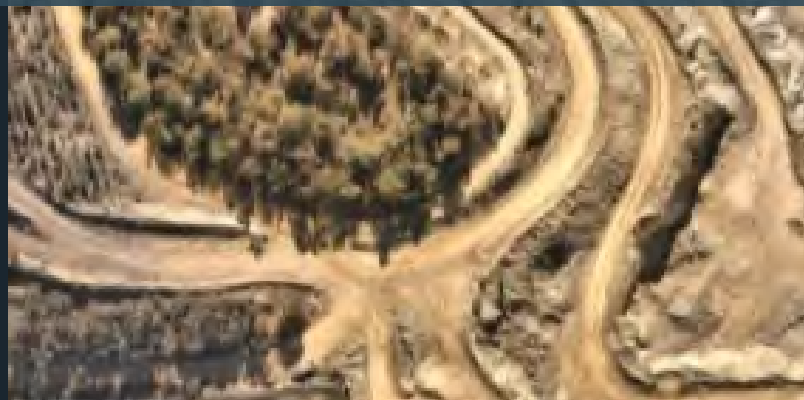


Year Ending
30th June 2023

Annual Review for Austen Quarry Extension Hy-Tec Industries Pty Ltd



COPYRIGHT

© VGT Environmental Compliance Solutions Pty Ltd
and
© Hy-Tec Industries Pty Limited

All intellectual property and copyright reserved.

Apart from any fair dealing for the purpose of the private study, research, criticism or review, as permitted under the Copyright Act 1968, no part of this report may be reproduced, transmitted, stored in a retrieval system or adapted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without written permission. Enquiries should be addressed to VGT Environmental Compliance Solutions Pty Ltd.

DISCLAIMER

This report was prepared in accordance with the scope of services set out in the contract between VGT Environmental Compliance Solutions Pty Ltd (VGT) ABN 26 621 943 888 and the Client and is not to be reproduced except in full. To the best of our knowledge, the report presented herein accurately reflects the Client's intentions when the document was printed. However, the application of conditions of approval or impacts of unanticipated future events could modify the outcomes described in this document. In preparing the report, VGT used data, surveys, analyses, designs, plans and other information provided by individuals and organisations referenced herein. While checks were undertaken to ensure that such materials were the correct and current versions of the materials provided, except as otherwise stated, VGT did not independently verify the accuracy or completeness of these information sources.

Title Block	
Name of Project	Austen Quarry Extension
Name of Operator	Hy-Tec Industries 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	15 th July 2015
Modification Date	Mod 2 – July 2019
AR Commencement Date	1 st July 2022
AR Completion Date	30 th June 2023
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@Hy-tec.com.au 02 6355 0268 0405 123 700

Revision Table

Date	Version	Author	Reviewed	Approved
4/10/2023	Final 0 for submission	LT/TO	JJ/DT/CM	

Contents

1	Executive Summary	1
2	Statement of Compliance	2
3	Introduction	3
3.1	Background	3
3.2	Location	3
3.3	Scope	3
3.4	Site Contacts	5
4	Approvals	6
4.1	SSD 6084	6
4.1.1	Proposed Modification	6
4.2	Environment Protection Licence	7
4.3	Water Licences	7
4.4	Environment Protection and Biodiversity Conservation Act Approval	7
5	Operations Summary	8
5.1	Quarry Production and Progress	8
5.2	Extractive Material Transportation	11
5.2.1	Performance and Management	11
5.2.2	Monitoring Data	11
5.3	Operation of Plant and Equipment	13
5.4	Operating Hours	14
5.4.1	Blasting out of hours non-compliance	14
5.5	Other Operations	14
6	Environmental Performance	15
6.1	Climate	18
6.1.1	Performance and Management	18
6.1.2	Monitoring	18
6.2	Noise	21
6.2.1	Performance and Management	21
6.2.2	Monitoring	21
6.2.3	Interpretation of Results	23
6.3	Blasting	24
6.3.1	Performance and Management	24
6.3.2	Monitoring Data	24
6.4	Air Quality	27
6.4.1	Performance and Management	27
6.4.2	Monitoring Data	27
6.4.3	Interpretation of Results	31
6.5	Heritage	32
6.6	Visual	33
6.6.1	Performance and Management	33
6.6.2	Monitoring Data	33
6.7	Waste, Liquid Storage and Dangerous Goods	34
6.7.1	Performance and Management	34
6.8	Bushfire	35
6.8.1	Performance and Management	35
6.8.2	Monitoring Data	35
6.9	Biodiversity and Terrestrial Ecology	36
6.9.1	Performance and Management	36
6.9.2	Monitoring	36
7	Water Management	38
7.1	Performance and Management	38
7.2	Monitoring Data and Interpretation	38
7.2.1	Surface Water Monitoring Data	38
7.2.2	Interpretation of Surface Water Results	42
7.2.3	Groundwater Monitoring Data	42
7.2.4	Interpretation of Groundwater Results	50
7.3	Water Take	50
8	Rehabilitation	52

9	Community	53
10	Incidents and Non-Compliances	54
10.1	Incidents	54
10.2	Non-Compliances	54
10.3	Actions Required from Previous Annual Reviews	55
11	Activities Proposed in the Next AR Period	56

Tables

Table 1.	Statement of Compliance at 30/06/2023	2
Table 2.	Non-Compliances for Year Ending 20 June 2023	2
Table 3.	Site Contacts	5
Table 4.	State Significant Development Summary	6
Table 5.	Environment Protection Licence Summary	7
Table 6.	Water Licences Summary	7
Table 7.	Production Summary	8
Table 8.	Transportation Monitoring Trends	12
Table 9.	Plant and Equipment	13
Table 10.	Operating Hours	14
Table 11.	Weather Summary versus Historical Averages	18
Table 12.	Weather Summary Report Period	20
Table 13.	Noise Monitoring Summary	22
Table 14.	Blasting Results	24
Table 15.	Blast Monitoring Summary	26
Table 16.	Deposited Dust Results – Sawmill, AQD 1, EPL 4	28
Table 17.	Deposited Dust Results – Baaners Lane, AQD 2, EPL 5	29
Table 18.	Deposited Dust Results – Bald Hill, AQD 3, EPL 6	30
Table 19.	Particulate Matter Less than 10 Micron Annual Averages	31
Table 20.	24 Hour Maximum Particulate Exceedances	31
Table 21.	Terrestrial Ecological Monitoring Summary	37
Table 22.	Water Monitoring Compliance	38
Table 23.	Summary of Surface Water Results for Report Period	39
Table 24.	Summary of Pit Inflow Estimates	50
Table 25.	Water Take	51
Table 26.	Complaints Summary	53
Table 27.	Summary of Notifications in Report Period	54
Table 28.	Actions Proposed in Last Report Period	55

Figures

Figure One.	Site Location	4
Figure Two.	Activities During Report Period (with aerial)	9
Figure Three.	Spot Survey	10
Figure Four.	Environmental Monitoring Location	16
Figure Five.	Perimeter Monitoring Locations	17

Photography

Photoplate 1.	Visual from Hassans Walls Lookout, July 2023 – 50mm Focal Length	33
---------------	--	----

Appendices

Appendix A	Compliance Tables
Appendix B	Consolidated Consent
Appendix C	EPA Licence
Appendix D	Water Licences
Appendix E	EPBC Approval and Compliance Audit
Appendix F	Noise Monitoring Reports
Appendix G	Visual Monitoring
Appendix H	Biodiversity Monitoring
Appendix I	Aquatic Ecology Monitoring
Appendix J	Surface Water Results for Report Period
Appendix K	Groundwater Monitoring Reports
Appendix L	Correspondence Regarding Non-Compliances
Appendix M	Correspondence Regarding Request for Increase in Vehicle Movements
Appendix N	Extractive Minerals Return
Appendix O	Truck Movement Data

1 Executive Summary

Aus10 Rhyolite Pty Ltd is part of the Hy-Tec Group, a wholly owned 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 2022 to 30th June 2023.

During the report period 1,431,823 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.

No additional planting was undertaken this report period.

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

There are 2 non-compliances reported against the SSD6084 consent conditions:

- Schedule 2, Condition 2A: not all conditions of consent are compliant;
- Schedule 3 Condition 1 and EPL 12323 condition L5.1: Blasting was conducted at 16:25pm on the 18th January 2023 due to a delay associated with the explosive truck breakdown.

2 Statement of Compliance

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

Table 1. Statement of Compliance at 30/06/2023

Relevant Approval	All Conditions Compliant?
Development Consent SSD-6084 Mod 1	No – Schedule 2, Condition 2A: not all conditions of consent compliant Schedule 3 Condition 1: Blasting hours exceeded (no material harm)
EPL 12323	Condition 5.1: Blasting hours exceeded (no material harm)
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 20 June 2023

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.		Section 10
Schedule 3, 1 EPL12323 L5.1	Blasting is permitted between the hours of 10am to 3pm Monday to Friday (except public holidays).	Blasting undertaken outside of approved hours due to a truck breakdown. Action: DPE notified, no further action.	Section 10

3 Introduction

3.1 BACKGROUND

Aus10 Rhyolite Pty Ltd is part of the Hy-Tec Group, a wholly owned subsidiary of ADBRI Limited. 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 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

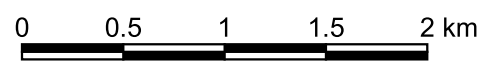
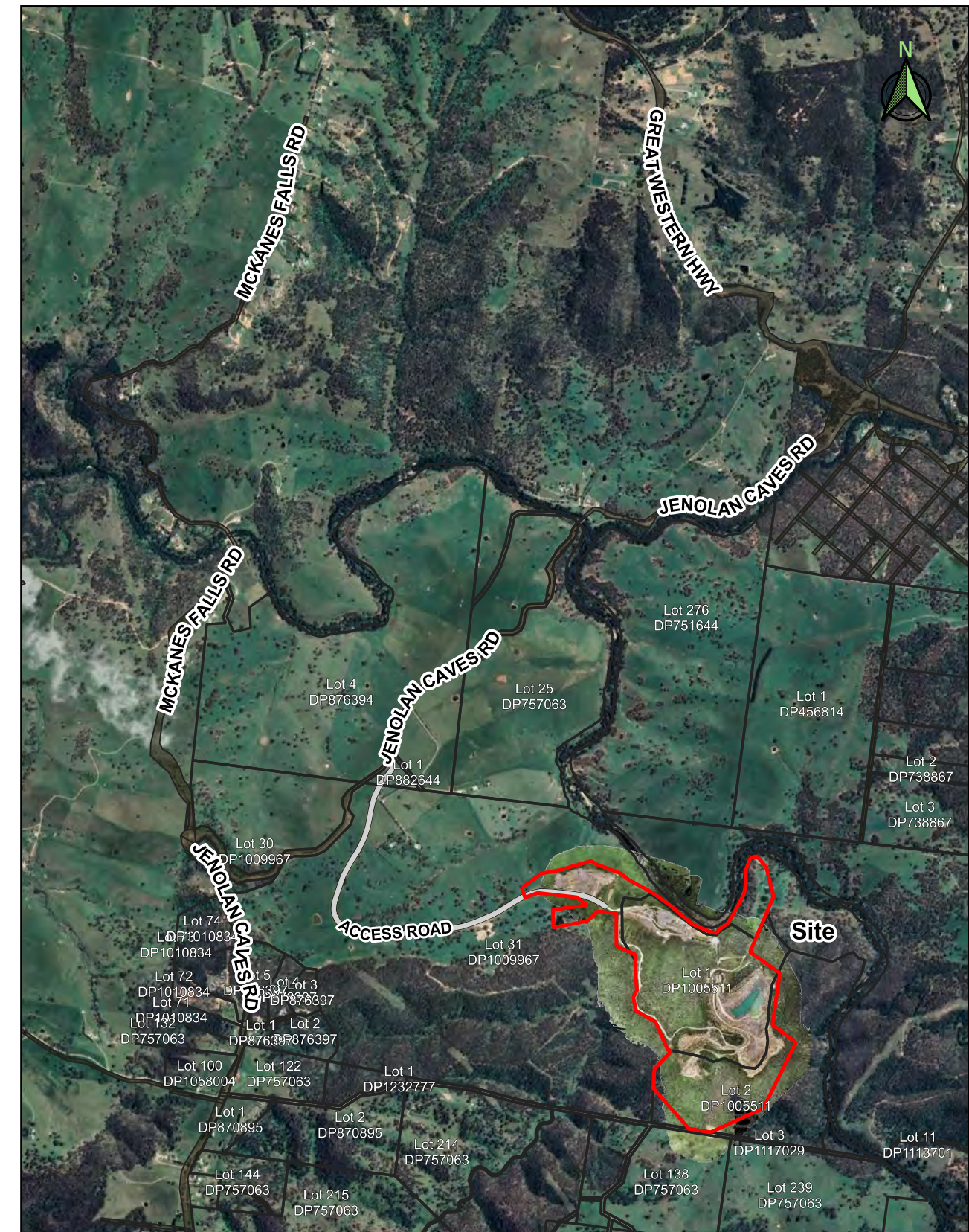
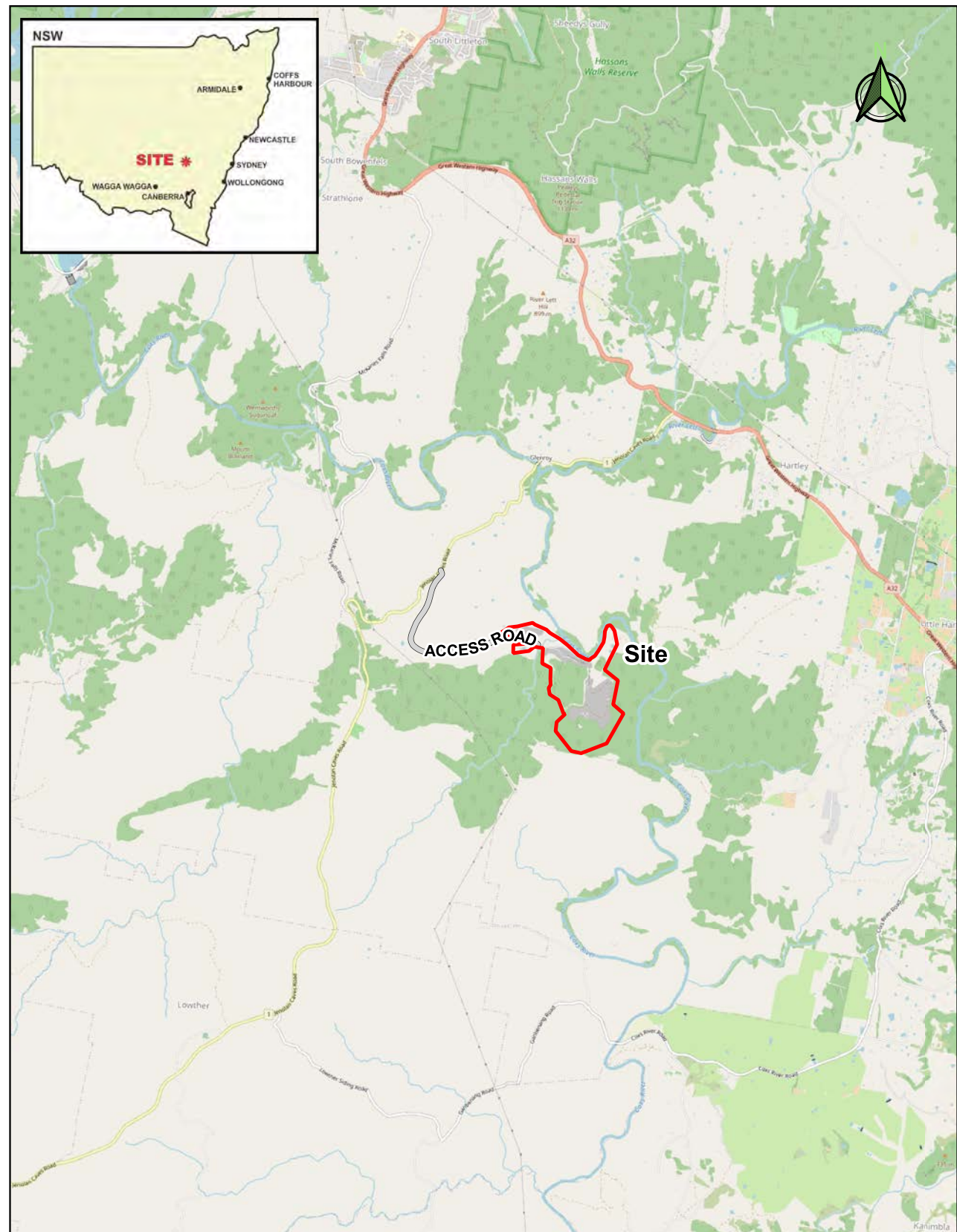
(f) describe what measures will be implemented over the current financial year to improve the environmental performance of the development.

This Annual Review summarises all site activities, condition compliance, environmental performance and rehabilitation progression during the reporting period 1st July 2022 to 30th June 2023.

Plan of:	Annual Review for the Austen Quarry Extension July 2022 to June 2023 - 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 18/08/2023	Tenure:	N/A	Projection:	GDA2020/MGA Zone 56 EPSG:7856	Office:	Thornton
Our Ref:	12536_HY_H_AR2022-23_Q001_V0_F1	Client:	Hy-Tec Industries Pty Ltd - Adelaide Brighton Limited	Contour Interval:	Not Applicable		



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.



Legend

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

[^] = Provided by Client Dated July 2019

3.4 SITE CONTACTS

Table 3. Site Contacts

Contact	Darryl Thiedeke	Craig McDonald
Title	National Planning and Development Manager	Austen Quarry Manager
Address	PO Box 6770, Silverwater NSW, 1811	391 Jenolan Caves Road, Hartley NSW 2790
Mobile	0409 652 022	0405 123 700
Phone	N/A	02 6355 0268
Email	Darryl.Thiedeke@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 15 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 30 th 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://www.hy-tec.com.au/quarry-documentation>.

4.1.1 Proposed Modification

Hy-Tec are in the process of seeking modification to SSD 6084 consent with DPE.

'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.'*

Hy-Tec is 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 (rounded)	Financial Year Limit	Compliant?
1/7/17 – 30/6/18	1,026,000	1,600,000	Yes
1/7/18 – 30/6/19	986,000	1,600,000	Yes
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

The Extractive Minerals Return for the financial year ending 30th June 2022 and 30th June 2023 is submitted online and is included in [Appendix N](#).

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 and is currently 706.2m AHD as surveyed on 09/08/2023, as shown on [Figure Three](#). This is above the limit of 685 m AHD.

