Treatment plant;
- Waste skip bins are emptied when required to prevent overtopping;
- Waste skip bins lids are closed when not in use;
- Wastes that are not disposed of in skip bins, are stored in a neat and orderly manner and clearly marked as wastes;
- Wastes are segregated on site into categories (general, scrap metal, oily, recyclables etc.);
- Wastes are removed by licenced contractors; and
- Liquid wastes are bunded appropriately with bunds exceeding 110% of the maximum storage tank capacity.

During the report period all wastes have been stored, transported offsite and disposed of appropriately during the reporting period. There have been no complaints regarding waste and dangerous goods.

6.8 BUSHFIRE

6.8.1 Performance and Management

The site is equipped with fire extinguishers and a fire suppression system covers the Electrical Control room. Vehicles are fitted with fire suppression equipment and the water cart has a cannon suitable for use in firefighting. Access to dams is maintained for fire-fighting purposes, and a 20m buffer is maintained around quarry operations to manage fuel loads.

The Quarry Manager regularly attends Rural Fire Service meetings. Staff are trained in evacuation procedures and plans, contact details and equipment are available and updated as required.

Refuelling is undertaken within designated fuel bays equipped with fire extinguishers.

There were no prescribed burns this report period due to the poor seasonal conditions.

6.8.2 Monitoring Data

No assistance was required for the RFS or the local community from the quarry operations during the report period.

No backburning was undertaken this report period. A site visit from the local Hartley RFS resulted in some site access improvements and tree trimming.

6.9 BIODIVERSITY AND TERRESTRIAL ECOLOGY

6.9.1 Performance and Management

Activities on the site have been undertaken in accordance with the Landscape and Rehabilitation Management Plan (LRMP), Biodiversity Offset Management Plan (BOMP) and the Silver Leaved Mountain Gum Management Plan (SLMGMP).

The Biodiversity Offset Area (BOA) has been removed from SSD 6084 and offsetting obligations have been replaced with biodiversity credits.

Maintenance of the existing fencing around the BOA has been included in the AQ Environmental Inspection Checklist. All topsoil and vegetation cleared during the report period has been re-used in accordance with the LRMP and BOMP.

The Independent Environmental Audit 2023 states;

"One non-compliance was raised in relation to biodiversity offset management. Biodiversity offset credits had not been retired by 31/12/2021.This non-compliance has been reported in each Annual Review. Hy-Tec has purchased the necessary ecosystem credits required to satisfy its entire offsetting obligations and in the process of completing the relevant application forms to retire the credits. Hy-Tec has also paid the required amount to the NSW Biodiversity Conservation Trust to account for the species credit requirements of naturally occurring Silver Leaved Mountain Gum. The planted Silver Leaved Mountain Gum are the subject of the current modification application for the Project."

6.9.1.1 Weed Management Activities

A weed identification manual and training package has been developed to assist with weed management on the site. Key personnel have been trained and quarterly weed inspections have been included in the AQ Environmental Inspection Checklist. The dominant weeds identified on the site are Blackberry, African Love Grass, Thistles, Wild Canola, Blue Heliotrope, Serated Tussock and Patterson's Curse. Spraying is conducted by sub-contractors predominantly for Love Grass, Blackberries and Serrated Tussock.

Targeted aerial spraying was conducted in January 2024 using a drone.

6.9.1.2 Pest Management Activities

The landowner continues an eradication program for feral goats, pigs, foxes and wild dogs in conjunction with Local Land Services. Baiting programs are co-ordinated with surrounding properties several times per year.

Estimated numbers from the land owner for feral animal control on the quarry surrounding property was

- 160 pigs removed;
- 40 foxes and 121 goats.

6.9.2 Monitoring

Aquatic monitoring was undertaken during November 2023 by Niche Environment and Heritage (*Appendix I*). The results showed that:

> *"Temporal variability was the major factor explaining differences in the macroinvertebrate assemblages in spring 2023.*
> *The spring 2023 biological monitoring results reflect the prevailing rainfall and stream flow conditions, being reduced when compared to previous year monitoring results. This reflects the physical conditions, rather than any reduced water quality conditions.*
> *The macroinvertebrate assemblages and stream health indicators show that the composition and ecological health of the river within the vicinity of the Quarry remains similar to other areas of the river not influenced by Quarry operations. As such, no impacts associated with any discharges from the Quarry are identified in Spring 2023."*

Biodiversity monitoring field surveys were undertaken by EMM in over a three-day and one-night period between 5 and 7 December 2023. The spring/summer season is targeted annually to provide consistency across annual trends

and generally coincides with both higher levels of fauna activity and greater numbers of flora species in flower. (*Appendix H*). From the discussion section of the report:

6.9.2.1 Flora

'The results show that some changes have occurred to flora and fauna communities surveyed at the site since the previous monitoring period in 2022 (EMM, 2023). Weed species diversity has decreased at all ridge sites, and increased slightly at all creek sites, since 2022. Native flora species diversity is similar to the previous monitoring year, with a slight increase in native species diversity at the Impact Ridge, Impact Creek, and Control Ridge sites since 2022; however, total native flora species diversity has declined since monitoring began.

An increase in the average number of individuals, and average plant health of Silver-leaved Mountain Gum across both monitoring transects was noted during this monitoring period. All individuals within both transects were observed to have flowered, exhibiting new growth and fruiting.

The Control Creek transects are similar to previous monitoring periods, with significant disturbance due to cattle grazing and high levels of weed invasion/ non-native species present.'

6.9.2.2 Fauna

'The number of bird species observed remains similar to the previous monitoring year; however, this number is low when compared to monitoring years prior to 2022. Habitat condition has not changed significantly in comparison to previous monitoring years; therefore, the overall decrease in bird species numbers is not expected.

The 2022 and 2023 surveys were conducted in early December compared to November in previous years, and with notably hot and dry conditions during this year's survey. This may be a cause for the difference in numbers in comparison to previous monitoring years.'

6.9.2.3 Weeds

Weed species diversity has decreased at all ridge monitoring sites and increased slightly at both Impact and Control creek monitoring sites since 2022. Both Impact and Control Ridge sites recorded only a single weed species (flatweed) for the 2023 monitoring period.

Serrated Tussock was recorded at the Impact Creek monitoring site, indicating a re-introduction of the species since the previous monitoring period where none were recorded at this site. Serrated Tussock was not recorded at any other monitoring site during this monitoring period. Serrated Tussock management was undertaken on the lease in previous years, with the worst areas previously noted to be around the dams above the Impact Creek site.

African Lovegrass presence has increased at the Impact Creek site over the previous monitoring year. St. John's Wort was not recorded at any of the monitoring sites during this year's monitoring survey. This is an improvement over the previous monitoring year, where the species was recorded at South Ridge, Impact Ridge, and Impact Creek monitoring sites.

Blackberry presence was noted to be consistent to the previous year of monitoring, with populations located within the Control Creek and Impact Creek sites.

Control of the spread of the Serrated Tussock, African Lovegrass, and Blackberry infestations should be reviewed as part of the property management and in co-ordination with DPI Agriculture weed programs in the local area.

Weed species abundance and diversity has decreased since monitoring began in 2018.

Table 21. Terrestrial Ecological Monitoring Summary

Approval criteria / EIS Predictions	Performance during the period	Trend / key management implications	Implemented / proposed actions
Monitor in accordance with the SLMGMP, LRMP, and BOMP	Compliant	Terrestrial ecological monitoring indicates management practices are effective	Continue in accordance with EMP.

7 Water Management

7.1 PERFORMANCE AND MANAGEMENT

The Water Management Plan (WMP) was developed in consultation with the NSW Department of Planning and Environment, NSW DPI-Water and Water NSW, and version 11 was approved in August 2019. The plan is available on the operator's website (https://adbriquarries.com.au/nsw/).

Surface water management and monitoring has continued in accordance with the EPL 12323. The controls and procedures undertaken to mitigate impacts on surface water at the site are considered effective. Monitoring of surface water pH levels using an onsite pH meter is undertaken to determine whether treatment of collected water is required prior to testing and discharge. Monitoring results and trends are given in the following section.

Groundwater monitoring bores were established in December 2017 as required by the WMP and monitored for baseline parameters between January 2018 and August 2020. This completed the 2 years of 6-monthly baseline monitoring required by the WMP. Monitoring locations are given on *Figure Four*. Depth is measured by continuous loggers installed in January 2018.

Compliance with relevant water conditions from the consent, EPL and WMP is summarised in *Table 22*.

EPL Point 3 was unsafe to access for sampling from 20/12/2023 to 22/12/2023 and 05/01/2024 to 07/01/2024 during significant rainfall. Samples were instead taken from a nearby site, also downstream of the processing area required by EPL Point 3. The EPA was advised via email at the time as well as within the EPL Annual Return.

Table 22. Water Monitoring Compliance

Approval / EPL criteria	Performance during the period	Implemented / proposed actions
Groundwater parameters monitored 6-monthly for 2-year period (WMP)	Compliant	Continue in accordance with EMP.
Limits specified in EPL condition L2.4 (DA Sched 3 Cond 16)	Compliant	Continue in accordance with EMP.
Frequency of samples collected as specified in EPL condition M2.3/2.4	Compliant	Continue in accordance with EMP.
Location of samples collected as specified in EPL condition P1.3	Non-Compliant	Continue in accordance with EMP. A variation to the EPL regarding location of sampling points in extreme conditions has yet to be submitted.
Stormwater control structures must be maintained at designed capacity EPL cond O4.1/4.3	Compliant	After heavy rain events water is pumped around site to avoid discharges where possible.

7.2 MONITORING DATA AND INTERPRETATION

7.2.1 Surface Water Monitoring Data

Water quality results are available at https://adbriquarries.com.au/nsw/ and summarised below. Monitoring point locations are shown on *Figure Four* and *Figure Five*. Sampling is to be conducted at EPL Points 1, 8, 9, 10, and 11 daily during discharges. At EPL Points 2 and 3, the sampling frequency is monthly and daily during discharge from Point 1.

The concentration limits stipulated by condition L2.1/L2.4 for EPA Identification Points 1,8, 9, 10 and 11 are deemed not to apply when the discharge from the stormwater control structures (sediment basins) occurs solely as a result of rainfall measured at the premises which exceeds a total of 44 millimetres of rainfall over any consecutive 5 day period.

Table 23. Dates 5-day Rainfall exceeds 44mm This Report Period

Date	Rainfall (mm)	5 Day Rainfall (mm)
4/10/2023	43.94	45.68
5/10/2023	0.61	46.28
6/10/2023	0.11	46.39
7/10/2023	0.05	44.71
8/10/2023	0.00	44.71
29/11/2023	33.76	49.16
2/12/2023	7.56	44.78
3/12/2023	0.04	44.15
20/12/2023	139.09	175.92
21/12/2023	0.03	175.95
22/12/2023	0.06	176.01
23/12/2023	7.73	183.74
24/12/2023	5.18	152.09
4/01/2024	60.46	95.04
5/01/2024	0.01	95.01
6/01/2024	0.01	95.02
7/01/2024	0.00	63.78
8/01/2024	6.91	67.39
17/01/2024	58.19	61.02
18/01/2024	0.00	60.97
19/01/2024	0.00	60.61
20/01/2024	0.00	60.55
21/01/2024	0.00	58.19
6/02/2024	43.99	44.00
7/02/2024	0.05	44.05
8/02/2024	0.02	44.07
9/02/2024	0.00	44.07
10/02/2024	0.19	44.25
5/04/2024	69.86	86.95
6/04/2024	15.39	102.34
7/04/2024	0.01	92.03
8/04/2024	0.29	92.31
9/04/2024	12.60	98.15

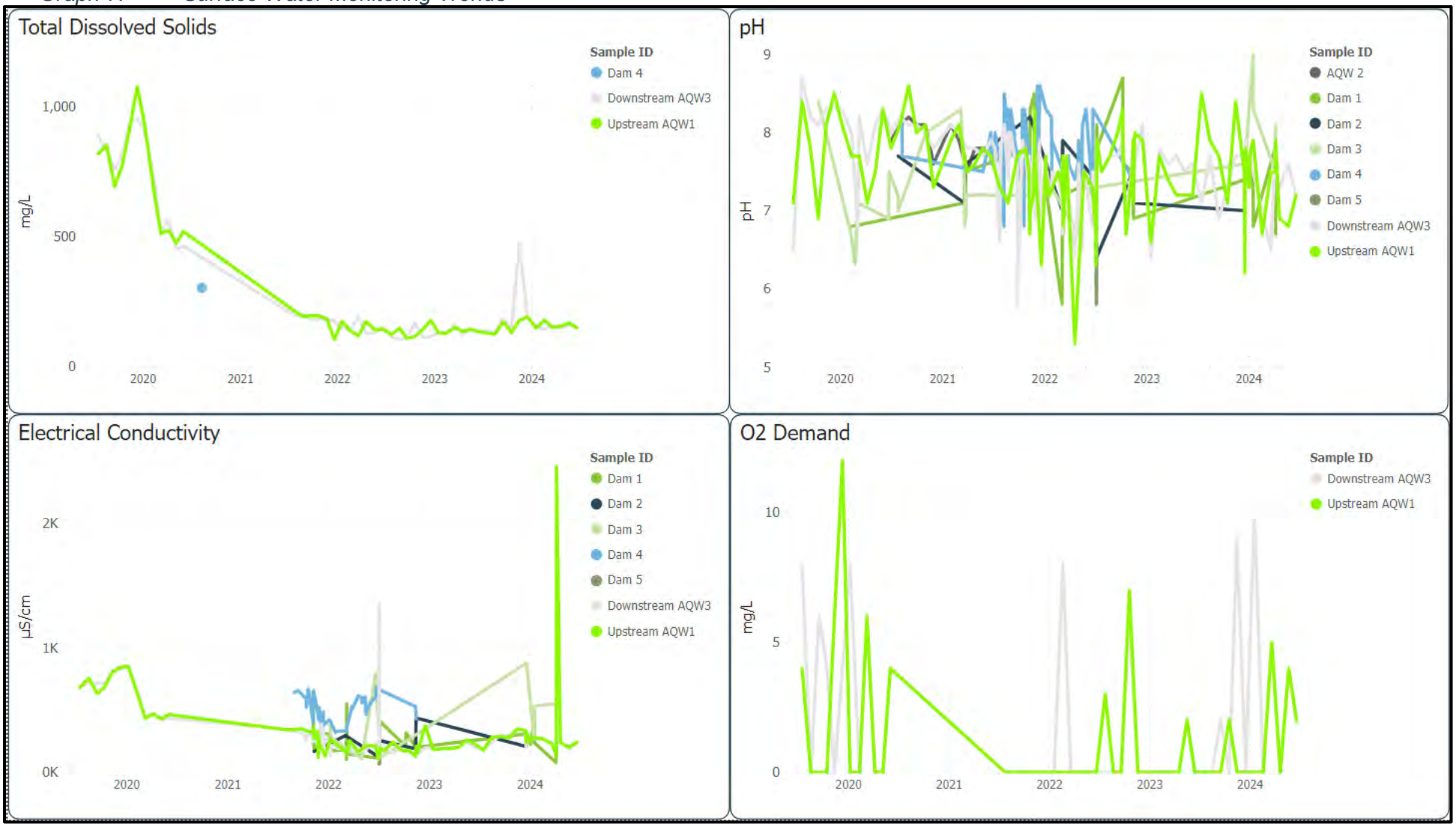
Table 24. Summary of Surface Water Results for Report Period

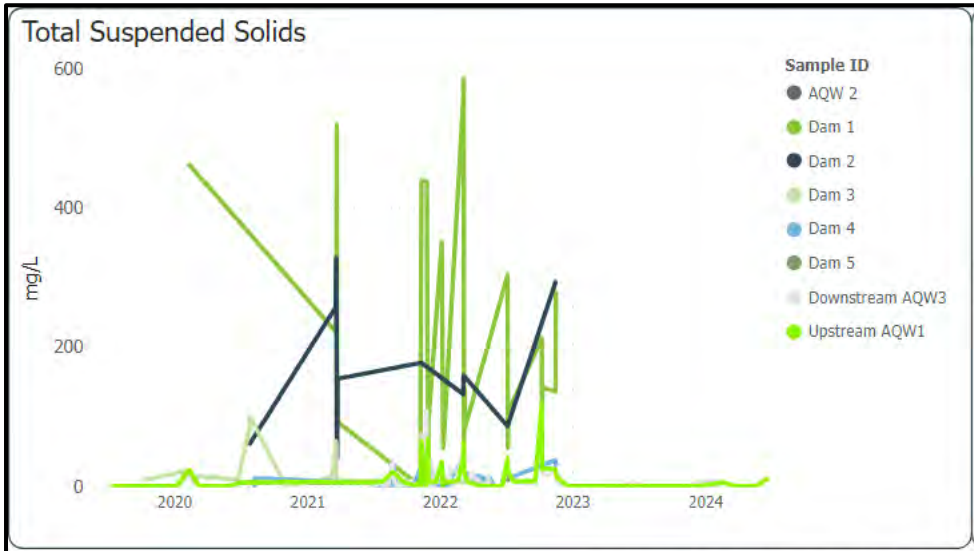
Sample ID	Count of Samples	Min of pH	Average of pH	Max of pH	Min of Conductivity	Average of Conductivity	Max of Conductivity	Min of Turbidity (NTU)	Average of Turbidity (NTU)	Max of Turbidity (NTU)	Min of Total Suspended Solids (mg/L)	Average of Total Suspended Solids (mg/L)	Max of Total Suspended Solids (mg/L)	Max of Oil & Grease (mg/L)
Dam 1	11	6.7	7.5	7.9	78	242	414	550.0	1,127.6	2,000.0	172	726	1,140	0
Dam 2	1	7.0	7.0	7.0	207	207	207	1,805.0	1,805.0	1,805.0	812	812	812	8
Dam 3	5	7.5	8.1	9.0	271	555	876	11.0	67.4	101.0	26	38	60	0
Downstream AQW3	23	6.5	7.4	7.9	147	255	338	1.0	21.8	140.0	0	34	378	0
Upstream AQW1	23	6.2	7.5	8.5	128	352	2,448	1.0	17.8	130.0	0	31	364	0

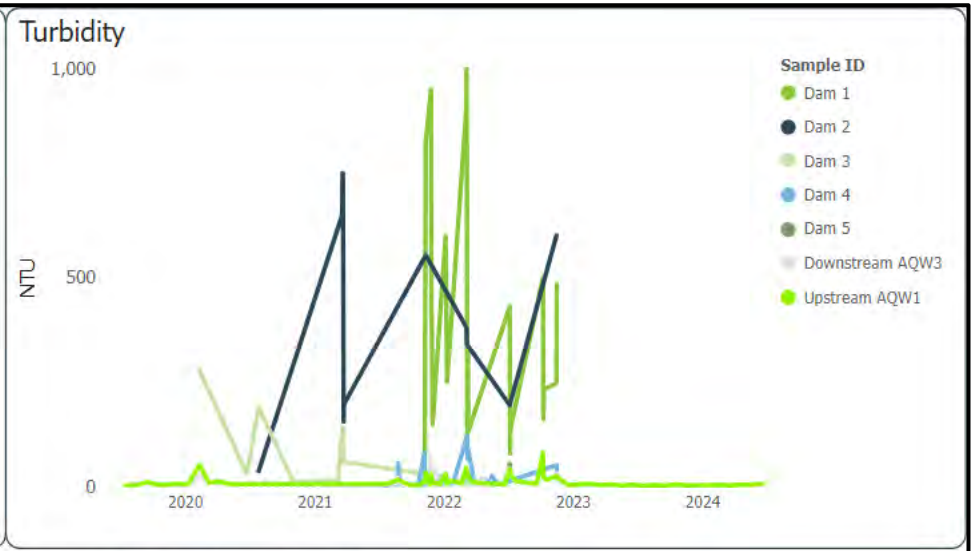
Notes:

- This table is a summary of all results, not all sampling events resulted in a discharge.
- Oil and Grease results of zero are actually <10 mg/L.

Graph 7. Surface Water Monitoring Trends







Dates excluded due to 5 day rainfall exceeding 44mm when limits are not applicable:
1-6 July 2022
13-15 Nov 2022
4-8 Oct 2023
29 Nov 2023
2-3 Dec 2023
20-24 Dec 2024
4-8 Jan 2024
17-21 Jan 2024
6-10 Feb 2024
5-9 April 2024

7.2.2 Interpretation of Surface Water Results

The pH in Coxs River is variable and can differ by more than 0.5 of a pH unit between upstream and downstream locations. Results for upstream and downstream generally correlate with each other as shown in *Graph 7*. This is independent of discharge from the quarry and is a result of natural variations.

The Total Suspended Solids results were variable during the reporting period.

Historically, low flow often results in low pH (more degrading matter that is producing natural acids) and more sediment per unit volume.

Oil and Grease was not plotted as all results were at or below detection limits.

The site's surface water management practices are considered effective.

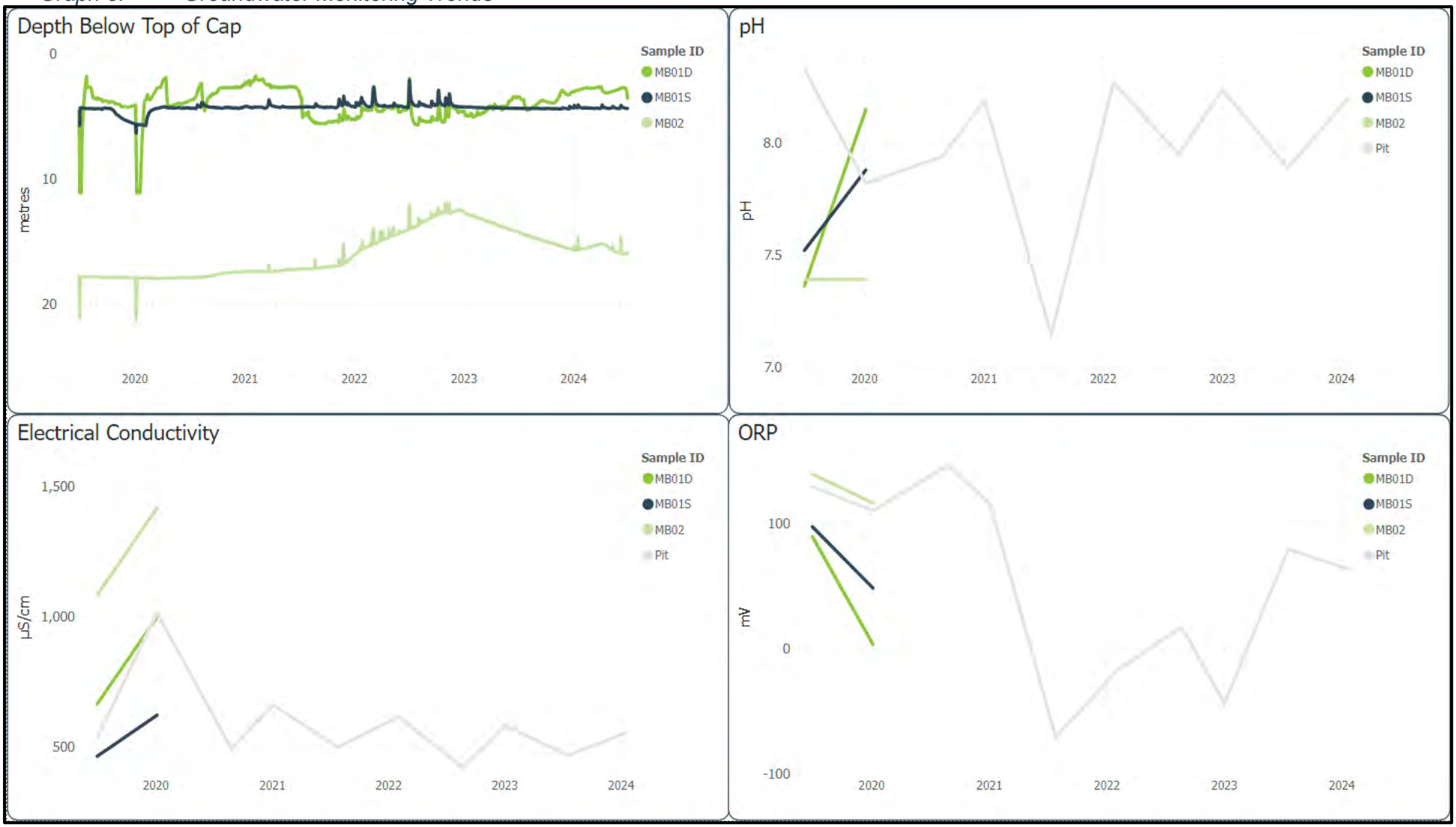
7.2.3 Groundwater Monitoring Data

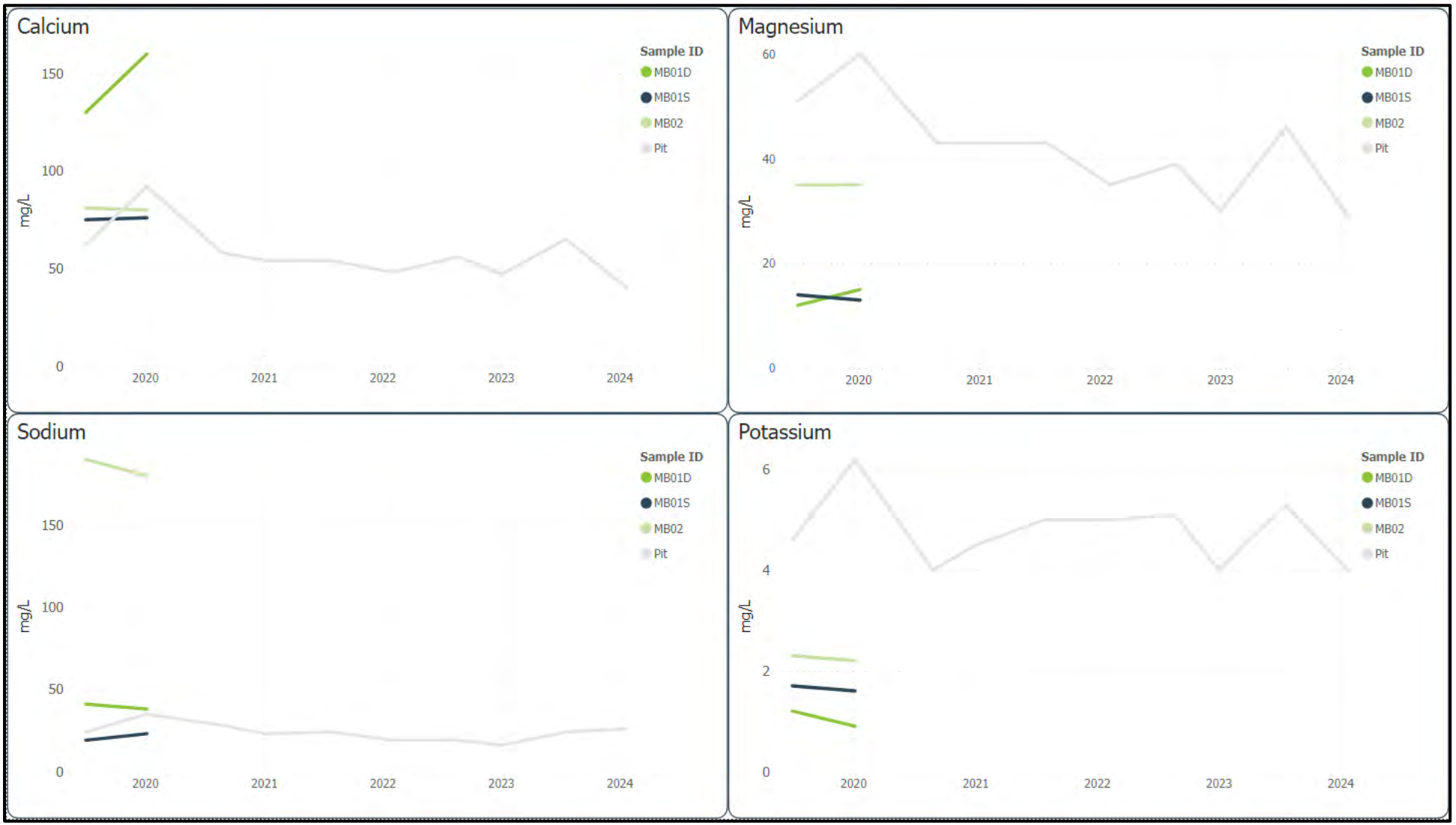
Pit water quality was monitored in July 2023 and January 2024 for the following parameters:

- pH, Electrical Conductivity, Oxidation Reduction Potential, Temperature
- Total Dissolved Solids
- Cations and anions
- Dissolved heavy metals
- Ammonia, Nitrate, Nitrite
- Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethyl Benzene, Xylenes (BTEX), Polyaromatic Hydrocarbons (PAHs).

The reports are included in *Appendix K*. Water quality trends are shown on the following graphs (*Graph 8*) where detectable parameters make this meaningful. There have been no organics detected in any monitoring round.

Graph 8. Groundwater Monitoring Trends

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Sample ID
MB01D
MB01S
MB02
Pit
mg/L
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100
50
0
2020
2021
2022
2023
2024
Magnesium
Sample ID
MB01D
MB01S
MB02
Pit
mg/L
60
40
20
0
2020
2021
2022
2023
2024
Sodium
Sample ID
MB01D
MB01S
MB02
Pit
mg/L
150
100
50
0
2020
2021
2022
2023
2024
Potassium
Sample ID
MB01D
MB01S
MB02
Pit
mg/L
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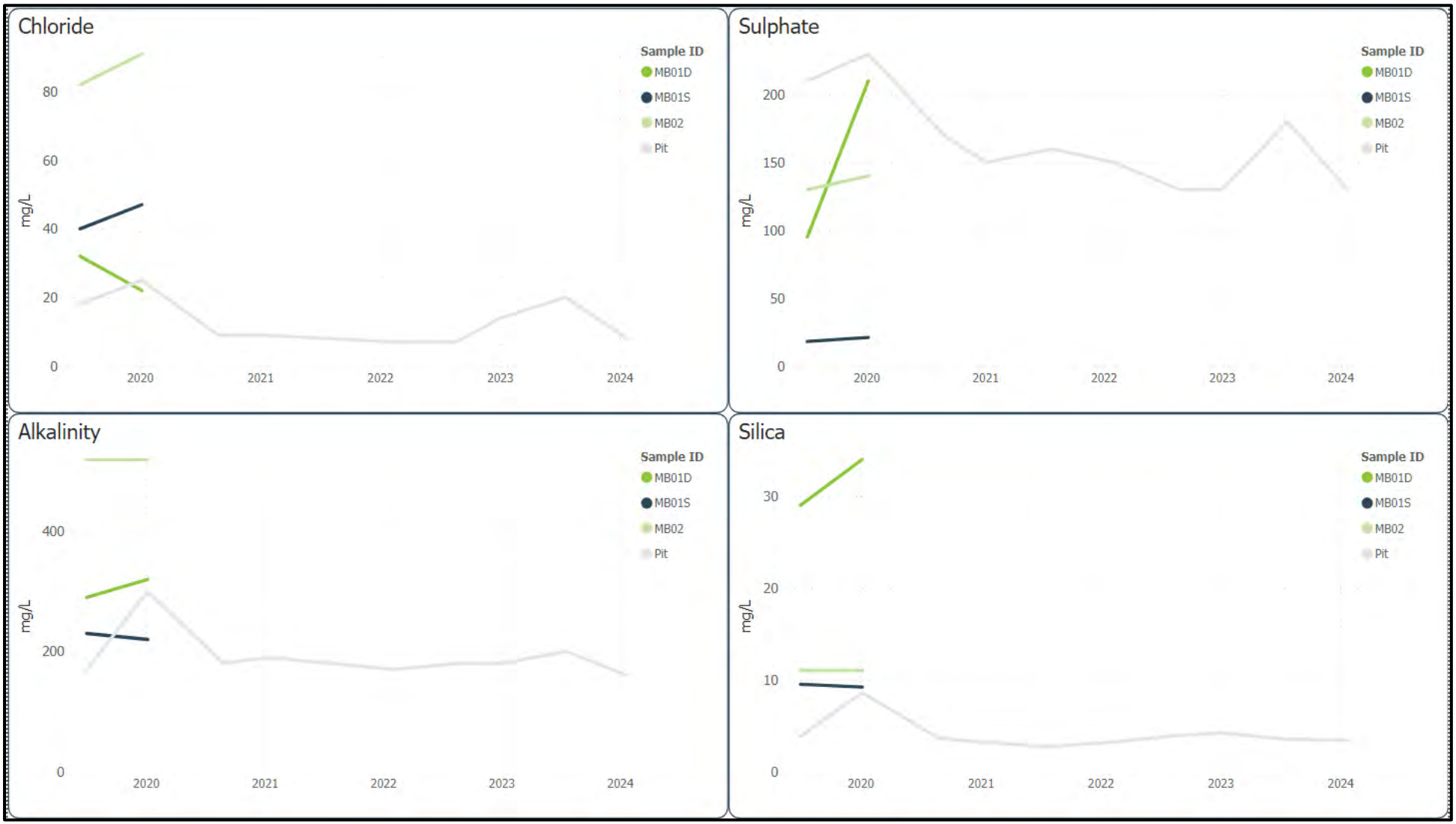
4
2
0
2020
2021
2022
2023
2024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20
40
60
80
2020
2021
2022
2023
2024
Sulphate
Sample ID
MB01D
MB01S
MB02
Pit
mg/L
0
50
100
150
200
2020
2021
2022
2023
2024
Alkalinity
Sample ID
MB01D
MB01S
MB02
Pit
mg/L
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400
2020
2021
2022
2023
2024
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30
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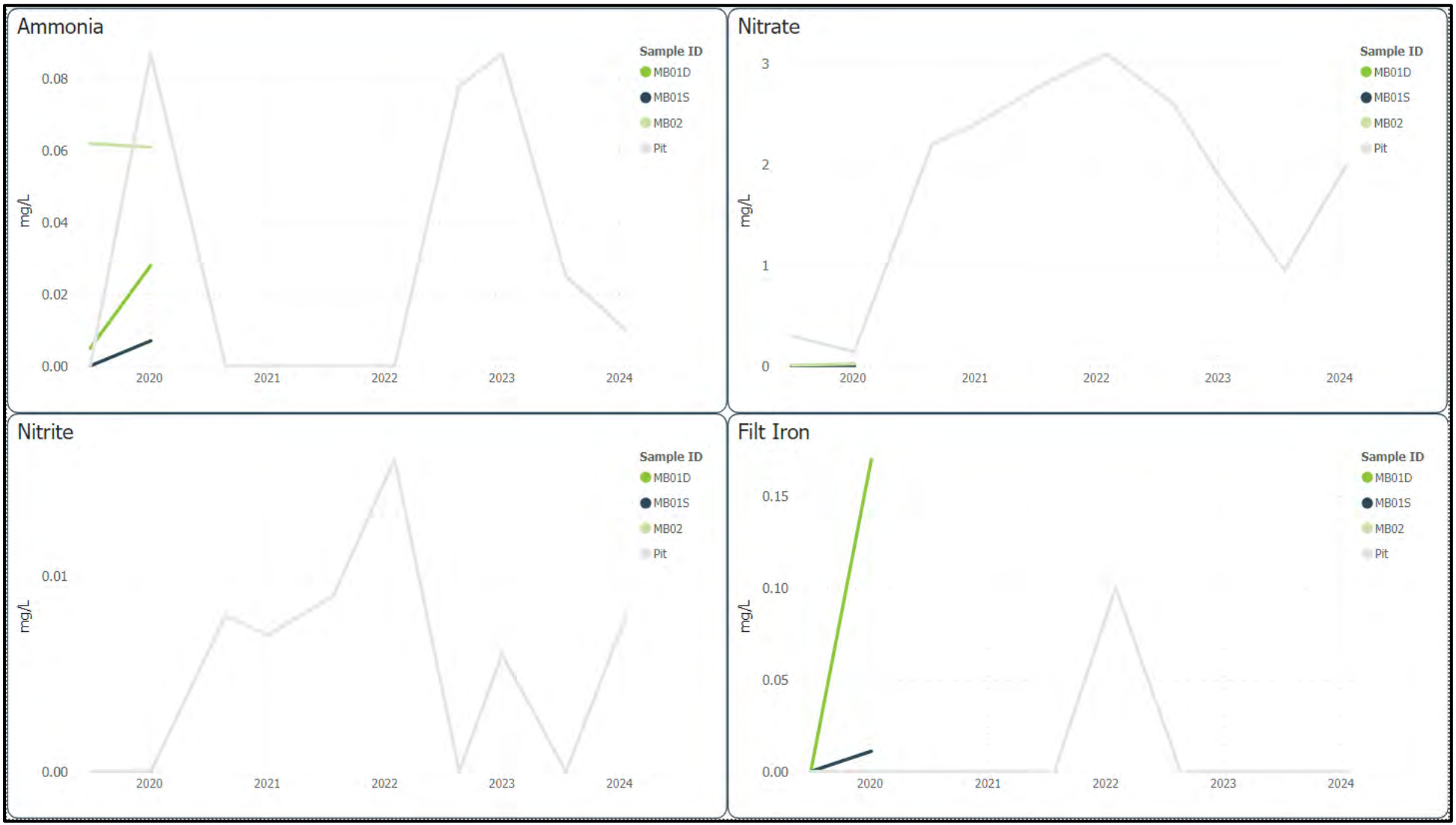
2022
2023
2024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2020
2021
2022
2023
2024
Sample ID
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MB01S
MB02
Pit
Nitrate
mg/L
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2
1
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Nitrite
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Filt Iron
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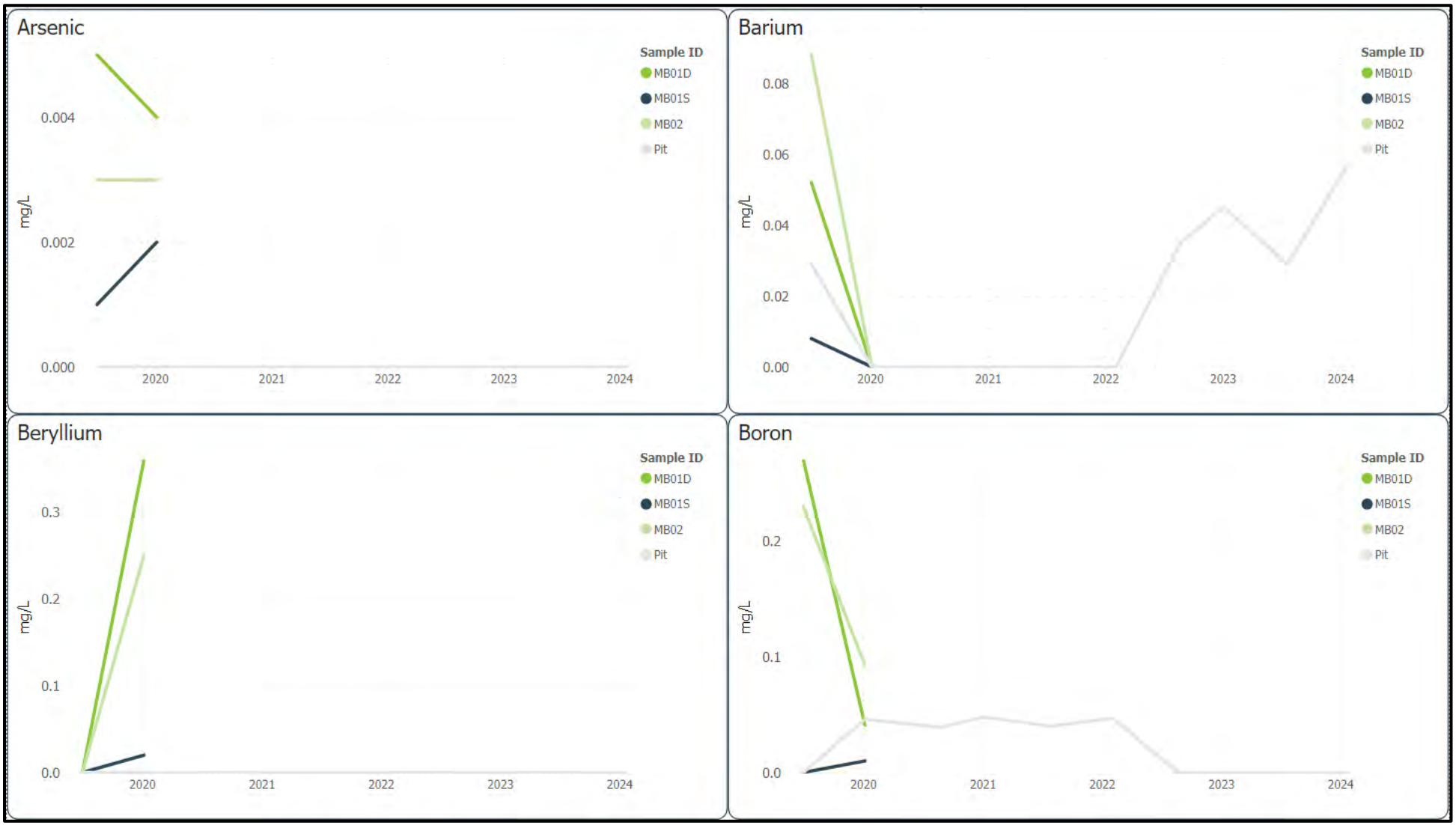
0.05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0.000
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2021
2022
2023
2024
Barium
Sample ID
MB01D
MB01S
MB02
Pit
mg/L
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0.06
0.04
0.02
0.00
2020
2021
2022
2023
2024
Beryllium
Sample ID
MB01D
MB01S
MB02
Pit
mg/L
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0.2
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2020
2021
2022
2023
2024
Boron
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mg/L
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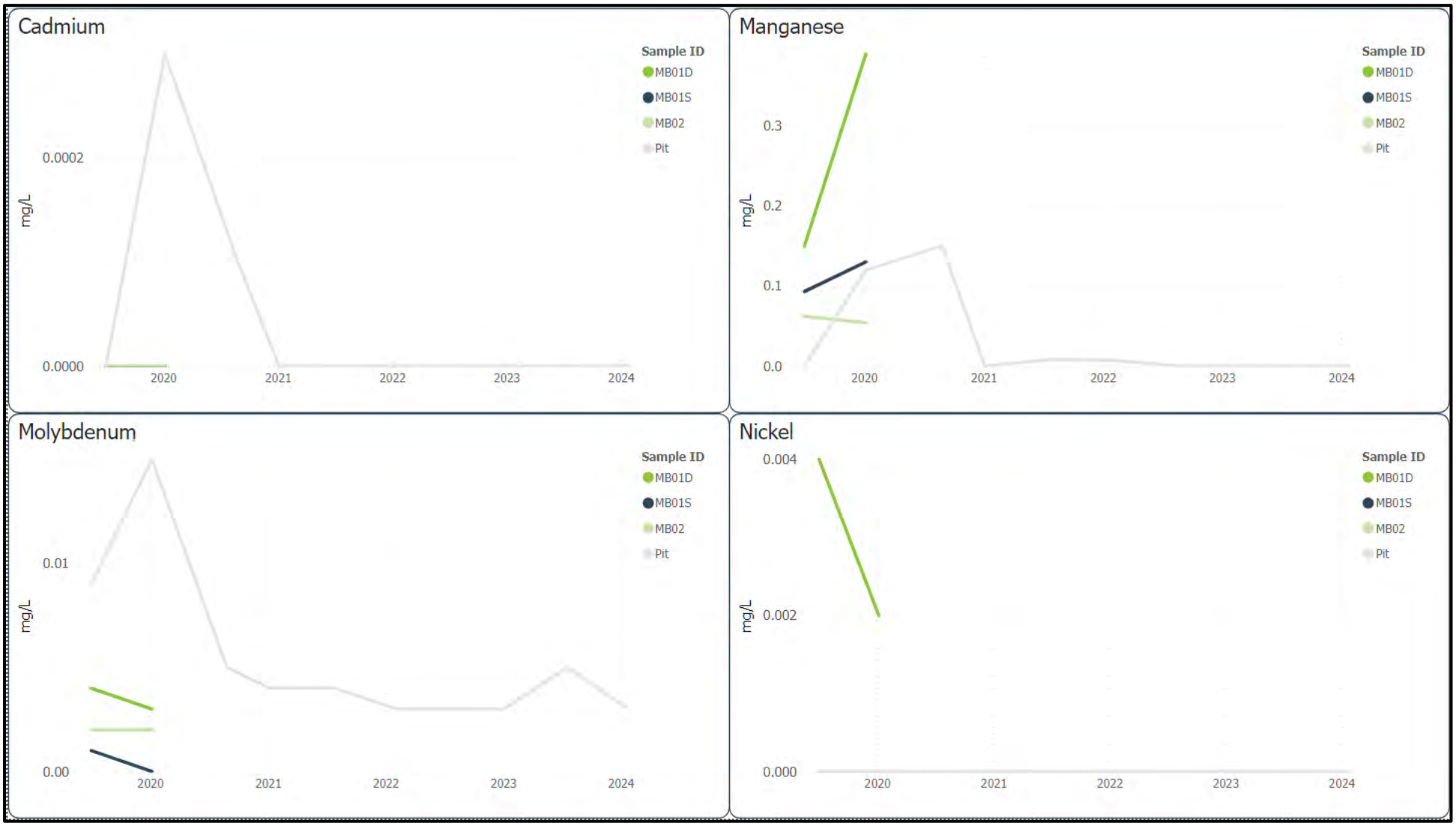
2022
2023
2024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mg/L
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2022
2023
2024
Manganese
Sample ID
MB01D
MB01S
MB02
Pit
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0.2
0.1
0.0
mg/L
2020
2021
2022
2023
2024
Molybdenum
Sample ID
MB01D
MB01S
MB02
Pit
0.01
0.00
mg/L
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2021
2022
2023
2024
Nickel
Sample ID
MB01D
MB01S
MB02
Pit
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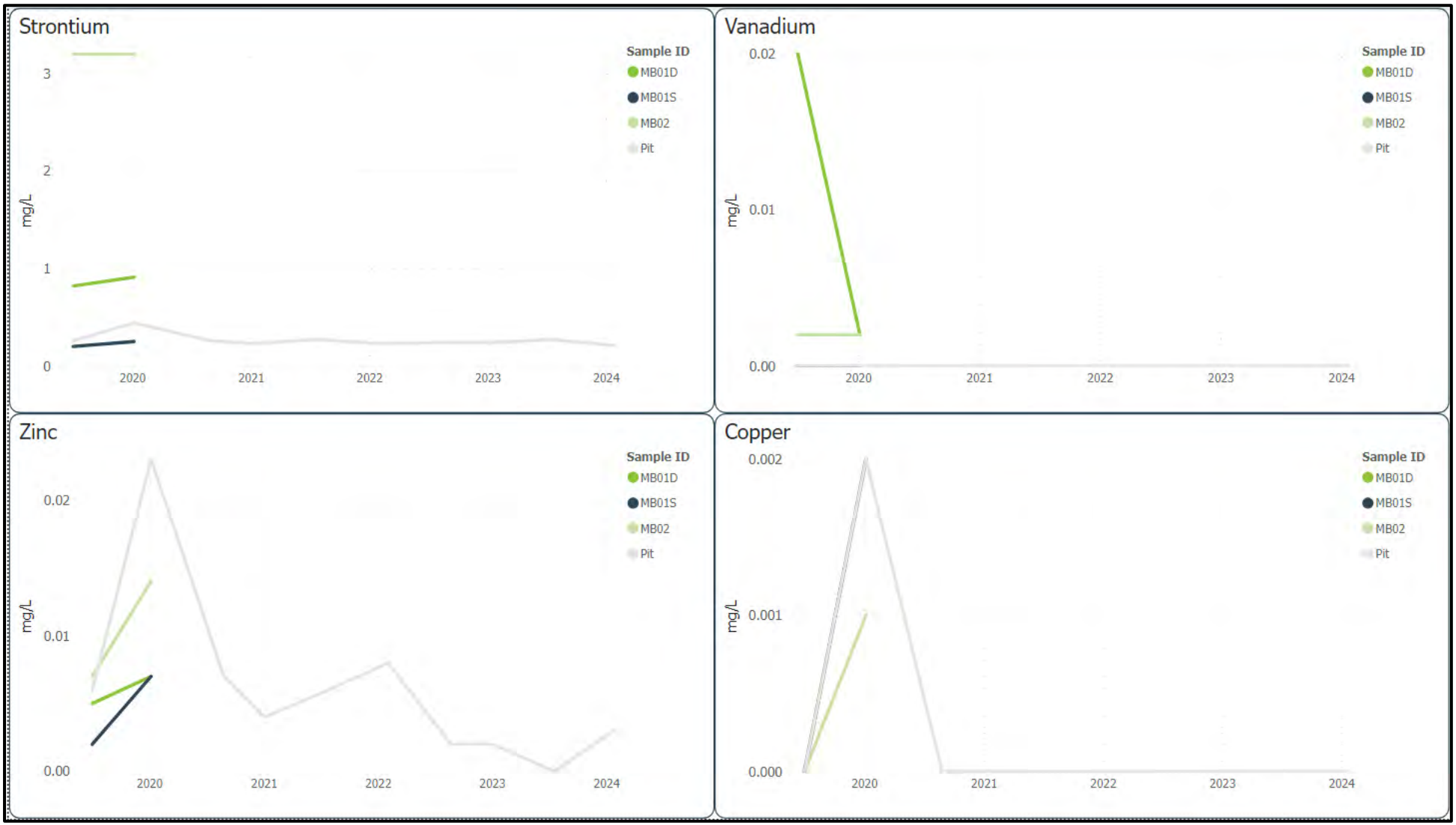
0.002
0.000
mg/L
2020
2021
2022
2023
2024


Strontium
mg/L
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2
1
0
2020
2021
2022
2023
2024
Sample ID
MB01D
MB01S
MB02
Pit
Vanadium
mg/L
0.02
0.01
0.00
2020
2021
2022
2023
2024
Sample ID
MB01D
MB01S
MB02
Pit
Zinc
mg/L
0.02
0.01
0.00
2020
2021
2022
2023
2024
Sample ID
MB01D
MB01S
MB02
Pit
Copper
mg/L
0.002
0.001
0.000
2020
2021
2022
2023
2024
Sample ID
MB01D
MB01S
MB02
Pit

7.2.4 Interpretation of Groundwater Results

Interpretation comments are summarised from the reports given in *Appendix K*.

7.2.4.1 Depth

- Observed groundwater level changes did not exceed the adopted trigger, which is a drop in water levels more than 10m below baseline water levels.
- The water level in MB01S was steady during the reporting period. Several brief spikes in water level are apparent and correspond to rainfall events.
- The water level within MB01D has fluctuated during the report period between 2.7m and 4.5m below top of casing for most of the monitoring period, with an upward trend.
- The water level within MB02 continued the steady decrease shown at the end of the previous report period until January 2024, then showed a slight rise and lowering potentially attributable to rainfall, with over 500mm recorded in December 2023 to February 2024.

7.2.4.2 Water Quality

- Reported concentrations of all analytes were less than the preliminary triggers outlined in the Water Management Plan (Groundwork Plus, 2017). Where analytes were detected above the laboratory reporting limits, the analyte concentrations were generally within the range of previous results.

7.3 WATER TAKE

Water take in the pit is monitored quarterly by the site and recorded in a logbook, in accordance with the WMP and WAL 37423. Ground Doctor have summarised the pit inflows in the monitoring reports for July 2024, as summarised below.

Table 25. Summary of Pit Inflow Estimates

Monitoring Event	Change in water Level	Description of Pit Conditions	Estimate of Groundwater Inflow
14-15 September 2023	No change in water level. 1.4mm evaporation loss	Pit floor approximately 6900m^2. Pit floor covered by water.	3.5 ML/yr
11-12 December 2023	No change in water level. 3.7mm evaporation loss	Pit floor approximately 6900m^2. Pit floor covered by water.	4.3ML/yr
		Average Inflow Estimate for July 2023 to Jan 24	***6.4 ML/yr Limit 20ML/yr***
11-12 January 2024	2m rise in water level over 24 hrs. 0mm evaporation* loss	Pit floor approximately 6900m^2. Pit floor covered by water.	5.0 ML/yr
24-25 April 2024	No change in water level. 3.0mm evaporation* loss	Pit floor approximately 6900m^2. Pit floor covered by water.	2.5 ML/yr
		Average Inflow Estimate for January 2024 to July 2024	***3.8 ML/yr Limit 20ML/yr***

* - BOM Evaporation data not published on date of monitoring. Evaporation estimated by taking one third of the daily average for the given month of measurement.

Active pumping of surface water from Coxs River is undertaken in accordance with WAL 25616 and is calculated from the logbook kept on site. No water take was undertaken during the reporting period, therefore no logbook entries are included with this AR.

The logbook now contains a cumulative average as required in condition W0036-00002.

Table 26. Water Take

Water Licence #	Plan / Source / Management Zone	Entitlement	Passive take / inflows	Active Pumping	Total
37423	Coxs River Fractured Rock Groundwater Source	20.0 ML	Nil	Nil	Compliant
25616	Upper Nepean and Upstream Warragamba Water Source, Dharabuladh Management Zone	20.0 ML	Nil	Nil	Compliant

8 Rehabilitation

600 plants were placed at the site during the reporting period, see *Figure Two*.. Inspection of previous plantings revealed the majority of plants are still alive and growing well, with most of the tree guards to be removed in the next reporting period to allow for further tree growth.

The review and revision of the Rehabilitation Bond was not undertaken within 3 months of the 2023 Independent Environmental Audit. The calculation is underway at the time of the report.

9 Community

There were no complaints received during the reporting period. Complaints are recorded on a complaints register, a copy of which may be found on the website: https://adbriquarries.com.au/nsw/ .

Table 27. Complaints Summary

Review Period	Details	Action	Where Addressed in Report
2019-2020	No complaints	N/A	-
2020-2021	1 complaint: Near miss incident on Jenolan Caves Rd with community member	An internal investigation was undertaken, and the driver was suspended for one week from the quarry. The community member was pleased with the outcome.	N/A
2021-2022	1 complaint to EPA: “dirty water in Cox’s River”	An internal investigation was undertaken and revealed that no water was discharged from the site during the period of the complaint.	N/A
	1 complaint: truck speed	Community member advised quarry of a truck he believed was travelling fast on Jenolan Caves Rd in April 2022. Community member thanked for his notification. Matter notified internally.	N/A
2022-2023	1 complaint: Blasting	Due to delayed blast, Neighbour called the quarry as he was home and felt the blast. Neighbour advised it was a courtesy call. Quarry staff advised blast was late due to operational issues on site and that the monitors showed that there had been no trigger at the existing monitoring sites, however a monitor would be located at his property for the next blast. Monitor placed next blast (24.02.2023) - no trigger recorded for the monitor at the property	N/A
	1 complaint: truck noise	Complaint raised by local resident re early morning truck noise. Road is 24-hour truck route. Quarry Manager met with resident and advised that next round of the quarry's noise monitoring would include additional monitoring at the property and the quarry will install additional signage at the quarry to remind heavy vehicles to minimize speed over the bridge near the property	N/A
2023-2024	No complaints	N/A	-

Active community engagement continues to be undertaken by staff members of the quarry. Liaison occurs with members of the Hartley District Progress Association and other local community members, along with meetings with Lithgow City Council staff. The Quarry continues to play an active support role with other local organisations such as Hartley Historic Site Advisory Committee and works with the Lithgow City Council on the provision of grants to the local communities.

10 Incidents and Non-Compliances

10.1 INCIDENTS

While the issues discussed in the next section (*10.2*) all resulted in notifications to the DPHI and EPA, none can be classed as "incidents", in accordance with the definition in the consent:

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

10.2 NON-COMPLIANCES

The details of the non-compliances are discussed below, as requested by the DPHI. Correspondence regarding all notifications is included in *Appendix L*. These details are also included in the relevant sections in this report.

Table 28. Summary of Notifications in Report Period

Description	Condition	Date of Incident	Material Harm caused or threatened?	Non-compliance	Authority Notification	Site Action
Weather station not monitoring continuously	Sched 3, Cond 13 EPL12323 M8.1	1 – 13/6/2024	No	Yes	DPHI and EPA was notified 23/7/2024. Issue caused by Telstra phone coverage being turned off	No further action.
Biodiversity credits not retired	Sched 3, Cond 25	Within 12 months of Mod 1	No	Yes	Yes – IEA and Annual Report	To be retired as soon as possible
Rehabilitation Bond	Sched 3 Cond 31a, b, c	October 2023	No	Yes	Yes – IEA and Annual Report	Rehabilitation bond to be reviewed and revised as soon as possible.
Water sampling location not utilised	EPL12323 P1.3	20/12/2023 to 22/12/2023 and 05/01/2024 to 07/01/2024	No	Yes	Issue caused by high rainfall event causing unsafe access to prescribed sampling point, alternative sampling point utilised.	Variation to EPL to be prepared and submitted
Not all conditions compliant	Sched 2 Cond 2A		No	Yes	Yes – Annual Report	No further action

10.3 ACTIONS REQUIRED FROM PREVIOUS REPORTS

10.3.1 Actions from Previous Annual Review

No actions were required as a result of the previous Annual Review. A letter stating that the previous Annual Review was considered generally satisfactory.

The following table lists the actions proposed to occur in the previous Annual Review.

Table 29. Actions Proposed in Last Report Period

Proposal	Where Addressed
Ongoing management of the priority weed infestations to supress the spread of these weeds into good quality vegetation surrounding the quarry. Aerial and spot spraying will be undertaken as required and when conditions are favourable.	Section *6.9.1.1*
Submit a variation application regarding relocation of the location of EPL Point 3 in the event of unsafe sampling conditions	Not undertaken yet.
It is anticipated that the currently proposed modification to SSD 6084 will be determined during the next reporting period.	Not determined yet.
Install additional signage at the quarry to remind heavy vehicles to minimise speed over the bridge near neighbouring property where noise complaint received	Section *5.2.1*
Review all management plans in accordance with consent conditions. The review should ensure that site practices match the management plans.	Management plans have been reviewed within 3 months of IEA.

10.3.2 Actions from Independent Environmental Audit

The findings of the Independent Environmental Audit undertaken by James Hart in July 2023 are given in *Table 30*. Most of the non-compliances were prior to the current report period and have been detailed in previous AR's and closed out. The remaining outstanding non-compliances have been listed in *Section 2*. An opportunity for improvement was noted to apply for a variation to the EPL to allow safer water monitoring during high flow events.

Table 30. IEA 2023 Findings

	Requirements	Findings
Schedule 2 – Administrative Controls	31	Compliant – 25
		Non-Compliant – 1
		Not Triggered – 5
Schedule 3 – Environmental Performance Conditions	32	Compliant – 35
		Non-Compliant – 5
		Not Triggered – 2
Schedule 4 – Additional Procedures	2	Compliant – 1
		Non-Compliant – 0
		Not Triggered – 1
Schedule 5 – Additional Procedures	11	Compliant – 8
		Non-Compliant – 1
		Not Triggered – 2
EPL 12323	44	Compliant – 31
		Non-Compliant – 4
		Not Triggered – 9
WAL 25616	17	Compliant – 14
		Non-Compliant – 0
		Not Triggered – 3
WAL 37423	22	Compliant – 5
		Non-Compliant – 0
		Not Triggered – 17
Statement of Commitments	77	Compliant – 62
		Non-Compliant – 3
		Not Triggered – 12

The operator submitted a response to items raised along with the Independent Environmental Audit report to the Major Projects Portal within the required timeframe.

Table 31. Outstanding Non-Compliances from IEA 23 at 30/6/2024

Issue No	Condition	Requirement	Issue Sighted and Recommendation	Recommendation	Operator Response and Action
NC-01	Schedule 2 Condition 2A Statement of Commitments 1.1, 1.2	The Applicant must carry out the development in accordance with the conditions of this consent	Non-compliances has been recorded against Conditions of Approval	It is recommended that all non-compliances identified are addressed and closed out. Consider implementing a process to track compliance requirements and status	This is noted. While Hy-Tec aims to achieve compliance with all conditional requirements, it is noted that the mostly administrative non-compliance issues have not threatened environmental harm.
NC-05	Schedule 3 Condition 20 EPL 12323 Condition M2.3	The Applicant must implement the Water Management Plan as approved by the Secretary.	Collection of water samples from EPL Point 3 could not be undertaken … due to high flow in the river. Sampled at nearest safely accessible location.	Hy-Tec should seek a modification to EPL12323 for water sampling during flood events.	It is planned that a variation will be applied for in the next 3 months
NC-06	Schedule 3 Condition 25	Within 12 months of the approval of Modification 1, or other timeframe agreed by the Secretary, the Applicant must retire the biodiversity credits specified in Table 4A below.	Biodiversity offset credits had not been retired by 31/12/2021.	Arrangements for the retirement of biodiversity offset credits should be finalised and implemented	The offset credits have been purchased and the Company is in the process of completing the paperwork to retire the credits

11 Activities Proposed in the Next AR Period

Activities proposed for the next reporting period may include:

- Ongoing management of the priority weed infestations to supress the spread of these weeds into good quality vegetation surrounding the quarry. Aerial and spot spraying will be undertaken as required and when conditions are favourable.
- Submit a variation application regarding relocation of the location of EPL Point 3 in the event of unsafe sampling conditions.
- It is anticipated that the currently proposed modification to SSD 6084 will be determined during the next reporting period.
- The offset credits will be purchased and the Biodiversity credits will be retired and approved. A payment will be made to the Biodiversity Conservation Trust to meet the biodiversity offsetting obligation associated with the naturally occurring Silver Leaved Mountain Gum ecological community.
- Rehabilitation bond calculation is to be reviewed and if necessary, revised.
- Review all management plans in accordance with consent conditions. The review should ensure that site practices match the management plans.

Appendix A: Compliance Tables

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

DA Conditions: SSD 6084 Mod 2

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevant.

Schedule	Condition	Condition Text	Details of compliance status at 30/6/2024	Where addressed in Annual Review
Compliance Summary		**Number of Conditions Non-compliant**		
Non Compliant		2		See Table Below
Not Triggered		11		
General				
2	1	In addition to meeting the specific performance criteria established under this consent, the Applicant must implement all reasonable and feasible measures to prevent and/or minimise any material harm to the environment that may result from the construction, operation, or rehabilitation of the development.	Compliant	
	2	The Applicant must carry out the development generally in accordance with the: (a) EIS, SEE (Mod 1); and SEE (Mod 2); (b) Statement of Commitments.	Compliant	
	2A	The Applicant must carry out the development in accordance with the conditions of this consent.	Non Compliant	
	3	If there is any inconsistency between the above documents, the most recent document shall prevail to the extent of the inconsistency. However, the conditions of this consent shall prevail to the extent of any inconsistency.	Compliant	
	4	The Applicant must comply with any reasonable requirement/s of the Secretary arising from the Department's assessment of: (a) any strategies, plans, programs, reviews, audits, reports or correspondence that are submitted in accordance with this consent; (b) any reviews, reports or audits undertaken or commissioned by the Department regarding compliance with this consent; or (c) the implementation of any actions or measures contained in these documents.	Compliant	
	5	If the development has not been physically commenced within 5 years of the date of this consent, then this development consent shall lapse	Compliant DA 103/94 was surrendered on the 15/09/16	
	6	The Applicant must not extract extractive materials below a level of 685 m AHD.	Compliant	See Figure 3
	7	The Applicant may carry out quarrying operations on the site until 30 June 2050.	Compliant	
	8 a)	The Applicant must not: a) transport more than 1.6 million tonnes of quarry products from the site during any financial year;	Compliant	Section 5.1
	8 b)	dispatch more than 300 laden trucks from the site on weekdays and 167 laden trucks from the site on Saturdays; and	Compliant	Section 5.2.2
	8 c)	dispatch more than 200 laden trucks from the site per weekday, averaged over the total number of dispatch weekdays in any calendar month.	Compliant	Section 5.2.2
	9	Within 12 months of the date of this consent, or as otherwise agreed by the Secretary, the Applicant shall surrender the development consent (DA 103/94) for the existing operations on the site in accordance with Section 4.63 of the EP&A Act.	Compliant DA 103/94 surrendered 15/09/2016	
	10	Prior to the surrender of development consent DA 103/94, the conditions of this consent shall prevail to the extent of any inconsistency with the conditions of development consent DA 103/94.	Compliant	
	11	The Applicant must ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.	Not Triggered No new structures this report period	
	12	The Applicant must ensure that all demolition work is carried out in accordance with Australian Standard AS 2601-2001: The Demolition of Structures, or its latest version	Not Triggered No demolition this report period	
	13	The Applicant must: a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development; and b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the development	Not Triggered	
	14	The Applicant must ensure that all the plant and equipment used at the site is: (a) maintained in a proper and efficient condition; and (b) operated in a proper and efficient manner.	Compliant	Section 5.3
	15	To ensure that strategies, plans and programs required under this consent are updated on a regular basis, and that they incorporate any appropriate additional measures to improve the environmental performance of the development, the Applicant may at any time submit revised strategies, plans or programs for the approval of the Secretary. With the agreement of the Secretary, the Applicant may also submit any strategy, plan or program required by this consent on a staged basis. With the agreement of the Secretary, the Applicant may prepare a revision of or a stage of a strategy, plan or program without undertaking consultation with all parties nominated under the applicable condition in this consent.	Compliant. Plans updated and approved Aug 2019	
	16	Until they are replaced by an equivalent strategy, plan or program approved under this consent, the Applicant must implement the existing strategies, plans or programs for the site that have been approved under DA 103/94	Compliant	
	17 a)	provide annual quarry production data to DRG using the standard form for that purpose;	Compliant	Submitted on line
	17 b)	Include a copy of this data in the Annual Review (see condition 4 of Schedule 5).	Compliant	Section 5.2
	18	By 30 September 2015, unless otherwise agreed with the Secretary, the Applicant must: (a) engage a registered surveyor to mark out the boundaries of the approved limits of extraction within the development area; and (b) submit a survey plan of these boundaries with applicable GPS coordinates to the Secretary.	Compliant	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

DA Conditions: SSD 6084 Mod 2

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevant.

Schedule	Condition	Condition Text	Details of compliance status at 30/6/2024	Where addressed in Annual Review
	19	While quarrying operations are being carried out, the Applicant must ensure that these boundaries are clearly marked at all times in a manner that allows operating staff to clearly identify the approved limits of extraction	Compliant Stage 2 extraction boundary marked out and pegged with steel posts	
	20	Within 6 months of the date of this consent, unless otherwise agreed by the Secretary, the Applicant must enter into a planning agreement with the Council in accordance with Division 7.1 of Part 7 of the EP&A Act; and the terms specified in Appendix 7. If there is any dispute between the Applicant and Council on the planning agreement, then either party may refer the matter to the Secretary for resolution.	Compliant Agreement signed	
	21 a)	Where conditions of this consent require consultation with an identified party, the Applicant must; (a) consult with the relevant party prior to submitting the subject document to the Secretary for approval; and	Compliant	https://adbriquarries.com.au/nsw/
	21 b)	(b) provide details of the consultation undertaken including: (i) the outcome of that consultation, matters resolved and unresolved; and (ii) details of any disagreement remaining between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved.	Compliant	
	22	References in the conditions of this consent to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, Standards or policies in the form they are in as the date of this consent.	Compliant	
	23	However, consistent with the conditions of this consent and without altering any limits or criteria in this consent, the Secretary may, when issuing directions under this consent in respect of ongoing monitoring and management obligations, require compliance with an updated or revised version of such a guideline, protocol, Standard or policy, or a replacement of them.	Compliant	
	24	The Applicant must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this consent relevant to activities they carry out in respect of the development.	Compliant	Inductions unchanged
3	1	The Applicant must comply with the operating hours set out in Table 1.	Compliant	Section 5.4 and 10
		Table 1: Operating Hours **Activity** / **Permissible Hours** • Extraction operations, • Processing operations, • Overburden Management, • Stockpile Management → • 6 am to 10 pm Monday to Friday; • 6 am to 3 pm Saturday; and • At no time on Sundays or public holidays. • Blasting → • 10 am to 3 pm Monday to Friday (except public holidays). • Loading and dispatch → • 4 am to 10 pm Monday to Friday; • 5 am to 3 pm Saturdays; and • At no time on Sundays or public holidays. • Maintenance → • Anytime.	Compliant	
	2 a)	The following activities may be carried out on the site outside the hours specified in condition 1:delivery or dispatch of materials as requested by Police or other authorities; and	Not Triggered	
	2 b)	emergency work to avoid the loss of lives, property and/or to prevent environmental harm. In such circumstances, the Applicant must notify the Secretary and affected residents prior to undertaking the activities, or as soon as is practical thereafter.	Not Triggered	
	3	The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 2 at any residence on privately-owned land Noise generated by the development must be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Noise Policy for Industry (EPA, 2017). However, the noise criteria in Table 2 do not apply if the Applicant has an agreement with the relevant landowner to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement. *Table 2: Noise criteria dB(A)* Receiver: All privately-owned residences → Day $dB(A)L_{Aeq(15\ min)}$: 35; Evening $dB(A)L_{Aeq(15\ min)}$: 35; Morning Shoulder $dB(A)L_{Aeq(15\ min)}$: 35; Morning Shoulder (Sleep Disturbance) $L_{A\ max}$: 52	Compliant	Section 6.2
	4 a)	The Applicant must: implement best practice management to minimise the operational and road transportation noise of the development;	Compliant	
	4 b)	minimise the noise impacts of the development during noise-enhancing meteorological conditions when the noise criteria in this consent do not apply (see Appendix 5)	Compliant	No cessation of operations due to any weather condition
	4 c)	carry out attended noise monitoring (at least every 6 months) to determine whether the development is complying with the relevant conditions of this consent; and	Compliant	Section 6.2
	4 d)	regularly assess noise monitoring data and modify and/or stop operations on site to ensure compliance with the relevant conditions of this consent.	Compliant	Section 6.2
	5 a)	The Applicant must prepare and implement a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:be prepared in consultation with EPA;	Compliant NMP 30/07/19 approved 23/08/19	
	5 b)	be submitted to the Secretary at least 3 months prior to the commencement of quarrying operations under this consent, unless otherwise agreed by the Secretary	Compliant V1 submitted 15/06/16	
	5 c)	describe the measures that would be implemented to ensure: □ compliance with the noise criteria in this consent; □ best practice management is being employed; and □ the noise impacts of the development are minimised during noise-enhancing meteorological conditions under which the noise criteria in this consent do not apply (see Appendix 5);	Compliant	
	5 d)	describe the proposed noise management system; and	Compliant	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

DA Conditions: SSD 6084 Mod 2

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevant.

<table>
<tr><th>Schedule</th><th>Condition</th><th>Condition Text</th><th>Details of compliance status at 30/6/2024</th><th>Where addressed in Annual Review</th></tr>
<tr><td></td><td>5 e)</td><td>include a monitoring program:
• to be implemented to measure noise from the development against the noise criteria in Table 2;
• that includes annual noise monitoring at R24A, unless otherwise agreed with the Secretary; and
• which evaluates and reports on the effectiveness of the noise management system on site.
The Applicant must implement the Noise Management Plan as approved by the Secretary.</td><td>Compliant

NMP was updated (30/07/19) to the MOD 2 conditions and approved 23/08/19.</td><td></td></tr>
<tr><td></td><td>6</td><td>The Applicant must ensure that blasting on site does not cause any exceedance of the criteria in Table 3.

Table 3: Blasting Criteria
<table><tr><th>Receiver</th><th>Airblast overpressure (dB(Lin Peak))</th><th>Ground vibration (mm/s)</th><th>Allowable exceedance</th></tr><tr><td rowspan="2">Any residence on privately-owned land</td><td>120</td><td>10</td><td>0%</td></tr><tr><td>115</td><td>5</td><td>5% of the total number of blasts over a period of 12 months</td></tr></table></td><td>Compliant

Nil exceedances.</td><td>Section 6.3</td></tr>
<tr><td></td><td>7</td><td>The Applicant may carry out a maximum of 1 blast per calendar week, unless an additional blast is required following a blast misfire. This condition does not apply to blasts required to ensure the safety of the quarry or workers on site.</td><td>Compliant</td><td></td></tr>
<tr><td></td><td>8 a)</td><td>During blasting operations, the Applicant must: implement best practice management to:
□ protect the safety of people and livestock in the areas surrounding blasting operations;
□ protect public or private infrastructure/property in the surrounding area from damage from blasting operations and
□ minimise the dust and fume emissions of blasting;</td><td>Compliant</td><td></td></tr>
<tr><td></td><td>8 b)</td><td>operate a suitable system to enable the local community to get up-to-date information on the proposed blasting schedule on site; and</td><td>Compliant</td><td>Letter drop at least one week prior to blast</td></tr>
<tr><td></td><td>8 c)</td><td>carry out regular monitoring to determine whether the development is complying with the relevant conditions of this consent,
to the satisfaction of the Secretary</td><td>Compliant</td><td>Every blast monitored

Section 6.3</td></tr>
<tr><td></td><td>9 a)</td><td>The Applicant must prepare and implement a Blast Management Plan for the development to the satisfaction of the Secretary. This plan must:be submitted to the Secretary for approval at least 3 months prior to the commencement of quarrying operations under this consent, unless otherwise agreed by the Secretary;</td><td>Compliant: BMP V3 23/07/2019 appoved 23/08/2019</td><td></td></tr>
<tr><td></td><td>9 b)</td><td>describe the measures that would be implemented to ensure compliance with the blast criteria and operating conditions of this consent;</td><td>Compliant</td><td></td></tr>
<tr><td></td><td>9 c)</td><td>include a monitoring program for evaluating and reporting on compliance with the blasting criteria in this consent;</td><td>Compliant</td><td></td></tr>
<tr><td></td><td>9 d)</td><td>include community notification procedures for the blasting schedule; and</td><td>Compliant</td><td></td></tr>
<tr><td></td><td>9 e)</td><td>include a protocol for investigating and responding to complaints. The Applicant must implement the Blast Management Plan as approved by the Secretary</td><td>Compliant</td><td></td></tr>
<tr><td></td><td>10</td><td>The Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria in Table 4 at any residence on privately-owned land.

Table 4: Air quality criteria
<table><tr><th>Pollutant</th><th>Averaging Period</th><th colspan="2">Criterion</th></tr><tr><td>Particulate matter < 10 µm (PM_{10})</td><td>Annual</td><td colspan="2">[a,d] 25 µg/m³</td></tr><tr><td>Particulate matter < 10 µm (PM_{10})</td><td>24 hour</td><td colspan="2">[b] 50 µg/m³</td></tr><tr><td>Particulate matter < 2.5 µm ($PM_{2.5}$)</td><td>Annual</td><td colspan="2">[a,d] 8 µg/m³</td></tr><tr><td>Particulate matter < 2.5 µm ($PM_{2.5}$)</td><td>24 hour</td><td colspan="2">[b] 25 µg/m³</td></tr><tr><td>Total suspended particulates (TSP)</td><td>Annual</td><td colspan="2">[a,d] 90 µg/m³</td></tr><tr><td>[c] Deposited dust</td><td>Annual</td><td>[b] 2 g/m²/month</td><td>[a,d] 4 g/m²/month</td></tr></table>
Notes to Table 4:
a Cumulative impact (ie increase in concentrations due to the development plus background concentrations due to all other sources).
b Incremental impact (ie increase in concentrations due to the development alone, with zero allowable exceedances of the criteria over the life of the development.
c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.
d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Secretary.
e "Reasonable and feasible avoidance measures" includes, but is not limited to, the operational requirements in conditions 11 and 12 to develop and implement an air quality management system that ensures operational responses to the risks of exceedance of the criteria.</td><td>Compliant - no exceedances</td><td>Section 6.4</td></tr>
<tr><td></td><td>11 a)</td><td>The Applicant must: implement best practice management to minimise the dust emissions of the development;</td><td>Compliant</td><td></td></tr>
<tr><td></td><td>11 b)</td><td>regularly assess meteorological and air quality monitoring data and relocate, modify and/or stop operations on site to ensure compliance with the air quality criteria in this consent;</td><td>Compliant</td><td>Section 6.1 (Climate) and 6.4 (Air Quality). Activities not ceased during report due to climatic conditions</td></tr>
<tr><td></td><td>11 c)</td><td>minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note under Table 4);</td><td>Compliant</td><td></td></tr>
<tr><td></td><td>11 d)</td><td>monitor and report on compliance with the relevant air quality conditions in this consent; and</td><td>Compliant</td><td>Section 6.4</td></tr>
<tr><td></td><td>11 e)</td><td>minimise the area of surface disturbance and undertake progressive rehabilitation of the site, to the satisfaction of the Secretary.</td><td>Compliant</td><td>See Figures</td></tr>
</table>

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

DA Conditions: SSD 6084 Mod 2

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevant.

Schedule	Condition	Condition Text	Details of compliance status at 30/6/2024	Where addressed in Annual Review
	12 a)	The Applicant must prepare and implement an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must: be submitted to the Secretary for approval at least 3 months prior to the commencement of quarrying operations under this consent, unless otherwise agree by the Secretary	Compliant AQMP submitted 15/6/16. V4 Final 30/7/19 approved 23/8/19	
	12 b)	describe the measures that would be implemented to ensure: • compliance with the relevant conditions of this consent; • best practice management is being employed; and • the air quality impacts of the development are minimised during adverse meteorological conditions and extraordinary events;	Compliant	
	12 c)	describe the proposed air quality management system;	Compliant	
	12 d)	include an air quality monitoring program that: • is capable of evaluating the performance of the development; • includes a protocol for determining any exceedances of the relevant conditions of consent; • effectively supports the air quality management system; and • evaluates and reports on the adequacy of the air quality management system The Applicant must implement the Air Quality Management Plan as approved by the Secretary	Compliant	Section 6.4
	13	For the life of the development, the Applicant must ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline.	Non-compliant Weather station not transmitting due to Telstra fault 1-13/6/2024	Section 6.1
	14	The Applicant must implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site.	Compliant	Measures included in AQMP
	15	The Applicant must ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of operations under the consent to match its available water supply, to the satisfaction of the Secretary.	Compliant	Water Balance in WMP
	16	The Applicant must comply with the discharge limits in any EPL, or with section 120 of the POEO Act	Compliant	Section 7.2
	17 a)	Within three months of the date of this consent, the Applicant must commission independent surface water expert/s, approved by the Secretary, to undertake an audit of current and proposed surface water management practices and infrastructure on the site. The audit must: be undertaken in consultation with EPA and WaterNSW	Compliant Audit conducted by Groundwork Plus accepted 14/7/16	
	17 b)	fully describe and audit existing site water management practices and consider the EIS's proposed water management practices;	Compliant	
	17 c)	identify all reasonable and feasible measures to improve surface water management on the site, with particular reference to opportunities to divert clean water away from the site; and	Compliant	
	17 d)	recommend design parameters for proposed water management systems on the site	Compliant	
	18	Unless otherwise agreed with the Secretary, the Applicant must submit the Surface Water Audit report to the Secretary within six months of commissioning the audit. The report must be accompanied by a Water Management Improvement Program, based on the report's recommendations, to improve surface water management practices on the site, including a program of proposed timeframes for implementation.	Compliant Audit 15/6/16 with WMIP included	
	19	The Applicant must implement the Water Management Improvement Program to the satisfaction of the Secretary.	Compliant	
	20 a)	The Applicant must prepare a Water Management Plan for the development to the satisfaction of the Secretary. This plan must: be prepared by suitably qualified person/s approved by the Secretary;	Compliant WMP first submitted 15/6/16. V11 approved 23/8/19	
	20 b)	be prepared in consultation with the EPA, DoI and Water NSW;		
	20 c)	be submitted to the Secretary for approval at least 3 months prior to the commencement of quarrying operations under this consent, unless otherwise agreed by the Secretary;		
	20 d)	include a: (i) Site Water Balance ; (ii) Surface Water Management Plan, (iii) Groundwater Management Plan, (iv) Surface and Ground Water Contingency Strategy. The Applicant must implement the Water Managament Plan as approved by the Secretary.		
	21	The Applicant must keep accurate records of all laden truck movements to and from the site (hourly, daily, weekly, monthly and annually) and publish a summary of records on its website every 6 months.	Compliant	Section 5.2 and https://adbriquarries.com.au/nsw/
	22 a)	The Applicant shall ensure that: all reasonable measures are taken such that laden trucks have appropriate signage, including a contact phone number, so they can be easily identified by road users;	Compliant	
	22 b)	all laden trucks entering or exiting the site have their loads covered;	Compliant	
	22 c)	all laden trucks exiting the site are cleaned of material that may fall on the road, before leaving the site; and	Compliant	
	22 d)	no trucks queue at the entrance to the quarry access road before 4 am on weekdays and 5 am on Saturday.	Compliant	
	22A	In 2022, and every 2 years thereafter, unless RMS directs otherwise, the Applicant must, in consultation with RMS, undertake monitoring of intersection performance at the Jenolan Caves Road and Great Western Highway intersection. Within 2 months of completing this monitoring, the results must be provided to RMS.	Compliant	Section 5.2 Next report due 2026
	23 a)	The Applicant must prepare and implement a Transport Management Plan for the development to the satisfaction of the Secretary. This plan must:be submitted to the Secretary for approval at least 3 months prior to the commencement of quarrying operations under this consent, unless otherwise agreed by the Secretary;	Compliant Transport Management Plan v1 submitted 15/6/18. V3 Final approved 23/8/19	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

DA Conditions: SSD 6084 Mod 2

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevant.