Plan of: Annual Review for the Austen Quarry Extension July 2022 to June 2023 - Activities During Reporting Period (with Aerial)

Figure: TWO

Version/Date: V0 18/08/2023

Our Ref: 12536_HY_H_AR2022-23_Q002_V0_F2

Location: Off Jenolan Caves Road, Hartley, NSW

Council: Lithgow City Council

Tenure: Not Applicable

Client: Hy-Tec Industries Pty Ltd - Adelaide Brighton Limited

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.

Survey: NSW Spatial Services cadastral.

Projection: GDA2020/MGA Zone 56 EPSG:7856

Contour Interval: Not Applicable

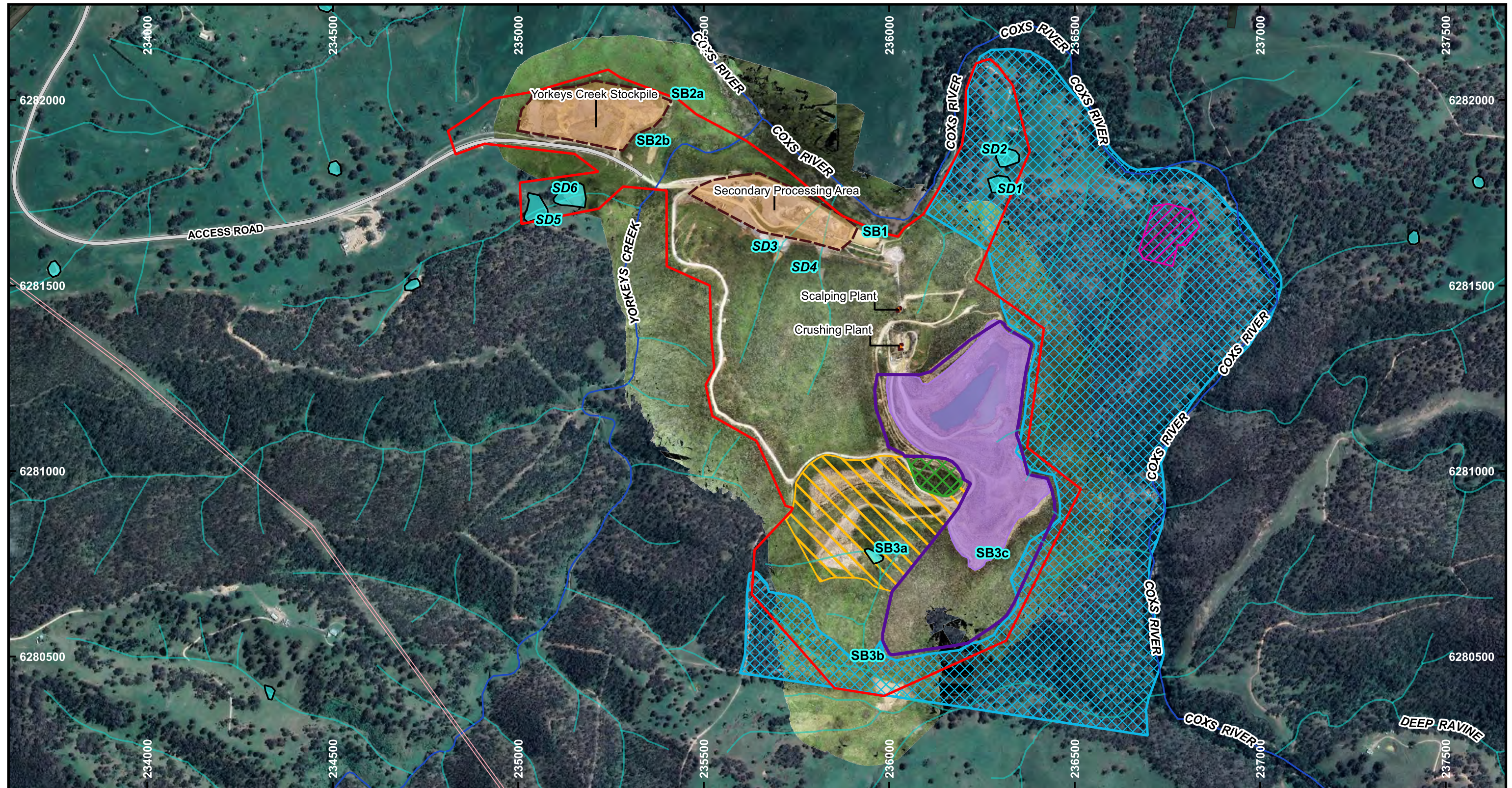
Plan By: SK/JD

Project Manager: LT



vgt environmental compliance solutions and laboratories

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.

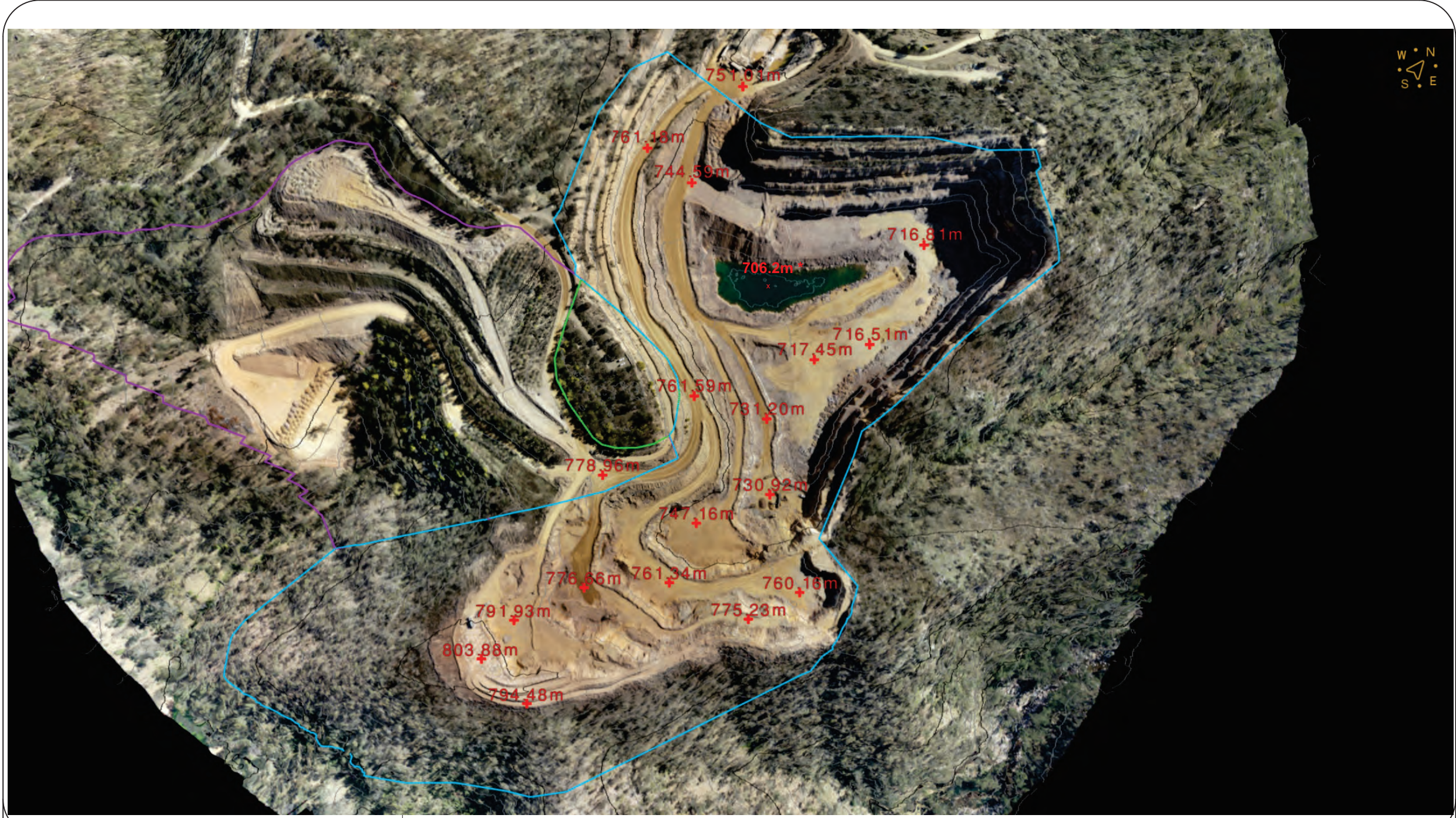


- Legend**
- Quarry Site Boundary[^]
 - Access Road
 - Drainage Line**
 - Major Drainage Line
 - Cocks River
 - Deep Creek
 - Yorkeys Creek
 - Conservation Area H[^]
 - Rehabilitated Area[^]
 - Original Biodiversity Offset Area[^]
 - Extraction Area
 - Limit of Extraction Area[^]
 - Dam/Sediment Dam or Basin
 - Overburden Emplacement Area[^]
 - Electricity Transmission Line Easement

[^] = Provided by Client Dated July 2019

Plan of:	Annual Review for the Austen Quarry Extension July 2022 to June 2023 - Spot Survey	Location:	Off Jenolan Caves Road, Hartley, NSW	Source:	Client - Skycatch DataHub - Pit Limits & Spot Heights Survey Date 09/08/2023	Plan By:	JD
Figure:	THREE	Council:	Lithgow City Council	Survey:	Client - Skycatch DataHub Survey Date 09/08/2023	Project Manager:	LT
Version/Date:	V1 3/10/2023	Tenure:	N/A	Projection:	MGA 94 ZONE 56	Office:	Thornton
Our Ref:	12536_HY_H_AR2022-2023_C001_V1_F3	Client:	Hy-Tec Industries Pty Ltd - Adelaide Brighton Limited	Contour Interval:	Not Applicable		

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.



		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	
		DATUM : AHD71 PROJECTION : MGA2020 Zone56			
TITLE : Pit Limits and Spot Heights SURVEY DATE : 09/08/2023 Report Date:22/08/2023 DRAWN BY : J. Mackenzie		DRAWING #			

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 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. Hy-Tec 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.

There was one operating hours related non-compliance this report period, as detailed in section 5.4.

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://www.hy-tec.com.au/quarry-documentation> and summarised below.

During the reporting period, a request was made to the DPE (see *Appendix O*) for a temporary increase in laden vehicle movements specified in in Schedule 2, Condition 8 of the development consent SSD 6084, as modified. The request was in response to the significant impacts experienced by Blue Mountains and Lithgow regions and its residents by the recent flooding and associated impacts to infrastructure. A material shortage was experienced in effecting repairs undertaken for the disaster recovery works.

The DPE provided approval for the temporary increase, with conditions, as reproduced in the correspondence below.

'The department notes Austen Quarry is seeking an increase in the laden trucks dispatched from the site per weekday, averaged over the total number of dispatch weekdays in any calendar month, from 200 laden trucks up to 250 laden trucks for a period up to 31 December 2022.'

Further, the department notes that any trucks used in excess of the 200 laden truck consent limit would be smaller, 12 to 15 tonne trucks (as opposed to the 30 to 35 tonne trucks). The department understands that the increase is sought to aid in disaster recovery works in Blue Mountains and Lithgow regions.'

The department has considered your request and provides assurance that it will not take enforcement action for the exceedance in laden trucks dispatched from the site per weekday, averaged over the total number of dispatch weekdays in any calendar month for a period until 31 December 2022.'

Table 8. Transportation Monitoring Trends

Material	1/7/18 – 30/6/19	1/7/19 – 30/6/20	1/7/20 - 30/6/21	1/7/21 - 30/6/22	1/7/22 - 30/6/23	Approved limit	Compliant?
Total movements during report period	24,498	26,078	27,805	32,256	43,053	-	
Maximum laden trucks per weekday	*158	185	167	251	250	300	Yes
Maximum laden trucks per Saturday	*71	90	70	81	111	167	Yes
Maximum average laden trucks per weekday averaged over the total number of dispatch weekdays in any calendar month	*119	119	117	193	188	200	Yes

* Period 16/8/18 to 30/6/19 (Mod 1)

Detailed sheet included in [Appendix O](#).

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 in the previous report period.

The report concluded:

“SIDRA modelling has been undertaken as part of the traffic monitoring for year 2022 and the results indicate that the Great Western Highway / Jenolan Caves Road intersection currently operate at LoS [Loss of Service] C [ie 29 to 42 seconds per vehicle through the intersection] or better in the peak hours, with spare capacity to cater for the future traffic growth at the intersection.”

Monitoring is required next in 2024.

5.3 OPERATION OF PLANT AND EQUIPMENT

The operating plant used at the site are summarised in *Table 11*.

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 one non-compliance 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	6 am to 10 pm Monday to Friday
Processing Operations	6 am to 3 pm Saturday
Overburden Management	At no time on Sundays or Public Holidays
Stockpile Management	
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

5.4.1 Blasting out of hours non-compliance

Blasting was conducted at 16:25pm on the 18th January 2023 due to a delay associated with the explosive truck breakdown whilst loading the blast. The blast was fired on the day instead of delaying to the next day due to safety concerns associated with the thunderstorms forecast for the afternoon. DPE and EPA were notified of the non-compliance and recorded the breach, see [Appendix L](#).

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://www.hy-tec.com.au/quarry-documentation>.

Plan of: Annual Review for the Austen Quarry Extension July 2022 to June 2023 - Environmental Monitoring Locations

Figure: FOUR

Version/Date: V0 18/08/2023

Our Ref: 12536_HY_H_AR2022-23_Q004_V0_F4

Location: Off Jenolan Caves Road, Hartley, NSW

Council: Lithgow City Council

Tenure: Not Applicable

Client: Hy-Tec Industries Pty Ltd - Adelaide Brighton Limited

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.

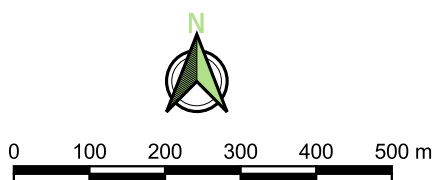
Survey: Not Applicable

Projection: GDA2020/MGA Zone 56 EPSG:7856

Contour Interval: Not Applicable

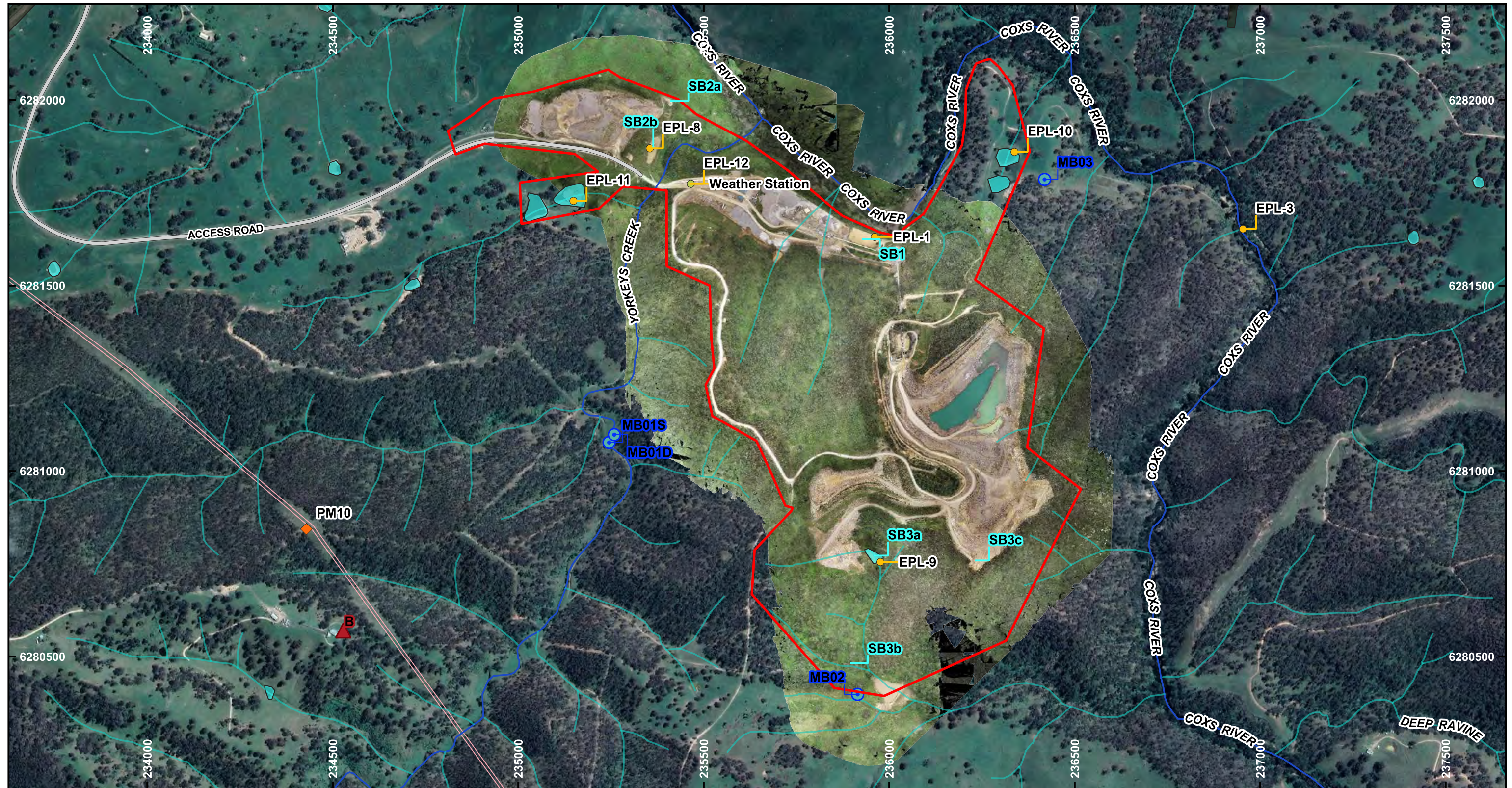
Plan By: SK/JD

Project Manager: LT



vgt environmental compliance solutions and laboratories

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.



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 from 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

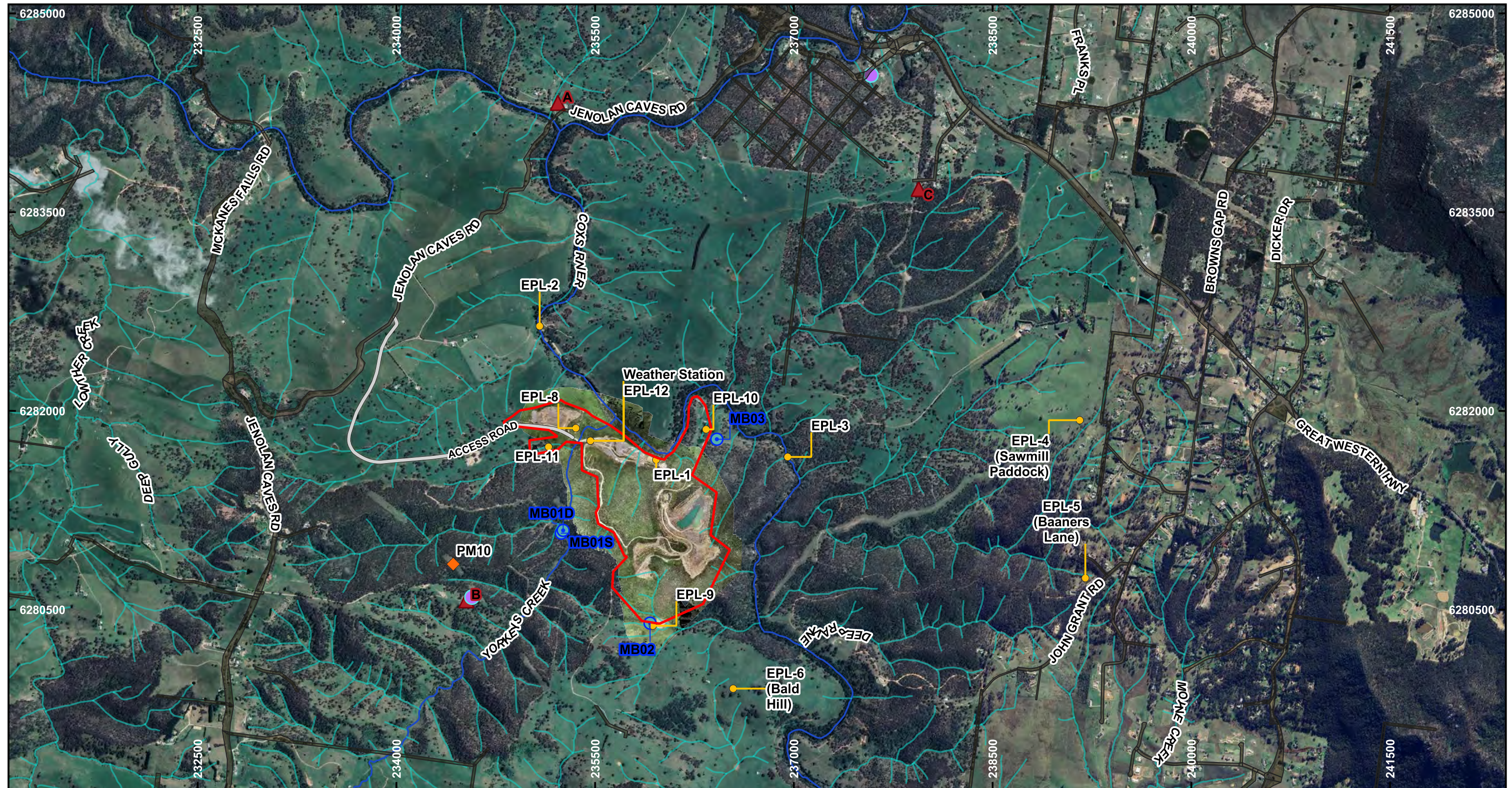
Plan of:	Annual Review for the Austen Quarry Extension July 2022 to June 2023 - Perimeter Monitoring Locations
Figure:	FIVE
Version/Date:	V1 3/10/2023
Our Ref:	12536_HY_H_AR2022-23_Q005_V1_F5

Location:	Off Jenolan Caves Road, Hartley, NSW
Council:	Lithgow City Council
Tenure:	Not Applicable
Client:	Hy-Tec Industries Pty Ltd - Adelaide Brighton Limited

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.
Survey:	NSW Clip & Ship Cadastral
Projection:	GDA2020/MGA Zone 56 EPSG:7856
Contour Interval:	Not Applicable

Plan By:	SK/JD
Project Manager:	LT

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.



Legend			
Quarry Site Boundary [^]	Drainage Line	Monitoring Sites	EPL Monitoring Points
Access Road	Major Drainage Line	Blast Noise Monitoring Location	
Cadastral Information	Coxs River	PM10	
Dam/Sediment Dam or Basin	Deep Creek	Noise Monitoring Location	
Electricity Transmission Line Easement	Yorkys Creek	Monitoring Bore	

Note:
Monitoring Locations positioned from 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 compliance 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.

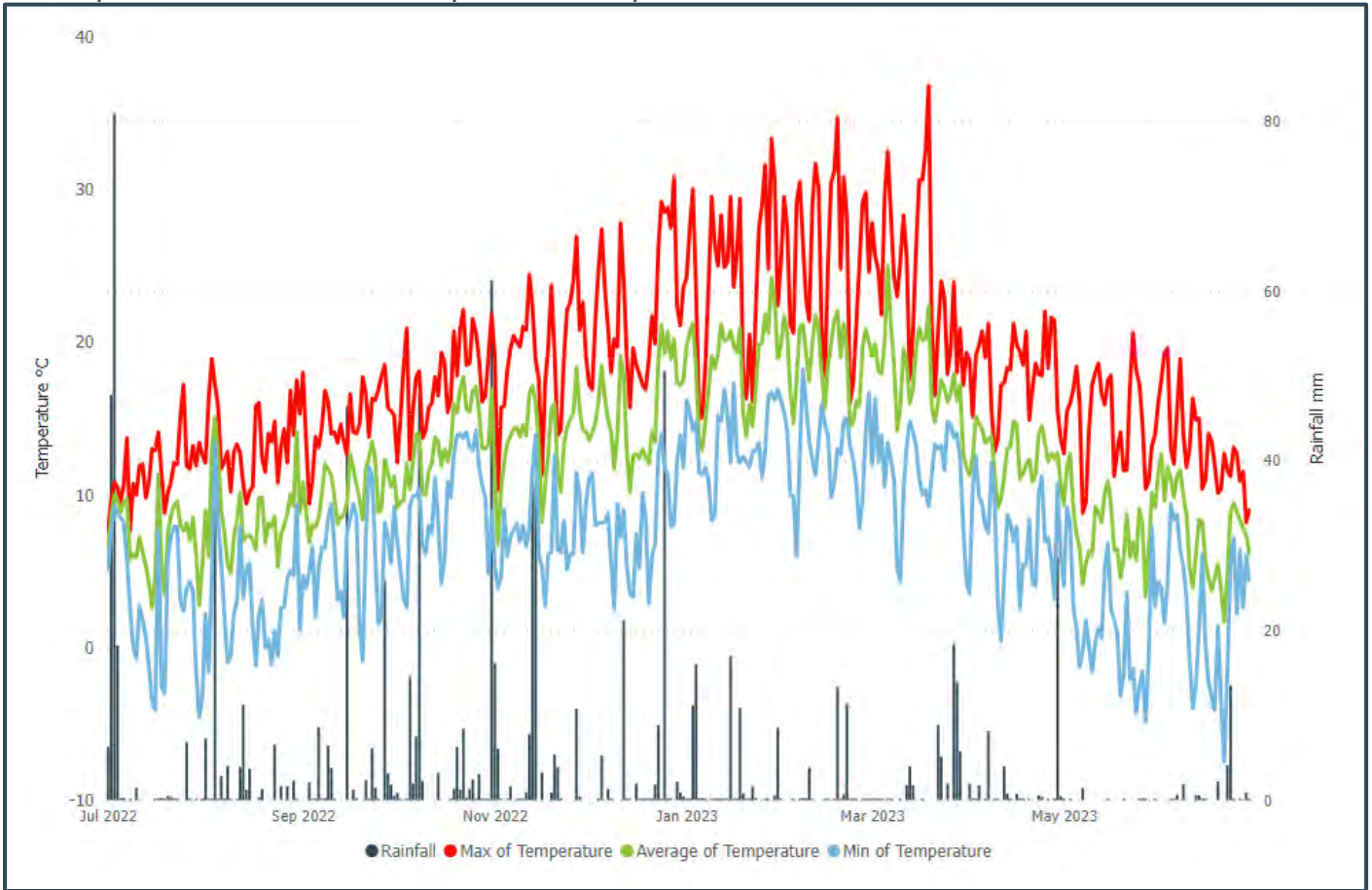
6.1.2 Monitoring

In summary, the weather during the report period is indicative of the La Nina conditions, with the site receiving 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)	1/07/17 to 30/06/18	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
Annual rainfall (mm)	972.9	264.4	362	648.7	907.0	1249.4	984.4
Minimum temperature (°C)	-3.6	-7.2	-7.0	-6.1	-4.0	-5.2	-7.5
Maximum temperature (°C)	37.2	38.0	37.7	39.2	36.4	30.7	36.8
Mean 9am wind speed (m/s)	4.1	2.1	1.9	2.1	1.88	1.8	1.84
Mean 3pm wind speed (m/s)	4.8	3.2	3.0	3.3	2.75	2.7	2.9

Graph 1. Rainfall and Temperature in Report Period



Graph 2. Wind Roses

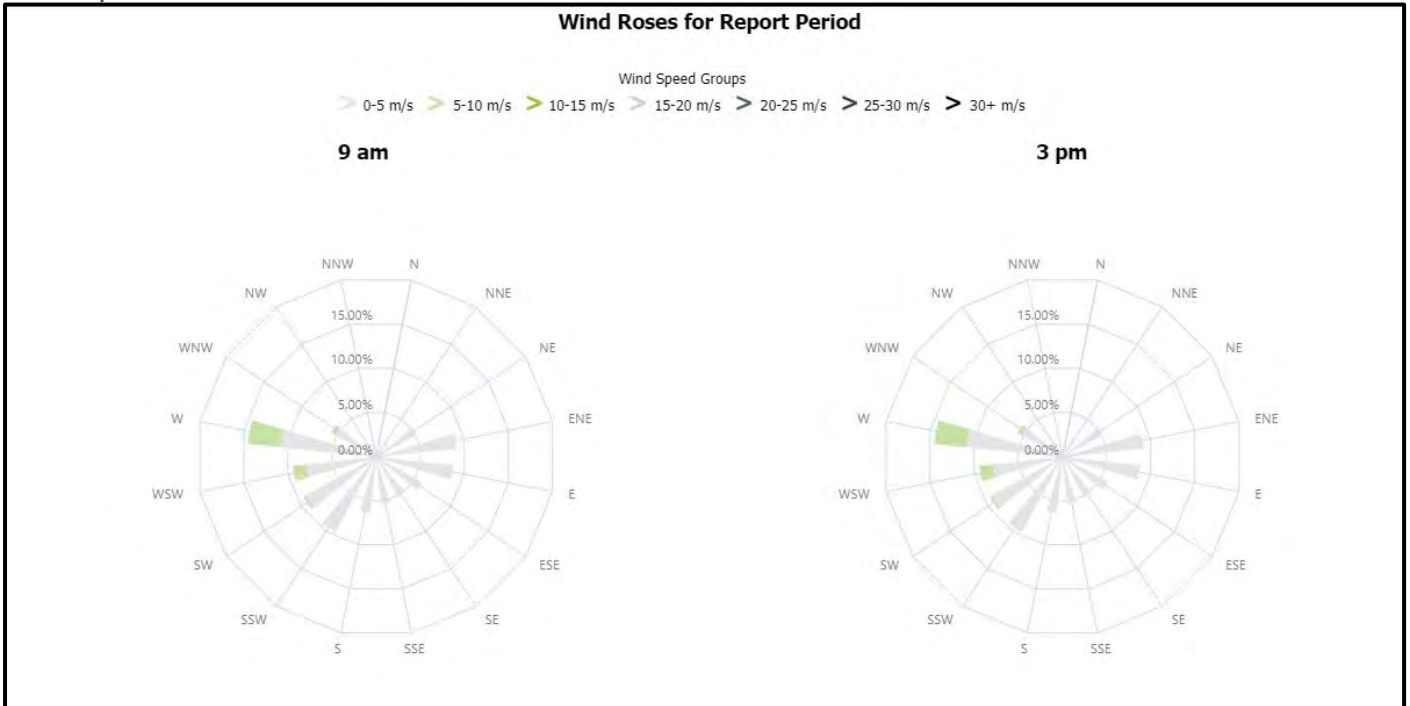


Table 12. Weather Summary Report Period

Year	Month	Rainfall (mm)	Min of Temperature °C	Average of Temperature °C	Max of Temperature °C
2022	July	163.4	-4.6	7.1	17.2
2022	August	85.6	-1.6	8.6	18.9
2022	September	110.4	-0.9	10.2	18.5
2022	October	163.9	2.6	13.4	22.1
2022	November	132.9	2.7	13.6	26.9
2022	December	95.1	2.5	15.5	30.8
2023	January	67.8	8.3	18.7	33.3
2023	February	30.1	6.0	18.9	34.7
2023	March	61.6	4.3	17.9	36.8
2023	April	47.6	0.4	12.6	22.0
2023	May	1.8	-4.9	7.9	20.6
2023	June	24.3	-7.5	7.5	19.6
Total		984.4	-7.5	12.6	36.8

Wind Speed at 9am

Year	Month	Average of Wind Speed (m/s)
2022	July	1.46
2022	August	2.07
2022	September	1.78
2022	October	2.37
2022	November	2.82
2022	December	2.30
2023	January	1.36
2023	February	1.79
2023	March	1.86
2023	April	1.18
2023	May	1.29
2023	June	1.74
Total		1.84

Wind Speed at 3pm

Year	Month	Average of Wind Speed (m/s)
2022	July	2.48
2022	August	3.45
2022	September	2.81
2022	October	2.81
2022	November	3.57
2022	December	2.78
2023	January	2.12
2023	February	2.85
2023	March	2.84
2023	April	2.28
2023	May	2.99
2023	June	3.59
Total		2.88

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 September 2022 and March 2023, and 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 6/9/2022 Evening 6/9/2022 Morning Shoulder 7/9/2022	<34 dB LA _{eq} (15 min) <35 dB LA _{eq} (15 min) <33 dB LA _{eq} (15 min)	35 dB LA _{eq} (15 min)
	Morning Shoulder (Sleep Disturbance)	<33 dB LA _{max}	52 LA _{max}
A	Day 16/03/2023 Evening 16/03/2023 Morning Shoulder 17/03/2023	<35 dB LA _{eq} (15 min) <28dB LA _{eq} (15 min) <31 dB LA _{eq} (15 min)	35 dB LA _{eq} (15 min)
	Morning Shoulder (Sleep Disturbance)	<31 dB LA _{max}	52 LA _{max}
Location A 2019		Compliant	
Location A 2020		Compliant	
Location A 2021		Compliant	
Location A 2022		Compliant	
Location A 2023		Compliant	
B	Day 6/9/2022 Evening 6/9/2022 Morning Shoulder 7/9/2022	<31 dB LA _{eq} (15 min) <20 dB LA _{eq} (15 min) <20 dB LA _{eq} (15 min)	35 dB LA _{eq} (15 min)
	Morning Shoulder (Sleep Disturbance)	<20 dB LA _{max}	52 LA _{max}
B	Day 16/03/2023 Evening 16/03/2023 Morning Shoulder 17/03/2023	<32 dB LA _{eq} (15 min) <22 dB LA _{eq} (15 min) <21 dB LA _{eq} (15 min)	35 dB LA _{eq} (15 min)
	Morning Shoulder (Sleep Disturbance)	<21 dB LA _{max}	52 LA _{max}
Location B 2019		Compliant	
Location B 2020		Compliant	
Location B 2021		Compliant	
Location B 2022		Compliant	
Location B 2023		Compliant	
C	Day 6/9/2022 Evening 6/9/2022 Morning Shoulder 7/9/2022	<29 dB LA _{eq} (15 min) <25 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 16/03/2023 Evening 16/03/2023 Morning Shoulder 17/03/2023	<35 dB LA _{eq} (15 min) <35 dB LA _{eq} (15 min) <28 dB LA _{eq} (15 min)	35 dB LA _{eq} (15 min)
	Morning Shoulder (Sleep Disturbance)	<28 dB LA _{max}	52 LA _{max}
Location C 2019		Compliant	
Location C 2020		Compliant	
Location C 2021		Compliant	
Location C 2022		Compliant	
Location C 2023		Compliant	

6.2.3 Interpretation of Results

Operator attended noise surveys were conducted in:

- 2020 on Thursday 12th and Friday 13th March, and Tuesday 1st and Wednesday 2nd September;
- 2021 on Wednesday 31st March and Thursday 1st April, and Tuesday 17th and Wednesday 18th September;
- 2022 on Tuesday 22nd and Wednesday 23rd March 2022; and
- 2023 on Thursday 16th March 2023 and Thursday 23rd March 2023.

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. One blast occurred outside of the hours 10:00 am and 3:00 pm Monday to Friday on 18th January 2023 at 4:25pm. This incident was reported to both the DPE and EPA, see [Appendix L](#).

Table 14. *Blasting Results*

Blasting	Date	Days Apart	Blast Number	Limits	Units of measure	Results - Hartley Village	2nd Monitor 781 Jenolan Caves Rd	3rd Monitor - South east of quarry	Time
Ground Vibration	11/05/2022		220	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger		
Over-pressure	11/05/2022		220	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger		
Ground Vibration	27/05/2022	16	221	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger		
Over-pressure	27/05/2022	16	221	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger		
Ground Vibration	3/06/2022	7	222	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger		
Over-pressure	3/06/2022	7	222	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger		
Ground Vibration	23/06/2022	20	223	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger		
Over-pressure	23/06/2022	20	223	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger		
Ground Vibration	13/07/2022	20	224	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger		1.09pm
Over-pressure	13/07/2022	20	224	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger		1.09pm
Ground Vibration	5/08/2022	23	225	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger		12.48pm
Over-pressure	5/08/2022	23	225	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger		12.48pm
Ground Vibration	10/08/2022	5	226	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger		1.40pm
Over-pressure	10/08/2022	5	226	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger		1.40pm
Ground Vibration	2/09/2022	23	227	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger		11.15am

Blasting	Date	Days Apart	Blast Number	Limits	Units of measure	Results - Hartley Village	2nd Monitor 781 Jenolan Caves Rd	3rd Monitor - South east of quarry	Time
Over-pressure	2/09/2022	23	227	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger		11.15am
Ground Vibration	16/09/2022	14	228	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger		12.59pm
Over-pressure	16/09/2022	14	228	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger		12.59pm
Ground Vibration	27/09/2022	11	229	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger		1.16pm
Over-pressure	27/09/2022	11	229	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger		1.16pm
Ground Vibration	12/10/2022	15	230	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger		2.30pm
Over-pressure	12/10/2022	15	230	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger		2.30pm
Ground Vibration	14/11/2022	33	231	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger		1.52pm
Over-pressure	14/11/2022	33	231	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger		1.52pm
Ground Vibration	30/11/2022	16	232	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger		11.33am
Over-pressure	30/11/2022	16	232	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger		11.33am
Ground Vibration	14/12/2022	14	233	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger		1.03pm
Over-pressure	14/12/2022	14	233	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger		1.03pm
Ground Vibration	18/01/2023	35	234	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger		4.25pm
Over-pressure	18/01/2023	35	234	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger		4.25pm
Ground Vibration	24/02/2023	37	235	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	Nil Trigger	12.41pm
Over-pressure	24/02/2023	37	235	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	Nil Trigger	12.41pm
Ground Vibration	3/03/2023	7	236	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	Not required	1.43pm
Over-pressure	3/03/2023	7	236	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	Not required	1.43pm
Ground Vibration	13/03/2023	10	237	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	Not required	2.35pm
Overpressure	13/03/2023	10	237	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	Not required	2.35pm
Ground Vibration	22/03/2023	9	238	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	Not required	11.10am
Over-pressure	22/03/2023	9	238	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	Not required	11.10am
Ground Vibration	20/04/2023	29	239	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	Not required	12.40pm
Over-pressure	20/04/2023	29	239	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	Not required	12.40pm

Blasting	Date	Days Apart	Blast Number	Limits	Units of measure	Results - Hartley Village	2nd Monitor 781 Jenolan Caves Rd	3rd Monitor - South east of quarry	Time
Ground Vibration	11/05/2023	21	240	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	Not required	1.39pm
Over-pressure	11/05/2023	21	240	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	Not required	1.39pm
Ground Vibration	20/05/2023	9	241	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	Not required	2.20pm
Over-pressure	20/05/2023	9	241	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	Not required	2.20pm
Ground Vibration	31/05/2023	11	242	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	Not required	11.17am
Over-pressure	31/05/2023	11	242	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	Not required	11.17am
Ground Vibration	14/06/2023	14	243	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger	Not required	1.44pm
Over-pressure	14/06/2023	14	243	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger	Not required	1.44pm

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)	Non-compliant	1 st timing NC	No further actions required See section 5.4.1

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/m²/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 (PM₁₀) 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://www.hy-tec.com.au/quarry-documentation> and are summarised below. The monitoring sites are shown on *Figure Six*.