Schedule	Condition	Condition Text	Details of compliance status at 30/6/2024	Where addressed in Annual Review
	23 b)	describe the measures that would be undertaken to monitor the level of service at the Jenolan Caves Road and Great Western Highway intersection and maintain an acceptable level of service at this intersection;	Compliant	
	23 c)	include a Drivers' Code of Conduct to minimise the impacts of development-related trucks on local residences and road users including measures to minimise use of local roads; and	Compliant	
	23 d)	describe the measures that would be put in place to ensure compliance with the Drivers' Code of Conduct.	Compliant	
	24 a)	If any item or object of Aboriginal heritage significance is identified on site, the Applicant must ensure that: all work in the immediate vicinity of the suspected Aboriginal item or object ceases immediately;	Not Triggered	
	24 b)	a 10 m buffer area around the suspected item or object is cordoned off; and	Not Triggered	
	24 c)	the OEH is contacted immediately.	Not Triggered	
	25	Within 12 months of the approval of Modification 1, or other timeframe agreed by the Secretary, the Applicant must retire the biodiversity credits specified in Table 4A below. *Table 4A: Biodiversity credits to be retired* **Credit Type** / **Offset Type** / **Number of Credits** Ecosystem Credit — PCT 1093 – Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion — 649 Ecosystem Credit — PCT 649 – Apple Box – Broad-leaved Peppermint dry open forest of the South Eastern Highlands Bioregion — 131 Ecosystem Credit — PCT 840 – Forest Red Gum – Yellow Box woodland of dry gorge slopes, southern Sydney Basin Bioregion and South-Eastern Highlands Bioregion — 60 Species Credit — Silver-leaved Mountain Gum *(Eucalyptus pulverulenta)* — 10,784 The retirement of the credits in Table 4A must be carried out in consultation with OEH and in accordance with the Biodiversity Offsets Scheme of the BC Act, to the satisfaction of the BCT. **Note**: *The credits in Table 4A were calculated in accordance with the Framework for Biodiversity Assessment of the NSW Biodiversity Offset Policy for Major Projects (OEH, 2014) and may need to be converted to reasonably equivalent 'biodiversity credits', within the meaning of the BC Act, to facilitate retirement.*	Non compliant. Subject of Mod 2	
	26	Deleted		
	27	The Applicant shall rehabilitate the site to the satisfaction of the Secretary. This rehabilitation must be generally consistent with the documents listed in Conditions 2 of Schedule 2 and the conceptual final landform in Appendix 4 and must comply with the objectives in Table 5. *Table 5: Rehabilitation Objectives* **Feature** / **Objective** Site (as a whole) — • Safe, stable and non-polluting • Final landform integrated with surrounding natural landforms as far as is reasonable and feasible, and minimising visual impacts when viewed from surrounding land Surface Infrastructure — • Decommissioned and removed, unless DRG agrees otherwise Quarry Benches — • Landscaped and vegetated using native tree and understorey species Quarry Pit Floor — • Landscaped and revegetated using native tree and understorey species Final Void — • Minimise the size, depth and slope of the batters of the final void • Minimise the drainage catchment of the final void	Compliant	Section 8
	28	The Applicant must rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable and feasible measures must be taken to minimise the total area exposed for dust generation at any time. Interim stabilisation measures must be implemented where reasonable and feasible to control dust emissions in disturbed areas that are not active and which are not ready for final rehabilitation.	Compliant	Section 8
	29 a)	The Applicant must prepare and implement a Landscape and Rehabilitation Management Plan for the development to the satisfaction of the Secretary. This plan must: be prepared in consultation with OEH and be submitted to the Secretary for approval at least 3 months prior to the commencement of quarrying operations under this consent, unless the Secretary agrees otherwise;	Compliant: LRMP v1 submitted 15/06/16, V2 24/11/16 approved 2/12/16. LRMP V2.2 submitted 1/8/19, approved 6/9/19	
	29 b)	provide details of the conceptual final landform and associated land uses for the site;	Compliant	
	29 c)	describe how the implementation of any land based offset (including Conservation Area H, shown in Appendix 2) would be integrated with the overall rehabilitation of the site;	Compliant	
	29 d)	include detailed performance and completion criteria for evaluating the performance of any land based offset and rehabilitation of the site, including triggers for any necessary remedial action;	Compliant	
	29 e)	describe the short, medium and long term measures that would be implemented to: □ manage remnant vegetation and habitat on site, including within any land based offset; and □ ensure compliance with the rehabilitation objectives and progressive rehabilitation obligations in this consent;	Compliant	

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Schedule	Condition	Condition Text	Details of compliance status at 30/6/2024	Where addressed in Annual Review
	29 f)	include a detailed description of the measures that would be implemented over the next 3 years (to be updated for each 3 year period following initial approval of the plan) including the procedures to be implemented for: □ maximising the salvage of environmental resources within the approved disturbance area, including tree hollows, vegetative and soil resources, for beneficial reuse in the enhancement of the offset area or site rehabilitation; □ restoring and enhancing the quality of native vegetation and fauna habitat in the biodiversity and rehabilitation areas through assisted natural regeneration, targeted vegetation establishment and the introduction of fauna habitat features; □ protect, conserve, propagate, plant and/or regenerate Silver-leaved Mountain Gum (Eucalyptus pulverulenta) (including the propagation and planting of at least 1,000 individuals of this species); □ protecting vegetation and fauna habitat outside the approved disturbance area on-site; □ minimising the impacts on native fauna, including undertaking pre-clearance surveys; □ establishing vegetation screening to minimise the visual impacts of the site on surrounding receivers; □ ensuring minimal environmental consequences for threatened species, populations and habitats; □ collecting and propagating seed; □ controlling weeds and feral pests; □ controlling erosion; □ controlling access; and □ managing bushfire risk;	Compliant	
	29 g)	include a program to monitor and report on the effectiveness of these measures, and progress against the performance and completion criteria;	Compliant	
	29 h)	identify the potential risks to the successful implementation of any land based offset, and include a description of the contingency measures that would be implemented to mitigate these risks; and	Compliant	
	29 i)	include details of who would be responsible for monitoring, reviewing, and implementing the plan. The Applicant must implement the Landscape and Rehabilitation Management Plan as approved by the Secretary.	Compliant	
	30 a)	Within 6 months of the approval of the Landscape Management Plan, the Applicant must lodge a Conservation and Rehabilitation Bond with the Department to ensure that any land based offset and rehabilitation of the site are implemented in accordance with the performance and completion criteria set out in the plan and relevant conditions of this consent. The sum of the bond must be determined by: calculating the full cost of implementing any land based offset over the next 3 years;	Compliant Bond calculated 25/7/17, lodged 17/8/17, acknowledged by DPE 23/8/17	
	30 b)	calculating the cost of rehabilitating the site, taking into account the likely surface disturbance over the next 3 years of quarrying operations; and	Compliant	
	30 c)	employing a suitably qualified quantity surveyor or other expert to verify the calculated costs, to the satisfaction of the Secretary. Notes: • Alternative funding arrangements for long term management of any land based offset, can be used to reduce the liability of the conservation and rehabilitation bond. • If capital and other expenditure required by the Landscape Management Plan is largely complete, the Secretary may waive the requirement for lodgement of a bond in respect of the remaining expenditure. • If any land based offset and rehabilitation of the site area are completed to the satisfaction of the Secretary, then the Secretary will release the bond. If any land based offset and rehabilitation of the site are not completed to the satisfaction of the Secretary, then the Secretary will call in all or part of the bond, and arrange for the completion of the relevant works.	Compliant	
	31 a)	Within 3 months of each Independent Environmental Audit (see condition 8 of Schedule 5), the Applicant must review, and if necessary revise, the sum of the Conservation and Rehabilitation Bond to the satisfaction of the Secretary. This review must consider the: effects of inflation;	Non Compliant	Section 8
	31 b)	likely cost of implementing any land based offset and rehabilitating the site (taking into account the likely surface disturbance over the next 3 years of the development); and	Non Compliant	Section 8
	31 c)	performance of the implementation of any land based offset and rehabilitation of the site to date.	Non Compliant	Section 8
	32	The Applicant must implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts of the development to the satisfaction of the Secretary.	Compliant	Section 6.6
	33 a)	The Applicant must:manage on-site sewage treatment and disposal in accordance with the requirements of its EPL, and to the satisfaction of the EPA and Council;	Compliant	
	33 b)	minimise the waste generated by the development;	Compliant	
	33 c)	ensure that the waste generated by the development is appropriately stored, handled, and disposed of; and	Compliant	
	33 d)	report on waste management and minimisation in the Annual Review, to the satisfaction of the Secretary	Compliant	Section 6.7
	34	Except as expressly permitted in an EPL, the Applicant must not receive waste at the site for storage, treatment, processing, reprocessing or disposal.	Compliant None received	
	35	The Applicant must ensure that all tanks and similar facilities for storage of liquids (other than for water) are protected by appropriate bunding, which must exceed 110% of the stored volume of the liquid.	Compliant	

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Schedule	Condition	Condition Text	Details of compliance status at 30/6/2024	Where addressed in Annual Review
	36	The Applicant must ensure that the storage, handling, and transport of dangerous goods is done in accordance with the relevant Australian Standards, particularly AS1940 and AS1596, and the Dangerous Goods Code.	Compliant	
	37 a)	The Applicant must: ensure that the development is suitably equipped to respond to any fires on site; and	Compliant	
	37 b)	assist the Rural Fire Service and emergency services as much as possible if there is a fire in the vicinity of the site.	Compliant	
	37 c)	prepare a Bush Fire Emergency Evacuation Plan in accordance with the NSW Rural Fire Service document, Guide for Developing a Bush Fire Emergency Evacuation Plan, to the satisfaction of the Secretary.	Compliant	
4	1 a)	As soon as practicable after obtaining monitoring results showing: an exceedance of any relevant criteria in Schedule 3, the Applicant must notify the affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the development is again complying with the relevant criteria; and	Compliant	
	1 b)	an exceedance of any relevant air quality criteria in Schedule 3, the Applicant must send a copy of the NSW Health fact sheet entitled “Mine Dust and You” (as may be updated from time to time) to the affected landowners and current tenants of the land (including the tenants of land which is not privately-owned).	Not Triggered	
	2 a)	If an owner of privately-owned land considers the development to be exceeding the relevant criteria in 2.Schedule 3, then he/she may ask the Secretary in writing for an independent review of the impacts of the development on his/her land. the Secretary is satisfied that an independent review is warranted, then within 2 months of the Secretary’s decision, the Applicant must: (a) commission a suitably qualified, experienced and independent person, whose	Not Triggered	
	2 b)	give the Secretary and landowner a copy of the independent review.	Not Triggered	
5	1 a)	The Applicant must prepare and implement an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must: be submitted to the Secretary for approval within 6 months of the date of this consent;	Compliant V2.1 30/7/19 approved 23/8/19	
	1 b)	(b) provide the strategic framework for environmental management of the development;	Compliant	
	1 c)	(c) identify the statutory approvals that apply to the development;	Compliant	
	1 d)	(d) set out the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;	Compliant	
	1 e)	(e) set out the procedures to be implemented to: □ keep the local community and relevant agencies informed about the operation and environmental performance of the development; □ receive, record, handle and respond to Complaints; □ resolve any disputes that may arise during the course of the development; □ respond to any non-compliance and any incident; □ respond to emergencies; and	Compliant	
	1 f)	(f) include: □ references to any strategies, plans and programs approved under the conditions of this consent; and □ a clear plan depicting all the monitoring to be carried out under the conditions of this consent. The Applicant must implement the Environmental Management Strategy as approved by the Secretary.	Compliant	
	2 a)	The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include: a summary of relevant background or baseline data;	Compliant	
	2 b)	a description of: □ the relevant statutory requirements (including any relevant approval, licence or lease conditions);	Compliant	
	2 c)	a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	Compliant	
	2 d)	a program to monitor and report on the: □ impacts and environmental performance of the development; and □ effectiveness of any management measures (see (c) above);	Compliant	
	2 e)	contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Compliant	
	2 f)	a program to investigate and implement ways to improve the environmental performance of the development over time;	Compliant	
	2 g)	a protocol for managing and reporting any: □ incidents; □ Complaints; □ non-compliances with statutory requirements; and □ exceedances of the impact assessment criteria and/or performance criteria; and	Compliant	
	2 h)	a protocol for periodic review of the plan	Compliant	
	3 a)	The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedule 3. Any exceedance of these criteria and/or performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation. Where any exceedance of these criteria and/or performance measures has occurred, the Applicant must, at the earliest opportunity: take all reasonable and feasible steps to ensure that the exceedance ceases and does not reoccur;	Compliant	
	3 b)	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; and	Compliant	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

DA Conditions: SSD 6084 Mod 2

Compliant	
Non Compliant	Non-compliance
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Schedule	Condition	Condition Text	Details of compliance status at 30/6/2024	Where addressed in Annual Review
	3 c)	implement remediation measures as directed by the Secretary;	Compliant	
	4 a)	By the end of September each year, or other timing as may be agreed by the Secretary, the Applicant must review the environmental performance of the development to the satisfaction of the Secretary. This review must:	Compliant	
	4 b)	include a comprehensive review of the monitoring results and Complaints records of the development over the previous financial year, which includes a comparison of these results against the: □ relevant statutory requirements, limits or performance measures/criteria; □ requirements of any plan or program required under this consent; □ monitoring results of previous years; and □ relevant predictions in the documents listed in condition 2 of Schedule 2;	Compliant	
	4 c)	identify any non-compliance over the past financial year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence;	Compliant	
	4 d)	identify any trends in the monitoring data over the life of the development;	Compliant	
	4 e)	identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and	Compliant	
	4 f)	describe what measures will be implemented over the current financial year to improve the environmental performance of the development.	Compliant	
	5 a)	Within 3 months of the submission of an: annual review under condition 4 above;	Compliant	
	5 b)	incident report under condition 6 below;	Compliant	
	5 c)	audit report under condition 8 below; and	Compliant	
	5 d)	any modifications to this consent, The Applicant must review the strategies, plans and programs required under this consent, to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted for the approval of the Secretary.	Compliant	
	6	The Applicant must immediately notify the Secretary and any other relevant agencies of any incident. Within 7 days of the date of the incident, the Applicant must provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.	Compliant	Section 10
	7	The Applicant must provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent.	Compliant	https://adbriquarries.com.au/nsw/
	8 a)	Within a year of the date of this consent, and every 3 years thereafter, unless the Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development. This audit must: (a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;	Compliant Independant Audit undertaken in July 2023.	
	8 b)	include consultation with the relevant agencies;	Compliant	
	8 c)	assess the environmental performance of the development and whether it is complying with the relevant requirements in this consent and any relevant EPL or necessary water licences for the development (including any assessment, strategy, plan or program required under these approvals);	Compliant	
	8 d)	review the adequacy of strategies, plans or programs required under the abovementioned approvals;	Compliant	
	8 e)	recommend appropriate measures or actions to improve the environmental performance of the development, and/or any assessment, strategy, plan or program required under the abovementioned approvals; and	Compliant	
	8 f)	be conducted and reported to the satisfaction of the Secretary	Compliant	
	9	Within 6 weeks of completion of this audit, or as otherwise agreed by the Secretary, the Applicant must submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report.	Compliant	
	10 a)	Within 6 months of the date of this consent, the Applicant must: (a) make the following information publicly available on its website: □ the documents listed in condition 2 of Schedule 2; □ current statutory approvals for the development; □ all approved strategies, plans and programs required under the conditions of this consent; □ a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs; □ a Complaints register, updated monthly; □ the annual reviews of the development; □ any independent environmental audit, and the Applicant's response to the recommendations in any audit; and □ any other matter required by the Secretary; and	Compliant	https://adbriquarries.com.au/nsw/
	10 b)	keep this information up-to-date, to the satisfaction of the Secretary	Compliant	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

DA Conditions: SSD 6084 Mod 2- Appendix 3 Statement of Commitments

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevant.

Desired Outcome	Condition	Action Text	Details of compliance status at 30/6/2024	Where addressed in Annual Review
Compliance Summary		**Number of Conditions Non-compliant**		
Non Compliant		1	See Table Below	See Table Below
Not Triggered		12		
General				
Compliance with all conditional requirements in all approvals, licences and leases.	1.1	Comply with commitments recorded in this table.	Compliant	
	1.2	Comply with all conditional requirements included in the: -Development Consent; -Environment Protection Licence; -Approval under the EPBC Act; -Water Access Licence; and any other approvals.	Non Compliant	0
Minimisation of general waste creation and maximisation of recycling, wherever possible.	2.1	Place all paper and general wastes originating from the site office, together with routine maintenance consumables from the daily servicing of equipment in waste skip bins located adjacent to the site office and workshop.	Compliant	Section 6.7
	2.2	Segregate waste into recyclables and non-recyclable materials for removal by a licensed contractor.	Compliant	
Minimisation of the potential risk of environmental impact due to waste creation, storage and/or disposal.	2.3	Ensure the appropriate storage and regular collection of industrial wastes including waste oils and scrap metal.	Compliant	
The creation of a stable final landform, available for the proposed future use(s) of nature conservation and low intensity agriculture.	3.1	Retain all soil and suitable cleared vegetation resources for use in rehabilitation of the final landform.	Compliant	Section 8
	3.2	Include Eucalyptus pulverulenta in the revegetation of the Stage 2 Site.	Compliant	
	3.3	Re-instate the pre-disturbance soil and land capability in the area used for the secondary processing area and Yorkeys Creek stockpile area.	Not Triggered Although rehabilitation is ongoing, these areas are still in use.	
Establish and manage a Biodiversity Offset Area.	3.4	Mark, and where appropriate fence, boundaries relevant to the Biodiversity Offset Area.	Compliant	Section 6.9
Ensure sections of the Site with higher land capability are returned to agricultural use.	4.1	Provide for rehabilitation of the secondary processing area and Yorkeys Creek stockpile area back to agricultural land.	Not Triggered Although rehabilitation is ongoing, these areas are still in use.	
Transport operations are undertaken with minimal impact on other road users and residents.	5.1	All transport contractors required to complete the Hy- Tec Chain of Responsibility: Driver Vehicle Check system.	Compliant	Section 5.2
	5.2	Maintain a complaints management system to appropriately respond to any complaints received through investigation and implementation of corrective treatments.	Compliant	Section 9
	5.3	Monitor the delays for vehicles turning right onto the Great Western Highway at two-yearly intervals from 2022 onwards.	Compliant	Section 5.2
Reduce the area of the Stage 2 Site exposed to surrounding vantage points.	6.1	Implement design and sequencing measures to minimise exposure of the Quarry, namely: a) limit extraction and overburden emplacement to the areas shown in the figures provided in SEE (Mod 2); b) retain the primary crusher in its current location within the Stage 1 extraction area; c) retain the visual screen provided by the Northern Ridge; and d) restrict further extension of the secondary processing area and Yorkeys Creek stockpile area.	Compliant	Section 6.6 & Section 8

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

DA Conditions: SSD 6084 Mod 2- Appendix 3 Statement of Commitments

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevant.

Desired Outcome	Condition	Action Text	Details of compliance status at 30/6/2024	Where addressed in Annual Review
Reduce the impact of the areas of quarry disturbance visible from surrounding vantage points.	6.2	Implement management measures to limit impacts to visual amenity including the following. a) Complete a trial of short-term visual mitigation measures for the Yorkeys Creek stockpile area. b) Implement short-term visual mitigation measures for the Yorkeys Creek stockpile area. c) Progressive revegetation or rehabilitation of terminal faces of the extraction area and overburden emplacement and profiled slopes between the administration area and the extraction area. d) Maintain existing visual barriers including retained northern face of extraction area and tree-lined visual barriers. e) Apply a bituminous film to reduce the contrast between the pale rhyolite and darker background vegetation on completed western facing slopeswhere necessary. f) Minimise dust emissions through suppression measures such as regular watering of areas. g) Maintain the Site in a tidy and orderly manner. h) Minimise the impacts of lighting by directing lights away from critical receptors (to the south and east) and minimise the 'lume'created by the lights. Note: If superseded by more effective measures, or no longer required due to progressive development of the Quarry Site, the above will cease to be implemented.	Compliant	Section 6.6 and Section 8
Monitor the progressive visual changes from nearby receptors	6.3	Monitor the sequence of visual impacts using a series of annual photographs from vantage points surrounding the Quarry Site. These photos, along with a discussion as to compliance with the impact predicted, would be included in annual reporting.	Compliant	Section 6.6
Appropriately document water management measures including erosion and sediment control.	7.1	Ensure any off-site discharge is monitored and reported in accordance with EPL 12323.	Compliant	Section 7
Capture of sediment-laden water flows from Proposal-related disturbance.	7.2	Ensure the capacity of the various sediment basins and water storages of the Site provides the required water settlement and sediment storage volumes for a 5-day 95th percentile rainfall event.	Compliant	
Manage the discharge of water from the various sediment basins and storage dams.	7.3	Apply procedures established in the Water Management Plan for the appropriate treatment of water that is to be discharged to natural drainage.	Compliant	
Prevention of hydrocarbon contamination of water on the Site.	7.4	Securely store all hydrocarbon products within designated and bunded areas.	Compliant	
	7.5	Refuel and maintain all equipment within designated areas of the Site, i.e. workshop area.	Compliant	
Prevention of groundwater contamination.	8.1	Securely store all hydrocarbon products within designated and bunded areas.	Compliant	
	8.2	Refuel and maintain all equipment within designated areas of the Site, i.e. workshop area.	Compliant	
Appropriately license any removal of groundwater.	8.3	Obtain and maintain a Water Access Licence(s) for the volume of groundwater seepage into the extraction area annually.	Compliant	
	8.4	Report annual and projected groundwater extraction to the DoI.	Compliant	
Avoid impacts on native flora and fauna.	9.1	Locate primary crushing station within extraction footprint.	Compliant	Section 5, Section 8 and report figures
	9.2	Limit extent of extraction area as nominated in the development consent.	Compliant	
Minimise or mitigate unavoidable impacts on native flora and fauna.	9.3	Operate a conveyor between the primary crushing station and secondary processing area to limit transportation of raw materials.	Compliant	
	9.4	Maintain a 10m buffer and exclusion zone around the proposed area of disturbance.	Compliant	
	9.5	Fence, as appropriate, sections of the Stage 2 Site not required for ongoing operations.	Compliant	
	9.6	Include the Silver-leafed mountain gum in progressive revegetation of the final landform.	Compliant	
	9.7	Install appropriate erosion and sediment control measures prior to vegetation clearing activities (to reduce the potential for pollution of downstream riparian and aquatic habitat).	Compliant	
	9.8	Limit vehicle speeds within the Site to limit the potential for vehicle trauma to wildlife.	Compliant	
Avoid, minimise or mitigate impacts as a result of operational activities on aquatic biota and habitats.	10.1	Design and construct any ancillary development works, e.g. access roads, in the vicinity of watercourses in accordance with the NSW DPI Policy and Guidelines for Fish Habitat Conservation and Management	Not Triggered	
	10.2	Minimise the occurrence of uncontrolled discharges of water by managing water in accordance with a Water Management Plan.	Compliant	Section 7
	10.3	Maintain a bunded area for storage of fuels, oils, refuelling and appropriate maintenance of vehicles and mechanical plant.	Compliant	
	10.4	Procedures would be implemented to manage handling of hazardous material and spill response protocols.	Compliant	
	10.5	Install and maintain scour protection at pipe outlet points.	Compliant	
Noise emissions do not exceed intrusiveness criteria nor significantly impact on neighbouring landowners and/or	11.1	Undertake processing operations with the current or equivalent crushing and screening plant.	Compliant	Section 6.2
	11.2	Ensure all equipment on Site has sound power levels at or below that nominated for noise modelling purposes (see Table 5-1 of Benbow, 2014a).	Compliant	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

DA Conditions: SSD 6084 Mod 2- Appendix 3 Statement of Commitments

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevant.

Desired Outcome	Condition	Action Text	Details of compliance status at 30/6/2024	Where addressed in Annual Review
residents.	11.3	Limit transportation noise by ensuring: a) All trucks under control of Hy-Tec, or accredited contractors would comply at all times with RMS noise limits. b) All truck drivers would be required to sign a Code of Conduct that includes noise limiting behaviour. c) Comply with conditional limits on truck movements. d) The internal road network would be graded, as required, to limit body noise from empty trucks	Compliant	
	11.4	Maintenance work would be confined to standard daytime hours where practicable.	Compliant	
Site activities are undertaken without exceeding the nominated air quality criteria.	12.1	Undertake operations in accordance with an Air Quality Management Plan.	Compliant	Section 6.4
Minimise greenhouse gas emissions from Site related activities.	12.2	Minimise the impacts of greenhouse gases relating to diesel consumption by: a) minimising use of haul trucks through use of an overland conveyor; b) minimising rehandling of overburden and products; c) maintaining and servicing equipment to ensure efficiency; d) minimising the quarry footprint to reduce land disturbance and travel distances; and e) optimising the design of the Processing Plant to f) maximise the use of gravity to move material throughout the plant and maximise energy efficient motors in major equipment.	Compliant	
Record and monitor the local environment regarding dust impacts.	12.3	Continue to monitor dust impacts through: a) the existing deposited dust gauges; and b) on-site meteorological monitoring to record relevant parameters.	Compliant	Section 6.4
Minimise the potential for adverse Proposalrelated impacts on indigenous heritage sites.	13.1	Include Indigenous heritage protocols and obligations within training and induction processes for the quarry.	Compliant	Section 6.5
	13.2	Halt all works in the immediate area if cultural objects are found and contact a suitably qualified archaeologist and Aboriginal community representative.	Not Triggered	
	13.3	Halt all works in the immediate area if human remains are found and contact NSW Police, Aboriginal community representative and OEH.	Not Triggered	
	13.4	Maintain reasonable efforts to avoid impacts to Aboriginal cultural heritage values at all stages of the development works	Compliant	
Maintain appropriate records of identified indigenous heritage sites.	13.5	Complete an Aboriginal Site Impact Recording Form and submit it to the Aboriginal Heritage Management Information Management System (AHIMS) Registrar, for each AHIMS site that is harmed through the proposed development.	Not Triggered	
Minimise the potential for adverse Proposalrelated impacts on historic heritage sites.	14.1	Halt all works in the immediate area if cultural object(s) are found.	Not Triggered	
	14.2	Secure the location, e.g. through the installation of protective fencing, flagging with high visibility tape.	Not Triggered	
	14.3	Contact a suitably qualified archaeologist to determine the significance of the object(s).	Not Triggered	
	14.4	Report discovery of relic (if advised of validity by archaeologist) in accordance within Section 146 of the Heritage Act 1977.	Not Triggered	
	14.5	Do not recommence works within the secured area until advised by archaeologist.	Not Triggered	
	14.6	Include the commitments of 14.1 to 14.4 within training and induction processes for the Site.	Not Triggered	
Manage bush fire risks on site to minimise the potential for property damage or personnel injury	15.1	Ensure refuelling is undertaken within designated fuel bays and vehicles are turned off during refuelling.	Compliant	Section 6.8
	15.2	Ensure no smoking policy is enforced in designated areas of the Site.	Compliant	
	15.3	Ensure fire extinguishers are maintained within site vehicles and refuelling areas.	Compliant	
	15.4	Ensure that a water cart is available to assist in extinguishing any fire ignited.	Compliant	
	15.5	Establish and maintain an Outer Protection Area around the administration area.	Compliant	
	15.6	Maintain the access road to the extraction area such that safe passage is guaranteed should an emergency evacuation be required.	Compliant	
	15.7	Maintain access to water contained within SD1 to SD6, as well as SB1 for use in fighting ember attack.	Compliant	
	15.8	Complete appropriate training with site personnel in relation to fire-fighting tasks and procedures.	Compliant	
	15.9	Ensure access is provided for Rural Fire Service and its and other emergency services'authority is recognised and assistance offered in the event of a bush fire.	Compliant	
Reduce risks of traffic accidents on roads used by Proposal-related traffic.	15.10	Ensure route selection for delivery of quarry products follows routes designated in the EIS for entry and exit to the Site, transportation through the Blue Mountains and local deliveries of products.	Compliant	
	15.11	Operate a Traffic Management Plan for all trucks entering and exiting Austen Quarry.	Compliant	
	15.12	Continue to implement the Chain of Responsibility – Driver Vehicle Check system for all transportation activities undertaken at the Site.	Compliant	
All members of the public are safe when near the Austen Quarry.	15.13	Implement measures to ensure the safety of public including visitors, contractors and employees through recruitment, induction and training programs.	Compliant	
Measures to be put in place to, where possible, restrict unauthorised entry and reduce the risk of accident to any trespasser on the Site.	15.14	Ensure gate at entrance on Jenolan Caves Road is locked outside standard operating hours.	Compliant	
	15.15	Use of locks on equipment when site personnel are not working on or with this equipment or plant.	Compliant	
	15.16	Installation and maintenance of safety signage around the Site and perimeter fencing, where necessary.	Compliant	
	15.17	Instruct all visitors entering and departing the Site to visit either the Site office or weighbridge for registration including time of arrival and departure, and an induction, if required.	Compliant	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

DA Conditions: SSD 6084 Mod 2- Appendix 3 Statement of Commitments

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevant.

Desired Outcome	Condition	Action Text	Details of compliance status at 30/6/2024	Where addressed in Annual Review
	15.18	Install appropriate controls to ensure the stability of the open cut, overburden emplacement and stockpiles.	Compliant	
Continue to proactively consult with members of the community affected by the Proposal .	16.1	Maintain the existing 'open door' policy for community members to approach the management staff of the Austen Quarry.	Compliant	Section 9
	16.2	Maintain the existing community complaints and response system.	Compliant	
	16.3	Seek local supply and service contractors from within the Lithgow LGA where it is practicable to do so.	Compliant	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

EPL12323

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevant.

Schedule	Condition	Condition Text	Details of compliance status	Where addressed in Annual Review
Compliance Summary		**Number of Conditions Non-compliant**		
Non Compliant		2	See Table Below	See Table Below
Not Triggered		Nil		
General				
A	1.1	This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation. Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition. Scheduled Activity Fee Based Activity Scale > 500000 - 2000000 T annual capacity to extract, process or store	Compliant	
	2.1	The licence applies to the following premises: Premises Details AUS-10 QUARRY 391 JENOLAN CAVES ROAD HARTLEY NSW 2790 LOT 1 DP 1005511, LOT 2 DP 1005511, LOT 31 DP 1009967	Compliant	
	3	Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence. In this condition the reference to "the licence application" includes a reference to: a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.	Compliant	
P	1.1	The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.	Compliant	
		Air EPA identification no. / Type of Monitoring Point / Type of Discharge Point / Location Description 4 / Ambient air monitoring / / Dust monitoring location identified as "AQD-1" on Figure 1 Environment Protection Licence Monitoring Points - provided to EPA on 19/09/11 (DOC11/40371). 5 / Ambient air monitoring / / Dust monitoring location identified as "AQD-2" on "Figure 1 Environment Protection Licence Monitoring Points" - provided to EPA on 19/09/11 as part of DOC11/40371. 6 / Ambient air monitoring / / Dust monitoring location identified as "AQD-3" on "Figure 1 Environment Protection Licence Monitoring Points" - provided to EPA on 19/09/11 as part of DOC11/40371. 12 / Weather Analysis / / Weather monitoring location as identified on "Figure 2 Environment Protection Licence Monitoring Points" - provided to EPA on 19/09/11 as part of DOC11/40371.	Compliant	
	1.2	The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.	Compliant	
	1.3	The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.	Non Compliant	Sample taken from wrong location due to flooding. Section 7.1
		Water and land EPA Identification no. / Type of Monitoring Point / Type of Discharge Point / Location Description 1 / Dischare to Waters; Discharge Quality Monitoring / Dischare to Waters; Discharge Quality Monitoring / Location identified as "Dam 1" on "Figure 2 - Environment Protection Licence Monitoring Points" - provided to EPA on 19/09/11 as part of DOC11/40371 2 / Ambient water monitoring / / Water monitoring location identified on Figure 6.1 of report entitled "Hartley Quarry - Annual Environmental Management Report" (2003), upstream of the processing area. 3 / Ambient water monitoring / / Water monitoring location identified on Figure 6.1 of report entitled "Hartley Quarry - Annual Environmental Management Report" (2003), downstream of the processing area.	Compliant	
		8 / Discharge to waters; Discharge quality monitoring / Discharge to waters; Discharge quality monitoring / Location identified as "Dam 2" on "Figure 2 - Environment Protection Licence Monitoring Points" - provided to EPA on 19/09/11 as part of DOC11/40371 9 / Discharge to waters; Discharge quality monitoring / Discharge to waters; Discharge quality monitoring / Location identified as "Dam 3" on "Figure 2 - Environment Protection Licence Monitoring Points" - provided to EPA on 19/09/11 as part of DOC11/40371 10 / Discharge to waters; Discharge quality monitoring / Discharge to waters; Discharge quality monitoring / Location identified as "Dam 4" on "Figure 2 - Environment Protection Licence Monitoring Points" - provided to EPA on 19/09/11 as part of DOC11/40371 11 / Discharge to waters; Discharge quality monitoring / Discharge to waters; Discharge quality monitoring / Location identified as "Dam 5" on "Figure 2 - Environment Protection Licence Monitoring Points" - provided to EPA on 19/09/11 as part of DOC11/40371	Compliant	
L	1.1	Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.	Compliant	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

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Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevant.

Schedule	Condition	Condition Text	Details of compliance status	Where addressed in Annual Review
	2.1	For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.	Compliant	
	2.2	Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.	Compliant	
	2.3	To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.	Compliant	
	2.4	Water and/or Land Concentration Limits	Compliant	
		POINT 11,8,9,10,1 Pollutant / Units of Measure / 50 percentile concentration limit / 90 percentile concentration limit / 3DGM concentration limit / 100 percentile concentration limit Oil and Grease / milligrams per litre / / / / 10 pH / pH / / / / 6.5 - 8.5 Total suspended solids / milligrams per litre / / / / 30	Compliant	
	3.1	The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled “Waste” and meeting the definition, if any, in the column titled “Description” in the table below. Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled “Activity” in the table below. Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled “Other Limits” in the table below. This condition does not limit any other conditions in this licence.	Compliant	
		Code / Waste / Description / Activity / Other Limits NA / Cured concrete waste from a batch plant / Recycled concrete aggregate sourced from Hy-Tec Industries Pty Limited's concrete batching plants / Resource recovery Waste processing (non-thermal treatment) Waste storage / 5,000 tonnes per year NA / General or Specific exempted waste / Waste that meets all the conditions of a resource recovery exemption under Clause 51A of the Protection of the Environment Operations (Waste) Regulation 2005 / As specified in each particular resource recovery exemption / NA	Compliant	
	4.1	Noise from the premises must not exceed 35 dB(A)LAeq (15 minute) at any time. Where LAeq means the equivalent continuous noise level - the level of noise equivalent to the energy-average of noise levels occurring over a measurement period	Compliant	
	4.2	To determine compliance with condition(s) L4.1 noise must be measured at, or computed for, any affected noise sensitive locations (such as a residence, school or hospital). A modifying factor correction must be applied for tonal, impulsive or intermittent noise in accordance with the "Environmental Noise Management - NSW Industrial Noise Policy (January 2000)".	Compliant	
	4.3	The noise emission limits identified in this licence apply under all meteorological conditions except: a) during rain and wind speeds (at 10m height) greater than 3m/s; and b) under "non-significant weather conditions".	Compliant	
	5.1	Blasting in or on the premises must only be carried out between 1000 hours and 1500 hours Monday to Friday. Blasting in or on the premises must not take place on Saturdays, Sundays or Public Holidays without the prior approval of the EPA.	Compliant	
	5.2	The airblast overpressure level from blasting operations in or on the premises must not exceed: a) 115 dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period; and b) 120 dB (Lin Peak) at any time. At the most affected noise-sensitive location not under the ownership or control of the licensee .	Compliant	
	5.3	The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed: a) 5mm/s for more than 5% of the total number of blasts carried out on the premises during each reporting period; and b) 10 mm/s at any time. At the most affected sensitive location not under the ownership or control of the licensee .	Compliant	
	5.4	The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed 2 mm/s at the most sensitive location within Hartley Village.	Compliant	
	6.1	Activities covered by this licence must only be carried out between the hours of 0600 hours and 1800 hours Monday to Friday, and 0700 hours and 1500 hours Saturday, and at no time on Sundays and Public Holidays.	Compliant	
	6.2	The loading and unloading of trucks at the Premises and transport to and from the Premises is permitted between 0400 hours and 2200 hours Monday to Friday and between 0500 hours and 1500 hours on Saturdays only.	Compliant	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

EPL12323

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevant.

Schedule	Condition	Condition Text	Details of compliance status	Where addressed in Annual Review
O	1.1	Licensed activities must be carried out in a competent manner. This includes: a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.	Compliant	
	2.1	All plant and equipment installed at the premises or used in connection with the licensed activity: a) must be maintained in a proper and efficient condition; and b) must be operated in a proper and efficient manner.	Compliant	
	3.1	The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.	Compliant	
	4.1	The stormwater control structures (sediment basins) identified at EPA Identification Points 1, 8, 9, 10 and 11 must be drained or pumped out as necessary to maintain each basins design storage capacity within 5 days following rainfall.	Compliant	
	4.2	Water discharged to comply with condition O4.1 may only be discharged to waters from those stormwater control structures (sediment basins) identified at EPA Identification Points 1, 8, 9, 10 and 11 where the discharged water complies with the discharge limits stipulated at condition L2.1/L2.4 (and taking into consideration condition L2.6).	Compliant	
	4.3	The licensee must undertake maintenance as necessary to desilt any stormwater control structures (sediment basins) identified at EPA Identification Points 1, 8, 9, 10 and 11 in order to retain each basins design storage capacity.	Compliant	
M	1.1	The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.	Compliant	
	1.2	All records required to be kept by this licence must be: a) in a legible form, or in a form that can readily be reduced to a legible form; b) kept for at least 4 years after the monitoring or event to which they relate took place; and c) produced in a legible form to any authorised officer of the EPA who asks to see them.	Compliant	
	1.3	The following records must be kept in respect of any samples required to be collected for the purposes of this licence: a) the date(s) on which the sample was taken; b) the time(s) at which the sample was collected; c) the point at which the sample was taken; and d) the name of the person who collected the sample.	Compliant	
	2.1	For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:	Compliant	
	2.2	POINT 4,5,6 Pollutant: Particulates - Deposited Matter; Units of measure: grams per square metre per month; Frequency: Continuous; Sampling Method: AM-19	Compliant	
	2.3	POINT 1,8,9,10,11 Pollutant: Oil and Grease; Units of measure: milligrams per litre; Frequency: Daily during any discharge; Sampling Method: Grab sample Pollutant: pH; Units of measure: pH; Frequency: Daily during any discharge; Sampling Method: Grab sample Pollutant: Total suspended solids; Units of measure: milligrams per litre; Frequency: Daily during any discharge; Sampling Method: Grab sample POINT 2,3 Pollutant: Oil and Grease; Units of measure: milligrams per litre; Frequency: Special Frequency 1; Sampling Method: Grab sample Pollutant: pH; Units of measure: pH; Frequency: Special Frequency 1; Sampling Method: Grab sample Pollutant: Total suspended solids; Units of measure: milligrams per litre; Frequency: Special Frequency 1; Sampling Method: Grab sample	Compliant	Monitoring taken from wrong location, but results within limits.
	2.4	For the purposes of the table(s) above Special Frequency 1 means the collection of samples monthly, with the exception of when a discharge is occuring from Point 1, where samples must be collected daily.	Compliant	
	3.1	Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with: a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.	Compliant	
	3.2	Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted	Compliant	
	4.1	The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.	Compliant	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

EPL12323

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevant.

Schedule	Condition	Condition Text	Details of compliance status	Where addressed in Annual Review
	4.2	The record must include details of the following: a) the date and time of the complaint; b) the method by which the complaint was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; d) the nature of the complaint; e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the licensee, the reasons why no action was taken.	Compliant	
	4.3	The record of a complaint must be kept for at least 4 years after the complaint was made.	Compliant	
	4.4	The record must be produced to any authorised officer of the EPA who asks to see them.	Compliant	
	5.1	The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.	Compliant	
	5.2	The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.	Compliant	
	5.3	The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.	Compliant	
	6.1	For each discharge point or utilisation area specified below, the licensee must monitor: a) the volume of liquids discharged to water or applied to the area; b) the mass of solids applied to the area; c) the mass of pollutants emitted to the air;	Compliant	
		POINT 11,8,9,10,1 **Frequency** / **Unit of Measure** / **Sampling Method** Daily during any discharge / kilolitres per day / Estimate	Compliant	
	7.1	To determine compliance with condition(s) L5.2, L5.3 and L5.4 a) Airblast overpressure and ground vibration must be measured and electronically recorded at the nearest residence or sensitive receiver or as otherwise directed by an authorised officer of the EPA for all blasts carried out in or on the premises; and b) Instrumentation used to measure the airblast overpressure and ground vibration must meet the requirements of Australian Standard AS 2187.2-2006.	Compliant	
	8.1	Requirement to Monitor Weather The applicant must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The applicant must use the sampling method, units of measure, averaging period and sample at the frequency specified opposite in the other columns unless otherwise approved by the EPA:	Non Compliant	Section 6.1
		Parameter / **Units of Measure** / **Frequency** / **Averaging Period** / **Sampling Method** Air temperature / oC / Continuous / 1 hour / AM-4 Wind Direction / o / Continuous / 15 minute / AM-2 &AM-4 Wind Speed / m/s / Continuous / 15 minute / AM-2 & AM-4 Sigma theta / o / Continuous / 15 minute / AM-2 & AM-4 Rainfall / mm / Continuous / 24 hour / AM-4		
R	1.1	The licensee must complete and supply to the EPA an Annual Return in the approved form comprising: 1. a Statement of Compliance, 2. a Monitoring and Complaints Summary, 3. a Statement of Compliance - Licence Conditions, 4. a Statement of Compliance - Load based Fee, 5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan, 6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and 7. a Statement of Compliance - Environmental Management Systems and Practices.	Compliant	
	1.2	An Annual Return must be prepared in respect of each reporting period, except as provided below.	Compliant	
	1.3	Where this licence is transferred from the licensee to a new licensee: a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.	Compliant	
	1.4	Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on: a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or b) in relation to the revocation of the licence - the date from which notice revoking the licence operates	Compliant	
	1.5	The Annual Return for the reporting period must be supplied to the EPA via eConnect EPA or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').	Compliant	
	1.6	The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA	Compliant	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

EPL12323

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevant.

Schedule	Condition	Condition Text	Details of compliance status	Where addressed in Annual Review
	1.7	Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by: a) the licence holder; or b) by a person approved in writing by the EPA to sign on behalf of the licence holder.	Compliant	
	1.8	The results of the blast monitoring required by condition M7.1 must be submitted to the EPA at the end of each reporting period	Compliant	
	2.1	Notifications must be made by telephoning the Environment Line service on 131 555.	Compliant	
	2.2	The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.	Compliant	
	3.1	Where an authorised officer of the EPA suspects on reasonable grounds that: a) where this licence applies to premises, an event has occurred at the premises; or b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.	Compliant	
	3.2	The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.	Compliant	
	3.3	The request may require a report which includes any or all of the following information: a) the cause, time and duration of the event; b) the type, volume and concentration of every pollutant discharged as a result of the event; c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event; d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort; e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants; f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and g) any other relevant matters.	Compliant	
		The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.	Compliant	
G	1.1	A copy of this licence must be kept at the premises to which the licence applies.	Compliant	
	1.2	The licence must be produced to any authorised officer of the EPA who asks to see it.	Compliant	
	1.3	The licence must be available for inspection by any employee or agent of the licensee working at the premises.	Compliant	
	2.1	The licensee must operate 24-hour telephone contact lines for the purpose of enabling the EPA to directly contact one or more representatives of the licensee who can: a) respond at all times to incidents relating to the premises; and b) contact the licensee's senior employees or agents authorised at all times to: i) speak on behalf of the licensee; and ii) provide any information or document required under this licence.	Compliant	
	2.2	The licensee is to inform the EPA of the representative or representatives and their telephone number within 3 months of the date of the issue of this licence. The EPA must be notified of the telephone number on commencement of its operation.	Compliant	
	2.3	The licensee is to inform the EPA in writing of the appointment of any subsequent contact persons, or changes to the person's contact details as soon as practicable and in any event within fourteen days of the appointment or change.	Compliant	
	3.1	The location of EPA point number(s) 1 to 7 inclusive must be clearly marked by signs that indicate the point identification number used in this licence and be located as close as practical to the point.	Compliant	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

WAL Conditions

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not

WAL 37423

Schedule	Condition	Condition Text	Details of compliance status
Compliance Summary		**Number of Conditions Non-compliant**	
Non Compliant		Nil	See Table Below
Not Triggered		1	
General			
	MW0929-001	From 1 July 2018, if the water supply work nominated on this access licence is located at or less than 40 m from the top of the high bank of a river then: A. water must not be taken in this groundwater source when flows are in the Very Low Flow Class for an unregulated river access licence in that river. B. This restriction will only apply when the system that confirms when water can be taken is available on DPI Water website. C. DPI Water will inform the licence holder in writing of the applicable restrictions and how to access the information on its website when this system becomes operative	Not Triggered
	MW0605-00001	Water must be taken in compliance with the conditions of the approval for the nominated work on this access licence through which water is to be taken	Compliant
	MW0919-00001	A maximum water allocation of 0.1 ML/unit share may be carried over in the account for this access licence from one water year to the next water year if a water meter is installed on each water supply work nominated on this licence and each meter is maintained in working order.	Compliant
	MW0547-00001	The total volume of water taken under this licence in any water year must not exceed a volume equal to: A. the sum of water in the account from the available water determination for the current year, plus B. the water carried over in the account from the previous water year, plus C. the net amount of water assigned to or from the account under a water allocation assignment, plus D. any water re-credited by the Minister to the account.	Compliant
	MW2338-00001	The completed logbook must be retained for five (5) years from the last date recorded in the logbook.	Compliant
	MW2336-00001	The purpose or purposes for which water is taken, as well as details of the type of crop, area cropped, and dates of planting and harvesting, must be recorded in the logbook each time water is taken.	Compliant
	MW2337-00001	The following information must be recorded in the logbook for each period of time that water is taken: A. date, volume of water, start and end time when water was taken as well as the pump capacity per unit of time, and B. the access licence number under which the water is taken, and C. the approval number under which the water is taken, and D. the volume of water taken for domestic consumption and/or stock watering	Compliant - none taken during reporting period.
	MW2339-00001	A logbook must be kept, unless the work is metered and fitted with a data logger. The logbook must be produced for inspection when requested by DPI Water.	Compliant
	MW0051 00002	Once the licence holder becomes aware of a breach of any condition on this access licence, the licence holder must notify the Minister as soon as practicable. The Minister must be notified by: A. email: water.enquiries@dpi.nsw.gov.au, or B. telephone: 1800 353 104. Any notification by telephone must also be confirmed in writing within seven (7) business days of the telephone call	Compliant

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

WAL Conditions

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevant.

10WA103330

Schedule	Condition	Condition Text	Details of compliance status
Compliance Summary		**Number of Conditions Non-compliant**	
Non Compliant		Nil	See Table Below
Not Triggered		3	
	MW0655-00001	Any water supply work authorised by this approval must take water in compliance with the conditions of the access licence under which water is being taken.	Compliant
	MW0097-00001	If contaminated water is found above the production aquifer during the construction of the water supply work authorised by this approval, the licensed driller must: A. notify the relevant licensor in writing within 48 hours of becoming aware of the contaminated water, and B. adhere to the Minimum Construction Requirements for Water Bores in Australia (2012), as amended or replaced from time to time.	Not Triggered
	MW0487-00001	The water supply work authorised by this approval must be constructed within three (3) years from the date this approval is granted.	Compliant
	MW0044-00001	A. When a water supply work authorised by this approval is to be abandoned or replaced, the approval holder must contact the relevant licensor in writing to verify whether the work must be decommissioned. B. The work is to be decommissioned, unless the approval holder receives notice from the Minister not to do so. C. When decommissioning the work the approval holder must: i. comply with the minimum requirements for decommissioning bores prescribed in the Minimum Construction Requirements for Water Bores in Australia (2012), as amended or replaced from time to time, and ii. notify the relevant licensor in writing within sixty (60) days of decommissioning that the work has been decommissioned.	Not Triggered
	MW0484-00001	Before water is taken through the water supply work authorised by this approval, confirmation must be recorded in the logbook that cease to take conditions do not apply and water may be taken. The method of confirming that water may be taken, such as visual inspection, internet search, must also be recorded in the logbook. If water may be taken, the: A. date, and B. time of the confirmation, and C. flow rate or water level at the reference point in the water source must be recorded in the logbook.	Compliant
	MW2338-00001	The completed logbook must be retained for five (5) years from the last date recorded in the logbook.	Compliant
	MW2336-00001	The purpose or purposes for which water is taken, as well as details of the type of crop, area cropped, and dates of planting and harvesting, must be recorded in the logbook each time water is taken.	Compliant - not for irrigation
	MW2337-00001	The following information must be recorded in the logbook for each period of time that water is taken: A. date, volume of water, start and end time when water was taken as well as the pump capacity per unit of time, and B. the access licence number under which the water is taken, and C. the approval number under which the water is taken, and D. the volume of water taken for domestic consumption and/or stock watering.	Compliant
	MW0482-00001	Where a water meter is installed on a water supply work authorised by this approval, the meter reading must be recorded in the logbook before taking water. This reading must be recorded every time water is to be taken.	Compliant
	MW2339-00001	A logbook must be kept, unless the work is metered and fitted with a data logger. The logbook must be produced for inspection when requested by the relevant licensor.	Compliant
	MW0051-00001	Once the approval holder becomes aware of a breach of any condition on this approval, the approval holder must notify the Minister as soon as practicable. The Minister must be notified by: A. email: water.enquiries@dpi.nsw.gov.au, or B. telephone: 1800 353 104. Any notification by telephone must also be confirmed in writing within seven (7) business days of the telephone call.	Not Triggered
	MK0485-00001	Within sixty (60) days of completing construction of the water supply work authorised by this approval, the approval holder must provide a completed Form A for that work to the relevant licensor.	Compliant
	DS2431-00001	A. Within 6 months of granting this approval, a monitoring plan to measure the water table, groundwater and surface water quality must be submitted to, and approved by, the relevant licensor, Parramatta Office. B. Then, the water table, groundwater and surface water quality must be measured according to the approved plan. C. All monitoring records must be kept for 10 years and provided to the relevant licensor when requested.	Compliant WMP first submitted 15/6/16. V11 approved 23/8/19

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

WAL Conditions

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevar

WAL 25616

Schedule	Condition	Condition Text	Details of compliance status
Compliance Summary		**Number of Conditions Non-compliant**	
Non Compliant		Nil	See Table Below
Not Triggered		1	
General			
	MW0112-00001	The maximum water allocation that may be carried over in the account for this access licence from one water year to the next water year is: A. a volume equal to 100 % of the share component of the licence, or B. 1 ML/unit share of the share component of the licence.	Compliant
	MW0017-00023	From 1 July 2011, water must not be taken from the Dharabuladh Management Zone of the Upper Nepean and Upstream Warragamba Water Source when flows are in the Very Low Flow Class, which means that the flow at Coxs River at the Island Hill gauge [No. 212045] is: A. equal to or less than 17 ML/day on a rising river, or B. equal to or less than 15 ML/day on a falling river. This restriction does not apply if water is to be taken from a runoff harvesting dam or an in-river dam pool.	Compliant
	MW0036-00002	The volume of water taken in any three (3) consecutive water years from 1 July 2012 must be recorded in the logbook at the end of those three water years. The maximum volume of water permitted to be taken in those years must also be recorded in the logbook.	Compliant - Logbook has been updated to provide a running 3-year cumulative total at the end of every water year June 30. No water taken during this reporting period thus logbook has not been included.
	MW0605-00001	Water must be taken in compliance with the conditions of the approval for the nominated work on this access licence through which water is to be taken.	Compliant
	MW0670-00001	Water must only be taken if there is visible flow in the water source at the location where water is to be taken. This restriction does not apply if water is to be taken: A. from an off-river pool, an in-river pool, a runoff harvesting dam or an in-river dam pool, or B. from the following Weirs: Maldon, Douglas Park, Menangle, Camden, Sharpes, Cobbity, Mount Hunter Rivulet, Brownlow Hill, Theresa Park and Wallacia.	Compliant
	MW0004-00002	From 1 July 2012, the total volume of water taken in any three (3) consecutive water years under this access licence must not exceed a volume which is equal to the lesser of either: A. the sum of: i. water in the account from the available water determinations in those 3 consecutive water years, plus ii. water in the account carried over from the water year prior to those 3 consecutive water years, plus iii. any net amount of water assigned to or from this account under a water allocation assignment in those 3 consecutive water years, plus iv. any water re-credited by the Minister to the account in those 3 consecutive water years, or B. the sum of: i. the share component of this licence at the beginning of the first year in those 3 consecutive water years, plus ii. the share component of this licence at the beginning of the second year in those 3 consecutive water years, plus iii. the share component of this licence at the beginning of the third year in those 3 consecutive water years, plus iv. any net amount of water assigned to or from this account under a water allocation assignment in those 3 consecutive water years, plus v. any water re-credited by the Minister to the account in those 3 consecutive water years.	Compliant

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

WAL Conditions

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not relevar

WAL 25616

Schedule	Condition	Condition Text	Details of compliance status
	MW2337-00001	The following information must be recorded in the logbook for each period of time that water is taken: A. date, volume of water, start and end time when water was taken as well as the pump capacity per unit of time, and B. the access licence number under which the water is taken, and C. the approval number under which the water is taken, and D. the volume of water taken for domestic consumption and/or stock watering.	Compliant
	MW2339-00001	A logbook must be kept, unless the work is metered and fitted with a data logger. The logbook must be produced for inspection when requested by the relevant licensor.	Compliant
	MW0051-00002	Once the licence holder becomes aware of a breach of any condition on this access licence, the licence holder must notify the Minister as soon as practicable. The Minister must be notified by: A. email: water.enquiries@dpi.nsw.gov.au, or B. telephone: 1800 353 104. Any notification by telephone must also be confirmed in writing within seven (7) business days of the telephone call	Not Triggered

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2023 - 30th June 2024

WAL Conditions

Compliant	
Non Compliant	Non-compliance
Not Triggered	A requirement has an activation or timing trigger that has not been met at the time when the audit is undertaken, therefore an assessment of compliance is not rele

10WA103330

Schedule	Condition	Condition Text	Details of compliance status
Compliance Summary		**Number of Conditions Non-compliant**	
Non Compliant		Nil	See Table Below
Not Triggered		2	
General			
	MW0655-00001	Any water supply work authorised by this approval must take water in compliance with the conditions of the access licence under which water is being taken.	Compliant
	MW0491-00001	When a water supply work authorised by this approval is to be abandoned or replaced, the approval holder must contact the relevant licensor in writing to verify whether the work must be decommissioned. The work is to be decommissioned, unless the approval holder receives notice from the Minister not to do so. Within sixty (60) days of decommissioning, the approval holder must notify the relevant licensor in writing that the work has been decommissioned.	Not Triggered
	MW0481-00001	A logbook must be kept and maintained at the authorised work site or on the property for each water supply work authorised by this approval, unless the work is metered and fitted with a data logger.	Compliant
	MW2338-00001	The completed logbook must be retained for five (5) years from the last date recorded in the logbook.	Compliant
	MW0482-00001	Where a water meter is installed on a water supply work authorised by this approval, the meter reading must be recorded in the logbook before taking water. This reading must be recorded every time water is to be taken.	Compliant
	MW0051-00001	Once the approval holder becomes aware of a breach of any condition on this approval, the approval holder must notify the Minister as soon as practicable. The Minister must be notified by: A. email: water.enquiries@dpi.nsw.gov.au, or B. telephone: 1800 353 104. Any notification by telephone must also be confirmed in writing within seven (7) business days of the telephone call.	Not Triggered
	DK0888-00001	Any water supply work authorised by this approval used for the purpose of conveying, diverting or storing water must be constructed or installed to allow free passage of floodwaters flowing into or from a river or lake.	Compliant
	DK0878-00001	A. The construction, installation or use of the water supply work authorised by this approval must not cause or increase erosion to the channel or bank of the watercourse. B. If erosion is observed, the area must be stabilised with grass cover, stone pitching or any other material that will prevent any further occurrence of erosion.	Compliant

Appendix B: Consolidated Consent

Development Consent

Section 89E of the *Environmental Planning and Assessment Act 1979*

As delegate of the Minister for Planning, I approve the development application referred to in Schedule 1, subject to the conditions in Schedules 2 to 5.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the on-going environmental management of the development.

Oliver Holm
Executive Director
Resource Assessments and Compliance

Sydney 2015

SCHEDULE 1

Application Number	SSD-6084
Applicant	Hy–Tec Industries Pty Ltd
Consent Authority:	Minister for Planning
Land:	Lots 1 and 2 DP 1000511 Lot 31 DP 1009967 Lot 4 DP 876394
Development	Austen Quarry Extension

August 2018 modification in red type

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DEFINITIONS

AHD	Australian Height Datum
Annual Review	The review required by condition 4 of Schedule 5
Applicant	Hy-Tec Industries Pty Ltd, or any other person/s who rely on this consent to carry out the development that is subject to this consent
BCA	Building Code of Australia
BC Act	Biodiversity Conservation Act 2016
BCT	NSW Biodiversity Conservation Trust
Conditions of consent	Conditions contained in Schedules 2 to 5 inclusive
Conservation Area H	The 2.2 ha conservation area shown as 'easement for conservation maintenance work' in Appendix 6 and established in accordance with condition 7b of DA 103/94
Construction	The demolition of buildings or works, carrying out of works and erection of buildings covered by this consent
Council	Lithgow City Council
Day	The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
Department	Department of Planning and Environment
Development	The development as described in the documents listed in condition 2 of Schedule 2
DoI	Department of Industry - Lands and Water
DRG	Division of Resources and Geoscience within the Department
EIS	Environmental Impact Statement titled *Environmental Impact Statement for the Austen Quarry Stage 2 Extension Project*, dated October 2014, as modified by the Response to Submissions titled, *Austen Quarry Stage 2 Extension Project Response to Submissions* dated January 2015
EPA	NSW Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPL	Environment Protection Licence under the POEO Act
Evening	The period from 6pm to 10pm
Feasible	Feasible relates to engineering considerations and what is practical to build
GPS	Global Positioning System
Incident	An occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance
Land	As defined in the EP&A Act, except where the term is used in the noise and air quality conditions in Schedules 3 and 4 of this consent, where it is defined as the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this consent
Laden trucks	Trucks transporting quarry products from the site
Material harm	Is harm that: • involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial, or • results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment) This definition excludes "harm" that is authorised under either this consent or any other statutory approval'
Minister	NSW Minister for Planning or delegate
Mitigation	Activities associated with reducing the impacts of the development
Morning Shoulder	The period between 4 am and 7 am
Night	The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
POEO Act	*Protection of the Environment Operations Act 1997*
Privately-owned land	Land that is not owned by a public agency or the Applicant (or its subsidiary)
Public infrastructure	Linear and other infrastructure that provides services to the general public, such as roads, railways, water supply, drainage, sewerage, gas supply, electricity, telephone, telecommunications, etc.
Quarrying operations	The extraction, processing and transportation of extractive materials on the site and the associated removal of vegetation, topsoil and overburden
Quarry products	Includes all saleable quarry products, but excludes tailings and other wastes

Reasonable	Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements
Rehabilitation	The restoration of land disturbed by the development to a good condition and for the purpose of establishing a safe, stable and non-polluting environment
RMS	Roads and Maritime Services
Secretary	Planning Secretary under the EP&A Act, or nominee
SEE (Mod 1)	Statement of Environmental Effects titled *Austen Quarry Stage 2 Extensions Project (MOD 1 – SSD 6084) Statement of Environmental Effects*, prepared by RW Corkery & Co Pty Limited, dated March 2018; including the Response to Submissions titled *Austen Quarry Stage 2 Extension Project (MOD 1 – SSD 6084) Response to Submissions*, prepared by RW Corkery & Co Pty Limited, dated June 2018
Site	The land described in Schedule 1
Stage 2 Extraction Area	The area within the Extraction Boundary shown in Appendix 2
Statement of commitments	The Applicant's commitments in Appendix 3
Weekday	Any day from Monday to Friday

SCHEDULE 2
ADMINISTRATIVE CONDITIONS

OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

1. In addition to meeting the specific performance criteria established under this consent, the Applicant must implement all reasonable and feasible measures to prevent and/or minimise any material harm to the environment that may result from the construction, operation, or rehabilitation of the development.

TERMS OF CONSENT

2. The Applicant must carry out the development generally in accordance with the:
   (a) EIS, SEE (Mod 1); and
   (b) Statement of Commitments.

   Note: The statement of commitments is reproduced in Appendix 3.

2A. The Applicant must carry out the development in accordance with the conditions of this consent.

3. If there is any inconsistency between the above documents, the most recent document shall prevail to the extent of the inconsistency. However, the conditions of this consent shall prevail to the extent of any inconsistency.

4. The Applicant must comply with any reasonable requirement/s of the Secretary arising from the Department's assessment of:
   (a) any strategies, plans, programs, reviews, audits, reports or correspondence that are submitted in accordance with this consent;
   (b) any reviews, reports or audits undertaken or commissioned by the Department regarding compliance with this consent; or
   (c) the implementation of any actions or measures contained in these documents.

LAPSING OF CONSENT

5. If the development has not been physically commenced within 5 years of the date of this consent, then this development consent shall lapse.

LIMITS ON CONSENT

Quarrying Operations

6. The Applicant must not extract extractive materials below a level of 685 m AHD.

7. The Applicant may carry out quarrying operations on the site until 30 June 2050.

   Note: Under this consent, the Applicant is required to rehabilitate the site and carry out additional undertakings to the satisfaction of the Secretary. Consequently, this consent will continue to apply in all other respects other than the right to conduct quarrying operations until the rehabilitation of the site and those undertakings have been carried out to a satisfactory standard.

Extractive Material Transport

8. The Applicant must not:
   (a) transport more than 1.6 million tonnes of quarry products from the site during any financial year;
   (b) dispatch more than 300 laden trucks from the site on weekdays and 167 laden trucks from the site on Saturdays; and
   (c) dispatch more than 200 laden trucks from the site per weekday, averaged over the total number of dispatch weekdays in any calendar month.

SURRENDER OF EXISTING DEVELOPMENT CONSENTS

9. Within 12 months of the date of this consent, or as otherwise agreed by the Secretary, the Applicant must surrender the development consent (DA 103/94) for the existing operations on the site in accordance with Section 4.63 of the EP&A Act.

   Note: This requirement does not extend to the surrender of construction and occupation certificates for existing and proposed building works under Part 4A of the EP&A Act. Surrendering of consent should not be understood as implying that works legally constructed under a valid consent can no longer be legally maintained or used.

10. Prior to the surrender of development consent DA 103/94, the conditions of this consent shall prevail to the extent of any inconsistency with the conditions of development consent DA 103/94.

STRUCTURAL ADEQUACY

11. The Applicant must ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.

Notes:
- *Under Part 4A of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for the proposed building works; and*
- *Part 8 of the EP&A Regulation sets out the requirements for the certification of the development or project.*

DEMOLITION

12. The Applicant must ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures*, or its latest version.

PROTECTION OF PUBLIC INFRASTRUCTURE

13. The Applicant must:
    (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development; and
    (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the development.

Note: This condition does not apply to damage to roads caused as a result of general road usage.

OPERATION OF PLANT AND EQUIPMENT

14. The Applicant must ensure that all the plant and equipment used at the site is:
    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient manner.

UPDATING AND STAGING OF STRATEGIES, PLANS OR PROGRAMS

15. To ensure that strategies, plans and programs required under this consent are updated on a regular basis, and that they incorporate any appropriate additional measures to improve the environmental performance of the development, the Applicant may at any time submit revised strategies, plans or programs for the approval of the Secretary. With the agreement of the Secretary, the Applicant may also submit any strategy, plan or program required by this consent on a staged basis.

    With the agreement of the Secretary, the Applicant may prepare a revision of or a stage of a strategy, plan or program without undertaking consultation with all parties nominated under the applicable condition in this consent.

    Notes:
    - *While any strategy, plan or program may be submitted on a staged basis, the Applicant will need to ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times.*
    - *If the submission of any strategy, plan or program is to be staged; then the relevant strategy, plan or program must clearly describe the specific stage/s of the development to which the strategy, plan or program applies; the relationship of this stage/s to any future stages; and the trigger for updating the strategy, plan or program.*

16. Until they are replaced by an equivalent strategy, plan or program approved under this consent, the Applicant must implement the existing strategies, plans or programs for the site that have been approved under DA 103/94.

PRODUCTION DATA

17. The Applicant must:
    (a) provide annual quarry production data to DRG using the standard form for that purpose; and
    (b) include a copy of this data in the Annual Review (see condition 4 of Schedule 5).

IDENTIFICATION OF APPROVED EXTRACTION LIMITS

18. By 30 September 2015, unless otherwise agreed with the Secretary, the Applicant must:
    (a) engage a registered surveyor to mark out the boundaries of the approved limits of extraction within the development area; and
    (b) submit a survey plan of these boundaries with applicable GPS coordinates to the Secretary.

19. While quarrying operations are being carried out, the Applicant must ensure that these boundaries are clearly marked at all times in a manner that allows operating staff to clearly identify the approved limits of extraction.

COMMUNITY ENHANCEMENT

20. Within 6 months of the date of this consent, unless otherwise agreed by the Secretary, the Applicant must enter into a planning agreement with the Council in accordance with;
    - Division 7.1 of Part 7 of the EP&A Act; and
    - the terms specified in Appendix 7.

    If there is any dispute between the Applicant and Council on the planning agreement, then either party may refer the matter to the Secretary for resolution.

EVIDENCE OF CONSULTATION

21. Where conditions of this consent require consultation with an identified party, the Applicant must;
    (a) consult with the relevant party prior to submitting the subject document to the Secretary for approval; and
    (b) provide details of the consultation undertaken including:
        (i) the outcome of that consultation, matters resolved and unresolved; and
        (ii) details of any disagreement remaining between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved.

APPLICABILITY OF GUIDELINES

22. References in the conditions of this consent to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, Standards or policies in the form they are in as the date of this consent.

23. However, consistent with the conditions of this consent and without altering any limits or criteria in this consent, the Secretary may, when issuing directions under this consent in respect of ongoing monitoring and management obligations, require compliance with an updated or revised version of such a guideline, protocol, Standard or policy, or a replacement of them.

COMPLIANCE

24. The Applicant must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this consent relevant to activities they carry out in respect of the development.

SCHEDULE 3
ENVIRONMENTAL PERFORMANCE CONDITIONS

NOISE

Hours of Operation

1. The Applicant must comply with the operating hours set out in Table 1.

Table 1: Operating Hours

Activity	Permissible Hours
• Extraction operations • Processing operations • Overburden Management • Stockpile Management	• 6 am to 10 pm Monday to Friday; • 6 am to 3 pm Saturday; and • At no time on Sundays or public holidays.
• Blasting	• 10 am to 3 pm Monday to Friday (except public holidays).
• Loading and dispatch	• 4 am to 10 pm Monday to Friday; • 5 am to 3 pm Saturdays; and • At no time on Sundays or public holidays.
• Maintenance	• Anytime.

2. The following activities may be carried out on the site outside the hours specified in condition 1:
   (a) delivery or dispatch of materials as requested by Police or other authorities; and
   (b) emergency work to avoid the loss of lives, property and/or to prevent environmental harm.

   In such circumstances, the Applicant must notify the Secretary and affected residents prior to undertaking the activities, or as soon as is practical thereafter.

Noise Impact Assessment Criteria

3. The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 2 at any residence on privately-owned land

Table 2: Noise criteria dB(A)

Receiver	Day $dB(A)L_{Aeq(15\ min)}$	Evening $dB(A)L_{Aeq(15\ min)}$	Morning Shoulder $dB(A)L_{Aeq(15\ min)}$	Morning Shoulder (Sleep Disturbance) $L_{A\ max}$
All privately-owned residences	35	35	35	52

Noise generated by the development must be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the *NSW Noise Policy for Industry (EPA, 2017)*.

However, the noise criteria in Table 2 do not apply if the Applicant has an agreement with the relevant landowner to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

Operating Conditions

4. The Applicant must:
   (a) implement best practice management to minimise the operational and road transportation noise of the development;
   (b) minimise the noise impacts of the development during noise-enhancing meteorological conditions;
   (c) carry out attended noise monitoring (at least every 6 months) to determine whether the development is complying with the relevant conditions of this consent; and
   (d) regularly assess noise monitoring data and modify and/or stop operations on site to ensure compliance with the relevant conditions of this consent,

   to the satisfaction of the Secretary.

Note: Required frequency of noise monitoring may be reduced if approved by the Secretary.

Noise Management Plan

5. The Applicant must prepare a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:
   (a) be prepared in consultation with EPA;
   (b) be submitted to the Secretary at least 3 months prior to the commencement of quarrying operations under this consent, unless otherwise agreed by the Secretary;
   (c) describe the measures that would be implemented to ensure:
      - compliance with the noise criteria in this consent;
      - best practice management is being employed; and
      - the noise impacts of the development are minimised during noise-enhancing meteorological conditions;
   (d) describe the proposed noise management system; and
   (e) include a monitoring program:
      - to be implemented to measure noise from the development against the noise criteria in Table 2;
      - that includes annual noise monitoring at R24A, unless otherwise agreed with the Secretary; and
      - which evaluates and reports on the effectiveness of the noise management system on site.

   The Applicant must implement the Noise Management Plan as approved by the Secretary.

BLASTING

Blasting Impact Assessment Criteria

6. The Applicant must ensure that blasting on site does not cause any exceedance of the criteria in Table 3.

Table 3: Blasting Criteria

Receiver	***Airblast overpressure (dB(Lin Peak))***	***Ground vibration (mm/s)***	***Allowable exceedance***
Any residence on privately-owned land	120	10	0%
	115	5	5% of the total number of blasts over a period of 12 months

However, these criteria do not apply if the Applicant has a written agreement with the relevant owner to exceed the limits in Table 3, and the Applicant has advised the Department in writing of the terms of this agreement.

Blasting Frequency

7. The Applicant may carry out a maximum of 1 blast per calendar week, unless an additional blast is required following a blast misfire. This condition does not apply to blasts required to ensure the safety of the quarry or workers on site.

   Note: For the purposes of this condition, a blast refers to a single blast event, which may involve a number of individual blasts fired in quick succession in a discrete area of the mine.

Operating Conditions

8. During blasting operations, the Applicant must:
   (a) implement best practice management to:
      - protect the safety of people and livestock in the areas surrounding blasting operations;
      - protect public or private infrastructure/property in the surrounding area from damage from blasting operations and
      - minimise the dust and fume emissions of blasting;
   (b) operate a suitable system to enable the local community to get up-to-date information on the proposed blasting schedule on site; and
   (c) carry out regular monitoring to determine whether the development is complying with the relevant conditions of this consent,

   to the satisfaction of the Secretary.

Blast Management Plan

9. The Applicant must prepare a Blast Management Plan for the development to the satisfaction of the Secretary. This plan must:

(a) be submitted to the Secretary for approval at least 3 months prior to the commencement of quarrying operations under this consent, unless otherwise agreed by the Secretary;
(b) describe the measures that would be implemented to ensure compliance with the blast criteria and operating conditions of this consent;
(c) include a monitoring program for evaluating and reporting on compliance with the blasting criteria in this consent;
(d) include community notification procedures for the blasting schedule; and
(e) include a protocol for investigating and responding to complaints.

The Applicant must implement the Blast Management Plan as approved by the Secretary.

AIR QUALITY

Air Quality Impact Assessment Criteria

10. The Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria in Table 4 at any residence on privately-owned land.

Table 4: Air quality criteria

Pollutant	***Averaging Period***	***Criterion***	
Particulate matter < 10 µm (PM_{10})	Annual	[a,d] 25 µg/m^3	
Particulate matter < 10 µm (PM_{10})	24 hour	[b] 50 µg/m^3	
Particulate matter < 2.5 µm ($PM_{2.5}$)	Annual	[a,d] 8 µg/m^3	
Particulate matter < 2.5 µm ($PM_{2.5}$)	24 hour	[b] 25 µg/m^3	
Total suspended particulates (TSP)	Annual	[a,d] 90 µg/m^3	
[c] Deposited dust	Annual	[b] 2 g/m^2/month	[a,d] 4 g/m^2/month

Notes to Table 4:
a Cumulative impact (ie increase in concentrations due to the development plus background concentrations due to all other sources).
b Incremental impact (ie increase in concentrations due to the development alone, with zero allowable exceedances of the criteria over the life of the development.
c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.
d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Secretary.
e "Reasonable and feasible avoidance measures" includes, but is not limited to, the operational requirements in conditions 11 and 12 to develop and implement an air quality management system that ensures operational responses to the risks of exceedance of the criteria.

Operating Conditions

11. The Applicant must:
(a) implement best practice management to minimise the dust emissions of the development;
(b) regularly assess meteorological and air quality monitoring data and relocate, modify and/or stop operations on site to ensure compliance with the air quality criteria in this consent;
(c) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note d under Table 4);
(d) monitor and report on compliance with the relevant air quality conditions in this consent; and
(e) minimise the area of surface disturbance and undertake progressive rehabilitation of the site,
to the satisfaction of the Secretary.

Air Quality Management Plan

12. The Applicant must prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must:
(a) be submitted to the Secretary for approval at least 3 months prior to the commencement of quarrying operations under this consent, unless otherwise agree by the Secretary;

(b) describe the measures that would be implemented to ensure:
- compliance with the relevant conditions of this consent;
- best practice management is being employed; and
- the air quality impacts of the development are minimised during adverse meteorological conditions and extraordinary events;

(c) describe the proposed air quality management system;
(d) include an air quality monitoring program that:
- is capable of evaluating the performance of the development;
- includes a protocol for determining any exceedances of the relevant conditions of consent;
- effectively supports the air quality management system; and
- evaluates and reports on the adequacy of the air quality management system.

The Applicant must implement the Air Quality Management Plan as approved by the Secretary.

Meteorological Monitoring

13. For the life of the development, the Applicant must ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* guideline.

Greenhouse Gas Emissions

14. The Applicant must implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site.

SOIL AND WATER

Note: Under the Water Act 1912 and/or the Water Management Act 2000, the Applicant is required to obtain the necessary water licences for the development, including in respect of the extraction and/or interception of groundwater.

Water Supply

15. The Applicant must ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of operations under the consent to match its available water supply, to the satisfaction of the Secretary.

Water Discharges

16. The Applicant must comply with the discharge limits in any EPL, or with section 120 of the POEO Act.

Surface Water Audit and Water Management Improvement Program

17. Within three months of the date of this consent, the Applicant must commission independent surface water expert/s, approved by the Secretary, to undertake an audit of current and proposed surface water management practices and infrastructure on the site. The audit must:
(a) be undertaken in consultation with EPA and WaterNSW;
(b) fully describe and audit existing site water management practices and consider the EIS's proposed water management practices;
(c) identify all reasonable and feasible measures to improve surface water management on the site, with particular reference to opportunities to divert clean water away from the site; and
(d) recommend design parameters for proposed water management systems on the site.

18. Unless otherwise agreed with the Secretary, the Applicant must submit the Surface Water Audit report to the Secretary within six months of commissioning the audit. The report must be accompanied by a Water Management Improvement Program, based on the report's recommendations, to improve surface water management practices on the site, including a program of proposed timeframes for implementation.

19. The Applicant must implement the Water Management Improvement Program to the satisfaction of the Secretary.

Water Management Plan

20. The Applicant must prepare a Water Management Plan for the development to the satisfaction of the Secretary. This plan must:
(a) be prepared by suitably qualified person/s approved by the Secretary;
(b) be prepared in consultation with the EPA, DoI and WaterNSW;

(c) be submitted to the Secretary for approval at least 3 months prior to the commencement of quarrying operations under this consent, unless otherwise agreed by the Secretary;

(d) include a:

(i) Site Water Balance that includes:

- details of:
  - sources and security of water supply;
  - water use and management on site;
  - any off-site water transfers; and
  - reporting procedures.
- measures that would be implemented to minimise clean water use on site;

(ii) Surface Water Management Plan, that includes:

- detailed baseline data on surface water flows and quality in water bodies that could potentially be affected by the development;
- a detailed description of the surface water management system on site including the:
  - clean water diversion system;
  - erosion and sediment controls;
  - dirty water management system; and
  - water storages; and
- a program to monitor and report on:
  - any surface water discharges;
  - the effectiveness of the water management system; and
  - surface water flows and quality in local watercourses;

(iii) Groundwater Management Plan, that includes:

- baseline data on groundwater levels, yield and quality in local aquifers and privately-owned groundwater bores that could be potentially affected by the development;
- a program to monitor and report on groundwater inflows to the quarry pit and the impacts of the development on surrounding aquifers and privately-owned groundwater bores; and
- an analysis of these monitoring results to predict long-term water levels within the quarry void; and

(iv) Surface and Ground Water Contingency Strategy, that includes:

- a protocol for the investigation, notification and mitigation of identified impacts on surface water flows and quality in water bodies and/or groundwater levels, yield and quality in local aquifers and privately-owned groundwater bores that could be potentially affected by the development; and
- the procedures that would be followed if any unforeseen impacts are detected during the development.

The Applicant must implement the Water Management Plan as approved by the Secretary.

TRANSPORT

Monitoring of Product Transport

21. The Applicant must keep accurate records of all laden truck movements to and from the site (hourly, daily, weekly, monthly and annually) and publish a summary of records on its website every 6 months.

Operating Conditions

22. The Applicant must ensure that:
(a) all reasonable measures are taken such that laden trucks have appropriate signage, including a contact phone number, so they can be easily identified by road users;
(b) all laden trucks entering or exiting the site have their loads covered;
(c) all laden trucks exiting the site are cleaned of material that may fall on the road, before leaving the site; and
(d) no trucks queue at the entrance to the quarry access road before 4 am on weekdays and 5 am on Saturday.

22A. In 2022, and every 2 years thereafter, unless RMS directs otherwise, the Applicant must, in consultation with RMS, undertake monitoring of intersection performance at the Jenolan Caves Road and Great Western Highway intersection. Within 2 months of completing this monitoring, the results must be provided to RMS.

Transport Management Plan

23. The Applicant must prepare a Transport Management Plan for the development to the satisfaction of the Secretary. This plan must:

(a) be submitted to the Secretary for approval at least 3 months prior to the commencement of quarrying operations under this consent, unless otherwise agreed by the Secretary;
(b) describe the measures that would be undertaken to monitor the intersection performance at the Jenolan Caves Road and Great Western Highway intersection and maintain an acceptable level of service at this intersection;
(c) include a Drivers' Code of Conduct that includes:
- details of the safe and quiet driving practices that must be used by drivers travelling to and from the quarry, with a particular focus on the morning shoulder period;
- a map of the primary haulage route;
- safety initiatives for haulage during peak periods and along school bus routes;
- an induction process for vehicle operators and regular toolbox meetings; and
- complaints resolution and disciplinary procedures;

(d) describe the measures that would be put in place to ensure compliance with the Drivers' Code of Conduct.

The Applicant must implement the Transport Management Plan as approved by the Secretary.

ABORIGINAL HERITAGE

24. If any item or object of Aboriginal heritage significance is identified on site, the Applicant must ensure that:
(a) all work in the immediate vicinity of the suspected Aboriginal item or object ceases immediately;
(b) a 10 m buffer area around the suspected item or object is cordoned off; and
(c) the OEH is contacted immediately.

Work in the vicinity of the Aboriginal item or object may only recommence in accordance with the provisions of Part 6 of the *National Parks and Wildlife Act 1974*.

LANDSCAPE AND REHABILITATION

Biodiversity Credits Required

25. Within 12 months of the approval of Modification 1, or other timeframe agreed by the Secretary, the Applicant must retire the biodiversity credits specified in Table 4A below.

Table 4A: Biodiversity credits to be retired

Credit Type	***Offset Type***	***Number of Credits***
Ecosystem Credit	PCT 1093 – Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	649
Ecosystem Credit	PCT 649 – Apple Box – Broad-leaved Peppermint dry open forest of the South Eastern Highlands Bioregion	131
Ecosystem Credit	PCT 840 – Forest Red Gum – Yellow Box woodland of dry gorge slopes, southern Sydney Basin Bioregion and South-Eastern Highlands Bioregion	60
Species Credit	Silver-leaved Mountain Gum *(Eucalyptus pulverulenta)*	10,784

The retirement of the credits in Table 4A must be carried out in consultation with OEH and in accordance with the Biodiversity Offsets Scheme of the BC Act, to the satisfaction of the BCT.

***Note**: The credits in Table 4A were calculated in accordance with the Framework for Biodiversity Assessment of the NSW Biodiversity Offset Policy for Major Projects (OEH, 2014) and may need to be converted to reasonably equivalent 'biodiversity credits', within the meaning of the BC Act, to facilitate retirement.*

26. *Deleted*

Rehabilitation Objectives

27. The Applicant must rehabilitate the site to the satisfaction of the Secretary. This rehabilitation must be generally consistent with the rehabilitation strategy in the documents listed in condition 2 of Schedule 2 and the conceptual final landform in Appendix 4 and must comply with the objectives in Table 5.

Table 5: Rehabilitation Objectives

Feature	***Objective***
Site (as a whole)	• Safe, stable and non-polluting

	• Final landform integrated with surrounding natural landforms as far as is reasonable and feasible, and minimising visual impacts when viewed from surrounding land
Surface Infrastructure	• Decommissioned and removed, unless DRG agrees otherwise
Quarry Benches	• Landscaped and vegetated using native tree and understorey species
Quarry Pit Floor	• Landscaped and revegetated using native tree and understorey species
Final Void	• Minimise the size, depth and slope of the batters of the final void • Minimise the drainage catchment of the final void

Progressive Rehabilitation

28. The Applicant must rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable and feasible measures must be taken to minimise the total area exposed for dust generation at any time. Interim stabilisation measures must be implemented where reasonable and feasible to control dust emissions in disturbed areas that are not active and which are not ready for final rehabilitation.

Note: It is accepted that parts of the site that are progressively rehabilitated may be subject to further disturbance in future.

Landscape and Rehabilitation Management Plan

29. The Applicant must prepare a Landscape and Rehabilitation Management Plan for the development to the satisfaction of the Secretary. This plan must:
    (a) be prepared in consultation with OEH and be submitted to the Secretary for approval at least 3 months prior to the commencement of quarrying operations under this consent, unless the Secretary agrees otherwise;
    (b) provide details of the conceptual final landform and associated land uses for the site;
    (c) describe how the implementation of any land based offset (including Conservation Area H, shown in Appendix 6) would be integrated with the overall rehabilitation of the site;
    (d) include detailed performance and completion criteria for evaluating the performance of any land based offset and rehabilitation of the site, including triggers for any necessary remedial action;
    (e) describe the short, medium and long term measures that would be implemented to:
        • manage remnant vegetation and habitat on site, including within any land based offset; and
        • ensure compliance with the rehabilitation objectives and progressive rehabilitation obligations in this consent;
    (f) include a detailed description of the measures that would be implemented over the next 3 years (to be updated for each 3 year period following initial approval of the plan) including the procedures to be implemented for:
        • maximising the salvage of environmental resources within the approved disturbance area, including tree hollows, vegetative and soil resources, for beneficial reuse in the enhancement of the offset area or site rehabilitation;
        • restoring and enhancing the quality of native vegetation and fauna habitat in the biodiversity and rehabilitation areas through assisted natural regeneration, targeted vegetation establishment and the introduction of fauna habitat features;
        • protect, conserve, propagate, plant and/or regenerate Silver-leaved Mountain Gum (*Eucalyptus pulverulenta*) (including the propagation and planting of at least 1,000 individuals of this species);
        • protecting vegetation and fauna habitat outside the approved disturbance area on-site;
        • minimising the impacts on native fauna, including undertaking pre-clearance surveys;
        • establishing vegetation screening to minimise the visual impacts of the site on surrounding receivers;
        • ensuring minimal environmental consequences for threatened species, populations and habitats;
        • collecting and propagating seed;
        • controlling weeds and feral pests;
        • controlling erosion;
        • controlling access; and
        • managing bushfire risk;
    (g) include a program to monitor and report on the effectiveness of these measures, and progress against the performance and completion criteria;
    (h) identify the potential risks to the successful implementation of any land based offset, and include a description of the contingency measures that would be implemented to mitigate these risks; and
    (i) include details of who would be responsible for monitoring, reviewing, and implementing the plan.

The Applicant must implement the Landscape and Rehabilitation Management Plan as approved by the Secretary.

Conservation and Rehabilitation Bond

30. Within 6 months of the approval of the Landscape Management Plan, the Applicant must lodge a Conservation and Rehabilitation Bond with the Department to ensure that any land based offset and rehabilitation of the site are implemented in accordance with the performance and completion criteria set out in the plan and relevant conditions of this consent. The sum of the bond must be determined by:
    (a) calculating the full cost of implementing any land based offset over the next 3 years;
    (b) calculating the cost of rehabilitating the site, taking into account the likely surface disturbance over the next 3 years of quarrying operations; and
    (c) employing a suitably qualified quantity surveyor or other expert to verify the calculated costs,

    to the satisfaction of the Secretary.

    Notes:
    - *Alternative funding arrangements for long term management of any land based offset, can be used to reduce the liability of the conservation and rehabilitation bond.*
    - *If capital and other expenditure required by the Landscape Management Plan is largely complete, the Secretary may waive the requirement for lodgement of a bond in respect of the remaining expenditure.*
    - *If any land based offset and rehabilitation of the site area are completed to the satisfaction of the Secretary, then the Secretary will release the bond. If any land based offset and rehabilitation of the site are not completed to the satisfaction of the Secretary, then the Secretary will call in all or part of the bond, and arrange for the completion of the relevant works.*

31. Within 3 months of each Independent Environmental Audit (see condition 8 of Schedule 5), the Applicant must review, and if necessary revise, the sum of the Conservation and Rehabilitation Bond to the satisfaction of the Secretary. This review must consider the:
    (a) effects of inflation;
    (b) likely cost of implementing any land based offset and rehabilitating the site (taking into account the likely surface disturbance over the next 3 years of the development); and
    (c) performance of the implementation of any land based offset and rehabilitation of the site to date.

VISUAL

32. The Applicant must implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts of the development to the satisfaction of the Secretary.

WASTE

33. The Applicant must:
    (a) manage on-site sewage treatment and disposal in accordance with the requirements of its EPL, and to the satisfaction of the EPA and Council;
    (b) minimise the waste generated by the development;
    (c) ensure that the waste generated by the development is appropriately stored, handled, and disposed of; and
    (d) report on waste management and minimisation in the Annual Review,

    to the satisfaction of the Secretary.

34. Except as expressly permitted in an EPL, the Applicant must not receive waste at the site for storage, treatment, processing, reprocessing or disposal.

LIQUID STORAGE

35. The Applicant must ensure that all tanks and similar facilities for storage of liquids (other than for water) are protected by appropriate bunding, which must exceed 110% of the stored volume of the liquid.

DANGEROUS GOODS

36. The Applicant must ensure that the storage, handling, and transport of dangerous goods is done in accordance with the relevant *Australian Standards*, particularly AS1940 and AS1596, and the *Dangerous Goods Code*.

BUSHFIRE

37. The Applicant must:
    (a) ensure that the development is suitably equipped to respond to any fires on site;
    (b) assist the Rural Fire Service and emergency services as much as possible if there is a fire in the vicinity of the site; and

(c) prepare a Bush Fire Emergency Evacuation Plan in accordance with the NSW Rural Fire Service document, *Guide for Developing a Bush Fire Emergency Evacuation Plan*, to the satisfaction of the Secretary.

SCHEDULE 4
ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS

1. As soon as practicable after obtaining monitoring results showing:
   (a) an exceedance of any relevant criteria in Schedule 3, the Applicant must notify the affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the development is again complying with the relevant criteria; and
   (b) an exceedance of any relevant air quality criteria in Schedule 3, the Applicant must send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the affected landowners and current tenants of the land (including the tenants of land which is not privately-owned).

INDEPENDENT REVIEW

2. If an owner of privately-owned land considers the development to be exceeding the relevant criteria in Schedule 3, then he/she may ask the Secretary in writing for an independent review of the impacts of the development on his/her land.

   If the Secretary is satisfied that an independent review is warranted, then within 2 months of the Secretary's decision, the Applicant must:
   (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to:
      - consult with the landowner to determine his/her concerns;
      - conduct monitoring to determine whether the development is complying with the relevant criteria in Schedule 3; and
      - if the development is not complying with these criteria, then identify measures that could be implemented to ensure compliance with the relevant criteria; and
   (b) give the Secretary and landowner a copy of the independent review.

SCHEDULE 5
ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING

ENVIRONMENTAL MANAGEMENT

Environmental Management Strategy

1. The Applicant must prepare an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must:
   (a) be submitted to the Secretary for approval within 6 months of the date of this consent;
   (b) provide the strategic framework for environmental management of the development;
   (c) identify the statutory approvals that apply to the development;
   (d) set out the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;
   (e) set out the procedures to be implemented to:
      - keep the local community and relevant agencies informed about the operation and environmental performance of the development;
      - receive, record, handle and respond to complaints;
      - resolve any disputes that may arise during the course of the development;
      - respond to any non-compliance and any incident;
      - respond to emergencies; and
   (f) include:
      - references to any strategies, plans and programs approved under the conditions of this consent; and
      - a clear plan depicting all the monitoring to be carried out under the conditions of this consent.

   The Applicant must implement the Environmental Management Strategy as approved by the Secretary.

Management Plan Requirements

2. The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:
   (a) a summary of relevant background or baseline data;
   (b) a description of:
      - the relevant statutory requirements (including any relevant approval, licence or lease conditions);
      - any relevant limits or performance measures/criteria; and
      - the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;
   (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;
   (d) a program to monitor and report on the:
      - impacts and environmental performance of the development; and
      - effectiveness of any management measures (see (c) above);
   (e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;
   (f) a program to investigate and implement ways to improve the environmental performance of the development over time;
   (g) a protocol for managing and reporting any:
      - incidents;
      - complaints;
      - non-compliances with statutory requirements; and
      - exceedances of the impact assessment criteria and/or performance criteria; and
   (h) a protocol for periodic review of the plan.

   Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.

Adaptive Management

3. The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedule 3. Any exceedance of these criteria and/or performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.

   Where any exceedance of these criteria and/or performance measures has occurred, the Applicant must, at the earliest opportunity:
   (a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not reoccur;

(b) 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; and
(c) implement remediation measures as directed by the Secretary;
to the satisfaction of the Secretary.

Annual Review

4. By the end of September each year, or other timing as may be agreed by the Secretary, the Applicant must review the environmental performance of the development to the satisfaction of the Secretary. This review must:
   (a) describe the development (including any rehabilitation) that was carried out in the previous financial year, and the development that is proposed to be carried out over the current financial year;
   (b) include a comprehensive review of the monitoring results and complaints records of the development over the previous financial year, which includes a comparison of these results against the:
      - relevant statutory requirements, limits or performance measures/criteria;
      - requirements of any plan or program required under this consent;
      - monitoring results of previous years; and
      - relevant predictions in the documents listed in condition 2 of Schedule 2;
   (c) identify any non-compliance over the past financial year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence;
   (d) identify any trends in the monitoring data over the life of the development;
   (e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and
   (f) describe what measures will be implemented over the current financial year to improve the environmental performance of the development.

Revision of Strategies, Plans & Programs

5. Within 3 months of the submission of an:
   (a) annual review under condition 4 above;
   (b) incident report under condition 6 below;
   (c) audit report under condition 8 below; and
   (d) any modifications to this consent,
   the Applicant must review the strategies, plans and programs required under this consent, to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted for the approval of the Secretary.

   Note: The purpose of this condition is to ensure that strategies, plans and programs are regularly updated to incorporate any measures recommended to improve environmental performance of the development.

REPORTING

Incident Reporting

6. The Applicant must immediately notify the Secretary and any other relevant agencies of any incident. Within 7 days of the date of the incident, the Applicant must provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.

Regular Reporting

7. The Applicant must provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent.

INDEPENDENT ENVIRONMENTAL AUDIT

8. Within a year of the date of this consent, and every 3 years thereafter, unless the Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:
   (a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;
   (b) include consultation with the relevant agencies;
   (c) assess the environmental performance of the development and whether it is complying with the relevant requirements in this consent and any relevant EPL or necessary water licences for the development (including any assessment, strategy, plan or program required under these approvals);
   (d) review the adequacy of strategies, plans or programs required under the abovementioned approvals;

(e) recommend appropriate measures or actions to improve the environmental performance of the development, and/or any assessment, strategy, plan or program required under the abovementioned approvals; and
(f) be conducted and reported to the satisfaction of the Secretary.

Note: This audit team must be led by a suitably qualified auditor and include experts in any fields specified by the Secretary.

9. Within 6 weeks of completion of this audit, or as otherwise agreed by the Secretary, the Applicant must submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report.

ACCESS TO INFORMATION

10. Within 6 months of the date of this consent, the Applicant must:
(a) make the following information publicly available on its website:
- the documents listed in condition 2 of Schedule 2;
- current statutory approvals for the development;
- all approved strategies, plans and programs required under the conditions of this consent;
- a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs;
- a complaints register, updated monthly;
- the annual reviews of the development;
- any independent environmental audit, and the Applicant's response to the recommendations in any audit; and
- any other matter required by the Secretary; and

(b) keep this information up-to-date,
to the satisfaction of the Secretary.

APPENDIX 1
DEVELOPMENT AREA

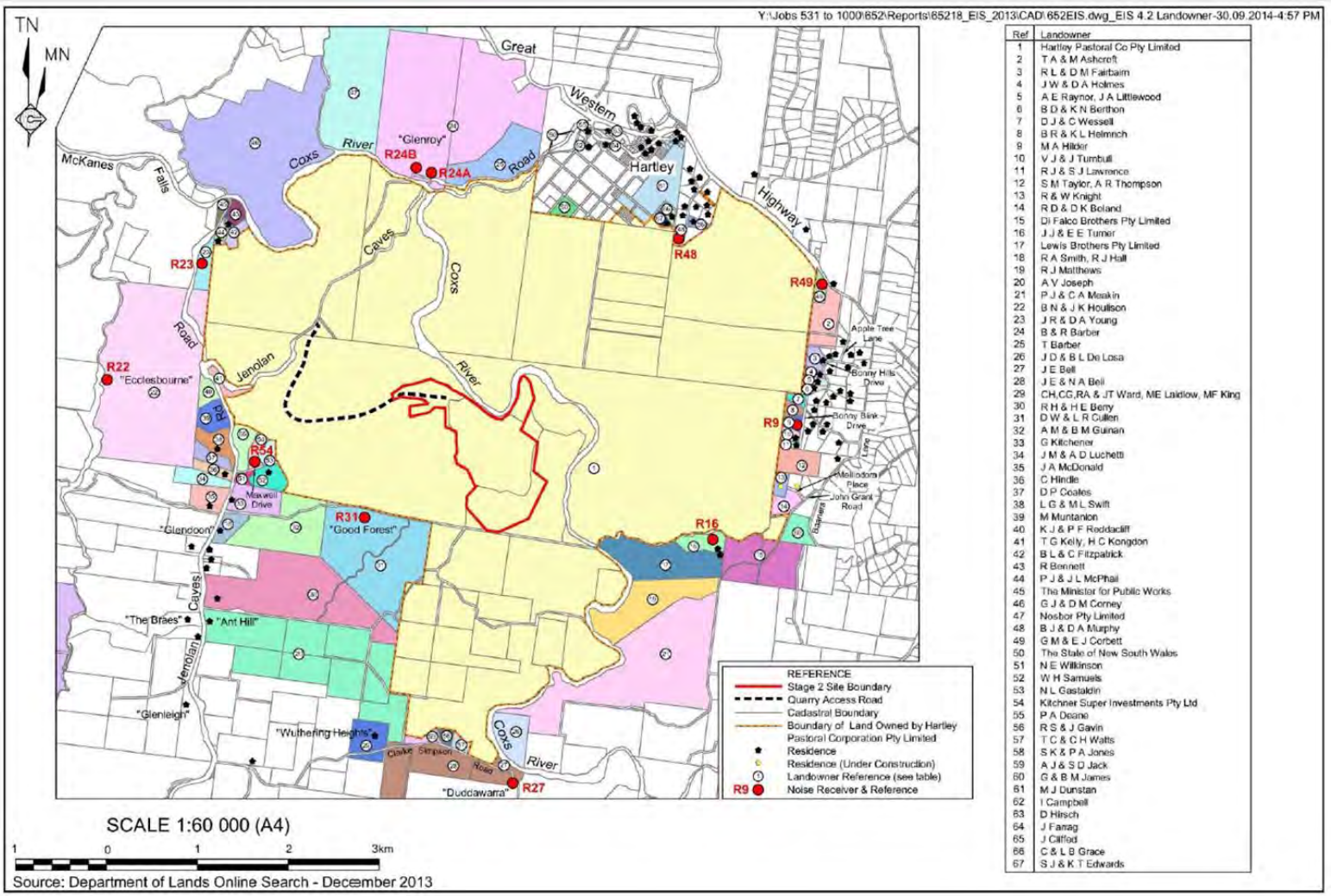
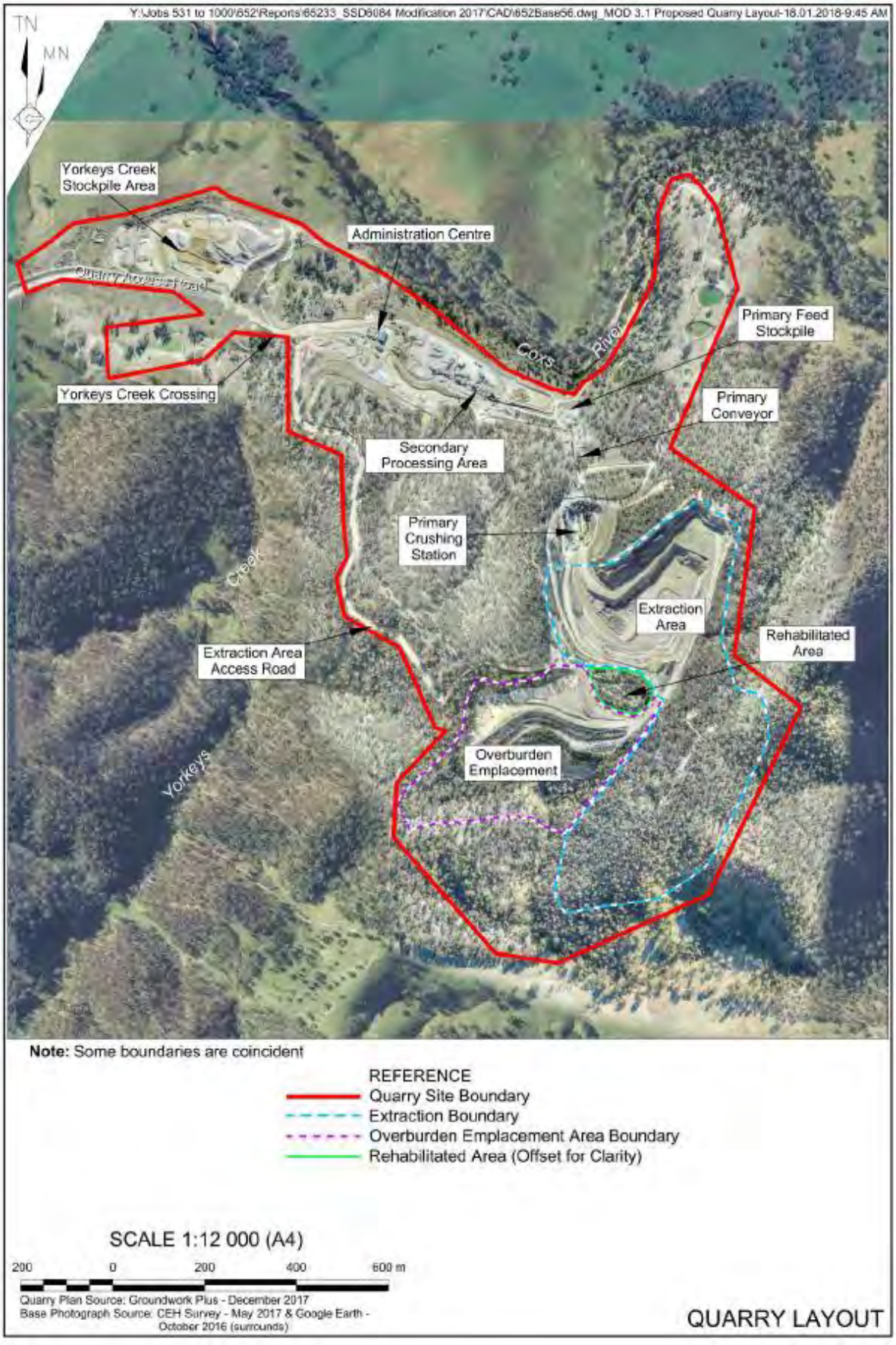


Figure 1: *Development Area and nearby residences*

APPENDIX 2
DEVELOPMENT LAYOUT



APPENDIX 3
STATEMENT OF COMMITMENTS

Desired Outcome	Action	Timing
1. Environmental Management		
Compliance with all conditional requirements in all approvals licences and leases.	1.1 Comply with commitments recorded in this table.	Continuous and as required.
	1.2 Comply with all conditional requirements included in the: • Development Consent; • Environment Protection Licence; • Approval under the EPBC Act; • Water Access Licence; and • any other approvals.	Ongoing.
2. Waste Management		
Minimisation of general waste creation and maximisation of recycling, wherever possible.	2.1 Place all paper and general wastes originating from the site office, together with routine maintenance consumables from the daily servicing of equipment in waste skip bins located adjacent to the site office and workshop.	Ongoing.
	2.2 Segregate waste into recyclables and non-recyclable materials for removal by a licensed contractor.	Ongoing.
Minimisation of the potential risk of environmental impact due to waste creation, storage and/or disposal.	2.3 Ensure the appropriate storage and regular collection of industrial wastes including waste oils and scrap metal.	Monthly or on an as needs basis.
3. Rehabilitation and Biodiversity Offset Management		
The creation of a stable final landform, available for the proposed future use(s) of nature conservation and low intensity agriculture.	3.1 Retain all soil and suitable cleared vegetation resources for use in rehabilitation of the final landform.	Ongoing.
	3.2 Include *Eucalyptus pulverulenta* in the revegetation of the Stage 2 Site.	During rehabilitation activities.
	3.3 Re-instate the pre-disturbance soil and land capability in the area used for the secondary processing area and Yorkeys Creek stockpile area.	Ongoing and prior to quarry closure.
Establish and manage a Biodiversity Offset Area.	3.4 Mark, and where appropriate fence, boundaries relevant to the Biodiversity Offset Area.	Within 6 months of approval of the Biodiversity Offset Area.
4. Land Resources		
Ensure sections of the Site with higher land capability are returned to agricultural use.	4.1 Provide for rehabilitation of the secondary processing area and Yorkeys Creek stockpile area back to agricultural land.	Ongoing as available.
5. Traffic and Transport		
	5.1 All transport contractors required to complete the Hy-Tec Chain of Responsibility: Driver Vehicle Check system.	Ongoing.

Desired Outcome	Action		Timing
Transport operations are undertaken with minimal impact on other road users and residents.	5.2	Maintain a complaints management system to appropriately respond to any complaints received through investigation and implementation of corrective treatments.	Ongoing.
	5.3	Monitor the delays for vehicles turning right onto the Great Western Highway at two-yearly intervals from 2022 onwards.	To begin in 2022.
6. Visibility			
Reduce the area of the Stage 2 Site exposed to surrounding vantage points.	6.1	Implement design and sequencing measures to minimise exposure of the Quarry, namely:	
		a) undertake the extraction area and overburden emplacement extensions in accordance with the limits noted on **Figure 3.2** of the SEE (Mod 1) and sequence generally as presented on **Figure 3.3** of the SEE (Mod 1);	Ongoing.
		b) retain the primary crusher in its current location within the Stage 1 extraction area;	Ongoing.
		c) retain the visual screen provided by the Northern Ridge; and	Ongoing.
		d) restrict further extension of the secondary processing area and Yorkeys Creek stockpile area.	Ongoing.
Reduce the impact of the areas of quarry disturbance visible from surrounding vantage points.	6.2	Implement management measures to limit impacts to visual amenity including the following.	
		a) Complete a trial of short-term visual mitigation measures for the Yorkeys Creek stockpile area.	Prior to November 2015.
		b) Implement short-term visual mitigation measures for the Yorkeys Creek stockpile area.	Prior to November 2016.
		c) Progressive revegetation or rehabilitation of terminal faces of the extraction area and overburden emplacement and profiled slopes between the administration area and the extraction area.	Ongoing.
		d) Maintain existing visual barriers including retained northern face of extraction area and tree-lined visual barriers.	Ongoing.
		e) Apply a bituminous film to reduce the contrast between the pale rhyolite and darker background vegetation on completed western facing slopes where necessary.	Ongoing.
		f) Minimise dust emissions through suppression measures such as regular watering of areas.	Ongoing.
		g) Maintain the Site in a tidy and orderly manner.	Ongoing.
		h) Minimise the impacts of lighting by directing lights away from critical receptors (to the south and east) and minimise the 'lume' created by the lights.	Ongoing.
	Note: If superseded by more effective measures, or no longer required due to progressive development of the Quarry Site, the above will cease to be implemented.		
Monitor the progressive visual changes from nearby receptors.	6.3	Monitor the sequence of visual impacts using a series of annual photographs from vantage points surrounding the Quarry Site. These photos, along with a discussion as to compliance with the impact predicted, would be included in annual reporting.	Annually.

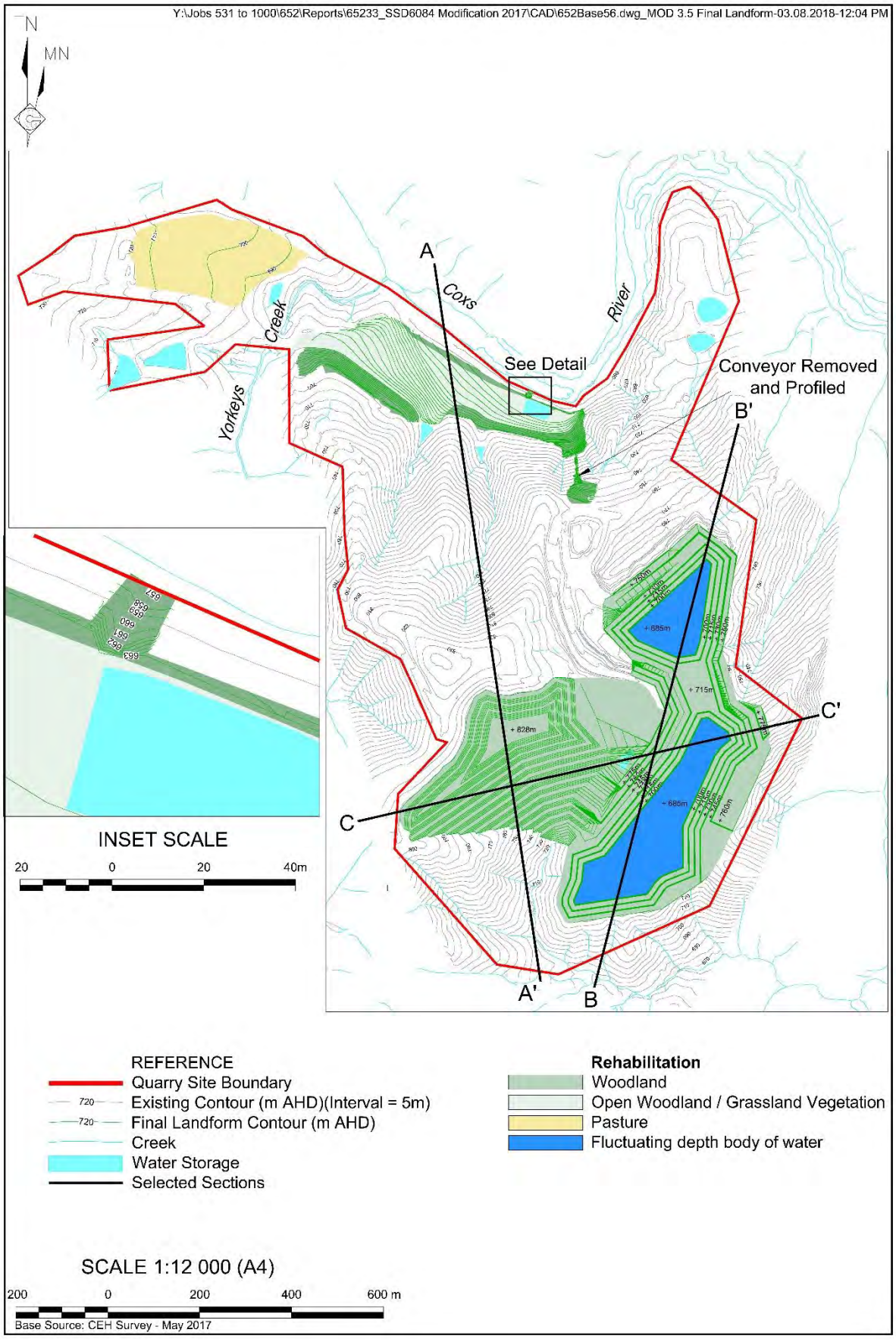
Desired Outcome	Action		Timing
7. Surface Water			
Appropriately document water management measures including erosion and sediment control.	7.1	Ensure any off-site discharge is monitored and reported in accordance with EPL 12323.	In the event of off-site discharge.
Capture of sediment-laden water flows from Proposal-related disturbance.	7.2	Ensure the capacity of the various sediment basins and water storages of the Site provides the required water settlement and sediment storage volumes for a 5-day 95th percentile rainfall event.	Ongoing.
Manage the discharge of water from the various sediment basins and storage dams.	7.3	Apply procedures established in the Water Management Plan for the appropriate treatment of water that is to be discharged to natural drainage.	In the event off-site discharge is required.
Prevention of hydrocarbon contamination of water on the Site.	7.4	Securely store all hydrocarbon products within designated and bunded areas.	Ongoing.
	7.5	Refuel and maintain all equipment within designated areas of the Site, i.e. workshop area.	Ongoing.
8. Groundwater			
Prevention of groundwater contamination.	8.1	Securely store all hydrocarbon products within designated and bunded areas.	Ongoing.
	8.2	Refuel and maintain all equipment within designated areas of the Site, i.e. workshop area.	Ongoing.
Appropriately license any removal of groundwater.	8.3	Obtain and maintain a Water Access Licence(s) for the volume of groundwater seepage into the extraction area annually.	Prior to commencement of development consent.
	8.4	Report annual and projected groundwater extraction to the DoI.	Annual.
9. Terrestrial Ecology			
Avoid impacts on native flora and fauna.	9.1	Locate primary crushing station within extraction footprint.	Ongoing.
	9.2	Limit extent of extraction area as nominated in the development consent.	Ongoing.
Minimise or mitigate unavoidable impacts on native flora and fauna.	9.3	Operate a conveyor between the primary crushing station and secondary processing area to limit transportation of raw materials.	Ongoing.
	9.4	Maintain a 10m buffer and exclusion zone around the proposed area of disturbance.	Ongoing.
	9.5	Fence, as appropriate, sections of the Stage 2 Site not required for ongoing operations.	Ongoing as needed.
	9.6	Include the Silver-leafed mountain gum in progressive revegetation of the final landform.	Ongoing.
	9.7	Install appropriate erosion and sediment control measures prior to vegetation clearing activities (to reduce the potential for pollution of downstream riparian and aquatic habitat).	Ongoing.

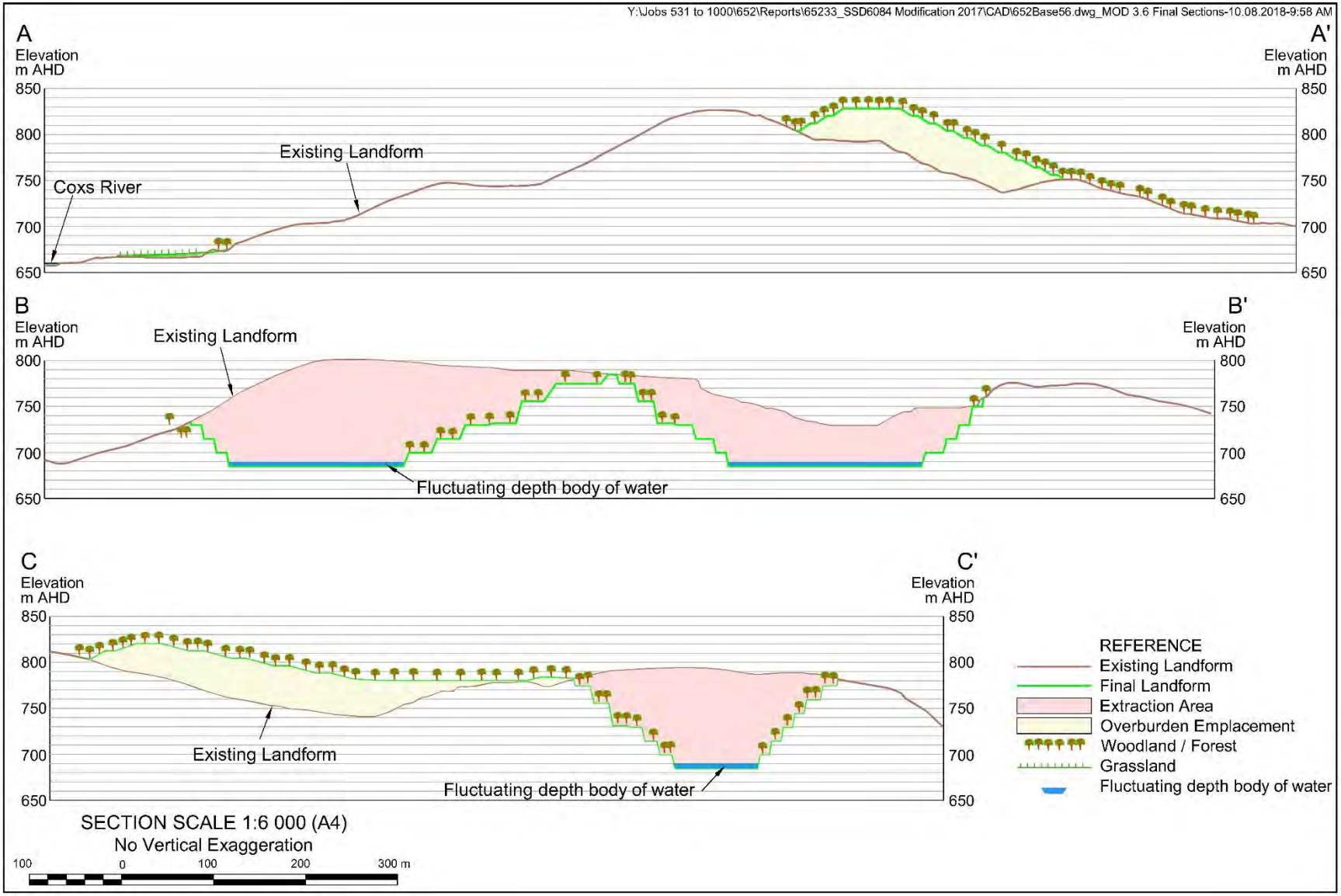
Desired Outcome	Action		Timing
	9.8	Limit vehicle speeds within the Site to limit the potential for vehicle trauma to wildlife.	Ongoing.
10. Aquatic Ecology			
Avoid, minimise or mitigate impacts as a result of operational activities on aquatic biota and habitats.	10.1	Design and construct any ancillary development works, e.g. access roads, in the vicinity of watercourses in accordance with the NSW DPI Policy and *Guidelines for Fish Habitat Conservation and Management*	As required.
	10.2	Minimise the occurrence of uncontrolled discharges of water by managing water in accordance with a Water Management Plan.	Ongoing.
	10.3	Maintain a bunded area for storage of fuels, oils, refuelling and appropriate maintenance of vehicles and mechanical plant.	Ongoing.
	10.4	Procedures would be implemented to manage handling of hazardous material and spill response protocols.	Ongoing.
	10.5	Install and maintain scour protection at pipe outlet points.	Ongoing.
11. Noise			
Noise emissions do not exceed intrusiveness criteria nor significantly impact on neighbouring landowners and/or residents.	11.1	Undertake processing operations with the current or equivalent crushing and screening plant.	Ongoing.
	11.2	Ensure all equipment on Site has sound power levels at or below that nominated for noise modelling purposes (see *Table 5-1* of Benbow, 2014a).	Ongoing.
	11.3	Limit transportation noise by ensuring: a) All trucks under control of Hy-Tec, or accredited contractors would comply at all times with RMS noise limits.	Ongoing.
		b) All truck drivers would be required to sign a Code of Conduct that includes noise limiting behaviour.	Ongoing.
		c) Comply with conditional limits on truck movements.	Ongoing.
		d) The internal road network would be graded, as required, to limit body noise from empty trucks	Ongoing.
	11.4	Maintenance work would be confined to standard daytime hours where practicable.	Ongoing.
12. Air Quality			
Site activities are undertaken without exceeding the nominated air quality criteria.	12.1	Undertake operations in accordance with an Air Quality Management Plan.	Ongoing.
Minimise greenhouse gas emissions from Site related activities.	12.2	Minimise the impacts of greenhouse gases relating to diesel consumption by: a) minimising use of haul trucks through use of an overland conveyor;	Ongoing.
		b) minimising rehandling of overburden and products;	Ongoing.
		c) maintaining and servicing equipment to ensure efficiency;	Ongoing.
		d) minimising the quarry footprint to reduce land disturbance and travel distances; and	Ongoing.
		e) optimising the design of the Processing Plant to	Ongoing.

Desired Outcome	Action	Timing
	f) maximise the use of gravity to move material throughout the plant and maximise energy efficient motors in major equipment.	Ongoing.
Record and monitor the local environment regarding dust impacts.	12.3 Continue to monitor dust impacts through: a) the existing deposited dust gauges; and b) on-site meteorological monitoring to record relevant parameters.	 Ongoing. Ongoing.
13. Indigenous Heritage		
Minimise the potential for adverse Proposal-related impacts on indigenous heritage sites.	13.1 Include Indigenous heritage protocols and obligations within training and induction processes for the quarry.	Ongoing.
	13.2 Halt all works in the immediate area if cultural objects are found and contact a suitably qualified archaeologist and Aboriginal community representative.	Ongoing.
	13.3 Halt all works in the immediate area if human remains are found and contact NSW Police, Aboriginal community representative and OEH.	Ongoing.
	13.4 Maintain reasonable efforts to avoid impacts to Aboriginal cultural heritage values at all stages of the development works	Ongoing.
Maintain appropriate records of identified indigenous heritage sites.	13.5 Complete an Aboriginal Site Impact Recording Form and submit it to the Aboriginal Heritage Management Information Management System (AHIMS) Registrar, for each AHIMS site that is harmed through the proposed development.	Upon discovery of a site of heritage significance.
14. Historic Heritage		
Minimise the potential for adverse Proposal-related impacts on historic heritage sites.	14.1 Halt all works in the immediate area if cultural object(s) are found.	Ongoing.
	14.2 Secure the location, e.g. through the installation of protective fencing, flagging with high visibility tape.	
	14.3 Contact a suitably qualified archaeologist to determine the significance of the object(s).	
	14.4 Report discovery of relic (if advised of validity by archaeologist) in accordance within Section 146 of the *Heritage Act 1977*.	
	14.5 Do not recommence works within the secured area until advised by archaeologist.	
	14.6 Include the commitments of 14.1 to 14.4 within training and induction processes for the Site.	On induction of new personnel.
15. Hazards		
Manage bush fire risks on site to minimise the potential for property damage or personnel injury.	15.1 Ensure refuelling is undertaken within designated fuel bays and vehicles are turned off during refuelling.	Ongoing.
	15.2 Ensure no smoking policy is enforced in designated areas of the Site.	Ongoing.
	15.3 Ensure fire extinguishers are maintained within site vehicles and refuelling areas.	Ongoing.
	15.4 Ensure that a water cart is available to assist in extinguishing any fire ignited.	Ongoing.
	15.5 Establish and maintain an Outer Protection Area around the administration area.	Ongoing.

Desired Outcome	Action	Timing
	15.6 Maintain the access road to the extraction area such that safe passage is guaranteed should an emergency evacuation be required.	Ongoing.
	15.7 Maintain access to water contained within SD1 to SD6, as well as SB1 for use in fighting ember attack.	Ongoing.
	15.8 Complete appropriate training with site personnel in relation to fire-fighting tasks and procedures.	Ongoing.
	15.9 Ensure access is provided for Rural Fire Service and its and other emergency services' authority is recognised and assistance offered in the event of a bush fire.	Ongoing.
Reduce risks of traffic accidents on roads used by Proposal-related traffic.	15.10 Ensure route selection for delivery of quarry products follows routes designated in the EIS for entry and exit to the Site, transportation through the Blue Mountains and local deliveries of products.	Ongoing.
	15.11 Operate a Traffic Management Plan for all trucks entering and exiting Austen Quarry.	Within 6 months of receipt of approval.
	15.12 Continue to implement the Chain of Responsibility – Driver Vehicle Check system for all transportation activities undertaken at the Site.	Ongoing.
All members of the public are safe when near the Austen Quarry.	15.13 Implement measures to ensure the safety of public including visitors, contractors and employees through recruitment, induction and training programs.	Ongoing.
Measures to be put in place to, where possible, restrict unauthorised entry and reduce the risk of accident to any trespasser on the Site.	15.14 Ensure gate at entrance on Jenolan Caves Road is locked outside standard operating hours.	Ongoing.
	15.15 Use of locks on equipment when site personnel are not working on or with this equipment or plant.	Ongoing.
	15.16 Installation and maintenance of safety signage around the Site and perimeter fencing, where necessary.	Ongoing.
	15.17 Instruct all visitors entering and departing the Site to visit either the Site office or weighbridge for registration including time of arrival and departure, and an induction, if required.	Ongoing.
	15.18 Install appropriate controls to ensure the stability of the open cut, overburden emplacement and stockpiles.	Ongoing.
16. Socio-economic Setting		
Continue to proactively consult with members of the community affected by the Proposal.	16.1 Maintain the existing 'open door' policy for community members to approach the management staff of the Austen Quarry.	Ongoing.
	16.2 Maintain the existing community complaints and response system.	Ongoing.
Consider local sources of service and supply contactors	16.3 Seek local supply and service contractors from within the Lithgow LGA where it is practicable to do so.	Ongoing.

APPENDIX 4
CONCEPTUAL FINAL LANDFORM

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A
A'
Elevation
m AHD
850
800
750
700
650
Existing Landform
Coxs River
B
B'
Fluctuating depth body of water
C
C'
REFERENCE
Existing Landform
Final Landform
Extraction Area
Overburden Emplacement
Woodland / Forest
Grassland
Fluctuating depth body of water
SECTION SCALE 1:6 000 (A4)
No Vertical Exaggeration
100
0
100
200
300 m

APPENDIX 5

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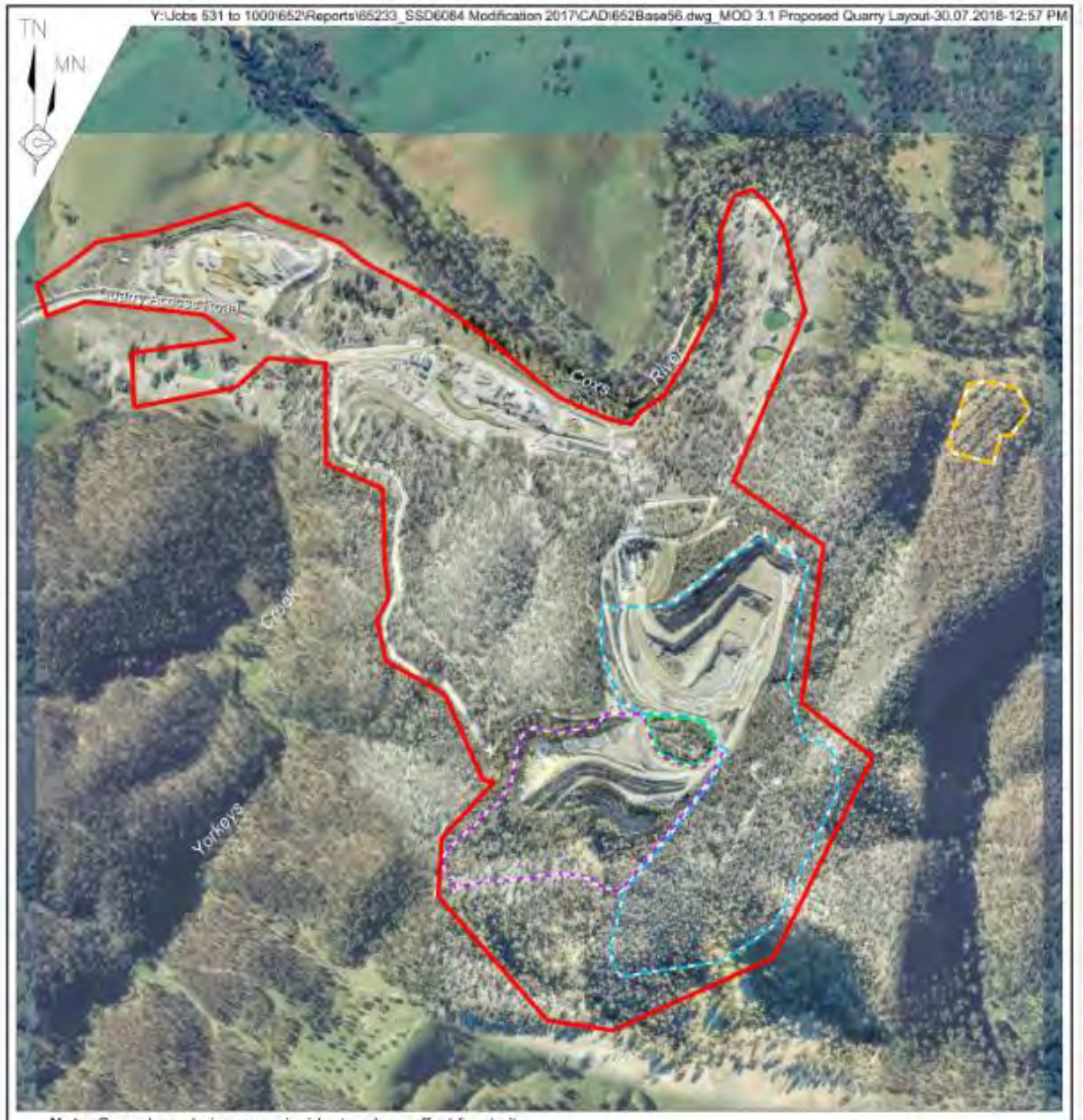
APPENDIX 6
CONSERVATION AREA H



Note: Some boundaries are coincident and are offset for clarity

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

SCALE (A4)

200 0 200 400 600 m

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

APPENDIX 7
PLANNING AGREEMENT

1. The Applicant must pay Council $0.025 per tonne of quarry product extracted and transported from the Stage 2 Extraction Area on a quarterly basis. Each payment must be:
   (a) based on weighbridge records of the quantity of extraction material transported from the site in the relevant quarter;
   (b) paid within 21 days of the end of the relevant quarter;
   (c) adjusted in line with the Consumer Price Index calculated from the date of approval and applied annually from the first day of operation.

Appendix C: EPA Licence

Environment Protection Licence

Licence - 12323

Licence Details	
Number:	12323
Anniversary Date:	01-July

Licensee

ADBRI QUARRIES SYDNEY PTY LTD

GPO BOX 2155

ADELAIDE SA 5001

Premises

AUS-10 QUARRY

391 JENOLAN CAVES ROAD

HARTLEY NSW 2790

Scheduled Activity

Extractive activities

Fee Based Activity	Scale
Land-based extractive activity (Expired)	> 500000-2000000 T annual capacity to extract, process or store

Contact Us

NSW EPA

6 Parramatta Square

10 Darcy Street

PARRAMATTA NSW 2150

Phone: 131 555

Email: info@epa.nsw.gov.au

Locked Bag 5022

PARRAMATTA NSW 2124

Environment Protection Licence

Licence - 12323

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Environment Protection Licence

Licence - 12323

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Environment Protection Licence

Licence - 12323

Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

Environment Protection Licence

The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

ADBRI QUARRIES SYDNEY PTY LTD
GPO BOX 2155
ADELAIDE SA 5001

subject to the conditions which follow.

Environment Protection Licence

Licence - 12323

1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Extractive activities	Land-based extractive activity (Expired)	> 500000 - 2000000 T annual capacity to extract, process or store

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
AUS-10 QUARRY
391 JENOLAN CAVES ROAD
HARTLEY
NSW 2790
LOT 1 DP 1005511, LOT 2 DP 1005511, LOT 31 DP 1009967

A3 Information supplied to the EPA

A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:
a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

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P1.1 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

Air

EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
4	Ambient air monitoring		Dust monitoring location identified as "AQD-1" on Figure 1 Environment Protection Licence Monitoring Points - provided to EPA on 19/09/11 (DOC11/40371).
5	Ambient air monitoring		Dust monitoring location identified as "AQD-2" on "Figure 1 Environment Protection Licence Monitoring Points" - provided to EPA on 19/09/11 as part of DOC11/40371.
6	Ambient air monitoring		Dust monitoring location identified as "AQD-3" on "Figure 1 Environment Protection Licence Monitoring Points" - provided to EPA on 19/09/11 as part of DOC11/40371.
12	Weather Analysis		Weather monitoring location as identified on "Figure 2 Environment Protection Licence Monitoring Points" - provided to EPA on 19/09/11 as part of DOC11/40371.

P1.2 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.

P1.3 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

Water and land

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1	Dischare to Waters; Discharge Quality Monitoring	Dischare to Waters; Discharge Quality Monitoring	Location identified as "Dam 1" on "Figure 2 - Environment Protection Licence Monitoring Points" - provided to EPA on 19/09/11 as part of DOC11/40371
2	Ambient water monitoring		Water monitoring location identified on Figure 6.1 of report entitled "Hartley Quarry - Annual Environmental Management Report" (2003), upstream of the processing area.

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3	Ambient water monitoring		Water monitoring location identified on Figure 6.1 of report entitled "Hartley Quarry - Annual Environmental Management Report" (2003), downstream of the processing area.
8	Discharge to waters; Discharge quality monitoring	Discharge to waters; Discharge quality monitoring	Location identified as "Dam 2" on "Figure 2 - Environment Protection Licence Monitoring Points" - provided to EPA on 19/09/11 as part of DOC11/40371
9	Discharge to waters; Discharge quality monitoring	Discharge to waters; Discharge quality monitoring	Location identified as "Dam 3" on "Figure 2 - Environment Protection Licence Monitoring Points" - provided to EPA on 19/09/11 as part of DOC11/40371
10	Discharge to waters; Discharge quality monitoring	Discharge to waters; Discharge quality monitoring	Location identified as "Dam 4" on "Figure 2 - Environment Protection Licence Monitoring Points" - provided to EPA on 19/09/11 as part of DOC11/40371
11	Discharge to waters; Discharge quality monitoring	Discharge to waters; Discharge quality monitoring	Location identified as "Dam 5" on "Figure 2 - Environment Protection Licence Monitoring Points" - provided to EPA on 19/09/11 as part of DOC11/40371

3 Limit Conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Concentration limits

L2.1 For each monitoring/discharge point or utilisation area specified in the table/s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

L2.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.

L2.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.

L2.4 Water and/or Land Concentration Limits

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POINT 1,8,9,10,11

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Oil and Grease	milligrams per litre				10
pH	pH				6.5 - 8.5
Total suspended solids	milligrams per litre				30

L2.5 The concentration limits stipulated by condition L2.1/L2.4 for EPA Identification Points 1,8, 9, 10 and 11 are deemed not to apply when the discharge from the stormwater control structures (sediment basins) occurs solely as a result of rainfall measured at the premises which exceeds:
a) a total of 44 millimetres of rainfall over any consecutive 5 day period.

Note: A 44mm rainfall event is defined by the EPA endorsed publication "Managing urban stormwater: soils and construction" (Landcom, 2004) as the rainfall depth in millimetres for a 95th percentile, 5 day rainfall event for the Central Tablelands which is also consistent with the storage capacity (recommended minimum design criteria) for Type D sediment basins for mines and quarries (see "Managing urban stormwater: soils and construction, Volume 2E, mines and quarries" (DECC, 2008)).

L2.6 The concentration limit for Total Suspended Solids stipulated by condition L2.1/L2.4 for EPA Identification Points 1, 8, 9, 10 and 11 are deemed not to have been breached where:
a) the water discharged is not covered by condition L2.5; and
b) the water discharged complies with a turbidity limit of 25 nephelometric turbidity units at the time of the discharge; and
c) the EPA is advised within 3 working days of the completion of the sample testing and analysis as required by condition M2.1/M2.2 of any results above the concentration limit.

Note: The purpose of this condition is to expedite the assessment and subsequent discharge of any clarified water from the stormwater control structures (sediment basins).

L3 Waste

L3.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled “Waste” and meeting the definition, if any, in the column titled “Description” in the table below.
Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled “Activity” in the table below.
Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled “Other Limits” in the table below.

This condition does not limit any other conditions in this licence.

Code	Waste	Description	Activity	Other Limits
NA	Cured concrete waste from a batch plant	Recycled concrete aggregate sourced fron Hy-Tec Industries Pty Limited's concrete batching plants	Resource recovery Waste processing (non-thermal treatment) Waste storage	5,000 tonnes per year
NA	General or Specific exempted waste	Waste that meets all the conditions of a resource recovery exemption under Clause 51A of the Protection of the Environment Operations (Waste) Regulation 2005	As specified in each particular resource recovery exemption	NA

L4 Noise limits

L4.1 Noise from the premises must not exceed 35 dB(A)$L_{Aeq\ (15\ minute)}$ at any time.

Where L_{Aeq} means the equivalent continuous noise level - the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.

L4.2 To determine compliance with condition(s) L4.1 noise must be measured at, or computed for, any affected noise sensitive locations (such as a residence, school or hospital). A modifying factor correction must be applied for tonal, impulsive or intermittent noise in accordance with the "Environmental Noise Management - NSW Industrial Noise Policy (January 2000)".

L4.3 The noise emission limits identified in this licence apply under all meteorological conditions except:
a) during rain and wind speeds (at 10m height) greater than 3m/s; and
b) under "non-significant weather conditions".

Note: Field meteorological indicators for non-significant weather conditions are described in the NSW Industrial Noise Policy, Chapter 5 and Appendix E in relation to wind and temperature inversions.

L5 Blasting

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

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

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

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

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

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

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

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

L6 Hours of operation

L6.1 Activities covered by this licence must only be carried out between the hours of 06:00 to 22:00 hours Monday to Friday, and 06:00 to 15:00 hours Saturday, and at no time on Sundays and Public Holidays.

L6.2 The loading and dispatch of trucks at the Premises and transport to and from the Premises is permitted between 04:00 hours and 22:00 hours Monday to Friday and between 05:00 hours and 15:00 hours on Saturdays only.

4 Operating Conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.
This includes:
a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
a) must be maintained in a proper and efficient condition; and
b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 All areas in or on the premises must be maintained in a condition that prevents or minimises the emission into the air of air pollutants (which includes dust).

O3.2 Any activity in or on the premises must be carried out by such practicable means as to prevent or minimise the emission into the air of air pollutants (which includes dust).

O3.3 Any plant in or on the premises must be operated by such practicable means as to prevent or minimise the emission into the air or air pollutants (which includes dust).

O4 Other operating conditions

O4.1 The stormwater control structures (sediment basins) identified at EPA Identification Points 1, 8, 9, 10 and 11 must be drained or pumped out as necessary to maintain each basins design storage capacity within 5 days following rainfall.

O4.2 Water discharged to comply with condition O4.1 may only be discharged to waters from those stormwater control structures (sediment basins) identified at EPA Identification Points 1, 8, 9, 10 and 11 where the discharged water complies with the discharge limits stipulated at condition L2.1/L2.4 (and taking into consideration condition L2.6).

O4.3 The licensee must undertake maintenance as necessary to desilt any stormwater control structures (sediment basins) identified at EPA Identification Points 1, 8, 9, 10 and 11 in order to retain each basins design storage capacity.

5 Monitoring and Recording Conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:
a) in a legible form, or in a form that can readily be reduced to a legible form;
b) kept for at least 4 years after the monitoring or event to which they relate took place; and
c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
a) the date(s) on which the sample was taken;
b) the time(s) at which the sample was collected;
c) the point at which the sample was taken; and
d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

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M2.2 Air Monitoring Requirements

POINT 4,5,6

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Continuous	AM-19

M2.3 Water and/ or Land Monitoring Requirements

POINT 1,8,9,10,11

Pollutant	Units of measure	Frequency	Sampling Method
Oil and Grease	milligrams per litre	Daily during any discharge	Grab sample
pH	pH	Daily during any discharge	Grab sample
Total suspended solids	milligrams per litre	Daily during any discharge	Grab sample

POINT 2,3

Pollutant	Units of measure	Frequency	Sampling Method
Oil and Grease	milligrams per litre	Special Frequency 1	Grab sample
pH	pH	Special Frequency 1	Grab sample
Total suspended solids	milligrams per litre	Special Frequency 1	Grab sample

M2.4 For the purposes of the table(s) above Special Frequency 1 means the collection of samples monthly, with the exception of when a discharge is occuring from Point 1, where samples must be collected daily.

M3 Testing methods - concentration limits

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:
a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or
b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or
c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

Note: The *Protection of the Environment Operations (Clean Air) Regulation 2022* requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

M3.2 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

M4 Recording of pollution complaints

M4.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M4.2 The record must include details of the following:
a) the date and time of the complaint;
b) the method by which the complaint was made;
c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
d) the nature of the complaint;
e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
f) if no action was taken by the licensee, the reasons why no action was taken.

M4.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M4.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M5 Telephone complaints line

M5.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M5.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M5.3 The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.

M6 Requirement to monitor volume or mass

M6.1 For each discharge point or utilisation area specified below, the licensee must monitor:
a) the volume of liquids discharged to water or applied to the area;
b) the mass of solids applied to the area;
c) the mass of pollutants emitted to the air;
at the frequency and using the method and units of measure, specified below.

POINT 1,8,9,10,11

Frequency	Unit of Measure	Sampling Method
Daily during any discharge	kilolitres per day	Estimate

M7 Blasting

M7.1 To determine compliance with condition(s) L5.2, L5.3 and L5.4

a) Airblast overpressure and ground vibration must be measured and electronically recorded at the nearest residence or sensitive receiver or as otherwise directed by an authorised officer of the EPA for all blasts carried out in or on the premises; and
b) Instrumentation used to measure the airblast overpressure and ground vibration must meet the requirements of Australian Standard AS 2187.2-2006.

M8 Other monitoring and recording conditions

M8.1 Requirement to Monitor Weather

The applicant must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The applicant must use the sampling method, units of measure, averaging period and sample at the frequency specified opposite in the other columns unless otherwise approved by the EPA:

Parameter	Units of Measure	Frequency	Averaging Period	Sampling Method
Air temperature	oC	Continuous	1 hour	AM-4
Wind Direction	o	Continuous	15 minute	AM-2 &AM-4
Wind Speed	m/s	Continuous	15 minute	AM-2 & AM-4
Sigma theta	o	Continuous	15 minute	AM-2 & AM-4
Rainfall	mm	Continuous	24 hour	AM-4

6 Reporting Conditions

R1 Annual return documents

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

1. a Statement of Compliance,
2. a Monitoring and Complaints Summary,
3. a Statement of Compliance - Licence Conditions,
4. a Statement of Compliance - Load based Fee,
5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and

7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee notification that the Annual Return is due.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:
a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:
a) the licence holder; or
b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

R1.8 The results of the blast monitoring required by condition M7.1 must be submitted to the EPA at the end of each reporting period.

R2 Notification of environmental harm

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which they became aware of the incident.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
a) where this licence applies to premises, an event has occurred at the premises; or
b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:
a) the cause, time and duration of the event;
b) the type, volume and concentration of every pollutant discharged as a result of the event;
c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

7 General Conditions

G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

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G2 Contact number for incidents and responsible employees

G2.1 The licensee must operate 24-hour telephone contact lines for the purpose of enabling the EPA to directly contact one or more representatives of the licensee who can:
a) respond at all times to incidents relating to the premises; and
b) contact the licensee's senior employees or agents authorised at all times to:
i) speak on behalf of the licensee; and
ii) provide any information or document required under this licence.

G2.2 The licensee is to inform the EPA of the representative or representatives and their telephone number within 3 months of the date of the issue of this licence. The EPA must be notified of the telephone number on commencement of its operation.

G2.3 The licensee is to inform the EPA in writing of the appointment of any subsequent contact persons, or changes to the person's contact details as soon as practicable and in any event within fourteen days of the appointment or change.

G3 Signage

G3.1 The location of EPA point number(s) 1 to 7 inclusive must be clearly marked by signs that indicate the point identification number used in this licence and be located as close as practical to the point.

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Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

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flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environmen t Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder describe d at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 mo nths. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.

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TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non-putrescible), special waste or hazardous waste
Wellhead	Has the same meaning as in Schedule 1 to the Protection of the Environment Operations (General) Regulation 2021.

Mr Darryl Clift

Environment Protection Authority

(By Delegation)

Date of this edition: 01-July-2005

Environment Protection Licence

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End Notes

1	Licence varied by notice 1057904, issued on 03-Apr-2006, which came into effect on 28-Apr-2006.
2	Licence varied by notice 1060537, issued on 30-May-2006, which came into effect on 30-May-2006.
3	Licence varied by notice 1068992, issued on 18-Oct-2007, which came into effect on 18-Oct-2007.
4	Licence varied by notice 1085280, issued on 07-Jul-2008, which came into effect on 07-Jul-2008.
5	Condition A1.3 Not applicable varied by notice issued on <issue date> which came into effect on <effective date>
6	Licence varied by notice 1501563 issued on 26-Oct-2011
7	Licence varied by notice 1542576 issued on 17-Aug-2016
8	Licence varied by notice 1546618 issued on 12-Dec-2016
9	Licence varied by notice 1582013 issued on 03-Jul-2019
10	Licence varied by notice 1586523 issued on 05-Nov-2020
11	Licence format updated on 05-Apr-2024

Appendix D: Water Licences

Information about a water licence or approval

Use this tool to search for information about water licences and approvals issued under the Water Act 1912 or Water Management Act 2000.

Select the type of licence or approval and enter the licence or approval number:

- Water access licence (WAL): a WAL number starts with the letters 'WAL' followed by several numbers; a WAL also has a reference number that starts with a two digit number, followed by 'AL' and then several numbers.
- 1912 water licence: a water licence number starts with a two digit number, followed by a two letter code and then several numbers. Note: a PT reference number cannot be entered.
- Approval: an approval number starts with a two digit number, followed by a two letter code (WA, UA, CA or FW) and then several numbers.

Search for information about either a:

- ○ Water access licence (WAL) issued under the Water Management Act 2000
- ○ Water Act 1912 Licences and Authorities
- ◉ Approval issued under the Water Management Act 2000

Approval Number: 10 ▼ WA ▼ 103330

Notes: The search results will list the conditions imposed on the approval and also list the number/s of any water access licence/s that nominate the water supply works associated with the approval.

This search tool does not include information about controlled activity approvals. Information publicly available from a register of controlled activity approvals is available at our local offices.

Find out if a Water Act 1912 licence has been converted

- ○ Water licence conversion status

« Previous Search Print Export

Search Results

Kind of Approval	Issue Date	Expiry Date	Approval Number	Status	Water Source
Water Supply Works	01-JUL-2011	24-NOV-2025	10WA103330	Current	Upper Nepean And Upstream Warragamba Water Source

Work Type	Description	No of Works	Location (Lot/DP)
Diversion Works - Pumps	50mm Centrifugal Pump	1	Lot 31, DP 1009967

Water Access Licences nominating these works

Reference Number	WAL Number
10AL103329	25616

- Conditions

Plan Conditions

Water sharing plan	Greater Metropolitan Region Unregulated River Water Sources
	Take of water
MW0655-00001	Any water supply work authorised by this approval must take water in compliance with the conditions of the access licence under which water is being taken.
	Water management works
MW0491-00001	When a water supply work authorised by this approval is to be abandoned or replaced, the approval holder must contact the relevant licensor in writing to verify whether the work must be decommissioned. The work is to be decommissioned, unless the approval holder receives notice from the Minister not to do so. Within sixty (60) days of decommissioning, the approval holder must notify the relevant licensor in writing that the work has been decommissioned.
	Monitoring and recording
MW0481-00001	A logbook must be kept and maintained at the authorised work site or on the property for each water supply work authorised by this approval, unless the work is metered and fitted with a data logger.
MW2338-00001	The completed logbook must be retained for five (5) years from the last date recorded in the logbook.
MW0482-00001	Where a water meter is installed on a water supply work authorised by this approval, the meter reading must be recorded in the logbook before taking water. This reading must be recorded every time water is to be taken.
	Reporting
MW0051-00001	Once the approval holder becomes aware of a breach of any condition on this approval, the approval holder must notify the Minister as soon as practicable. The Minister must be notified by: A. email: water.enquiries@dpi.nsw.gov.au, or B. telephone: 1800 353 104. Any notification by telephone must also be confirmed in writing within seven (7) business days of the telephone call.

Other Conditions

	Water management works
DK0888-00001	Any water supply work authorised by this approval used for the purpose of conveying, diverting or storing water must be constructed or installed to allow free passage of floodwaters flowing into or from a river or lake.
DK0878-00001	A. The construction, installation or use of the water supply work authorised by this approval must not cause or increase erosion to the channel or bank of the watercourse. B. If erosion is observed, the area must be stabilised with grass cover, stone pitching or any other material that will prevent any further occurrence of erosion.

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- 1912 water licence: a water licence number starts with a two digit number, followed by a two letter code and then several numbers. Note: a PT reference number cannot be entered.
- Approval: an approval number starts with a two digit number, followed by a two letter code (WA, UA, CA or FW) and then several numbers.

Search for information about either a:

(•) Water access licence (WAL) issu ed under the Water Management Act 2000

Water Access Licence (WAL) Number WAL 25616

A WAL number starts with the letters 'WAL' followed by several numbers

Can't find your WAL number? Do you have a reference number? A reference number starts with a two digit number, followed by 'AL' and then several numbers. Use the following tool to find your WAL by entering your reference number. Enter the reference number to find the WAL number.

Notes:

The search results will list the conditions imposed on the water access licence. Any approved water supply work/s nominated on the water access licence are identified by the approval number/s for the work/s.

The information about a water access licence provided in the search results is a summary and may not always be up to date. If you require full and up to date details about a particular water access licence (including current holders, share and extraction component details, encumbrances and notations) you should search the Water Access Licence Register administered by Land and Property Information.

( ) Water Act 1912 Licences and Authorities

( ) Approval issued under the Water Management Act 2000

Find out if a Water Act 1912 licence has been converted

( ) Water licence conversion status

« Previous Search Print Export

Search Results

Category [Subcategory]	Status	Water Source	Tenure Type	Management Zone	Share Components (units or ML)

Unregulated River	Current	Upper Nepean And Upstream Warragamba Water Source	Continuing	Dharabuladh Management Zone	20.00

Extraction Times or Rates

Subject to conditions water may be taken at any time or rate

Nominated Work Approval(s)

10WA103330

- Conditions

Plan Conditions

Water sharing plan	Greater Metropolitan Region Unregulated River Water Sources
	Take of water
MW0112-00001	The maximum water allocation that may be carried over in the account for this access licence from one water year to the next water year is: A. a volume equal to 100 % of the share component of the licence, or B. 1 ML/unit share of the share component of the licence.
MW0017-00023	From 1 July 2011, water must not be taken from the Dharabuladh Management Zone of the Upper Nepean and Upstream Warragamba Water Source when flows are in the Very Low Flow Class, which means that the flow at Coxs River at the Island Hill gauge [No. 212045] is: A. equal to or less than 17 ML/day on a rising river, or B. equal to or less than 15 ML/day on a falling river. This restriction does not apply if water is to be taken from a runoff harvesting dam or an in-river dam pool.
MW0036-00002	The volume of water taken in any three (3) consecutive water years from 1 July 2012 must be recorded in the logbook at the end of those three water years. The maximum volume of water permitted to be taken in those years must also be recorded in the logbook.
MW0605-00001	Water must be taken in compliance with the conditions of the approval for the nominated work on this access licence through which water is to be taken.
MW0670-00001	Water must only be taken if there is visible flow in the water source at the location where water is to be taken. This restriction does not apply if water is to be taken: A. from an off-river pool, an in-river pool, a runoff harvesting dam or an in-river dam pool, or B. from the following Weirs: Maldon, Douglas Park, Menangle, Camden, Sharpes, Cobbity, Mount Hunter Rivulet, Brownlow Hill, Theresa Park and Wallacia.
MW0004-00002	From 1 July 2012, the total volume of water taken in any three (3) consecutive water years under this access licence must not exceed a volume which is equal to the lesser of either: A. the sum of: i. water in the account from the available water determinations in those 3 consecutive water years, plus ii. water in the account carried over from the water year prior to those 3 consecutive water years, plus iii. any net amount of water assigned to or from this account under a water allocation assignment in those 3 consecutive water years, plus iv. any water re-credited by the Minister to the account in those 3 consecutive water years, or

	B. the sum of: i. the share component of this licence at the beginning of the first year in those 3 consecutive water years, plus ii. the share component of this licence at the beginning of the second year in those 3 consecutive water years, plus iii. the share component of this licence at the beginning of the third year in those 3 consecutive water years, plus iv. any net amount of water assigned to or from this account under a water allocation assignment in those 3 consecutive water years, plus v. any water re-credited by the Minister to the account in those 3 consecutive water years.
	Monitoring and recording
MW2337-00001	The following information must be recorded in the logbook for each period of time that water is taken: A. date, volume of water, start and end time when water was taken as well as the pump capacity per unit of time, and B. the access licence number under which the water is taken, and C. the approval number under which the water is taken, and D. the volume of water taken for domestic consumption and/or stock watering.
MW2339-00001	A logbook must be kept, unless the work is metered and fitted with a data logger. The logbook must be produced for inspection when requested by the relevant licensor.
	Reporting
MW0051-00002	Once the licence holder becomes aware of a breach of any condition on this access licence, the licence holder must notify the Minister as soon as practicable. The Minister must be notified by: A. email: water.enquiries@dpi.nsw.gov.au, or B. telephone: 1800 353 104. Any notification by telephone must also be confirmed in writing within seven (7) business days of the telephone call.

Other Conditions

NIL

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Information about a water licence or approval

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Select the type of licence or approval and enter the licence or approval number:

- Water access licence (WAL): a WAL number starts with the letters 'WAL' followed by several numbers; a WAL also has a reference number that starts with a two digit number, followed by 'AL' and then several numbers.
- 1912 water licence: a water licence number starts with a two digit number, followed by a two letter code and then several numbers. Note: a PT reference number cannot be entered.
- Approval: an approval number starts with a two digit number, followed by a two letter code (WA, UA, CA or FW) and then several numbers.

Search for information about either a:

- ○ Water access licence (WAL) issued under the Water Management Act 2000
- ○ Water Act 1912 Licences and Authorities
- ◉ Approval issued under the Water Management Act 2000

Approval Number: 10 ▼ WA ▼ 119180

Notes: The search results will list the conditions imposed on the approval and also list the number/s of any water access licence/s that nominate the water supply works associated with the approval.

This search tool does not include information about controlled activity approvals. Information publicly available from a register of controlled activity approvals is available at our local offices.

Find out if a Water Act 1912 licence has been converted

- ○ Water licence conversion status

« Previous Search Print Export

Search Results

Kind of Approval	Issue Date	Expiry Date	Approval Number	Status	Water Source
Water Supply Works	25-MAR-2015	24-MAR-2025	10WA119180	Current	Coxs River Fractured Rock Groundwater Source

Work Type	Description	No of Works	Location (Lot/DP)
Extraction Works Gw	Excavation - Groundwater	1	Lot 1, DP 1005511 Lot 2, DP 1005511

Water Access Licences nominating these works

Reference Number	WAL Number

10AL119210 37423

- Conditions

Plan Conditions

Water sharing plan	Greater Metropolitan Region Groundwater Sources
	Take of water
MW0655-00001	Any water supply work authorised by this approval must take water in compliance with the conditions of the access licence under which water is being taken.
	Water management works
MW0097-00001	If contaminated water is found above the production aquifer during the construction of the water supply work authorised by this approval, the licensed driller must: A. notify the relevant licensor in writing within 48 hours of becoming aware of the contaminated water, and B. adhere to the Minimum Construction Requirements for Water Bores in Australia (2012), as amended or replaced from time to time.
MW0487-00001	The water supply work authorised by this approval must be constructed within three (3) years from the date this approval is granted.
MW0044-00001	A. When a water supply work authorised by this approval is to be abandoned or replaced, the approval holder must contact the relevant licensor in writing to verify whether the work must be decommissioned. B. The work is to be decommissioned, unless the approval holder receives notice from the Minister not to do so. C. When decommissioning the work the approval holder must: i. comply with the minimum requirements for decommissioning bores prescribed in the Minimum Construction Requirements for Water Bores in Australia (2012), as amended or replaced from time to time, and ii. notify the relevant licensor in writing within sixty (60) days of decommissioning that the work has been decommissioned.
	Monitoring and recording
MW0484-00001	Before water is taken through the water supply work authorised by this approval, confirmation must be recorded in the logbook that cease to take conditions do not apply and water may be taken. The method of confirming that water may be taken, such as visual inspection, internet search, must also be recorded in the logbook. If water may be taken, the: A. date, and B. time of the confirmation, and C. flow rate or water level at the reference point in the water source must be recorded in the logbook.
MW2338-00001	The completed logbook must be retained for five (5) years from the last date recorded in the logbook.
MW2336-00001	The purpose or purposes for which water is taken, as well as details of the type of crop, area cropped, and dates of planting and harvesting, must be recorded in the logbook each time water is taken.
MW2337-00001	The following information must be recorded in the logbook for each period of time that water is taken: A. date, volume of water, start and end time when water was taken as well as the pump capacity

	per unit of time, and B. the access licence number under which the water is taken, and C. the approval number under which the water is taken, and D. the volume of water taken for domestic consumption and/or stock watering.
MW0482-00001	Where a water meter is installed on a water supply work authorised by this approval, the meter reading must be recorded in the logbook before taking water. This reading must be recorded every time water is to be taken.
MW2339-00001	A logbook must be kept, unless the work is metered and fitted with a data logger. The logbook must be produced for inspection when requested by the relevant licensor.
	Reporting
MW0051-00001	Once the approval holder becomes aware of a breach of any condition on this approval, the approval holder must notify the Minister as soon as practicable. The Minister must be notified by: A. email: water.enquiries@dpi.nsw.gov.au, or B. telephone: 1800 353 104. Any notification by telephone must also be confirmed in writing within seven (7) business days of the telephone call.
MK0485-00001	Within sixty (60) days of completing construction of the water supply work authorised by this approval, the approval holder must provide a completed Form A for that work to the relevant licensor.

Other Conditions

	Monitoring and recording
DS2431-00001	A. Within 6 months of granting this approval, a monitoring plan to measure the water table, groundwater and surface water quality must be submitted to, and approved by, the relevant licensor, Parramatta Office. B. Then, the water table, groundwater and surface water quality must be measured according to the approved plan. C. All monitoring records must be kept for 10 years and provided to the relevant licensor when requested.

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Information about a water licence or approval

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Select the type of licence or approval and enter the licence or approval number:

- **Water access licence (WAL):** a WAL number starts with the letters 'WAL' followed by several numbers; a WAL also has a reference number that starts with a two digit number, followed by 'AL' and then several numbers.
- **1912 water licence:** a water licence number starts with a two digit number, followed by a two letter code and then several numbers. Note: a PT reference number cannot be entered.
- **Approval:** an approval number starts with a two digit number, followed by a two letter code (WA, UA, CA or FW) and then several numbers.

Search for information about either a:

Water access licence (WAL) issued under the *Water Management Act 2000*

Water Access Licence (WAL) Number WAL 37423

A WAL number starts with the letters 'WAL' followed by several numbers

Can't find your WAL number? Do you have a reference number? A reference number starts with a two digit number, followed by 'AL' and then several numbers. Use the following tool to find your WAL by entering your reference number. Enter the reference number to find the WAL number.

Notes:

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Approval issued under the *Water Management Act 2000*

Find out if a *Water Act 1912* licence has been converted

Water licence conversion status

Search Results

Category [Subcategory]	Status	Water Source	Tenure Type	Management Zone	Share Components (units or ML)
Aquifer	Current	Coxs River Fractured Rock Groundwater Source	Continuing		20.00

Extraction Times or Rates

Subject to conditions water may be taken at any time or rate

Nominated Work Approval(s)

10WA119180

- Conditions

Plan Conditions

Water sharing plan	Greater Metropolitan Region Groundwater Sources
	Take of water
MW0929-00001	From 1 July 2018, if the water supply work nominated on this access licence is located at or less than 40 m from the top of the high bank of a river then: A. water must not be taken in this groundwater source when flows are in the Very Low Flow Class for an unregulated river access licence in that river. B. This restriction will only apply when the system that confirms when water can be taken is available on DPI Water website. C. DPI Water will inform the licence holder in writing of the applicable restrictions and how to access the information on its website when this system becomes operative.
MW0605-00001	Water must be taken in compliance with the conditions of the approval for the nominated work on this access licence through which water is to be taken.
MW0919-00001	A maximum water allocation of 0.1 ML/unit share may be carried over in the account for this access licence from one water year to the next water year if a water meter is installed on each water supply work nominated on this licence and each meter is maintained in working order.
MW0547-00001	The total volume of water taken under this licence in any water year must not exceed a volume equal to: A. the sum of water in the account from the available water determination for the current year, plus B. the water carried over in the account from the previous water year, plus C. the net amount of water assigned to or from the account under a water allocation assignment, plus D. any water re-credited by the Minister to the account.
	Monitoring and recording
MW2338-00001	The completed logbook must be retained for five (5) years from the last date recorded in the logbook.
MW2336-00001	The purpose or purposes for which water is taken, as well as details of the type of crop, area cropped, and dates of planting and harvesting, must be recorded in the logbook each time water is taken.
MW2337-00001	The following information must be recorded in the logbook for each period of time that water is taken: A. date, volume of water, start and end time when water was taken as well as the pump capacity per unit of time, and B. the access licence number under which the water is taken, and C. the approval number under which the water is taken, and D. the volume of water taken for domestic consumption and/or stock watering.
MW2339-00001	A logbook must be kept, unless the work is metered and fitted with a data logger. The logbook must be produced for inspection when requested by DPI Water.
	Reporting
MW0051-	Once the licence holder becomes aware of a breach of any condition on this access licence, the

00002	licence holder must notify the Minister as soon as practicable. The Minister must be notified by: A. email: water.enquiries@dpi.nsw.gov.au, or B. telephone: 1800 353 104. Any notification by telephone must also be confirmed in writing within seven (7) business days of the telephone call.

Other Conditions

NIL

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Appendix E: EPBC Approval and Compliance Audit

Austen Quarry (EPBC Approval 2013/6967) – Review of Compliance 2023/2024

Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
1. The approval holder must not remove more than 721 individuals of Silver-leaved Mountain Gum within the Austen Quarry Boundary depicted at Schedule 1.	Yes	Approval for removal of Silver-leaved Mountain Gum individuals within the Austen Quarry covers all clearing for the Project which will occur progressively over the life of the operation. Therefore, at the time of this review, all vegetation clearing operations for the Austen Quarry have not been completed and 721 had not been removed. On 15 August 2018 a modification to Development Consent SSD 6084 was approved that reduced the number of Silver-leaved Mountain Gum individuals that would be removed to 701 individual plants.	Subject to a modification application to biodiversity offsetting obligations under SSD6084 (pending), it is proposed that this condition be updated to reflect the anticipated impact to the Silver-leaved Mountain Gum (that is, approved impacts are limited to 701 individual plants).	No action required.
2. To mitigate the impacts of the action on the Silver-leaved Mountain Gum, the approval holder must prepare and submit at least three (3) months prior to the commencement of the action, a mine site Silver-leaved Mountain Gum Management Plan (SLMGMP) for the Minister's approval. The SLMGMP must contain:	Yes	The Silver-leaved Mountain Gum Management Plan (SLMGMP) was submitted on 15 July 2015 and was approved on 10 November 2016. Since that time, the Silver-leaved Mountain Gum within the disturbance areas have been managed in accordance with the SLMGMP, the Biodiversity Offset Management Plan (BOMP) and the Landscape and	The offset area proposed in the BOMP and the RLMP has not been finalised and was the subject of a modification to SSD 6084. Therefore, formal management of the Silver-leaved Mountain Gum within the offset area recognised in the BOMP has yet to commence. Notwithstanding this, the area has been the	Once the proposed modification to SSD 6084 (MOD3) has been determined, an application to vary EPBC Approval 2013/6967 would be submitted. The removal of this condition (or alternatively, Condition 3) should be considered with the requirements for management of the Silver-

Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
		Rehabilitation Management Plan (RLMP) (required under SSD 6084).	subject of broader scale land management within the landowner's holdings. Many of the requirements of the SLMGMP are repeated in the BOMP or in the RLMP.	leaved Mountain Gum to be incorporated into one plan. Once the Biodiversity Offset Strategy for the Silver-leaved Mountain Gum has been approved, an update to Silver-leaved Mountain Gum management would be incorporated into the relevant plan and submitted to DCCEEW for review and approval.
a) Baseline data on the local Silver-leaved Mountain Gum population within the Austen Quarry Boundary, Disturbance area and Offset Area;	Yes	See Section 3 of the SLMGMP	None	No action required.
b) Measures to mitigate and manage impacts on the Silver-leaved Mountain Gum in the Disturbance area and Offset area that: a. are for the life of the approval; b. are complementary with the offsetting objectives and targets within the Biodiversity Offset Management Plan and other rehabilitation and offsetting activities within and adjacent to the Austen Quarry Boundary;	Yes	See Section 4 of the SLMGMP	The Silver-leaved Mountain Gum in the disturbance area has been managed in accordance with the SLMGMP (refer to Section 6.9 of the Annual Review for the Austen Quarry (1st July 2022 to 30th June 2023). Observations of Quarry personnel are that retained SLMG continue to thrive and planted individuals are surviving well with planting processes established to encourage growth.	No action required.

Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
c. is in accordance with the approved Conservation Advice. The SLMGMP should discuss, as a minimum, measures to avoid or manage impacts to Silver-leaved Mountain Gum relating to habitat loss, edge effects, disease prevention, feral pests, weed incursion, fire ecology and grazing; and actions promoting regeneration.				
c) A program to monitor Silver-leaved Mountain Gum distribution and population size in the Offset Area;	Yes	See Section 5 of the SLMGMP	Monitoring has occurred in accordance with the SLMGMP (refer to Section 6.9.2 of the Annual Review for the Austen Quarry (1st July 2022 to 30th June 2023).	No action required.
d) Details of remedial actions where objectives and targets are not being achieved; and	Yes	See Section 5.3 of the SLMGMP	Not required.	No action required.
e) Details of who will be responsible for monitoring, reviewing and implementing the SLMGMP.	Yes	See Section 5.4 of the SLMGMP	None	No action required.
The approval holder must not commence the action until the SLMGMP is approved by the Minister in writing. The approved SLMGMP must be implemented.	Yes	The SLMGMP was submitted on 15 July 2015 and was approved on 10 November 2016. Operations under the Stage 2 Extension Project commenced on 6 April 2017.	None	No action required.

Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
3. To compensate for the loss of 721 individuals of Silver-leaved Mountain Gum, the approval holder must prepare and submit at least three (3) months prior to the commencement of the action, a Biodiversity Offset Management Plan (BOMP) for the proposed Offset Area, for the Ministers approval. The BOMP must be prepared by a suitably qualified person and:	Yes	The BOMP was submitted on 15 July 2015 and was approved on 10 November 2016. As an offset area is yet to be finalised, management of any offset area has yet to formally commence.	As noted above, offsetting arrangements for the Stage 2 Project are yet to be finalised and are the subject of a modification to the offsetting conditions within SSD 6084. The area formerly approved as an offset area has been the subject of broader scale land management within the landowner's holdings.	Once the proposed modification to SSD 6084 (MOD3) has been determined, an application to vary EPBC Approval 2013/6967 would be submitted. Once the Biodiversity Offset Strategy for the Silver-leaved Mountain Gum has been approved, an update to the proposed offsetting approach would be formalised in an updated BOMP that would be submitted to DCCEEW for review and approval.
a) Identify the land described as the Offset Area at Schedule 2 of this notice that is necessary to achieve the outcomes required by the Environmental Offsets Policy 2012. This must include offset attributes, shapefiles, textual descriptions and maps to clearly define the location and boundaries of the Offset Area.	Yes	See Section 2 of the BOMP	The land the subject of this approval (and original offset) is no longer recognised in SSD 6084. Once the proposed modification to SSD 6084 (MOD3) has been determined, an application to vary EPBC Approval 2013/6967 would be submitted to DCCEEW.	No action required.
b) Provide a survey and description of the current condition (prior to any management activities) of the Offset Area identified in Condition 3a.	Yes	See Section 2.5 of the BOMP	None	No action required.
c) Detail management actions and regeneration and revegetation strategies to be undertaken on the Offset Area to increase the				

Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
population of Silver-leaved Mountain Gum in this area, including:				
i) a description and timeframe of measures that would be implemented to improve the condition of the ecological communities on the site;	Yes	See Section 3 of the BOMP	None	No action required.
ii) performance and completion criteria for evaluating the management of the Offset Area, and criteria for triggering remedial action;	Yes	See Section 4 of the BOMP	None	No action required.
iii) a program to monitor and report on the effectiveness of these measures, and progress against the performance and completion criteria;	Yes	See Section 4 of the BOMP	Monitoring has occurred in accordance with the BOMP (refer to Section 6.9.2 of the Annual Review for the Austen Quarry (1st July 2022 to 30th June 2023)).	No action required.
iv) description of potential risks to the successful implementation of the plan , a description of the measures that will be implemented to mitigate against these risks and a description of the contingency measures that will be implemented if defined triggers arise; and	Yes	See Section 4 of the BOMP	None	No action required.
v) details of who would be responsible for monitoring, reviewing, and implementing the plan.	Yes	See Section 4 of the BOMP	None	No action required.

Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
The approval holder must not commence the action until the BOMP is approved by the Minister in writing. The approved BOMP must be implemented.	Yes	The BOMP was submitted on 15 July 2015 was approved on 10 November 2016. Operations under the Stage 2 Extension Project commenced on 6 April 2017.	None	No action required.
4. To compensate for the loss of 721 individuals of Silver-leaved Mountain Gum, and ensure the ongoing conservation of a viable population of Silver-leaved Mountain Gum in the Offset Area, within 18 months of the date of this approval, the approval holder must secure the land(s) identified as the Offset Area as a biodiversity offset by a legal instrument under relevant nature conservation legislation on the title of the land. This instrument must: a) provide enduring protection for the land that will survive transfer of ownership; b) prevent any future development activities, including mining and mineral extraction; c) ensure the active management of the land to achieve the outcomes identified; and d) be provided to the Department within three (3) months of it being issued, as evidence of compliance with this condition.	Not Yet Required	The biodiversity offsetting arrangements for the Austen Quarry Stage 2 development are the subject of a modification application to SSD 6084 (MOD3). The offsetting arrangement are yet to be finalised and therefore this condition is not yet able to be satisfied.	Once the proposed modification to SSD 6084 (MOD3) has been determined, an update to the Biodiversity Offset Strategy would be submitted to DCCEEW for review and approval. The land the subject of this approval (and original offset) is no longer recognised in SSD 6084. Once the proposed modification to SSD 6084 (MOD3) has been determined, an application to vary EPBC Approval 2013/6967 would be submitted. Land-based offsets adjacent to the Quarry are no longer proposed as an offset strategy.	Notice of satisfaction of the offsetting obligations of the Stage 2 Project would be submitted to DCCEEW within 3 months of it becoming available.

Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
5. Within 30 days after the commencement of the action. the approval holder must advise the Department in writing of the actual date of commencement of the action.	No	The action commenced on 6 April 2017. No correspondence notifying the then Department of the Environment and Energy of the commencement date can be located.	This is an historical non-compliance that has been noted in previous audits of EPBC Approval 2013/6967.	No action is possible for this condition.
6. The approval holder must maintain accurate records substantiating all activities associated with or relevant to these conditions of approval, including measures taken to implement the BOMP and SLMGMP, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also be publicised through the general media.	Yes	A rehabilitation and revegetation monitoring check list for monitoring of all planting activities is implemented and retained.	Hy-Tec has planted over 4 000 SLMG within rehabilitation areas of the Quarry since the commencement of the Quarry operations. While not a requirement of this approval, it is a demonstration of Hy-Tec achieving a greater than like-for-like outcome for the SLMG (when compared to the approval to remove 701 individuals).	No action required.
7. Within 3 months of every 12 month anniversary of the commencement of the action, the approval holder must publish a report on its website addressing compliance with each of the conditions of this approval, including implementation of the BOMP and SLMGMP as specified in the conditions. Documentary evidence providing proof of the date of publication must be provided to the	Yes	This audit	The anniversary date for the commencement of the action is 6 April.	No action required.

Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
Department at the same time as the compliance report is published.				
8. Non-compliance with any of the conditions of this approval must be reported to the Department within two (2) business days of becoming aware of the non-compliance.	Noted	None	One historic non-compliance issue has been identified as a result of this review. Given the historic non-compliance has previously been notified to DCCEEW, it is not necessary to notify the Department again.	No action required.
9. Upon the direction of the Minister, the approval holder must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The audit must not commence until the independent auditor and audit criteria have been approved by the Minister. The audit report must address the approved criteria to the satisfaction of the Minister.	Noted	To be actioned, if requested.	None	No action required.
10. If the approval holder wishes to *carry* out any activity otherwise than in accordance with the Plans as specified in the conditions, the approval holder must submit to the Department for the Minister's written approval a revised version of that Plan. The approval holder must not commence the varied activity until the Minister has approved the varied Plan in writing. The Minister will not approve a varied plan unless the revised Plan would result in an	Noted	None	The offset area described in this approval is no longer recognised in SSD 6084. A modification to SSD 6084 to finalise its offset strategy is pending. Once the proposed modification to SSD 6084 (MOD3) has been determined, an application to vary EPBC Approval 2013/6967 would be submitted to DCCEEW and the relevant plans updated.	No action required.

Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
equivalent or improved environmental outcome over time. If the Minister approves the revised Plan, that Plan must be implemented in place of the Plan previously approved.				
11. If the Minister believes that it is necessary or convenient for the better protection of listed threatened species and ecological communities to do so, the Minister may request that the approval holder make specified revisions to the Plan specified in the conditions and submit the revised Plan for the Minister's written approval. The approval holder must comply with any such request. The revised approved Plan must be implemented. Unless the Minister has approved the revised Plan then the approval holder must continue to implement the Plan previously approved.	Noted	None	None	No action required.
12. If, at any time after five (5) years from the date of this approval, the approval holder has not substantially commenced the action, then the approval holder must not substantially commence the action without the written agreement of the Minister.	Noted	The action was substantially commenced on 6 April 2017.	None	No action required.
13. Unless otherwise agreed to in writing by the Minister, the approval holder must publish, and maintain for the life of the approval, all management plans referred to in these conditions of approval on its website. Each management plan must be published	Yes	The SLMGMP and the BOMP are available from the Hy-Tec website under the Quarry Documentation section. https://adbriquarries.com.au/nsw/ Previously	None	No action required.

Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
on the website within one (1) month of being approved.		(https://www.hy-tec.com.au/quarry-documentation)		

Appendix F: Noise Monitoring Reports

Noise Monitoring Assessment

Austen Quarry, Hartley, NSW
August 2023

Prepared for: RW Corkery & Co Pty Limited
August 2023
MAC170523RP14

Muller Acoustic Consulting

Document Information

Noise Monitoring Assessment

Austen Quarry, Hartley, NSW

August 2023

Prepared for: RW Corkery & Co Pty Limited (on behalf of Hy-Tec Pty Ltd)

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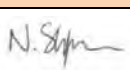
Document ID	Date	Prepared By	Signed	Reviewed By	Signed
MAC170523RP14	30 August 2023	Nicholas Shipman		Oliver Muller	

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by RW Corkery & Co Pty Limited (RWC) on behalf of Hy-Tec Industries Pty Ltd (HT) to complete a Noise Monitoring Assessment (NMA) for Austen Quarry Operations, Hartley, NSW.

The monitoring has been conducted in accordance with the approved Austen Quarry Noise Management Plan and in general accordance with Conditions L4.1 to L4.3 of EPL#12323 (EPL); at three representative monitoring locations.

The assessment was conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- Environment Protection Licence EPL#12323;
- NSW Environment Protection Authority (EPA's), Approved Methods for the measurement and analysis of environmental noise in NSW, 2022;
- RW Corkery & Co Pty Limited, Austen Quarry Noise Management Plan (NMP); and
- Standards Australia AS 1055:2018 - Acoustics - Description and measurement of environmental noise.

This assessment was completed on Thursday 17 August 2023, Friday 18 August 2023 and Friday 25 August 2023 and forms part of the noise monitoring program to address conditions of EPL#12323, Austen Quarry Development Consent SSD 6084 (SSD-6084) and the Noise Management Plan.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

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2 Noise Criteria

2.1 Environmental Protection License Noise Limits

Section L4 of the project's EPL (EPL #12323) outlines the applicable operational noise criteria for all privately owned receivers surrounding the mine. The criteria outlined in the EPL is reproduced below:

L4.1 Noise from the premises must not exceed 35 dB(A)LAeq (15 minute) at any time.

Where LAeq means the equivalent continuous noise level - the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.

L4.2 To determine compliance with condition(s) L4.1 noise must be measured at, or computed for, any affected noise sensitive locations (such as a residence, school or hospital). A modifying factor correction must be applied for tonal, impulsive or intermittent noise in accordance with the "Environmental Noise Management - NSW Industrial Noise Policy (January 2000)".

L4.3 The noise emission limits identified in this licence apply under all meteorological conditions except:

a) *during rain and wind speeds (at 10m height) greater than 3m/s; and*
b) *under "non-significant weather conditions".*

Note: Field meteorological indicators for non-significant weather conditions are described in the NSW Industrial Noise Policy, Chapter 5 and Appendix E in relation to wind and temperature inversions.

2.2 State Significant Development Consent Noise Limits

The operating criteria specified in Schedule 3, Condition 3 of the Austen Quarry Development Consent (SSD-6084), approved and modified on 15 July 2019 aligns with criteria outlined in EPL#12323 for the quarry at all privately owned receivers, ie 35dB $LA_{eq(15min)}$. Furthermore, SSD-6084 specifies an LA_{max} criteria for site operations of 52dBA during the morning shoulder period.

2.3 Noise Limits Summary

Table 1 presents a summary of the noise criteria for privately owned residential receivers surrounding the quarry, as outlined in SSD-6084 and EPL#12323.

Table 1 Noise Criteria

Receiver	Day dB $LA_{eq(15min)}$	Evening dB $LA_{eq(15min)}$	Morning Shoulder dB $LA_{eq(15min)}$	Morning Shoulder dB LA_{max}
All privately owned residences	35	35	35	52

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3 Methodology

3.1 Locality

The quarry is located on Jenolan Caves Road, Hartley, NSW, approximately 10km south of Lithgow, NSW. Receivers in the locality surrounding the quarry are primarily rural/residential. The Great Western Highway is situated to the north east of the site and Jenolan Caves Road to the west of the site.

3.2 Noise Monitoring Locations

Three monitoring locations have been selected as part of the NMA in accordance with the Noise Management Plan (NMP) and are summarised below:

- Location A (residence identifier R24A as per NMP), is located at 200 Jenolan Caves Road, Hartley, NSW, approximately 2.5km north of the project;
- Location B (residence identifier R31 as per NMP), is located at 781 Jenolan Caves Road, Good Forest, NSW, approximately 1km south west of the project site; and
- Location C (residential identifier R48 as per NMP) is located at 64 Carroll Drive, Hartley, NSW, approximately 2.5km north east of the quarry.

The monitoring locations with respect to quarry are presented in the locality plan shown in **Figure 1**.

3.3 Attended Monitoring Methodology

The attended noise surveys were conducted in general accordance with the procedures described in Standards Australia AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and EPL#12323. The measurements were carried out using a Svantek Type 1, 971 noise analyser on Thursday 17 August 2023, Friday 18 August 2023 and Friday 25 August 2023. The acoustic instrumentation used carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained by MAC as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022) and complies with AS/NZS IEC 61672.1-2019- Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA.

Noise measurements were of 15-minutes in duration and where possible, throughout each survey, the operator quantified the contribution of each significant noise source. One measurement was conducted at each of the monitoring locations during the day, evening and morning shoulder monitoring periods to quantify the noise sources in the ambient noise environment.

3.4 Unattended Monitoring Methodology

The unattended noise survey, completed at Location B - 791 Jenolan Caves Road, Good Forest was conducted in general accordance with the procedures described in Standards Australia AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise". The measurements were carried out using a Svantek Type 1, 977 noise analyser. Monitoring was conducted between Thursday 17 August 2023 and Friday 25 August 2023. The acoustic instrumentation used carries current NATA calibration and complies with AS/NZS IEC 61672:2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA. Data affected by adverse meteorological conditions (ie winds greater than 10m/s at 10m elevation and rain periods) have been excluded from the results.

3.5 Operational Logs

Operational logs for the primary and secondary crushers have been provided by Austen Quarry management. It is noted that processing equipment commences at 6am. Daily pre-shift meetings and safety checks often delay commencement of onsite operations until closer to 7am. Morning shoulder measurements were conducted from 6am to 7am on Friday 18 August 2023 and Friday 25 August 2023 to capture the onsite operations at the nominated monitoring locations.

Table 2 presents a summary of the hours of operation of the primary and secondary crushers with the quarry operational logs which are reproduced **Appendix B**.

Table 2 Primary and Secondary Crushers Hours of Operation

Date	Primary Crusher		Secondary Crusher	
	Commenced Crushing (hrs)	Ceased Crushing (hrs)	Commenced Crushing (hrs)	Ceased Crushing (hrs)
17/08/2023	07:45	16:35	07:26	19:30
18/08/2023	07:20	11:00	19:52	21:17
25/08/2023	07:35	19:36	06:12	20:35

FIGURE 1

LOCALITY PLAN

REF: MAC170523

0 500m

KEY

A MONITORING LOCATION

SITE LOCATION

MAC
Muller Acoustic Consulting

*Imagery Source : nearmaps

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4 Results

4.1 Meteorological Conditions – Location B

As prescribed in Condition L3.2 of the EPL (EPL #12323) weather data for the noise assessment period was sourced from the onsite weather station (station #3490) as well as operator measured conditions on site of EPL nominated receiver Location B to determine prevailing meteorological conditions at the time of the attended measurements and are presented in **Table 3**.

Table 3 Prevailing Meteorological Conditions

Date & Time	Onsite Weather Station Station #3490 (10mAGL)		Operator Measured Weather EPL Monitoring Location (1.8m AGL)	
	Wind Direction	Wind (m/s)	Wind Direction	Wind (m/s)
17/08/2023 16:42	W	1.1	W	1.8
17/08/2023 17:07	W	1.1	W	0.2
17/08/2023 17:28	W	0.9	W	0.1
17/08/2023 18:01	SW	0.3	W	0.1
17/08/2023 18:28	SW	0.9	W	0.1
17/08/2023 19:51	NW	1.6	W	0.1
18/08/2023 6:01	SSW	0.8	W	2.0
25/08/2023 6:00	SW	0.6	W	0.3
25/08/2023 6:27	W	1.1	NW	0.2

Location B was selected as the nearest monitoring location to weather station #3490

4.2 Assessment Results - Location A

Operational attended noise monitoring was completed in each assessment period at Location A, 200 Jenolan Caves Road on Thursday 17 August 2023, Friday 18 August 2023 and Friday 25 August 2023. **Table 4** presents the monitored noise level contributions and observed meteorological conditions for each measurement.

Table 4 Operator-Attended Noise Survey Results – Location A

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
17/08/2023	17:07 (Day)	84	61	39	WD: W WS: 0.2m/s Rain: Nil	Creek flow 39-40 Birds 40-48 Traffic 40-84 Gunshots 68-76 Quarry inaudible
Austen Quarry Contribution[1]						<29 dB $L_{Aeq(15min)}$
17/08/2023	18:28 (Evening)	76	55	42	WD: W WS: 0.1m/s Rain: Nil	Insects 41-43 Creek flow 41-43 Traffic 41-76 Quarry inaudible
Austen Quarry Contribution[1]						<32 dB $L_{Aeq(15min)}$
25/08/2023	6:27 (Morning Shoulder)	85	66	44	WD: WS: m/s Rain: Nil	Traffic 45-85 Creek flow 40-46 Birds 40-48 Quarry inaudible
Austen Quarry Contribution[1]						<34 dB $L_{Aeq(15min)}$ <34dB L_{Amax}

Note 1: Estimated quarry noise contribution.

4.3 Assessment Results - Location B

Operational attended noise monitoring was completed in each assessment period at Location B, 781 Jenolan Caves Road on Thursday 17 August 2023, Friday 18 August 2023 and Friday 25 August 2023. **Table 5** presents the monitored noise level contributions and observed meteorological conditions for each measurement.

Table 5 Operator-Attended Noise Survey Results – Location B

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
17/08/2023	16:42 (Day)	61	42	28	WD: W WS: 1.8m/s Rain: Nil	Traffic 27-40 Wind in vegetation 27-36 Birds 42-48 Aircraft 40-61 Quarry reverse alarm <28
Austen Quarry Contribution[1]						<28 dB $L_{Aeq(15min)}$
17/08/2023	18:01 (Evening)	49	29	24	WD: W WS: 0.1m/s Rain: Nil	Traffic 26-49 Site mobile plant 26-34
Austen Quarry Contribution[1]						30 dB $L_{Aeq(15min)}$
25/08/2023	6:00 (Morning Shoulder)	65	44	33	WD: WS: m/s Rain: Nil	Birds 35-65 Aircraft 40-48 Traffic 37-42 Dog 33-45 Residential noise 32 Site mobile plant 30-33
Austen Quarry Contribution[1]						<32 dB $L_{Aeq(15min)}$ <32 dB L_{Amax}

Note 1: Estimated quarry noise contribution.

4.4 Assessment Results - Location C

Operational attended noise monitoring was completed in each assessment period at Location C, 64 Carroll Drive on Thursday 17 August 2023 and Friday 18 August 2023. **Table 6** presents the monitored noise level contributions and observed meteorological conditions for each measurement.

Table 6 Operator-Attended Noise Survey Results – Location C

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
17/8/2023	17:28 (Day)	63	41	35	WD: WS: m/s Rain: Nil	Local residential noise 40-63 Birds 39-48 Traffic 33-40 Dog barking 58 Aircraft 38-45 Insect <33 Quarry inaudible
Austen Quarry Contribution[1]						<25 dB $L_{Aeq(15min)}$
17/8/2023	18:51 (Evening)	55	37	34	WD: W WS: 0.1m/s Rain: Nil	Traffic 38-46 Insects 34-38 Dog barking 50-55 Quarry inaudible
Austen Quarry Contribution[1]						<24 dB $L_{Aeq(15min)}$
18/8/2023	6:01 (Morning Shoulder)	59	43	37	WD: NW WS: 1.5m/s Rain: Nil	Traffic 34-46 Birds 40-59 Quarry inaudible
Austen Quarry Contribution[1]						<27 dB $L_{Aeq(15min)}$ <27 dB L_{Amax}

Note 1: Estimated quarry noise contribution.

4.5 Unattended Noise Monitoring Results

Unattended noise monitoring was conducted at Location B from Thursday 17 August 2023 to Friday 25 August 2023 while the quarry was operational. A comparison of attended and unattended noise monitoring data has been completed. **Table 7** presents the result of this comparison, focusing on the 15-minute statistics for the corresponding measurement times.

Table 7 Unattended Logging versus Operator-Attended Noise Survey – Location B

Date	Time (hrs)	Attended descriptors (dBA re 20 µPa)			Unattended descriptors (dBA re 20 µPa)		
		dB L_{Amax}	dB L_{Aeq}	dB L_{A90}	dB L_{Amax}	dB L_{Aeq}	dB L_{A90}
17/08/2023	16:42	61	42	28	95	65	30
17/08/2023	18:01	49	29	24	52	35	26
25/08/2023	06:00	65	44	33	65	42	30

Results of the comparison identify that the unattended results are generally lower due to the offset to the road, although results remain relativity consistent during the measurement periods.

Attended noise monitoring identified that quarry noise remained inaudible during the monitoring period. Accordingly, it is deemed that the monitored unattended noise levels are not representative of the quarry emissions but rather representative of the ambient local environment. A summary of daily metrics for the assessment period from Thursday 17 August 2023 to Friday 25 August 2023 is presented in **Table 8**. **Appendix C** presents the logger charts of the results of the unattended monitoring survey.

Table 8 Unattended Noise Logging Summary – Location B

Date	Unattended descriptors (dBA re 20 µPa)		
	dB L_{Aeq}		
	Day	Evening	Night
Thursday, 17 August 2023	38	41	45
Friday, 18 August 2023	57	57	42
Saturday, 19 August 2023	48	38	36
Sunday, 20 August 2023	38	27	39
Monday, 21 August 2023	40	33	37
Tuesday, 22 August 2023	43	41	36
Wednesday, 23 August 2023	37	30	43
Thursday, 24 August 2023	39	32	36
Friday, 25 August 2023	38	N/A	N/A

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5 Noise Compliance Assessment

The compliance assessment for the nominated monitoring locations are presented in **Table 9** to **Table 12** for day, evening and morning shoulder assessment periods.

Table 9 Daytime $LA_{eq(15min)}$ Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB $LA_{eq(15min)}$	dB $LA_{eq(15min)}$	
A	<29	35	✓
B	<28	35	✓
C	<25	35	✓

Table 10 Evening $LA_{eq(15min)}$ Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB $LA_{eq(15min)}$	dB $LA_{eq(15min)}$	
A	<32	35	✓
B	30	35	✓
C	<24	35	✓

Table 11 Morning Shoulder $LA_{eq(15min)}$ Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB $LA_{eq(15min)}$	dB $LA_{eq(15min)}$	
A	<34	35	✓
B	<32	35	✓
C	<27	35	✓

Table 12 Morning Shoulder LA_{max} Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB LA_{max}	dB LA_{max}	
A	<34	52	✓
B	<32	52	✓
C	<27	52	✓

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6 Discussion

6.1 Discussion of Results - Location A

Monitoring conducted at Location A, 200 Jenolan Caves Road, Hartley, NSW, was dominated by passing traffic. Traffic included trucks from Austen Quarry, adjacent (non-project) quarries and several transport firms. Local light vehicle traffic also contributed to the overall ambient environment. Quarry noise emissions were inaudible during all three monitoring periods for the August 2023 survey. Other extraneous noise sources audible during the three attended surveys included insects, birds, traffic, gunshots and creek flow.

The measured quarry day, evening and morning shoulder noise contribution for Location A are consistent with the noise levels predicted in the Noise and Blasting Impact Assessment (NBIA) (Ref: MAC170511RP1, Muller Acoustic Consulting Pty Ltd, 2018) prepared for the Stage 2 extension of the quarry.

6.2 Discussion of Results - Location B

Monitoring results at Location B, 781 Jenolan Caves Road, Good Forest, NSW, identified that the quarry was audible during all three assessment periods. Quarry sources included site mobile plant and reverse alarms. Notwithstanding, emissions from the quarry remained below applicable noise criteria for all measurements. Extraneous noise sources dominated the noise environment which included insects, traffic, wind in vegetation, aircraft, local residential noise, birds, dogs barking livestock and aircraft.

The measured quarry day, evening and morning shoulder noise contribution for Location B are consistent with the noise levels predicted in the NBIA.

6.3 Discussion of Results - Location C

Monitoring results at Location C, 64 Carroll Drive, Hartley, NSW, identified that the quarry remained inaudible during all three assessment periods for the August 2023 survey. Extraneous noise sources dominated the noise environment which included local residential noise, aircraft, wind, traffic, insects. birds and dogs barking.

The measured quarry day, evening and morning shoulder noise contribution for Location C are consistent with the noise levels predicted in the NBIA.

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7 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment for RW Corkery & Co Pty Limited on behalf of Hy-Tec Industries Pty Ltd for Austen Quarry, Hartley, NSW. The assessment was completed to assess the quarry's compliance with the relevant criteria outlined in EPL#12323 and SSD-6084 for three nominated residential receivers surrounding the quarry.

Operator attended noise monitoring was undertaken on Thursday 17 August 2023, Friday 18 August 2023 and Friday 25 August 2023 at the nominated monitoring locations with quarry noise contributions compared against the relevant criteria.

The assessment has identified that noise emissions generated by Austen Quarry comply with relevant noise criteria specified in EPL#12323 and SSD-6084 at all assessed locations for the three relevant assessment periods.

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Appendix A – Glossary of Terms

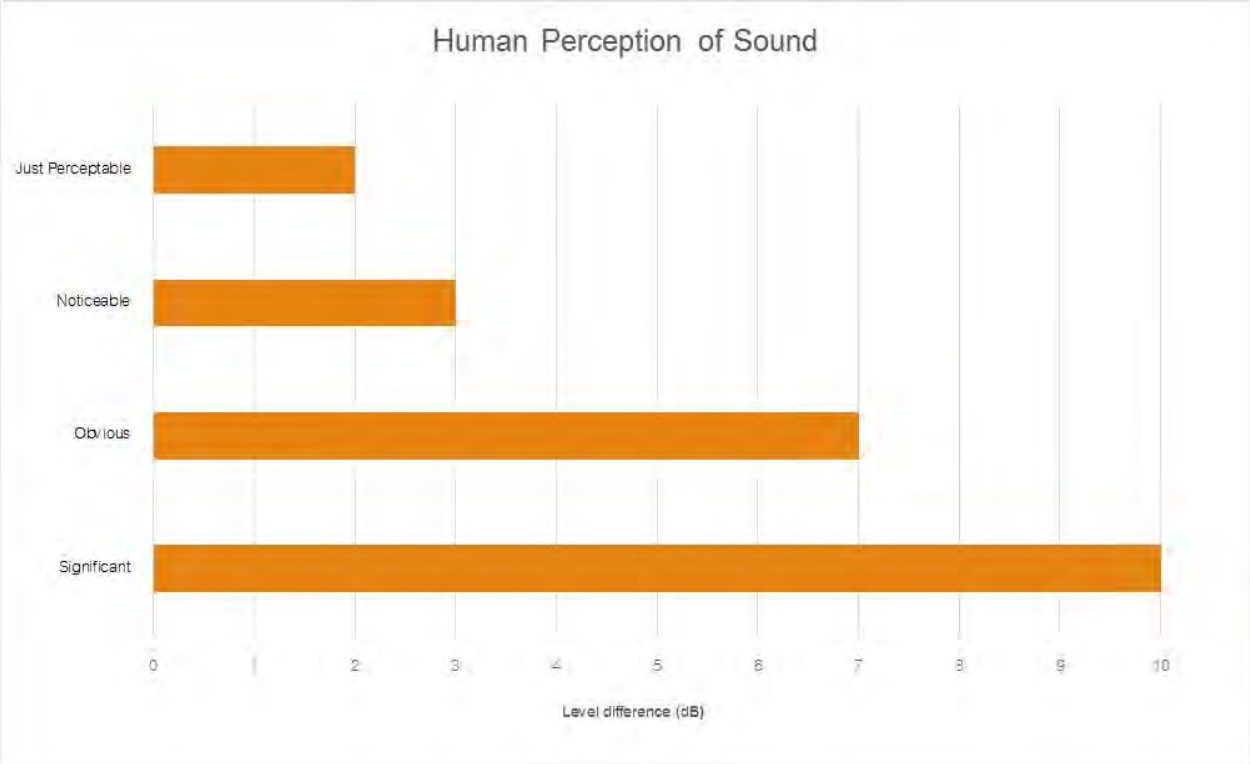
Table A1 provides a number of technical terms have been used in this report.

Table A1 Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAmax	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : = 10.log10 (W/Wo) Where : W is the sound power in watts and Wo is the sound reference power at 10-12 watts.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



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Appendix B – Operational Logs

DAILY PRODUCTION LOG & CHECKLIST - PRIMARY

Date: 17/8/23 Operator: BRETT

Weather Conditions; FINE FROST Quarry Bench ID. 775

Shift Start Time	6 AM	Shift Finish Time	5 PM
Crusher Start Time	7.45	End of day Crusher stopped	4.35

Belt Weightometer Reading - Daily

Conveyor 1 Start	Conveyor 1 Finish	Total Tonnes Crushed
		3498

Cartage of Raw Feed from Face to Boot – Number of loads

DU4 Loads to Boot	44	DU1 Loads to Boot	
DU6 Loads to Boot	42	Contractor Loads to Boot	231

Stoppages due to Trucks	Stoppages due to Jaw

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
	5:25		
	7.45	1.45	FROST ON CV 8
4.35		.25	Shutdown

Pre start checks;

Generator hours. 36514 Generator oil level.. ✓

Plant Visual ..... Pilot hours .....

COMMENTS

CV3 lanyard tripped

DAILY PRODUCTION LOG & CHECKLIST - SECONDARY

an ADBRI company

Date: 17/8/23 Operator: NEIL

Weather Conditions: Frost

Shift Start Time	6AM	Shift Finish Time	
Crusher Start Time	726	End of day Crusher stopped	

Weightometer Reading; Start: 6592466 **Finish:** 6597783

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
	4:40		
	630	.5	CV4 slipping in frost CV2 slipping
	~~6:40~~		~~450~~ crusher - unblock 450 shoot
			PRC Longyard trip
	747	1.17	PRC start frost
11.07	11.09	.2	PRC off clean 450 shoot
11.62	11.19	.7	crusher inspection
1.00	123	.23	crusher oils - screen clean - Head Box hose 10-7
135	205	.30	450 Lube Fault
~~450~~	451	.1	450 +550 Adj
609	604	.1	550 Adj
7:30		2.5	Shutdown - CV4 Belt

PRODUCTION SUMMARY

Belts	Size	Description	Total Tonnes	Comments
CV 8	20 mm	Concrete Aggregate	1300	
CV 20	Course Sand 4-0mm	Manufactured Sand	950	
CV 20	Old Man Sand	Man sand By-Pass Air-Sep		
CV 21	Super Fine –50micron	Super Fine Sand	350	
CV19*	10-7mm Blend*	Concrete Blend	1100	
CV19	7mm	Concrete Aggregate		
CV17	10mm	Concrete Aggregate		
CV15	14mm	Concrete Aggregate	250	
CV5	Ballast/40mm	Non Spec Aggregate		

3950

SECONDARY CRUSHER - PRE START CHECK

Date: ..... Operator: .....

HY-TEC an ADBRI company

GENERATOR

	Generator
OIL LEVEL	/
FUEL DAY TANK	
ENGINE DIP STICK	/
HOURS	7903
AIR FILTER	
PILOT HOURS	

CRUSHERS

	MVP 450	MVP 550
OIL LEVEL	/	/
CSS	29	21
VISUAL LINER CHECK	/	/

COMMENT

Canica, air seperator, crushers and water off

DAILY PRODUCTION LOG & CHECKLIST - PRIMARY

Date: 18/8/23 Operator: BRETT

Weather Conditions; WET Quarry Bench ID. 775

Shift Start Time	6 AM	Shift Finish Time	3.30 PM
Crusher Start Time	7.20	End of day Crusher stopped	11 AM

Belt Weightometer Reading - Daily

Conveyor 1 Start	Conveyor 1 Finish	Total Tonnes Crushed
		1390

Cartage of Raw Feed from Face to Boot – Number of loads

DU4 Loads to Boot		DU1 Loads to Boot	
DU6 Loads to Boot		Contractor Loads to Boot	

Stoppages due to Trucks	Stoppages due to Jaw

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
9.30	10.00	30	SMOKO
11.00			CVS SPLIT

Pre start checks;

Generator hours. 36526 Generator oil level.. ✓

Plant Visual ..... Pilot hours .....

COMMENTS

Owner: Quarry Manager		HY-TEC CONCRETE & QUARRIES	Form: HTQY-P-SFT-036
Forms & Templates	Revision: 4	Status: Approved	Issue Date: 18 Dec 2013

DAILY PRODUCTION LOG & CHECKLIST - SECONDARY

an ADBRI company

Date: 18/8/23 Operator: Brenton

Weather Conditions; Wet

Shift Start Time	100pm	Shift Finish Time	930pm
Crusher Start Time	752pm	End of day Crusher stopped	917pm

Weightometer Reading; Start: 6617783 **Finish:** 6698396 = 613

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
	752pm		Late start CV4 change out
814	815		450 + 560 kN's

PRODUCTION SUMMARY

Belts	Size	Description	Total Tonnes	Comments
CV 8	20 mm	Concrete Aggregate	150	
CV 20	Course Sand 4-0mm	Manufactured Sand	150	
CV 20	Old Man Sand	Man sand By-Pass Air-Sep		
CV 21	Super Fine –50micron	Super Fine Sand	30	
CV19*	10-7mm Blend*	Concrete Blend	150	
CV19	7mm	Concrete Aggregate		
CV17	10mm	Concrete Aggregate		
CV15	14mm	Concrete Aggregate	25	
CV5	Ballast/40mm	Non Spec Aggregate		
			505	

SECONDARY CRUSHER - PRE START CHECK

Date: 18/8/23 Operator: Brendan

HY-TEC an ADBRI company

GENERATOR

	Generator
OIL LEVEL	✓
FUEL DAY TANK	✓
ENGINE DIP STICK	✓
HOURS	7919
AIR FILTER	✓
PILOT HOURS	

CRUSHERS

	MVP 450	MVP 550
OIL LEVEL	✓ 60 Litres	✓ 10 Litres
CSS	30	18
VISUAL LINER CHECK	✓	✓

COMMENT

DAILY PRODUCTION LOG & CHECKLIST - PRIMARY

Date: 25.8.23 Operator: BRETT

Weather Conditions; FINE & FROST Quarry Bench ID. 775

Shift Start Time	6 AM	Shift Finish Time	9.30 pm
Crusher Start Time	7.35	End of day Crusher stopped	7.36

Belt Weightometer Reading - Daily

Conveyor 1 Start	Conveyor 1 Finish	Total Tonnes Crushed
		4317

Cartage of Raw Feed from Face to Boot – Number of loads

DU4 Loads to Boot	27	DU1 Loads to Boot	
DU6 Loads to Boot	28	Contractor Loads to Boot	518

CAT 769 is

Stoppages due to Trucks	Stoppages due to Jaw

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
			FROST ON CV 8
11.10	11.30	20	ROCK IN CV2 CHUTE
3.05			
6.57	7.18	21 mins	Rock in CV2 CHUTE

Pre start checks;

Generator hours. 36596 Generator oil level. ✓

Plant Visual ..... Pilot hours .....

COMMENTS

Loader 1 1033 tonnes into bin

DAILY PRODUCTION LOG & CHECKLIST - SECONDARY

HY-TEC an ADBRI company

Date: 25-8-23 Operator: NEIL

Weather Conditions; Frost - Fine ☺

Shift Start Time	5AM	Shift Finish Time	9.00pm
Crusher Start Time	6.12 am	End of day Crusher stopped	835pm

Weightometer Reading; Start: 6924256 **Finish:** ~~6930144~~ 6930144=5888

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
			450 Hydraulic Fault
	612	.12	450 Crusher start
			CV4 slipping CV2 slipping
647	648	.1	550 Adj (5 teeth)
657	658	.1	450 Adj (5 teeth)
9.58	9.59	.1	550 Adj (5 teeth)
10.50	10.51	.1	450 Adj
12.55	121	.26	Crusher oils - screen clean 10/7 H/Box clean
~~R1~~	R2	.1	450 Adj
152	153	.7	metal detector
211	315	1.04	Check Conica Plates
411	412	.1	450 Adj
506	515	.9	metal detector
616	617	.1	450 +550 Adj
815	821	.6	metal detector

PRODUCTION SUMMARY

Belts	Size	Description	Total Tonnes	Comments
CV 8	20 mm	Concrete Aggregate	1300	
CV 20	Course Sand 4-0mm	Manufactured Sand	1000	
CV 20	Old Man Sand	Man sand By-Pass Air-Sep		
CV 21	Super Fine –50micron	Super Fine Sand	300	
CV19*	10-7mm Blend*	Concrete Blend	1200	
CV19	7mm	Concrete Aggregate		
CV17	10mm	Concrete Aggregate		
CV15	14mm	Concrete Aggregate	300	
CV5	Ballast/40mm	Non Spec Aggregate		

4100

SECONDARY CRUSHER - PRE START CHECK

Date: 25-8-22 Operator: MEIL

HY-TEC an ADBRI company

GENERATOR

	Generator
OIL LEVEL	/
FUEL DAY TANK	
ENGINE DIP STICK	
HOURS	7993
AIR FILTER	
PILOT HOURS	

CRUSHERS

	MVP 450	MVP 550
OIL LEVEL	/	/
CSS	31	21
VISUAL LINER CHECK	/	/

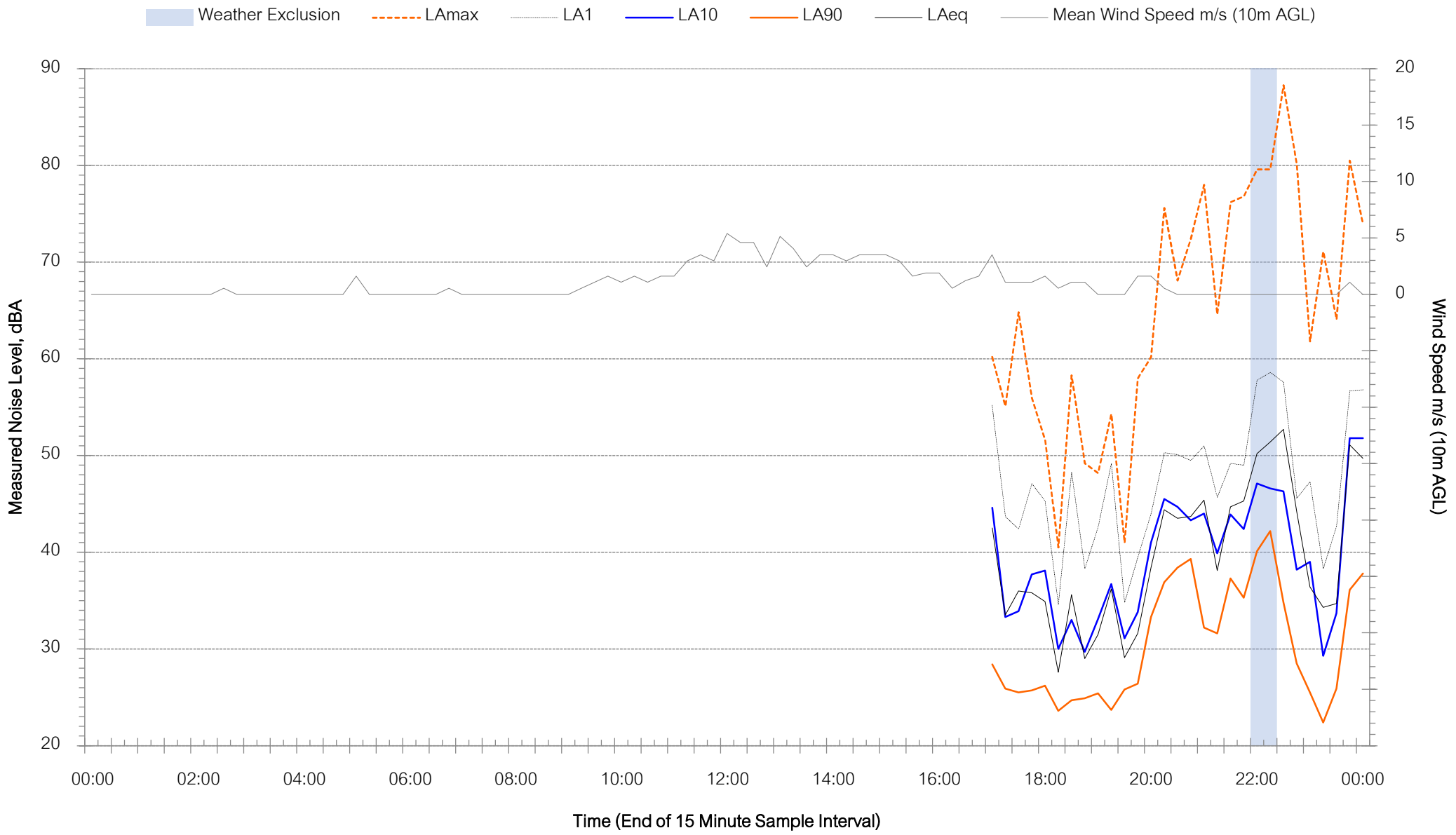
COMMENT

NEW 450 Liner

Appendix C – Noise Monitoring Charts

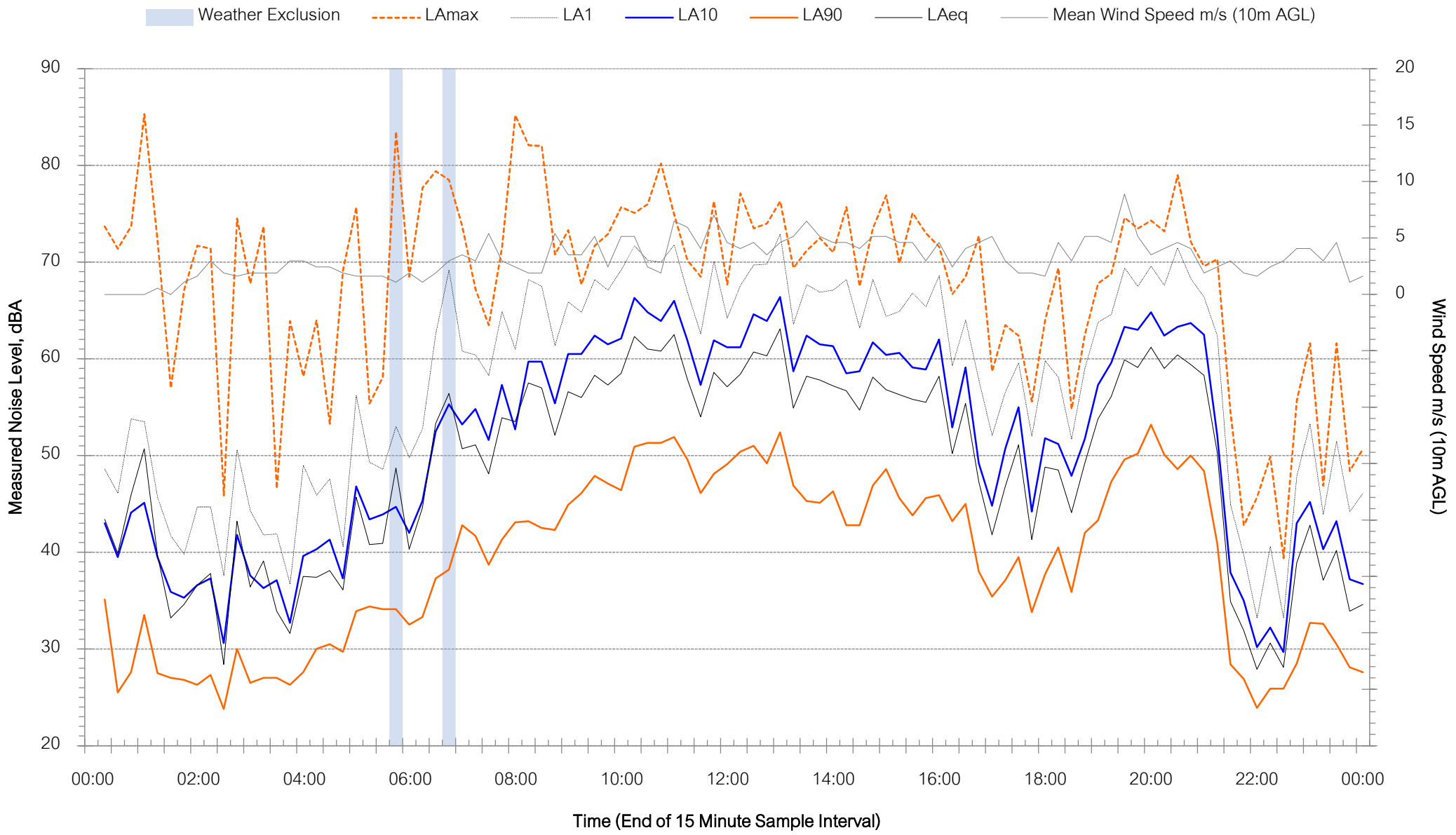
Background Noise Levels

Location B, 791 Jenolan Caves Road, Good Forest - Thursday 17 August 2023



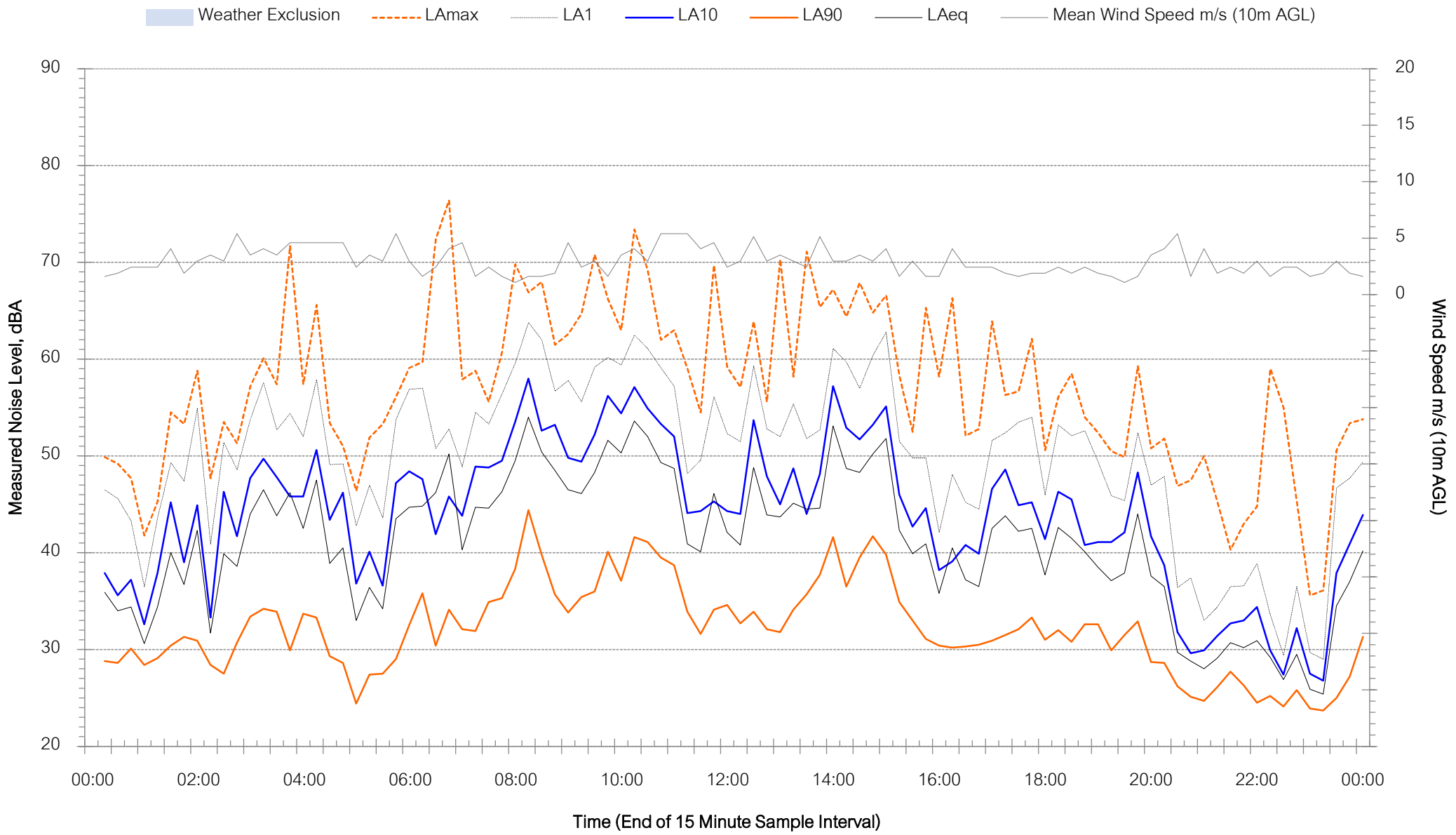
Background Noise Levels

Location B, 791 Jenolan Caves Road, Good Forest - Friday 18 August 2023



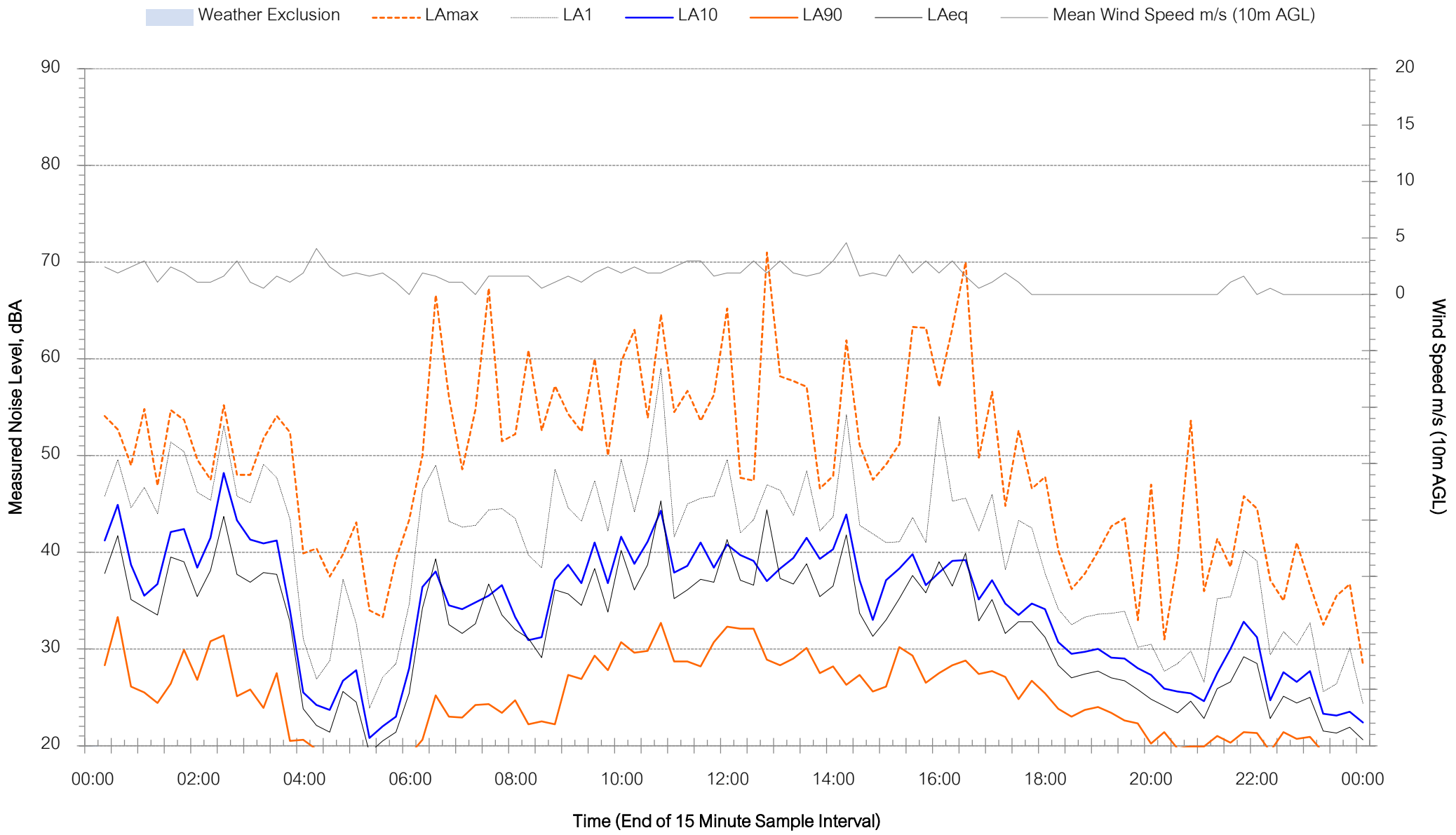
Background Noise Levels

Location B, 791 Jenolan Caves Road, Good Forest - Saturday 19 August 2023



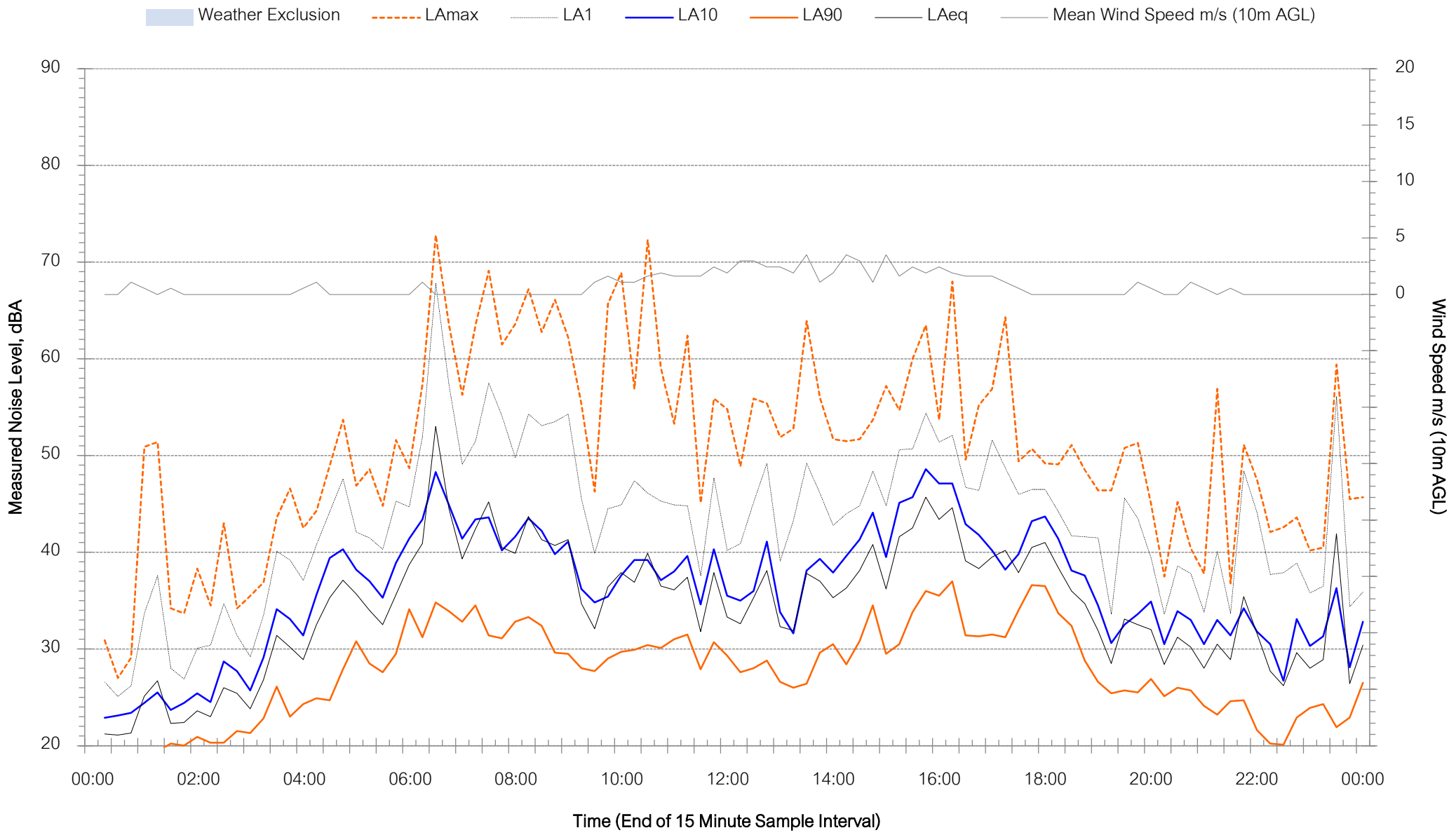
Background Noise Levels

Location B, 791 Jenolan Caves Road, Good Forest - Sunday 20 August 2023



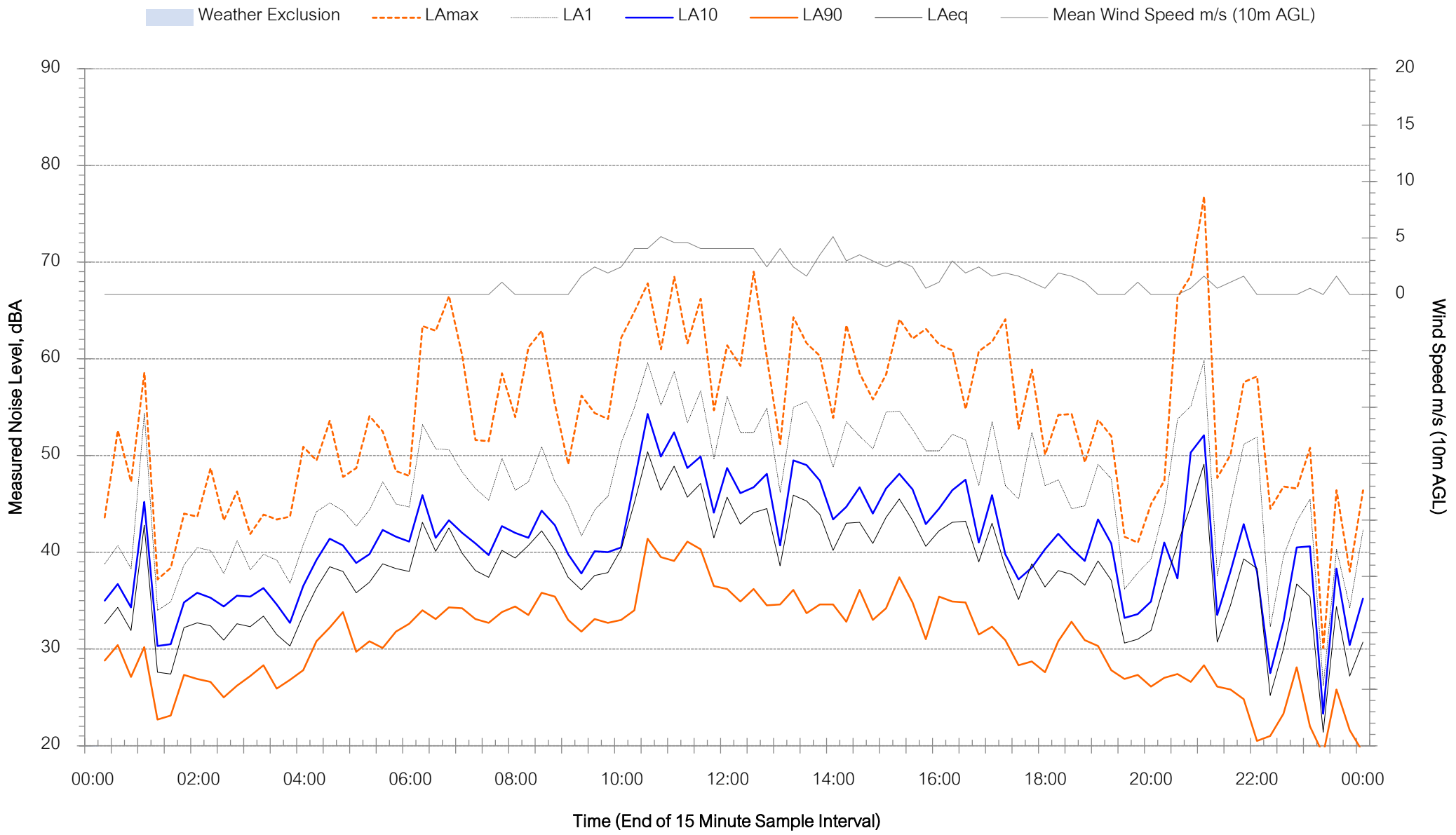
Background Noise Levels

Location B, 791 Jenolan Caves Road, Good Forest - Monday 21 August 2023



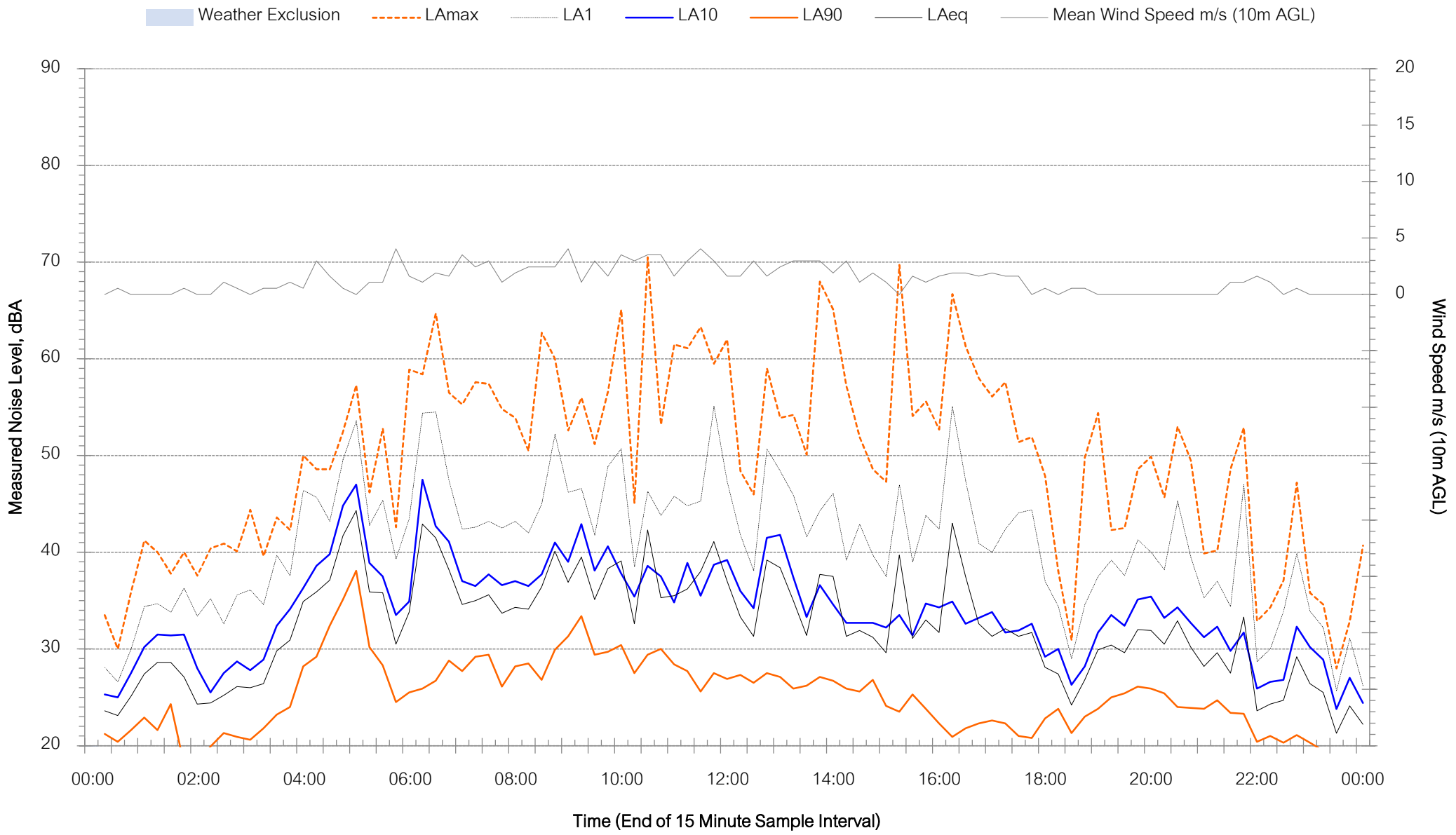
Background Noise Levels

Location B, 791 Jenolan Caves Road, Good Forest - Tuesday 22 August 2023



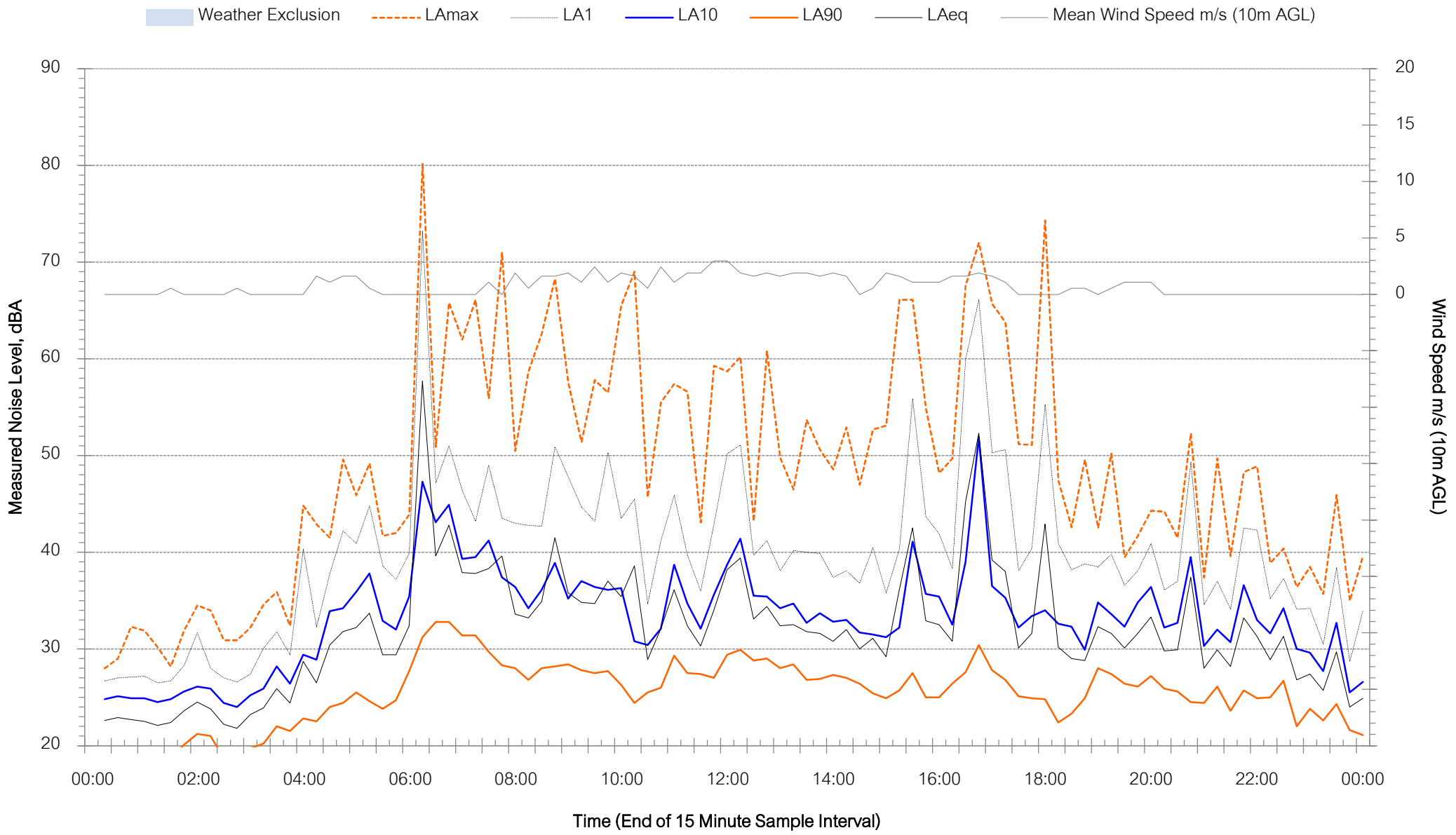
Background Noise Levels

Location B, 791 Jenolan Caves Road, Good Forest - Wednesday 23 August 2023



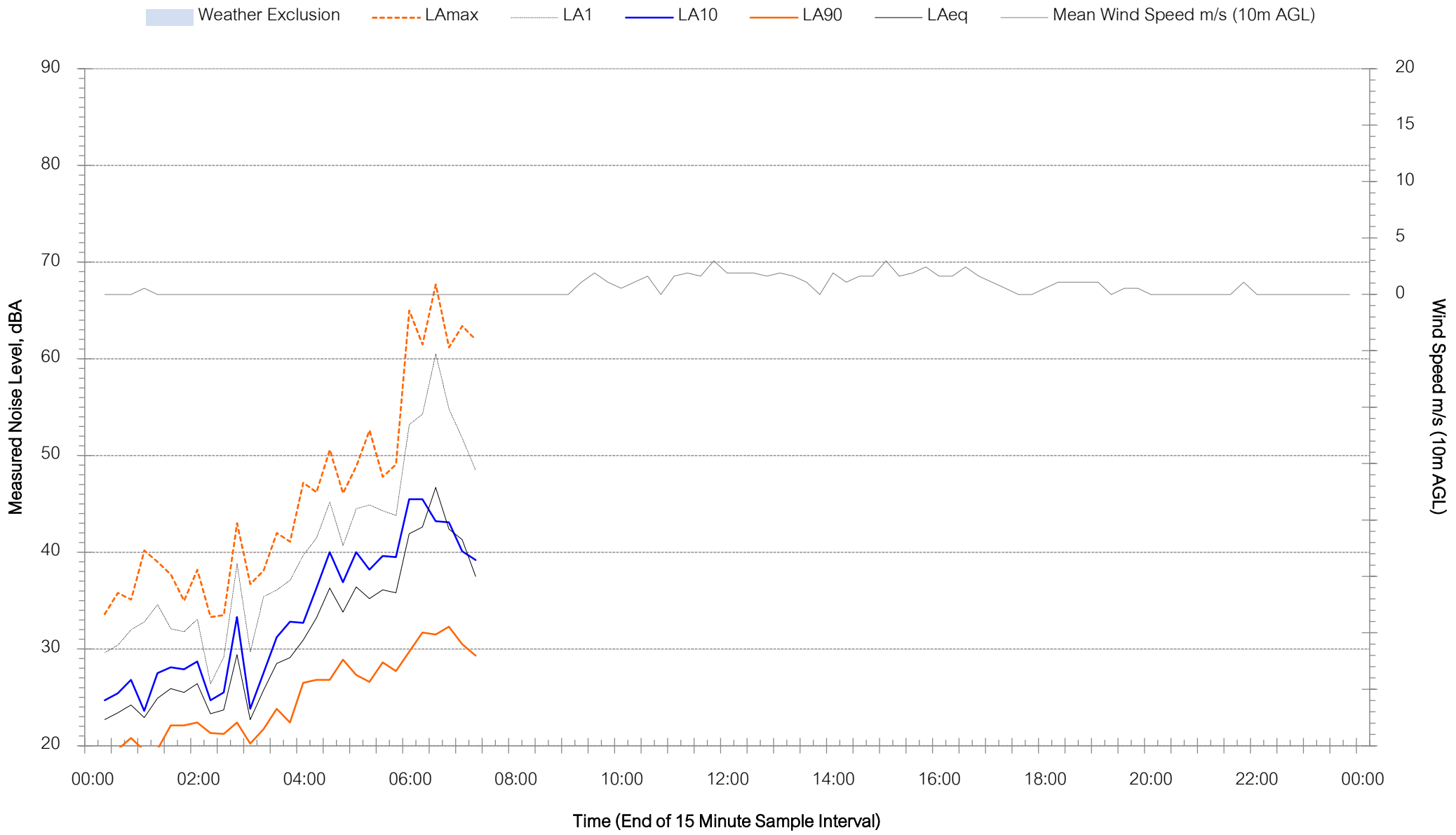
Background Noise Levels

Location B, 791 Jenolan Caves Road, Good Forest - Thursday 24 August 2023



Background Noise Levels

Location B, 791 Jenolan Caves Road, Good Forest - Friday 25 August 2023



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MAC
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Noise Monitoring Assessment

Austen Quarry, Hartley, NSW
April 2024

Prepared for: RW Corkery & Co Pty Limited
April 2024
MAC170523RP15

Muller Acoustic Consulting

Document Information

Noise Monitoring Assessment

Austen Quarry, Hartley, NSW

April 2024

Prepared for: RW Corkery & Co Pty Limited (on behalf of Hy-Tec Pty Ltd)

Prepared by: Muller Acoustic Consulting Pty Ltd
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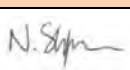
Document ID	Date	Prepared By	Signed	Reviewed By	Signed
MAC170523RP15	30 April 2024	Nicholas Shipman		Oliver Muller	

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APPENDIX A – GLOSSARY OF TERMS

APPENDIX B – OPERATIONAL LOGS

APPENDIX C – NOISE MONITORING CHARTS

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by RW Corkery & Co Pty Limited (RWC) on behalf of Hy-Tec Industries Pty Ltd (HT) to complete a Noise Monitoring Assessment (NMA) for Austen Quarry Operations, Hartley, NSW.

The monitoring has been conducted in accordance with the approved Austen Quarry Noise Management Plan and in general accordance with Conditions L4.1 to L4.3 of EPL #12323 (EPL); at three representative monitoring locations.

The assessment was conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- Environment Protection Licence (EPL #12323);
- NSW Environment Protection Authority (EPA's), Approved Methods for the measurement and analysis of environmental noise in NSW, 2022;
- RW Corkery & Co Pty Limited, Austen Quarry Noise Management Plan (NMP); and
- Standards Australia AS 1055:2018 - Acoustics - Description and measurement of environmental noise.

This assessment was completed on Monday 8 April 2024 and Tuesday 9 April 2024 and forms part of the noise monitoring program to address conditions of EPL #12323, Austen Quarry Development Consent SSD 6084 (SSD-6084) and the Noise Management Plan.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

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2 Noise Criteria

2.1 Environmental Protection License Noise Limits

Section L4 of the project's EPL (EPL #12323) outlines the applicable operational noise criteria for all privately owned receivers surrounding the mine. The criteria outlined in the EPL is reproduced below:

> *L4.1 Noise from the premises must not exceed 35 dB(A)LAeq (15 minute) at any time.*
>
> *Where LAeq means the equivalent continuous noise level - the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.*
>
> *L4.2 To determine compliance with condition(s) L4.1 noise must be measured at, or computed for, any affected noise sensitive locations (such as a residence, school or hospital). A modifying factor correction must be applied for tonal, impulsive or intermittent noise in accordance with the "Environmental Noise Management - NSW Industrial Noise Policy (January 2000)".*
>
> *L4.3 The noise emission limits identified in this licence apply under all meteorological conditions except:*
>
> a) *during rain and wind speeds (at 10m height) greater than 3m/s; and*
> b) *under "non-significant weather conditions".*
>
> *Note: Field meteorological indicators for non-significant weather conditions are described in the NSW Industrial Noise Policy, Chapter 5 and Appendix E in relation to wind and temperature inversions.*

2.2 State Significant Development Consent Noise Limits

The operating criteria specified in Schedule 3, Condition 3 of the Austen Quarry Development Consent (SSD-6084), approved and modified on 15 July 2019 aligns with criteria outlined in EPL #12323 for the quarry at all privately owned receivers, ie 35dB $LA_{eq(15min)}$. Furthermore, SSD-6084 specifies an LA_{max} criteria for site operations of 52dBA during the morning shoulder period.

2.3 Noise Limits Summary

Table 1 presents a summary of the noise criteria for privately owned residential receivers surrounding the quarry, as outlined in SSD-6084 and EPL #12323.

Table 1 Noise Criteria

Receiver	Day dB $LA_{eq(15min)}$	Evening dB $LA_{eq(15min)}$	Morning Shoulder dB $LA_{eq(15min)}$	Morning Shoulder dB LA_{max}
All privately owned residences	35	35	35	52

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3 Methodology

3.1 Locality

The quarry is located on Jenolan Caves Road, Hartley, NSW, approximately 10km south of Lithgow, NSW. Receivers in the locality surrounding the quarry are primarily rural/residential. The Great Western Highway is situated to the northeast of the site and Jenolan Caves Road to the west of the site.

3.2 Noise Monitoring Locations

Three monitoring locations have been selected as part of the NMA in accordance with the Noise Management Plan (NMP) and are summarised below:

- Location A (residence identifier R24A as per NMP), is located at 200 Jenolan Caves Road, Hartley, NSW, approximately 2.5km north of the project;
- Location B (residence identifier R31 as per NMP), is located at 781 Jenolan Caves Road, Good Forest, NSW, approximately 1km southwest of the project site; and
- Location C (residential identifier R48 as per NMP) is located at 64 Carroll Drive, Hartley, NSW, approximately 2.5km northeast of the quarry.

The monitoring locations with respect to quarry are presented in the locality plan shown in **Figure 1**.

3.3 Attended Monitoring Methodology

The attended noise surveys were conducted in general accordance with the procedures described in Standards Australia AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and EPL #12323. The measurements were carried out using a Svantek Type 1, 971 noise analyser on Monday 8 April 2024 and Tuesday 9 April 2024. The acoustic instrumentation used carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained by MAC as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022) and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA.

Noise measurements were of 15-minutes in duration and where possible, throughout each survey, the operator quantified the contribution of each significant noise source. One measurement was conducted at each of the monitoring locations during the day, evening, and morning shoulder monitoring periods to quantify the noise sources in the ambient noise environment.

3.4 Unattended Monitoring Methodology

The unattended noise survey, completed at Location A - 200 Jenolan Caves Road, Hartley, NSW, was conducted in general accordance with the procedures described in Standards Australia AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise". The measurements were carried out using a Svantek Type 1, 977 noise analyser. Monitoring was conducted between Monday 8 April 2024 and Thursday 18 April 2024. The acoustic instrumentation used carries current NATA calibration and complies with AS/NZS IEC 61672:2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA. Data affected by adverse meteorological conditions (ie winds greater than 10m/s at 10m elevation and rain periods) have been excluded from the results.

3.5 Operational Logs

Operational logs for the primary and secondary crushers have been provided by Austen Quarry management. It is noted that processing equipment commences at 6am. Daily pre-shift meetings and safety checks often delay commencement of onsite operations until closer to 7am. Morning shoulder measurements were conducted from 6am to 7am on Tuesday 9 April 2024 to capture the onsite operations at the nominated monitoring locations.

Table 2 presents a summary of the hours of operation of the primary and secondary crushers with the quarry operational logs which are reproduced **Appendix B**.

Table 2 Primary and Secondary Crushers Hours of Operation

Date	Primary Crusher		Secondary Crusher	
	Commenced Crushing (hrs)	Ceased Crushing (hrs)	Commenced Crushing (hrs)	Ceased Crushing (hrs)
08/04/2024	06:50	16:30	06:40	21:25
09/04/2024	06:55	20:30	06:50	18:30

FIGURE 1

LOCALITY PLAN

REF: MAC170523

0 500m

KEY

A MONITORING LOCATION

SITE LOCATION

MAC
Muller Acoustic Consulting

*Imagery Source : nearmaps

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4 Results

4.1 Meteorological Conditions – Location B

As prescribed in Condition L3.2 of the EPL (EPL #12323) weather data for the noise assessment period was sourced from the onsite weather station #3490 as well as operator measured conditions on site of EPL nominated receiver Location B to determine prevailing meteorological conditions at the time of the attended measurements and are presented in **Table 3**.

Table 3 Prevailing Meteorological Conditions

Date & Time	Onsite Weather Station Station #3490 (10mAGL)		Operator Measured Weather EPL Monitoring Location (1.8m AGL)	
	Wind Direction	Wind (m/s)	Wind Direction	Wind (m/s)
08/04/2024 17:22	SSW	1.6	S	0.1
08/04/2024 17:45	SW	1.0	S	0.1
08/04/2024 18:03	S	1.6	S	0.1
08/04/2024 18:29	WSW	0.9	S	0.1
08/04/2024 18:51	SW	1.0	S	0.1
09/04/2024 06:01	E	0.4	S	0.1
09/04/2024 06:26	NNE	0.1	S	0.1
09/04/2024 06:47	SSW	0.2	S	0.1
09/04/2024 07:04	SE	0.4	S	0.1

Location B was selected as the nearest monitoring location to weather station #3490

4.2 Assessment Results - Location A

Operational attended noise monitoring was completed in each assessment period at Location A, 200 Jenolan Caves Road, on Monday 8 April 2024 and Tuesday 9 April 2024. **Table 4** presents the monitored noise level contributions and observed meteorological conditions for each measurement.

Table 4 Operator-Attended Noise Survey Results – Location A

Date	Time (hrs)	Descriptor (dBA re 20µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
08/04/2024	17:22 (Day)	80	59	46	WD: S WS: 0.1m/s Rain: Nil	Birds 46-58 Insects <46 Creek flow 46-48 Traffic 46-80 Quarry inaudible
Austen Quarry Contribution[1]						<35 dB $L_{Aeq(15min)}$
08/04/2024	18:29 (Evening)	76	57	47	WD: S WS: 0.1m/s Rain: Nil	Creek flow 47-49 Insects <47 Traffic 47-76 Quarry inaudible
Austen Quarry Contribution[1]						<35 dB $L_{Aeq(15min)}$
09/04/2024	06:26 (Morning Shoulder)	92	68	47	WD: S WS: 0.1m/s Rain: Nil	Creek flow 46-47 Birds 46-58 Traffic 48-92 Quarry inaudible
Austen Quarry Contribution[1]						<35 dB $L_{Aeq(15min)}$ <35 dB L_{Amax}

Note 1: Estimated quarry noise contribution.

4.3 Assessment Results - Location B

Operational attended noise monitoring was completed in each assessment period at Location B, 781 Jenolan Caves Road, on Monday 8 April 2024 and Tuesday 9 April 2024. **Table 5** presents the monitored noise level contributions and observed meteorological conditions for each measurement.

Table 5 Operator-Attended Noise Survey Results – Location B

Date	Time (hrs)	Descriptor (dBA re 20µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
08/04/2024	17:45 (Day)	66	42	33	WD: S WS: 0.1m/s Rain: Nil	Birds 31-66 Insects 31-33 Traffic 31-36 Livestock 31-34 Quarry inaudible
Austen Quarry Contribution[1]						<30 dB $L_{Aeq(15min)}$
08/04/2024	18:03 (Evening)	51	41	31	WD: S WS: 0.1m/s Rain: Nil	Birds 34-51 Aircraft 31-44 Insects 31-34 Quarry inaudible
Austen Quarry Contribution[1]						<30 dB $L_{Aeq(15min)}$
09/04/2024	06:01 (Morning Shoulder)	59	39	30	WD: S WS: 0.1m/s Rain: Nil	Birds 30-59 Traffic 30-38 Insects <27 Wind in vegetation 27-31 Quarry inaudible
Austen Quarry Contribution[1]						<30 dB $L_{Aeq(15min)}$ <30 dB L_{Amax}

Note 1: Estimated quarry noise contribution.

4.4 Assessment Results - Location C

Operational attended noise monitoring was completed in each assessment period at Location C, 64 Carroll Drive, on Monday 8 April 2024 and Tuesday 9 April 2024. **Table 6** presents the monitored noise level contributions and observed meteorological conditions for each measurement.

Table 6 Operator-Attended Noise Survey Results – Location C

Date	Time (hrs)	Descriptor (dBA re 20µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
09/04/2024	07:04 (Day)	60	43	38	WD: S WS: 0.1m/s Rain: Nil	Birds 35-60 Traffic 35-50 Quarry inaudible
		Austen Quarry Contribution[1]				<30 dB $L_{Aeq(15min)}$
08/04/2024	18:51 (Evening)	56	41	37	WD: S WS: 0.1m/s Rain: Nil	Insects 35-37 Traffic 35-56 Quarry inaudible
		Austen Quarry Contribution[1]				<30 dB $L_{Aeq(15min)}$
09/04/2024	06:47 (Morning Shoulder)	68	42	36	WD: S WS: 0.1m/s Rain: Nil	Traffic 34-46 Birds 34-68 Quarry inaudible
		Austen Quarry Contribution[1]				<30 dB $L_{Aeq(15min)}$ <30 dB L_{Amax}

Note 1: Estimated quarry noise contribution.

4.5 Unattended Noise Monitoring Results

Unattended noise monitoring was conducted at Location A from Monday 8 April 2024 and Friday 19 April 2024 while the quarry was operational. A comparison of attended and unattended noise monitoring data has been completed. **Table 7** presents the result of this comparison, focusing on the 15-minute statistics for the corresponding measurement times.

Table 7 Unattended Logging and Operator-Attended Comparison – Location A

Date	Time (hrs)	Attended descriptors (dBA re 20µPa)			Unattended descriptors (dBA re 20µPa)		
		dB L_{Amax}	dB L_{Aeq}	dB L_{A90}	dB L_{Amax}	dB L_{Aeq}	dB L_{A90}
08/04/2024	17:22	80	59	46	69[1]	55[1]	44[1]
08/04/2024	18:29	76	57	47	71	53	43
09/04/2024	06:26	92	68	47	72	57	43

Note 1: 7pm measurement period has been adopted for correlation, during secondary crushing operations.

Results of the comparison identify that the unattended results are generally lower due to the offset to the road, although results remain relativity consistent during the measurement periods.

Attended noise monitoring identified that quarry noise remained inaudible during the monitoring period. Accordingly, it is deemed that the monitored unattended noise levels are not representative of the quarry emissions but rather representative of the ambient local environment. A summary of daily metrics for the assessment period from Monday 8 April 2024 and Friday 19 April 2024 is presented in **Table 8**. **Appendix C** presents the logger charts of the results of the unattended monitoring survey.

Table 8 Unattended Noise Logging Summary – Location A

Date	Unattended descriptors (dBA re 20µPa)		
	dB L_{Aeq}		
	Day	Evening	Night
Monday 08 April 2024	N/A	52	52
Tuesday 09 April 20243	57	50	51
Wednesday 10 April 2024	55	51	52
Thursday 11 April 2024	54	52	52
Friday 12 April 2024	53	51	47
Saturday 13 April 2024	53	50	41
Sunday 14 April 2024	53	50	51
Monday 15 April 2024	55	50	53
Tuesday 16 April 2024	56	50	52
Wednesday 17 April 2024	55	51	52
Thursday 18 April 2024	53	51	52
Friday 19 April 2024	56	N/A	N/A

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5 Noise Compliance Assessment

The compliance assessment for the nominated monitoring locations is presented in **Table 9** to **Table 12** for day, evening and morning shoulder assessment periods.

Table 9 Daytime $LA_{eq(15min)}$ Noise Compliance Assessment

Location.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB $LA_{eq(15min)}$	dB $LA_{eq(15min)}$	
A	<35	35	✓
B	<35	35	✓
C	<35	35	✓

Table 10 Evening $LA_{eq(15min)}$ Noise Compliance Assessment

Location.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB $LA_{eq(15min)}$	dB $LA_{eq(15min)}$	
A	<30	35	✓
B	<30	35	✓
C	<30	35	✓

Table 11 Morning Shoulder $LA_{eq(15min)}$ Noise Compliance Assessment

Location	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB $LA_{eq(15min)}$	dB $LA_{eq(15min)}$	
A	<30	35	✓
B	<30	35	✓
C	<30	35	✓

Table 12 Morning Shoulder LA_{max} Noise Compliance Assessment

Location	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB LA_{max}	dB LA_{max}	
A	<35	52	✓
B	<30	52	✓
C	<30	52	✓

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6 Discussion

6.1 Discussion of Results - Location A

Monitoring conducted at Location A, 200 Jenolan Caves Road, Hartley, NSW, was dominated by passing traffic. Traffic included trucks from Austen Quarry, adjacent (non-project) quarries and several transport firms. Local light vehicle traffic also contributed to the overall ambient environment. Quarry noise emissions were inaudible during all three monitoring periods for the April 2024 survey. Other extraneous noise sources audible during the three attended surveys included insects, birds, traffic, and creek flow.