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

Deposited Matter g/m ² /month				
Year	Month	Insoluble Solids	Insoluble Solids Annual Average	Limit-Annual Insol Solids
2022	July	0.8	1.32	4
2022	August	1.0	1.19	4
2022	September	0.4	1.16	4
2022	October	0.9	1.16	4
2022	November	4.8	1.48	4
2022	December	1.0	1.51	4
2023	January	0.4	1.21	4
2023	February	0.8	1.02	4
2023	March	0.3	1.01	4
2023	April	0.4	0.98	4
2023	May	0.4	0.92	4
2023	June	0.8	0.92	4

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

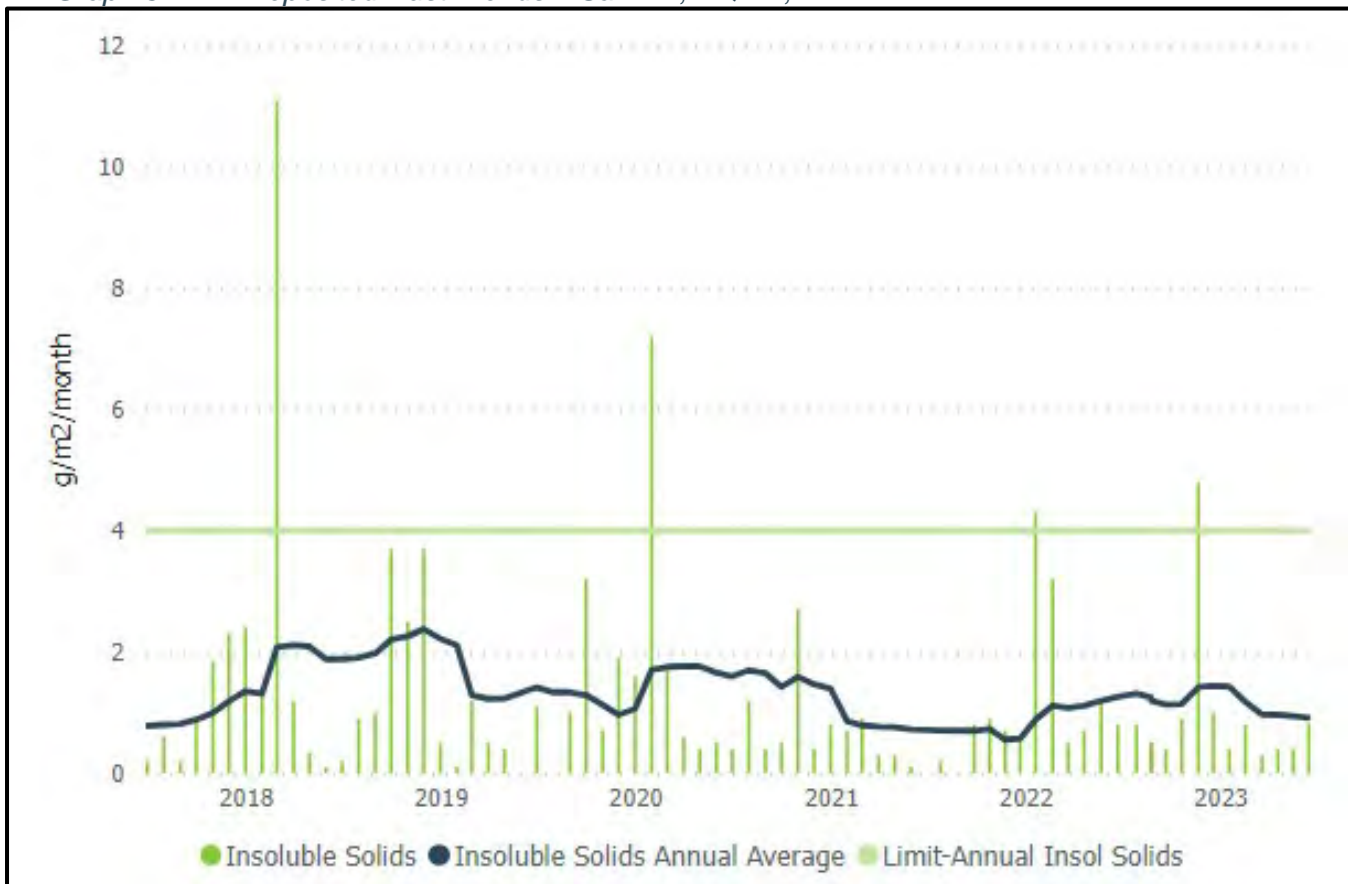


Table 17. Deposited Dust Results – Baaners Lane, AQD 2, EPL 5

Deposited Matter g/m ² /month				
Year	Month	Insoluble Solids	Insoluble Solids Annual Average	Limit-Annual Insol Solids
2022	July	0.5	0.52	4
2022	August	1.2	0.53	4
2022	September	0.6	0.52	4
2022	October	0.9	0.52	4
2022	November	0.7	0.55	4
2022	December	0.7	0.55	4
2023	January	0.3	0.55	4
2023	February	0.2	0.54	4
2023	March	0.5	0.57	4
2023	April	0.2	0.55	4
2023	May	0.6	0.56	4
2023	June	0.4	0.52	4

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

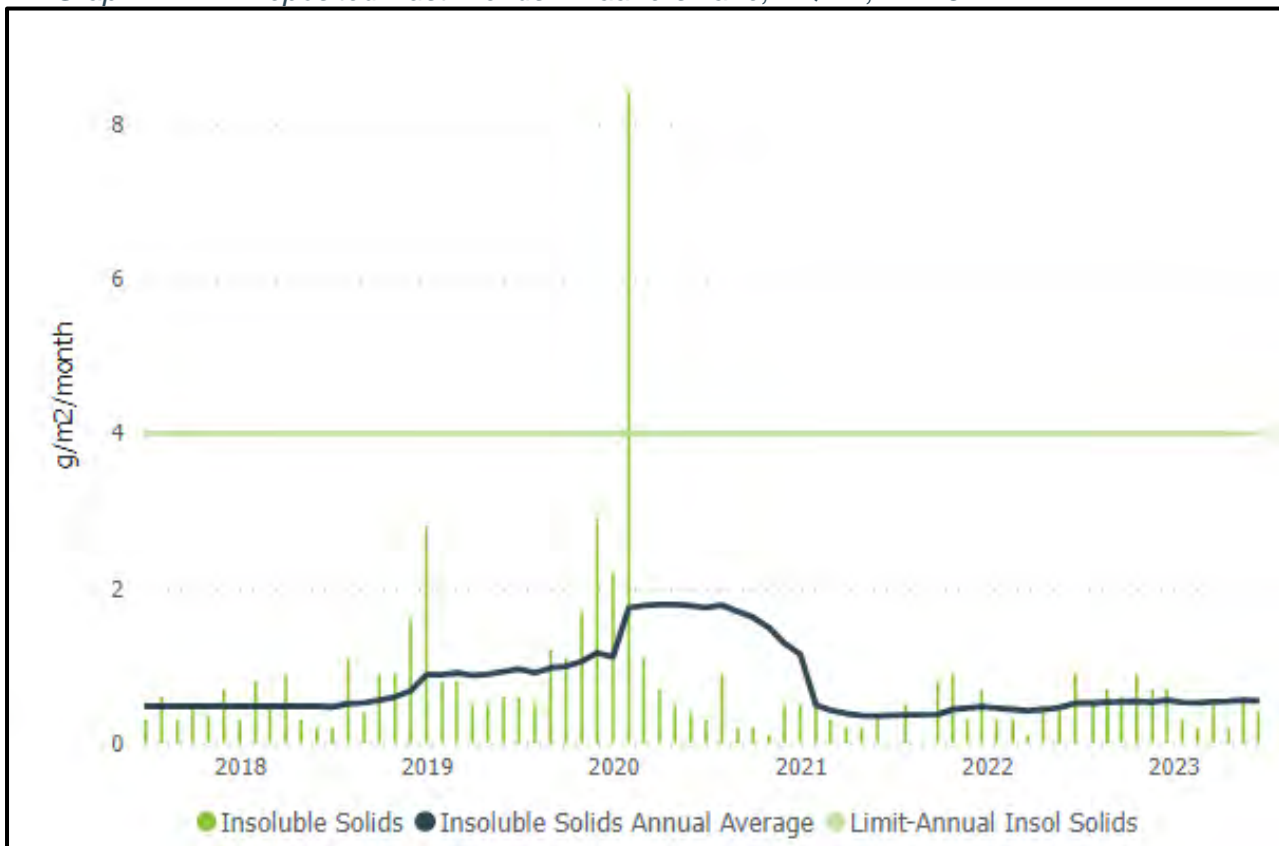


Table 18. Deposited Dust Results – Bald Hill, AQD 3, EPL 6

Deposited Matter g/m ² /month				
Year	Month	Insoluble Solids	Insoluble Solids Annual Average	Limit-Annual Insol Solids
2022	July	1.0	1.90	4
2022	August	1.1	1.69	4
2022	September	0.5	1.62	4
2022	October	1.0	1.58	4
2022	November	0.6	1.57	4
2022	December	0.8	1.58	4
2023	January	0.9	1.63	4
2023	February	0.4	0.80	4
2023	March	0.5	0.81	4
2023	April	0.5	0.79	4
2023	May	0.5	0.68	4
2023	June	0.3	0.62	4

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

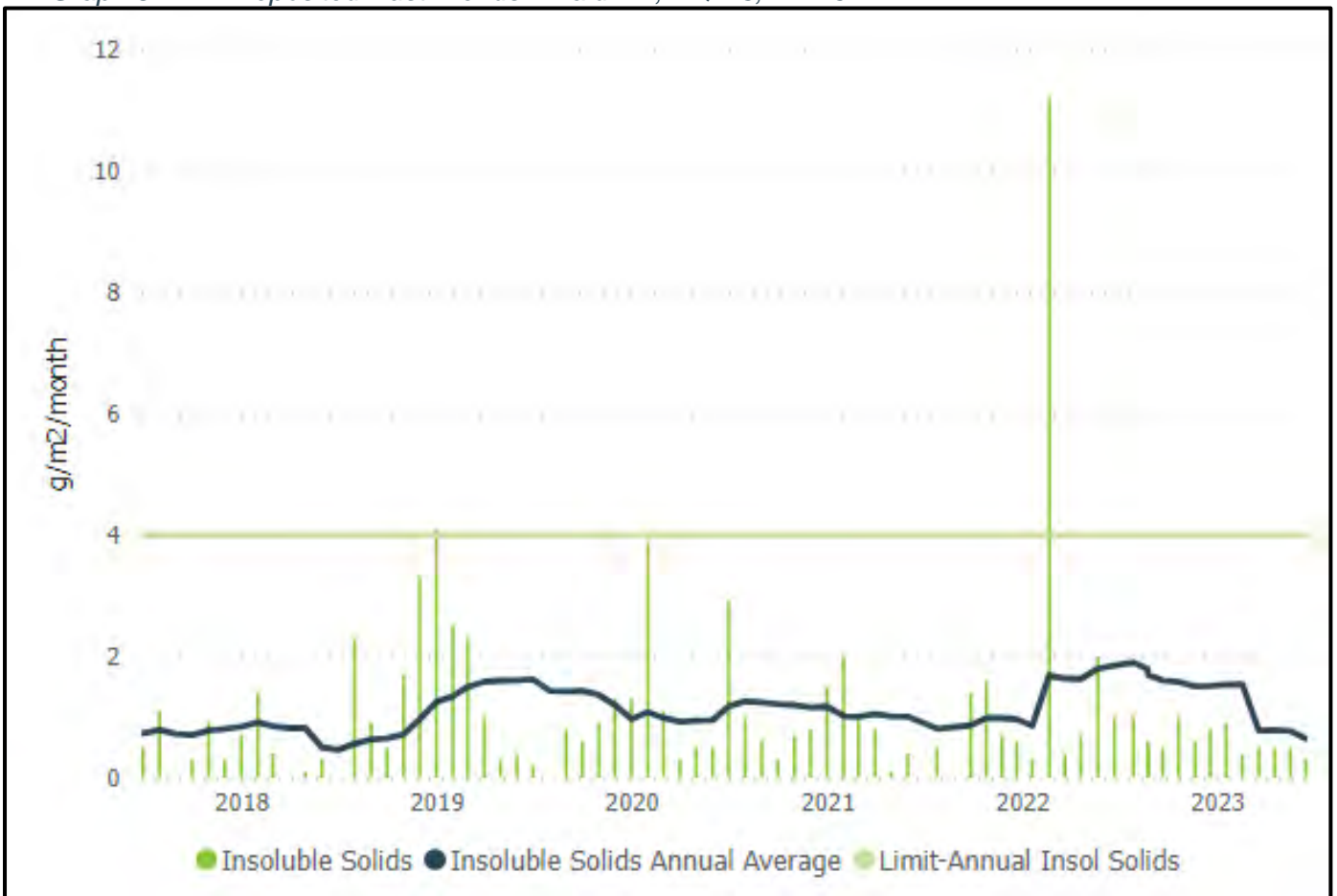


Table 19. Particulate Matter Less than 10 Micron Annual Averages

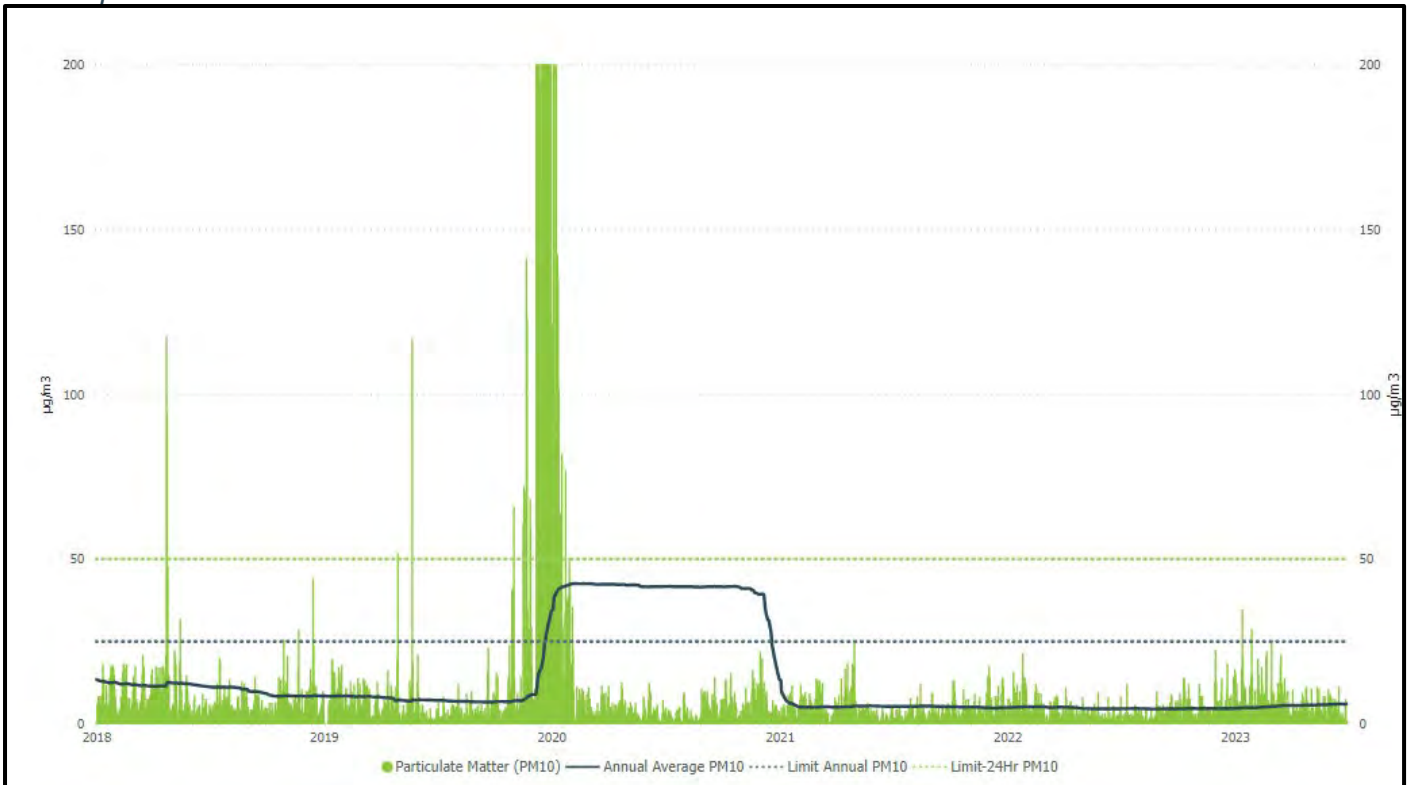
Annual Averages	PM ₁₀ µg/m ³
1/07/2019 – 30/06/2020	5.4
1/07/2020 – 30/06/2021*	5.28
1/07/2021 – 30/06/2022	4.56
1/07/2022 – 30/06/2023	6.0
Compliant with DA	Yes
Limit	25

*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/m ³
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 PM₁₀ 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 Cocks 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, July 2023 – 50mm 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.

Hy-Tec 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 banded appropriately with bands 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.

A meeting is proposed with the Rural Bushfire Service on the site prior to the next bush fire season.

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. The offset credits have been purchased during this report period, and the Company is in the process of completing the paperwork to retire the credits for PCT 1093, PCT 649, PCT 840. A payment to the Biodiversity Conservation Trust has been made to meet the biodiversity offsetting obligation associated with the naturally occurring Silver Leaved Mountain Gum ecological community.

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.

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 over about 20 days per year, predominantly for Love Grass, Blackberries and Serrated Tussock.

Hand spraying (550L) of weeds was undertaken in January 2023. Targeted aerial spraying was conducted in October 2020 and again in April 2022 for serrated Tussock. Another program is expected in March 2024.

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.

6.9.2 Monitoring

Aquatic monitoring was undertaken during November 2022 by Niche Environment and Heritage ([Appendix J](#)). The results showed that:

'The spring 2022 biological monitoring results reflect the prevailing high rainfall and stream flow conditions through the year and are reduced when compared to previous year monitoring results. This reflects the prevailing harsh physical conditions, rather than any reduced water quality conditions or impacts.

Importantly, both pool edge and riffle habitats recorded comparable stream health results in spring 2022, with no outright spatially significant differences among site groups. 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 2022.'

Biodiversity monitoring was undertaken by EMM in December 2022 ([Appendix I](#)). The results showed:

'The results show that some changes have occurred to flora and fauna communities surveyed at the site since the previous monitoring period in 2021 (EMM, 2021). Weed invasion has decreased at all sites except for the new rehab site (Rehab 2). Weed invasion has decreased in comparison to previous monitoring years with a similar decrease in presence of native vegetation at all ridge and creek sites.

*A slight increase in native vegetation has occurred at the Old Rehab transects, with comparable numbers being observed to previous years at the New Rehab site within the active quarry areas. The occurrence of Strawberry Broomrape (*Orobanche* sp.) that was prevalent in previous monitoring years was not observed in this survey, likely due to management actions employed following last year's survey.*

An increase in the number of individuals of Silver-leaved Mountain Gum was noted during this monitoring period, with the height and conditions of the individuals remaining comparable to previous monitoring years. No

individuals were observed to be in flower, while a small number of individuals were observed with new growth and evidence of fruiting.

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

The report notes that bird species, reptile and amphibian numbers have decreased slightly, possible due to the different time of year the survey was conducted (December compared to November in previous years). Mammal numbers have remained steady, with wombat activity remaining high. Overall, no significant decline in fauna type or numbers was reported.

The monitoring data from the next reporting period will be vital to understand if changes are a downward trend or natural fluctuations.

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 Hy-Tec website (<https://www.hy-tec.com.au/quarry-documentation>).

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 Five*. 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 24*.

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	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://www.hy-tec.com.au/quarry-documentation> 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) a total of 44 millimetres of rainfall over any consecutive 5 day period.

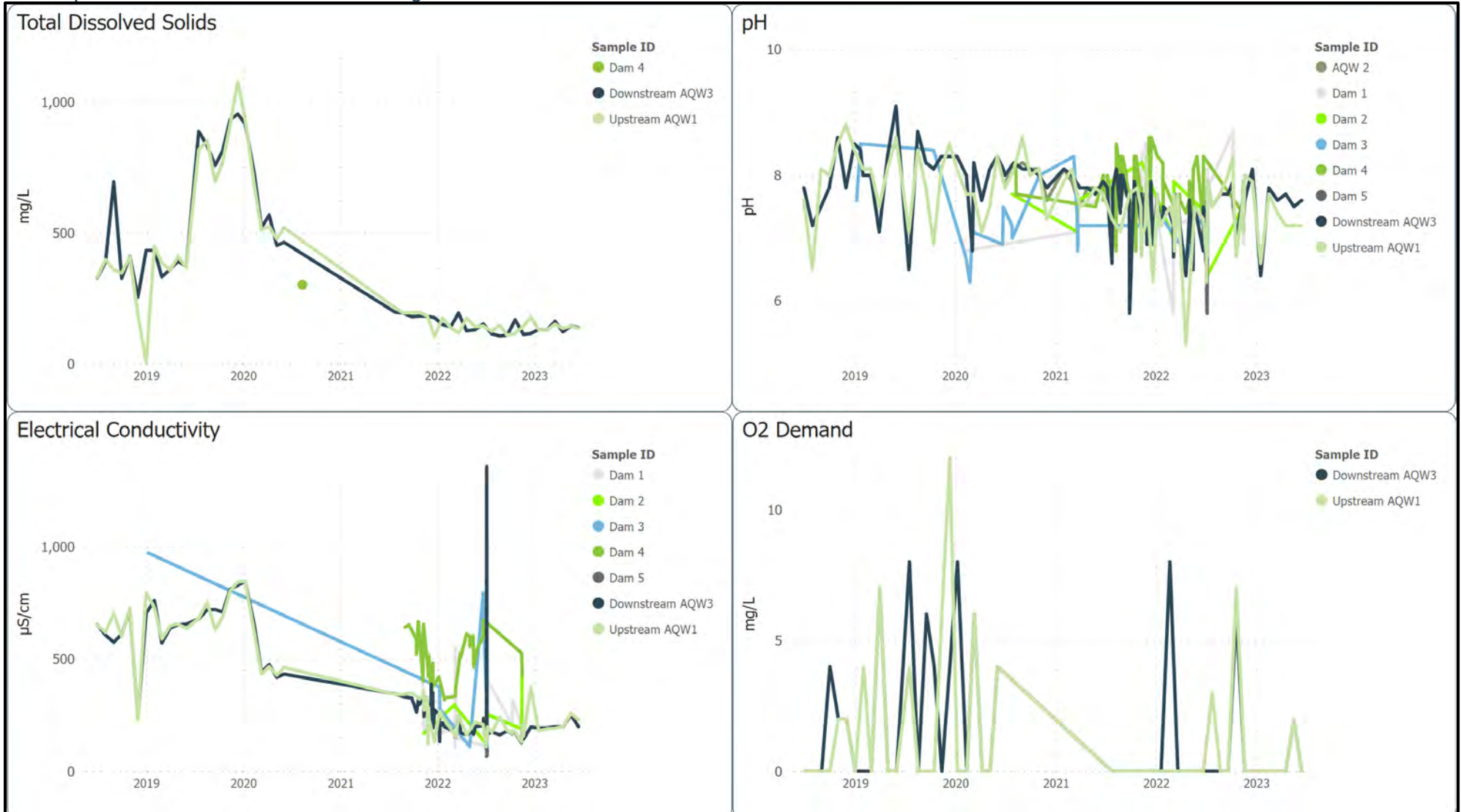
Table 23. Summary of Surface Water Results for Report Period

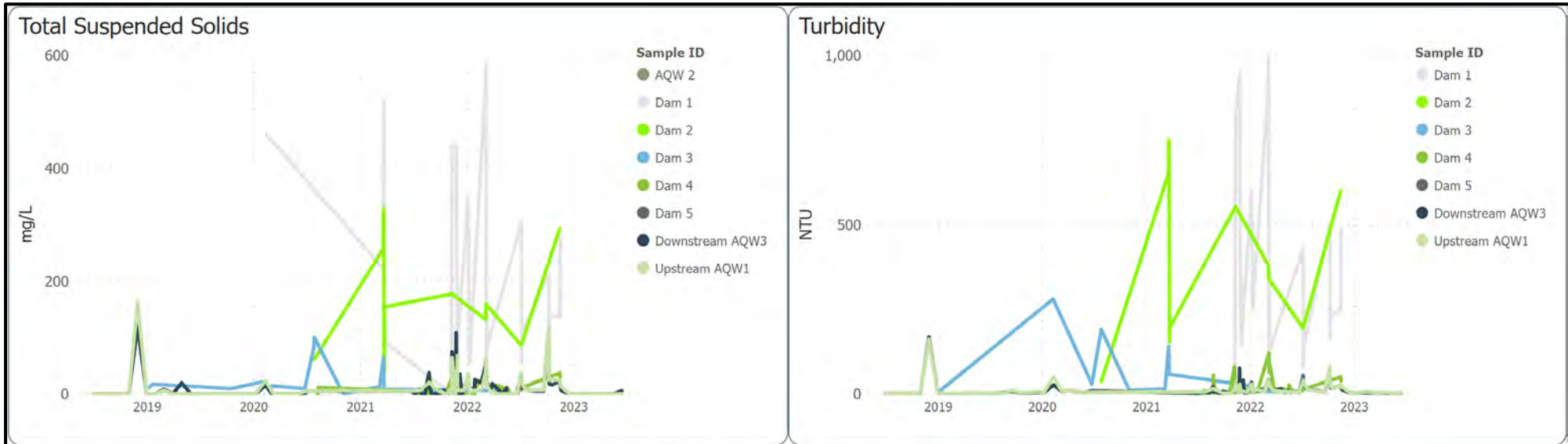
Sample ID	Count of Samples	Min of pH	Average of pH	Max of pH	Min of Conductivity	Average of Conductivity	Max of Conductivity	Min of Turbidity (NTU)	Average of Turbidity (NTU)	Max of Turbidity (NTU)	Min of Total Suspended Solids (mg/L)	Average of Total Suspended Solids (mg/L)	Max of Total Suspended Solids (mg/L)	Max of Oil & Grease (mg/L)
Dam 1	14	6.9	7.5	8.7	113	239	408	78.0	691.9	2,800.0	55	344	1,353	0
Dam 2	8	6.4	7.1	7.7	124	216	436	194.0	2,030.5	4,900.0	86	906	2,678	0
Dam 3	4	5.8	6.5	7.3	68	148	338	38.0	73.5	130.0	10	36	78	0
Dam 4	4	7.4	7.6	7.8	429	481	527	13.0	43.3	72.0	10	34	57	0
Dam 5	4	5.8	6.3	7.2	67	75	94	39.0	70.3	120.0	8	36	94	0
Downstream AQW3	26	6.4	7.4	8.1	103	217	1,358	1.2	49.1	400.0	0	52	364	0
Upstream AQW1	26	6.3	7.4	8.3	108	185	372	1.2	53.0	460.0	0	46	309	0

Notes:

- This table is a summary of all results, not all sampling events resulted in a discharge.
- Turbidity results of 4900 are actually >4000 NTU. Oil and Grease results of zero are actually <10 mg/L.
- 5-day rainfall events exceeding 44mm where discharges occurred during the report period were recorded from 1-6/07/2022 and 13-15/11/2022.

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 November 2022.

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 8](#). 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.

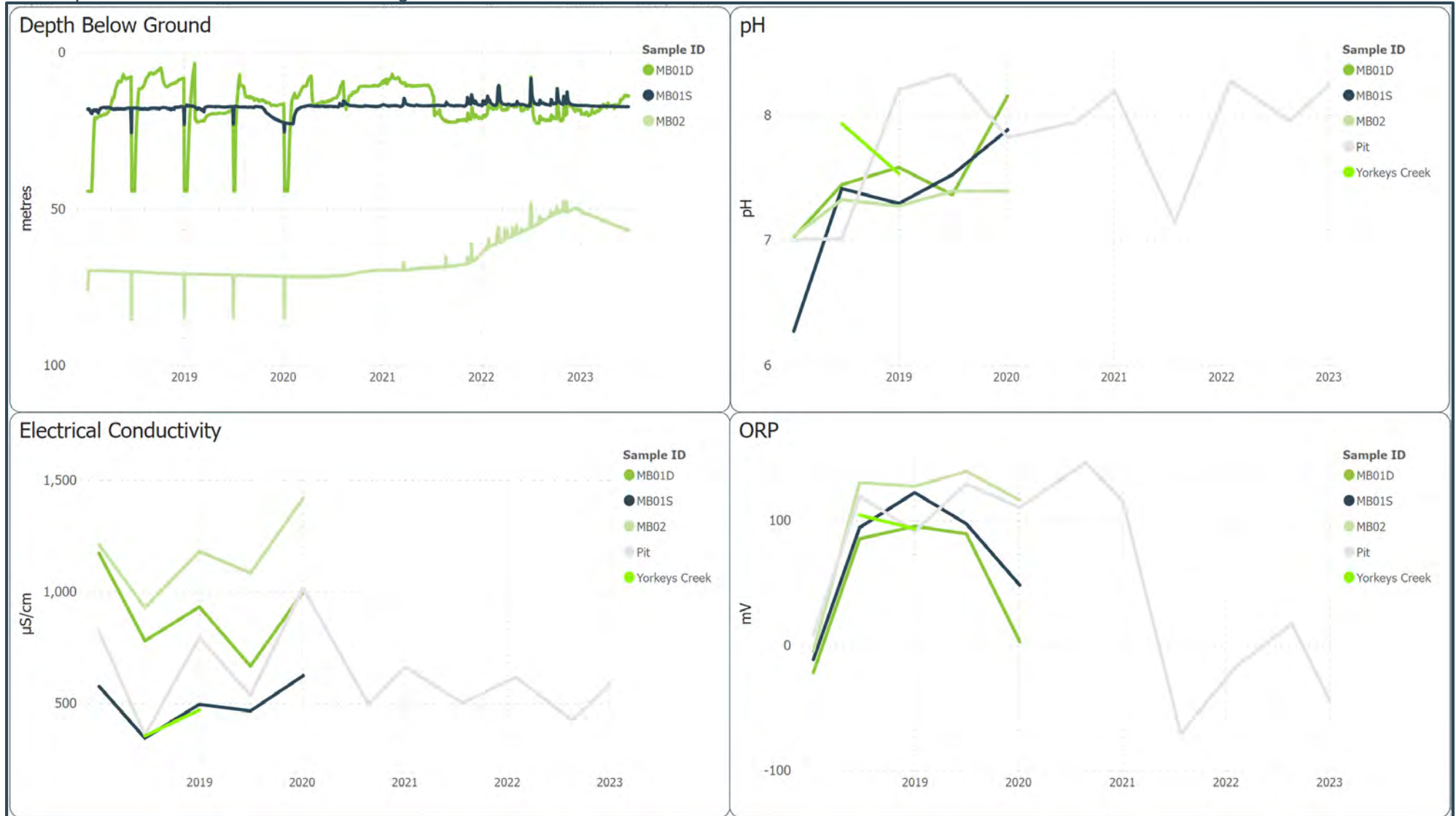
7.2.3 Groundwater Monitoring Data

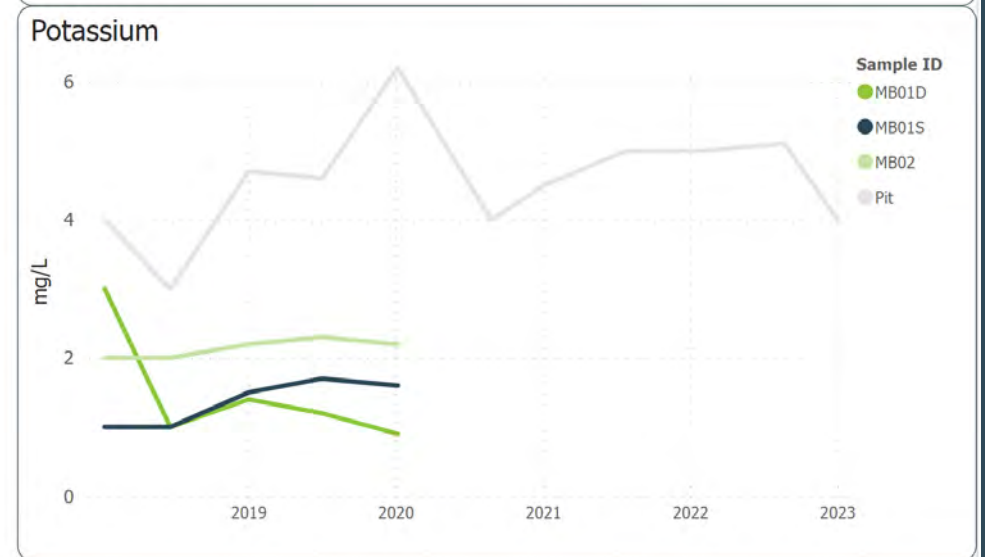
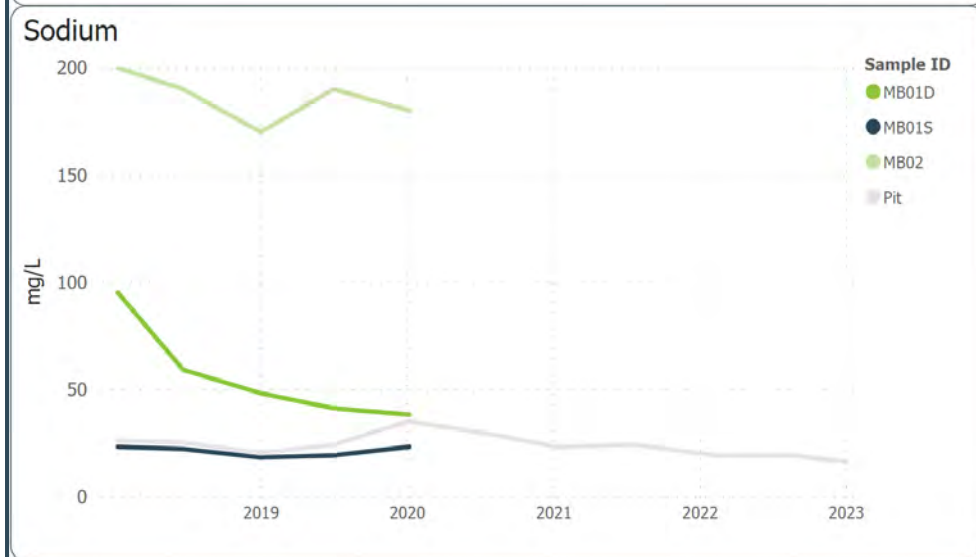
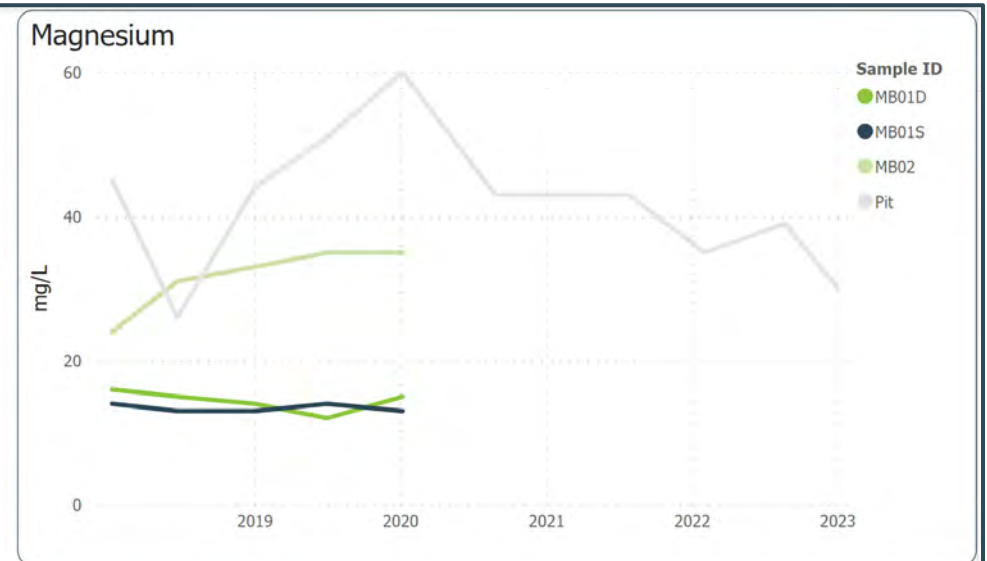
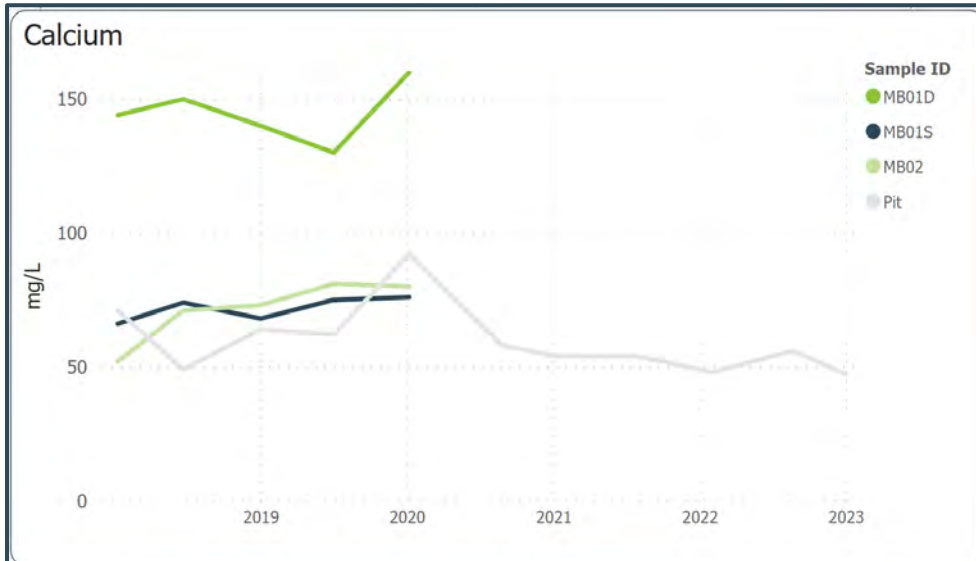
Pit water quality was monitored in August 2022 and January 2023 for the following parameters:

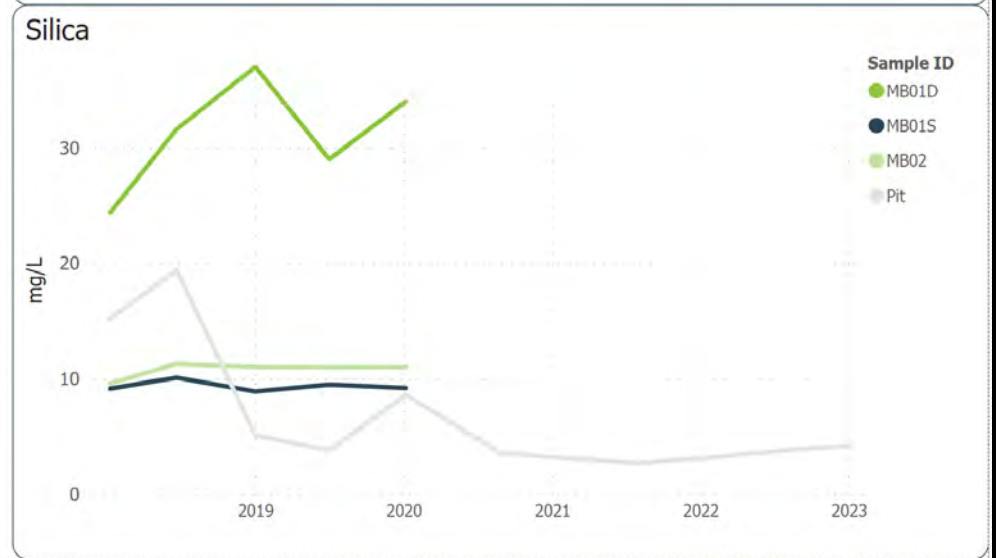
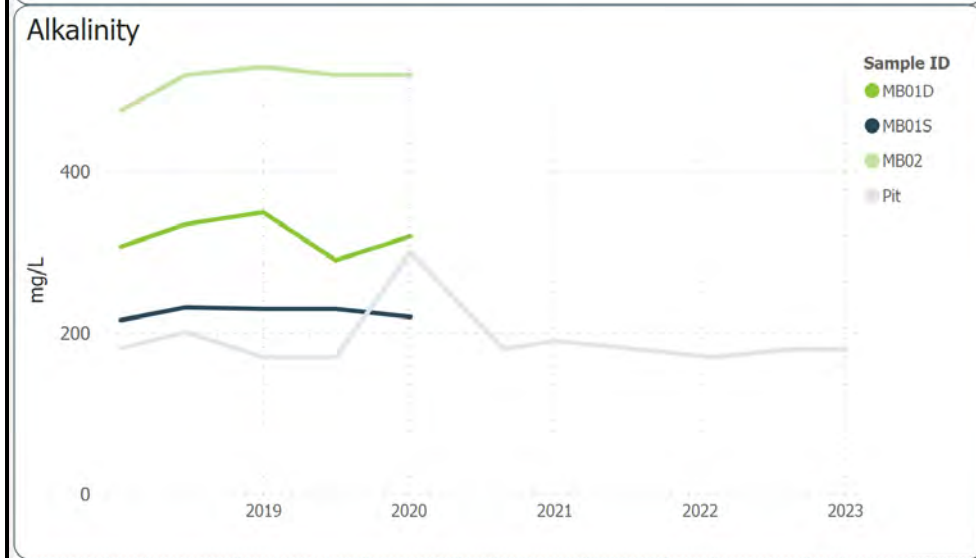
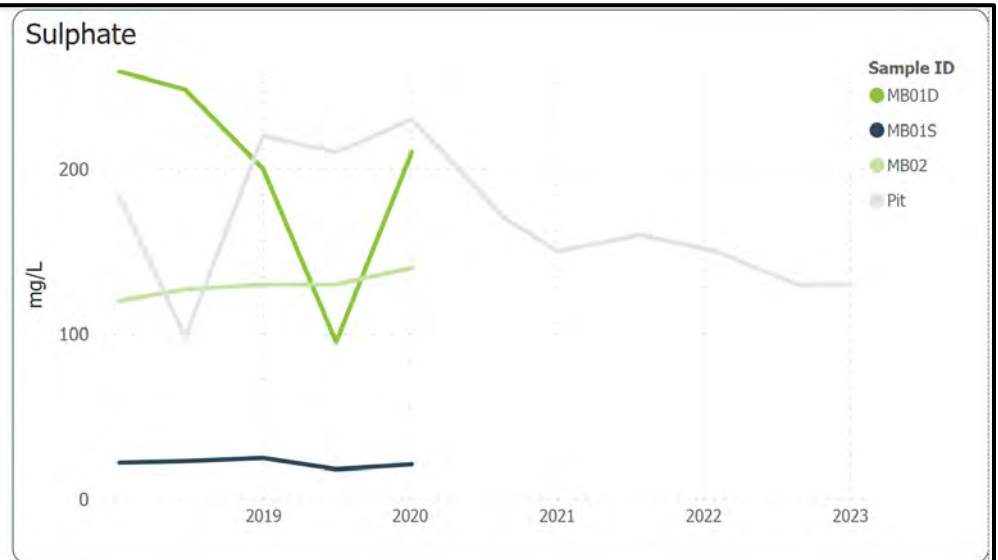
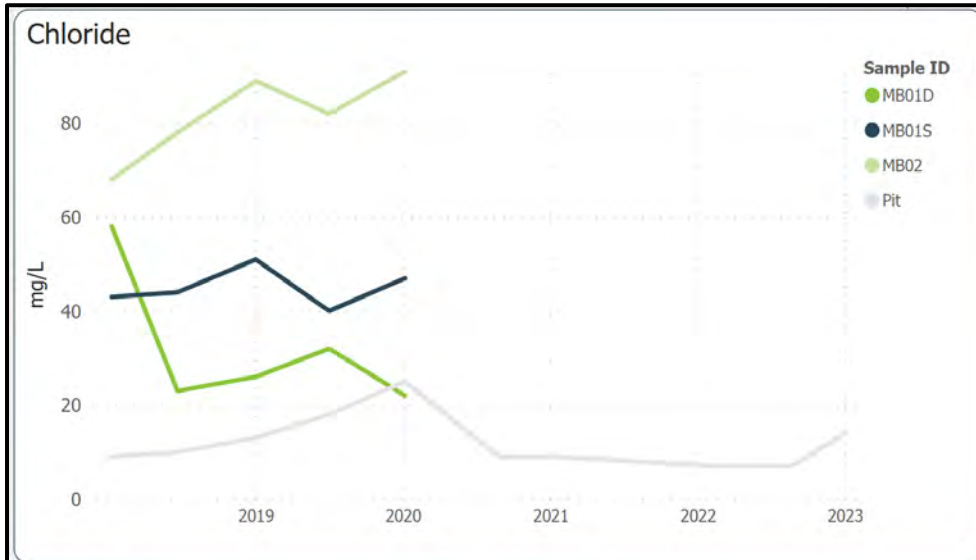
- pH, Electrical Conductivity, Oxidation Reduction Potential, Temperature
- Total Dissolved Solids
- Cations and anions
- Dissolved heavy metals
- Ammonia, Nitrate, Nitrite
- Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethyl Benzene, Xylenes (BTEX), Polyaromatic Hydrocarbons (PAHs) – pit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

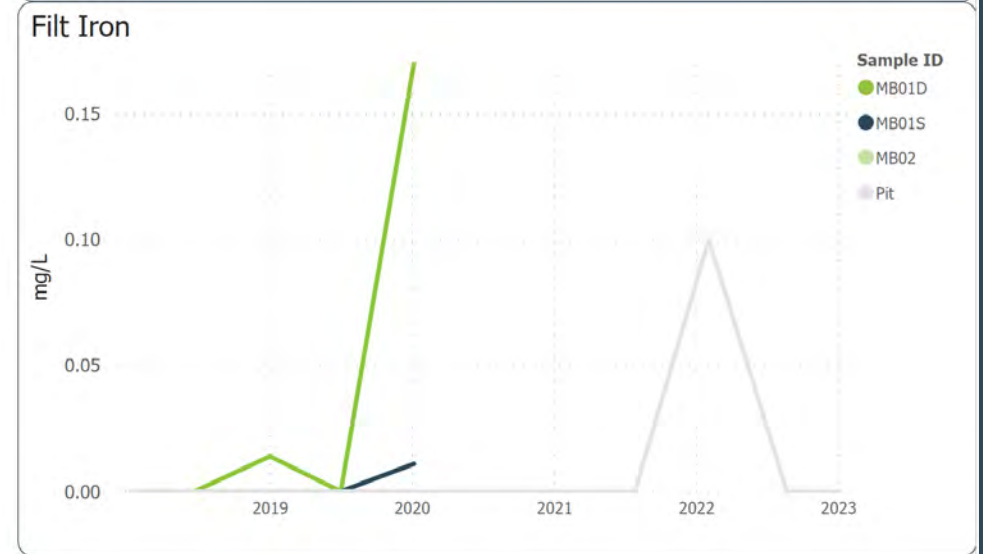
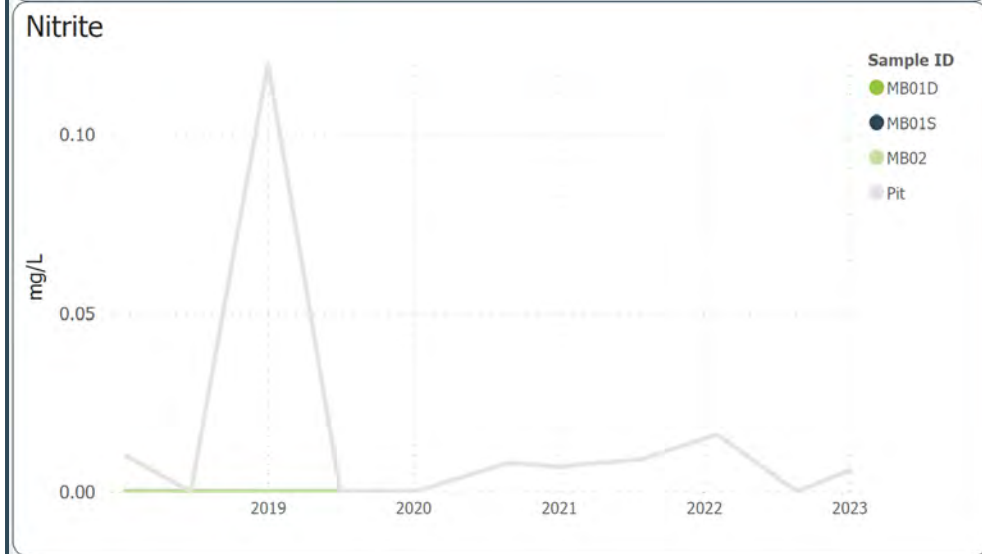
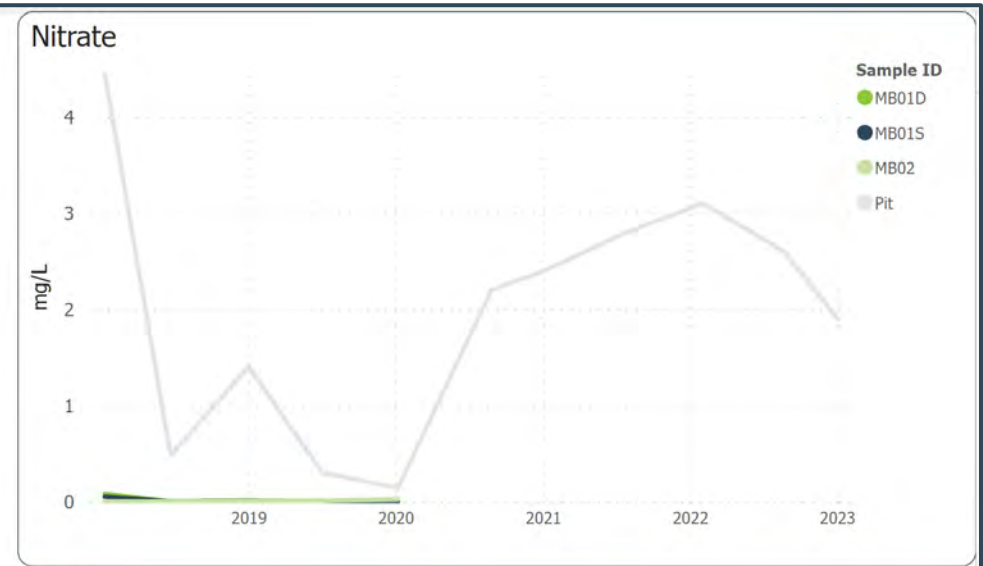
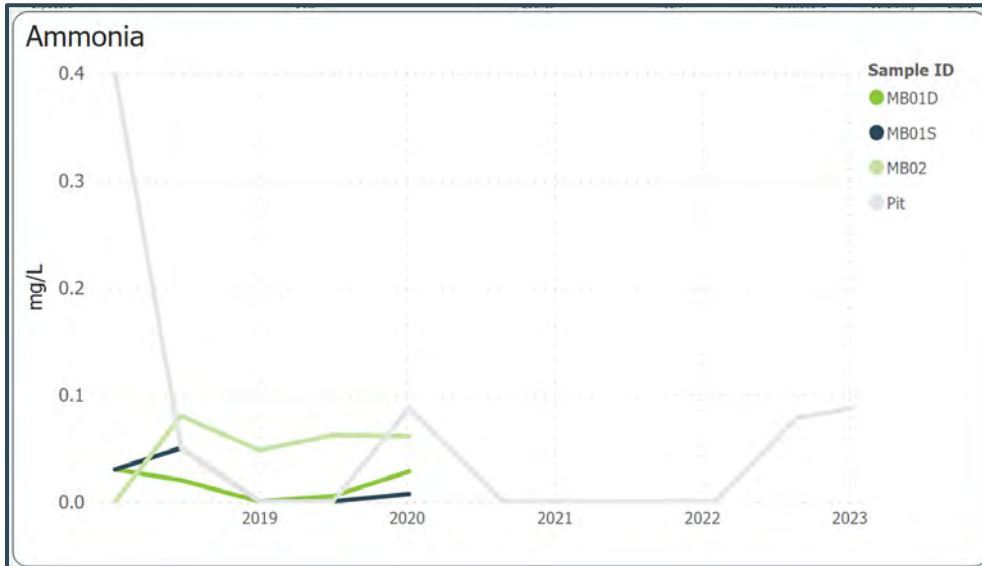
The reports are included in [Appendix K](#). Water quality trends are shown on the following graphs ([Graph 9](#)) where detectable parameters make this meaningful. There have been no organics detected in any monitoring round.