The measured quarry day, evening and morning shoulder noise contribution for Location A are consistent with the noise levels predicted in the Noise and Blasting Impact Assessment (NBIA) (Report Reference: MAC170511RP1, Muller Acoustic Consulting Pty Ltd, 2018) prepared for the Stage 2 extension of the quarry.

6.2 Discussion of Results - Location B

Monitoring results at Location B, 781 Jenolan Caves Road, Good Forest, NSW, identified that the quarry was inaudible during all three assessment periods. Notwithstanding, emissions from the quarry therefore remained below applicable noise criteria for all measurements. Extraneous noise sources dominated the noise environment which included insects, traffic, wind in vegetation, aircraft, birds, livestock, and aircraft.

The measured quarry day, evening and morning shoulder noise contribution for Location B are consistent with the noise levels predicted in the NBIA.

6.3 Discussion of Results - Location C

Monitoring results at Location C, 64 Carroll Drive, Hartley, NSW, identified that the quarry remained inaudible during all three assessment periods for the April 2024 survey. Extraneous noise sources dominated the noise environment which included traffic, insects, and birds.

The measured quarry day, evening and morning shoulder noise contribution for Location C are consistent with the noise levels predicted in the NBIA.

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7 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment for RW Corkery & Co Pty Limited on behalf of Hy-Tec Industries Pty Ltd for Austen Quarry, Hartley, NSW. The assessment was completed to assess the quarry's compliance with the relevant criteria outlined in EPL #12323 and SSD-6084 for three nominated residential receivers surrounding the quarry.

Operator attended noise monitoring was undertaken on Monday 8 April 2024 and Tuesday 9 April 2024 at the nominated monitoring locations with quarry noise contributions compared against the relevant criteria.

The assessment has identified that noise emissions generated by Austen Quarry comply with relevant noise criteria specified in EPL #12323 and SSD-6084 at all assessed locations for the three relevant assessment periods.

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Appendix A – Glossary of Terms

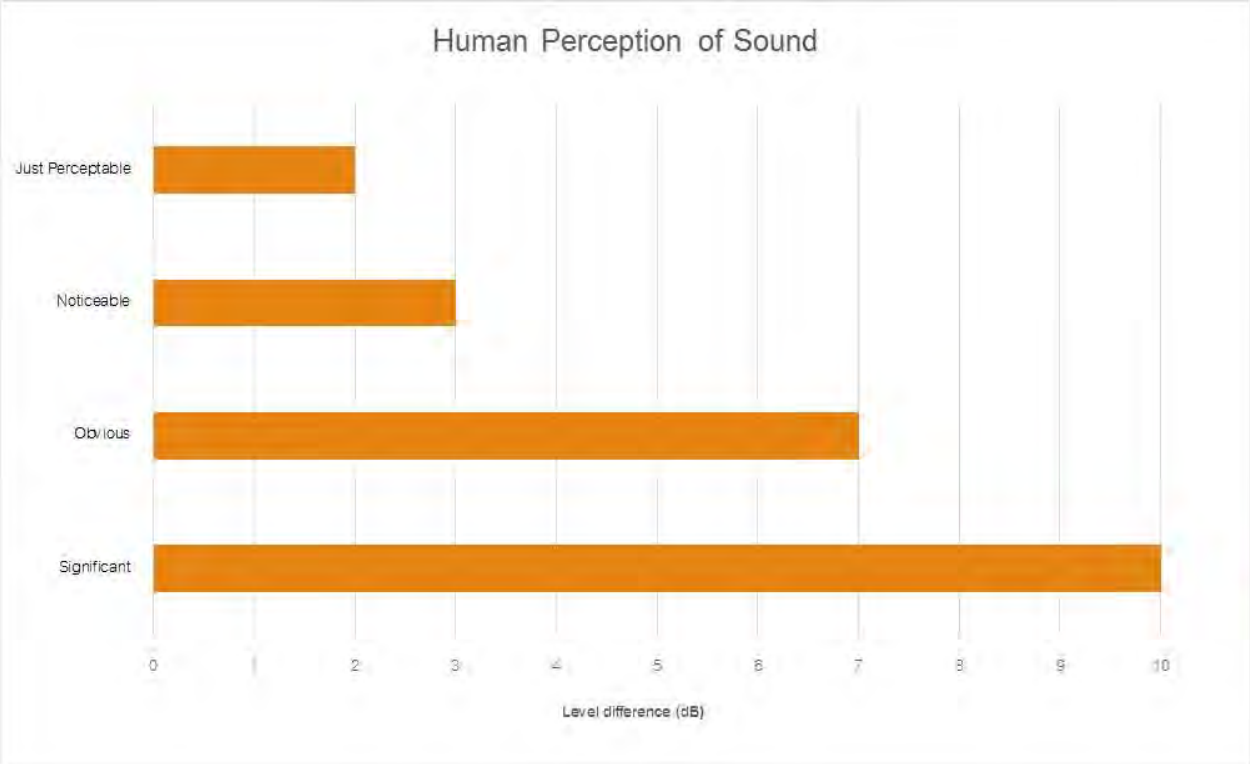
Table A1 provides a number of technical terms have been used in this report.

Table A1 Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAmax	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : = 10.log10 (W/Wo) Where : W is the sound power in watts and Wo is the sound reference power at 10-12 watts.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



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Appendix B – Operational Logs

DAILY PRODUCTION LOG & CHECKLIST - PRIMARY

HY-TEC an ADBRI company

Date: 9/4/24 Operator: BRETT

Weather Conditions; FINE Quarry Bench ID. 745

Shift Start Time	6AM	Shift Finish Time	5PM
Crusher Start Time	6·55	End of day Crusher stopped	4·35

Belt Weightometer Reading - Daily

Conveyor 1 Start	Conveyor 1 Finish	Total Tonnes Crushed
		2863 ?

Cartage of Raw Feed from Face to Boot – Number of loads

DT4 Loads to Boot	46	DT1 Loads to Boot	
DT6 Loads to Boot	40	Loader tonnes to Boot	

Stoppages due to Trucks	Stoppages due to Jaw

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
9·15	10·20	1H 5M	SMOKO & JAW ADJSTMENT
12·00	1·00	1H	STICK IN CV2 CHUTE

Pre start checks;

Generator hours. 28613 Generator oil level..

Plant Visual Pilot hours

COMMENTS

HY-TEC
an ADBRI company

DAILY PRODUCTION LOG & CHECKLIST - PRIMARY

Date: 9/4/24 Operator: Brett D

Weather Conditions; Raining Quarry Bench ID. 745

Shift Start Time	~~5.00pm~~ 1.00 pm	**Shift Finish Time**	~~5.30 pm~~ 10.00 pm.
Crusher Start Time	5.45 pm	**End of day Crusher stopped**	8.30 pm.

Belt Weightometer Reading - Daily

Conveyor 1 Start	Conveyor 1 Finish	Total Tonnes Crushed
0	0	1029 (Loader)

Cartage of Raw Feed from Face to Boot – Number of loads

DT4 Loads to Boot		**DT1 Loads to Boot**	
DT6 Loads to Boot		**Loader tonnes to Boot**	

Stoppages due to Trucks	Stoppages due to Jaw

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason

Pre start checks;

Generator hours. ..... Generator oil level.. .....

Plant Visual ..... Pilot hours .....

COMMENTS

DAILY PRODUCTION LOG & CHECKLIST - SECONDARY

HY-TEC an ADBRI company

Date: 9-4-24 Operator: Chris

Weather Conditions; Fine

Shift Start Time	5-30	Shift Finish Time	
Crusher Start Time	9-50	End of day Crusher stopped	6·30

Weightometer Reading; Start: 7694300 **Finish:**

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
11.00	11.01	1 min	CLOSE UP 450 CRUSHER.
11-11	11-12	.1	Nip up 550 1 m
11-15	11-16	.1	Nip up 450 5 teeth
12 10	12-11	.1	Nip up 450 3 teeth
126	127	.1	Adj 450
146	156	10min	Rezero 550
3-25	4·00	30m	Add prompters with the PRC Belt
4-25	615	1.50	CV19 Slipping
6·15	6·30	.15	run out plant

PRODUCTION SUMMARY

Belts	Size	Description	Total Tonnes	Comments
CV 8	20 mm	Concrete Aggregate	1441	
CV 20	Course Sand 4-0mm	Manufactured Sand		
CV 20	Old Man Sand	Man sand By-Pass Air-Sep	768	
CV 21	Super Fine –50micron	Super Fine Sand		
CV19*	10-7mm Blend*	Concrete Blend		
CV19	7mm	Concrete Aggregate		
CV17	10mm	Concrete Aggregate		
CV15	14mm	Concrete Aggregate	250	
CV5	Ballast/40mm	Non Spec Aggregate		

3759

DAILY PRODUCTION LOG & CHECKLIST - PRIMARY

HY-TEC an ADBRI company

Date: 8/4/24 Operator: BRETT

Weather Conditions; FINE Quarry Bench ID. 745

Shift Start Time	6AM	Shift Finish Time	5PM
Crusher Start Time	650	End of day Crusher stopped	430

Belt Weightometer Reading - Daily

Conveyor 1 Start	Conveyor 1 Finish	Total Tonnes Crushed
		4030

Cartage of Raw Feed from Face to Boot – Number of loads

DT4 Loads to Boot	44	DT1 Loads to Boot	
DT6 Loads to Boot	36	Loader tonnes to Boot	

Stoppages due to Trucks	Stoppages due to Jaw

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
9.30	11.15	1H40m	SMOKO & DRUG TESTING
1.00	1.30	30	LUNCH

Pre start checks;

Generator hours. 38602 Generator oil level. .....

Plant Visual ..... Pilot hours .....

COMMENTS

DAILY PRODUCTION LOG & CHECKLIST - SECONDARY

HY-TEC an ADBRI company

Date: 8-4-24 Operator: Chris

Weather Conditions; Fine

Shift Start Time	5-30	Shift Finish Time	10PM
Crusher Start Time	6-40	End of day Crusher stopped	925 PM

Weightometer Reading; Start: 7687058 **Finish:** 7694300 = 7167

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
6-54	6-55	.1	N.IP up 550
7.01	7-02	.1	N.IP up 450
8-48	8-49	.1	N.IP up 450
9-00	9-01	.1	N.IP up 550
9-58	9-59	.1	N.IP up 450
11-44	11-45	.1	N.IP up 450
12-30	12-31	.1	N.IP up 550
13.09	13.10.	.1	NIP UP 450.
2-24	2-25	.1	N.IP up 550
4.09	4-10	.1	N.IP up 550
4-32	4.33	.1	N.IP up 450
7PM	705	.5	Re zero 550 CRUSHER
725	726	.1	Adj 450
818	820	.2	Adj 550
838	840	.2	Adj 450 .21
9:25			Shutdown

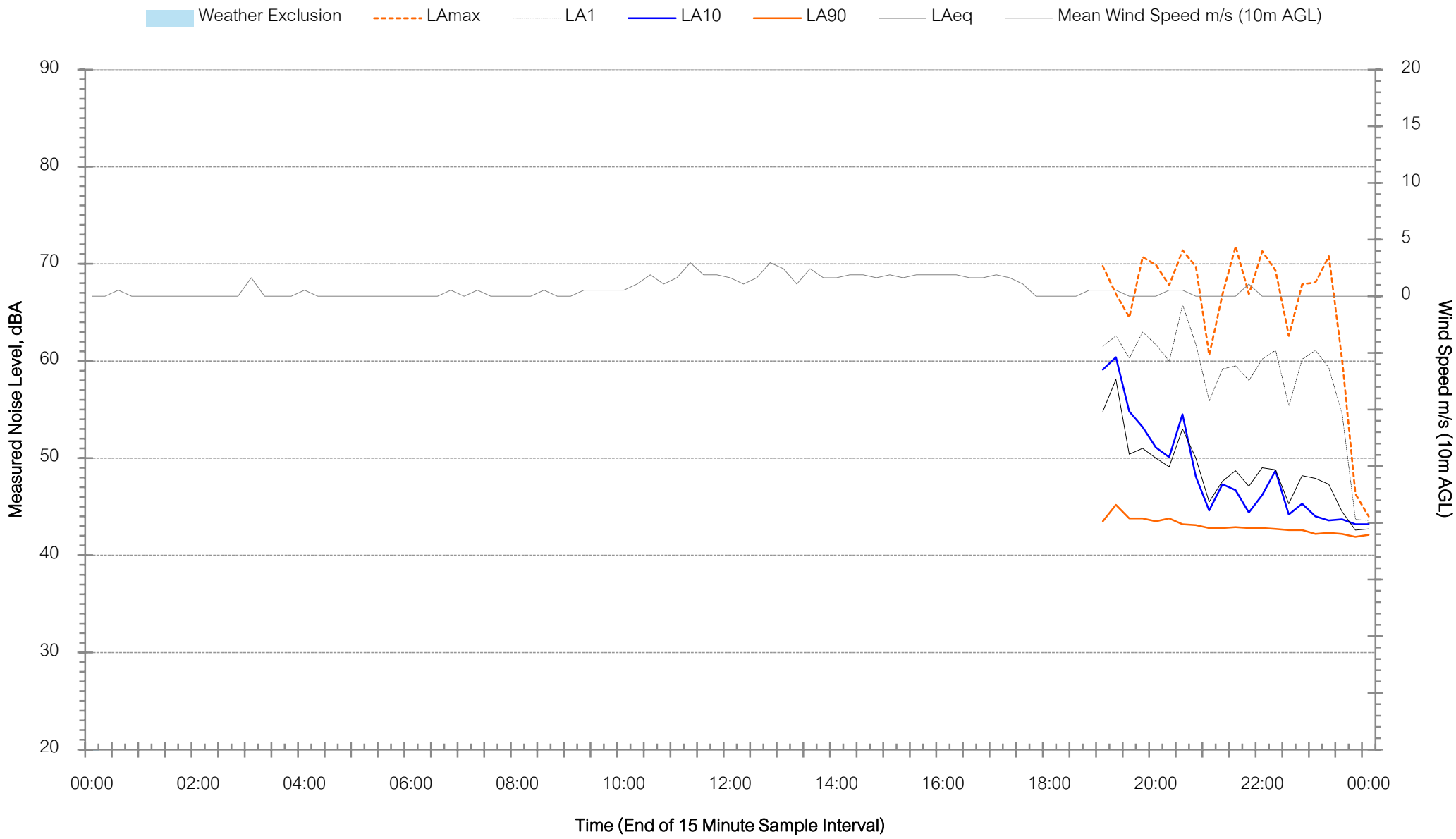
PRODUCTION SUMMARY

Belts	Size	Description	Total Tonnes	Comments
CV 8	20 mm	Concrete Aggregate	4162	
CV 20	Course Sand 4-0mm	Manufactured Sand		
CV 20	Old Man Sand	Man sand By-Pass Air-Sep	1230	
CV 21	Super Fine –50micron	Super Fine Sand	—	
CV19*	10-7mm Blend*	Concrete Blend	—	counter Not Working
CV19	7mm	Concrete Aggregate		
CV17	10mm	Concrete Aggregate		
CV15	14mm	Concrete Aggregate	445	
CV5	Ballast/40mm	Non Spec Aggregate		
			5475	

Appendix C – Noise Monitoring Charts

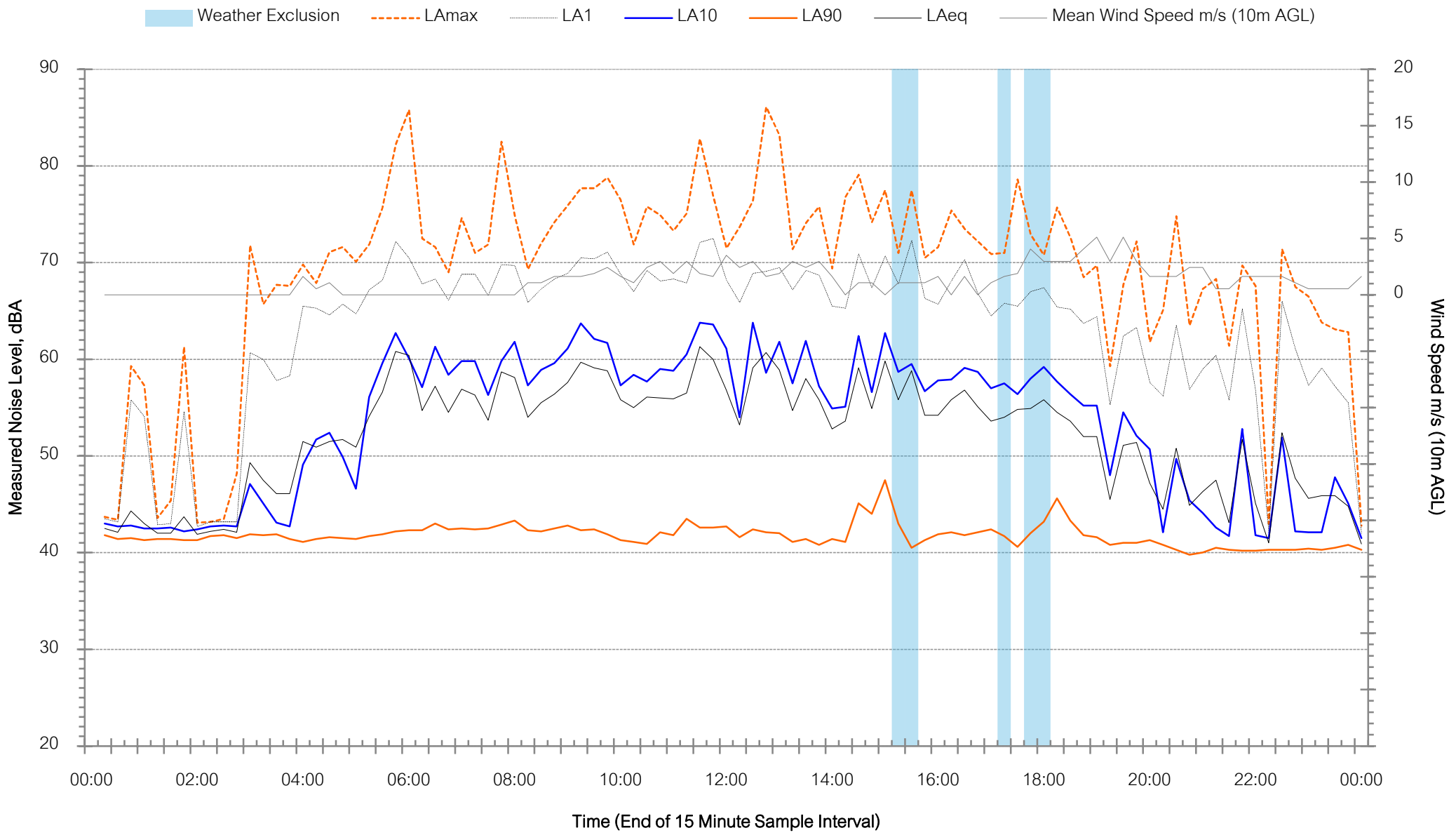
Background Noise Levels

Jenolan Caves Rd, Hartley - Monday 8 April 2024



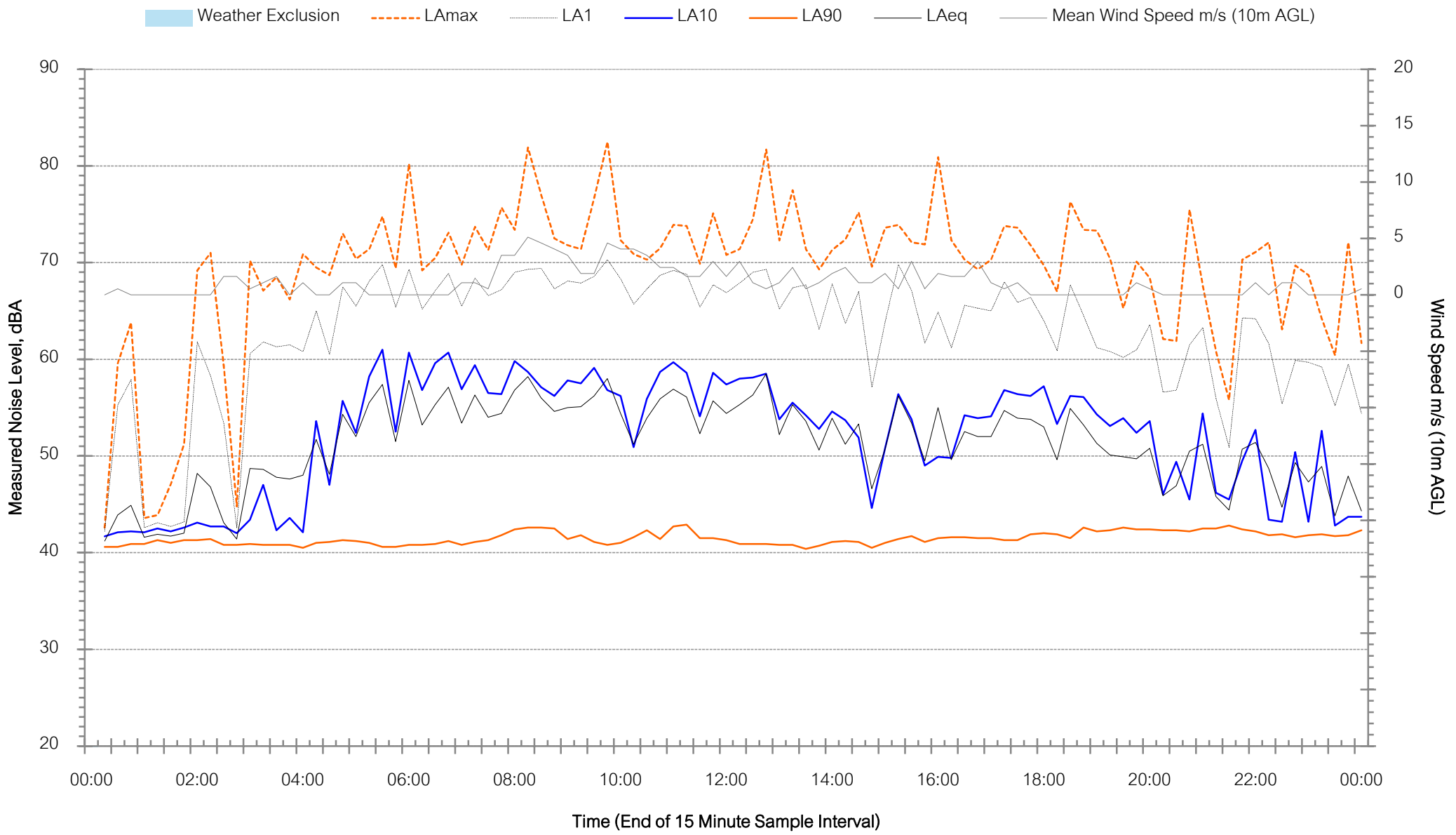
Background Noise Levels

Jenolan Caves Rd, Hartley - Tuesday 9 April 2024



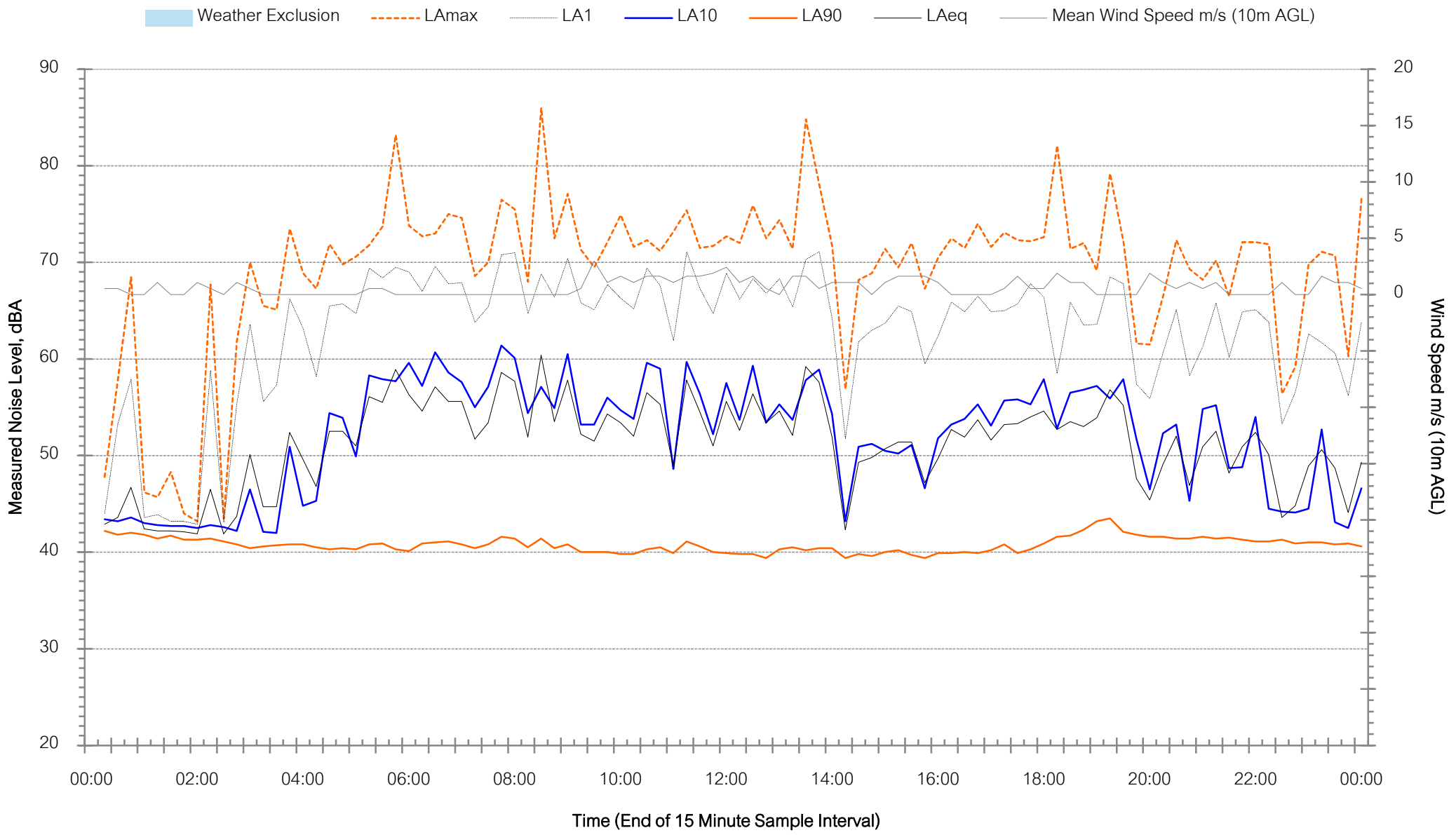
Background Noise Levels

Jenolan Caves Rd, Hartley - Wednesday 10 April 2024



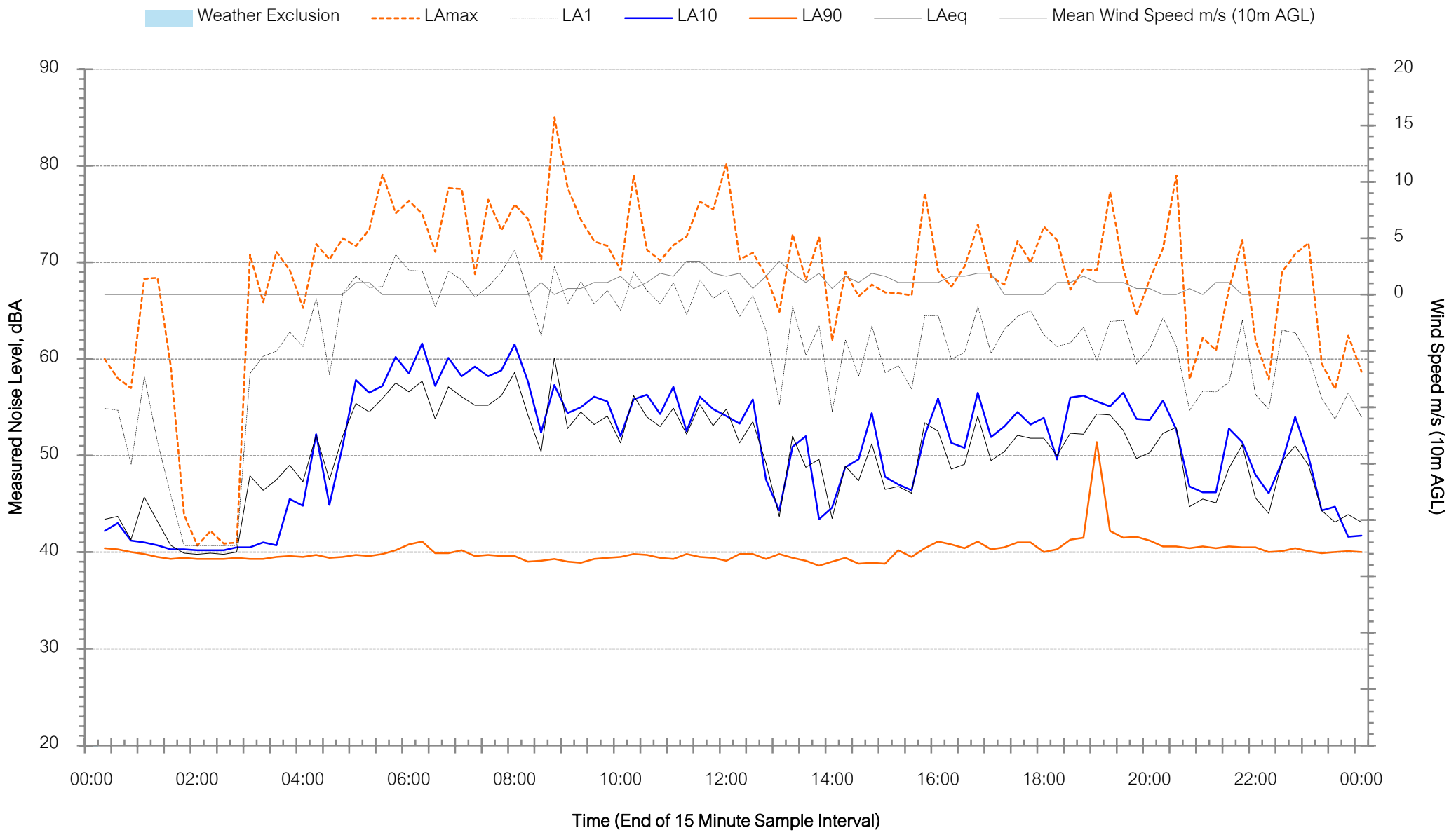
Background Noise Levels

Jenolan Caves Rd, Hartley - Thursday 11 April 2024



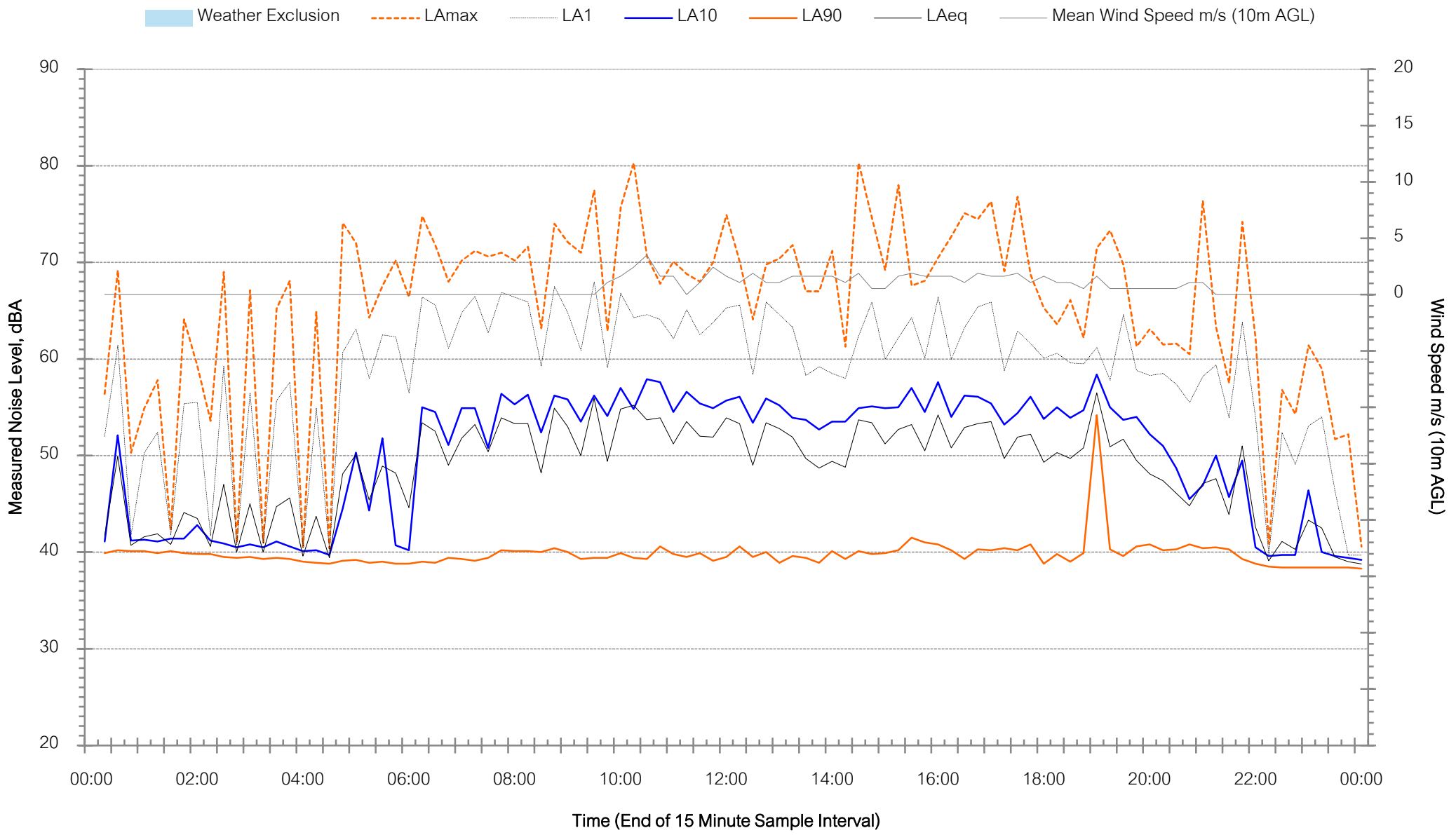
Background Noise Levels

Jenolan Caves Rd, Hartley - Friday 12 April 2024



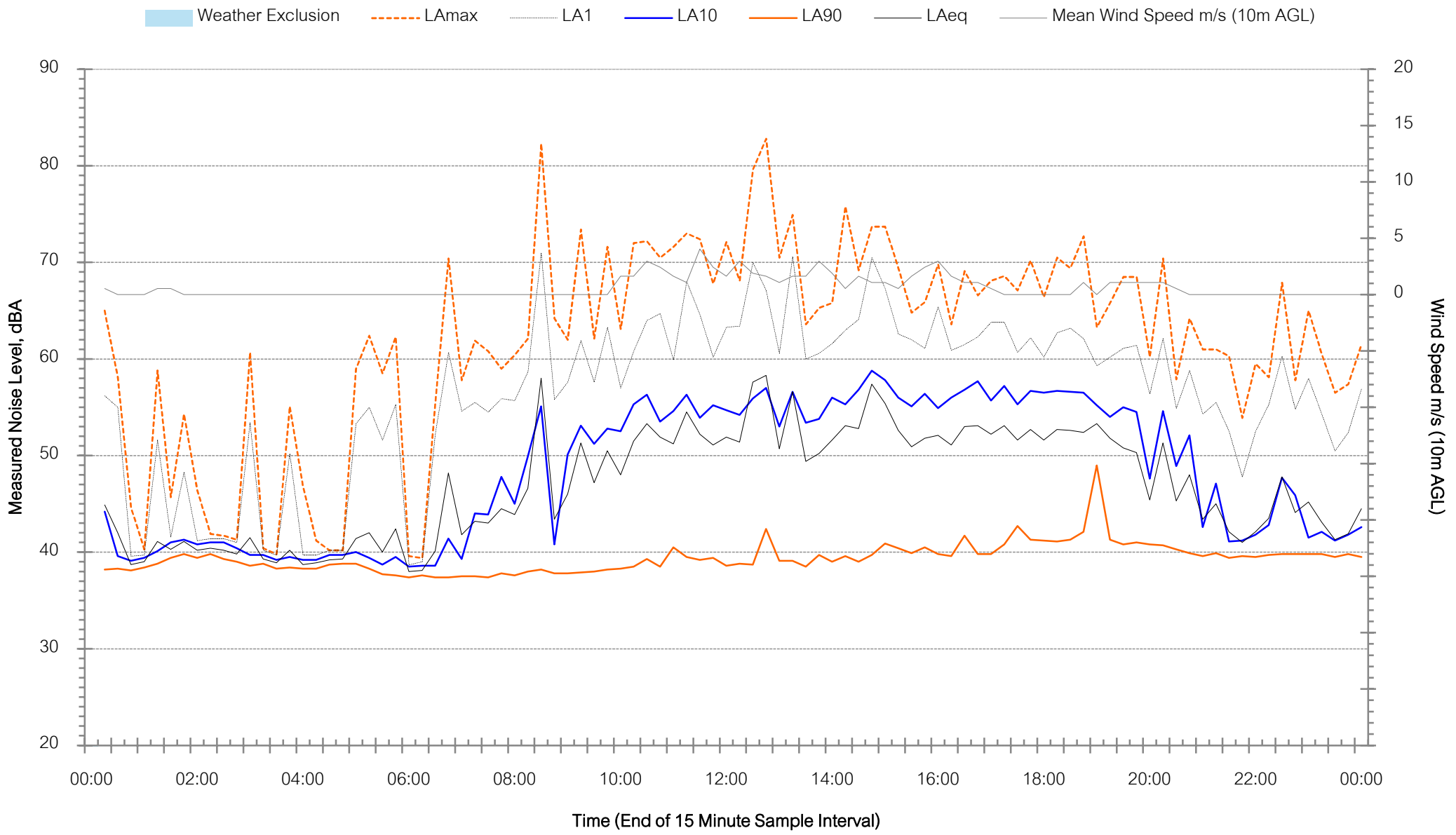
Background Noise Levels

Jenolan Caves Rd, Hartley - Saturday 13 April 2024



Background Noise Levels

Jenolan Caves Rd, Hartley - Sunday 14 April 2024

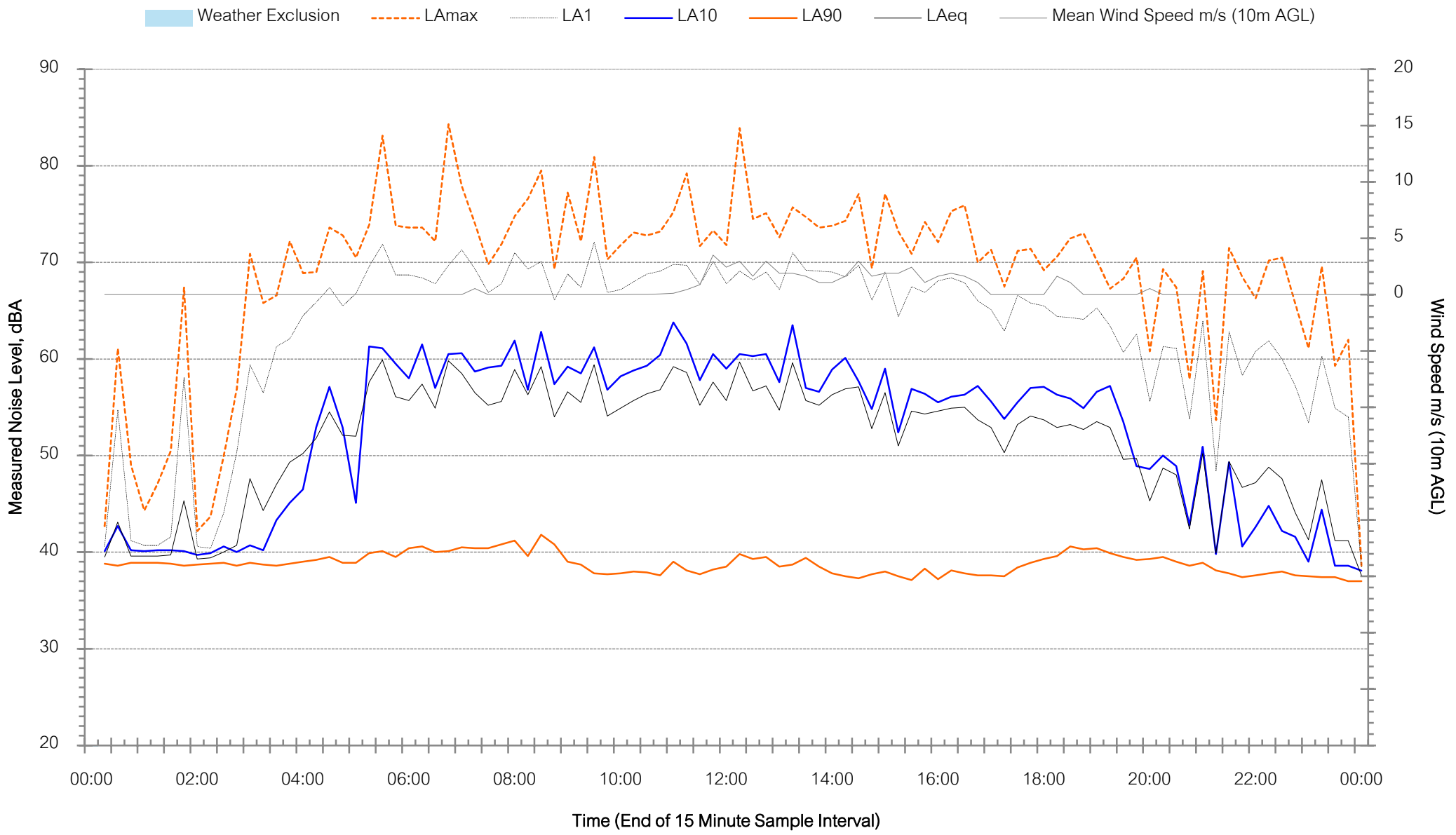


Background Noise Levels

Jenolan Caves Rd, Hartley - Monday 15 April 2024

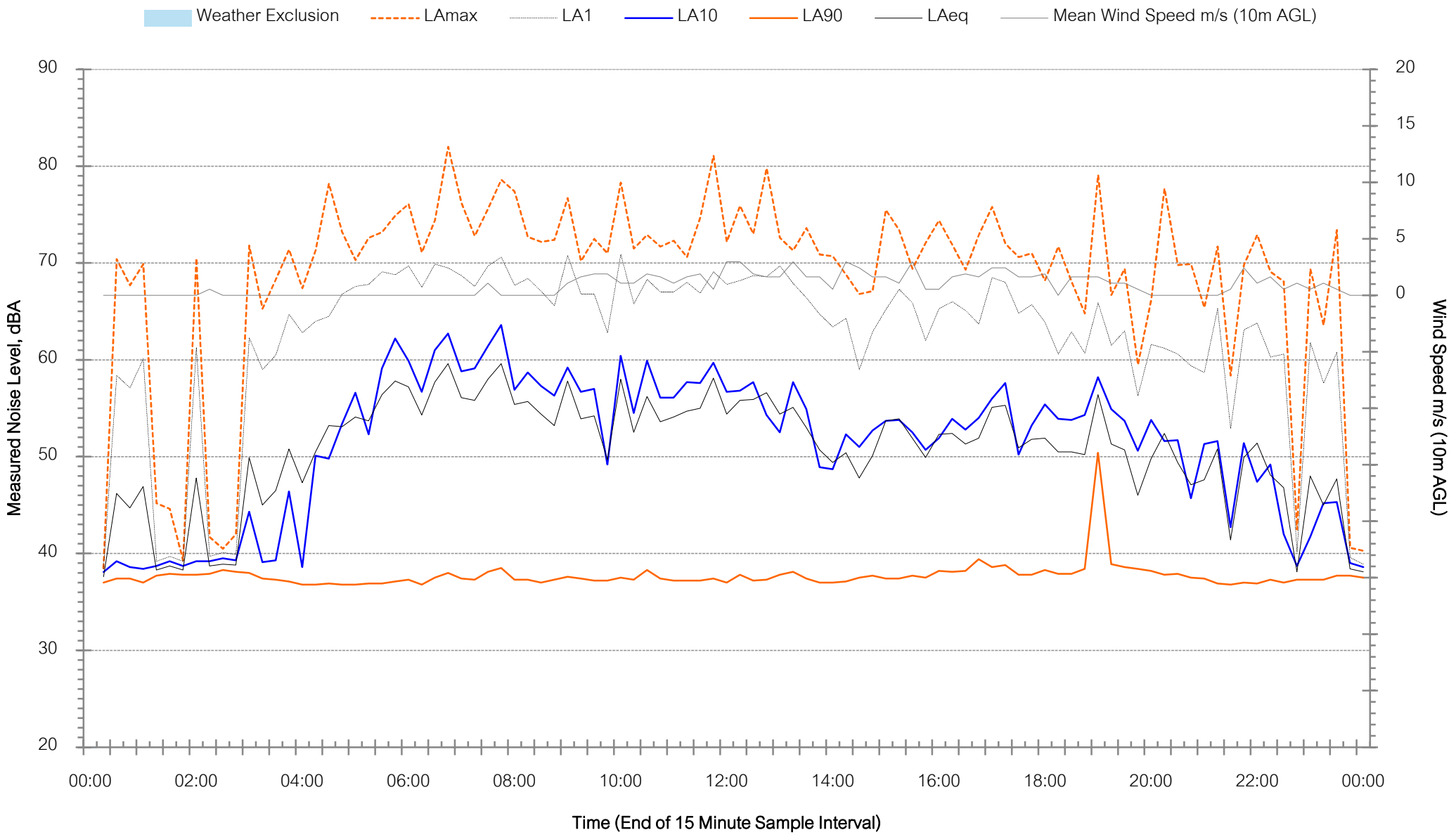
Background Noise Levels

Jenolan Caves Rd, Hartley - Tuesday 16 April 2024



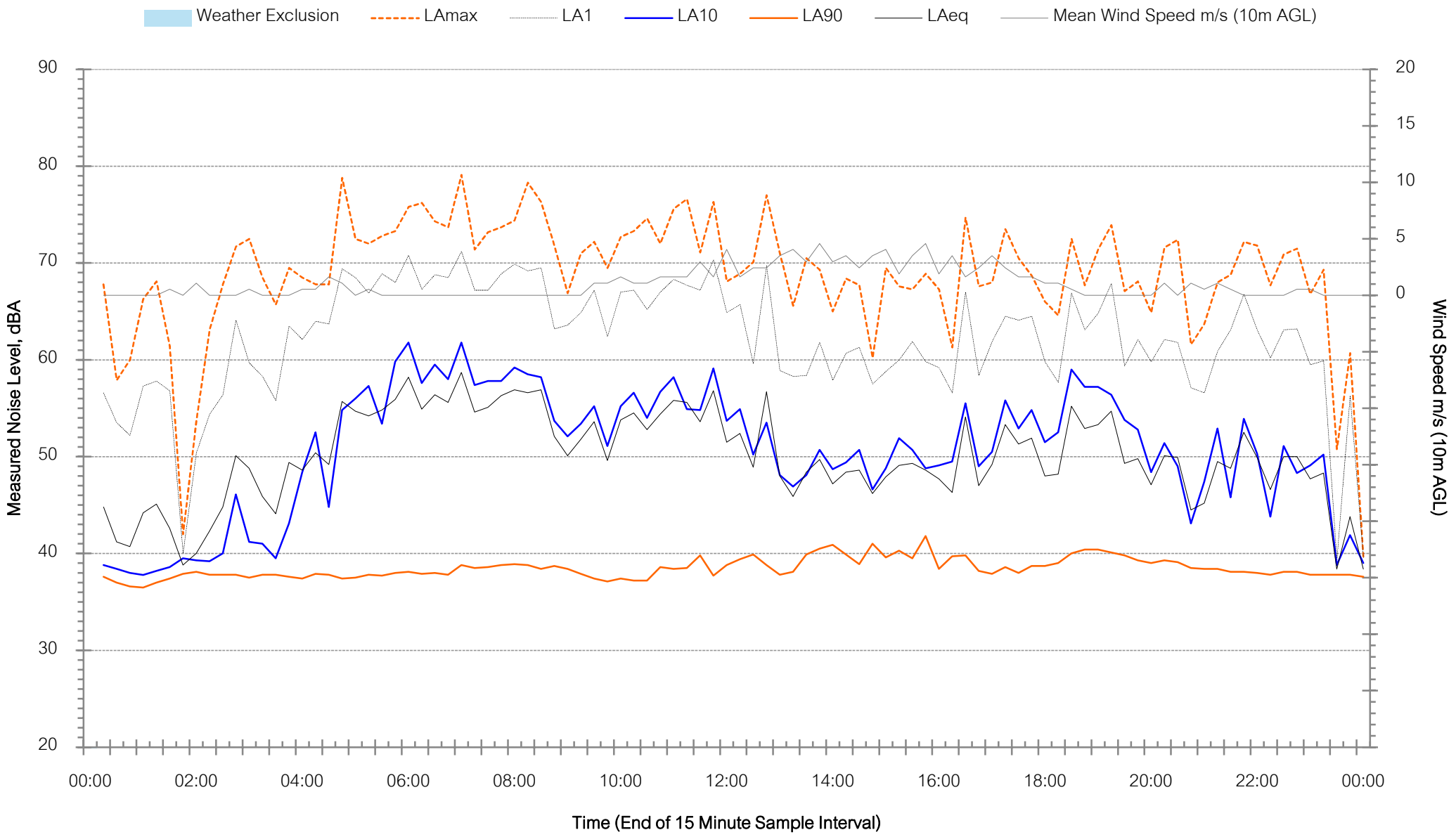
Background Noise Levels

Jenolan Caves Rd, Hartley - Wednesday 17 April 2024



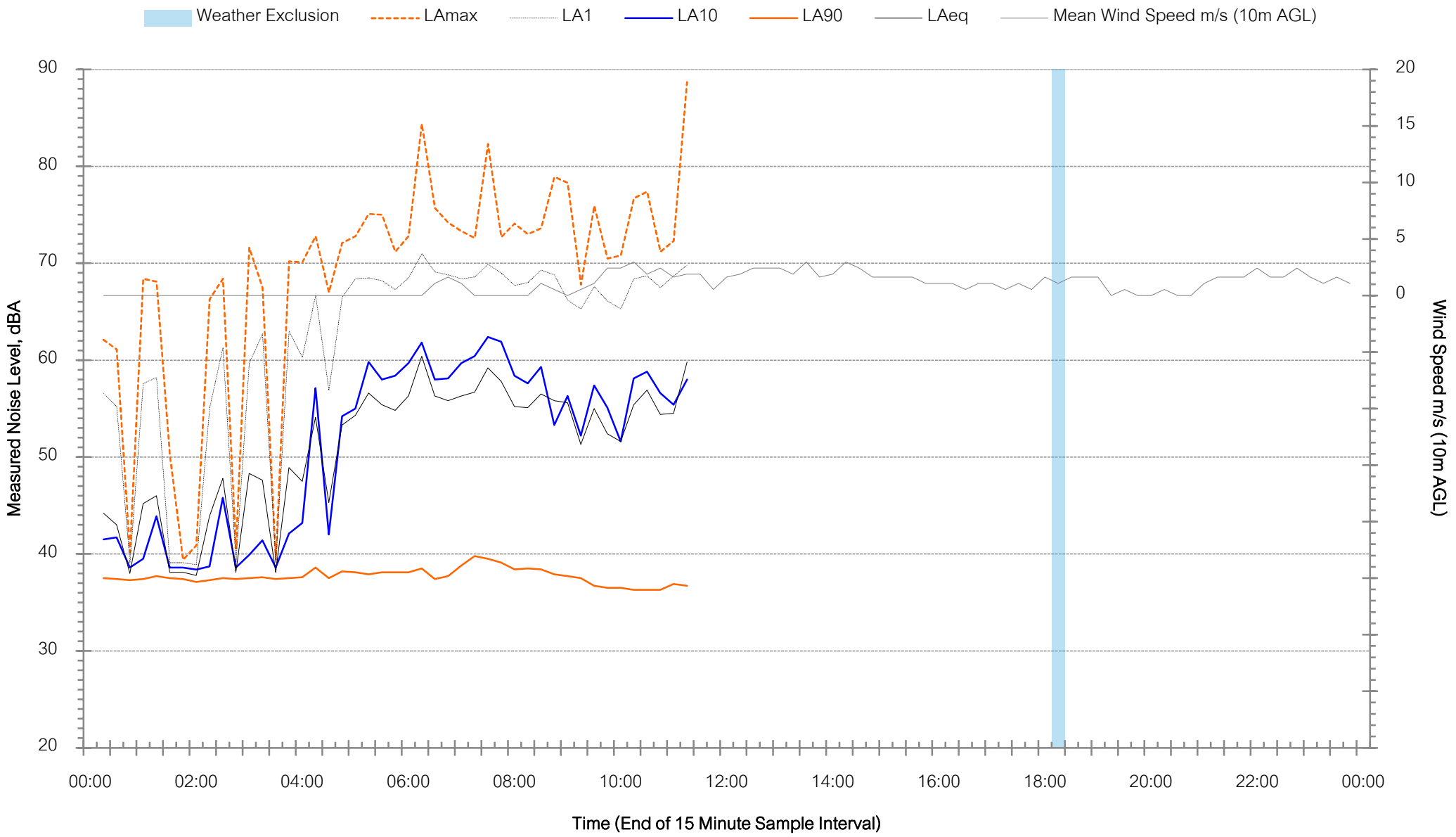
Background Noise Levels

Jenolan Caves Rd, Hartley - Thursday 18 April 2024



Background Noise Levels

Jenolan Caves Rd, Hartley - Friday 19 April 2024



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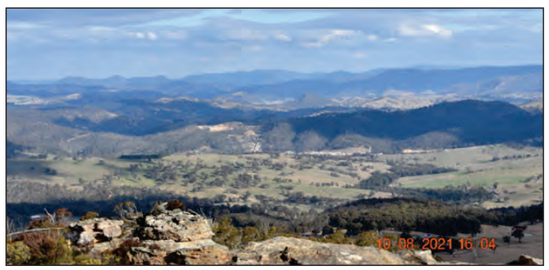
MAC
Muller Acoustic Consulting

Appendix G: Visual Monitoring

Plan of:	Annual Review for the Austen Quarry Extension July 2023 to June 2024 - Photoplates Showing Focal Length Comparisons	***Version/Date:***	V0 27/08/2024	***Location:***	Off Jenolan Caves Road, Hartley, NSW	***Tenure :***	Not Applicable	***Source:***	Client	***Project Manager:***	LT
Figure:	Photoplate ONE	***Our Ref:***	126376_HY_H_AR2023-24_C001_V1_P1	***Council:***	Lithgow City Council	***Client:***	Adbri Quarries Sydney Pty Ltd	***Plan By:***	JD	***Office:***	Thornton

This figure may be based on third party data which has not been verified by vgt and may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and vgt does not warrant its accuracy.

Date/Focal Length	26 - 27mm (August 2024 - 18mm)	42mm (August 2024 - 32mm)	50 - 52mm (August 2024 - 55mm)	85mm
June 2019				
July 2020				
Aug 2021				
July 2022				
July 2023				
August 2024				

Appendix H: Biodiversity Monitoring

EMM
creating opportunities

Biodiversity Monitoring 2023

Austen Quarry

Prepared for Adelaide Brighton - Hy-Tec

April 2024

Biodiversity Monitoring 2023

Austen Quarry

Adelaide Brighton - Hy-Tec

E230206 RP1

April 2024

Version	Date	Prepared by	Reviewed by	Comments
V1	3 April 2024	C. Douchkov	P. Fagan	Final

Approved by

Philippa Fagan
Associate Ecologist – Team Leader
3 April 2024

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1 Introduction

1.1 Background

EMM Consulting Pty Limited (EMM) has been engaged by Hy-Tec Industries Pty Ltd (Hy-Tec) to conduct annual biodiversity monitoring at Austen Quarry, as defined in the *Austen Quarry Landscape and Rehabilitation Management Plan* (LRMP) (R.W. Corkery & Co., 2019). Monitoring was originally undertaken by Onsite Environmental Management (Onsite) from 2003 to 2017, while EMM has conducted annual monitoring surveys since 2018.

1.2 Project description

Austen Quarry (the Quarry) is a hard rock quarry located at Hartley, NSW which extracts and processes rhyolite to produce aggregate and road pavement products to local and Sydney markets.

The Quarry is within an east/west orientated ridgeline which is characterised by relatively steep slopes and incised valleys, most of which are covered by native vegetation. The landscape surrounding the ridgeline, includes river floodplains and slopes. There are partially cleared areas for agriculture consisting of grassland with scattered trees and patches of woodland. The Coxs River occurs to the west and north of the Quarry, flowing from south to north direction. A tributary of the Coxs River, Yorkey's Creek, occurs just west of the Quarry, joining the Coxs River just north-east of the processing area.

Development of the Quarry was granted to Aus10 Rhyolite Pty Ltd by Lithgow City Council in 1995 (DA 104/93), with Hy-Tec, a subsidiary of Adelaide Brighton Ltd, taking over quarrying operations in 2002. A modification to DA 104/93 was approved for the operation of the Quarry under the *Environmental Planning and Assessment Act 1979* (EP&A Act) in July 2015 (SSD_6084). Hy-Tec currently operates the Quarry under MOD1 of SSD_6084.

Condition 29 of SSD_6084 required the preparation and approval of a Landscape and Rehabilitation Management Plan (LRMP). The project's original LRMP was prepared by R.W. Corkery & Co. Pty. Limited and approved in December 2016 (R.W. Corkery & Co. , 2016). The Quarry currently operates under Version 2.2 of this plan, approved in September 2019 (R.W. Corkery & Co., 2019).

Chapters 11.2 and 11.3 of the LRMP prescribe that a biodiversity monitoring program is to be undertaken annually for the life of the project (R.W. Corkery & Co., 2019). The biodiversity monitoring program comprises fauna and flora ecological surveys at identified control and impact monitoring sites within and surrounding the project site to assess project impacts upon local fauna and flora, health of threatened flora within the project Biodiversity Offset Area (BOA), and performance of rehabilitation areas within the Quarry site.

1.3 Terminology

Table 1.1 Terminology

Term	Definition
BC Act	Biodiversity Conservation Act 2016
BOA	Biodiversity Offset Area
EMM	EMM Consulting Pty Ltd
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*

Table 1.1 Terminology

Term	Definition
GPS	Global Positioning System
Hy-Tec	Hy-Tec Industries Pty Ltd
LRMP	Austen Quarry Landscape and Rehabilitation Management Plan
OEH	Office of Environment and Heritage
Onsite	Onsite Environmental Management
The Quarry	Austen Quarry

1.4 Purpose and objectives

The LRMP (R.W. Corkery & Co., 2019) identifies the following key ecological values present within the Austen Quarry project area:

- known and potential habitat for at least 12 threatened fauna species, listed under the *Biodiversity Conservation Act 2016* (BC Act) and/or the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- a large population of Silver-leaved Mountain Gum (*Eucalyptus pulverulenta*), listed as Vulnerable under the BC Act and EPBC Act

1.4.1 Annual biodiversity monitoring

The LRMP (R.W. Corkery & Co., 2019) outlines the ecological monitoring requirements for Austen Quarry. In line with these requirements, EMM undertakes annual monitoring of:

- biometric indicators, and flora and fauna at established monitoring locations within and surrounding the Quarry
- the Silver-leaved Mountain Gum population within the BOA.

The focus of the biodiversity monitoring is to examine the impact of quarry operations on flora and fauna habitats and the extent of exotic or weed species present in these areas as indicators of habitat health where the Quarry has the potential to have an indirect impact.

This monitoring report has been prepared to assess the success of site management, rehabilitation, and possible impacts to biodiversity within the Quarry site and BOA with reference to performance targets outlined in the LRMP (R.W. Corkery & Co., 2019), as well as provide management recommendations as required.

2 Survey methodology

2.1 Qualification and experience of personnel

Preparation of this report and associated fieldwork was undertaken by EMM ecologists Callan Douchkov and Ross Davey under the authority of a Scientific License (SL100409).

2.2 Survey timing and climatic conditions

Field surveys were conducted over a three-day and one-night period between 5 and 7 December 2023. The spring/summer season is targeted annually to provide consistency across annual trends and generally coincides with both higher levels of fauna activity and greater numbers of flora species in flower.

Weather conditions during the biodiversity survey included hot, dry conditions with an occasional light breeze across all three days of survey. Temperatures ranged from 10.2 degrees overnight to 32.3 degrees during the day.

2.3 Vegetation monitoring

Monitoring sites are established at seven vegetation community survey locations around the Quarry, comprising five impact and control locations which are surveyed annually, and two rehabilitation sites which are surveyed bi-annually (every two years). Flora surveys are conducted within each vegetation community survey location using two 100 m transects to record vegetation composition, bare areas, rock, and leaf litter. Each parameter was recorded at 5 m intervals along transect lines for a total of 44 survey points per vegetation community survey location. Biometric data from each 100 m transect within each vegetation community survey location is averaged together to establish a vegetation community summary score for each biometric parameter.

Global Positioning System (GPS) coordinates of monitoring transects are presented in Table 2.1, and shown in Figure 2.1.

Table 2.1 Vegetation transect locations

Site	Latitude	Longitude	Bearing
South Ridge 1	33.579073°S	150.152899°E	SW
South Ridge 2	33.578866°S	150.152397°E	SW
Control Ridge 1	33.573948°S	150.163390°E	SE
Control Ridge 2	33.574274°S	150.163177°E	SE
Impact Ridge 1	33.580233°S	150.157019°E	SE
Impact Ridge 2	33.581202°S	150.157249°E	NE
Control Creek 1	33.562549°S	150.145885°E	NE
Control Creek 2	33.562451°S	150.146187°E	NE
Impact Creek 1	33.569956°S	150.157831°E	N
Impact Creek 2	33.572176°S	150.156266°E	N
Rehab 1*	33.578123°S	150.157116°E	SE
Rehab 2*	33.578166°S	150.156226°E	W

Notes: *Bi-annual (every two years) Rehab sites 1 and 2 to be surveyed in 2024 monitoring year

2.3.1 Impact and control sites

The 'impact creek' transects along the Coxs River are to the north of the active quarry site, with 'control creek' transects upstream to the north-west of the Quarry. These areas are surveyed to assess the degree of impact of the Quarry operations upon the riparian areas bordering the Quarry (i.e. using the upstream site as an unimpacted reference site).

The 'impact ridge' transects are directly adjacent to the east of the active stage-2 bench area, the 'south ridge impact' transects are south-west of the overburden emplacement, and the 'control ridge' transects are north-east of the Quarry. These areas are surveyed to assess the degree of impact of the Quarry operations on woodland areas within and bordering the Quarry (i.e. using the 'control ridge' site as an unimpacted reference site).

Species richness and abundance were recorded at two 20 x 20 m plots within each transect. This method has been adapted from the NSW Office of Environment and Heritage (OEH) *Biometric 3.1* (OEH, 2011) used for the rapid survey and assessment of clearing and impacts from proposals under the *Native Vegetation Conservation Act 2003*. This rapid technique allows for the determination of abundance of species, weeds, or other variables. When a point is reached along the line transect, the presence of weeds, natives, bare ground, rock, or leaf litter is recorded. The scores from each line transect in each survey area are then averaged and recorded, and the data is analysed against the previous year's results.

2.3.2 Silver-leaved Mountain Gum monitoring

Silver-leaved Mountain Gum surveys were conducted at two established monitoring locations within the BOA to the north of the Quarry, comprising one 50 x 10 m transect per location (Figure 2.1). Biometric data was gathered at 5 m intervals along each transect, including silver-leaved mountain gum plant count, plant condition, evidence of animal grazing/damage, new growth, fruiting, flowering, and average plant height. The GPS coordinates of these monitoring transects are presented in Table 2.2.

Table 2.2 Silver-leaved Mountain Gum transect locations

Site	Latitude	Longitude	Bearing
Transect 1	33.575804°S	150.162289°E	SW
Transect 2	33.576444°S	150.161542°E	SW

Mapping of the distribution and extent of the silver-leaved mountain gum population is undertaken with a GPS on a bi-annual basis (every two years). The extent of the silver-leaved mountain gum population for the 2023 monitoring year is shown in Figure 2.1.

2.4 Fauna surveys

Fauna surveys were conducted using point census methods at established flora transect locations for diurnal species and spotlight transects for nocturnal species on accessible tracks.

Diurnal fauna surveys included:

- 20-minute bird census periods at discrete points along flora transects in each community
- opportunistic survey along flora transects.

Nocturnal fauna surveys occurred over one night in all vegetation communities and included:

- spotlight transects
- motion-activated fauna cameras.

X:\2023\E230206 - Austen Quarry Biodiversity Monitoring 2023\GIS\02_Maps\G001_BiometricMonitoring_20240320_01.mxd 22/03/2024

Source: EMM (2024); DCSSS (2023); GA (2009); MetroMap (2024)

0 250 500 m

GDA2020 MGA Zone 56

N

KEY

- Remote camera
- Biometric monitoring
- *E. pulverulenta* population extent

Existing environment

- Minor road
- Vehicular track
- Named watercourse

INSET KEY

- Major road
- NPWS reserve
- State forest

Biodiversity monitoring 2023

Hy-Tec - Austen Quarry
Biodiversity Monitoring 2023
Figure 2.1

EMM
creating opportunities

3 Results

3.1 Vegetation monitoring

3.1.1 Native species richness and composition

Native flora species richness and composition was recorded at each monitoring site. Table 3.1 below details the count of native flora species recorded at impact and control sites during the 2023 monitoring year and provides a comparison of species numbers recorded at each site to previous monitoring years. A complete list of flora and fauna species observed during the 2023 monitoring survey is included in Appendix A.

Table 3.1 Native species richness – impact and control sites (2018–2023)

Site	2018	2019	2020	2021	2022	2023
South Ridge	27	50	43	56	28	26
Control Ridge	30	0	31	24	18	20
Impact Ridge	35	44	16	21	17	21
Control Creek	8	19	16	16	11	9
Impact Creek	14	30	28	28	11	14
Total	**114**	**143**	**134**	**145**	**85**	**90**

3.1.2 Occurrence and abundance of weeds

The assessment of environmental weeds across all transects is displayed in Table 3.2 below, which shows the number of weed species recorded at each site and provides an abundance rating based on the criteria below and averaged across two transects.

1. Less than 5% cover, <3 individuals
2. Less than 5% cover, 4–10 individuals
3. 5%–25%
4. 25%–50%
5. 50%–75%
6. >75%

Table 3.2 Diversity of weed species (2018–2023)

Site	2018	2019	2020	2021	2022	2023
South Ridge	1	12	3	14	8	7
Control Ridge	1	0	2	7	4	1
Impact Ridge	13	17	22	19	13	1
Control Creek	41	36	37	37	21	25
Impact Creek	35	43	43	43	19	26
Total	**91**	**108**	**107**	**120**	**65**	**60**

3.1.3 Biometric monitoring

Biometric data detailing the structural composition of the vegetation communities within each monitoring site was also recorded. Table 3.3 details the findings of biometric monitoring undertaken at each monitoring site.

Table 3.3 Vegetation community biometric data 2023

Site	Native over-storey			Native mid-storey			Native groundcover			Native Grass (Score/6)	Litter (Score/6)	Bare Ground (Score/6)	Moss (Score/6)	Weeds (Score/6)
	Height (m)	Health (Score/3)	Cover (%)	Height (m)	Health (Score/3)	Cover (%)	Height (m)	Health (Score/3)	Cover (%)					
South Ridge	6.4	2.1	11.1	2.6	1.8	0.8	0.4	1.8	34.4	3.6	4.6	2.5	1.1	2.0
Control Ridge	5.2	2.0	10.3	N/A	N/A	0	0.4	2.0	29.3	4.1	4.5	3.9	1.8	1.3
Impact Ridge	5.2	2.1	14	3	2	0.2	0.6	1.8	23.1	3	4.6	4.1	2.0	1.5
Control Creek	20.6	3.0	23.1	3.0	3.0	0.1	0.3	2.1	6.8	1.6	3.0	3.7	1.0	4.5
Impact Creek	12.6	2.6	12.6	N/A	N/A	0	0.6	2.1	3.9	1.3	3.6	3.1	1.2	4.8

3.2 Silver-leaved Mountain Gum monitoring

Two 50 x 10 m transects were traversed within the Silver-leaved Mountain Gum Mallee Woodland vegetation community, within the BOA to the north of quarrying activities in accordance with the LRMP (R.W. Corkery & Co., 2019). The transects assessed population and health parameters of the Silver-leaved Mountain Gum population within the vegetation community. Biometric data was gathered at 5 m intervals along each transect. The Silver-leaved Mountain gum monitoring transects are shown in Figure 2.1.

Table 3.4 Abundance of Silver-Leaved Mountain Gum (2018–2023)

Transect	2018	2019	2020	2021	2022	2023
1	29	20	19	14	19	13
2	37	25	13	7	9	12
Total	**66**	**45**	**32**	**21**	**28**	**25**

Table 3.5 presents the survey data within Silver-leaved Mountain Gum transects during the 2023 survey period, with vegetation scoring as follows:

- 0 = Not present
- 1 = Poor condition
- 2 = Fair condition
- 3 = Good condition.

The overall condition of the Silver-leaved Mountain Gum Mallee Woodland was observed to be healthy. Although a decrease in total plant numbers was recorded over the 2018 to 2021 monitoring years, the total number of plants has remained consistent over the 2021 to 2023 monitoring years.

Most Silver-leaved Mountain Gums observed along both transects were noted to be in good condition and exhibited no evidence of dieback. A minor amount of animal/ insect damage was observed in transect 1. All plants exhibited new growth, and evidence of both fruiting and flowering.

Table 3.5 Silver-leaved Mountain Gum survey data (2023)

Transect	Plant count	Plant condition (Score/3)	Animal grazing (Score/10)	New Growth (Score/10)	Fruiting (Score/10)	Flowering (Score/10)	Average Plant Height (m)
1	13	2.3	3.3	10	8.3	8.3	3.2
2	12	2.5	0	10	10	10	3.3

Photograph 3.1 Habit of Silver-leaved Mountain Gum within BOA

Photograph 3.2 Evidence of flowering and fruiting of Silver-leaved Mountain Gum in BOA

3.3 Priority environmental weeds

The assessment of priority weeds across all transects is displayed in Table 3.6 below, which shows at which sites each weed species was recorded and provides an abundance rating based on the criteria below and averaged across two transects. A complete list of priority weeds for the Central Tablelands region is provided in Appendix B.

1. Less than 5% cover, <3 individuals
2. Less than 5% cover, 4–10 individuals
3. 5%–25%
4. 25%–50%
5. 50%–75%
6. >75%

Table 3.6 Priority weeds relative abundance (2023)

Scientific name	Common name	Control Ridge	Impact Ridge	South Ridge	Control Creek	Impact Creek
Eragrostis curvula	African Lovegrass	0	0	0	0	3
Hypericum perforatum	St. John's Wort	0	0	0	0	0
Nassella Trichotoma	Serrated Tussock	0	0	0	0	2
Rubus fruticosus	Blackberry	0	0	0	2	2

3.4 Fauna survey results

The results of the fauna survey are presented in Table 3.7 and have been broken up into the following groups or assemblages:

- amphibians
- reptiles
- mammals
- total birds
- birds of prey (including magpies, crows etc.)
- nocturnal birds
- waterbirds (ducks, coots, moorhens, egrets etc.)
- parrots
- forest woodland species (whipbirds, kingfishers, pigeons and doves, pipits and song larks, quails, starlings, and miner birds)

- robins, wrens, and finches
- honeyeaters.

Table 3.7 Diversity of fauna species (2005–2023)

Group	2005–2018 (Average)	2019 (Oct)	2020 (Nov)	2021 (Nov)	2022 (Dec)	2023 (Dec)
Amphibians	5	8	9	5	2	2
Reptiles	5	5	5	7	1	5
Mammals	8	8	7	8	7	8
Birds of prey	8	7	9	7	5	5
Nocturnal birds	1	1	0	0	0	0
Waterbirds	7	10	9	6	3	3
Parrots	5	5	3	3	3	2
Forest / woodland birds	20	23	21	13	6	8
Robins, wrens, and finches	4	3	3	1	1	1
Honeyeaters	6	3	5	4	2	3
Total birds	**51**	**54**	**51**	**34**	**20**	**22**
Total species	**70**	**76**	**72**	**55**	**32**	**38**

3.4.1 Listed threatened species and Endangered Ecological Communities

The following threatened/ endangered flora and fauna have been newly listed to potentially occur within the study area since the 2022 monitoring period:

- A Shrub (*Leionema lachnaeoides*) – Endangered
- Swamp Everlasting (*Xerochrysum palustre*) – Vulnerable
- Blue-winged Parrot (*Neophema chrysostoma*) – Vulnerable
- Brown Treecreeper (*Climacteris picumnus victoriae*) – Vulnerable
- Diamond Firetail (*Stagonopleura guttata*) – Vulnerable
- Latham's Snipe (*Gallinago hardwickii*) – Vulnerable
- Sharp-tailed Sandpiper (*Calidris acuminata*) – Vulnerable
- South-eastern Hooded Robin (*Melanodryas cucullata cucullata*) – Endangered
- Southern Whiteface (*Aphelocephala leucopsis*) – Vulnerable.

The threatened species database search is included in Appendix C.

3.4.2 Wildlife camera monitoring

Two motion-activated fauna cameras and bait stations were installed in strategic locations (Figure 2.1) at the outset of survey activities. Fauna camera monitoring is primarily utilised to detect human-wary nocturnal species which typically hide during spotlighting activities such as foxes, feral cats, and wombats.

Camera locations consisted of one camera installed at the Impact Creek monitoring site, and one camera installed at the South Ridge monitoring site. Species observed by the Impact Creek camera comprised wombat, goanna, grey fantail, and white-throated tree creeper. No fauna were recorded by the South Ridge camera.

Photograph 3.3 Wombat observed at Impact Creek remote camera site

Photograph 3.4 Goanna (pictured left) observed at Impact Creek remote camera site

4 Discussion

Biodiversity monitoring was undertaken in December 2023 to satisfy the requirements of SSD_6084 Condition 29, which requires the monitoring of indirect impacts of the Quarry operations on surrounding flora and fauna habitats.

4.1 Flora

The results show that some changes have occurred to flora and fauna communities surveyed at the site since the previous monitoring period in 2022 (EMM, 2023). Weed species diversity has decreased at all ridge sites, and increased slightly at all creek sites, since 2022. Native flora species diversity is similar to the previous monitoring year, with a slight increase in native species diversity at the Impact Ridge, Impact Creek, and Control Ridge sites since 2022; however, total native flora species diversity has declined since monitoring began.

An increase in the average number of individuals, and average plant health of Silver-leaved Mountain Gum across both monitoring transects was noted during this monitoring period. All individuals within both transects were observed to have flowered, exhibiting new growth and fruiting.

The Control Creek transects are similar to previous monitoring periods, with significant disturbance due to cattle grazing and high levels of weed invasion/ non-native species present.

4.1.1 Weeds

Weed species diversity has decreased at all ridge monitoring sites and increased slightly at both Impact and Control creek monitoring sites since 2022. Both Impact and Control Ridge sites recorded only a single weed species (flatweed) for the 2023 monitoring period.

Serrated Tussock was recorded at the Impact Creek monitoring site, indicating a re-introduction of the species since the previous monitoring period where none were recorded at this site. Serrated Tussock was not recorded at any other monitoring site during this monitoring period. Serrated Tussock management was undertaken on the lease in previous years, with the worst areas previously noted to be around the dams above the Impact Creek site.

African Lovegrass presence has increased at the Impact Creek site over the previous monitoring year.

St. John's Wort was not recorded at any of the monitoring sites during this year's monitoring survey. This is an improvement over the previous monitoring year, where the species was recorded at South Ridge, Impact Ridge, and Impact Creek monitoring sites.

Blackberry presence was noted to be consistent to the previous year of monitoring, with populations located within the Control Creek and Impact Creek sites.

Control of the spread of the Serrated Tussock, African Lovegrass, and Blackberry infestations should be reviewed as part of the property management and in co-ordination with DPI Agriculture weed programs in the local area.

Weed species abundance and diversity has decreased since monitoring began in 2018.

4.2 Fauna

The number of bird species observed remains similar to the previous monitoring year; however, this number is low when compared to monitoring years prior to 2022. Habitat condition has not changed significantly in comparison to previous monitoring years; therefore, the overall decrease in bird species numbers is not expected. The 2022 and 2023 surveys were conducted in early December compared to November in previous years, and with notably hot and dry conditions during this year's survey. This may be a cause for the difference in numbers in comparison to previous monitoring years.

Amphibian numbers have remained similar, and reptile numbers increased in comparison to the previous year's survey. Hot and dry conditions experienced throughout this year's survey may have suppressed amphibian activity during the survey period.

Mammal numbers also remain similar in relation to the previous year. Wombat activity remains high with several active burrows and individuals observed around the river and ridge sites.

Feral pigs were recorded during spotlighting activities to the east of the Impact Creek monitoring sites. Feral pigs have not been observed within the Quarry lease in previous monitoring years and are, therefore, a new pest species record for the site.

5 Recommendations

The following tasks are recommended for the 2024 monitoring period:

- Ongoing management of the priority weed infestations of African Lovegrass/ Serrated Tussock at the riverine sites is required to supress the spread of these weeds into good quality vegetation surrounding the Quarry. Care should be taken with vehicle movements around dam areas and with the reuse of soil materials within areas containing these species, such as around the office and stockpile areas.
- Blackberry presence has remained consistent in comparison to the previous monitoring year and is present in large numbers within the Control Creek site. Control of the spread of this weed should be reviewed as part of the on-going weed management for the Quarry.
- Pest control efforts as undertaken in previous years should continue to control the goat and fox populations and should be expanded to target newly recorded feral pigs.
- Conduct 2024 monitoring in late October or early November during moderate weather conditions and monitor fluctuations in species diversity across the Quarry.

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Appendix A
Survey species list

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Appendix A2

			First year recorded						4	4	4	2	6	0	2	0	0	2	0	1	0	0	1
Family	**common name**	**scientific name**	65	71	64	75	77	71	62	60	71	94	67	82	52	63	74	68	77	72	55	32	38
			Jun-05	**Mar-06**	**Aug-06**	**Mar-07**	**Jan-08**	**Nov-08**	**Oct-09**	**Nov-10**	**Nov-11**	**Nov-12**	**Nov-13**	**Nov-14**	**Nov-15**	**Nov-16**	**Nov-17**	**Nov-18**	**Oct-19**	**Nov-20**	**Nov-21**	**Dec-22**	**Dec-23**
Amphibians			1	6	2	5	6	8	5	4	4	5	5	5	6	5	6	9	8	9	5	2	2
Hylidae	Brown Tree Frog	*Litoria ewingii*		1	1		1											1	1	1			
	Lesueur's Frog	*Litoria lesueuri*		1		1	1										1	1	1	1	1		
	Peron's Tree Frog	*Litoria peronii*		1				1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Leaf-green Tree Frog	*Litoria phyllochroa*					1																
	Verreaux's Tree Frog	*Litoria verrauxii*						1										1		1			
	Keferstein's Tree Frog	*Litoria dentata*						1		1		1	1	1	1	1		1	1	1	1		
	Dwarf Green Tree Frog	*Litoria fallax*											1				1		1	1			
Myobatrachidae	Common Eastern Froglet	*Crinia signifera*	1	1	1	1	1	1			1	1	1	1	1	1	1	1	1	1	1	1	1
	Eastern Banjo Frog	*Limnodynastes dumerilii*		1		1		1		1	1				1	1	1		1				
	Spotted Grass Frog	*Limnodynastes tasmaniensis*		1		1	1	1				1						1		1			
	Striped Marsh Frog	*Limnodynastes peronii*				1	1	1					1	1	1	1	1	1	1	1	1		
	Keferstein Smooth Toadlet	*Uperoia laevigata*						1		1	1	1		1	1			1					
			Jun-05	**Mar-06**	**Aug-06**	**Mar-07**	**Jan-08**	**Nov-08**	**Oct-09**	**Nov-10**	**Nov-11**	**Nov-12**	**Nov-13**	**Nov-14**	**Nov-15**	**Nov-16**	**Nov-17**	**Nov-18**	**Oct-19**	**Nov-20**	**Nov-21**	**Dec-22**	**Dec-23**
Reptiles			1	4	2	6	2	6	1	5	5	6	5	7	4	8	6	7	5	5	7	1	5
Agamidae																							
	Eastern Water Dragon	*Physignathus lesueurii*		1		1	1			1	1	1		1	1	1	1	1	1	1	1		1
	Jacky Lizard	*Amphibolurus muricatus*				1						1	1	1				1					
	Goanna	*Varanus varius*						1				1				1	1		1	1			1
Chelidae	Eastern Long-necked Turtle	*Chelodina longicollis*				1				1				1	1	1	1	1	1	1	1		1
Elapidae	Eastern Brown Snake	*Pseudonaja textilis*				1										1		1			1		
	Red-Bellied Black Snake	*Pseudechis porphyriacus*							1		1				1	1		1			1		
Scincidae	Copper-tailed Skink	*Ctenotus taeniolatus*		1	1	1		1		1			1			1	1						
	Eastern Water Skink	*Eulamprus quoyii*		1			1	1		1	1	1	1	1		1	1		1	1	1	1	1
	Delicate Skink	*Lampropholis delicata*	1	1		1		1		1	1	1	1	1							1		
	Grass Skink	*Lampropholis guicheniti*						1				1	1	1	1	1	1	1	1	1	1		1
	Blue Tongue Lizard	*Tiliqua scincoides*						1			1			1				1					
Typhlopidae	Blind Snake	*Ramphotyphiops* sp.			1																		
			Jun-05	**Mar-06**	**Aug-06**	**Mar-07**	**Jan-08**	**Nov-08**	**Oct-09**	**Nov-10**	**Nov-11**	**Nov-12**	**Nov-13**	**Nov-14**	**Nov-15**	**Nov-16**	**Nov-17**	**Nov-18**	**Oct-19**	**Nov-20**	**Nov-21**	**Dec-22**	**Dec-23**
Birds total			53	53	53	55	62	47	47	39	53	71	47	61	37	38	53	41	54	51	34	20	22
Birds of prey			8	9	7	8	11	9	0	5	11	11	7	10	5	5	8	7	7	9	7	5	5
Nocturnal Birds			0	1	0	1	1	1	0	0	1	1	0	0	0	1	0	0	1	0	0	0	0
Water birds			7	4	3	8	4	5	0	7	6	7	6	8	7	5	8	6	7	7	4	3	3
Parrots			3	3	3	3	5	4	0	3	4	7	6	5	6	4	6	6	5	3	3	3	2
Insects			10	10	9	11	12	10	0	9	10	10	9	13	5	11	9	7	12	12	7	3	3
Robins, Wrens, Finches etc			19	17	21	17	21	13	1	10	18	25	11	19	11	10	17	10	16	13	8	4	6
Honeyeaters			6	9	10	7	8	5	0	4	3	8	8	4	2	2	4	3	3	5	4	2	3
			53	53	53	55	62	47	1	38	53	69	47	59	36	38	52	39	51	49	33	20	22
Birds of Prey			**Jun-05**	**Mar-06**	**Aug-06**	**Mar-07**	**Jan-08**	**Nov-08**	**Oct-09**	**Nov-10**	**Nov-11**	**Nov-12**	**Nov-13**	**Nov-14**	**Nov-15**	**Nov-16**	**Nov-17**	**Nov-18**	**Oct-19**	**Nov-20**	**Nov-21**	**Dec-22**	**Dec-23**
			8	9	7	8	11	9	7	5	11	11	7	10	5	5	8	7	7	9	7	5	5
Nocturnal Birds			**Jun-05**	**Mar-06**	**Aug-06**	**Mar-07**	**Jan-08**	**Nov-08**	**Oct-09**	**Nov-10**	**Nov-11**	**Nov-12**	**Nov-13**	**Nov-14**	**Nov-15**	**Nov-16**	**Nov-17**	**Nov-18**	**Oct-19**	**Nov-20**	**Nov-21**	**Dec-22**	**Dec-23**
			0	1	0	1	1	1	1	0	1	1	0	0	0	1	0	0	1	0	0	0	0
Riverine Birds			**Jun-05**	**Mar-06**	**Aug-06**	**Mar-07**	**Jan-08**	**Nov-08**	**Oct-09**	**Nov-10**	**Nov-11**	**Nov-12**	**Nov-13**	**Nov-14**	**Nov-15**	**Nov-16**	**Nov-17**	**Nov-18**	**Oct-19**	**Nov-20**	**Nov-21**	**Dec-22**	**Dec-23**
			7	5	3	8	5	5	5	9	7	9	6	11	8	7	11	8	10	9	6	3	3
Parrots			**Jun-05**	**Mar-06**	**Aug-06**	**Mar-07**	**Jan-08**	**Nov-08**	**Oct-09**	**Nov-10**	**Nov-11**	**Nov-12**	**Nov-13**	**Nov-14**	**Nov-15**	**Nov-16**	**Nov-17**	**Nov-18**	**Oct-19**	**Nov-20**	**Nov-21**	**Dec-22**	**Dec-23**
			3	3	3	3	5	4	4	3	4	7	6	5	6	4	6	6	5	3	3	3	2
Forest Woodland Species			**Jun-05**	**Mar-06**	**Aug-06**	**Mar-07**	**Jan-08**	**Nov-08**	**Oct-09**	**Nov-10**	**Nov-11**	**Nov-12**	**Nov-13**	**Nov-14**	**Nov-15**	**Nov-16**	**Nov-17**	**Nov-18**	**Oct-19**	**Nov-20**	**Nov-21**	**Dec-22**	**Dec-23**
			23	22	23	24	28	19	17	16	21	28	15	25	14	16	20	15	23	21	13	6	8
Robins Wrens Finches			**Jun-05**	**Mar-06**	**Aug-06**	**Mar-07**	**Jan-08**	**Nov-08**	**Oct-09**	**Nov-10**	**Nov-11**	**Nov-12**	**Nov-13**	**Nov-14**	**Nov-15**	**Nov-16**	**Nov-17**	**Nov-18**	**Oct-19**	**Nov-20**	**Nov-21**	**Dec-22**	**Dec-23**
			6	4	7	4	4	4	7	2	6	7	3	5	2	2	4	1	3	3	1	1	1
Honeyeaters			**Jun-05**	**Mar-06**	**Aug-06**	**Mar-07**	**Jan-08**	**Nov-08**	**Oct-09**	**Nov-10**	**Nov-11**	**Nov-12**	**Nov-13**	**Nov-14**	**Nov-15**	**Nov-16**	**Nov-17**	**Nov-18**	**Oct-19**	**Nov-20**	**Nov-21**	**Dec-22**	**Dec-23**
			6	9	10	7	8	5	6	4	3	8	8	4	2	2	4	3	3	5	4	2	3
Birds																							
Accipitridae	Black-shouldered Kite	*Elanus axillaris*	1	1		1	1	1			1			1			1		1				
	Brown Goshawk	*Accipiter fasciatus*					1									1							
	Collared Sparrowhawk	*Accipiter cirrhocephalus*					1							1						1			
	Nankeen Kestrel	*Falco cenchroides*			1		1	1			1	1		1	1				1	1			
	Wedge-tailed Eagle	*Aquila audax*	1	1		1		1			1	1		1			1	1		1	1		
	White-bellied Sea-eagle	*Haliaeetus leucogaster*					1	1											1				
Aegothelidae	Australian Owlet-nightjar	*Aegotheles cristatus*		1			1									1							
	Tawny Frogmouth	*Podargus strigoides*						1			1	1											
Alcedinidae	Azure Kingfisher	*Alcedo azurea*	1			1				1		1											
Anatidae	Australian Wood Duck	*Chenonetta jubata*	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Chestnut Teal	*Anas castanea*	1									1		1		1	1			1			
	Grey Teal	*Anas gracilis*				1									1		1	1	1				
	Hardhead	*Aythya australis*				1					1				1			1				1	
	Pacific Black Duck	*Anas superciliosa*	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ardeidae	White-faced Heron	*Egretta novaehollandiae*	1	1		1				1		1	1	1			1		1	1			
Artamidae	Australian Magpie	*Gymnorhina tibicen*	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1		1	1	1	1
	Dusky Woodswallow	*Artamus cyanopterus*			1	1	1	1		1	1	1	1	1		1	1	1	1	1	1	1	1

			Jun-05	Mar-06	Aug-06	Mar-07	Jan-08	Nov-08	Oct-09	Nov-10	Nov-11	Nov-12	Nov-13	Nov-14	Nov-15	Nov-16	Nov-17	Nov-18	Oct-19	Nov-20	Nov-21	Dec-22	Dec-23
	White-browed Woodswallow	*Artamus superciliosus*													1								
	Grey Butcherbird	*Cracticus torquatus*	1	1	1	1	1				1	1	1	1									
	Pied Butcherbird	*Cracticus nigrogularis*									1	1	1	1			1			1	1		1
	Magpie-lark	*Grallina cyanoleuea*	1	1	1	1	1	1		1	1	1	1	1	1		1	1	1	1	1	1	
	Pied Currawong	*Strepera graculina*	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cacatuidae	Galah	*Cacatua roseicapilla*	1	1	1	1	1	1				1	1		1								
	Gang-gang Cockatoo	*Calocephalon fimbriatum*			1	1	1			1		1	1	1		1	1	1	1				
	Sulphur-crested Cockatoo	*Cacatua galerita*	1	1	1	1	1	1			1	1	1		1		1	1	1	1	1		
	Yellow-tailed Black- Cockatoo	*Calyptorhynchus funereus*	1	1										1				1					
Campephagidae	Black-faced Cuckoo-shrike	*Coracina novaeholandiae*	1	1	1	1	1	1		1	1	1	1			1	1	1		1			
	Cicada Bird	*Coracina tenuirostris*											1										
	White-Winged Triller	*Lalage tricolor*											1	1		1			1				
Charadriidae	Masked Lapwing	*Vanellus miles*		1			1			1		1		1		1	1	1	1		1		
	black fronted dotterel	*Elseyornis melanops*									1			1		1	1		1	1			
Cinclosomatidae	Eastern Whipbird	*Psophodes olivaceus*			1		1	1		1	1			1		1	1		1		1		
Climacteridae	White-throated Treecreeper	*Cormobates leueophaeus*	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Columbidae	Bar-shouldered Dove	*Geopelia humeralis*					1																
	Common Bronzewing	*Phaps ehalcoptera*				1					1									1			
	Crested Pigeon	*Ocyphaps lophotes*	1	1	1	1	1					1											
	Peaceful Dove	*Geopelia striata*	1	1				1				1		1		1							
Coraciidae	Dollarbird	*Eurystomus orientalis*					1	1		1	1	1	1	1	1			1	1	1	1		
Corcoracidae	White-winged Chough	*Corcorax melanorhamphos*	1		1	1	1	1		1	1	1		1	1	1			1	1	1		1
Corvidae	Australian Raven	*Corvus coronoides*	1	1	1	1	1	1		1	1	1				1	1	1	1	1	1	1	1
	Little Raven	*Corvus mellori*		1								1											
	Torresian Crow	*Corvus orru*									1	1	1					1					
Cuculidae	Fan-tailed Cuckoo	*Cacomantis flabelliformis*		1	1	1	1					1		1			1		1	1			
	Eastern Koel	*Eudynamys orientalis*																		1			
Dicaeidae	Mistletoebird	*Dicaeum hirundinaceum*	1		1		1							1									
Dicruridae	Grey Fantail	*Rhipidura fuliginosa*	1	1	1	1	1	1		1	1	1	1	1	1		1	1	1	1	1		1
	Restless Flycatcher	*Myiagra inquieta*	1	1	1		1					1											
	Satin Flycatcher	*Myiagra cyanoleuca*					1				1	1											
	Willie Wagtail	*Rhipidura leucophrys*	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1		1
	Leaden Flycatcher							1			1	1		1									
Falconidae	Brown Falcon	*Falco berigora*	1																				
	Peregrine Falcon	*Falco peregrinus*		1																			
Halcyonidae	Laughing Kookaburra	*Dacelo novaeguineae*	1	1	1	1	1			1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Sacred Kingfisher	*Todiramphus sanetus*		1			1	1		1	1	1	1	1	1	1	1	1	1	1	1		
	Forest Kingfisher	*Todiramphus macleayii*																					
Hirundinidae	Unidentified Martin	*Hirundo sp_*				1		1								1		1		1			
	Welcome Swallow	*Hirundo neoxena*		1		1	1	1		1	1	1	1	1	1	1	1		1	1	1	1	1
Maluridae	Superb Fairy-wren	*Malurus cyaneus*	1	1	1	1	1	1		1	1	1	1	1		1	1	1	1	1	1		1
	Variegated Fairy-wren	*Malurus lamberti*	1		1						1	1											
Meliphagidae	Brown-headed Honeyeater	*Melithreptus validirostris*		1	1		1														1		
	Red Wattlebird	*Anthochaera carunculata*																					
	Eastern Spinebill	*Acanthorhynchus tenuirostris*	1	1	1	1	1					1											
	Noisy Miner	*Manorina melanocephala*	1	1	1	1	1	1		1	1	1	1	1								1	
	New Holland	*Phylidonyris novaehollandiae*		1	1	1	1					1	1										
	Noisy Friarbird	*Philemon corniculatus*		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Red Wattlebird	*Anthochaera carunculata*	1	1	1	1	1						1		1				1	1	1		1
	White-eared Honeyeater	*Lichenostomus ieucotis*	1	1	1							1	1							1			
	White-naped Honeyeater	*Melithretus lunatus*	1	1	1	1	1					1											
	White-plumed Honeyeater	*Lichenostomus penicilliatus*			1					1							1						
	Yellow-faced Honeyeater	*Lichenostomus chrysops*	1	1	1	1	1	1		1	1	1	1	1		1	1	1	1	1	1		1
	Lewins Honeyeater	*Meliphaga lewinii*						1				1		1			1			1			
	Black-chinned Honeyeater	*Melithreptus gularis*											1										
	Rainbow Bee-eater	*Merops ornatus*						1					1					1					
Motacillidae	Richard's Pipit	*Anthus novaeseelandiae*	1	1									1	1			1		1	1			
	Brown Songlark							1					1										
Muscicapidae	Australian Reed-Warbler	*Acrocephalus australis*					1			1	1	1	1	1	1	1	1						
	Clamorous Reed-Warbler	*Acrocephalus stentoreus*																1	1	1			
Neosittidae	Varied Sitella	*Daphoenositta chrysoptera*				1				1													
Oriolidae	Olive-backed Oriole	*Oriolus saggittatus*										1		1					1				
Pachycephalidae	Golden Whistler	*Pachycephaia pectoralis*	1		1	1	1					1		1			1		1				
	Grey Shrike-thrush	*Colluricincia harmonica*	1	1	1	1	1				1	1		1	1	1	1	1	1	1	1		
	Rufous Whistler	*Pachycephala rufiventris*		1		1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pardalotidae	Brown Thornbill	*Acanthiza pusilia*	1	1	1	1	1	1			1	1		1		1	1		1	1			
	Buff-rumped thornbill	*Acanthiza reguloides*	1		1		1					1					1		1				
	Spotted Pardalote	*Pardalotus punctatus*	1	1	1	1	1	1				1	1	1		1					1		
	Striated Pardalote	*Pardalotus striatus*	1	1	1	1	1	1		1	1	1	1	1	1		1		1	1			
	Striated Thornbill	*Acanthiza lineata*			1	1	1	1		1	1	1		1		1	1	1	1	1	1		
	White-browed Scrubwren	*Sericornis frontalis*	1		1	1	1			1	1	1		1	1		1	1	1	1			
	Brown Gerygone	*Gerygone mouki*							1									1					
	White-throated Gerygone	*Gerygone olivacea*		1										1					1			1	
	Yellow Thornbill	*Acanthiza nana*	1	1	1		1				1	1			1	1	1						

			Jun-05	Mar-06	Aug-06	Mar-07	Jan-08	Nov-08	Oct-09	Nov-10	Nov-11	Nov-12	Nov-13	Nov-14	Nov-15	Nov-16	Nov-17	Nov-18	Oct-19	Nov-20	Nov-21	Dec-22	Dec-23
	Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	1	1		1	1			1		1	1	1	1		1		1	1			1
Passeridae	Double-barred Finch	*Taeniopygia bichenovli*	1	1	1	1	1	1		1													
	Red-browed Finch	*Neochmia temporalis*	1	1	1	1	1	1			1	1	1	1	1		1		1	1			
Petroicidae	Eastern Yellow Robin	*Eopsaltria australis*		1	1	1					1	1		1	1		1		1	1			
	Flame Robin	*Petroica phoenicea*	1									1		1									
	Jacky Winter	*Microeca fascinans*	1									1		1									
	Rose Robin	*Petroica rosea*			1						1												
	Scarlet Robin	*Petroica multicolor*			1		1						1			1	1					1	
	Hooded Robin	*Melanodryas cucullata*						1			1	1											
Phalacrocoracidae	Little Pied Cormorant	*Phalacrocorax melanoleucos*						1						1			1		1	1			
	Pied Cormorant	*Phalacrocorax varius*				1																	
Phasianidae	Stubble Quail	*Cotumix pectoralis*	1																				
Podicipedidae	Australasian Grebe	*Tachybaptus novaehollandiae*								1		1		1	1		1	1	1	1	1		
Psittacidae	Crimson Rosella	*Platycercus elegans*					1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Eastern Rosella	*Platycercus eximius*					1	1		1	1	1	1	1	1	1	1	1	1		1	1	1
	Rainbow Lorikeet	*Trichoglossus haematodus*											1										
	Australian King Parrot	*Alisterus scapularis*										1			1		1			1			
	Red-rumped Parrot	*Psephotus haematonotus*									1	1		1	1	1	1	1	1			1	
Rallidae	Dusky Moorhen	*Gallinula tenebrosa*	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1		
	Eurasian Coot	*Fulica atra*	1					1		1	1		1	1	1			1	1	1	1		1
Strigidae	Southern Boobook	*Ninox novaeseelandiae*				1													1				
Zosteropidae	Silyereye	*Zosterops lateralis*		1	1	1	1					1	1					1					
Sturnidae	Common Myna	*Acridotheres tristis*	1	1	1	1																	
	Common Starling	*Sturnus vulgaris*	1		1	1		1			1							1	1			1	

			Jun-05	Mar-06	Aug-06	Mar-07	Jan-08	Nov-08	Oct-09	Nov-10	Nov-11	Nov-12	Nov-13	Nov-14	Nov-15	Nov-16	Nov-17	Nov-18	Oct-19	Nov-20	Nov-21	Dec-22	Dec-23
Mammals			9	6	7	7	5	8	9	12	7	10	10	9	5	10	9	10	8	7	8	7	8
Macropodidae	Common Wallaroo	*Macropus robustus*	1	1	1	1	1	1		1	1	1	1					1				1	
	Eastern Grey Kangaroo	*Macropus giganteus*	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Swamp Wallaby	*Wallabia bicolor*	1		1						1	1		1		1	1	1	1	1	1	1	1
	Red Necked Wallaby	*Macropus rufogriseus*									1	1	1		1						1		1
Molossidae	White-striped Freetail-bat	*Tadarida australis*		1		1		1				1		1		1	1		1				1
Muridae	Unidentified Bush Rat	*Rattus sp.*				1						1	1										
	Water-rat	*Hydromys chrysogaster*		1		1	1																
Ornithorhynchidae	Platypus	*Ornithorhynchus anatinus*	1					1				1	1					1					
Petauridae	Feathertail Glider	*Acrobates pygmaeus*		1						1	1				1								
	Sugar Glider	*Petaurus breviceps*												1				1	1				
Phalangeridae	Common Brushtail Possum	*Trichosurus vulpecula*			1	1		1		1	1	1		1		1	1	1	1	1	1	1	
Pseudocheiridae	Common Ringtail Possum	*Pseudocheirus peregrinus*	1		1			1		1		1	1	1		1	1	1	1	1	1		
Tachyglossidae	Echidna	*Tachyglossus aculeatus*							1	1			1		1	1				1			
Vespertilionidae	Gould's Long-eared Bat	*Nyctophilus gouldii*							1	1							1						
	Western Broad-nosed Bat	*Scotorepans balstoni*								1						1							
	Chocolate Wattled Bat	*Chalinolobus morio*								1				1			1						
Vombatidae	Common Wombat	*Vombatus ursinus*	1							1	1	1	1		1	1	1	1	1	1	1	1	1
Ferals														1									
Bovidae	*Goat	*Carpe hircus*																1	1		1	1	1
Canidae	*Fox	*Vulpes vulpes*	1		1		1	1	1	1			1			1	1	1		1		1	
Felidae	*Cat	*Felis Catus*							1					1		1							1
Leporidae	*Rabbit	*Oryctolagus cuniculus*	1	1	1	1	1	1	1	1			1								1		
Muridae	*House Mouse	*Mus musculus*	1																				
Suidae	*Pig	*Sus scrofa*																					1

Transect no.	Austen Quarry	Abundance				
Date	5 - 7 December 2023	1 = Less than 5% Cover <3 individuals				
Surveyor	Ross Davey	2 = Less than 5% Cover </=10 individuals				
		3 = 5%-25%				
		4 = 25%- 50%				
		5 = 50% - 75%				
		6 = >75%				
Flora Detected within Survey sites 2022		Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek
Native Species		21	26	20	9	14
Scientific	**Common**					
Acacia buxifolia	Box-leaf Wattle					
Acacia clandullensis	Gold-dust Wattle					
Acacia dealbata	Silver Wattle					
Acacia falciformis	Hickory Wattle		2			
Acacia homalophylla	Yarran					
Acacia implexa	Hickory Wattle					
Acacia longissima	Long-leaved Wattle					
Acacia melanoxylon	Blackwood					
Acacia myrtifolia	Myrtle Wattle					
Acacia obtusata	Bluntleaf Wattle					
Acacia uilicifolia	Prickly Moses		1.5			
Acaena ovina	Sheeps Burr		1			
Actinotus helianthi	Flannel Flower			1		
Adiantum aethiopicum	Maiden Hair Fern					
Allocasuarina distyla	Scrub She-oak					
Allocasuarina littoralis	Black She-oak					
Alternanthera denticulata	Lesser Joy-weed					
Angophora floribunda	Rough-barked Apple					
Anisopogon avenaceus	Oat Spear Grass					
Aristida ramosa var. ramosa	Purple Wiregrass					
Aristida vagans	Threeawn Speargrass			2		
Asplenium flabellifolium	Spleenwort					
Austrodanthonia caespitosa						
Austrodanthonia penicillata	Wallaby Grass	2		1		1
Austrodanthonia racemosa var. *racemosa*	Wallaby Grass					
Austrodanthonia spp.	Wallaby Grass					
Austrodanthonia tenuior	Wallaby Grass					
Austrostipa pubescens	Speargrass					
Austrostipa ramosissima	Speargrass					
Austrostipa rudis ssp.*australis*	Speargrass					
Austrostipa rudis ssp.*rudis*	Speargrass			2		
Austrostipa scabra ssp.*falcata*	Speargrass					
Austrostipa scabra ssp.*scabra*	Speargrass					
Austrostipa aristiglumis	Speargrass					
Banksia spinulosa var. *spinulosa*	Hairpin Banksia					
Baumen articulata	Jointed Twigrush					
Blechnum indicum	Swamp Waterfern					
Bossiaea buxifolia	Matted Bossiaea					
Bossiaea prostrata						
Bothriochloa macra	Red-leg Grass					
Bothriochloa spp.	Bluegrass					
Brachyloma daphnoides ssp.*daphnoides*	Daphne Heath		2	1		

Flora Detected within Survey sites 2022		Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek
Bulbine bulbosa	Native Leek					
Bursaria spinosa ssp. *spinosa*	Blackthorn					
Caesia parviflora var vittata	Pale Grass Lily					
Caladenia spp.	Spider Orchid					
Callistemon sp.	Bottle Brush					
Calochilus sp	Beard Orchid					
Calytrix tetragona	Fringe Myrtle	1		1		
Carex appressa	Tall Sedge				3.5	2
Carex fascicularis	Tassel Sedge					
Carex inversa						
Carex spp.						
Cassinia uncata	Sticky Cassinia	2				
Cassytha glabella f. *glabella*	Devils Twine	1				
Casuarina cunninghamiana ssp.*cunninghamiana*	River Oak				5.5	4.5
Cheilanthes distans	Rock Fern					
Cheilanthes sieberi ssp.sieberi	Rock Fern		1	1		
Chloris truncata	Windmill Grass					
Chrysocephalum apiculatum	Yellow Buttons					
Clematis aristata	Old Man's Beard					
Commelina cyanea	Commelina					
Convolvulus erubescens	Bindweed					
Craspedia variabilis	Billy-buttons					
Crassula sieberiana ssp.*sieberiana*	Stonecrop					
Cryptandra amara	Bitter Cryptandra					
Cymbonotus lawsonianus	Bears-ear					
Cymbopogon refractus	Barbed Wire Grass					
Cynoglossum australe			1			
Cyperus gracilis	Slender Flat Sedge					
Daviesia acicularis	Bitter Pea			1		
Desmodium brachypodum	Tick-trefoil					
Desmodium spp.	Tick-trefoil					
Desmodium varians	Tick-trefoil					
Dianella revoluta var. *revoluta*	Flax Lily		2			
Dichelachne inaequiglumis	Plumegrass					
Dichelachne micrantha	Plumegrass					
Dichelachne spp.	Plumegrass	1				
Dichondra repens	Kidney Weed		2			
Digitaria brownii	Cotton Panic Grass					
Digitaria parviflora	Finger Grass					
Dillwynia phylicoides						
Dillwynia phylicoides A.Cunn species complex						
Diuris aurea						
Diuris sulphurea	Tiger Orchid					
Drosera binata	Sundew					
Echinopogon caespitosus var. *caespitosus*	Hedgehog Grass					
Echinopogon ovatus	Hedgehog Grass	2			2	2
Echinopogon spp.	Hedgehog Grass					
Einadia hastata	Saltbush		2			
Einadia polygonoides			2			

Flora Detected within Survey sites 2022		Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek
Einadia nutans ssp.*nutans*	Saltbush					
Einadia trigonos ssp.*trigonos*	Saltbush					
Elymus scaber var. *scaber*	Wheatgrass					
Entolasia marginata	Right-angle Grass					
Entolasia stricta	Right-angle Grass	1.5		2		
Eragrostis leptostachya	Paddock Lovegrass					
Eucalyptus albens	White Box					
Eucalytptus blakeii			2.5			
Eucalyptus bridgesiana			2			
Eucalyptus dives	Broad-leaved Peppermint	1.5		2		
Eucalyptus oblonga	Sandstone Stringybark		3			
Eucalyptus mannifera	Brittle Gum	3		3		
Eucalytus melliodora			1			
Eucalyptus praecox	Brittle Gum					
Eucalyptus pulverulenta	Silver-leaved Mountain Gum					
Eucalyptus viminalis	Ribbon Gum					3
Euchiton sphaericus	Cudweed		1			1
Exocarpos cupressiformis	Native Cherry					
Galium gaudichaudii	Rough Bedstraw					
Galium leptogonium	Galium					
Geranium solanderi var. *solanderi*	Geranium				2	
Glossostigma elatinoides	Mud Mat					
Glycine clandestina	Glycine		2			
Glycine tabacina	Glycine					
Gonocarpus tetragynus	Raspwort	1.5		2		
Gonocarpus teuricoides	Raspwort					
Goodenia bellidifolia		1.5				
Goodenia hederacea ssp.*hederacea*	Goodenia	2		2		
Grevillea arenaria	Hoary Grevillea					
Grevillea aspleniifolia						
Haemodorum corymbosum						
Haemodorum planifolium						
Hakea dactyloides	Broad-leaved Hakea					
Hardenbergia violacea	False Sarsparilla					
Hibbertia aspera	Hairy Guinea Flower					
Hibbertia cistiflora						
Hibbertia obtusifolia	Hoary Guinea Flower	2	2			
Hovea linearis						
Hovea rosmarinifolia						
Hydrocotyle laxiflora	Pennywort		2			
Hydrocotyle tripartita	Pennywort					2
Hymenanthera dentata	Tree Violet					
Hypericum gramineum	Small St.Johns Wort		2			
Imperata cylindrica var. *major*	Blady Grass					
Indigofera australis	Australian Indigo					
Isolepis inundata	Club-sedge				2	
Isotoma axillaris	Rock Isotome					
Joycea pallida	Red-anther Wallaby Grass					
Juncus spp.						
Juncus usitatus					2	2

Flora Detected within Survey sites 2022		Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek
Lachnagrostis filiformis	Blown Grass					
Lagenophora stipitata	Blue-bottle Daisy					
Laxmannia compacta	Slender Wire Lily					
Lepidosperma gunnii		2				
Lepidosperma laterale				2		
Lepidosperma viscidum		1		2		
Leptospermum parvifolium						
Leptospermum polygalifolium ssp.*polygalifolium*						
Leptospermum trinervium		2				
Leucopogon appressus						
Leucopogon ericoides	Pink Beard-heath					
Lindsaea linearis	Screw Fern					
Lissanthe strigosa ssp. *strigosa*	Peach Heath					
Lomandra filiformis ssp.*coriacea*	Wattle Matt-rush	2	2			
Lomandra filiformis ssp.*filiformis*	Wattle Matt-rush					
Lomandra glauca	Pale Matt-rush					
Lomandra longifolia	Spiny Matt-rush	3	2.5	4	1	2
Lomandra multiflora ssp. *multiflora*						
Lomandra spp.	Matt Rush					
Lomatia myricoides	River Lomatia					
Mentha diemenica	Slender Mint					
Microlaena stipoides	Weeping Meadow Grass					3
Mirbelia platylobioides						
Monotoca eliptica	Tree Broom-heath					
Monotoca scoparia						
Notodanthonia longifolia	Long-leaved Wallaby Grass					
Opercularia hispida	Stinkweed					
Opercularia varia	Stinkweed					
Oplismenus aemulus	Basket Grass					
Oplismenus imbecillis	Basket Grass					
Oxalis exilis	Oxalis		1			
Panicum effusum	Hairy Panic					
Panicum simile	Two-colour Panic				2	
Paspalum distichum	Water Couch					
Patersonia sericea	Silky Purple Flag			1		
Persicaria decipiens	Knotweed					
Persicaria hydropiper	Knotweed					
Persicaria praetermissa	Knotweed					
Persicaria strigosa	Knotweed				1	
Persicaria lapathifolia	Knotweed					
Persoonia linearis	Narrow-leaved Geebung					
Philotheca spp.	Wax Flower					
Phragmites australis	Common Reed					2
Phyllanthus hirtellus	Thyme Spurge					
Plantago gaudichaudii	Narrow-leaved Plantain					
Platysace ericoides						
Poa affinis						
Poa labillardierei var. *labillardierei*	Tussock Grass					
Poa sieberiana		2	4	5		
Pomaderris spp.						

Flora Detected within Survey sites 2022		Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek
Pomax umbellata		2		2		
Poranthera microphylla						
Portulaca oleracea	Pigweed					
Prasophyllum spp.	Leek Orchid					
Prostathera incana	Velvet Mint-bush					
Pteridium esculentum	Bracken					2
Pterostylis reflexa	Greenhood Orchid					
Pultanea sp.						1
Ranunculus lappaceus	Common Buttercup					
Rubus parvifolius	Silky Bramble					
Rumex brownii	Swamp Dock					
Samolus valerandi	Brookweed					
Schoenoplectus validus	River Club Rush					
Schoenus ericetorum	Bog-rush		1	1		
Schoenus moorei	Bog-rush					
Scutellaria humilis	Dwarf Scullcap					
Senecio diaschides	Fireweed					
Senecio hispidulus	Fireweed					
Senecio hispidulus var. *hispidulus*	Fireweed					
Senecio quadridentatus	Fireweed					1
Sigesbeckia orientalis	Indian Weed					
Solanum americanum	Glossy Nightshade					
Solanum chenopodinum						
Solanum cinereum	Narrawa Burr					
Solanum prinophyllum	Forest Nightshade					
Solanum pungentium	Eastern Nightshade					
Stellaria pungens	Prickly Starwort		1			
Stylidium sp.	Trigger Plant					
Stypandra glauca	Nodding Blue-lily	3				
Thelymitra sp.	Sun Orchid					
Themeda australis	Kangaroo Grass		3			
Thysanotus juncifolius	Fringe Lily					
Typha domingensis	Cumbungi					
Urtica incisa	Stinging Nettle					
Veronica plebeia	Speedwell					
Viola betonicifolia	Native Violet					
Vittadinia cuneata var. *cuneata* f. *cuneata*	Fuzzweed					
Wahlenbergia gracilis	Bluebell					
Wahlenbergia planiflora	Bluebell					
Wahlenbergia spp.						
Wahlenbergia stricta ssp.*stricta*	Bluebell					
Wahlenbergia victoriensis	Bluebell					
Xerochrysum bracteatum	Golden Everlasting					
		22	27	21	10	15

Transect no.	Austen Quarry	Abundance
Date	5 - 7 December 2023	1 = Less than 5% Cover <3 individuals
Surveyor	Ross Davey	2 = Less than 5% Cover </=10 individuals
		3 = 5%-25%
		4 = 25%- 50%
		5 = 50% - 75%
		6 = >75%

Flora Detected within Survey sites 2022		Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek
Introduced Species		1	7	1	25	26
Scientific	**Common**					
*Acetosella vulgaris	Sheep Sorrel					
*Aira cupaniana	Silvery Hair Grass					
*Alternanthera spp.						
*Ambrosia artemisiifolia	Annual Tagweed					
*Anagallis arvensis	Scarlet Pimpernel				1	1
*Anthoxanthum odoratum	Sweet Vernal Grass		3		2.5	1
*Aster subulatus	Wild Aster					
*Avena barbarta	Oats					
*Brassica fruticulosa	Twiggy Turnip				1	1
*Brassica rapa spp sylvestris	Wild Turnip					
*Briza maxima	Blowfly Grass					
*Briza minor	Shivery Grass					
*Bromus catharticus	Prairie Grass				2	
*Bromus diandrus	Great Brome					
*Bromus hordeaceus	Soft Brome					
*Carduus pycnocephalus	Slender Thistle					
*Carthamus lanatus	Saffron Thistle					
*Centaurium tenuiflorum	Centaury					
*Cerastium glomeratum	Chickweed					
*Chenopodium album	Fat Hen					
*Chenopodium pumilio	Small Crumbweed					
*Chenopodium spp.						
*Chondrilla juncea	Skeleton Weed					
*Cirsium vulgare	Spear Thistle		2		1	1
*Conium maculatum	Hemlock				2	1
*Conyza bonariensis	Fleabane		1		2	1
*Conyza sumatrensis	Fleabane					
*Crataegus monoguna	Hawthorn					1
*Cymbopogon refractus	Barbed Wire Grass					
*Cynodon dactylon	Couch				3	3
*Cyperus eragrostis	Cyperus				2	1.5
*Cyperus sp.	Cyperus					
*Cytisus scoparius ssp.scoparius	Scotch Broom					
*Dactylis glomerata	Cocksfoot				3	3.5
*Digitaria sanguinalis	Summer Grass					
*Echium plantagineum	Pattersons Curse					
*Echium vulgare	Vipers Bugloss					1
*Ehrharta erecta	Ehrharta				2	
*Eleusine indica	Crowsfoot Grass					
*Eleusine tristachya	Goose Grass					
*Eragrostis curvula	African Love Grass					3
*Eragrostis tenuifolia	Elastic Grass					

Flora Detected within Survey sites 2022		Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek
*Erodium cicutarium	Storksbill					
*Euphorbia lathyris	Caper Spurge				2	2
*Euphorbia peplus	Petty Spurge				2	1
*Foeniculum vulgare	Fennel					
*Fumaria muralis	Fumaria					
*Fumaria spp.	Fumaria					
*Galium tricomutum	Galium					
*Genista monspessulana	Montpellier Broome					
*Gnaphalium sp.	Cudweed					
*Herschfeldia incana	Buchan Weed					
*Holcus lanatus	Yorkshire Fog				2.5	3
*Hydrocotyle bonariensis	Pennywort					
*Hypericum perforatum	St. Johns Wort					
*Hypochaeris radicata	Flatweed	2	2	1	1	1
*Lactuca serriola	Prickly Lettuce					
*Lepidium spp.	Peppercress					
*Lepidium virginicum	Virginian Peppercress					
*Lolium perenne	Perennial Ryegrass				2	2
*Lycium ferocissimum	African Boxthorn					
*Lythrum hyssopifolia	Hyssop Loosestrife					
*Malus spp.	Apple					
*Malva parviflora	Small-flowered Mallow					
*Medicago arabica	Spotted Burr Medic					
*Medicago satavia	Lucerne					
*Modiola caroliniana	Red-flowered Mallow					
*Myosotis spp.	Forget-me-not					
*Nassella trichotoma	Serrated Tussock					2
*Oenothera mollissima	Evening Primrose					
*Onopordum acanthium	Scotch Thistle					
*Orobanche sp.	Broomrape					
*Oxalis corniculata	Yellow Wood Sorrel					
*Panicum maximum	Green Panic					
*Papaver somniferum	Poppy					
*Parentucellia latifolia	Red Bartsia					
*Paronychia brasiliana	Brasilian Witlow					
*Paspalum dilatatum	Paspalum					
*Pennisetum clandestinum	Kikuyu					
*Petrorhagia nanteuilii	Childing Pink					
*Phalaris aquatica	Phalaris				2	
*Phytolacca octandra	Inkweed					
*Plantago lanceolata	Plantain				1.5	1
*Plantago major						1
*Polygonum aviculare	Wireweed					
*Prunella vulgaris	Self-heal					
*Prunus spp.	Peach/Nectarine					
*Pyracantha spp.	Firethorn					
*Ranunculus lappaceus	Common Buttercup				2	1
*Rorippa palustris	Yellow Cress					
*Rosa sp.	Rose					
*Rubus fruiticosus	Blackberry				2	2
*Rumex conglomeratus	Clustered Dock					
*Rumex crispus	Curled Dock					

Flora Detected within Survey sites 2022		Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek
*Rumex obtusifolius	Broadleaf Dock		2		2	1
*Rumex spp.	Dock					
*Salix sp.	Willow					
*Senecio madagascariensis	Fireweed					
*Setaria gracilis	Pigeon Grass					
*Silene gallica	Silene					
*Silybum marianum	Variegated Thistle					
*Solanum chenopodioides	Whitetip Nightshade					
*Solanum linnaeanum	Apple of Sodom					
*Solanum nigrum	Blackberry Nightshade				1	
*Sonchus asper	Prickly Sowthistle				1	1
*Sonchus oleraceus	Sowthistle					
*Sporobolus spp.	Parramatta Grass					
*Stenotaphrun secundatum	Buffalo Grass					
*Tagetes minuta	Stinking Roger		1			
*Taraxacum officinale	Dandelion		2			
*Trifolium angustifolium	Narrow Leaved Clover					
*Trifolium arvense	Haresfoot Clover					
*Trifolium repens	White Clover				1	
*Urtica urens	Stinging Nettle					
*Verbascum thapsus	Great Mullein					
*Verbascum virgatum	Twiggy Mullein					
*Verbena bonariensis	Purpletop				1	1
*Verbena rigida	Purpletop					
*Veronica anagallis-aquatica	Blue Water Speedwell					
*Veronica persica	Creeping Speedwell					
*Vicia satavia	Vetch					
*Vulpia bromoides	Silver Grass					2
		1	7	1	25	26

Appendix B

Declared weeds of the Central Tablelands

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B.1 Declared weeds of the Central Tablelands

The *Central Tablelands Regional Strategic Weed Management Plan 2023 – 2027* (LLS, 2022) identifies several priority weeds for the Central Tablelands region. Priority weeds are categorised by the following management strategies:

- **Prevention** – weeds not currently found within the region that present a significant biosecurity risk, but for which prevention is a reasonably practical objective
- **Eradication** – weeds are present in limited abundance within the region, and elimination is a reasonably practical objective
- **Containment** – weeds are widely distributed in parts of the region and broadscale elimination is impractical; minimisation of risk posed by these weeds is reasonably practical
- **Asset protection** – weeds are widely distributed in some areas of the region and their spread should be minimised to protect priority regional assets.

Priority weeds for the Central Tablelands are presented in Table B.1.

Table B.1 Priority weeds for the Central Tablelands

Common name	Scientific name	Regional management priority	Present?
African Boxthorn	*Lycium ferocissimum*	Asset protection	N
African Olive	*Olea europaea* subsp. *cuspidata*	Containment	N
Blackberry	*Rubis fruticosus* spp. agg	Asset protection	Y
Blue Heliotrope	*Heliotropium amplexicaule*	Asset protection	N
Bridal Creeper	*Asparagus asparagoides*	Containment	N
Burr Ragweed	*Ambrosia confertiflora*	Prevention	N
Cape Broom	*Genista monspessulana*	Containment	N
Chilean Needle Grass	*Nassella neesiana*	Containment	N
Coolatai Grass	*Hyparrhenia hirta*	Containment	N
Cylindropuntia	*Cylindropuntia* spp.	Prevention	N
Fireweed	*Senecio madagascariensis*	Containment	N
Giant Parramatta Grass	*Sporobolus fertilis*	Eradication	N
Giant Reed	*Arunda donax*	Containment	N
Gorse	*Ulex europaeus*	Containment	N
Green cestrum	*Cestrum parqui*	Containment	N
Harrisia	*Harrisia* spp.	Prevention	N
Honey Locust	*Gleditsia triacanthos*	Containment	N
Horsetails	*Equisetum* spp.	Prevention	N
Madeira vine	*Anredera cordifolia*	Eradication	N

Table B.1 Priority weeds for the Central Tablelands

Common name	Scientific name	Regional management priority	Present?
Mother-of-millions	*Bryophyllum* spp.	Eradication	N
Opuntia species	*Opuntia spp.*	Asset protection	N
Ox-eye Daisy	*Leucanthemum vulgare*	Asset protection	N
Pampas Grass	*Cortaderia* spp.	Containment	N
Privet	*Ligustrum* spp.	Containment	N
Rope Pear	*Cylindropuntia imbricata*	Eradication	N
Sagittaria	*Sagittaria platyphylla*	Eradication	N
Scotch Broom / English Broom	*Cytisus scoparius* subsp. *scoparius*	Containment	N
Serrated Tussock	*Nassella trichotoma*	Asset protection	Y
Silverleaf Nightshade	*Solanum elaeagnifolium*	Containment	N
Spanish Heath	*Erica lusitanica*	Containment	N
Spiny Burr Grass	*Cenchrus spinifex* and *Cenchrus longispinus*	Containment	N
St John's Wort	*Hypericum perforatum*	Asset protection	N
Sticky Nightshade	*Solanum sisymbrifolium*	Containment	N
Tutsan	*Hypericum androsaemum*	Containment	N

Appendix C
Threatened Species Database search

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C.1 Protected Matters Search Tool – Threatened Species Database results

Table C.1 Threatened species list

Common name	Scientific name	Habitat requirements	EPBC Act listing
Endangered ecological communities			
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	No scientific name	Dominated by White Box Yellow Box or Blakely's Red Gum where a tree canopy still exists. Must be greater than 0.1 hectares in size where these canopy species dominate	Critically Endangered
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	No scientific name	Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion are generally tall open eucalypt forests found on igneous rock (predominately Tertiary basalt and microsyenite) in, or adjacent to, the Sydney Basin Bioregion. The ecological community occurs in areas of high rainfall, generally ranging from 950 to 1,600 mm/year. The ecological community typically occurs at elevations between 650 and 1,050 m above sea level	Endangered
Natural Temperate Grassland of the South Eastern Highlands	No scientific name	Natural Temperate Grassland is confined to the Southern Tablelands, a region bounded by the ACT, Yass, Boorowa, the Abercrombie River, Goulburn, the Great Eastern Escarpment, the Victorian border, and the eastern boundary of Kosciusko National Park. The community occurs in a number of distinct plant associations (see Armstrong et al., 2013). According to the association present, the community is found in various topographical positions and on a variety of substrates. The altitudinal range of the community is between 500 m and 1,200 m asl. The community is found on broad sweeping plains with poor drainage and cold air inversions that promote frosts which inhibit tree growth; on all topographical locations, including upper-slopes, crests, and plateaux on basalt landscapes; and in frost hollows in areas otherwise dominated by woodlands or forests. The community may also occur in a landscape mosaic with several woodland communities.	Critically Endangered
Flora			
A Herb	*Euphrasia arguta*	Its previous habitat consists of grassy areas near rivers in elevations until 700 m asl with an annual rainfall of 600 mm. The flowering period is from October to January	Critically Endangered
A Shrub	*Leionema lachnaeoides*	Occurs on exposed cliff tops and terraces in the Megalong and Jamison valleys. Occurs in montane heath communities.	Endangered
Austral Toadflax	*Thesium australe*	Occurs in grassland or grassy woodland. Often found in damp sites in association with Kangaroo Grass (Themeda australis). A root parasite that takes water and some nutrient from other plants, especially Kangaroo Grass	Vulnerable

Table C.1 Threatened species list

Common name	Scientific name	Habitat requirements	EPBC Act listing
Black Gum	*Eucalyptus aggregate*	Grows on alluvial soils, on cold, poorly drained flats and hollows adjacent to creeks and small rivers. Often grows with other cold-adapted eucalypts, such as Snow Gum or White Sallee (*Eucalyptus pauciflora*), Manna or Ribbon Gum (*E. viminalis*), Candlebark (*E. rubida*), Black Sallee (*E. stellulata*) and Swamp Gum (*E. ovata*). Black Gum usually occurs in an open woodland formation with a grassy ground layer dominated either by River Tussock (*Poa labillardierei*) or Kangaroo Grass (*Themeda australis*), but with few shrubs. Also occurs as isolated paddock trees in modified native or exotic pastures. Many populations occur on travelling stock reserves, though stands and isolated individuals also occur on private land. There are very few stands in conservation reserves.	Vulnerable
Bynoe's Wattle	*Acacia bynoeana*	Occurs in heath or dry sclerophyll forest on sandy soils. Seems to prefer open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia, and Narrow-leafed Apple.	Vulnerable
Cambage Kunzea	*Kunzea cambagei*	Restricted to damp, sandy soils in wet heath or mallee open scrub at higher altitudes on sandstone outcrops or Silurian group sediments. Flowering occurs between September and November	Vulnerable
Cotoneaster	*Pomaderris cotoneaster*	Usually growing on shallow soils with outcropping rock, often associated with cliff lines (above, on or below) or riverbanks. The species occurs in dry, shrubby open forest on north-west to south-west facing slopes.	Endangered
Eastern Underground Orchid	*Rhizanthella slateri*	Habitat requirements are poorly understood and no particular vegetation type has been associated with the species, although known to occur in sclerophyll forest. Flowers September to November.	Endangered
Flockton Wattle	*Acacia flocktoniae*	The Flockton Wattle is found only in the Southern Blue Mountains (at Mt Victoria, Megalong Valley, and Yerranderie) and grows in dry sclerophyll forest on sandstone.	Vulnerable
Hoary Sunray	*Leucochrysum albicans* subsp. *tricolor*	Occurs in a wide variety of grassland, woodland, and forest habitats, generally on relatively heavy soils. Highly dependent on the presence of bare ground for germination.	Endangered
Silver-leaved Mountain Gum	*Eucalyptus pulverulenta*	The Silver-leafed Gum is found in two quite separate areas, the Lithgow to Bathurst area and the Monaro (Bredbo and Bombala areas). Grows in shallow soils as an understorey plant in open forest, typically dominated by Brittle Gum (*Eucalyptus mannifera*), Red Stringybark (*E. macrorhynca*), Broad-leafed Peppermint (*E. dives*), Silvertop Ash (*E. sieberi*) and Apple Box (*E. bridgesiana*).	Vulnerable

Table C.1 Threatened species list

Common name	Scientific name	Habitat requirements	EPBC Act listing
Swamp Everlasting	*Xerochrysum palustre*	Swamp Everlasting grows in wetlands including sedge-swamps and shallow freshwater marshes, often on heavy black clay soils. Commonly associated genera include Swamp Wallaby-grasses (*Amphibromus* spp.), Twig-sedges (*Baumea* spp.), Sedges (*Carex* spp.), Chorizandra, Billy-buttons (*Craspedia* spp.), Spike-sedges (*Eleocharis* spp.), Club-sedges (*Isolepis* spp.), Blowngrasses (*Lachnagrostis* spp.), Sword-sedges (*Lepidosperma* spp.), Water-milfoils (*Myriophyllum* spp.), Common reed (*Phragmites australis*), Kangaroo grass (*Themeda triandra*) and Villarsia.	Vulnerable
Fauna			
Fish			
Australian Grayling	*Prototroches maraena*	The Australian Grayling is a slender fish with a small head and pointed snout. The colour varies from silvery with an olive-grey back and whitish belly to olive-green or brownish on the back, with clear to greyish fins.	Vulnerable
Macquarie Perch	*Macquaria australasica*	Macquarie Perch are an elongated, oval shaped fish with large eyes and a rounded tail. They can be black, silver-grey, blue-grey or green-brown in colour, with a paler underside.	Endangered
Amphibians			
Booroolong Frog	*Litoria booroolongensis*	Live along permanent streams with some fringing vegetation cover such as ferns, sedges, or grasses. Adults occur on or near cobble banks and other rock structures within stream margins. Shelter under rocks or amongst vegetation near the ground on the stream edge. Sometimes bask in the sun on exposed rocks near flowing water during summer. Breeding occurs in spring and early summer and tadpoles metamorphose in late summer to early autumn. Eggs are laid in submerged rock crevices and tadpoles grow in slow-flowing connected or isolated pools.	Endangered
Insects			
Bathurst Copper Butterfly	*Paralucia spinifera*	Occurs on the Central Tablelands of NSW in an area approximately bounded by Oberon, Hartley, and Bathurst. The butterfly is found at 35 locations, all within the Greater Lithgow, Bathurst Regional and Oberon local government areas. It is possible that additional locations will be identified, and these may lie outside the currently known distribution.	Vulnerable
Birds			
Australian Bittern	*Botaurus poiciloptilus*	Australasian Bitterns are widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly tall bulrushes and spikerushes.	Endangered

Table C.1 Threatened species list

Common name	Scientific name	Habitat requirements	EPBC Act listing
Australian Painted Snipe	*Rostratula australis*	In NSW, this species has been recorded at the Paroo wetlands, Lake Cowell, Macquarie Marshes, and Hexham Swamp. Most common in the Murray-Darling Basin. Prefers fringes of swamps, dams, and nearby marshy areas where there is a cover of grasses, lignum, low scrub, or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks, or reeds. The nest consists of a scrape in the ground, lined with grasses and leaves. Breeding is often in response to local conditions; generally occurs from September to December. Forages nocturnally on mudflats and in shallow water. Feeds on worms, molluscs, insects, and some plant-matter.	Endangered
Blue-winged Parrot	*Neophema chrysostoma*	Blue-winged parrots inhabit a range of habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. They tend to favour grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones. The species can also be seen in altered environments such as airfields, golf-courses and paddocks.	Vulnerable
Brown Treecreeper (south-eastern)	*Climacteris picumnus victoriae*	Brown Treecreepers are found across much of eastern Australia. They range from patches in the northern part of Cape York Peninsula across central and eastern Queensland, down throughout New South Wales into the majority of Victoria and eastern parts of South Australia. Occupies dry open forests and woodlands.	Vulnerable
Curlew Sandpiper	*Calidris ferruginea*	The Curlew Sandpiper generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. Also occurs in non-tidal swamps, lakes, and lagoons on the coast and sometimes inland. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed. Roosts on shingle, shell, or sand beaches; spits or islets on the coast or in wetlands; or sometimes in salt marsh, among beach-cast seaweed, or on rocky shores.	Critically Endangered
Diamond Firetail	*Stagonopleura guttata*	Diamond firetails occur in eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats, including farmland and grassland with scattered trees. They prefer areas with relatively low tree density, few large logs, and little litter cover but high grass cover. Diamond firetails usually occur in flocks of between 5 to 40, and occasionally more. The species appears to be sedentary, though some populations move locally. Their flight is described as low and direct in long lines with slight undulations. Birds roost in dense shrubs or in smaller nests built especially for roosting.	Vulnerable
Gang-gang Cockatoo	*Callocephalon fimbriatum*	In summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, may occur at lower altitudes in drier more open eucalypt forests and woodlands, and often found in urban areas. May also occur in sub-alpine Snow Gum Eucalyptus pauciflora woodland and occasionally in temperate rainforests. Move to lower altitudes in winter, preferring more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. Favours old growth attributes for nesting and roosting	Endangered

Table C.1 Threatened species list

Common name	Scientific name	Habitat requirements	EPBC Act listing
Grey Falcon	*Falco hypoleucos*	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey. Preys primarily on birds, especially parrots and pigeons, using high-speed chases and stoops; reptiles and mammals are also taken. Like other falcons it utilises old nests of other birds of prey and ravens, usually high in a living eucalypt near water or a watercourse; peak laying season is in late winter and early spring.	Vulnerable
Latham's Snipe	*Gallinago hardwickii*	In Australia, Latham's Snipe occurs in a wide variety of permanent and ephemeral wetlands. They usually occur in open, freshwater wetlands that have some form of shelter. They generally occupy flooded meadows, seasonal or semi-permanent swamps, or open waters but various other freshwater habitats can be used including bogs, waterholes, billabongs, lagoons, lakes, creek or river margins, river pools and floodplains. The structure and composition of the vegetation that occurs around these wetlands is not important in determining the suitability of habitat. As such, snipe may be found in a variety of vegetation types or communities including tussock grasslands with rushes, reeds and sedges, coastal and alpine heathlands, lignum or tea-tree scrub, button-grass plains, alpine herb fields and open forest.	Vulnerable
Painted Honeyeater	*Grantiella picta*	The species inhabits mistletoes in eucalypt forests/woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks, casuarinas, callitris, and trees on farmland or gardens. The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes. It is more common in wider blocks of remnant woodland than in narrower strips.	Vulnerable
Pilotbird	*Pycnoptilus floccosus*	Pilotbirds are strictly terrestrial, living on the ground in dense forests with heavy undergrowth. Largely sedentary, they are typically seen hopping briskly over the forest floor and foraging on damp ground or among leaf-litter. Flight is described as fairly weak; though, if disturbed, birds can sometimes ascend into shrubs (but no more than 1–2 m from the ground).	Vulnerable
Regent Honeyeater	*Anthochaera phrygia*	Regent Honeyeaters occur mainly in box-ironbark open forests and riparian stands of Casuarina on the inland slopes of the Great Dividing Range. At times significant numbers also occur in coastal forests in NSW and eastern Victoria. Particularly when breeding, Regent Honeyeaters require access to nectar or another form of sugary plant exudate such as lerps or honeydew. A few species of Eucalyptus and mistletoe (*Amyema cambagei*) seem to be important in providing reliable and relatively predictable nectar flows. Lack of access to these dependable nectar flows at critical times, due to clearance of the most fertile stands, the poor health of many remnants, and competition for nectar from other honeyeaters, may be a major cause of the decline of this species.	Critically Endangered

Table C.1 Threatened species list

Common name	Scientific name	Habitat requirements	EPBC Act listing
Sharp-tailed Sandpiper	*Calidris acuminata*	In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline salt lakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and swamps and creeks lined with mangroves. They tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season. They may be attracted to mats of algae and water weed either floating or washed up around terrestrial wetlands, and coastal areas with much beach cast seaweed.	Vulnerable
South-eastern Glossy Black-Cockatoo	*Calyptorhynchus lathami lathami*	Inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1,000 m in which stands of she oak species, particularly Black She-oak (*Allocasuarina littoralis*), Forest She-oak (*A. torulosa*) or Drooping She-oak (*A. verticillata*) occur. Feeds almost exclusively on the seeds of several species of she-oak (Casuarina and Allocasuarina species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites.	Vulnerable
South-eastern Hooded Robin	*Melanodryas cucullata cucullata*	Found in Eucalypt woodland and mallee and Acacia shrubland. Studies suggest that there are three key components to their habitat: (1) the presence of relatively open areas. (2) patches of young Eucalypts or shrubs for nest-sites and (3) the presence of suitable perches for foraging. They are often found near clearings or more open areas, such as paddocks.	Endangered
Southern Whiteface	*Aphelocephala leucopsis*	Southern whitefaces live in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. These areas are usually in habitats dominated by acacias or eucalypts on ranges, foothills and lowlands, and plains.	Vulnerable
Superb Parrot	*Polytelis swainsonii*	Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina, the birds' nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes, nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. Nest in small colonies, often with more than one nest in a single tree. Breed between September and January. May forage up to 10 km from nesting sites, primarily in grassy box woodland	Vulnerable
Swift Parrot	*Lathamus discolor*	Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia. In NSW mostly occurs on the coast and south-west slopes between March and October. Favoured feed trees include winter flowering species such as Swamp Mahogany Spotted Gum, Red Bloodwood, *E. sideroxylon* and White Box. Commonly used lerp infested trees include E. microcarpa, Grey Box and Blackbutt.	Critically Endangered

Table C.1 Threatened species list

Common name	Scientific name	Habitat requirements	EPBC Act listing
White-throated Needletail	*Hirundapus caudacutus*	In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1,000 m above the ground. Because they are aerial, it has been stated that conventional habitat descriptions are inapplicable, but there are, nevertheless, certain preferences exhibited by the species. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps.	Vulnerable
Mammals			
Brush-tailed Rock-wallaby	*Petrogale penicillata*	Occupy rocky escarpments, outcrops, and cliffs with a preference for complex structures with fissures, caves, and ledges, often facing north. Browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees. Shelter or bask during the day in rock crevices, caves, and overhangs and are most active at night. Highly territorial and have strong site fidelity with an average home range size of about 15 ha. Live in family groups of 2 to 5 adults and usually one or two juvenile and sub-adult individuals. Dominant males associate and breed with up to four females.	Vulnerable
Greater Glider (southern and central)	*Petauroides volans*	The greater glider chooses habitat based on several factors, the dominant factor being the presence of specific species of eucalypt. Distribution levels are higher in regions of montane forest containing manna gum and mountain gum. Furthermore, the presence of appears to improve the quality of habitat for the greater glider in forests dominated by *E. obliqua*. Another factor determining population density is elevation. Optimal levels are 845 m above sea level. Within a forest of suitable habitat, they prefer overstorey basal areas in old-growth tree stands.	Endangered
Grey-headed Flying-fox	*Pteropus poliocephalus*	Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Travels up to 50 km to forage on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines.	Vulnerable
Koala	*Phascolarctos cinereus*	Inhabits eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Inactive for most of the day, feeding and moving mostly at night. Spends most of their time in trees but will descend and traverse open ground to move between trees. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size.	Endangered

Table C.1 Threatened species list

Common name	Scientific name	Habitat requirements	EPBC Act listing
Large-eared Pied Bat	*Chalinolobus dwyeri*	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Hirundo ariel*), frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity roosts (c. 20–40 females) from November through to January in roof domes in sandstone caves. They remain loyal to the same cave over many years. Found in well-timbered areas containing gullies. The relatively short, broad wing combined with the low weight per unit area of wing indicates manoeuvrable flight. This species probably forages for small, flying insects below the forest canopy. Likely to hibernate through the coolest months. It is uncertain whether mating occurs early in winter or in spring.	Endangered
New Holland Mouse	*Pseudomys novaehollandiae*	Across the species' range the New Holland Mouse is known to inhabit open heathlands, open woodlands with a heathland understorey, and vegetated sand dunes. The home range of the New Holland Mouse can range from 0.44 ha to 1.4 ha. The New Holland Mouse is a social animal, living predominantly in burrows shared with others. The species is nocturnal and omnivorous, feeding on seeds, insects, leaves, flowers, and fungi, and is therefore likely to play an important role in seed dispersal and fungal spore dispersal.	Vulnerable
Spotted-tail Quoll	*Dasyurus maculatus maculatus*	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath, and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites. Mostly nocturnal, although will hunt during the day; spends most of the time on the ground, although also an excellent climber and may raid possum and glider dens and prey on roosting birds.	Endangered
Yellow-bellied Glider	*Petaurus australis australis*	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Live in small family groups of two–six individuals and are nocturnal. Den, often in family groups, in hollows of large trees. Very mobile and occupy large home ranges between 20 to 85 ha to encompass dispersed and seasonally variable food resources.	Vulnerable
Reptiles			
Pink-tailed Worm-lizard	*Aprasia parapulchella*	Inhabits sloping, open woodland areas with predominantly native grassy ground layers, particularly those dominated by Kangaroo Grass (Themeda australis). Sites are typically well drained, with rocky outcrops or scattered, partially buried rocks. Commonly found beneath small, partially embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites. Feeds on the larvae and eggs of the ants with which it shares its burrows.	Vulnerable

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Appendix I: Aquatic Ecology Monitoring

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Aquatic Monitoring Report

Spring 2023

Prepared for Austen Quarry Pty Ltd | 6 March 2024

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Executive summary

Hy-Tec Industries Pty Ltd (Hy-Tec) commissioned Niche Environment and Heritage Pty Ltd (Niche) to undertake the spring 2023 aquatic ecology survey at Austen Quarry near Hartley, NSW (the Quarry) as part of an ongoing monitoring program that examines the ecological health of the Coxs River. Water from the Quarry is occasionally discharged into the nearby Coxs River (i.e., during significant wet weather events and controlled releases) via a number of Licensed Discharge Points (LDPs) to maintain water storage capacity within the various dams located at the Quarry.

The purpose of the aquatic monitoring program is to assess stream health at sites upstream and downstream of the Quarry's LDPs. This report describes the current stream health conditions and specifically identifies any impacts downstream of the mixing zone from the Quarry water discharge. The objectives are to:

- Examine the quality of aquatic habitats and physico-chemical water quality at each monitoring site.
- Collect macroinvertebrate samples consistent with previous sampling and AUSRIVAS spring sampling protocols.
- Examine the spatial and temporal patterns in macroinvertebrate assemblage structure and AUSRIVAS indices consistent with previous monitoring to ascertain whether Quarry operations are impacting aquatic health.

Edge and riffle habitat was sampled at six sites for aquatic macroinvertebrates during November 2023 as part of the spring sampling period. The data collected was analysed using both univariate and multivariate statistical techniques to examine the spatial and temporal variability within aquatic macroinvertebrate assemblage structure to ascertain changes in river health.

Sampling was conducted at two Quarry Treatment sites, two Quarry Control sites and two Upstream Control sites. The key findings from the monitoring results are:

- Water quality readings were within ANZG DGVs at all sites, with the exception of pH at Upstream Control Sites 4 and 5 and Quarry Control Site 7 where it was above DGVs, and dissolved oxygen which was below DGVs at Quarry Processing site 2.
- Pool edge and riffle habitat macroinvertebrate assemblages were consistent between Control sites and Quarry Treatment monitoring sites. As such, no indicators of impacts to stream health associated with quarry operations are identifies in the spring 2023 data.
- The AUSRIVAS 0E50 scores for spring 2023 in riffle habitats are better than the results recorded in in all previous years of monitoring. While the AUSRIVAS OE50 scores for spring 2023 in edge habitats, showed slightly lower, but comparable, scores to previous years (2020-2023).
- The number of taxa recorded in 2023 were lower than previous years of monitoring (all years except 2022) at pool edge, and riffle habitats. Despite this, SIGNAL2 results were comparable to at edge and riffle habitats across all sites.
- Statistical analysis of the pool edge and riffle data found that significant differences were identified in a number of stream health results, including the interaction term year x location. However, pairwise tests and further investigation did not identify any indicators of impact at the Quarry Treatment sites. With the results being comparable or superior at Quarry Treatment sites when compared to the Control sites. Many of the significant differences are driven by the differences in assemblages between 2023, 2022 and previous years (likely due to changing weather conditions) and differences in Control groups.

The spring 2023 biological monitoring results reflect the prevailing low rainfall and stream flow conditions through the year and are reduced when compared to monitoring results in previous years of more nominal

rainfall levels. Although, the results are improved when compared to 2022, which suffered from significantly above average rainfall and stream flows modifying habitats and macroinvertebrate assemblages. This reflects the prevailing physical conditions, rather than any reduced water quality conditions.

Importantly, both pool edge and riffle habitats recorded AUSRIVAS results that were comparable between Control and Quarry Treatment sites in spring 2023. While the pool habitat results indicated that there were significant differences for the SIGNAL2 scores between the Quarry Treatment and Upstream Control locations, there were no significant differences detected between the Quarry Control and Quarry Treatment locations. Similarly for the riffle habitats, a significant difference was detected between the Quarry Treatment and Upstream Control locations for the Total Taxa number, and for the OE50 Taxa value between Quarry Control and Upstream Control locations. None of the significant differences identified show an indication of the Quarry Control being significantly different to the Quarry Treatment. Therefore, the macroinvertebrate assemblages and stream health indicators show that the composition and ecological health of the river within the vicinity of the Quarry remains similar to other areas of the river not influenced by Quarry operations. As such, no impacts associated with any discharges from the Quarry are identified in Spring 2023.

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Glossary and abbreviations

Anthropogenic	Caused or produced by humans.
ANZECC	Australian and New Zealand Environment and Conservation Council
ANZG	Australian and New Zealand Guidelines (ANZG) for Fresh and Marine Water Quality.
Aquatic macroinvertebrates	Animals that have no backbone, are visible with the naked eye and spend all or part of their life in water.
AUSRIVAS	Australian Rivers Assessment System
CMA	Catchment Management Area
Drainage	Natural or artificial means for the interception and removal of surface or subsurface water.
DGVs	Default Guideline Values.
Ecology	The study of the relationship between living things and the environment.
Ephemeral	Existing for a short amount of time.
Habitat	The place where a species, population or ecological community lives (whether permanently, periodically, or occasionally).
In situ	In the original place- measurements conducted at the site as opposed to laboratory.
LMP	Landscape Management Plan
RCE inventory	Riparian and Channel and Environment inventory assessment.
Riparian	Relating to the banks of a natural waterway.
SIGNAL	Stream Invertebrate Grade Number Average Level. SIGNAL2 scores are indicative only and pollution does not refer to just anthropogenic sources. Environmental stress may result in poor water quality occurring naturally in waterways such as those conditions found in ephemeral streams. Low family richness and the occurrence of pollution tolerant invertebrates can give a low SIGNAL score even though they are a natural condition.
Stress	Response to a stressor such as an environmental condition or a stimulus.

1. Introduction

1.1 Background

Hy-Tec Industries Pty Ltd (Hy-Tec) commissioned Niche Environment and Heritage Pty Ltd (Niche) to undertake the spring 2023 aquatic ecology survey at Austen Quarry near Hartley, NSW (the Quarry) as part of an ongoing monitoring program that examines the ecological health of the Coxs River. Field sampling for the monitoring program was undertaken within the spring AUSRIVAS sampling period (15 September to 15 December) and has been conducted on an annual basis since 2005.

Austen Quarry extracts rhyolite, a durable igneous rock, which is used for a variety of applications including concrete aggregates, asphalt aggregates, road base materials, rail infrastructure and landscaping products. As part of the quarry operations, various water management practices are utilised across the site and include the collection of water runoff for environmental control and for use in a variety of quarry processes and dust suppression. Water from the site is sometimes discharged into the nearby Coxs River (i.e. during significant wet weather events and controlled releases) via a number of Licensed Discharge Points (LDPs) to maintain water storage capacity within the various dams located at the Quarry. As such, the discharge of water from the Quarry must comply with the water quality criteria set out in Environment Protection Licence (EPL) 12323 and S.120 of the *Protection of the Environment Operations Act 1997*, which prohibits the pollution of surface waters unless expressly authorised by the EPL. To ensure water pollution is minimised prior to any releases, various processes, such as the addition of flocculants and other dam management practices, may be utilised.

In previous years (prior to 2016), as part of the conditions of Development Consent issued by Lithgow Council for the Quarry (DA 103/94), Hy-Tec monitored impacts on the aquatic environment by assessing macroinvertebrate assemblages within the Coxs River upstream and downstream of the Quarry. As such, monitoring of aquatic macroinvertebrates was undertaken (since 2005) to determine whether the occasional discharge of water from the Quarry, or the operation of the Quarry in general, has had any detectable impact on the ecology of the river. To date, no apparent impact from Quarry operations on the aquatic macroinvertebrates within Coxs River has been detected throughout the monitoring program.

1.2 Purpose and objectives of this report

The purpose of the aquatic monitoring is to assess stream health at sites above and below the LDPs, and selected tributaries. This report aims to describe the current stream health and specifically identify any impacts downstream of the mixing zone from Quarry water discharge. The objectives of the report are to:

- Examine the quality of aquatic habitats and physico-chemical water quality at each monitoring site.
- Collect macroinvertebrate samples consistent with previous sampling and AUSRIVAS spring sampling protocol.
- Examine the spatial and temporal patterns in macroinvertebrate assemblage structure and AUSRIVAS indices consistent with previous monitoring to ascertain whether Quarry operations are impacting aquatic health.

2. Methods

2.1 Survey methods

The monitoring survey was undertaken by David Wilkinson (Aquatic Ecology Consultant) and Luke Stone (Principle Aquatic Ecologist) over two days (02/11/2023 and 03/11/2023). AUSRIVAS was the primary survey method employed, which is a standard rapid assessment methodology for assessing river health using macroinvertebrates (Turak *et al.* 2004). Further information on sampling methods and analysis is provided in Section 2.4.

2.2 Sampling locations and study design

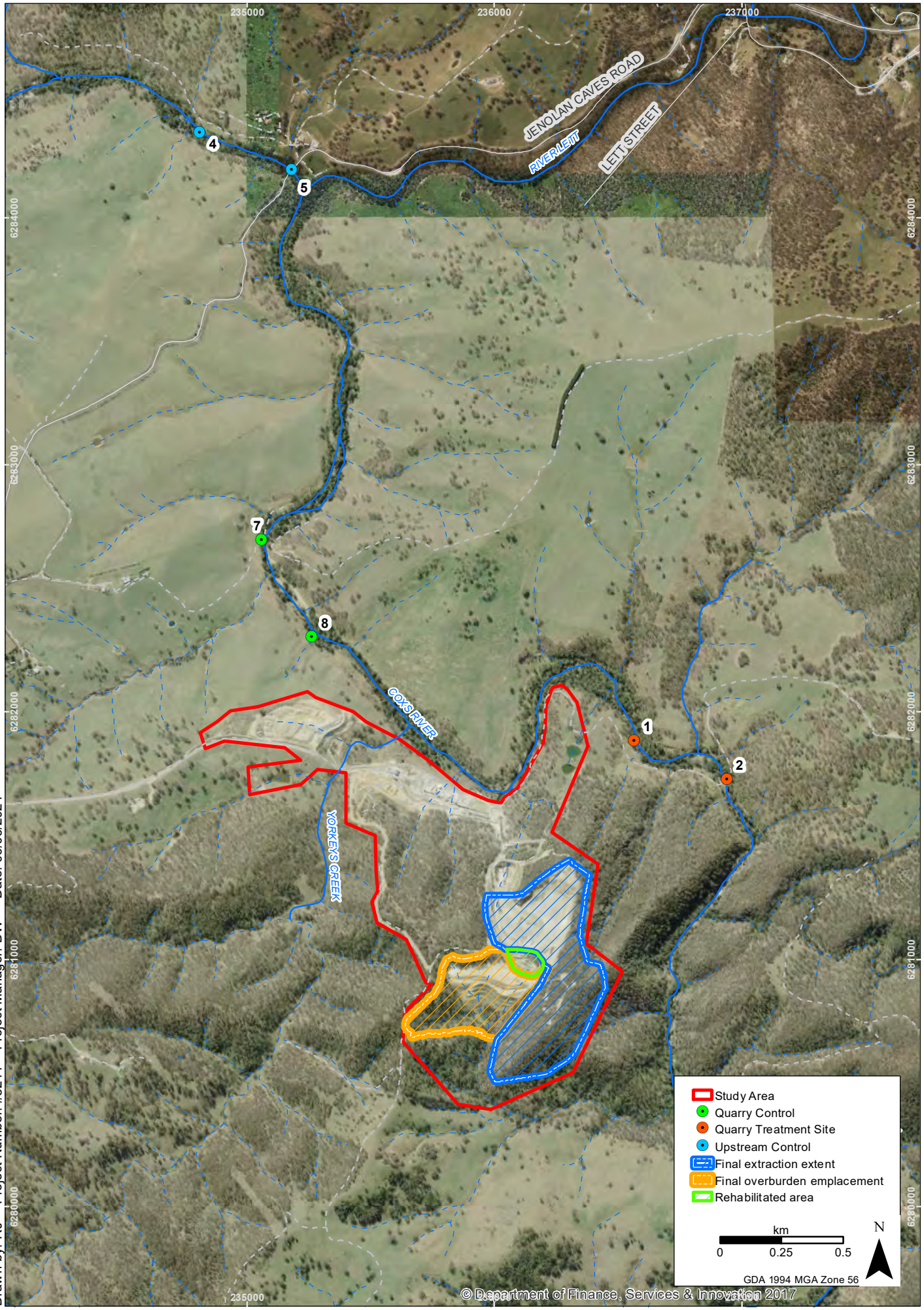
A total of six sites were sampled(Figure 1, Table 1), consistent with those sampled in previous monitoring and allows for comparison of data collected over time.

Sites are grouped into three pairs to allow for spatial replication, with each group representing a particular treatment (Table 1). Quarry Processing (Treatment) Sites 1 and 2 are located downstream of the study area, providing an assessment of stream health conditions in sections of Coxs River subject to potential impacts from occasional discharges from the LDP's. Upstream Control Sites 4 and 5 are located approximately 3.25 kilometres upstream, also along Coxs River above the confluence of River Lett, providing an assessment of the prevailing stream conditions along Coxs River at distance from the Quarry. The Quarry Control Sites 7 and 8 are located immediately upstream of the study area and are utilised to assess the stream health conditions along Coxs river immediately upstream of waters receiving any discharge. Comparisons of the stream health and water quality results between the Quarry Processing (Treatment) Site and the Upstream Control and Quarry Controls provide a robust assessment of any potential impacts to aquatic ecology with Coxs River associated with discharge.

Table 1 Location of aquatic ecology sampling sites

Location	Site number	Easting	Northing
Quarry Processing (Treatment) Site	1	236564	6281888
	2	236938	6281730
Upstream Control	4	234808	6284343
	5	235178	6284196
Quarry Control	7	235058	6282700
	8	235262	6282308

Figure 1: Location of monitoring sites



Drawn by: RJ Project Number: #8241 Project Manager: DW Date: 06/03/2024

Spring 2023 Aquatic Monitoring Program - Austen Quarry

Location of monitoring sites

niche Environment and Heritage

FIGURE 1

Imagery (c) LPI 2013-09-03

2.3 Water quality sampling

Surface water quality was measured *in situ* using a Yeokal 618 water quality probe at each site. The following variables were recorded:

- Temperature (°C)
- Conductivity (µS/cm)
- pH
- Oxidation – Reduction Potential (ORP) (mV)
- Dissolved Oxygen (DO) (% saturation and mg/L)
- Turbidity (NTU).

Two replicate measures were taken at each site for all above parameters. Alkalinity (mg $CaCO_3$/L) was measured with a standard field titration kit at each site.

2.4 Macroinvertebrate survey

2.4.1 Field methods – macroinvertebrate collection

AUSRIVAS pool sampling

Samples were collected from pool edges for a length of 10 metres (m) either as a continuous line or in disconnected segments. Sampling in segments was undertaken to ensure sampling of sub-habitats such as macrophyte beds, bank overhangs, submerged branches, and root mats. Segmented sampling was also employed where pool length was short, and it was logistically difficult to sample in a continuous line (e.g., due to the presence of in-stream logs). A 250 micrometre (µ/m) dip net was drawn through the water with short sweeps towards the bank to dislodge benthic fauna while scraping submerged rocks and debris, sides of the stream bank and the bed substrate. Further sweeps in the water column targeted the suspended fauna.

AUSRIVAS riffle sampling

Riffles were sampled by disturbing the substratum with the feet while holding the net downstream with its mouth facing upstream, the flow of the riffle conveys the detritus and macroinvertebrates into the dip net. This process was continued for a total of 10 m of riffle habitat. Depending on the extent and structure of the riffle habitats being sampled this was either a continuous 10 m or consisted of a number of discrete segments totalling 10 m. Effort was made to ensure sub-habitats were sampled; all available combinations of flow (fast, moderate, and slow flowing), depth (shallow to deep), and substratum (boulder, cobble, pebble, etc.) were sampled where present.

Sorting

Each sample was rinsed from the net onto a white sorting tray from which animals were picked using forceps, pipettes and or paint brushes. Each tray was picked for a minimum period of forty minutes, after which they were picked at ten-minute intervals for either a total of one hour or until no new specimens had been found. Care was taken to collect cryptic and fast-moving animals in addition to those that were conspicuous or slow. The animals collected at each site were placed into a labelled jar containing 70% ethanol.

Physical parameters

The chemical and physical variables required for running the AUSRIVAS predictive model were also recorded. Alkalinity, modal depth and width of the stream, percentage bedrock, boulder or cobble and latitude and longitude were recorded. Distance from source, altitude, land-slope, and rainfall were also calculated.

2.4.2 Laboratory methods - invertebrate identification

Macroinvertebrate samples were identified to family level with the exception of Oligochaeta (to class), Polychaeta (to class), Ostracoda (to subclass), Nematoda (to phylum), Nemertea (to phylum), Acarina (to order) and Chironomidae (to subfamily). Identification keys used include:

- Dean, J., Rosalind, M., St Clair, M., and Cartwright, D. (2004). Identification keys to Australian families and genera of caddis-fly larvae (Trichoptera).
- Gooderham, J. and Tsyrlin, E. (2002). The Waterbug Book: A guide to the Freshwater Macroinvertebrates of Temperate Australia.
- Hawking J. and Theischinger G. (1999). A guide to the identification of larvae of Australian families and to the identification of ecology of larvae from NSW.
- Madden, C. (2010). Key to genera of Australian Chironomidae.
- Madden, C. (2011). Draft identification key to families of Diptera larvae of Australian inland waters.
- Smith, B. (1996). Identification keys to the families and genera of bivalve and gastropod molluscs found in Australian inland waters.
- Website - http://www.mdfrc.org.au/bugguide/.

2.5 Data analysis

2.5.1 Water quality

Water quality data from each site was tabulated and compared to the Australian and New Zealand Guidelines (ANZG) for Fresh and Marine Water Quality Default Guideline Values (DGVs) for the region as a benchmark for comparison for the program. Currently, no updated ANZG DGVs for the region have been provided. As such the DGFVs applied in this report are the ANZECC (2000) physical and chemical stressors for protection of slightly upland aquatic ecosystems in South-Eastern Australia default guideline values. This is consistent with previous iterations of the monitoring program.

2.5.2 Macroinvertebrates

AUSRIVAS

Samples collected using AUSRIVAS protocol were analysed using the predictive models for NSW pool edge/riffle habitats. The AUSRIVAS model predicts the aquatic macroinvertebrate fauna expected to occur at a site in the absence of environmental stress, such as pollution or habitat degradation. The AUSRIVAS spring models were used for the data collected. Observed to expected ratio (OE50), SIGNAL2 (Stream Invertebrate Grade Number Average Level), and Number of Taxa were the indices used to interpret stream health.

OE50

The Observed to Expected ratio is the ratio of the number of invertebrate families observed at a site (NTC50) to the number of families expected (NTE50) at that site. Only macroinvertebrate families with a greater than 50% predicted probability of occurrences are used by the model. OE50 provides a measure of biological impairment at the test site. Bands derived from the OE50 indicate the level of impairment of the assemblage. The OE50 ratios are divided into bands representing different levels of impairment (Table 2).

Table 2: AUSRIVAS band interpretation

Band	Interpretation
Band X	Represents a more biologically diverse community than reference
Band A	Is considered similar to reference condition
Band B	Represents sites significantly impaired
Band C	Represents sites in a severely impaired condition
Band D	Represents sites that are extremely impaired

O0Signal (Stream Invertebrate Grade Number Average Level) scores

This is the observed O0Signal (SIGNAL2) score for taxa that have a probability of occurrence of more than 0% calculated by the AUSRIVAS model.

Table 3 provides a broad guide for interpreting the health of the site according to the SIGNAL2 score of the site. Note that SIGNAL2 scores are indicative only and that pollution does not refer to just anthropogenic pollution. Environmental stress, or harsh physical conditions, may result in poor water quality occurring naturally in waterways. Low family richness and the occurrence of pollution tolerant invertebrates can give a low SIGNAL2 score even though they are natural condition.

Table 3 Guide to interpreting the SIGNAL2 scores

SIGNAL2 Score	Habitat quality
Greater than 6	Healthy habitat
Between 5 and 6	Mild pollution
Between 4 and 5	Moderate pollution
Less than 4	Severe pollution

Note: This guide is indicative only. Streams can have low SIGNAL2 scores when they are in natural condition, due to the natural dominance of pollution tolerant fauna (Gooderham and Tsyrlin 2002).

OE50Signal

This is the ratio of the observed to expected SIGNAL2 score per site for taxa that have a probability of occurrence of more than 50%.

2.6 Statistical Analysis

Statistical analysis of differences among the sampled macroinvertebrate assemblage was investigated using PERMANOVA+ for Primer statistical software package (Anderson et al 2008). PERMANOVA is a permutational approach to analysis of variance (ANOVA) that has a number of advantages of traditional statistical methods.

Both multivariate (many variables) and univariate (single variable) analyses can be undertaken using PERMANOVA. In both cases, the significance level was set at $p < 0.05$ for all statistical tests undertaken for this report. In the case where the number of unique permutations for a particular test was less than 100, Monte Carlo probability values were used to assess the significance of the test as outlined in Anderson *et al.* (2008). As with previous surveys within the monitoring program, analyses were undertaken using the software package Primer v6 with the PERMANOVA+ add on.

In order to examine the spatial and temporal differences in macroinvertebrate data, two factors were analysed. These included:

- Year (ten levels: 2011, 2014, 2015, 2016, 2017, 2019, 2020, 2021, 2022 and 2023)
- Location (three levels: Quarry Processing Area, Quarry Control and Upstream Control).

Both factors were considered as fixed and orthogonal factors for the purposes of the statistical analyses. Sites were treated as replicates within each location to provide replication at the Location level (i.e., n = 2). This experimental design was used in both multivariate and univariate style analyses.

Pairwise comparisons were performed to further investigate significant Factors identified in the PERMANOVA for comparisons of interest (between or within 2023). In the case where the number of unique permutations for a particular test was less than 100, Monte Carlo probability values were used to assess the significance of the test as outlined in Anderson *et al.* (2008).

Multivariate Analysis

Spatial and temporal variability in macroinvertebrate assemblages, for both edge and riffle habitat, were examined using the Bray-Curtis similarity measure on assemblage data transformed to presence/absence. This transformation was undertaken as per previous analyses, as the AUSRIVAS sampling and processing protocol does not generate reliable abundance data. However, it does provide robust presence/absence data for statistical analyses. Any significant tests were further analysed using pairwise comparisons to further investigate detected differences.

Principle Coordinates Analysis (PCoA) was used to provide a graphical representation of the spatial and temporal patterns in macroinvertebrate assemblages. Vector overlays based on the Spearman's Correlation Coefficients were added to the graphical output base to display the strongest drivers of differences. The PCoA routine allows for the multivariate assemblages to be visualised using metric multidimensional scaling. This approach is more appropriate when PERMANOVA is applied than traditional uses of non-metric Multidimensional Scaling (nMDS), as it models the actual dissimilarities of interest that provide a direct projection of the points considered using PERMANOVA (Anderson et al 2008). The PCoA analysis itself provides a measure of the amount of variation in the data that can be captured by the first two axes.

Univariate Analysis

The spatial and temporal variability in the Total Taxa, and the AUSRIVAS indices, O0Signal, OE50Signal and OE50Taxa was examined using the Euclidean distance measure on untransformed data. As with the multivariate analyses, any significant tests were further analysed using pairwise comparisons to examine which pairs of locations/surveys were different.

Limitations

The statistical analysis procedures detailed in this report have been repeated in line with previous iterations of the monitoring program, as a requirement of the report.

The univariate analyses undertaken on outputs of the AUSRIVAS model (O0Signal, OE50Signal and OE50Taxa) must be interpreted with caution, as these are themselves outputs of a mathematical predictive model, rather than raw data.

The univariate analysis of Total Taxa, as well as the multivariate analyses, are not subject to this limitation. As such, these analyses form the primary means of statistical analysis relied upon in this report.

3. Results

Macroinvertebrate field data are provided in Appendix 1, Statistical analyses data are provided in Appendix 2 and 3 and photographs of each site are provided in Appendix 4 (Plate 2 - Plate 7).

3.1 Hydrology

River flow in 2022 was relatively low at the time of survey in comparison to mean yearly flows since 2010 (Figure 2, Table 4), recording beyond which the continuous dataset is incomplete. The flows during 2023 were almost nine times lower than 2022, which was characterised by more frequent high flow events (Figure 2) and much higher average daily discharge volumes (Table 4).