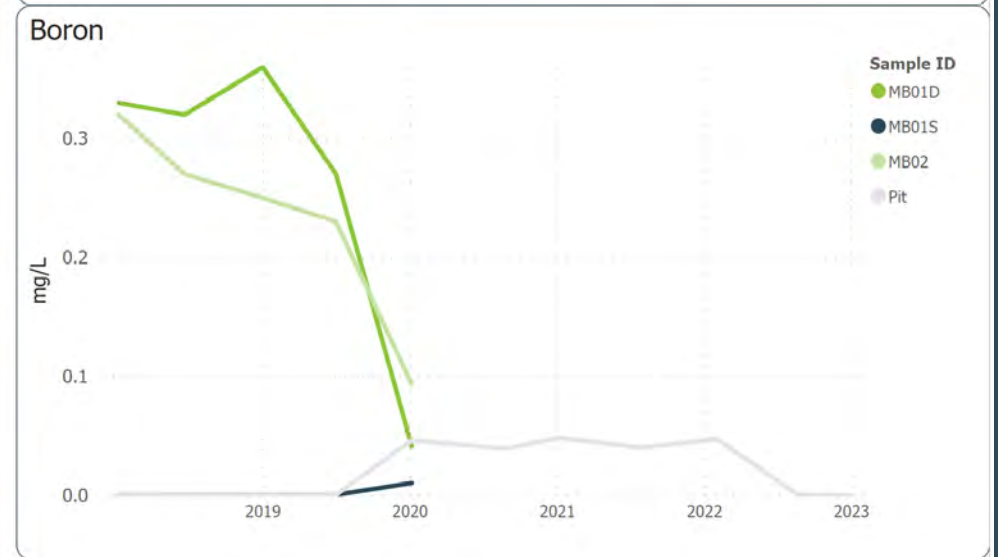
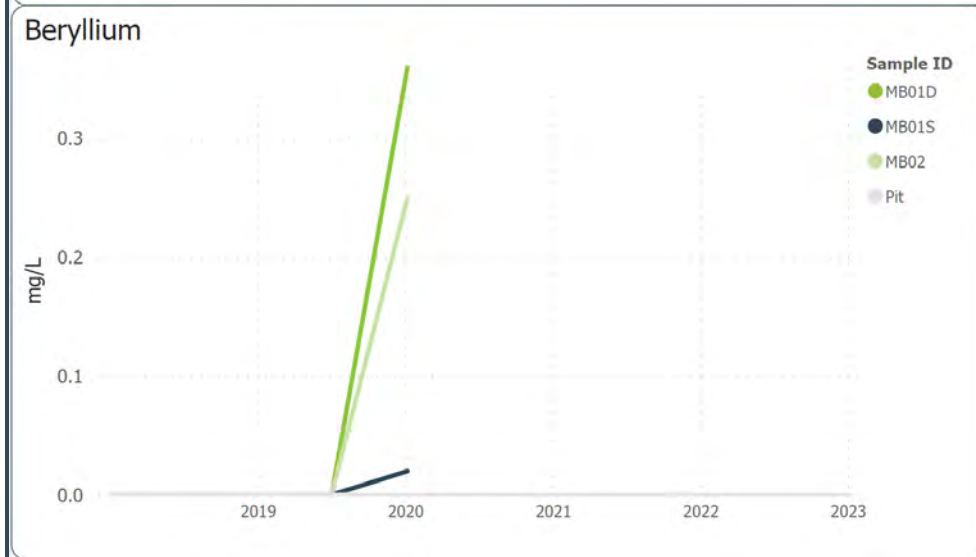
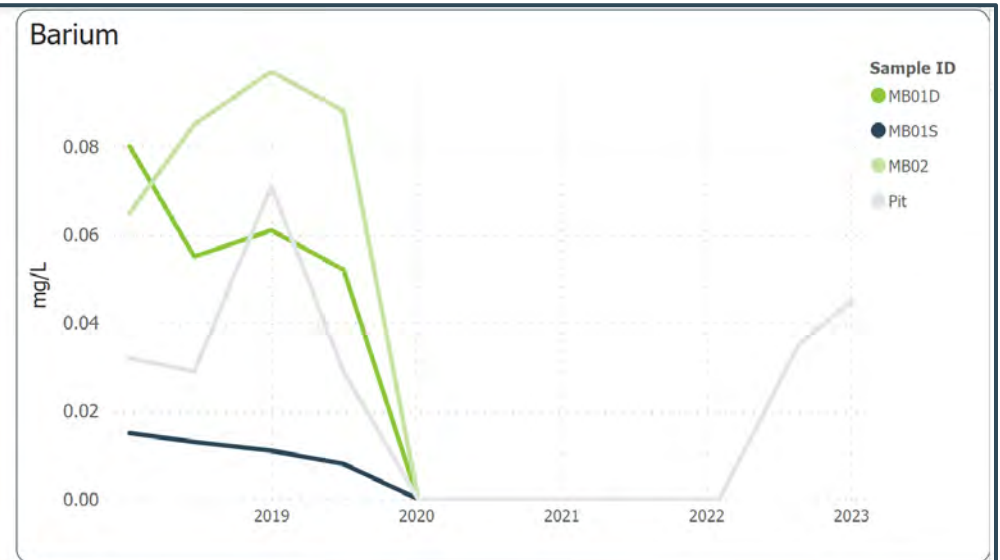
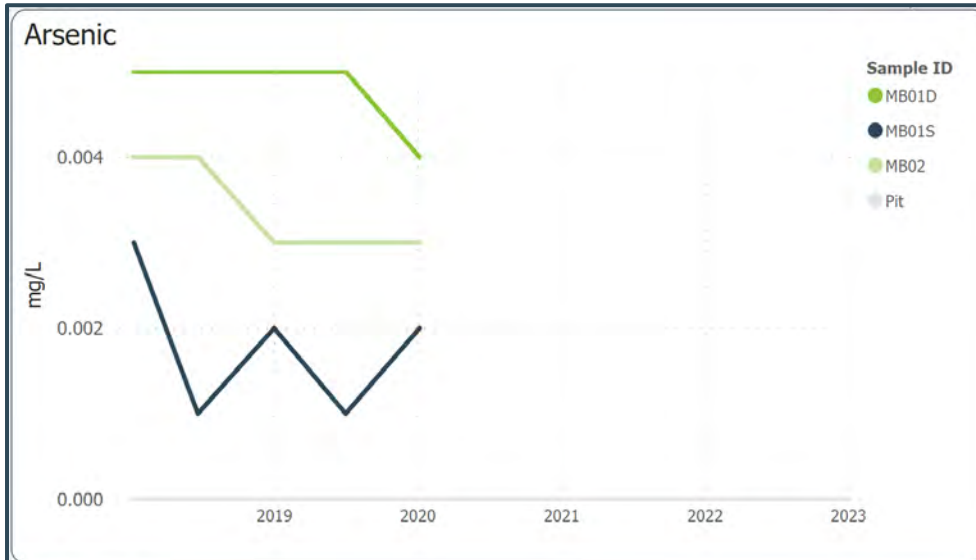
Graph 8. Groundwater Monitoring Trends

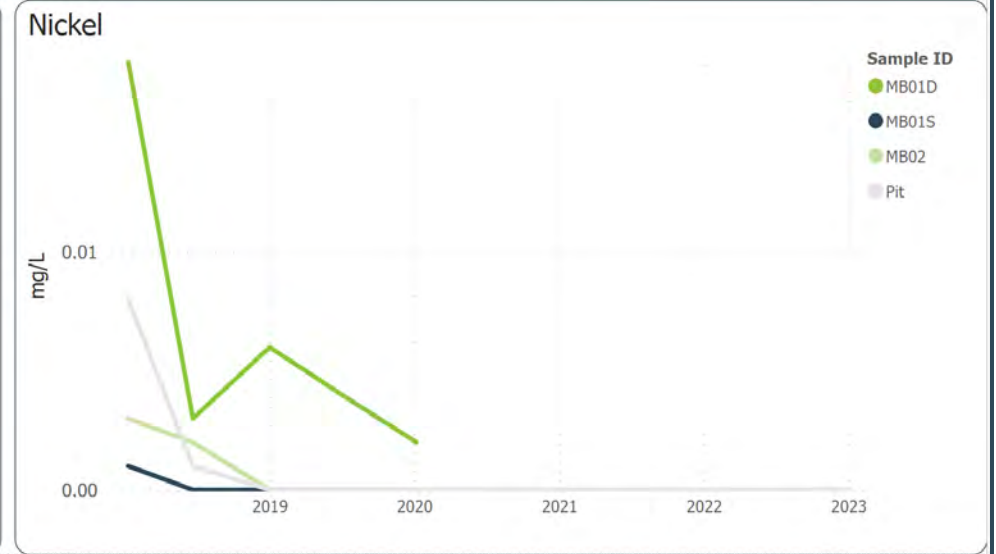
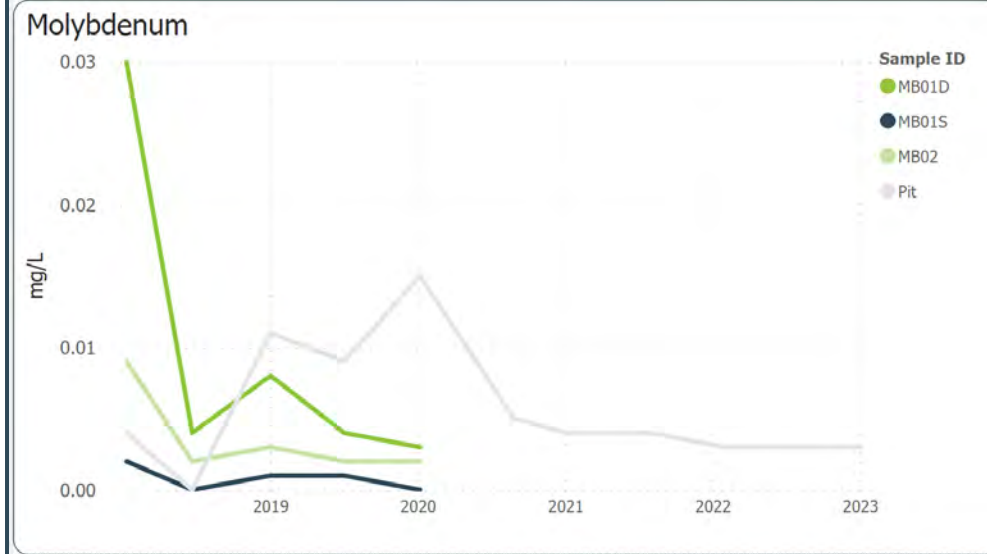
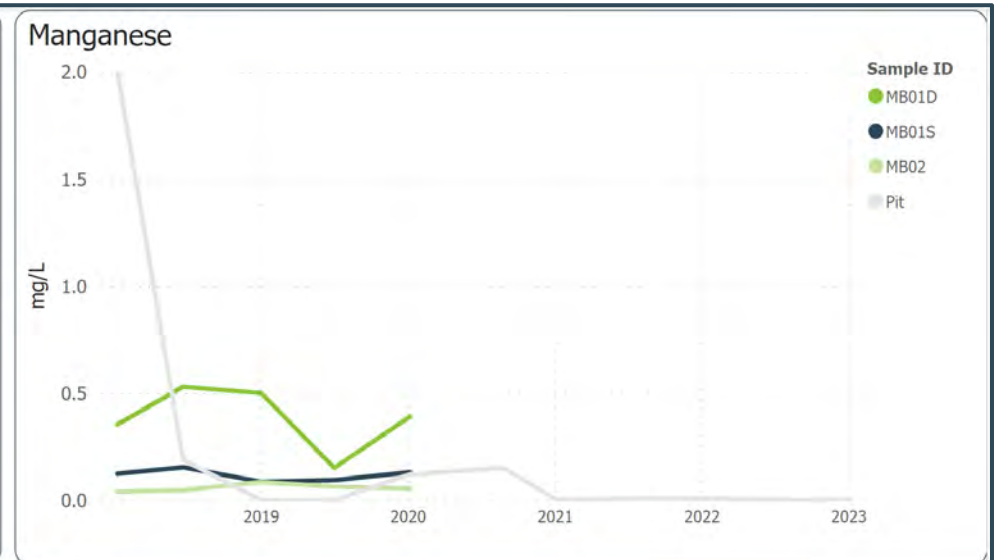
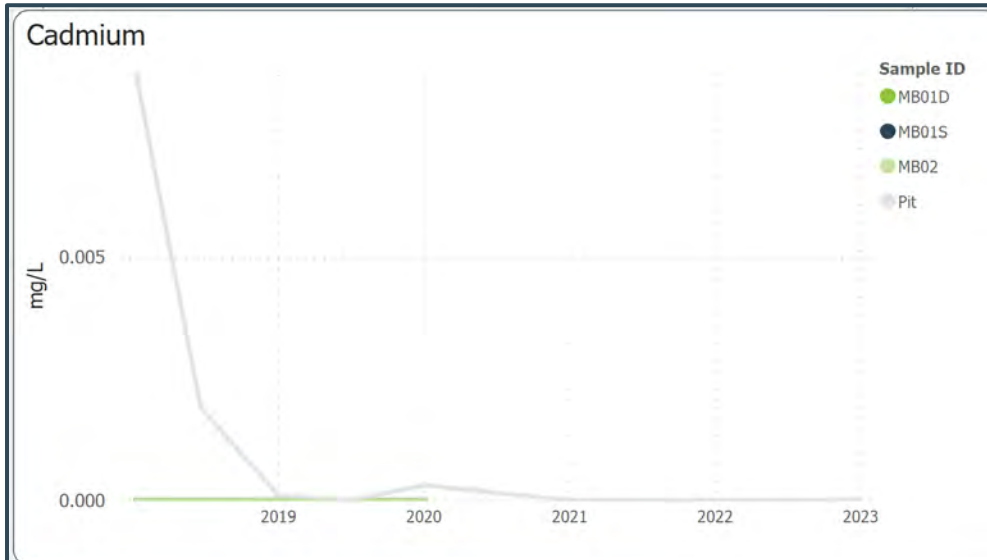


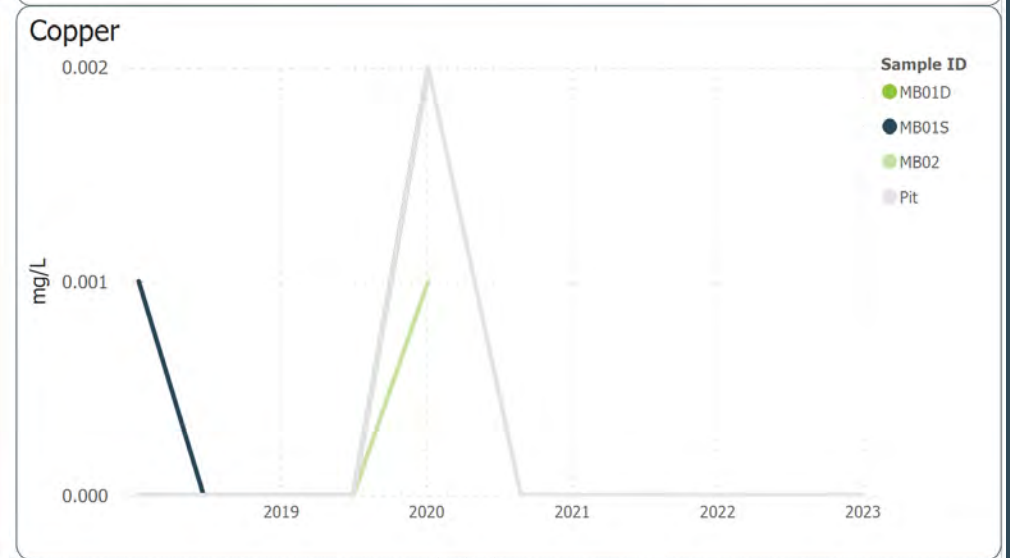
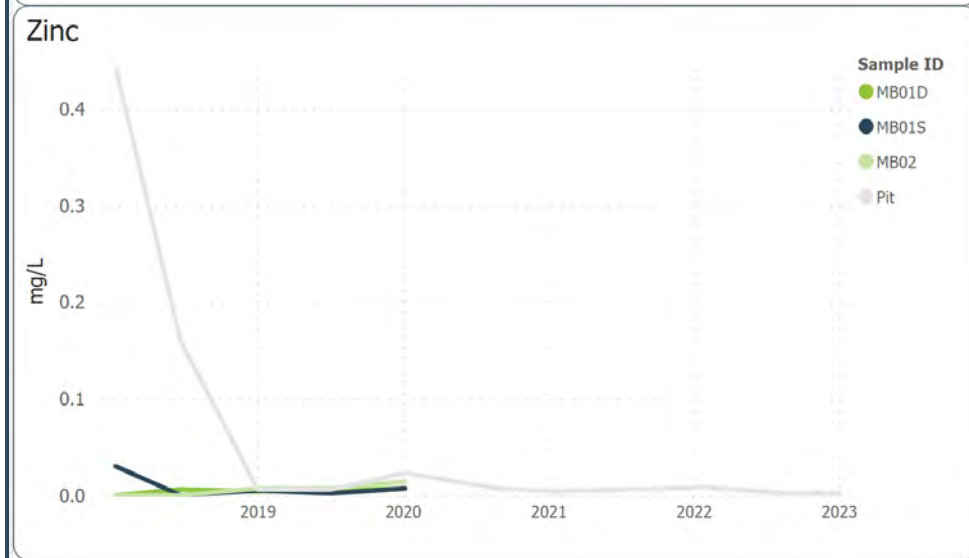
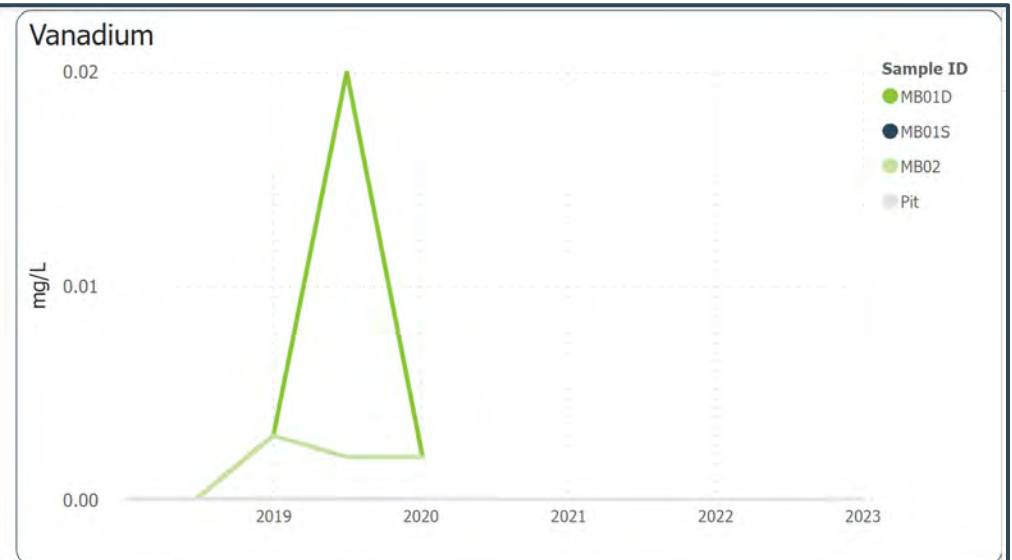
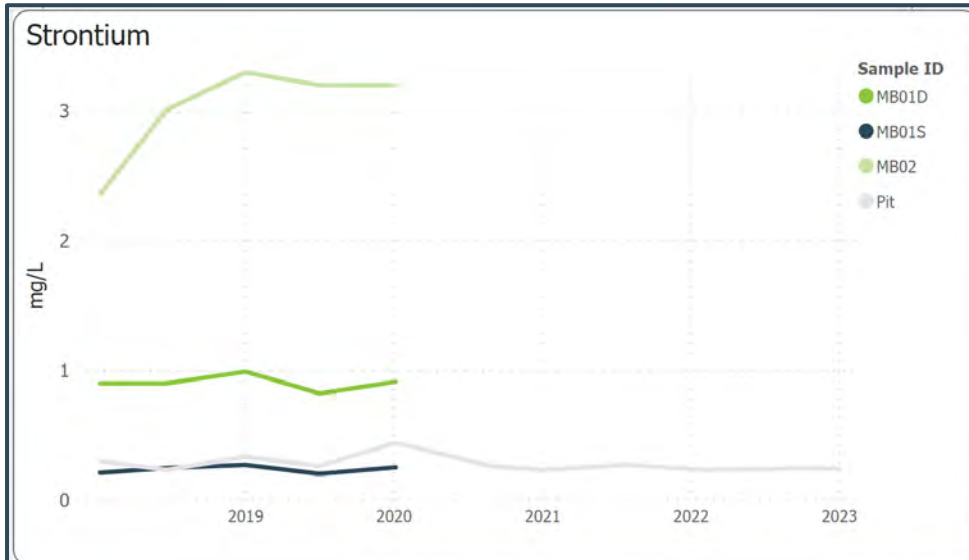












7.2.4 Interpretation of Groundwater Results

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 fluctuated several times during the reporting period. Several brief spikes in water level are apparent and correspond to rainfall events.
- The water level within MB01D has spiked several times, but was between 4.5m and 5.5m below top of casing for most of the monitoring period, with an upward trend. Several temporary groundwater elevation spikes were observed, possibly due to rainfall.
- The water level within MB02 rose approximately 4.0m between November 2021 and November 2022, at which point the elevation started a steady decrease.