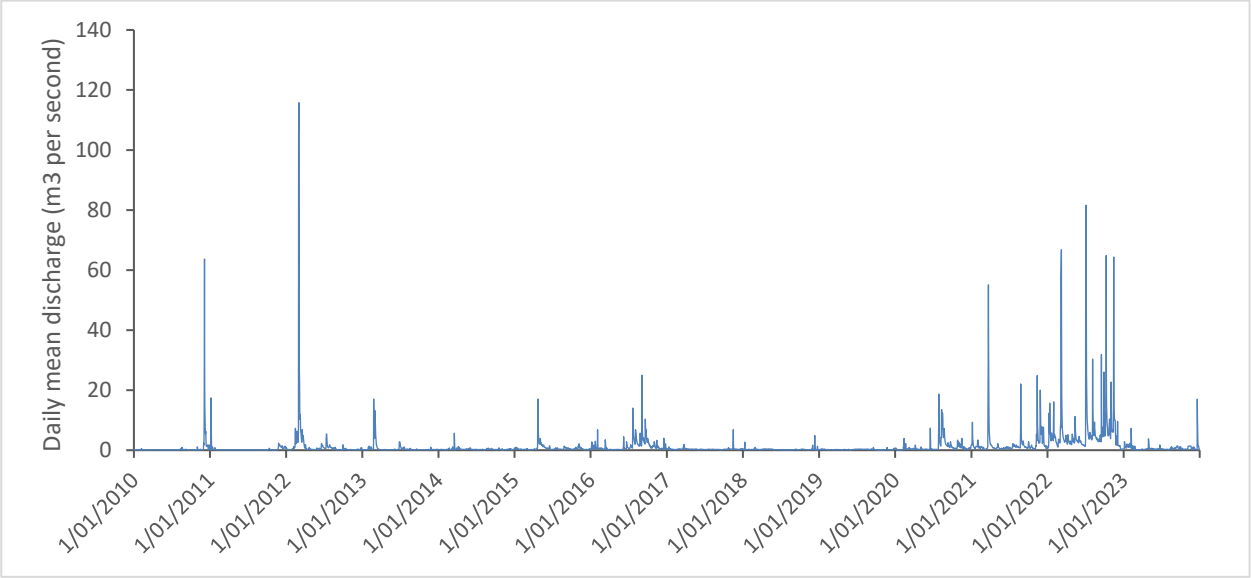


Figure 2: Daily mean stream flow at Coxs River downstream Lake Lyell – Gauge 212011 (2010 – 2023)

Source http://www.bom.gov.au/waterdata/

A total discharge of 22,855.20 Megalitres was recorded in 2023, less than the mean of 40,209.27 Megalitres between 2010 and 2023 (Table 4). These totals are recorded in the context of high flows throughout 2022, with 2020 and 2021 also being 'wetter' than average.

Table 4: Mean yearly flow at Coxs River downstream Lake Lyell – Gauge 212011

Year	Total annual discharge volume (ML)	Average daily mean discharge (m^3 per second)
2010	18,436.91	0.58
2011	9,413.09	0.30
2012	61,196.79	1.94
2013	18,150.90	0.58
2014	9,978.34	0.32
2015	22,101.70	0.70
2016	47,330.69	1.50
2017	11,355.18	0.36
2018	8,016.12	0.25
2019	6,686.60	0.21
2020	37,625.69	1.19
2021	68,467.50	2.17

Year	Total annual discharge volume (ML)	Average daily mean discharge (m^3 per second)
2022	203,960.95	6.43
2023	22,855.20	0.73

Source http://www.bom.gov.au/waterdata/

Stream flows in 2023 were highest in January and February (Summer), with higher flows also recorded in December (post survey) (Figure 3). The lowest stream flows were recorded during March and July. With the third lowest flows recorded during October, the month prior to sampling.

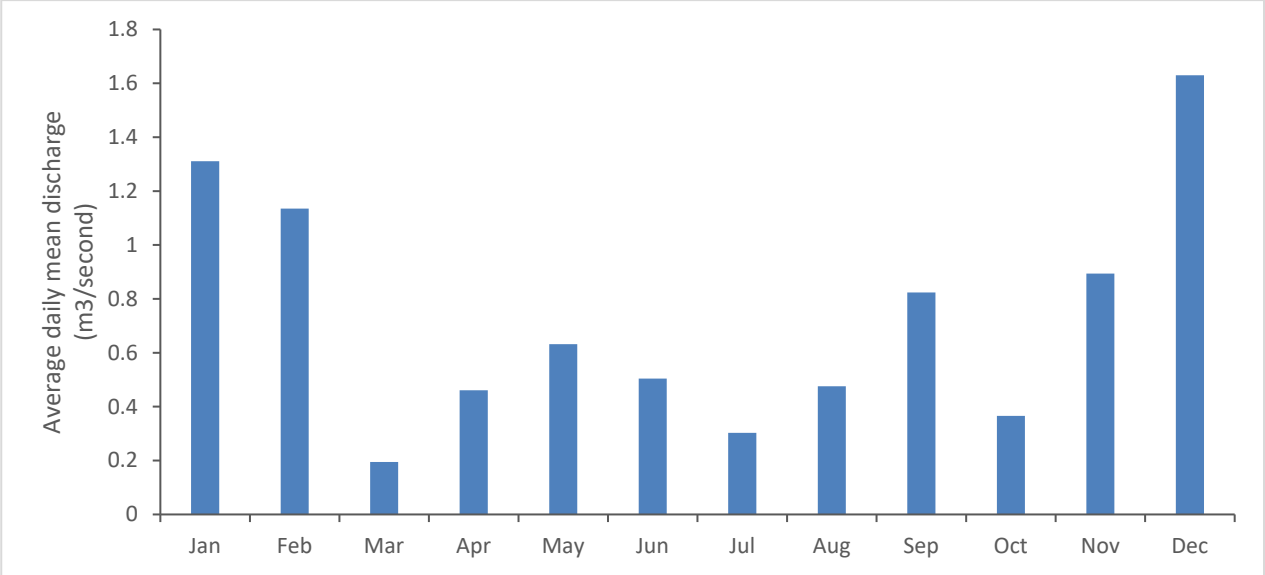


Figure 3: Average daily mean stream flow at Coxs River downstream Lake Lyell – Gauge 212011 in 2023

Source http://www.bom.gov.au/waterdata/

Stream flows were moderate at the time of sampling. Riffle habitats that were observed to be modified with the high flows in the previous sampling period (Niche 2023), were observed to have returned to flows comparable to previous years and more reminiscent of the usual flows associated with riffle habitat. The pool edge habitats were observed to have suffered some level of bank erosion likely caused by the much higher flows through the 2022 period (Niche 2023). There were sections of bank undercutting and slightly deeper pools from scouring.

Plate 1: Edge habitats and sampling during 2023.

3.2 Water quality

Water quality results of temperature, electrical conductivity, and turbidity were generally consistent across all sites (Table 5). All results were within the relevant ANZG Default Guideline Values (DGVs) in spring 2023, with the exception of pH at Upstream Control Sites 4 and 5, and Quarry Control Site 7, where it was above DGVs. Dissolved oxygen levels were marginally below DGVs at Quary Processing Site 2.

Table 5 Water quality results for spring 2023

Location	DGV's	Quarry Processing		Upstream Control		Quarry Control	
Site		1	2	4	5	7	8
Temperature °C	-	16.20	16.43	19.38	19.95	16.52	16.51
Electrical conductivity (µS/cm)	30-350	241	240	244	256	232	243
Turbidity (NTU)	2-25	2.7	1.9	3.0	2.8	3.5	1.6
Dissolved Oxygen (% sat)	90-110	94.5	**88.1**	103.9	102.5	100.2	97.2
Dissolved Oxygen (mg/L)	-	9.23	8.64	9.73	9.48	9.84	9.32
pH	6.5-8	7.88	7.36	**8.47**	**8.49**	**8.02**	7.86
Alkalinity (mg $CaCO_3$/L)	-	120	100	80	80	100	160

Text in bold indicate those variables that exceed the default Guideline values.

3.2.1 Fauna observation

Both Brown Trout (*Salmo trutta*) and Rainbow Trout (*Oncorhynchus mykiss*) were observed to be present at Quarry Control Sites 7 and 8 at the time of sampling.

3.3 Macroinvertebrates

3.3.1 Edge habitat

AUSRIVAS Indices and SIGNAL2 results

AUSRIVAS spring results for pool edge habitat are presented in Table 6 and raw data is provided in Appendix 1. A total of 28 different taxa were collected from the pool sampling, with the number of taxa collected at each site ranging between 10-18. Pool edges were dominated numerically by Leptophlebiidae (mayflies), Caenidae (mayflies), Ecnomidae (caddis flies) and Chironominae (true flies), which collectively made up 64% of the total number of macroinvertebrates collected from this habitat.

In comparison to reference site data generated by the AUSRIVAS model, edge habitat macroinvertebrate assemblages at all sites were 'significantly impaired', recording OE50 scores within Band B. For SIGNAL2, sites ranged between 4.17 and 4.82, indicating macroinvertebrate assemblages that are dominated by taxa that are able to withstand moderate levels of pollution. In terms of the number of taxa recorded at each site, Upstream Control Site 5 recorded the highest (18) along with Quarry Treatment Site 2 (18), with the lowest (10) recorded at the Upstream Control Site 4.

Overall, the stream health indices results recorded at the Quarry Treatment sites are comparable to those recorded at the Control sites.

Table 6 AUSRIVAS results for edge habitat (2023)

Status	Quarry Treatment		Upstream Control		Quarry Control	
Site	**1**	**2**	**4**	**5**	**7**	**8**
OE50	0.55	0.79	0.59	0.76	0.64	0.64
Band	B	B	B	B	B	B
No of taxa	11	18	10	18	12	15
SIGNAL2 (O0SIGNAL)	4.82	4.61	4.40	4.17	4.25	4.80
OE50SIGNAL	0.93	0.95	1.00	0.90	0.99	0.96

Statistical analysis

Statistical analysis outputs are presented in Appendix 2. The statistical analysis of the number of taxa (Total Taxa) detected a significant difference for the Year term. Pairwise comparisons show that there was a significant difference between 2023 and all previous years of sampling. With 2023 recording the lowest number of taxa to date, with the exception of 2022, which recorded substantially lower numbers of total taxa than other years (Figure 4).

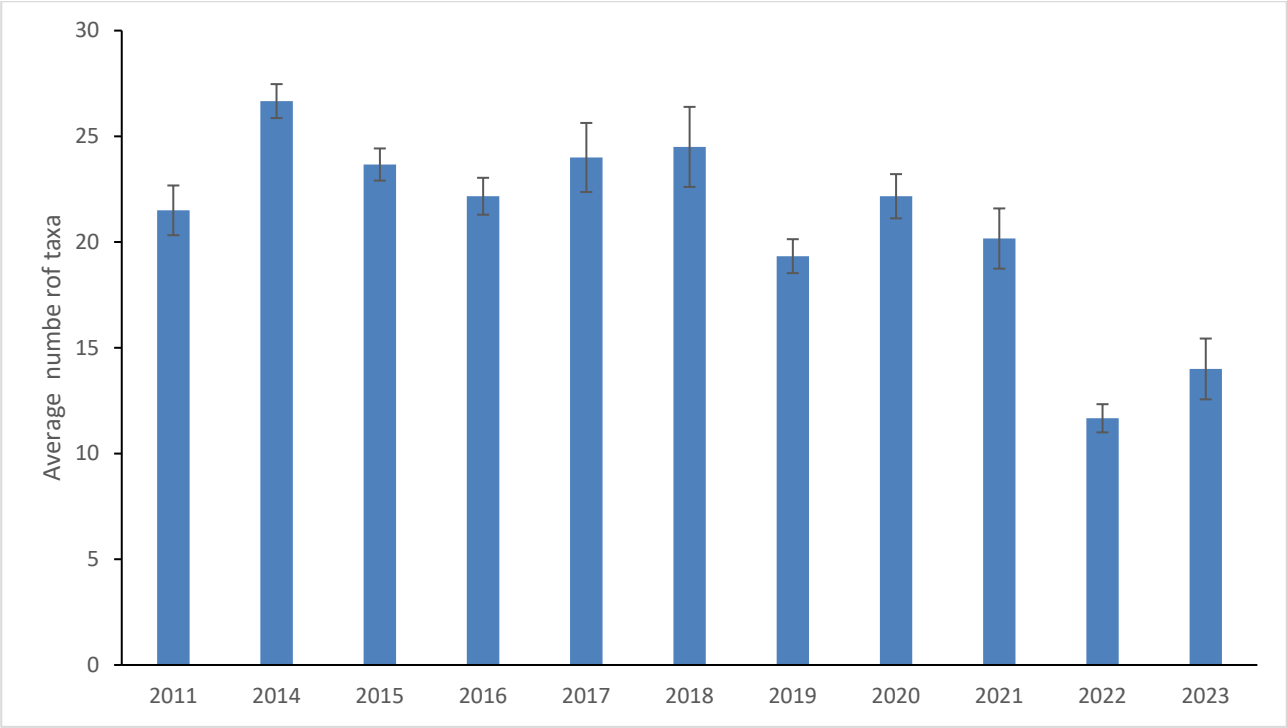


Figure 4: Comparison of average Total Taxa (x̄, ±SE) between Years for Edge habitat

Significant differences for O0Signal (SIGNAL2) were detected for the Location term (Figure 5). Pairwise comparisons indicated that there was a significant difference between the Quarry Treatment and Upstream Control. However, there was no significant difference between the Quarry Treatment and Quarry Control. Due to there not being a significant difference in the term Year, and as the Quarry Treatment sites have recorded on average greater scores than the Upstream Control Sites, this does not indicate an impact to water quality associated with Quarry operations.

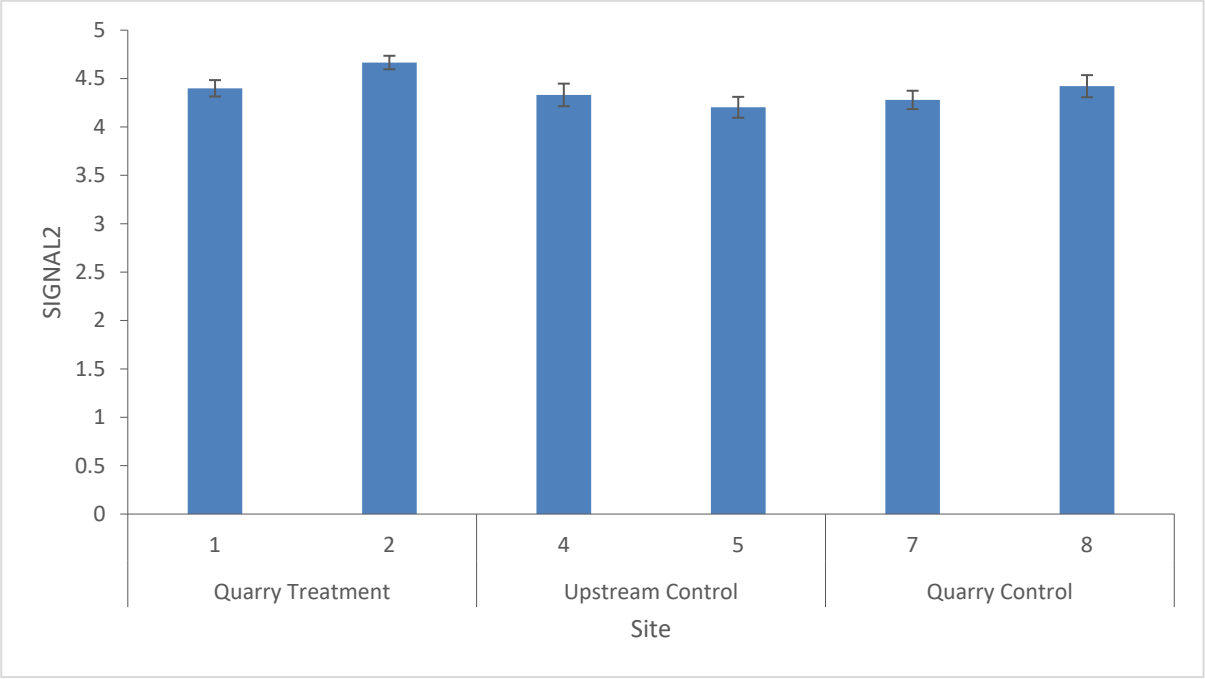


Figure 5: Comparison of average O0Signal(SIGNAL2) (x̄, ±SE) between Location for Edge habitat in 2023

Significant differences for OE50SIGNAL were detected for the Year term. Pairwise comparisons indicated that these differences included between 2023 with previous Years of 2016, 2017, 2018 and 2019 (Figure 6). Indicating that while there were significant differences between 2023 and previous years (2016, 2017, 2018 and 2019), there were no significant differences between Control and Treatment sites in 2023.

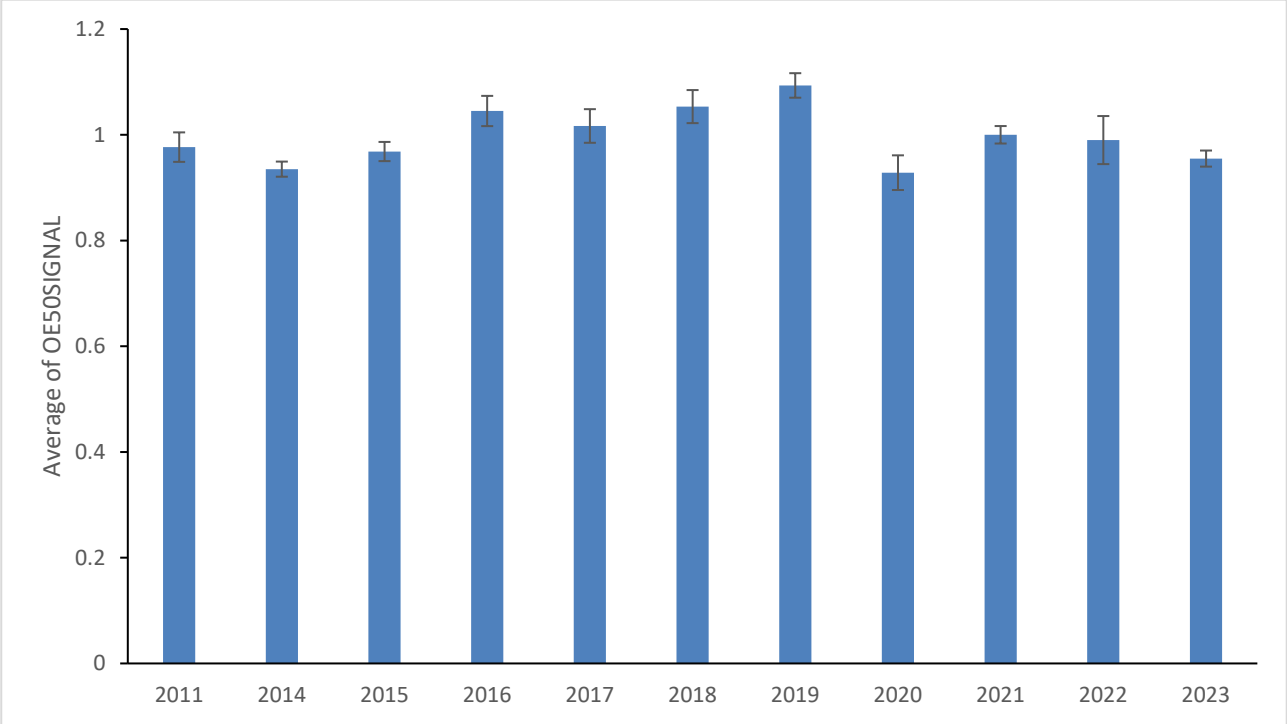


Figure 6: Comparison of average OE50Signal (x̄, ±SE) between Year for Edge habitat

Significant differences were also detected in 0E50 Taxa for the Year term. Pairwise comparisons identified that there were significant differences between 2023 with all years prior to 2019 (Figure 7). While there were significant differences between 2023 and some previous years, there were no significant differences between Control and Treatment sites during 2023. This suggests that these charges have been driven by environmental conditions rather than Quarry operations.

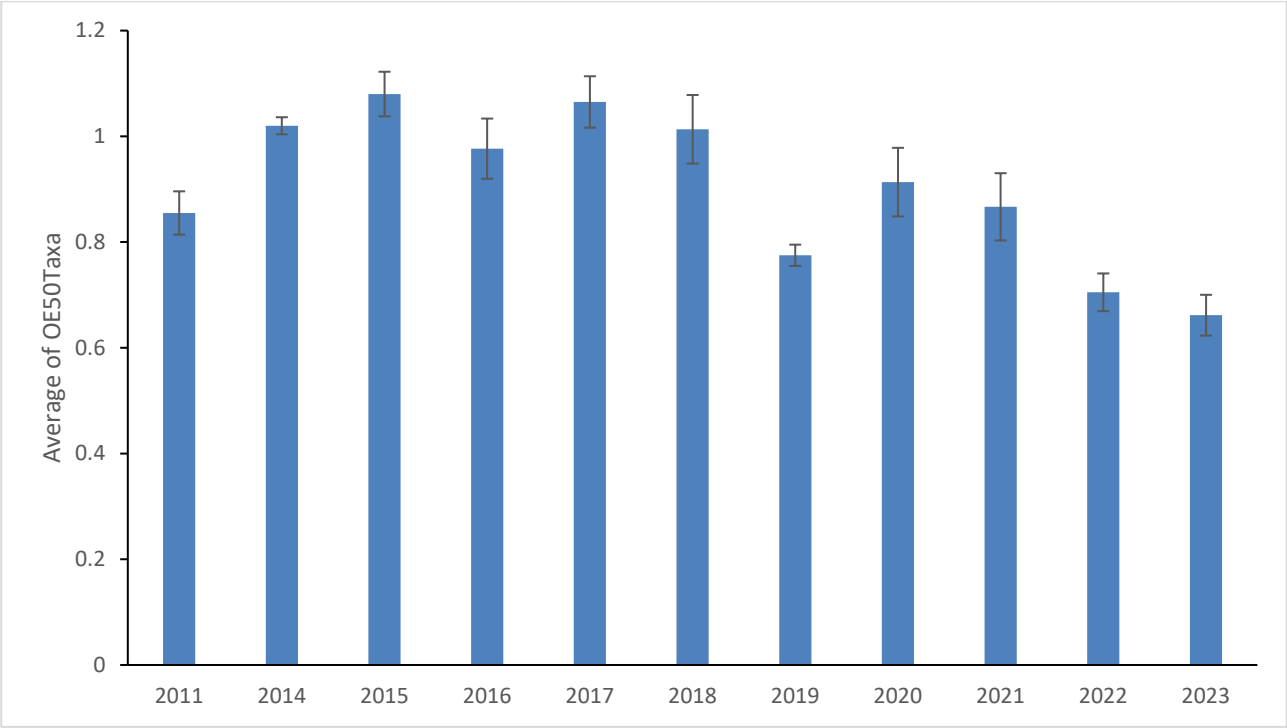


Figure 7: Comparison of average OE50Taxa (x̄, ±SE) between Year for Edge habitat

Assemblage Structure

Significant differences were detected for the interaction of Year x Location for assemblage structure (Figure 8, Figure 9, Appendix 2). Pairwise comparisons determined that significant differences occurred between Years that did not include 2023, and Locations in Years other than 2023. Indicating that while there were significant differences between 2023 and previous years, there were no significant differences between Control and Treatment sites in 2023.

The PCO analysis for all years of data found that that the first two axes explain 30.9% of the variation when the Year term is considered (Figure 8). The 2023 data can be seen to be most similar to the 2022 data. Grouping between years, appears to be much more evident than between locations (Figure 9), which appear to have substantial overlap. These results would suggest the influence of prevailing environmental conditions (e.g. rainfall and flow rates) on the macroinvertebrate assemblages, rather than indicating impacts associated with quarry operations.

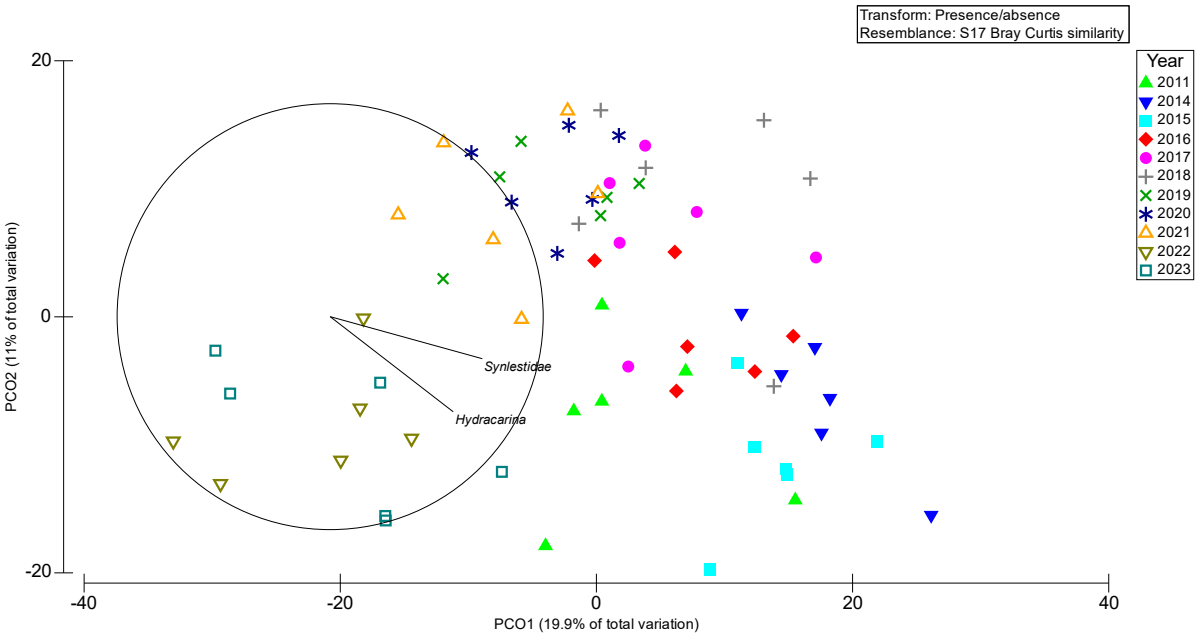


Figure 8: PCoA plot with vector overlays of taxa based on Spearman's Correlation (r2> 0.7) for the edge habitat assemblages within Year (2023)

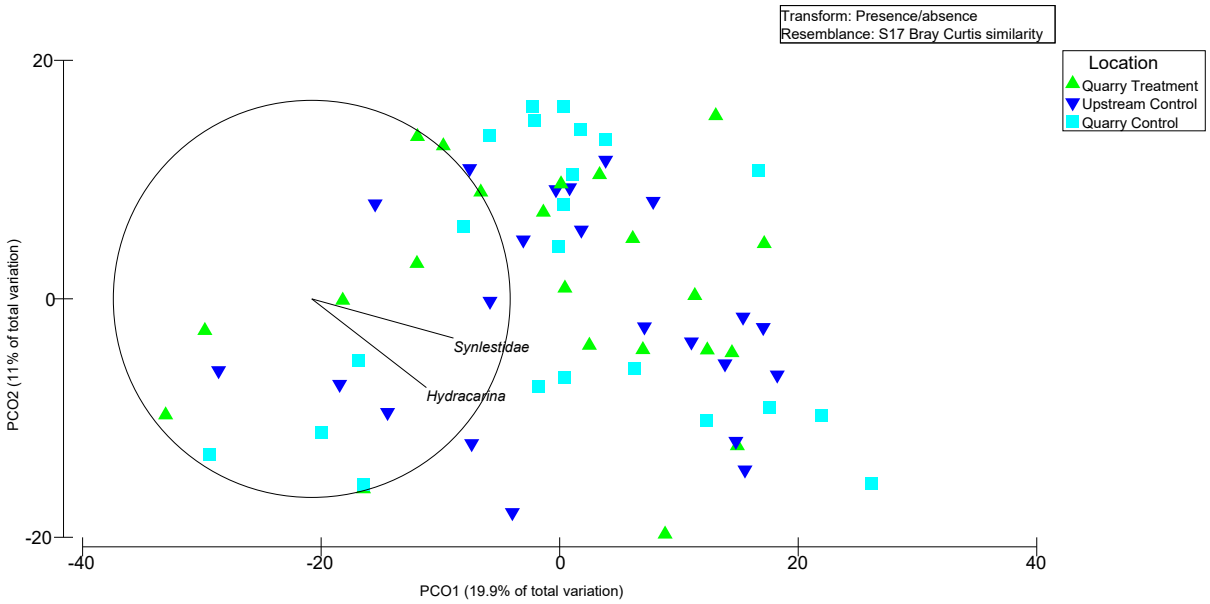


Figure 9: PCoA plot with vector overlays of taxa based on Spearman's Correlation (r2> 0.7) for the location assemblages within Year (2023)

3.3.2 Riffle habitat

AUSRIVAS Indices and SIGNAL2

AUSRIVAS spring results for riffle habitat are presented in Table 7 and raw data is provided in Appendix 1. Overall, 26 different taxa were collected with the number of taxa collected ranging between 12-20 at each site. Riffle habitat was dominated numerically by Leptophlebiidae (mayflies), Gripopterygidae (Stoneflies), Caenidae (mayflies) and Hydropsychidae (caddis flies), which together made up 46% of the total number of macroinvertebrates collected from this habitat.

In comparison to the AUSRIVAS model generated reference site data for the for riffle habitats, all sites recorded OE50 scores within Band B. These results indicate the macroinvertebrate assemblages at these sites are 'significantly impaired' when compared to the modelled reference sites. In terms of SIGNAL2, all sites were between 5-6, indicating they were dominated by species that are able to withstand low levels of pollution (Table 7)**.** The SIGNAL2 scores are relatively consistent across the sites, with Quarry Control Site 7 having the lowest score (5.08). The overall numbers of taxa were consistent across the sites, ranging between 12 and 20, with the Quarry Treatment Site 1 having the highest number of taxa (20).

Table 7: AUSRIVAS results for riffle habitat (2023)

Status	Quarry Treatment		Upstream Control		Quarry Control	
Site	**1**	**2**	**4**	**5**	**7**	**8**
OE50	0.80	0.71	0.76	0.76	0.65	0.65
Band	B	B	B	B	B	B
No. of taxa	20	14	13	14	13	12
SIGNAL2 (O0SIGNAL)	5.60	5.50	5.92	5.29	5.08	6.00
OE50SIGNAL	1.08	1.07	1.07	1.09	1.05	1.09

Statistical analysis

Statistical analysis outputs are presented in Appendix 2. The statistical analysis of the number of taxa (Total Taxa) detected a significant difference for both the Year and Location terms. Pairwise comparisons indicated that this result included significant differences between 2023 with all previous Years (Figure 10). While for Location during 2023, the Quarry Treatment was significantly different to the Upstream Control (Figure 11). The comparison of Total Taxa across the sites demonstrates that there was a greater number of Taxa recorded at the Test sites when compared to the Control sites in 2023. While the 2023 results were lower than average, comparable numbers of taxa were recorded across the Control and Treatment sites. Therefore, no indication of impact associated with quarry operations is identified in the data.

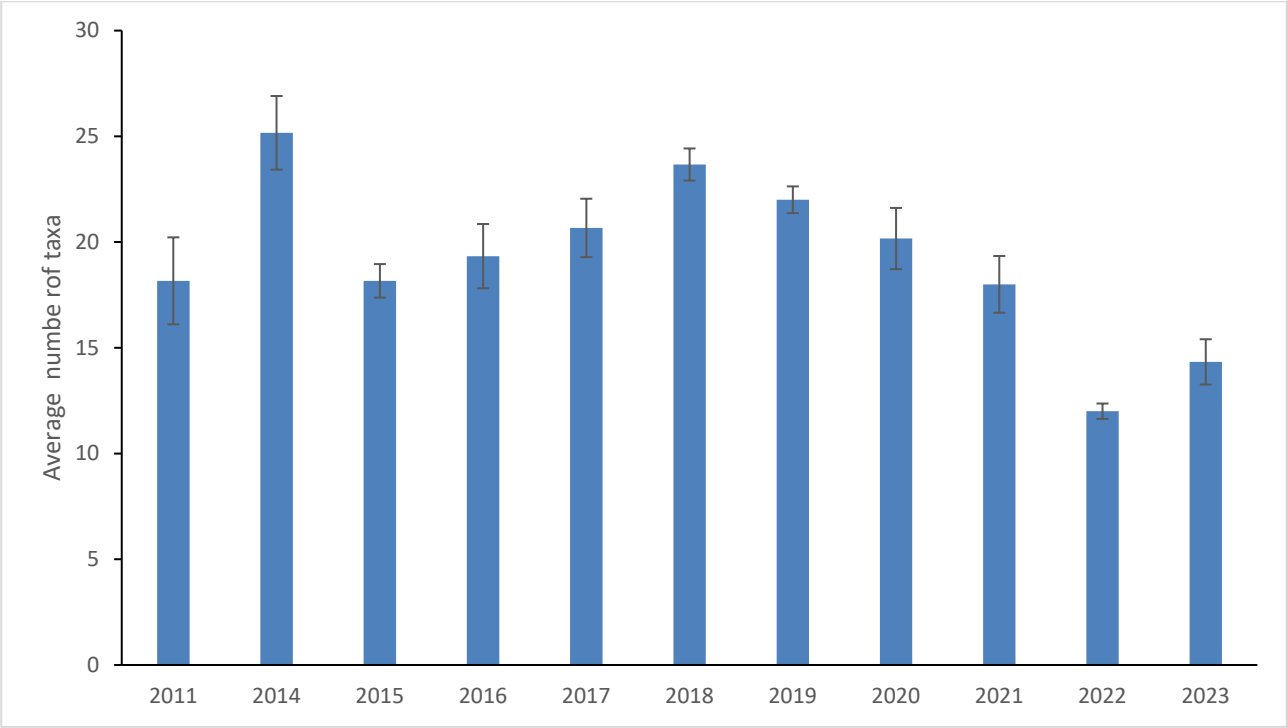


Figure 10: Comparison of average Total Taxa (x̄, ±SE) between Year for Riffle habitat

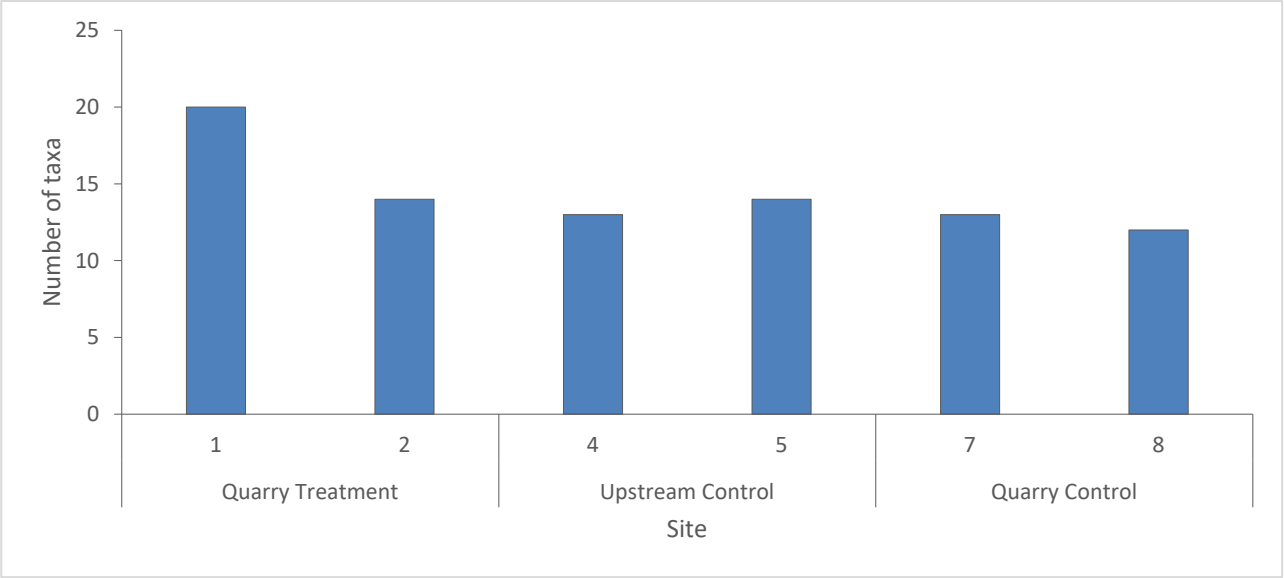


Figure 11: Comparison of Total Taxa (x̄, ±SE) recorded between Location in 2023 for Riffle habitat

Significant differences were detected for O0SIGNAL (SIGNAL2) for the interaction of Year x Location. Pairwise comparisons indicated that these differences were between Years or Locations that did not include 2023 (2023 in fact recorded the highest average O0SIGNAL score to date [5.565] when compared to all previous years). Indicating that, while there were significant differences for the interaction between site treatments previously, this does not indicate an impact to water quality associated with Quarry operations in 2023.

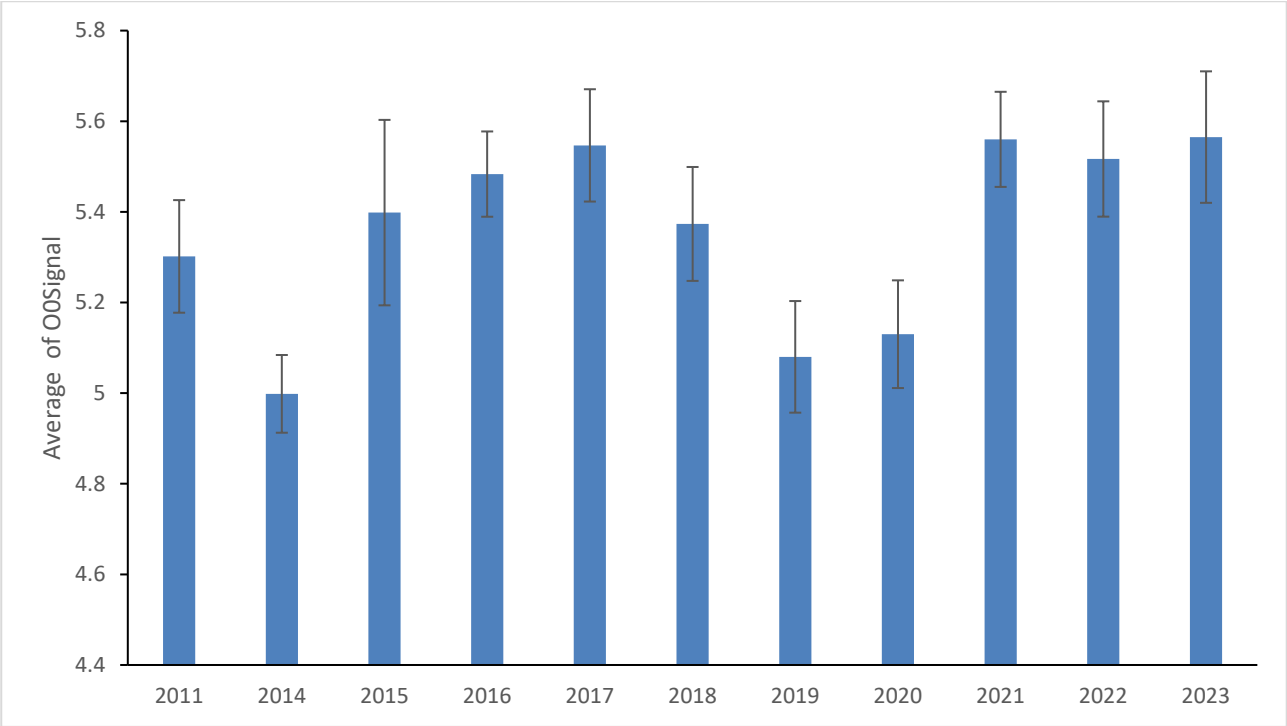


Figure 12: Comparison of average O0Signal (x̄, ±SE) between Year

Significant differences were detected for OE50 SIGNAL for the Year term (Appendix 3). Pairwise comparisons indicated that this result included significant differences between 2023 with all previous years. However, there were no significant differences between Control and Treatment sites in 2023.

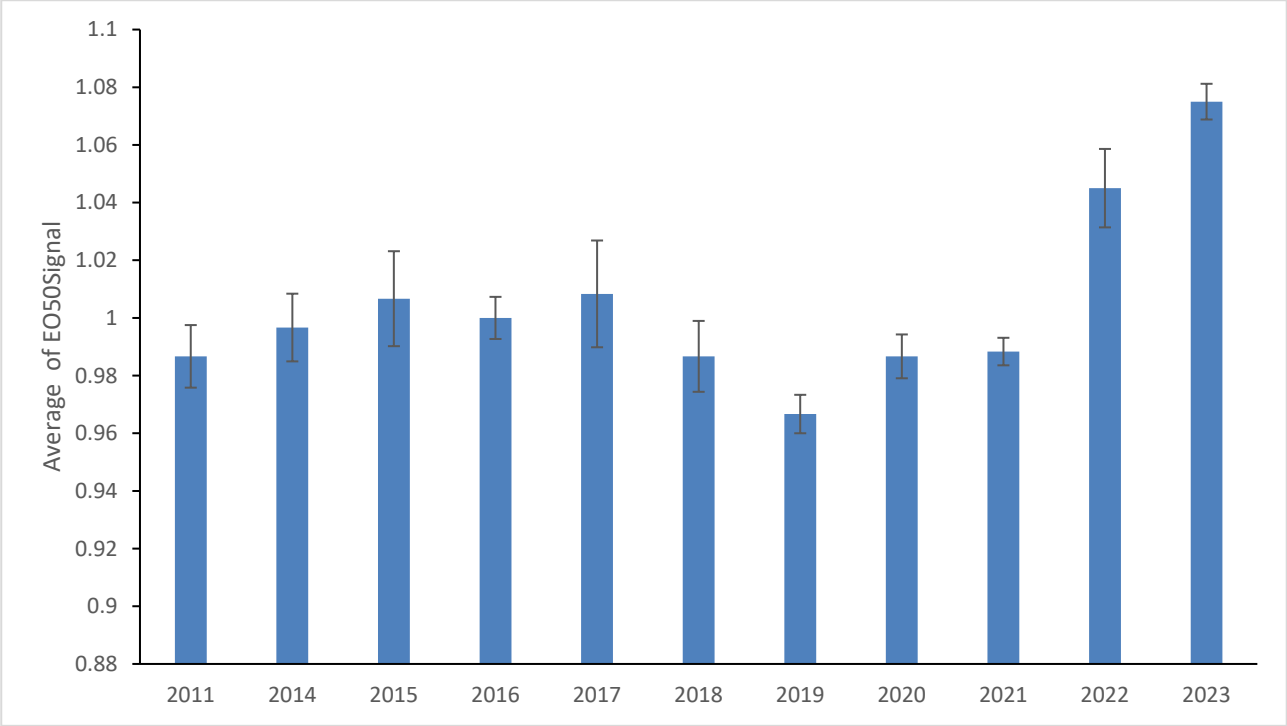


Figure 13: Comparison of average OE50Signal (x̄, ±SE) between Year

Significant differences were detected for OE50 taxa for the Year and Location term (Appendix 3). Pairwise comparisons indicated that this result included significant differences between 2023 with all previous Years, except 2022. Figure 14 shows that average OE50 Taxa was greatest in 2023, across the entire

monitoring period, as such no indication of impact is detected. While for Location, the Upstream Control was significantly different to Quarry Control. However, there was no significant difference between the Quarry Treatment and either the Upstream Control or Quarry Control sites. The Quarry Treatment sites, showed comparable OE50 Taxa levels to the Control Sites in 2023 (Figure 15). Indicating that while there were significant differences between Control Sites, there were no significant differences between Control and Treatment sites in 2023.

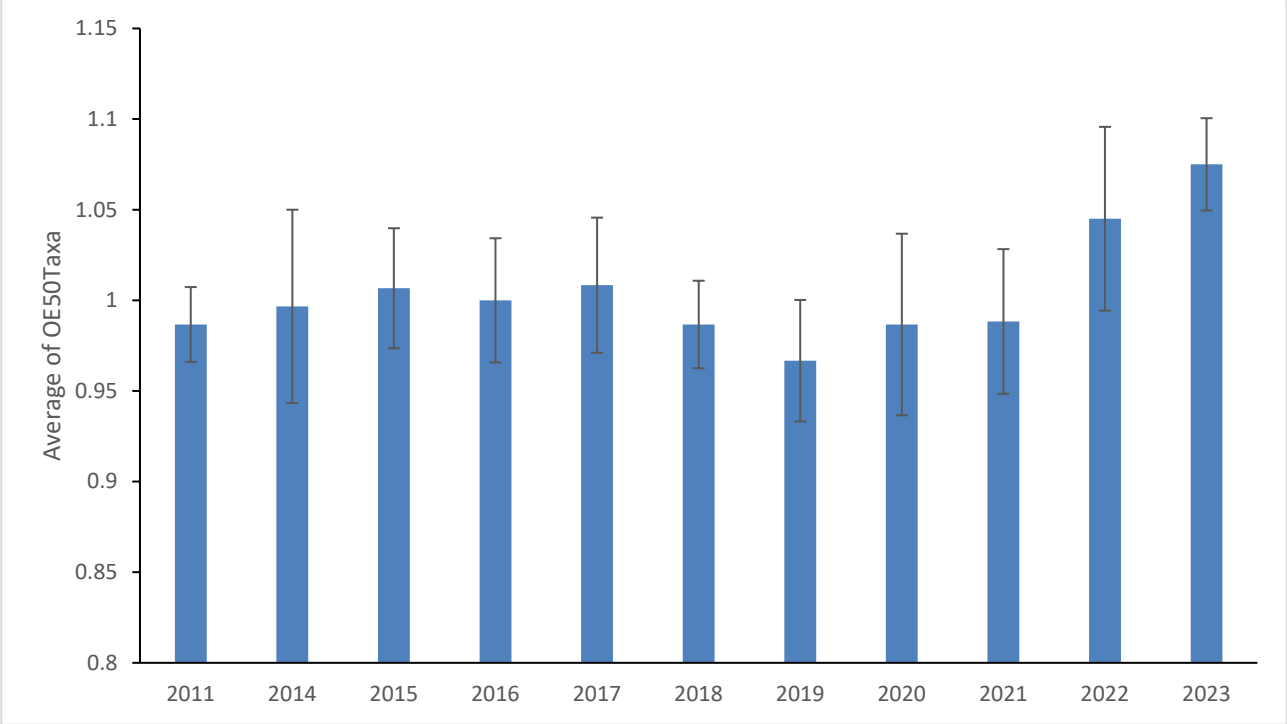


Figure 14: Comparison of average OE50Taxa (x̄, ±SE) between Year

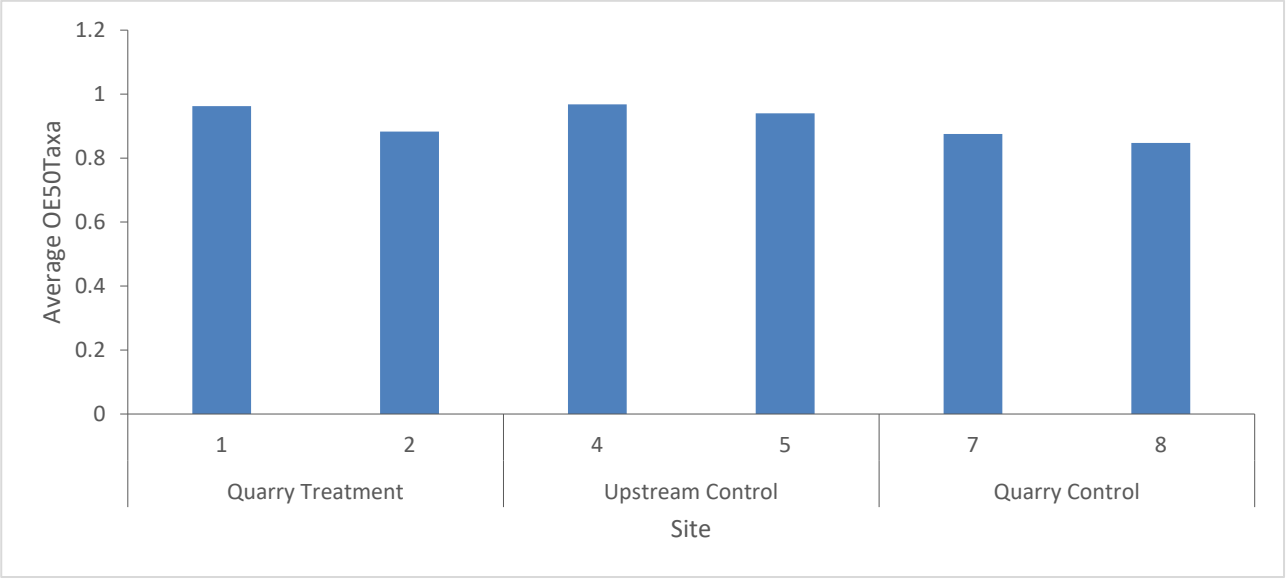


Figure 15: Comparison of average OE50Taxa between Location

Assemblage structure

Significant differences were detected for the interaction of Year x Location for assemblage structure (Appendix 2). Pairwise comparisons determined that significant differences occurred in Years that did not

include 2023, and Locations in Years other than 2023. Indicating that while there were significant differences between Years and Locations for previous years, there were no significant differences between Control and Treatment sites in 2023.

The PCO analysis of all the data found that the first two axes explain 36.6% of the variation (Figure 16). The 2023 data can be seen to be more similar to previous years than the 2022 data, while grouping between Years, appears to be much more evident than between locations, which appear to have substantial overlap. No significant grouping is evident when comparing site treatments (Figure 17), which appear to overall substantially.

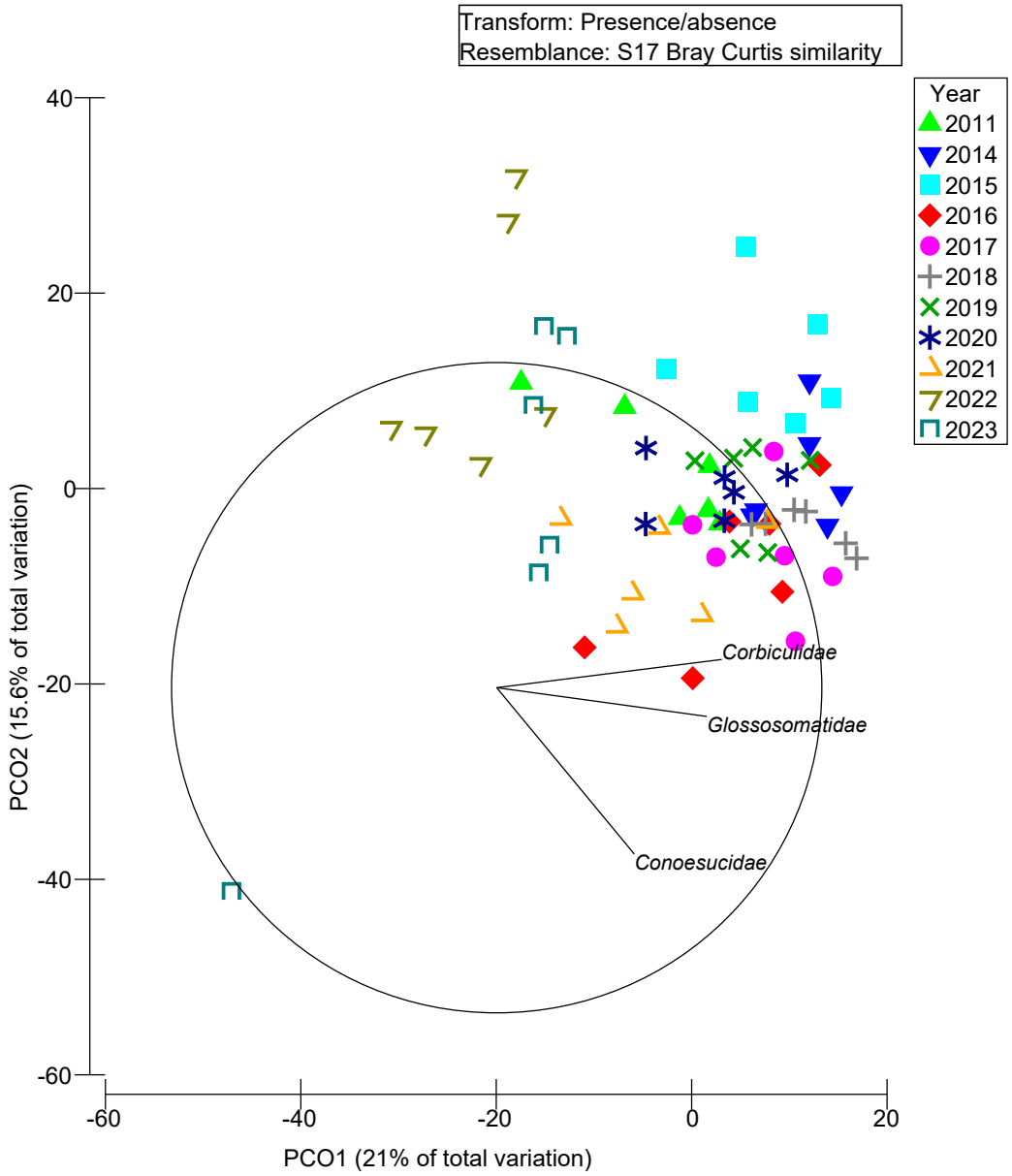


Figure 16: PCoA plot with vector overlays of taxa based on Spearman's Correlation (r2> 0.50) of riffle habitat assemblages for Year (2023)

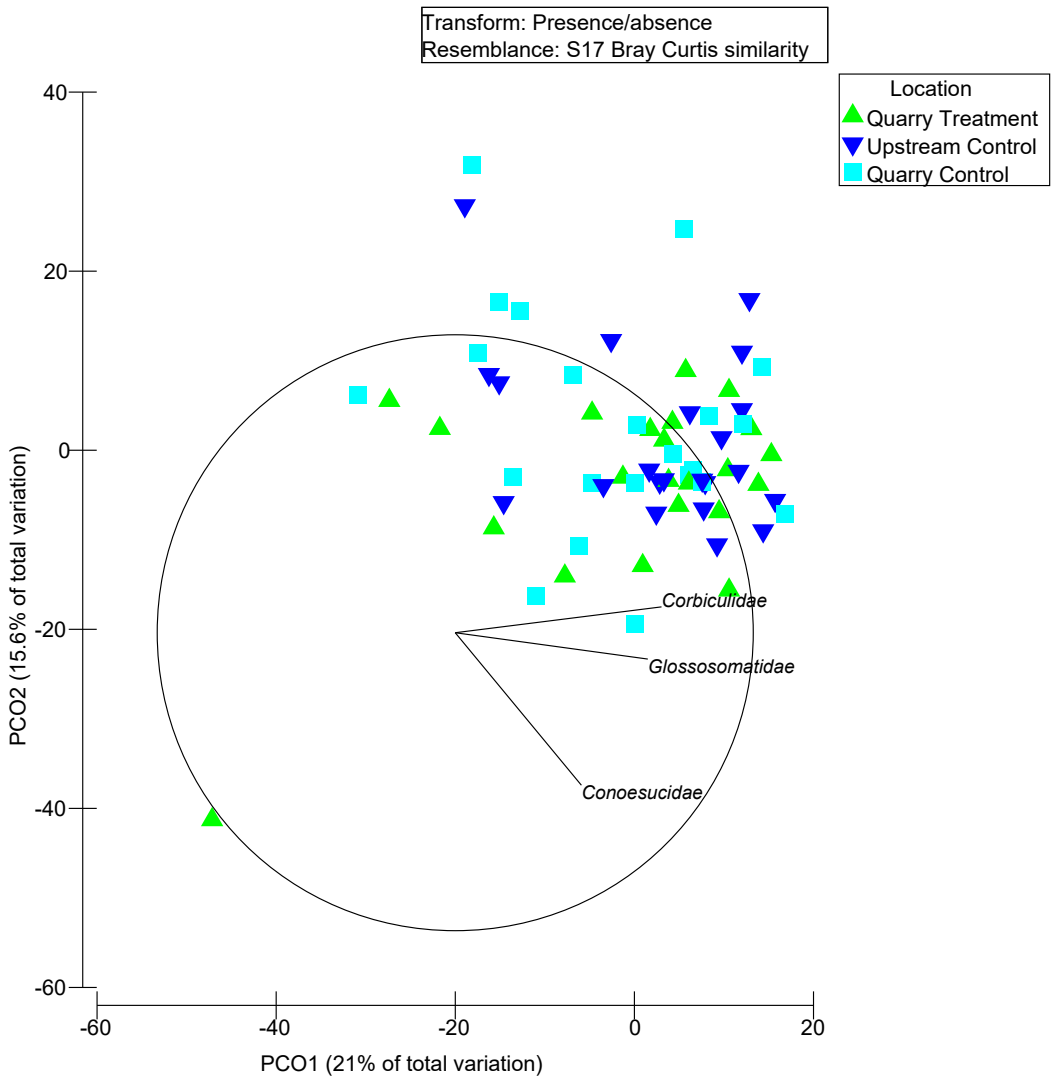


Figure 17: PCoA plot with vector overlays of taxa based on Spearman's Correlation (r2> 0.50) of Location assemblages for Year (2023)

4. Discussion

4.1 Key findings summary

Sampling was conducted at two Quarry Treatment sites, two Quarry Control sites and two Upstream Control sites during a wet period, with moderate flows. The key findings from the monitoring results are:

- Water quality readings were within ANZG DGVs at all sites, with the exception of pH at Upstream Control sites 4 and 5 and Quarry Control Site 7 where it was above DGVs, and dissolved oxygen which was below DGVs at Quarry Processing Site 2.
- Pool edge and riffle habitat macroinvertebrate assemblages were consistent between Control Sites and Quarry Treatment monitoring Sites. As such, no indicators of impacts to stream health associated with quarry operations are identified in the spring 2023 data.
- The AUSRIVAS 0E50 scores for spring 2023 in riffle habitats are better than the results recorded in in all previous years of monitoring. While the AUSRIVAS OE50 scores for spring 2023 in edge habitats, showed slightly lower, but comparable, scores to previous years (2020-2022).
- The number of taxa recorded in 2023 were lower than previous years of monitoring (all years except 2022) at pool edge, and riffle habitats. Despite this, SIGNAL2 results were comparable at edge and riffle habitats across all sites.
- Statistical analysis of the pool edge and riffle data found that significant differences were identified in a number of stream health results, including the interaction term year x location. However, pairwise tests and further investigation did not identify any indicators of impact at the Quarry Treatment sites. With the results being comparable or superior at Quarry Treatment sites when compared to the Control sites. Many of the significant differences are driven by the differences in assemblages between 2023, 2022 and previous years (likely due to changing weather conditions) and differences in Control groups.

4.2 Discussion of 2023 findings

In 2023 all water quality variables were within DGVs (with the exception of pH at Upstream Control Sites 4 and 5, Quarry Control Site 7 and DO at Quarry Treatment Site 2) and similar values were observed across all locations. This does not indicate any localised water quality changes as a result of the Quarry at the time of the survey that could negatively affect the aquatic ecology of the Cox's River. The readings reflect the prevailing moderate flow conditions at the time of survey (e.g. high Dissolved Oxygen and low electrical conductivity readings).

Macroinvertebrates provide strong indicators of ecological condition of freshwater streams, creeks, and rivers (Chessman 2003). The AUSRIVAS sampling procedure utilises models to determine how macroinvertebrate assemblages compare with reference conditions (Turak *et al.* 2004). The pool edge and riffle habitat data collected in 2023 showed relatively consistent results between the Control sites and the Quarry Treatment sites across all stream health indices. There is no indication that the Quarry Treatment sites have lower stream health indices, and it is therefore concluded that quarry operations were not impacting upon biological stream health during spring 2023 sampling.

The stream health results are low in comparison to previous years, across the monitoring sites, however they do show improvement over the 2022 results (Niche 2023). This is attributed to the physical conditions prevailing at the time of sampling (low moderate flows). This is likely driven by the reduced stream flows in spring 2023 in comparison to recent monitoring years, and the lag time in aquatic habitat establishment and macroinvertebrate assemblage development following the transition from an extended period of above average flows to low flows.

The macroinvertebrate analysis identified significant differences in the macroinvertebrate assemblages that were primarily driven by temporal change. In particular, between 2023 and previous years, where there has been a marked transition from consistently elevated flows to more nominal conditions. Given the comparable results across the sites, this trend is likely to reflect the catchment scale processes operating at the time of sampling. Ongoing monitoring will assist in identifying and long-term trends in stream condition and macroinvertebrate assemblages over time and distinguishing indicators of potential impact from levels of natural variability and change.

The statistical analysis of stream health indices supports the interpretation of biological stream health indices results. The analyses indicate that differences in the edge data are primarily associated with the Year term, with 2023 representing a significantly lower number of taxa and macroinvertebrate assemblage to previous monitoring years (except for 2022). This temporal variation is likely driven by the low stream flows that occurred through 2023, including during the Spring 2023 sampling.

The analyses indicate that differences in the riffle data are primarily associated with the Year and Location terms, with 2023 representing a significantly lower number of taxa and macroinvertebrate assemblage to previous monitoring years (expect for 2022). While the number of taxa may have been low, 2023 also recorded the highest average O0SIGNAL score to date. Similarly, to the edge analyses, this temporal variation is likely driven by the low stream flows that occurred through 2023.

Overall, the monitoring results in spring 2023 reflect the prevailing environmental conditions (low rainfall and low flows), in particular in comparison to the extensive high flows in 2022. These factors have resulted in generally somewhat reduced stream health index results when compared to previous years. This does not indicate a reduction in water quality, given the same factors are observed at the Control Sites, rather the physical conditions present during spring 2023. Any observed changes in macroinvertebrate assemblages and stream health indices are unrelated to any discharges from the Quarry, as the stream health results are comparable between the impact monitoring sites and the control monitoring sites, with environmental conditions the driving factor.

5. Conclusion

Temporal variability was the major factor explaining differences in the macroinvertebrate assemblages in spring 2023.

The spring 2023 biological monitoring results reflect the prevailing rainfall and stream flow conditions, being reduced when compared to previous year monitoring results. This reflects the physical conditions, rather than any reduced water quality conditions.

The macroinvertebrate assemblages and stream health indicators show that the composition and ecological health of the river within the vicinity of the Quarry remains similar to other areas of the river not influenced by Quarry operations. As such, no impacts associated with any discharges from the Quarry are identified in Spring 2023.

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Appendix 1. Macroinvertebrate data

Macroinvertebrates recorded at survey sites: spring 2023.

Site	Quarry Processing				Upstream Control				Quarry Control			
	Site 1		Site 2		Site 4		Site 5		Site 7		Site 8	
Taxa	Pool	Riffle	Pool	Riffle	Pool	Riffle	Pool	Riffle	Pool	Riffle	Pool	Riffle
Lumbriculidae	1	1	0	1	0	3	0	0	2	0	0	0
Atyidae	0	0	0	0	0	0	0	1	0	0	0	0
Corbiculidae	0	0	5	0	0	0	3	0	0	0	2	0
Physidae	0	0	4	0	1	0	3	0	0	0	0	0
Planorbidae	0	1	0	1	0	0	0	0	0	0	0	0
Baetidae	0	0	0	0	5	9	10	14	1	0	1	0
Caenidae	20	28	43	13	20	8	50	10	36	5	22	13
Leptophlebiidae	7	9	4	3	6	26	1	3	19	10	15	30
Coenagrionidae	0	0	0	0	0	0	3	0	0	0	11	0
Magapodagrionidae	0	0	0	0	0	0	1	0	2	0	0	0
Gomphidae	0	1	0	0	0	0	0	0	0	0	1	1
Hemicorduliidae	0	0	0	0	0	0	0	0	0	0	1	0
Telephlebiidae	0	1	0	0	0	0	0	0	0	0	0	0
Gripopterygidae	0	4	8	10	1	14	1	15	1	25	0	6
Corydalidae	0	13	0	8	0	3	0	2	0	9	0	6
Sialidae	0	1	0	0	0	0	0	0	0	0	0	0
Corixidae	6	0	22	0	8	0	5	0	1	0	5	0
Notonectidae	0	0	2	0	0	0	0	0	1	0	0	0
Veliidae	0	1	6	0	0	0	19	0	10	1	1	0
Dytiscida	1	0	6	0	0	0	3	32	0	27	0	0
Elmidae	1	7	2	28	0	0	0	0	0	0	4	3
Hydraenidae	0	0	0	0	0	0	1	0	0	0	0	0
Hydrophilidae	0	0	0	0	0	0	0	0	0	1	0	0
Psephenidae	0	2	2	1	0	2	1	0	0	0	1	1

Site	Quarry Processing				Upstream Control				Quarry Control			
	Site 1		Site 2		Site 4		Site 5		Site 7		Site 8	
Taxa	Pool	Riffle	Pool	Riffle	Pool	Riffle	Pool	Riffle	Pool	Riffle	Pool	Riffle
Ceratopogonidae	0	0	0	0	2	0	0	0	0	0	0	0
chironominae	27	0	5	2	21	0	2	5	15	7	9	9
Tanipodinae	0	0	2	0	0	0	0	0	0	0	0	0
Orthocladinae	0	12	0	0	0	0	0	0	0	0	0	0
Simuliidae	0	0	1	0	1	2	0	4	0	0	0	0
Tipulidae	0	1	0	1	0	1	1	2	0	2	0	0
Conoesucidae	1	5	4	7	0	6	0	32	0	0	0	0
Ecnomidae	5	2	9	3	22	0	6	5	21	1	16	8
Heliopsychidae	0	0	1	0	0	0	0	0	0	0	0	0
Hydrobiosidae	1	4	0	6	0	11	0	4	0	5	1	1
Hydropsychidae	0	10	0	22	0	15	0	10	0	9	0	3
Hydroptilidae	0	0	0	0	0	0	1	0	0	0	0	0
Leptoceridae	3	1	5	0	0	2	6	0	7	6	4	2
Mites (Acarina)	0	1	0	0	0	0	0	0	0	0	0	0

Appendix 2: Statistical analysis – edge habitat

Statistical Results for Edge Total Taxa

Ye: Year, Lo: Location, Res: Residual, RED = Redundant factor. P statistic in bold where significant at p<0.05. Monte Carlo derived P statistic P(MC) adopted where unique permutations <100.

PERMANOVA

Source	df	SS	MS	Pseudo-F	P(perm)	Unique Perms
Ye	10	1802.40	180.24	28.94	**0.0001**	9886
Lo	2	13.58	6.79	1.09	0.3522	9835
YexLo	20	204.76	10.24	1.64	0.1017	9901
Res	33	205.50	6.23			
Total	65	2226.30				

Significant terms in Bold

Pairwise comparisons for Year (2023)

Groups	t	P(perm)	Unique perms	P(MC)
2011, 2023	12.65	**0.0010**	4532	0.0001
2014, 2023	15.54	**0.0021**	3970	0.0001
2015, 2023	17.27	**0.0019**	3137	0.0001
2016, 2023	15.34	**0.0011**	3677	0.0001
2018, 2023	8.22	**0.0010**	5064	0.0004
2019, 2023	12.89	**0.0012**	2817	0.0001
2020, 2023	19.80	**0.0005**	3227	0.0001
2021, 2023	6.99	**0.0036**	3437	0.0010
2022, 2023	5.10	**0.0027**	560	0.0030

Significant terms in Bold

Statistical Results for Edge 00SIGNAL

Ye: Year, Lo: Location, Res: Residual, RED = Redundant factor. P statistic in bold where significant at p<0.05. Monte Carlo derived P statistic P(MC) adopted where unique permutations <100.

PERMANOVA

Source	df	SS	MS	Pseudo-F	P(perm)	Unique Perms
Ye	10	1.42	0.14	1.33	0.2545	9947
Lo	2	0.81	0.41	3.81	**0.0317**	9954
YexLo	20	2.19	0.11	1.03	0.4585	9933
Res	33	3.51	0.11			
Total	65	7.93				

Significant terms in Bold

Statistical Results for Edge OE50SIGNAL

Ye: Year, Lo: Location, Res: Residual, RED = Redundant factor. P statistic in bold where significant at p<0.05. Monte Carlo derived P statistic P(MC) adopted where unique permutations <100.

PERMANOVA

Source	df	SS	MS	Pseudo-F	P(perm)	Unique Perms
Ye	10	0.16	0.02	4.75	**0.0004**	9927
Lo	2	0.01	0.01	1.56	0.2202	9918
YexLo	20	0.13	0.01	1.88	0.0512	9914
Res	33	0.11	0.00			
Total	65	0.41				

Pairwise comparisons for Year (2023)

Groups	t	P(perm)	Unique perms	P(MC)
2011, 2023	0.76	0.4761	3596	0.4768
2014, 2023	1.02	0.3385	964	0.3546
2015, 2023	0.57	0.5881	1530	0.5923
2016, 2023	2.67	**0.0357**	4969	0.0383
2017, 2023	2.68	**0.0396**	4924	0.0351
2018, 2023	2.39	**0.0492**	5638	0.0557
2019, 2023	4.22	**0.0092**	4829	0.0081
2020, 2023	1.15	0.2934	4066	0.2947
2021, 2023	1.70	0.1436	2241	0.1439
2022, 2023	0.87	0.4333	5238	0.4103

Statistical Results for Edge OE50Taxa

Ye: Year, Lo: Location, Res: Residual, RED = Redundant factor. P statistic in bold where significant at p<0.05. Monte Carlo derived P statistic P(MC) adopted where unique permutations <100.

PERMANOVA

Source	df	SS	MS	Pseudo-F	P(perm)	Unique Perms
Ye	10	1.24	0.12	6.95	**0.0001**	9932
Lo	2	0.00	0.00	0.10	0.9102	9962
YexLo	20	0.16	0.01	0.44	0.9676	9919
Res	33	0.59	0.02			
Total	65	1.99				

Significant terms in Bold

Pairwise comparisons for Year (2023)

Groups	t	P(perm)	Unique perms	P(MC)
2011, 2023	2.89	**0.0275**	8029	0.0275
2014, 2023	6.99	**0.0036**	4573	0.0005
2015, 2023	6.54	**0.0017**	8681	0.0004
2016, 2023	3.76	**0.0102**	8638	0.0089
2017, 2023	6.36	**0.0016**	7300	0.0008
2018, 2023	3.87	**0.0079**	8495	0.0075
2019, 2023	2.21	0.0748	1377	0.0737
2020, 2023	2.61	0.0528	6805	0.0391
2021, 2023	2.15	0.0835	8415	0.0760
2022, 2023	0.82	0.4357	2555	0.4345

Statistical Results for Multivariate Analysis of the Edge Assemblage

Ye: Year, Lo: Location, Res: Residual, RED = Redundant factor. P statistic in bold where significant at p<0.05. Monte Carlo derived P statistic P(MC) adopted where unique permutations <100.

PERMANOVA

Source	df	SS	MS	Pseudo-F	P(perm)	Unique Perms
Ye	10	26807	2680.70	5.14	RED	9833
Lo	2	1887	943.50	1.81	RED	9911
YexLo	20	13262	663.08	1.27	**0.028**	9790
Res	33	17211	521.54			
Total	65	59166				

Pairwise comparisons for Year x Location (2023)

Term 'YexLo' for pairs of levels of factor 'Year'

Level	Comparison	t	P(perm)	Unique perms	P(MC)
Quarry Treatment	2011, 2023	1.522	0.3285	3	0.1953
Quarry Treatment	2014, 2023	1.390	0.3306	3	0.2433
Quarry Treatment	2015, 2023	1.524	0.3417	3	0.1946
Quarry Treatment	2016, 2023	1.693	0.3329	3	0.1610
Quarry Treatment	2017, 2023	1.341	0.3398	3	0.2623
Quarry Treatment	2018, 2023	1.239	0.3331	3	0.3072
Quarry Treatment	2019, 2023	1.193	0.3380	3	0.3221
Quarry Treatment	2020, 2023	1.262	0.6713	3	0.3064
Quarry Treatment	2021, 2023	1.166	0.6565	3	0.3475
Quarry Treatment	2022, 2023	0.937	1.0000	3	0.5038
Upstream Control	2011, 2023	1.408	0.3332	3	0.2156
Upstream Control	2014, 2023	1.942	0.3352	3	0.1220
Upstream Control	2015, 2023	1.752	0.3350	3	0.1410
Upstream Control	2016, 2023	1.949	0.3295	3	0.1135
Upstream Control	2017, 2023	1.751	0.3278	3	0.1583
Upstream Control	2018, 2023	1.623	0.3333	3	0.1744
Upstream Control	2019, 2023	1.215	0.6728	3	0.3265
Upstream Control	2020, 2023	1.501	0.3346	3	0.2025
Upstream Control	2021, 2023	0.952	0.6616	3	0.4890
Upstream Control	2022, 2023	1.451	0.3320	3	0.2290
Quarry Control	2011, 2023	1.577	0.3314	3	0.1843
Quarry Control	2014, 2023	1.977	0.3350	3	0.1164
Quarry Control	2015, 2023	1.712	0.3356	3	0.1490
Quarry Control	2016, 2023	1.941	0.3379	2	0.1079
Quarry Control	2017, 2023	1.546	0.3347	3	0.1804
Quarry Control	2018, 2023	1.821	0.3334	3	0.1232

Level	Comparison	t	P(perm)	Unique perms	P(MC)
Quarry Control	2019, 2023	1.573	0.3363	3	0.1711
Quarry Control	2020, 2023	1.661	0.3284	3	0.1506
Quarry Control	2021, 2023	1.376	0.3313	3	0.2464
Quarry Control	2022, 2023	1.658	0.3327	3	0.1744
2023	Quarry Treatment, Upstream Control	0.898	1.0000	3	0.5331
2023	Quarry Treatment, Quarry Control	0.565	1.0000	3	0.7926
2023	Upstream Control, Quarry Control	0.887	0.6686	3	0.5277

Appendix 3: Statistical analysis - riffle habitat

Statistical Results for Riffle Total Taxa

Ye: Year, Lo: Location, Res: Residual, RED = Redundant factor. P statistic in bold where significant at p<0.05. Monte Carlo derived P statistic P(MC) adopted where unique permutations <100.

PERMANOVA

Source	df	SS	MS	Pseudo-F	P(perm)	Unique Perms
Ye	10	1402.70	140.270	18.7030	**0.0010**	999
Lo	2	62.76	31.379	4.1838	**0.0300**	999
YexLo	20	204.58	10.229	1.3638	0.1900	998
Res	33	247.50	7.500			
Total	65	1917.50				

Pairwise comparisons for Year (2023)

Groups	t	P(perm)	Unique perms	P(MC)
2011, 2023	7.1393	**0.0010**	624	0.0020
2014, 2023	8.7039	**0.0030**	729	0.0010
2015, 2023	11.3750	**0.0030**	582	0.0010
2016, 2023	9.1018	**0.0010**	738	0.0010
2017, 2023	7.6525	**0.0040**	710	0.0020
2018, 2023	15.3820	**0.0040**	395	0.0010
2019, 2023	30.6150	**0.0010**	505	0.0010
2020, 2023	9.1915	**0.0010**	714	0.0010
2021, 2023	10.2380	**0.0010**	680	0.0010
2022, 2023	7.9373	**0.0010**	198	0.0020

Pairwise comparisons for Location

Groups	t	P(perm)	Unique perms	P(MC)
Quarry Treatment, Upstream Control	2.4244	**0.0280**	951	0.0300
Quarry Treatment, Quarry Control	0.0634	0.9580	968	0.9580
Upstream Control, Quarry Control	2.3054	0.0390	971	0.0360

Statistical Results for Riffle 00SIGNAL

Ye: Year, Lo: Location, RED = Redundant facto. P statistic in bold where significant at p<0.05. Monte Carlo derived P statistic P(MC) adopted where unique permutations <100

PERMANOVA

Source	df	SS	MS	Pseudo-F	P(perm)	Unique Perms
Ye	10	2.54	0.254	3.8951	RED	9933
Lo	2	0.51	0.257	3.9412	RED	9950
YexLo	20	2.80	0.140	2.1431	**0.0271**	9914
Res	33	2.15	0.065			
Total	65	8.01				

Statistical Results for Riffle OE50SIGNAL

Ye: Year, Lo: Location, RED = Redundant facto. P statistic in bold where significant at p<0.05. Monte Carlo derived P statistic P(MC) adopted where unique permutations <100

PERMANOVA

Source	df	SS	MS	Pseudo-F	P(perm)	Unique Perms
Ye	10	113.83	11.383	587.3200	**0.0002**	9730
Lo	2	0.00	0.002	0.0958	0.8623	9783
YexLo	20	0.03	0.001	0.0768	0.9998	9843
Res	33	0.64	0.019			
Total	65	114.51				

Pairwise comparisons Year (2023)

Level	t	P(perm)	Unique perms	P(MC)
2011, 2023	24.5280	**0.0028**	7809	0.0001
2014, 2023	24.4120	**0.0036**	7874	0.0001
2016, 2023	24.4410	**0.0033**	7749	0.0001
2017, 2023	24.3970	**0.0028**	7418	0.0001
2018, 2023	24.5000	**0.0049**	7832	0.0001
2019, 2023	24.6270	**0.0025**	6584	0.0001
2020, 2023	24.5220	**0.0038**	5599	0.0001
2021, 2023	24.5160	**0.0046**	6930	0.0001
2022, 2023	24.2010	**0.0040**	5770	0.0001

Statistical Results for Riffle OE50Taxa

Ye: Year, Lo: Location, RED = Redundant facto. P statistic in bold where significant at p<0.05. Monte Carlo derived P statistic P(MC) adopted where unique permutations <100

PERMANOVA

Source	df	SS	MS	Pseudo-F	P(perm)	Unique Perms
Ye	10	0.94	0.094	9.8363	**0.0001**	9925
Lo	2	0.10	0.049	5.1451	**0.0119**	9942
YexLo	20	0.07	0.003	0.3526	0.9936	9932
Res	33	0.31	0.010			
Total	65	1.42				

Pairwise comparisons for Year (2023)

Groups	t	P(perm)	Unique perms	P(MC)
2011, 2023	10.3070	**0.0006**	1951	0.0001
2014, 2023	5.0990	**0.0044**	6717	0.0019
2015, 2023	4.0646	**0.0046**	1150	0.0071
2016, 2023	7.5653	**0.0004**	4914	0.0002
2017, 2023	11.2110	**0.0001**	1901	0.0002
2018, 2023	10.6430	**0.0003**	5063	0.0001
2019, 2023	11.2110	**0.0001**	5258	0.0001
2020, 2023	3.8735	**0.0177**	3655	0.0084
2021, 2023	4.9907	**0.0043**	4966	0.0044
2022, 2023	1.3855	0.2150	2176	0.2139

Pairwise comparisons for Location

Groups	t	P(perm)	Unique perms	P(MC)
Quarry Treatment, Upstream Control	1.0838	0.2939	9617	0.2907
Quarry Treatment, Quarry Control	1.8683	0.0761	9557	0.0688
Upstream Control, Quarry Control	3.5609	**0.0014**	9597	0.0023

Statistical Results for Multivariate Analysis of the Riffle Assemblage

Ye: Year, Lo: Location, Res: Residual, RED = Redundant factor. P statistic in bold where significant at p<0.05. Monte Carlo derived P statistic P(MC) adopted where unique permutations <100.

PERMANOVA

Source	df	SS	MS	Pseudo-F	P(perm)	Unique Perms
Ye	10	24370.0	2,437.0	6.128	**RED**	9850
Lo	2	2138.7	1,069.3	2.689	**RED**	9905
YexLo	20	11613.0	580.7	1.460	**0.0032**	9791
Res	33	13124.0	397.7			
Total	65	51246.0				

Pairwise comparisons Year x Location (2023)

Level	Groups	t	P(perm)	Unique perms	P(MC)
Quarry Treatment	2011, 2023	1.9033	0.3293	3	0.1629
Quarry Treatment	2014, 2023	1.8261	0.3327	3	0.1559
Quarry Treatment	2015, 2023	2.0778	0.3385	3	0.1301
Quarry Treatment	2016, 2023	2.0157	0.3398	3	0.1246
Quarry Treatment	2017, 2023	1.6763	0.3369	3	0.2042
Quarry Treatment	2018, 2023	1.9324	0.3275	3	0.1482
Quarry Treatment	2019, 2023	1.7068	0.3326	3	0.1946
Quarry Treatment	2020, 2023	1.5269	0.3343	3	0.2049
Quarry Treatment	2021, 2023	1.4935	0.3309	3	0.2269
Quarry Treatment	2022, 2023	1.4578	0.3359	3	0.2496
Upstream Control	2011, 2023	2.2930	0.3262	3	0.0687
Upstream Control	2014, 2023	2.3280	0.3345	3	0.0809
Upstream Control	2015, 2023	1.8314	0.3322	3	0.1231
Upstream Control	2016, 2023	2.0469	0.3392	3	0.1227
Upstream Control	2017, 2023	2.1881	0.3241	3	0.1009
Upstream Control	2018, 2023	2.1238	0.3350	3	0.0880
Upstream Control	2019, 2023	1.9328	0.3328	3	0.1101
Upstream Control	2020, 2023	2.0975	0.3350	3	0.0908
Upstream Control	2021, 2023	2.1838	0.3339	3	0.0935
Upstream Control	2022, 2023	1.8486	0.3347	3	0.1222
Quarry Control	2011, 2023	1.3663	0.3374	3	0.2648
Quarry Control	2014, 2023	1.9826	0.3384	3	0.1030
Quarry Control	2015, 2023	1.8695	0.3303	3	0.1210
Quarry Control	2016, 2023	2.4669	0.3339	3	0.0616
Quarry Control	2017, 2023	1.8311	0.3359	3	0.1225
Quarry Control	2018, 2023	2.1065	0.3294	3	0.0912
Quarry Control	2019, 2023	2.1403	0.3359	3	0.0960

Level	Groups	t	P(perm)	Unique perms	P(MC)
Quarry Control	2020, 2023	1.8304	0.3298	3	0.1290
Quarry Control	2021, 2023	2.1039	0.3387	3	0.1090
Quarry Control	2022, 2023	1.9325	0.3395	3	0.1293
2023	Quarry Treatment, Upstream Control	1.4558	0.3310	3	0.2540
2023	Quarry Treatment, Quarry Control	1.5456	0.3288	3	0.2260
2023	Upstream Control, Quarry Control	1.5438	0.3367	3	0.1880

Appendix 4 – Plates

A

B

Plate 2: Site 1 (Quarry Processing Area). A) Upstream B) Downstream.

A

B

Plate 3: Site 2 (Quarry Processing Area). A) Upstream B) Downstream.

A B

Plate 4: Site 4 (Upstream Control). A) Upstream B) Downstream.

A B

Plate 5: Site 5 (Upstream Control). A) Upstream B) Downstream.

A B

Plate 6: Site 7 (Quarry Control). A) Upstream B) Downstream.

A B

Plate 7: Site 8 (Quarry Control). A) Upstream B) Downstream.

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Aboriginal heritage
Historical heritage
Conservation management
Community consultation
Archaeological, built and landscape values

Environmental management and approvals
Impact assessments
Development and activity approvals
Rehabilitation
Stakeholder consultation and facilitation
Project management

Environmental offsetting
Offset strategy and assessment (NSW, QLD, Commonwealth)
Accredited BAM assessors (NSW)
Biodiversity Stewardship Site Agreements (NSW)
Offset site establishment and management
Offset brokerage
Advanced Offset establishment (QLD)

Appendix J: Surface Water Results for Report Period

Date	Sample ID	pH	Conductivity (uS/cm)	O2 demand	Turbidity (NTU)	Total Suspended Solids (mg/L)	TDS (mg/L)	Oil & Grease (mg/L)	Volume Discharged (kL)
18/07/2023	Downstream AQW3	7.1	187	0	1.1	0	138	0	
18/07/2023	Upstream AQW1	8.5	177	0	1.2	0	129	0	
17/08/2023	Downstream AQW3	7.7	235	0	2	0	131	0	
17/08/2023	Upstream AQW1	7.9	280	0	2.5	0	125	0	
18/09/2023	Downstream AQW3	6.9	302	2	1.6	0	184	0	
18/09/2023	Upstream AQW1	7.7	287	0	1	0	172	0	
19/10/2023	Downstream AQW3	7.3	280	0	2	0	146	0	
19/10/2023	Upstream AQW1	7.1	276	2	4	0	132	0	
17/11/2023	Downstream AQW3	7.7	338	9	1.3	0	475	0	
17/11/2023	Upstream AQW1	8.4	349	0	1.6	0	177	0	
18/12/2023	Downstream AQW3	7.7	322	0	1	5	190	0	
18/12/2023	Upstream AQW1	7.5	335	0	2	0	192	0	
20/12/2023	Dam 1	7.4	308		834	812		0	2000
20/12/2023	Dam 2	7	207		1805	812		8	2000
20/12/2023	Downstream AQW3	7	204		138	378		0	
20/12/2023	Upstream AQW1	6.2	243		130	364		0	
21/12/2023	Dam 1	7.7	228		1400	1070		0	2000
21/12/2023	Dam 3	7.6	876		101	33		0	2000
21/12/2023	Downstream AQW3	7.5	316		8.5	15		0	
21/12/2023	Upstream AQW1	7.2	319		9.1	14		0	
22/12/2023	Dam 1	7.8	291		770	424		0	1000
22/12/2023	Downstream AQW3	7.9	318		8	10		0	
22/12/2023	Upstream AQW1	7.8	317		5	11		0	
5/01/2024	Dam 1	7.3	225		1400	828		0	2000
5/01/2024	Downstream AQW3	7.4	242		29	24		0	
5/01/2024	Upstream AQW1	7.3	242		29	26		0	
6/01/2024	Dam 1	7.5	235		950	639		0	2000
6/01/2024	Downstream AQW3	7.6	272		13	16		0	
6/01/2024	Upstream AQW1	7.5	275		10	10		0	
7/01/2024	Dam 1	7.7	247		550	172		0	2000
7/01/2024	Downstream AQW3	7.7	277		12	10		0	
7/01/2024	Upstream AQW1	7.7	271		8	8		0	

Date	Sample ID	pH	Conductivity (uS/cm)	O2 demand	Turbidity (NTU)	Total Suspended Solids (mg/L)	TDS (mg/L)	Oil & Grease (mg/L)	Volume Discharged (kL)
18/01/2024	Dam 1	7.9	414		1350	655		0	2000
18/01/2024	Dam 3	9	271		60	26		0	2000
18/01/2024	Downstream AQW3	7.8	270		22	34		0	
18/01/2024	Upstream AQW1	7.9	278		32	34		0	
19/01/2024	Dam 1	6.8	236		2000	999		0	3000
19/01/2024	Dam 3	8.3	531		75	60		0	2000
19/01/2024	Downstream AQW3	14.8	540	10	15.4	18	155	0	
19/01/2024	Upstream AQW1	15.1	547	0	14	14	148	0	
20/02/2024	Downstream AQW3	7	263	0	2.9	6	144	0	
20/02/2024	Upstream AQW1	6.7	266	0	2.8	5	179	0	
22/03/2024	Downstream AQW3	6.5	241	5	3.7	0	156	0	
22/03/2024	Upstream AQW1	7.5	227	5	1.6	0	151	0	
6/04/2024	Dam 1	7.8	78		1500	1140		0	3000
6/04/2024	Downstream AQW3	7.7	147		140	176		0	
6/04/2024	Upstream AQW1	7.5	147		90	159		0	
7/04/2024	Dam 1	7.7	158		1100	976		0	3000
7/04/2024	Dam 3	7.5	548		90	39		0	2000
7/04/2024	Downstream AQW3	7.8	203		75	65		0	
7/04/2024	Upstream AQW1	7.7	128		40	35		0	
8/04/2024	Dam 1	6.7	243		550	272		0	2000
8/04/2024	Dam 3	8.1	547		11	34		0	2000
8/04/2024	Downstream AQW3	7.5	247		12	6		0	
8/04/2024	Upstream AQW1	7.9	2448		13	19		0	
22/04/2024	Downstream AQW3	7.3	238	0	3.3	0	148	0	
22/04/2024	Upstream AQW1	6.9	239	0	3.1	0	156	0	
23/05/2024	Downstream AQW3	7.6	184	4	4.5	0	160	0	
23/05/2024	Upstream AQW1	6.8	200	4	3.5	0	168	0	
20/06/2024	Downstream AQW3	7.2	240	2	5.5	10	150	0	
20/06/2024	Upstream AQW1	7.2	240	2	5.5	10	150	0	

Appendix K: Groundwater Monitoring Reports

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2 February 2024

Mr Craig McDonald
Hy-tec Industries Pty Ltd
Austen Quarry
391 Jenolan Caves Road
Hartley NSW 2790
Craig.Mcdonald@adbri.com.au

Dear Craig,

RE: JANUARY 2024 WATER MONITORING RESULTS, AUSTEN QUARRY, HARTLEY, NSW

Ground Doctor was engaged by Hy-tec Industries Pty Ltd (Hy-tec) to collect groundwater level and quarry excavation water quality data biannually at the Austen Quarry, 391 Jenolan Caves Road, Hartley, NSW (the site). This report outlines the methodology and results of the monitoring round conducted on 24 January 2024.

1 Monitoring Objectives

The objective of the monitoring round was to collect water data to comply with monitoring programme outlined in the Water Management Plan (Groundwork Plus, 2017).

The Water Management Plan (Groundwork Plus, 2017) stipulates that Hy-tec will monitor water quality within the quarry excavation on a six-monthly basis for the life of the quarry. The Water Management Plan also stipulates that groundwater levels will be continuously monitored during the operational life of the quarry and outlines triggers for groundwater level changes at four existing monitoring bores.

2 Scope of Work

Ground Doctor conducted the following work.

- Gauged four existing groundwater monitoring wells to measure the depth to groundwater.
- Downloaded groundwater level data from data loggers within three bores in which groundwater was encountered (MB01S, MB01D and MB02).
- Downloaded atmospheric pressure data from a baro-logger installed within MB03.
- Measured water quality parameters within accumulated water at the base of the quarry excavation.
- Collected samples of water within the base of the quarry excavation for laboratory analysis.
- Prepared this report outlining methodology and results of the monitoring round.

3 Monitoring Bore Locations

The monitoring bore locations are shown on *Figure 1* of *Attachment A*. Monitoring bore coordinates and details are summarised in *Table 1*. *Table 1* also presents a summary of the monitoring bore construction details.

Table 1: Monitoring Bore Construction Details

Bore ID	Easting	Northing	Approx. Surface Elevation (AHD)	Depth to Bottom (btc)	Screened Intervals (bgl)	Stickup (agl)
MB01S	235245	6281077	700m	7.42m	3.7-6.7m	0.8m
MB01D	235259	6281098	700m	29.30m	20-23m 26-28.5m	0.8m
MB02	235915	6280398	710m	29.10m	10.5-13.5m 22.5-28.5m	0.6m
MB03	236419	6281786	690m	25.31m	18.5-24.5m	0.4m

Eastings and northings are MGA Zone 56.
btc = below top of casing
bgl = below ground level
agl = above ground level

4 Water Monitoring Methodology

Each monitoring bore was gauged using an electronic dip meter prior to any disturbance of the water column. Bores were gauged on the morning of 24 January 2024. The depth to water was measured from the top of casing at each bore. MB03 was installed into a dry hole and the hole was found to be dry at the time of gauging.

The water level logger was removed from each borehole following gauging. Data stored within each water level logger were downloaded at the time of gauging on 24 January 2024. The water level loggers were reinstated in each monitoring bore after download.

A water sample was collected from standing water in the quarry excavation on 24 January 2024. An unpreserved sample bottle was filled directly from ponded water in the quarry excavation. This bottle was then used to fill preserved sample bottles and samples requiring field filtering. Once sampling was complete field water quality parameters were measured. The water quality meter was placed in the pond and allowed to equilibrate for a period of approximately 10 minutes. The field water quality parameters were then recorded.

Water quality measurements were made using a YSI water quality meter. Ground Doctor calibrated the water meter prior to use.

Water samples were collected into laboratory supplied bottles, each marked with the appropriate identification. Sample bottles were appropriately preserved where necessary. The sample for dissolved metals analysis was filtered in the field using disposable 45µm filters. The sampler wore disposable nitrile gloves at all times during sampling to minimise potential for cross contamination. Samples were placed into an esky with ice immediately after collection.

Water samples were delivered directly to Envirolab (Sydney) by Ground Doctor field personnel on the afternoon of 25 January 2024.

Water samples collected from the base of the quarry excavation were analysed for major cations, major anions, nutrients, dissolved metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylenes (BTEX) and polycyclic aromatic hydrocarbons (PAHs) as specified in Table 37 of the Water Management Plan (Groundwork Plus, 2017).

5 Field Observations

Water quality data measured within water in the base of the quarry excavation is presented with all previous monitoring data in *Table 2*.

Table 2: Water Quality Parameters for Pit Water – All Monitoring Rounds

Date	Temp (ºC)	DO (ppm)	EC (uS/cm)	pH	Field ORP (mV)
Jan-18	21.9	4.30	820	7.00	8
Jun-18	7.6	6.97	357	7.01	119
Jan-19	25.2	5.30	794	8.20	91
Jul-19	7.9	9.50	536	8.33	129
Jan-20	19.4	3.17	1015	7.82	110
Aug-20	9.2	8.74	494	7.94	146
Jan 21	20.5	5.34	662	8.19	115
Jul 21	8.8	9.31	500	7.14	-71
Feb 22	23.1	3.15	617	8.27	-18
Aug 22	10.2	7.70	422	7.95	17
Jan 23	22.3	4.49	585	8.24	-44
Jul 23	9.3	7.38	468	7.89	79
Jan 24	23.0	5.87	558	8.20	63

6 Analytical Results

A summary of analytical data is presented in *Table B1* of *Attachment B*. The summary table presents January 2024 results against preliminary triggers outlined in the Water Management Plan (Groundwork Plus, 2017) and analytical data from previous monitoring rounds spanning January 2018 to January 2024.

The certificate of analysis for water samples is presented as *Attachment C*.

Reported concentrations of all analytes were less than the preliminary triggers outlined in the Water Management Plan (Groundwork Plus, 2017). Where analytes were detected above the laboratory reporting limits, the analyte concentrations were within the range of previous results.

7 Water Level Logger Data

All water level loggers were set to record water level at 6 hour intervals commencing 12am on 12 January 2018. The water level data loggers were not vented. A baro-logger was deployed to record air pressure at the same recording interval to allow water level logger readings to be corrected to account for changes in air pressure.

Water level data loggers installed in MB01S, MB01D and MB02, and the barometric pressure logger installed at MB03, were downloaded on 24 January 2024.

The raw data was corrected for changes in air pressure using the barometric pressure data. The manual water level measurement collected at the time the loggers were removed from each borehole were used to convert the water level logger data to a depth to water relative to the top of the PVC bore casing.

At the completion of the monitoring round the water level loggers were redeployed in their respective boreholes.

Corrected water level data is presented graphically as *Attachment D*. The presented data is for the period spanning January 2018 to January 2024.

Observed groundwater level changes did not exceed the adopted trigger, which is a drop in water levels more than 10m below baseline water levels. Water level trends in each monitoring bore over the monitoring interval (January 2023 to July 2023) were as follows.

7.1 MB01S

The water level within MB01S increased by a total of approximately 0.2m over the monitoring interval (July 2023 to January 2024). The water level was decreasing at a steady but slow rate until late November 2023 after which the water level rose. There are several small spikes in water level evident in the period December 2023 to January 2024 and these are most likely indicative of recharge events associated with rainfall. The spikes correlate with a period of above average rainfall following a relatively dry first 9 months of 2023.

7.2 MB01D

In the period July 2023 to January 2024 the water level within MB01D rose approximately 1.0m. Water level fluctuation within MB01D was noisy relative to the trends observed in MB01S and MB02 across the same interval. The water level within MB01D remained well within the range of previously observed variation. A clear increasing trend is evident for the period August 2023 to January 2024.

7.3 MB02

The water level within MB02 decreased by a total of approximately 0.6m over the monitoring interval (July 2023 to January 2024). The decrease occurred at a steady rate across the monitoring interval to December 2023. There are two obvious spikes in the January 2024 period and evidence of groundwater level increase at the end of the monitoring interval. This correlates with a return to above average rainfall conditions in the December 2023 to January 2024 period.

8 Estimated Groundwater Inflow to Pit

The WMP specifies that water inflow to the pit should be estimated on a quarterly basis by measuring changes to water levels within the pit during a period of fine weather and no water extraction. Hy-tec monitored water level changes in the base of the quarry excavation on two occasions in the period July 2023 and January 2024.

At the time of each monitoring event, water had not been removed from the pit for several days prior to monitoring. There had been no significant rainfall in the days leading up to the monitoring period and there was no obvious overland flow of water into the pit floor during the monitoring period.

A measuring benchmark was established at the waterline in the base of the pit. The height of standing water was noted to the nearest millimetre at the commencement of the monitoring period. The height of water at the benchmark was noted 24 hours later.

At the time of the monitoring events the pit floor was covered with water. The pit floor at the time of monitoring was estimated to be approximately 230m long with an average width of 30m, giving an estimated area of approximately 6900m^2.

Ground Doctor estimated evaporation from the pit using evaporation data from the nearest BOM gauging station that measures evaporation (Bathurst Agricultural Station). Ground Doctor used an evaporation rate of one third of the BOM reading at Bathurst. This was justified on the basis that the Quarry floor is surrounded by walls that are approximately 50m high, which protects ponded

water from wind and reduces the amount of solar radiation reaching the bottom of the pit. In addition, the quarry is situated further east of Bathurst and evaporation typically decreases as you move closer to the east coast of Australia due to topographical effects and average humidity of the airmass.

The daily change in water level within the quarry excavation was used to estimate the annual groundwater inflow. *Table 3* summarises the observation made during the two monitoring events in the period July 2023 to January 2024.

Table 3: Summary of Pit Inflow Estimates July 2023 to January 2024

Monitoring Event	Change in Water Level	Description of Pit Conditions	Estimate of Groundwater Inflow
14-15 September 2023	No change in water level. 1.4mm Evaporation Loss (avg daily rate for September 2023)	Pit floor approximately 6900m^2. Pit floor covered by water.	3.5ML/yr
11-12 December 2023	No change in water level. 3.7mm Evaporation Loss	Pit floor approximately 6900m^2. Pit floor covered by water.	9.3ML/yr
		Average Inflow Estimate For July 2023 to January 2024	**6.4ML/yr**

* - BOM Evaporation data not published for Bathurst on date of monitoring. Evaporation was estimated by taking one third of the daily average for the given month of measurement.

The average estimate of groundwater inflow across the monitoring period was 6.4ML/yr. Hy-tec's licensed groundwater use is 20ML/yr.

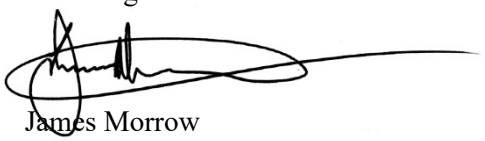
9 Conclusions

Groundwater level monitoring, quarry excavation water quality monitoring and quarry excavation inflow monitoring was undertaken as specified by the Water Management Plan (Groundwork Plus, 2017). The data collected during the January 2024 monitoring round did not exceed any of the relevant triggers outlined in the Water Management Plan (Groundwork Plus, 2017).

Estimated inflow to the quarry excavation did not exceed Hy-tec's licensed use of groundwater (20ML/yr).

If you have any questions regarding the works outlined in this report please contact the undersigned on 0407 875 302.

Kind Regards



James Morrow
Environmental Engineer
Ground Doctor Pty Ltd
Certified Environmental Practitioner No.: 1194
Site Contamination Specialist No.: SC41087

Attachments:

Attachment A – Figure

Attachment B – Analytical Results Summary Table

Attachment C – Laboratory Certificate of Analysis

Attachment D – Groundwater Level Chart

10 References

- ANZECC/ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Trigger values for 95% protection of fresh water ecosystems.
- Groundwork Plus (2017), "*Austen Quarry Water Management Plan*", Report Number 1517_610_002_RPTO_Water Management Plan_V8, 10 October 2017.
- National Health and Medical Research Council (NHMRC) (2018) *Australian Drinking Water Guidelines.*

Attachment A

Figure

Ground Doctor Pty Ltd

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PO Box 6278
22 Tamworth Street
Dubbo NSW 2830

Project Name: January 2024 Groundwater Monitoring Round	Figure 1
Project Number: 2018-GD001	Groundwater Monitoring Bore Locations

Attachment **B**

Analytical Results Summary Table

Table B1

Analytical Data Summary - Pit Water - January 2018 to January 2024

Sampling Date		ANZECC	Aust. Drinking Water	10/01/2018	10/01/2018	22/06/2018	03/01/19	03/07/19	07/01/20	27/08/20	05/01/21	28/07/21	03/02/22	23/08/22	03/01/23	21/07/23	Units
Sample Location		DGV 2018 (Fresh)	2011	PIT	PIT	PIT	PIT	PIT	PIT	PIT	PIT	PIT	PIT	PIT	PIT	PIT	
Major Cations (mg/L)	Calcium	-	-	40	71	49	64	62	92	58	54	54	48	56	47	65	mg/L
	Magnesium	-	-	29	45	26	44	51	60	43	43	43	35	39	30	46	mg/L
	Sodium	-	-	26	26	25	20	24	35	28	23	24	19	19	16	24	mg/L
	Potassium	-	-	4	4	3	4.7	4.6	6.2	4	4.5	5	5	5.1	4	5.3	mg/L
Major Anions (mg/L)	Sulphate	-	-	130	183	98	220	210	230	170	150	160	150	130	130	180	mg/L
	Chloride	-	-	8	9	10	13	18	25	9	9	8	7	7	14	20	mg/L
	Hydroxide as CaCO3	-	-	<5	<1	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L
	Carbonate as CaCO3	-	-	<5	<1	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L
	Bicarbonate as CaCO3	-	-	160	181	201	170	170	300	180	190	180	170	180	180	200	mg/L
Heavy Metals (Dissolved) (mg/L)	Aluminium	0.055	-	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	0.01	mg/L
	Arsenic	0.013	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Barium	-	2	0.057	0.032	0.029	0.071	0.029	0.046	0.039	0.048	0.040	0.047	0.035	0.045	0.029	mg/L
	Beryllium	-	0.06	<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	mg/L
	Boron	0.37	4	<0.02	<0.05	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/L
	Cadmium	0.0002	0.002	<0.0001	0.0088	0.0019	0.0001	<0.0001	0.0003	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	mg/L
	Chromium	0.001	0.05	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Cobalt	-	-	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Copper	0.0014	2	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Iron	-	-	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.100	<0.01	<0.01	<0.01	mg/L
	Lead	0.0034	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Manganese	1.9	0.5	<0.005	2.000	0.188	<0.005	<0.005	0.120	0.150	<0.005	0.008	0.007	<0.005	<0.005	<0.005	mg/L
	Mercury	0.6	0.001	<0.00005	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	mg/L
	Molybdenum	-	0.05	0.003	0.004	<0.001	0.011	0.009	0.015	0.005	0.004	0.004	0.003	0.003	0.003	0.005	mg/L
	Nickel	0.011	0.02	<0.001	0.008	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Selenium	0.005	0.01	<0.001	<0.01	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Silver	0.00005	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Strontium	-	-	0.210	0.298	0.231	0.330	0.260	0.440	0.260	0.230	0.270	0.230	0.240	0.240	0.270	mg/L
	Titanium	-	-	<0.001	<0.01	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Vanadium	-	-	<0.001	<0.01	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Zinc	0.008	-	0.003	0.443	0.16	0.006	0.006	0.023	0.007	0.004	0.006	0.008	0.002	0.002	<0.001	mg/L
Silicon (mg/L)	Silicon	-	-	3.4	15.2	19.4	5.1	3.8	8.6	3.6	3.2	2.7	3.2	3.9	4.2	3.5	mg/L
Nutrients (mg/L)	Nitrate*	10 (as N)	50 (as NO3)	2.0	4.45	0.48	1.4	0.3	0.14	2.2	2.4	2.8	3.1	2.6	1.9	0.95	mg/L
	Nitrite	-	-	0.008	0.010	<0.01	0.012	<0.005	<0.005	0.008	0.007	0.009	0.016	<0.005	0.006	<0.005	mg/L
	Ammonia	0.9	-	0.01	0.4	0.05	<0.005	<0.005	0.087	<0.005	<0.005	<0.005	<0.005	0.078	0.087	0.025	mg/L
Hydrocarbons (ug/L)	TRH	-	-	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ug/L
	Benzene	950	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/L
	Toluene	-	800	<2	<2	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/L
	Ethylbenzene	-	300	<2	<2	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/L
	Xylene	200	600	<2	<2	<2	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/L
	Naphthalene	16	-	<5	<5	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/L
	Benzo(a)pyrene	-	0.01	<0.5	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/L

Attachment **C**

Laboratory Certificate of Analysis

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Ground Doctor Pty Ltd
Attention	James Morrow

Sample Login Details

Your reference	Hytec Austen Quarry Groundwater Monitoring-Jan 24
Envirolab Reference	342337
Date Sample Received	25/01/2024
Date Instructions Received	25/01/2024
Date Results Expected to be Reported	02/02/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHsin Water	All metals in water-dissolved	Calcium - Dissolved	Potassium - Dissolved	Sodium - Dissolved	Magnesium - Dissolved	Hardness	Hydroxide Alkalinity (OH-) as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Sulphate, SO4	Chloride, Cl	Ionic Balance	Metals in Waters -Dissolved	Ammonia as N in water	Nitrate as N in water	Nitrite as N in water	Total Dissolved Solids(grav)
Pit	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 342337

Client Details

Client	Ground Doctor Pty Ltd
Attention	James Morrow
Address	PO Box 6278, Dubbo, NSW, 2830

Sample Details

Your Reference	**Hytec Austen Quarry Groundwater Monitoring-Jan 24**
Number of Samples	1 Water
Date samples received	25/01/2024
Date completed instructions received	25/01/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	02/02/2024
Date of Issue	02/02/2024

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Hannah Nguyen, Metals Supervisor
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Water		
Our Reference		342337-1
Your Reference	UNITS	Pit
Date Sampled		24/01/2024
Type of sample		Water
Date extracted	-	31/01/2024
Date analysed	-	01/02/2024
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	101
Surrogate Toluene-d8	%	100
Surrogate 4-Bromofluorobenzene	%	105

svTRH (C10-C40) in Water		
Our Reference		342337-1
Your Reference	UNITS	Pit
Date Sampled		24/01/2024
Type of sample		Water
Date extracted	-	31/01/2024
Date analysed	-	01/02/2024
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	<50
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	<50
Surrogate o-Terphenyl	%	81

PAHs in Water		
Our Reference		342337-1
Your Reference	UNITS	Pit
Date Sampled		24/01/2024
Type of sample		Water
Date extracted	-	31/01/2024
Date analysed	-	01/02/2024
Naphthalene	µg/L	<2
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b,j+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	83

All metals in water-dissolved		
Our Reference		342337-1
Your Reference	UNITS	Pit
Date Sampled		24/01/2024
Type of sample		Water
Date prepared	-	31/01/2024
Date analysed	-	31/01/2024
Aluminium-Dissolved	µg/L	<10
Arsenic-Dissolved	µg/L	<1
Boron-Dissolved	µg/L	<20
Barium-Dissolved	µg/L	57
Beryllium-Dissolved	µg/L	<0.5
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	1
Cobalt-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	<1
Iron-Dissolved	µg/L	<10
Lead-Dissolved	µg/L	<1
Manganese-Dissolved	µg/L	<5
Mercury-Dissolved	µg/L	<0.05
Molybdenum-Dissolved	µg/L	3
Nickel-Dissolved	µg/L	<1
Selenium-Dissolved	µg/L	<1
Silver-Dissolved	µg/L	<1
Strontium-Dissolved	µg/L	210
Titanium-Dissolved	µg/L	<1
Vanadium-Dissolved	µg/L	<1
Zinc-Dissolved	µg/L	3

Ion Balance		
Our Reference		342337-1
Your Reference	UNITS	Pit
Date Sampled		24/01/2024
Type of sample		Water
Date prepared	-	25/01/2024
Date analysed	-	25/01/2024
Calcium - Dissolved	mg/L	40
Potassium - Dissolved	mg/L	4
Sodium - Dissolved	mg/L	26
Magnesium - Dissolved	mg/L	29
Hardness	mgCaCO 3 /L	220
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	160
Carbonate Alkalinity as $CaCO_3$	mg/L	<5
Total Alkalinity as $CaCO_3$	mg/L	160
Sulphate, SO4	mg/L	130
Chloride, Cl	mg/L	8
Ionic Balance	%	-5.0

Metals in Waters - Dissolved		
Our Reference		342337-1
Your Reference	UNITS	Pit
Date Sampled		24/01/2024
Type of sample		Water
Date digested	-	01/02/2024
Date analysed	-	01/02/2024
Silicon*- Dissolved	mg/L	3.4

Miscellaneous Inorganics		
Our Reference		342337-1
Your Reference	UNITS	Pit
Date Sampled		24/01/2024
Type of sample		Water
Date prepared	-	25/01/2024
Date analysed	-	25/01/2024
Ammonia as N in water	mg/L	0.010
Nitrate as N in water	mg/L	2.0
Nitrite as N in water	mg/L	0.008
Total Dissolved Solids (grav)	mg/L	450

Method ID	Methodology Summary
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180+/-10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation below:- TDS = EC * 0.6
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055	Nitrite - determined colourimetrically based on APHA latest edition NO2- B. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determinined stoichiometrically from the base metal concentration.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			31/01/2024	[NT]	[NT]	[NT]	[NT]	31/01/2024	[NT]
Date analysed	-			01/02/2024	[NT]	[NT]	[NT]	[NT]	01/02/2024	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	104	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	105	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	102	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate Toluene-d8	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	107	[NT]	[NT]	[NT]	[NT]	106	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	342337-1
Date extracted	-			31/01/2024	[NT]	[NT]	[NT]	[NT]	31/01/2024	31/01/2024
Date analysed	-			01/02/2024	[NT]	[NT]	[NT]	[NT]	01/02/2024	01/02/2024
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	114	103
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	112	106
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	86
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	114	103
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	112	106
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	86
Surrogate o-Terphenyl	%		Org-020	78	[NT]	[NT]	[NT]	[NT]	85	85

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	342337-1
Date extracted	-			31/01/2024	[NT]	[NT]	[NT]	[NT]	31/01/2024	31/01/2024
Date analysed	-			01/02/2024	[NT]	[NT]	[NT]	[NT]	01/02/2024	01/02/2024
Naphthalene	µg/L	2	Org-022/025	<2	[NT]	[NT]	[NT]	[NT]	109	102
Acenaphthylene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	99	97
Fluorene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	101	102
Phenanthrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	98	97
Anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	101	101
Pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	104	103
Benzo(a)anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	91	91
Benzo(b,j+k)fluoranthene	µg/L	2	Org-022/025	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	103	104
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	65	[NT]	[NT]	[NT]	[NT]	90	83

QUALITY CONTROL: All metals in water-dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date prepared	-			31/01/2024	[NT]	[NT]	[NT]	[NT]	31/01/2024	[NT]
Date analysed	-			31/01/2024	[NT]	[NT]	[NT]	[NT]	31/01/2024	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	115	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	[NT]	[NT]	[NT]	[NT]	118	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	106	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	119	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	102	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	[NT]	[NT]	[NT]	[NT]	102	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	103	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Silver-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Strontium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Titanium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Vanadium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			25/01/2024	[NT]	[NT]	[NT]	[NT]	25/01/2024	[NT]
Date analysed	-			25/01/2024	[NT]	[NT]	[NT]	[NT]	25/01/2024	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	89	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	98	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	103	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	90	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	103	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]

QUALITY CONTROL: Metals in Waters - Dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			01/02/2024	[NT]	[NT]	[NT]	[NT]	01/02/2024	[NT]
Date analysed	-			01/02/2024	[NT]	[NT]	[NT]	[NT]	01/02/2024	[NT]
Silicon*- Dissolved	mg/L	0.2	Metals-020	<0.2	[NT]	[NT]	[NT]	[NT]	85	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			25/01/2024	[NT]	[NT]	[NT]	[NT]	25/01/2024	[NT]
Date analysed	-			25/01/2024	[NT]	[NT]	[NT]	[NT]	25/01/2024	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	[NT]	[NT]	100	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	99	[NT]
Nitrite as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	99	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	[NT]	[NT]	[NT]	[NT]	107	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

COC 25/1 11:09.

CHAIN OF CUSTODY - Client

Client: Ground Doctor Pty Ltd	Client Project Name / Number / Site etc (ie report title): Hytec Austen Quarry Groundwater Monitoring - Jan 24
Contact person: James Morrow ph: 0407 875 302	PO No.:
Project Mgr: James Morrow	Envirolab Quote No. :
Sampler: James Morrow	Standard TAT
Address: Austen Quarry, 391 Jenolan Caves Road, Hartley, NSW	Or choose: standard / same day / 1 day / 2 day / 3 day
Phone: -- Mob: 0407875302	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*
Fax: --	Lab comments:
Email:	

Phone:
E-mail:
Contact:

Sample information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Hy-tec Suite (see table below)	TRH, BTEX, PAHs													Provide as much information about the sample as you can
(1)	Pit	-	24-Jan-24	Water	x	x													

Relinquished by (company):	James Morrow	Received by (company): ~~SEE~~ ELS SYD	*Lab use only:* 342537
Print Name:	James Morrow	Print Name: Grace Elmes	Samples Received: Cool or Ambient (circle one)
Date & Time:	24/1/24 1500	Date & Time: 25/01/24 1000	Temperature Received at: 12 (if applicable)
Signature:	JRM	Signature:	Transported by: Hand delivered / courier

White - Lab copy / Blue - Client copy / Pink - Retain in Book

HYTEC Groundwater Suite

Analyte Group	Analyte

Dissolved Solids	Total Dissolved Solids
Major Cations	Magnesium Calcium Sodium Potassium
Major Anions	Sulphate Chloride Hydroxide as $CaCO_3$ Carbonate as $CaCO_3$ Bicarbonate as $CaCO_3$
Heavy Metals (Dissolved)	Aluminium Arsenic Boron Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Molybdenum Nickel Selenium Silicon Silver Strontium Titanium Vanadium Zinc
Nutrients	Ammonia Nitrate Nitrite

342337
az

Attachment D

Groundwater Level Chart

Depth to Water vs Time

MB01S MB01D MB02

Depth to Water (m below top of PVC Casing)

0.00 1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00 18.00 19.00 20.00 21.00 22.00 23.00 24.00 25.00

01/01/18 01/02/18 01/03/18 01/04/18 01/05/18 01/06/18 01/07/18 01/08/18 01/09/18 01/10/18 01/11/18 01/12/18 01/01/19 01/02/19 01/03/19 01/04/19 01/05/19 01/06/19 01/07/19 01/08/19 01/09/19 01/10/19 01/11/19 01/12/19 01/01/20 01/02/20 01/03/20 01/04/20 01/05/20 01/06/20 01/07/20 01/08/20 01/09/20 01/10/20 01/11/20 01/12/20 01/01/21 01/02/21 01/03/21 01/04/21 01/05/21 01/06/21 01/07/21 01/08/21 01/09/21 01/10/21 01/11/21 01/12/21 01/01/22 01/02/22 01/03/22 01/04/22 01/05/22 01/06/22 01/07/22 01/08/22 01/09/22 01/10/22 01/11/22 01/12/22 01/01/23 01/02/23 01/03/23 01/04/23 01/05/23 01/06/23 01/07/23 01/08/23 01/09/23 01/10/23 01/11/23 01/12/23 01/01/24 01/02/24

Ground Doctor Pty Ltd
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Dubbo NSW 2830

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admin@grounddoc.com.au

22 July 2024

Mr Craig McDonald
Adbri Limited
Austen Quarry
391 Jenolan Caves Road
Hartley NSW 2790
Craig.Mcdonald@adbri.com.au

Dear Craig,

RE: JULY 2024 WATER MONITORING RESULTS, AUSTEN QUARRY, HARTLEY, NSW

Ground Doctor was engaged by Adbri Limited (Adbri) to collect groundwater level and quarry excavation water quality data biannually at the Austen Quarry, 391 Jenolan Caves Road, Hartley, NSW (the site). This report outlines the methodology and results of the monitoring round conducted on 5 July 2024.

1 Monitoring Objectives

The objective of the monitoring round was to collect water data to comply with monitoring programme outlined in the Water Management Plan (Groundwork Plus, 2017).

The Water Management Plan (Groundwork Plus, 2017) stipulates that Hy-tec will monitor water quality within the quarry excavation on a six-monthly basis for the life of the quarry. The Water Management Plan also stipulates that groundwater levels will be continuously monitored during the operational life of the quarry and outlines triggers for groundwater level changes at four existing monitoring bores.

2 Scope of Work

Ground Doctor conducted the following work.

- Gauged four existing groundwater monitoring wells to measure the depth to groundwater.
- Downloaded groundwater level data from data loggers within three bores in which groundwater was encountered (MB01S, MB01D and MB02).
- Downloaded atmospheric pressure data from a baro-logger installed within MB03.
- Measured water quality parameters within accumulated water at the base of the quarry excavation.
- Collected samples of water within the base of the quarry excavation for laboratory analysis.
- Prepared this report outlining methodology and results of the monitoring round.

3 Monitoring Bore Locations

The monitoring bore locations are shown on *Figure 1* of *Attachment A*. Monitoring bore coordinates and details are summarised in *Table 1*. *Table 1* also presents a summary of the monitoring bore construction details.

Table 1: Monitoring Bore Construction Details

Bore ID	Easting	Northing	Approx. Surface Elevation (AHD)	Depth to Bottom (btc)	Screened Intervals (bgl)	Stickup (agl)
MB01S	235245	6281077	700m	7.42m	3.7-6.7m	0.8m
MB01D	235259	6281098	700m	29.30m	20-23m 26-28.5m	0.8m
MB02	235915	6280398	710m	29.10m	10.5-13.5m 22.5-28.5m	0.6m
MB03	236419	6281786	690m	25.31m	18.5-24.5m	0.4m

Eastings and northings are MGA Zone 56.
btc = below top of casing
bgl = below ground level
agl = above ground level

4 Water Monitoring Methodology

Each monitoring bore was gauged using an electronic dip meter prior to any disturbance of the water column. Bores were gauged on the morning of 5 July 2024. The depth to water was measured from the top of casing at each bore. MB03 was installed into a dry hole and the hole was found to be dry at the time of gauging.

The water level logger was removed from each borehole following gauging. Data stored within each water level logger were downloaded at the time of gauging on 5 July 2024. The water level loggers were reinstated in each monitoring bore after download.

A water sample was collected from standing water in the quarry excavation on 5 July 2024. An unpreserved sample bottle was filled directly from ponded water in the quarry excavation. This bottle was then used to fill preserved sample bottles and samples requiring field filtering. Once sampling was complete field water quality parameters were measured. The water quality meter was placed in the pond and allowed to equilibrate for a period of approximately 10 minutes. The field water quality parameters were then recorded.

Water quality measurements were made using a YSI water quality meter. Ground Doctor calibrated the water meter prior to use.

Water samples were collected into laboratory supplied bottles, each marked with the appropriate identification. Sample bottles were appropriately preserved where necessary. The sample for dissolved metals analysis was filtered in the field using disposable 45µm filters. The sampler wore disposable nitrile gloves at all times during sampling to minimise potential for cross contamination. Samples were placed into an esky with ice immediately after collection.

Water samples were delivered directly to Envirolab (Sydney) by Ground Doctor field personnel on the afternoon of 5 July 2024.

Water samples collected from the base of the quarry excavation were analysed for major cations, major anions, nutrients, dissolved metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylenes (BTEX) and polycyclic aromatic hydrocarbons (PAHs) as specified in Table 37 of the Water Management Plan (Groundwork Plus, 2017).

5 Field Observations

Water quality data measured within water in the base of the quarry excavation is presented with all previous monitoring data in *Table 2*.

Table 2: Water Quality Parameters for Pit Water – All Monitoring Rounds

Date	Temp (ºC)	DO (ppm)	EC (uS/cm)	pH	Field ORP (mV)
Jan-18	21.9	4.30	820	7.00	8
Jun-18	7.6	6.97	357	7.01	119
Jan-19	25.2	5.30	794	8.20	91
Jul-19	7.9	9.50	536	8.33	129
Jan-20	19.4	3.17	1015	7.82	110
Aug-20	9.2	8.74	494	7.94	146
Jan 21	20.5	5.34	662	8.19	115
Jul 21	8.8	9.31	500	7.14	-71
Feb 22	23.1	3.15	617	8.27	-18
Aug 22	10.2	7.70	422	7.95	17
Jan 23	22.3	4.49	585	8.24	-44
Jul 23	9.3	7.38	468	7.89	79
Jan 24	23.0	5.87	558	8.20	63
Jul 24	10.0	8.67	413	8.32	98

6 Analytical Results

A summary of analytical data is presented in *Table B1* of *Attachment B*. The summary table presents July 2024 results against preliminary triggers outlined in the Water Management Plan (Groundwork Plus, 2017) and analytical data from previous monitoring rounds spanning January 2018 to July 2024.

The certificate of analysis for water samples is presented as *Attachment C*.

Reported concentrations of all analytes were less than the preliminary triggers outlined in the Water Management Plan (Groundwork Plus, 2017). Where analytes were detected above the laboratory reporting limits, the analyte concentrations were within the range of previous results.

7 Water Level Logger Data

All water level loggers were set to record water level at 6 hour intervals commencing 12am on 12 January 2018. The water level data loggers were not vented. A baro-logger was deployed to record air pressure at the same recording interval to allow water level logger readings to be corrected to account for changes in air pressure.

Water level data loggers installed in MB01S, MB01D and MB02, and the barometric pressure logger installed at MB03, were downloaded on 5 July 2024.

The raw data was corrected for changes in air pressure using the barometric pressure data. The manual water level measurement collected at the time the loggers were removed from each borehole were used to convert the water level logger data to a depth to water relative to the top of the PVC bore casing.

At the completion of the monitoring round the water level loggers were redeployed in their respective boreholes.

Corrected water level data is presented graphically as *Attachment D*. The presented data is for the period spanning January 2018 to July 2024.

Observed groundwater level changes did not exceed the adopted trigger, which is a drop in water levels more than 10m below baseline water levels. Water level trends in each monitoring bore over the monitoring interval (January 2023 to July 2024) were as follows.

7.1 MB01S

There was no significant change to the water level in MB01S over the monitoring interval.

There are several small spikes in water level evident over the monitoring interval and these are most likely indicative of recharge events associated with rainfall. The spikes correlate with periods of rainfall.

7.2 MB01D

In the period January 2024 to July 2024 water level within MB01D fell approximately 2.2m. The water level varied by less than 0.5m until the last week of the monitoring interval, where the 2.2m fall occurred.

7.3 MB02

The water level within MB02 increased for the first half of the monitoring interval and then decreased over the second half of the interval. Overall there was an approximate 0.3m fall over the entire monitoring interval. This continues a decreasing trend since January 2023 when rainfalls returned close to average after a very wet 2022.

8 Estimated Groundwater Inflow to Pit

The WMP specifies that water inflow to the pit should be estimated on a quarterly basis by measuring changes to water levels within the pit during a period of fine weather and no water extraction. Adbri monitored water level changes in the base of the quarry excavation on two occasions in the period January 2024 to July 2024.

At the time of the monitoring event, water had not been removed from the pit for several days prior to monitoring. There had been no significant rainfall in the days leading up to the monitoring period and there was no obvious overland flow of water into the pit floor during the monitoring period.

A measuring benchmark was established at the waterline in the base of the pit. The height of standing water was noted to the nearest millimetre at the commencement of the monitoring period. The height of water at the benchmark was noted 24 hours later.

At the time of the monitoring events the pit floor was covered with water. The pit floor at the time of monitoring was estimated to be approximately 230m long with an average width of 30m, giving an estimated area of approximately 6900m^2.

Ground Doctor estimated evaporation from the pit using evaporation data from the nearest BOM gauging station that measures evaporation (Bathurst Agricultural Station). Ground Doctor used an evaporation rate of one third of the BOM reading at Bathurst. This was justified on the basis that the Quarry floor is surrounded by walls that are approximately 50m high, which protects ponded water from wind and reduces the amount of solar radiation reaching the bottom of the pit. In addition, the quarry is situated further east of Bathurst and evaporation typically decreases as you move closer to the east coast of Australia due to topographical effects and average humidity of the airmass.

The daily change in water level within the quarry excavation was used to estimate the annual groundwater inflow. *Table 3* summarises the observation made during the two monitoring events in the period January 2024 to July 2024.

Table 3: Summary of Pit Inflow Estimates January 2024 to July 2024

Monitoring Event	Change in Water Level	Description of Pit Conditions	Estimate of Groundwater Inflow
11-12 January 2024	2m rise in water level over 24 hours. 0mm Evaporation Loss Recorded	Pit floor approximately 6900m^2. Pit floor covered by water.	5.0ML/yr
24-25 April 2024	No change in water level. 3.0mm Evaporation Loss	Pit floor approximately 6900m^2. Pit floor covered by water.	2.5ML/yr
		Average Inflow Estimate For January 2024 to July 2024	**3.8ML/yr**

* - BOM Evaporation data not published for Bathurst on date of monitoring. Evaporation was estimated by taking one third of the daily average for the given month of measurement.

The average estimate of groundwater inflow across the monitoring period was 3.8ML/yr. Adbri's licensed groundwater use is 20ML/yr.

9 Conclusions

Groundwater level monitoring, quarry excavation water quality monitoring and quarry excavation inflow monitoring was undertaken as specified by the Water Management Plan (Groundwork Plus, 2017). The data collected during the July 2024 monitoring round did not exceed any of the relevant triggers outlined in the Water Management Plan (Groundwork Plus, 2017).

Estimated inflow to the quarry excavation did not exceed Adbri's licensed use of groundwater (20ML/yr).

If you have any questions regarding the works outlined in this report please contact the undersigned on 0407 875 302.

Kind Regards

James Morrow
Environmental Engineer
Ground Doctor Pty Ltd
Certified Environmental Practitioner No.: 1194
Site Contamination Specialist No.: SC41087

Attachments:

Attachment A – Figure
Attachment B – Analytical Results Summary Table
Attachment C – Laboratory Certificate of Analysis
Attachment D – Groundwater Level Chart

10 References

- ANZECC/ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Trigger values for 95% protection of fresh water ecosystems.

- Groundwork Plus (2017), "*Austen Quarry Water Management Plan*", Report Number 1517_610_002_RPTO_Water Management Plan_V8, 10 October 2017.

- National Health and Medical Research Council (NHMRC) (2018) *Australian Drinking Water Guidelines.*

Attachment A

Figure

Ground Doctor Pty Ltd

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PO Box 6278
22 Tamworth Street
Dubbo NSW 2830

Project Name: July 2023 Groundwater Monitoring Round	Figure 1
Project Number: 2018-GD001	Groundwater Monitoring Bore Locations

Attachment **B**

Analytical Results Summary Table

Table B1

Analytical Data Summary - Pit Water - January 2018 to July 2024

Sampling Date		ANZECC	Aust. Drinking Water	10/01/2018	22/06/2018	03/01/19	03/07/19	07/01/20	27/08/20	05/01/21	28/07/21	03/02/22	23/08/22	03/01/23	21/07/23	24/01/24	05/07/24	Units
Sample Location		DGV 2018 (Fresh)	2011	PIT	PIT	PIT	PIT	PIT	PIT	PIT	PIT	PIT	PIT	PIT	PIT	PIT	PIT	
Major Cations (mg/L)	Calcium	-	-	71	49	64	62	92	58	54	54	48	56	47	65	40	45	mg/L
	Magnesium	-	-	45	26	44	51	60	43	43	43	35	39	30	46	29	38	mg/L
	Sodium	-	-	26	25	20	24	35	28	23	24	19	19	16	24	26	17	mg/L
	Potassium	-	-	4	3	4.7	4.6	6.2	4	4.5	5	5	5.1	4	5.3	4	4	mg/L
Major Anions (mg/L)	Sulphate	-	-	183	98	220	210	230	170	150	160	150	130	130	180	130	140	mg/L
	Chloride	-	-	9	10	13	18	25	9	9	8	7	7	14	20	8	8	mg/L
	Hydroxide as CaCO3	-	-	<1	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L
	Carbonate as CaCO3	-	-	<1	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L
	Bicarbonate as CaCO3	-	-	181	201	170	170	300	180	190	180	170	180	180	200	160	170	mg/L
Heavy Metals (Dissolved) (mg/L)	Aluminium	0.055	-	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	0.01	<0.01	<0.01	mg/L
	Arsenic	0.013	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Barium	-	2	0.032	0.029	0.071	0.029	0.046	0.039	0.048	0.040	0.047	0.035	0.045	0.029	0.057	0.048	mg/L
	Beryllium	-	0.06	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	mg/L
	Boron	0.37	4	<0.05	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/L
	Cadmium	0.0002	0.002	0.0088	0.0019	0.0001	<0.0001	0.0003	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	mg/L
	Chromium	0.001	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	mg/L
	Cobalt	-	-	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Copper	0.0014	2	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Iron	-	-	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.100	<0.01	<0.01	<0.01	<0.01	<0.01	mg/L
	Lead	0.0034	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Manganese	1.9	0.5	2.000	0.188	<0.005	<0.005	0.120	0.150	<0.005	0.008	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	mg/L
	Mercury	0.6	0.001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	mg/L
	Molybdenum	-	0.05	0.004	<0.001	0.011	0.009	0.015	0.005	0.004	0.004	0.003	0.003	0.003	0.005	0.003	0.004	mg/L
	Nickel	0.011	0.02	0.008	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Selenium	0.005	0.01	<0.01	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Silver	0.00005	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Strontium	-	-	0.298	0.231	0.330	0.260	0.440	0.260	0.230	0.270	0.230	0.240	0.240	0.270	0.210	0.260	mg/L
	Titanium	-	-	<0.01	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Vanadium	-	-	<0.01	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L
	Zinc	0.008	-	0.443	0.16	0.006	0.006	0.023	0.007	0.004	0.006	0.008	0.002	0.002	<0.001	0.003	0.002	mg/L
Silicon (mg/L)	Silicon	-	-	15.2	19.4	5.1	3.8	8.6	3.6	3.2	2.7	3.2	3.9	4.2	3.5	3.4	2.5	mg/L
Nutrients (mg/L)	Nitrate*	10 (as N)	50 (as NO3)	4.45	0.48	1.4	0.3	0.14	2.2	2.4	2.8	3.1	2.6	1.9	0.95	2	1	mg/L
	Nitrite	-	-	0.010	<0.01	0.012	<0.005	<0.005	0.008	0.007	0.009	0.016	<0.005	0.006	<0.005	0.008	0.006	mg/L
	Ammonia	0.9	-	0.4	0.05	<0.005	<0.005	0.087	<0.005	<0.005	<0.005	<0.005	0.078	0.087	0.025	0.010	0.020	mg/L
Hydrocarbons (ug/L)	TRH	-	-	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ug/L
	Benzene	950	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/L
	Toluene	-	800	<2	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/L
	Ethylbenzene	-	300	<2	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/L
	Xylene	200	600	<2	<2	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/L
	Naphthalene	16	-	<5	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/L
	Benzo(a)pyrene	-	0.01	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/L

Attachment **C**

Laboratory Certificate of Analysis

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Ground Doctor Pty Ltd
Attention	James Morrow

Sample Login Details

Your reference	Hytec Austen Quarry Groundwater Monitoring-July 24
Envirolab Reference	355856
Date Sample Received	05/07/2024
Date Instructions Received	05/07/2024
Date Results Expected to be Reported	12/07/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	3
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHsin Water	All metals in water-dissolved	Calcium - Dissolved	Potassium - Dissolved	Sodium - Dissolved	Magnesium - Dissolved	Hardness (calc) equivalent CaCO3	Hydroxide Alkalinity (OH-) as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Sulphate, SO4	Chloride, Cl	Ionic Balance	Metals in Waters -Dissolved	Ammonia as N in water	Nitrate as N in water	Nitrite as N in water	Total Dissolved Solids(grav)
Pit	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 355856

Client Details

Client	Ground Doctor Pty Ltd
Attention	James Morrow
Address	PO Box 6278, Dubbo, NSW, 2830

Sample Details

Your Reference	**Hytec Austen Quarry Groundwater Monitoring-July 24**
Number of Samples	1 Water
Date samples received	05/07/2024
Date completed instructions received	05/07/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	12/07/2024
Date of Issue	12/07/2024

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Giovanni Agosti, Group Technical Manager
Jack Wallis, Chemist (FAS)
Jenny He, Senior Chemist
Liam Timmins, Organics Supervisor
Nick Sarlamis, Assistant Operation Manager

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Water		
Our Reference		355856-1
Your Reference	UNITS	Pit
Date Sampled		05/07/2024
Type of sample		Water
Date extracted	-	08/07/2024
Date analysed	-	09/07/2024
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	104
Surrogate Toluene-d8	%	98
Surrogate 4-Bromofluorobenzene	%	79

svTRH (C10-C40) in Water		
Our Reference	UNITS	355856-1
Your Reference		Pit
Date Sampled		05/07/2024
Type of sample		Water
Date extracted	-	08/07/2024
Date analysed	-	09/07/2024
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	<50
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	<50
Surrogate o-Terphenyl	%	82

PAHs in Water		
Our Reference		355856-1
Your Reference	UNITS	Pit
Date Sampled		05/07/2024
Type of sample		Water
Date extracted	-	08/07/2024
Date analysed	-	08/07/2024
Naphthalene	µg/L	<2
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b,j+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	93

All metals in water-dissolved		
Our Reference		355856-1
Your Reference	UNITS	Pit
Date Sampled		05/07/2024
Type of sample		Water
Date prepared	-	09/07/2024
Date analysed	-	09/07/2024
Aluminium-Dissolved	µg/L	<10
Arsenic-Dissolved	µg/L	<1
Boron-Dissolved	µg/L	<20
Barium-Dissolved	µg/L	48
Beryllium-Dissolved	µg/L	<0.5
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	<1
Cobalt-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	<1
Iron-Dissolved	µg/L	<10
Lead-Dissolved	µg/L	<1
Manganese-Dissolved	µg/L	<5
Mercury-Dissolved	µg/L	<0.05
Molybdenum-Dissolved	µg/L	4
Nickel-Dissolved	µg/L	<1
Selenium-Dissolved	µg/L	<1
Silver-Dissolved	µg/L	<1
Strontium-Dissolved	µg/L	260
Titanium-Dissolved	µg/L	<1
Vanadium-Dissolved	µg/L	<1
Zinc-Dissolved	µg/L	2

Ion Balance		
Our Reference		355856-1
Your Reference	UNITS	Pit
Date Sampled		05/07/2024
Type of sample		Water
Date prepared	-	08/07/2024
Date analysed	-	08/07/2024
Calcium - Dissolved	mg/L	45
Potassium - Dissolved	mg/L	4
Sodium - Dissolved	mg/L	17
Magnesium - Dissolved	mg/L	38
Hardness (calc) equivalent $CaCO_3$	mg/L	270
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	170
Carbonate Alkalinity as $CaCO_3$	mg/L	<5
Total Alkalinity as $CaCO_3$	mg/L	170
Sulphate, SO4	mg/L	140
Chloride, Cl	mg/L	8
Ionic Balance	%	-3.0

Metals in Waters - Dissolved		
Our Reference		355856-1
Your Reference	UNITS	Pit
Date Sampled		05/07/2024
Type of sample		Water
Date digested	-	11/07/2024
Date analysed	-	12/07/2024
Silicon*- Dissolved	mg/L	2.5

Miscellaneous Inorganics		
Our Reference		355856-1
Your Reference	UNITS	Pit
Date Sampled		05/07/2024
Type of sample		Water
Date prepared	-	08/07/2024
Date analysed	-	08/07/2024
Ammonia as N in water	mg/L	0.020
Nitrate as N in water	mg/L	1.0
Nitrite as N in water	mg/L	0.006
Total Dissolved Solids (grav)	mg/L	410

Method ID	Methodology Summary
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180+/-10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation below:- TDS = EC * 0.6
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055	Nitrite - determined colourimetrically based on APHA latest edition NO2- B. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determined stoichiometrically from the base metal concentration.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			08/07/2024	1	08/07/2024	09/07/2024		08/07/2024	[NT]
Date analysed	-			09/07/2024	1	09/07/2024	10/07/2024		09/07/2024	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	<10	0	99	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	<10	<10	0	99	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	108	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	104	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	94	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	94	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	102	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	105	1	104	106	2	101	[NT]
Surrogate Toluene-d8	%		Org-023	98	1	98	101	3	101	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	79	1	79	88	11	86	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			08/07/2024	[NT]	[NT]	[NT]	[NT]	08/07/2024	[NT]
Date analysed	-			09/07/2024	[NT]	[NT]	[NT]	[NT]	09/07/2024	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	99	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	83	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	99	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	83	[NT]
Surrogate o-Terphenyl	%		Org-020	81	[NT]	[NT]	[NT]	[NT]	111	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			08/07/2024	[NT]	[NT]	[NT]	[NT]	08/07/2024	[NT]
Date analysed	-			08/07/2024	[NT]	[NT]	[NT]	[NT]	08/07/2024	[NT]
Naphthalene	µg/L	2	Org-022/025	<2	[NT]	[NT]	[NT]	[NT]	87	[NT]
Acenaphthylene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Fluorene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Phenanthrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Benzo(a)anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	73	[NT]
Benzo(b,j+k)fluoranthene	µg/L	2	Org-022/025	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	83	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	85	[NT]	[NT]	[NT]	[NT]	94	[NT]

QUALITY CONTROL: All metals in water-dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			09/07/2024	[NT]	[NT]	[NT]	[NT]	09/07/2024	[NT]
Date analysed	-			09/07/2024	[NT]	[NT]	[NT]	[NT]	09/07/2024	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	107	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	[NT]	[NT]	[NT]	[NT]	106	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	108	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	97	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	[NT]	[NT]	[NT]	[NT]	101	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	118	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Silver-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Strontium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Titanium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Vanadium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			08/07/2024	[NT]	[NT]	[NT]	[NT]	08/07/2024	[NT]
Date analysed	-			08/07/2024	[NT]	[NT]	[NT]	[NT]	08/07/2024	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	100	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	91	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	85	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	104	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	118	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: Metals in Waters - Dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			11/07/2024	[NT]	[NT]	[NT]	[NT]	11/07/2024	[NT]
Date analysed	-			12/07/2024	[NT]	[NT]	[NT]	[NT]	12/07/2024	[NT]
Silicon*- Dissolved	mg/L	0.2	Metals-020	<0.2	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			08/07/2024	[NT]	[NT]	[NT]	[NT]	08/07/2024	[NT]
Date analysed	-			08/07/2024	[NT]	[NT]	[NT]	[NT]	08/07/2024	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	[NT]	[NT]	88	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	101	[NT]
Nitrite as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	104	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	[NT]	[NT]	[NT]	[NT]	109	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

CoC: 5/7/24 1517

CHAIN OF CUSTODY - Client

Client: Ground Doctor Pty Ltd	**Client Project Name / Number / Site etc (ie report title):** Hytec Austen Quarry Groundwater Monitoring - July 24	
Contact person: James Morrow ph: 0407 875 302	**PO No.:**	**Phone:**
Project Mgr: James Morrow	**Envirolab Quote No. :** Ground_Doctor_Pty_Ltd_Pricelist_BP12	**E-mail:**
Sampler: James Morrow	**Standard TAT**	**Contact:**
Address: Austen Quarry, 391 Jenolan Caves Road, Hartley, NSW	**Or choose:** standard / same day / 1 day / 2 day / 3 day	
	Note: Inform lab in advance if urgent turnaround is required - surcharge applies	
Phone: -- **Mob:** 0407875302	**Lab comments:**	
Fax: --		
Email:		

Sample information					Tests Required															Comments
Envirolab Sample ID	**Client Sample ID or information**	**Depth**	**Date sampled**	**Type of sample**	Hy-tec Suite (see table below)	TRH, BTEX, PAHs														**Provide as much information about the sample as you can**
1	Pit	-	05-Jul-24	Water	x	x														

Relinquished by (company):	**James Morrow**	**Received by (company):** ELS SYD	***Lab use only:***
Print Name:	**James Morrow**	**Print Name:** Katy Wayne	**Samples Received:** Cool or Ambient (circle one)
Date & Time:	5/7/24 1500	**Date & Time:** 5/7/24 1505	**Temperature Received at:** 3°C **(if applicable)**
Signature:	**JRM**	**Signature:**	**Transported by:** Hand delivered / courier

ENVIROLAB GROUP
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 355856

Date Received: 5/7/24
Time Received: 1505
Received By: KW
Temp: Cool/Ambient
Cooling: Ice/Icepack 3°C
Security: Intact/Broken/None

HYTEC Groundwater Suite

Analyte Group	Analyte
Dissolved Solids	Total Dissolved Solids
Major Cations	Magnesium
	Calcium
	Sodium
	Potassium
Major Anions	Sulphate
	Chloride
	Hydroxide as $CaCO_3$
	Carbonate as $CaCO_3$
	Bicarbonate as $CaCO_3$
Heavy Metals (Dissolved)	Aluminium
	Arsenic
	Boron
	Barium
	Beryllium
	Cadmium
	Chromium
	Cobalt
	Copper
	Iron
	Lead
	Manganese
	Mercury
	Molybdenum
	Nickel
	Selenium
	Silicon
	Silver
	Strontium
	Titanium
	Vanadium
	Zinc
Nutrients	Ammonia
	Nitrate
	Nitrite

#355856
5/7 KW

Attachment D

Groundwater Level Chart

Depth to Water vs Time

MB01S MB01D MB02

Depth to Water (m below top of PVC Casing)

0.00 1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00 18.00 19.00 20.00 21.00 22.00 23.00 24.00 25.00

01/01/18 01/02/18 01/03/18 01/04/18 01/05/18 01/06/18 01/07/18 01/08/18 01/09/18 01/10/18 01/11/18 01/12/18 01/01/19 01/02/19 01/03/19 01/04/19 01/05/19 01/06/19 01/07/19 01/08/19 01/09/19 01/10/19 01/11/19 01/12/19 01/01/20 01/02/20 01/03/20 01/04/20 01/05/20 01/06/20 01/07/20 01/08/20 01/09/20 01/10/20 01/11/20 01/12/20 01/01/21 01/02/21 01/03/21 01/04/21 01/05/21 01/06/21 01/07/21 01/08/21 01/09/21 01/10/21 01/11/21 01/12/21 01/01/22 01/02/22 01/03/22 01/04/22 01/05/22 01/06/22 01/07/22 01/08/22 01/09/22 01/10/22 01/11/22 01/12/22 01/01/23 01/02/23 01/03/23 01/04/23 01/05/23 01/06/23 01/07/23 01/08/23 01/09/23 01/10/23 01/11/23 01/12/23 01/01/24 01/02/24 01/03/24 01/04/24 01/05/24 01/06/24 01/07/24 01/08/24

Appendix L: Correspondence Regarding Non-Compliances

EPA reference: DOC24/590630-1

Jilu John
Manager - Projects
ADBRI Quarries

Via e-mail: Jilu.John@adbri.com.au

1 August 2024

Dear Jilu John

Environment Protection Licence 1223

Notification Of Meteorological Monitoring Station Failure

I refer to your letter dated 23 July 2024 notifying the Environment Protection Authority (EPA) of the failure of Meteorological Monitoring station from 1 June 2024 to 13 June 2024 as required by Environment Protection Licence 1223. Thank you for taking the time to report the monitoring non-compliance.

The EPA understands that the operation of the telecommunication network is outside the control of the quarry operations. The EPA confirms that this is not considered a pollution incident and does not fall under the reporting requirements as per the Conditions R2 and R3 of the EPL. However, this failure will be considered as a non-compliance to the Monitoring Condition M8.1 and for transparency should be included in the next Annual Return.

If you have any specific questions regarding this matter, please contact Mr Raj Pottapenjara on 6333 3816 or via e-mail at info@epa.nsw.gov.au.

Yours sincerely

LUCY APPS
Unit Head
Regulatory Operations

[EXTERNAL] Communication regarding Weather Monitoring station failure -1 - 13 June 2024 due to telstra 3 G closeout SSD-6084-PA-28

no-reply@majorprojects.planning.nsw.gov.au <no-reply@majorprojects.planning.nsw.gov.au>

Wed 31/07/2024 9:23 AM

To:David Cilento <david.cilento@hy-tec.com.au>
Cc:Jilu John <Jilu.John@adbri.com.au>

Caution: This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Dear David ,

Dear Miss John,

NSW Planning acknowledges receipt of the notification of a non-compliance (Schedule 3 condition 13 of SSD 6084) relating to the failure of the weather monitoring station for Austen Quarry Extension between 1 - 13 June 2024.

It is noted that the reason for the failure was due to Telstra 3 G network being switched off.

It is also noted that the monitoring station was back on line on 14 June 2024 and during the outage period the PM10 monitoring station was collecting continous data.

The non-complaince has been assessed in accordance with NSW Planning Compliacne Policy and has determined to note the non-compliance. The noting of the issue does

not preclude NSW Planning from taking alternate action in the futre should it become apparent a more appropriate action is deemed necessary.

Please include detail of the issue in the the next Annual Review.

NSW Planning is satisfied that the non-compliance in this instance does not consistent an incident under the Consent definitions.

Regards

Katrina

To sign in to your account click here or visit the Major Projects Website.
Please do not reply to this email.

Kind regards

The Department of Planning and Environment

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This email is intended for the addressee(s) named and may contain confidential and/or privileged information.

If you are not the intended recipient, please notify the sender and then delete it immediately.

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

Post Approval

Proponent Details

Personal Details

Title	Miss
First Name	Jilu
Last name	John
Email	jilu.john@adbri.com.au
Phone	0481 451 540
Role/Position	Project Manager
Address	63-79 PARRAMATTA ROAD Silverwater 2128 AUS

Company Details

Applying as a company/business?

Yes

Company Name	AUS - 10 RHYOLITE PTY LIMITED
ABN	79002325144
Branch Name	

Primary contact

Title	Mr
First Name	David
Last Name	Cilento
Email	david.cilento@hy-tec.com.au
Phone	0418162498
Role/Position	Employee

Post Approval Details

Project:

Austen Quarry Extension - SSD-6084-PA-28

Name of Document

Meteorological Monitoring Station Failure

Related matter

Compliance Report, Annual Review, Audit Report

Type of Document Lodgement

New Document

Description of the document and reason for submission / Overview of changes made to existing documents

Notification of failure to record climate data

Applicable Conditions

Schedule	Condition
3	13

Consultation through the Major Projects portal

Consultation required as part of the preparation of the document?

No

Attachment of Post Approval application

File Name	Category
Weather Station-Austen.pdf	Post Approval Document

adbriquarries.com.au

ADBRI Quarries

Adbri Quarries Sydney Pty Ltd
ABN 79 002 325 144
PO Box 6770
Silverwater NSW 1811
+61 2 9647 2866

23 July 2024

Department of Planning, Housing and Infrastructure
NSW Environment Protection Authority
Level17, 4PSQ
12 Darcy Street
PARRAMATTA NSW 2150

Sent by email to:
compliance@planningnsw.gov.au
info@epa.nsw.gov.au

Dear Sir/Madam

Re: Austen Quarry – Meteorological Monitoring Station Failure

I am writing to inform the Department of Planning, Housing and Infrastructure (DPHI) and the Environment Protection Authority (EPA) of a non-compliance related to monitoring and recording conditions of EPL12323 for the Austen Quarry (the Quarry), owned and operated by Adbri Quarries Sydney (Adbri). The approval conditions relevant to this non-compliance include the following.

- Condition 3(13) of SSD-6084
- Condition M8.1 of Environment Protection License (EPL) 12323

Condition M8.1 of EPL 12323 for the Quarry required the following monitoring and recording conditions to be met.

The applicant must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The applicant must use the sampling method, units of measure, averaging period and sample at the frequency specified opposite in the other columns unless otherwise approved by the EPA:

Parameter	Units of Measure	Frequency	Averaging Period	Sampling Method
Air temperature	oC	Continuous	1 hour	AM-4
Wind Direction	o	Continuous	15 minute	AM-2 &AM-4
Wind Speed	m/s	Continuous	15 minute	AM-2 & AM-4
Sigma theta	o	Continuous	15 minute	AM-2 & AM-4
Rainfall	mm	Continuous	24 hour	AM-4

The logger at the Quarry's primary meteorological monitoring station was a Telstra 3G operated unit. During the period of 1 June 2024 to 13 June 2024, Telstra shut all 3G service across Australia to convert all units to 4G. As a result, the meteorological station at the Quarry could not record data during this 13-day period. Data recording re-commenced when the 4G service started from 14 June 2024.

The Quarry operates a PM10 emissions air quality monitor outside the Quarry Site Boundary (Figure A) that provides a secondary station for monitoring meteorological data. From 1 June 2024 to 13 June 2024, the PM10 station provided continuously monitored air temperature, wind direction, and wind speed data.

We want to clarify that our inability to record from 1 June to 13 June 2024 was entirely outside the control of our quarry operations and is not attributable to any actions or issues related to our activities.

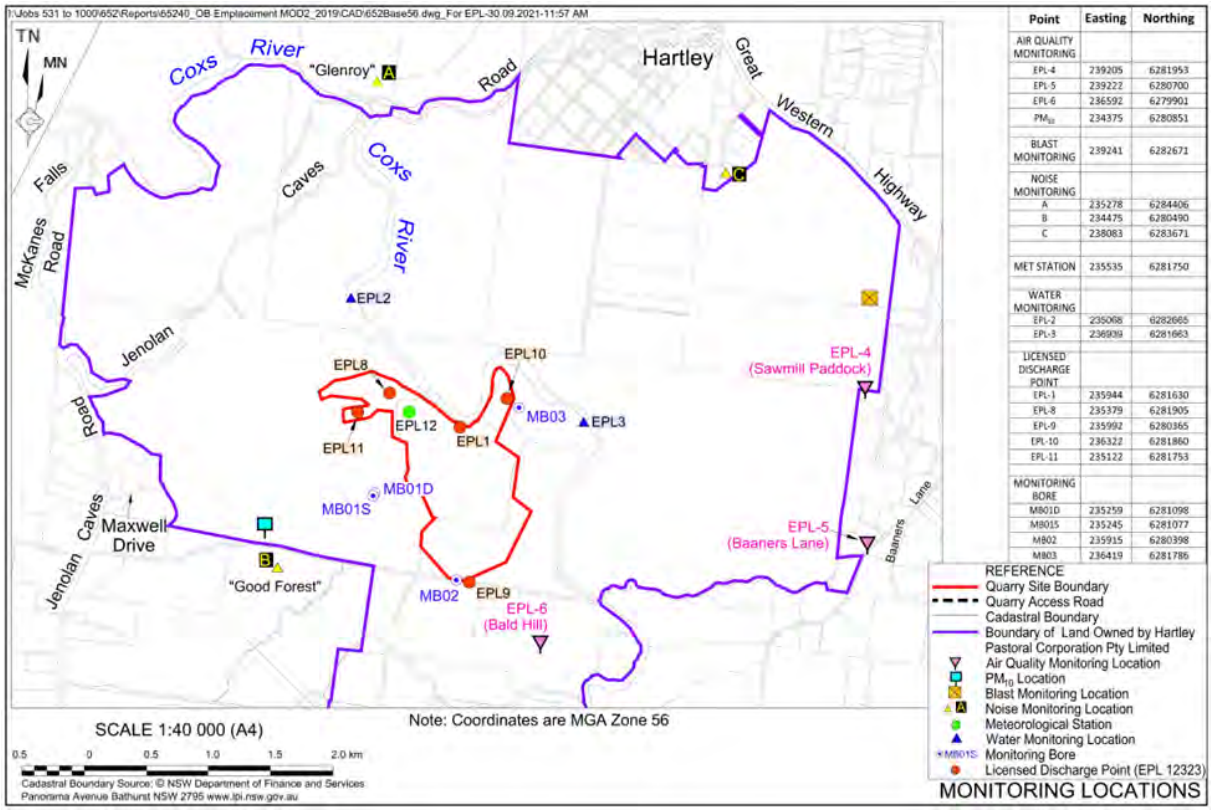
Given the above, this non-compliance is not considered an incident, therefore, the incident reporting requirements under Conditions 5(6) of SSD-6084 do not apply. Likewise, Conditions R2 and R3 of Condition 6 of EPL 12323 do not apply (there was no material harm requiring notification). Additionally, no records of exceedances or complaints of air quality, noise or blasting activities were recorded at the Quarry during this period.

It would be appreciated if DPHI and the EPA could confirm that they are satisfied that an incident has not occurred or whether any formal reporting is required.

Yours Sincerely,

Jilu John
Manager- Project

Figure A



Point	Easting	Northing
AIR QUALITY MONITORING		
EPL-4	239205	6281953
EPL-5	239222	6280700
EPL-6	236592	6279901
PM_{10}	234375	6280851
BLAST MONITORING	239241	6282671
NOISE MONITORING		
A	235278	6284406
B	234475	6280490
C	238083	6283671
MET STATION	235535	6281750
WATER MONITORING		
EPL-2	235068	6282665
EPL-3	236939	6281663
LICENSED DISCHARGE POINT		
EPL-1	235944	6281630
EPL-8	235379	6281905
EPL-9	235992	6280365
EPL-10	236322	6281860
EPL-11	235122	6281753
MONITORING BORE		
MB01D	235259	6281098
MB01S	235245	6281077
MB02	235915	6280398
MB03	236419	6281786

Appendix M: Truck Movement Data

Austen Quarry 2023 / 2024

Jul-23	Daily Average Truck Movements	Aug-23	Daily Average Truck Movements	Sep-23	Daily Average Truck Movements	Oct-23	Daily Average Truck Movements	Nov-23	Daily Average Truck Movements	Dec-23	Daily Average Truck Movements
Sat 1	29	1	181	1	140	1	0	1	161	1	114
2	0	2	175	Sat 2	30	2	0	2	165	Sat 2	37
3	110	3	188	3	0	3	92	3	172	3	0
4	66	4	189	4	152	4	96	Sat 4	17	4	81
5	71	Sat 5	48	5	147	5	126	5	0	5	98
6	129	6	0	6	167	6	126	6	89	6	131
7	123	7	167	7	162	Sat 7	38	7	122	7	131
Sat 8	32	8	144	8	136	8	0	8	155	8	131
9	0	9	179	Sat 9	26	9	130	9	92	Sat 9	29
10	156	10	164	10	0	10	158	10	127	10	0
11	174	11	129	11	172	11	162	Sat 11	30	11	122
12	142	Sat 12	35	12	159	12	174	12	0	12	119
13	147	13	0	13	170	13	160	13	143	13	121
14	148	14	107	14	175	Sat 14	70	14	136	14	121
Sat 15	32	15	108	15	133	15	0	15	117	15	106
16	0	16	128	Sat 16	23	16	175	16	150	Sat 16	37
17	124	17	166	17	0	17	176	17	164	17	0
18	117	18	135	18	175	18	139	Sat 18	51	18	112
19	128	Sat 19	27	19	184	19	173	19	0	19	108
20	128	20	0	20	195	20	190	20	175	20	47
21	146	21	138	21	152	Sat 21	37	21	176	21	67
Sat 22	33	22	176	22	113	22	0	22	149	22	38
23	0	23	170	Sat 23	29	23	179	23	173	Sat 23	0
24	138	24	154	24	0	24	178	24	125	24	0
25	142	25	159	25	146	25	193	Sat 25	21	25	0
26	139	Sat 26	39	26	165	26	152	26	0	26	0
27	154	27	0	27	160	27	146	27	121	27	0
28	147	28	169	28	147	Sat 28	33	28	78	28	0
Sat 29	27	29	180	29	124	29	0	29	63	29	0
30	0	30	176	Sat 30	32	30	160	30	113	Sat 30	0
31	150	31	125			31	167			31	0
Number of Despatch Days	26	Number of Despatch Days	27	Number of Despatch Days	26	Number of Despatch Days	25	Number of Despatch Days	26	Number of Despatch Days	19
Daily Movements averaged over **Monday to Friday** per month - Max **200** - Despatched days	**132**	Daily Movements averaged over **Monday to Friday** per month - Max **200** - Despatched days	**157**	Daily Movements averaged over **Monday to Friday** per month - Max **200** - Despatched days	**156**	Daily Movements averaged over **Monday to Friday** per month - Max **200** - Despatched days	**148**	Daily Movements averaged over **Monday to Friday** per month - Max **200** - Despatched days	**135**	Daily Movements averaged over **Monday to Friday** per month - Max **200** - Despatched days	**78**
Daily Movements averaged over **total** despatch days per month	113	Daily Movements averaged over **total** despatch days per month	139	Daily Movements averaged over **total** despatch days per month	131	Daily Movements averaged over **total** despatch days per month	137	Daily Movements averaged over **total** despatch days per month	119	Daily Movements averaged over **total** despatch days per month	92
Maximum number of dispatched laden trucks - Max **300**	174	Maximum number of dispatched laden trucks - Max **300**	189	Maximum number of dispatched laden trucks - Max **300**	195	Maximum number of dispatched laden trucks - Max **300**	193	Maximum number of dispatched laden trucks - Max **300**	176	Maximum number of dispatched laden trucks - Max **300**	131
Maximum number of laden truck movements on a **Saturday -** Max **167**	**33**	Maximum number of laden truck movements on a **Saturday - Max 167**	**48**	Maximum number of laden truck movements on a **Saturday** Max **167**	**32**	Maximum number of laden truck movements on a **Saturday -** Max **167**	**70**	Maximum number of laden truck movements on a **Saturday - Max 167**	**51**	Maximum number of laden truck movements on a **Saturday -** Max **167**	**37**
Total Monthly Movements	2932	Total Monthly Movements	3756	Total Monthly Movements	3414	Total Monthly Movements	3430	Total Monthly Movements	3085	Total Monthly Movements	1750
	2932		6688		10102		13532		16617		18367

Jul to Dec 2023 Maximum
157
139
195
70

Austen Quarry 2023 / 2024

Jan-24	Daily Average Truck Movements	Feb-24	Daily Average Truck Movements	Mar-24	Daily Average Truck Movements	Apr-24	Daily Average Truck Movements	May-24	Daily Average Truck Movements	Jun-24	Daily Average Truck Movements
1		1	91	1	122	1	0	1	97	Sat 1	38
2	9	2	107	Sat 2	25	2	102	2	94	2	0
3	7	Sat 3	25	3	0	3	138	3	70	3	120
4	6	4	0	4	117	4	97	Sat 4	19	4	108
5	5	5	87	5	101	5	54	5	0	5	174
Sat 6	0	6	55	6	95	Sat 6	1	6	91	6	88
7	0	7	80	7	93	7	0	7	126	7	62
8	51	8	102	8	117	8	125	8	85	Sat 8	24
9	67	9	104	Sat 9	39	9	142	9	94	9	0
10	47	Sat 10	45	10	0	10	113	10	124	10	0
11	64	11	0	11	110	11	111	Sat 11	8	11	122
12	54	12	106	12	105	12	127	12	0	12	85
Sat 13	17	13	105	13	127	Sat 13	29	13	106	13	107
14	0	14	122	14	117	14	0	14	115	14	107
15	44	15	84	15	96	15	133	15	131	Sat 15	29
16	36	16	62	Sat 16	22	16	132	16	137	16	0
17	72	Sat 17	14	17	0	17	121	17	141	17	110
18	60	18	0	18	91	18	97	Sat 18	53	18	119
19	69	19	85	19	133	19	127	19	0	19	121
Sat 20	28	20	85	20	94	Sat 20	37	20	118	20	114
21	0	21	80	21	106	21	0	21	126	21	117
22	67	22	89	22	116	22	101	22	142	Sat 22	35
23	97	23	103	Sat 23	32	23	132	23	153	23	0
24	106	Sat 24	24	24	0	24	119	24	124	24	99
25	84	25	0	25	127	25	0	Sat 25	39	25	92
26	0	26	99	26	120	26	83	26	0	26	91
Sat 27	2	27	100	27	136	Sat 27	20	27	140	27	118
28	0	28	119	28	88	28	0	28	154	28	118
29	71	29	107	29	0	29	119	29	129	Sat 29	53
30	82			Sat 30	0	30	90	30	136	30	0
31	76			31	0			31	123		
TOTAL	1221	TOTAL	2080	TOTAL	2329	TOTAL	2350	TOTAL	2875	TOTAL	2251
Number of Despatch Days	24	Number of Despatch Days	25	Number of Despatch Days	24	Number of Despatch Days	24	Number of Despatch Days	27	Number of Despatch Days	24
Daily Movements averaged over **Monday to Friday** per month - Max **200** - Despatched days	53	Daily Movements averaged over **Monday to Friday** per month - Max **200** - Despatched days	**94**	Daily Movements averaged over **Monday to Friday** per month - Max **200** - Despatched days	**105**	Daily Movements averaged over **Monday to Friday** per month - Max **200** - Despatched days	103	Daily Movements averaged over **Monday to Friday** per month - Max **200** - Despatched days	**120**	Daily Movements averaged over **Monday to Friday** per month - Max **200** - Despatched days	**104**
Daily Movements averaged over **total** despatch days per month	51	Daily Movements averaged over **total** despatch days per month	83	Daily Movements averaged over **total** despatch days per month	97	Daily Movements averaged over **total** despatch days per month	98	Daily Movements averaged over **total** despatch days per month	106	Daily Movements averaged over **total** despatch days per month	94
Maximum number of dispatched laden trucks - Max **300**	106	Maximum number of dispatched laden trucks - Max **300**	122	Maximum number of dispatched laden trucks - Max **300**	136	Maximum number of dispatched laden trucks - Max **300**	142	Maximum number of dispatched laden trucks - Max **300**	154	Maximum number of dispatched laden trucks - Max **300**	174
Maximum number of laden truck movements on a **Saturday -** Max **167**	**28**	Maximum number of laden truck movements on a **Saturday - Max 167**	**45**	Maximum number of laden truck movements on a **Saturday** Max **167**	**39**	Maximum number of laden truck movements on a **Saturday -** Max **167**	**37**	Maximum number of laden truck movements on a **Saturday - Max 167**	**53**	Maximum number of laden truck movements on a **Saturday -** Max **167**	**53**
Total Monthly Movements	1221	Total Monthly Movements	2080	Total Monthly Movements	2329	Total Monthly Movements	2350	Total Monthly Movements	2875	Total Monthly Movements	2251
	19588		21668		23997		26347		29222		31473

Jan to Jun 2024 Maximum
105
106
174
53

Appendix N: Resources Regulator Annual Return Data

Extractive Materials Return 2023-2024

Regional NSW

Form S1 – Period Ending 30 June 2024

Quote RIMS ID in all correspondence

Quarry Id: Rims ID: 400891 Operators Name: AUS-10 RHYOLITE PTY LTD Address: PO BOX 6770 SILVERWATER NSW 1811 Email: lee.attard@adbri.com.au Quarry Name: AUSTEN QUARRY, LIDDLETON Quarry Address: 391 JENOLAN CAVES RD, HARTLEY NSW 2790	**Inquiries** please telephone: (02) 4063 6713 **Completed or Nil Returns** Email – mineral.royalty@planning.nsw.gov.au Postal Address (see below) ***Please amend name, postal address and location of mine or quarry if incorrect or incomplete.***

The return should be completed and forwarded to **Senior Advisory Officer, RESOURCE ECONOMICS, STRATEGY, PERFORMANCE & INDUSTRY DEVELOPMENT, DEPARTMENT OF REGIONAL NSW, PO BOX 344 HUNTER REGION MAIL CENTRE NSW 2310 on or before 31 October 2024**. If completion of the return is unavoidably delayed, an application for extension of time should be requested **before** the due date. If no work was done during the year, a **NIL** return must be forwarded.

The return should relate to the **above quarrying establishment** and should cover the operations of quarrying and treatment (such as crushing, screening, washing etc.) carried out at or near the quarry. A return is required even if the operations are solely of a developmental nature and whether the area being worked is held under a mining title or otherwise.

Director, Resources Policy

Please complete all the following information to assist in identifying the location of the Quarry

Typical Geology **Rhyolite**

Nearest Town to Quarry **Hartley - Lithgow**

Local Council Name **Lithgow City Council**

Deposited Plan and Lot Number/s of Quarry **Lot 1 DP1005511, Lot 2 DP1005511 and part lot 31 DP1009967**

Email Address of Operator **As above**

Name of Owner or Licensee **As above**

Postal Address of Licensee **As above**

Licence/Lease Number/s (if any)

From Mining, Exploration & Geoscience (NSW Mineral Resources) **N/A**

From Crown Lands or other NSW Department **N/A**

If any output was obtained from land NOT held under licence from the above Departments, state the Name/s and Address/es of the Owners of the land **N/A**

To the best of my knowledge, information entered in this return is correct and no blank spaces left where figures should have been inserted.

SIGNATURE of PROPRIETOR or MANAGER _____ **DATE** **20.09.2024**

- **CONTACT PERSON for this return** _____
- **NAME** (Block letters) Lee Attard **Telephone** 0497 603 401

Extractive Materials Return 2023-2024

NSW GOVERNMENT | Regional NSW

Form S1 – Period Ending 30 June 2024

Sales During 2023-2024

Production information may be published in aggregated form for statistical reporting. However, production data for individual operations is kept strictly confidential.

Product	Description	Quantity Tonnes
Virgin Materials		
Crushed Coarse Aggregates		
Over 75mm		**5,066**
Over 30mm to 75mm		**9, 671**
5mm to 30mm		**737,398**
Under 5mm		**0**
Natural Sand		**0**
Manufactured Sand		**205,601**
Prepared Road Base & Sub Base		**196,903**
Other Unprocessed Materials		
Recycled Materials		
Crushed Coarse Aggregates		
Over 75mm		
Over 30mm to 75mm		
5mm to 30mm	**Recycled roadbase**	
Under 5mm		
Natural Sand		
Manufactured Sand		
Prepared Road Base & Sub Base		
Other Unprocessed Materials		
River Gravel		
Over 30mm		
5mm to 30mm		
Under 5mm		
Construction Sand	Excluding Industrial	
Industrial Sand		
Foundry, Moulding		
Glass		
Other (Specify)		
Dimension Stone	Building, Ornamental, Monumental	
Quarried in Blocks		
Quarried in Slabs		
Decorative Aggregate	Including Terrazzo	
Loam	Soil for Topdressing, Garden soil, Horticultural purposes)	
TOTAL SITE PRODUCTION		**1,154, 640**
Gross Value ($) of all Sales		**$32.87 M**
Type of Material	**Concrete aggregates, Roadbase and Fill materials**	
Number of Full-Time Equivalent (FTE) Employees	**Employees - 21**	**Contractors - 8**

Please Note: A return for clay-based products can be obtained by contacting the inquiry number.

vgt environmental compliance solutions and laboratories

Beyond Compliance

VGT Environmental Compliance Solutions Pty Ltd
ABN 26 621 943 888

Unit 4, 30 Glenwood Drive Thornton NSW 2322
PO Box 2335, Greenhills NSW 2323

Ph: (02) 4028 6412
E: mail@vgt.com.au

www.vgt.com.au