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 August 22 and January and July 23, as summarised below.

Table 24. Summary of Pit Inflow Estimates

Monitoring Event	Change in water Level	Description of Pit Conditions	Estimate of Groundwater Inflow
18-19 September 2020	0mm Water Level Change 1mm Evaporation Loss	Pit floor approximately 6900m ² . Pit floor covered by water.	2.5ML/yr
12-13 December 2020	1mm rise. 1.4mm Evaporation Loss.	Pit floor approximately 6900m ² . Pit floor covered by water.	6.0ML/yr
		Average Inflow Estimate for August 2020 to January 2021	4.3ML/yr Limit 20ML/yr
30-31 March 2021	0mm Water Level Change 1.7mm Evaporation Loss	Pit floor approximately 6900m ² . Pit floor covered by water.	1.6ML/yr
26-27 May 2021	0mm Water Level Change 0.5mm Evaporation Loss	Pit floor approximately 6900m ² . Pit floor covered by water.	1.3ML/yr
		Average Inflow Estimate for January 2021 to July 2021	1.4ML/yr Limit 20ML/yr
18-19 August 2021	0mm Water Level Change 0.4mm Evaporation Loss	Pit floor approximately 6900m ² . Pit floor covered by water.	1.0ML/yr
17-18 December 2021	0mm Water Level Change 2.0mm Evaporation Loss	Pit floor approximately 6900m ² . Pit floor covered by water.	5.0ML/yr
		Average Inflow Estimate for July 2021 to February 2022	3.0ML/yr Limit 20ML/yr
15-16 February 2022	No change observed	Pit floor approximately 6900m ² . Pit floor covered by water.	6.3ML/yr
23-24 May 2022	No change observed	Pit floor approximately 6900m ² .	0.8ML/yr

Monitoring Event	Change in water Level	Description of Pit Conditions	Estimate of Groundwater Inflow
		Pit floor covered by water.	
		Average Inflow Estimate for February 2022 to August 2022	3.5ML/yr Limit 20ML/yr
6-7 September 2022	No change in water level. 0.4mm evaporation loss	Pit floor approximately 6900m ² . Pit floor covered by water.	1.0ML/yr
20-21 December 2022	No change in water level. 1.7mm evaporation loss	Pit floor approximately 6900m ² . Pit floor covered by water.	4.3ML/yr
27-28 January 2023	No change in water level. 2.1mm evaporation* loss	Pit floor approximately 6900m ² . Pit floor covered by water.	5.3ML/yr
23-24 March 2023	No change in water level. 2.2mm evaporation* loss	Pit floor approximately 6900m ² . Pit floor covered by water.	5.5ML/yr
22-23 June 2023	No change in water level. 0.5mm evaporation* loss	Pit floor approximately 6900m ² . Pit floor covered by water.	1.3ML/yr
		Average Inflow Estimate for August 2022 to July 2023	3.5ML/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 25. 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

No planting activities were undertaken in this report period. Inspection of previous plantings revealed the majority of plants are still alive and growing well, with most of the tree guards removed to allow for further tree growth.

9 Community

There were two complaints received during the reporting period, see *Table 30*. Complaints are recorded on a complaints register, a copy of which may be found on the website: <https://www.hy-tec.com.au/quarry-documentation>.

Table 26. Complaints Summary

Review Period	Details	Action	Where Addressed in Report
2017-2018	1 complaint: noisy truck	Mufflers upgraded	N/A
2018-2019	No complaints	N/A	-
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	Section 6.3
	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	Section 11

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 DPIE 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 DPIE. Correspondence regarding all notifications is included in [Appendix L](#). These details are also included in the relevant sections in this report.

Table 27. Summary of Notifications in Report Period

Description	Condition	Date of Incident	Material Harm caused or threatened?	Non-compliance	Authority Notification	Site Action
Blasting outside of approved hours.	Sched 3, Cond 1	18/1/2023 16:25pm	No	Yes	DPE was notified and DPE issued a letter acknowledging the non-compliance dated 20/1/2023. Blast monitoring complied and no complaints were received. A breach in conditions was recoded by DPE and no further actions are proposed.	No further action.

10.3 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEWS

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 28. Actions Proposed in Last Report Period

Proposal	Where Addressed
It is anticipated that the currently proposed modification to SSD 6084 will be determined during the next reporting period.	Section 4.1.1
Once the outcomes of the Assessment of Reasonable Equivalence of Biodiversity Offsetting Credits have been completed, a Biodiversity Offsetting Strategy will be finalised and submitted to DPIE and OEH for approval.	Section 4.1.1
Ongoing management of the priority weed infestations to suppress 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
A control program for feral animals will be undertaken in conjunction with the landowner to ensure fox, rabbit and goat numbers do not increase at the site.	Section 6.9.1.2
Controlled burn-off will be undertaken in conjunction with RFS is conditions are suitable.	Section 6.8
Consult with EPA on whether EPL Point 3 requires an alternative location in the event of unsafe sampling conditions, as experienced in March 2021.	Variation to the licence is not yet submitted.

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 suppress 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.
- Install additional signage at the quarry to remind heavy vehicles to minimise speed over the bridge near neighbouring property where noise complaint received.
- 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 2022 - 30th June 2023

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 30/6/2022	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	NC with Sched 3 cond 1 on 18/01/2023, blast out of hours
	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 2022 - 30th June 2023

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 30/6/2022	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://www.hy-tec.com.au/quarry-documentation																				
	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. <table border="1"> <caption>Table 1: Operating Hours</caption> <thead> <tr> <th>Activity</th> <th>Permissible Hours</th> </tr> </thead> <tbody> <tr> <td>• Extraction operations</td> <td>• 6 am to 10 pm Monday to Friday;</td> </tr> <tr> <td>• Processing operations</td> <td>• 6 am to 3 pm Saturday; and</td> </tr> <tr> <td>• Overburden Management</td> <td>• At no time on Sundays or public holidays.</td> </tr> <tr> <td>• Stockpile Management</td> <td></td> </tr> <tr> <td>• Blasting</td> <td>• 10 am to 3 pm Monday to Friday (except public holidays).</td> </tr> <tr> <td>• Loading and dispatch</td> <td>• 4 am to 10 pm Monday to Friday;</td> </tr> <tr> <td></td> <td>• 5 am to 3 pm Saturdays; and</td> </tr> <tr> <td></td> <td>• At no time on Sundays or public holidays.</td> </tr> <tr> <td>• Maintenance</td> <td>• Anytime.</td> </tr> </tbody> </table>	Activity	Permissible Hours	• Extraction operations	• 6 am to 10 pm Monday to Friday;	• Processing operations	• 6 am to 3 pm Saturday; and	• Overburden Management	• At no time on Sundays or public holidays.	• Stockpile Management		• 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.	1 Non Compliance Blasting undertaken outside of approved hours	Section 5.4 and 10
Activity	Permissible Hours																							
• Extraction operations	• 6 am to 10 pm Monday to Friday;																							
• Processing operations	• 6 am to 3 pm Saturday; and																							
• Overburden Management	• At no time on Sundays or public holidays.																							
• Stockpile Management																								
• 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 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 border="1"> <caption>Table 2: Noise criteria dB(A)</caption> <thead> <tr> <th>Receiver</th> <th>Day dB(A)_{LAeq(15 min)}</th> <th>Evening dB(A)_{LAeq(15 min)}</th> <th>Morning Shoulder dB(A)_{LAeq(15 min)}</th> <th>Morning Shoulder (Sleep Disturbance) <i>LA max</i></th> </tr> </thead> <tbody> <tr> <td>All privately-owned residences</td> <td>35</td> <td>35</td> <td>35</td> <td>52</td> </tr> </tbody> </table>	Receiver	Day dB(A) _{LAeq(15 min)}	Evening dB(A) _{LAeq(15 min)}	Morning Shoulder dB(A) _{LAeq(15 min)}	Morning Shoulder (Sleep Disturbance) <i>LA max</i>	All privately-owned residences	35	35	35	52	Compliant	Section 6.2										
Receiver	Day dB(A) _{LAeq(15 min)}	Evening dB(A) _{LAeq(15 min)}	Morning Shoulder dB(A) _{LAeq(15 min)}	Morning Shoulder (Sleep Disturbance) <i>LA max</i>																				
All privately-owned residences	35	35	35	52																				
	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: September 2022, March 2023.	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: <input type="checkbox"/> compliance with the noise criteria in this consent; <input type="checkbox"/> best practice management is being employed; and <input type="checkbox"/> 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																					

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2022 - 30th June 2023

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 30/6/2022	Where addressed in Annual Review																					
	5 d)	describe the proposed noise management system; and	Compliant																						
	5 e)	include a monitoring program: <ul style="list-style-type: none"> 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.	Compliant NMP was updated (30/07/19) to the MOD 2 conditions and approved 23/08/19.																						
	6	The Applicant must ensure that blasting on site does not cause any exceedance of the criteria in Table 3. <table border="1"> <caption>Table 3: Blasting Criteria</caption> <thead> <tr> <th>Receiver</th> <th>Airblast overpressure (dB(Lin Peak))</th> <th>Ground vibration (mm/s)</th> <th>Allowable exceedance</th> </tr> </thead> <tbody> <tr> <td>Any residence on privately-owned land</td> <td>120</td> <td>10</td> <td>0%</td> </tr> <tr> <td></td> <td>115</td> <td>5</td> <td>5% of the total number of blasts over a period of 12 months</td> </tr> </tbody> </table>	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	Compliant Nil exceedances.	Section 6.3									
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																						
	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.	Compliant																						
	8 a)	During blasting operations, the Applicant must : implement best practice management to: <ul style="list-style-type: none"> 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; 	Compliant																						
	8 b)	operate a suitable system to enable the local community to get up-to-date information on the proposed blasting schedule on site; and	Compliant	Letter drop at least one week prior to blast																					
	8 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	Compliant	Every blast monitored Section 6.3																					
	9 a)	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;	Compliant: BMP V3 23/07/2019 approved 23/08/2019																						
	9 b)	describe the measures that would be implemented to ensure compliance with the blast criteria and operating conditions of this consent;	Compliant																						
	9 c)	include a monitoring program for evaluating and reporting on compliance with the blasting criteria in this consent;	Compliant																						
	9 d)	include community notification procedures for the blasting schedule; and	Compliant																						
	9 e)	include a protocol for investigating and responding to complaints. The Applicant must implement the Blast Management Plan as approved by the Secretary	Compliant																						
	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 border="1"> <caption>Table 4: Air quality criteria</caption> <thead> <tr> <th>Pollutant</th> <th>Averaging Period</th> <th>Criterion</th> </tr> </thead> <tbody> <tr> <td>Particulate matter < 10 µm (PM₁₀)</td> <td>Annual</td> <td>^{a,d} 25 µg/m³</td> </tr> <tr> <td>Particulate matter < 10 µm (PM₁₀)</td> <td>24 hour</td> <td>^b 50 µg/m³</td> </tr> <tr> <td>Particulate matter < 2.5 µm (PM_{2.5})</td> <td>Annual</td> <td>^{a,d} 8 µg/m³</td> </tr> <tr> <td>Particulate matter < 2.5 µm (PM_{2.5})</td> <td>24 hour</td> <td>^b 25 µg/m³</td> </tr> <tr> <td>Total suspended particulates (TSP)</td> <td>Annual</td> <td>^{a,d} 90 µg/m³</td> </tr> <tr> <td>^c Deposited dust</td> <td>Annual</td> <td>^b 2 g/m²/month ^{a,d} 4 g/m²/month</td> </tr> </tbody> </table> <p>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.</p>	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	Compliant - no exceedances	Section 6.4
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																							
	11 a)	The Applicant must : implement best practice management to minimise the dust emissions of the development;	Compliant																						
	11 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;	Compliant	Section 6.1 (Climate) and 6.4 (Air Quality). Activities not ceased during report due to climatic conditions																					
	11 c)	minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note under Table 4);	Compliant																						
	11 d)	monitor and report on compliance with the relevant air quality conditions in this consent; and	Compliant	Section 6.4																					
	11 e)	minimise the area of surface disturbance and undertake progressive rehabilitation of the site, to the satisfaction of the Secretary.	Compliant	See Figures																					

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2022 - 30th June 2023

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 30/6/2022	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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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.	Compliant Operational meteorological weather station on site	
	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, Dol 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: <ul style="list-style-type: none"> (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 Management 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 and annually) and publish a summary of records on its website every 6 months.	Compliant	Section 5.2 and https://www.hy-tec.com.au/quarry-documentation
	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 2024
	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 2022 - 30th June 2023

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 30/6/2022	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	<p>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.</p> <table border="1"> <caption>Table 4A: Biodiversity credits to be retired</caption> <thead> <tr> <th>Credit Type</th> <th>Offset Type</th> <th>Number of Credits</th> </tr> </thead> <tbody> <tr> <td>Ecosystem Credit</td> <td>PCT 1093 – Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion</td> <td>649</td> </tr> <tr> <td>Ecosystem Credit</td> <td>PCT 649 – Apple Box – Broad-leaved Peppermint dry open forest of the South Eastern Highlands Bioregion</td> <td>131</td> </tr> <tr> <td>Ecosystem Credit</td> <td>PCT 840 – Forest Red Gum – Yellow Box woodland of dry gorge slopes, southern Sydney Basin Bioregion and South-Eastern Highlands Bioregion</td> <td>60</td> </tr> <tr> <td>Species Credit</td> <td>Silver-leaved Mountain Gum (<i>Eucalyptus pulverulenta</i>)</td> <td>10,784</td> </tr> </tbody> </table> <p>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.</p> <p><i>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.</i></p>	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 (<i>Eucalyptus pulverulenta</i>)	10,784	Compliant	
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 (<i>Eucalyptus pulverulenta</i>)	10,784																	
	26	Deleted																	
	27	<p>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.</p> <table border="1"> <caption>Table 5: Rehabilitation Objectives</caption> <thead> <tr> <th>Feature</th> <th>Objective</th> </tr> </thead> <tbody> <tr> <td>Site (as a whole)</td> <td> <ul style="list-style-type: none"> 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 </td> </tr> <tr> <td>Surface Infrastructure</td> <td> <ul style="list-style-type: none"> Decommissioned and removed, unless DRG agrees otherwise </td> </tr> <tr> <td>Quarry Benches</td> <td> <ul style="list-style-type: none"> Landscaped and vegetated using native tree and understorey species </td> </tr> <tr> <td>Quarry Pit Floor</td> <td> <ul style="list-style-type: none"> Landscaped and revegetated using native tree and understorey species </td> </tr> <tr> <td>Final Void</td> <td> <ul style="list-style-type: none"> Minimise the size, depth and slope of the batters of the final void Minimise the drainage catchment of the final void </td> </tr> </tbody> </table>	Feature	Objective	Site (as a whole)	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Decommissioned and removed, unless DRG agrees otherwise 	Quarry Benches	<ul style="list-style-type: none"> Landscaped and vegetated using native tree and understorey species 	Quarry Pit Floor	<ul style="list-style-type: none"> Landscaped and revegetated using native tree and understorey species 	Final Void	<ul style="list-style-type: none"> Minimise the size, depth and slope of the batters of the final void Minimise the drainage catchment of the final void 	Compliant	Section 8			
Feature	Objective																		
Site (as a whole)	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Decommissioned and removed, unless DRG agrees otherwise 																		
Quarry Benches	<ul style="list-style-type: none"> Landscaped and vegetated using native tree and understorey species 																		
Quarry Pit Floor	<ul style="list-style-type: none"> Landscaped and revegetated using native tree and understorey species 																		
Final Void	<ul style="list-style-type: none"> Minimise the size, depth and slope of the batters of the final void Minimise the drainage catchment of the final void 																		
	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: <input type="checkbox"/> manage remnant vegetation and habitat on site, including within any land based offset; and <input type="checkbox"/> ensure compliance with the rehabilitation objectives and progressive rehabilitation obligations in this consent;	Compliant																

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2022 - 30th June 2023

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 30/6/2022	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: <ul style="list-style-type: none"> <input type="checkbox"/> 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; <input type="checkbox"/> 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; <input type="checkbox"/> protect, conserve, propagate, plant and/or regenerate Silver-leaved Mountain Gum (<i>Eucalyptus pulverulenta</i>) (including the propagation and planting of at least 1,000 individuals of this species); <input type="checkbox"/> protecting vegetation and fauna habitat outside the approved disturbance area on-site; <input type="checkbox"/> minimising the impacts on native fauna, including undertaking pre-clearance surveys; <input type="checkbox"/> establishing vegetation screening to minimise the visual impacts of the site on surrounding receivers; <input type="checkbox"/> ensuring minimal environmental consequences for threatened species, populations and habitats; <input type="checkbox"/> collecting and propagating seed; <input type="checkbox"/> controlling weeds and feral pests; <input type="checkbox"/> controlling erosion; <input type="checkbox"/> controlling access; and <input type="checkbox"/> 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: <ul style="list-style-type: none"> • 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;	Compliant. Next due 2023	
	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	Compliant. Next due 2023	
	31 c)	performance of the implementation of any land based offset and rehabilitation of the site to date.	Compliant. Next due 2023	
	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	
	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.	None received Compliant	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2022 - 30th June 2023

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 30/6/2022	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: <input type="checkbox"/> keep the local community and relevant agencies informed about the operation and environmental performance of the development; <input type="checkbox"/> receive, record, handle and respond to Complaints; <input type="checkbox"/> resolve any disputes that may arise during the course of the development; <input type="checkbox"/> respond to any non-compliance and any incident ; <input type="checkbox"/> respond to emergencies; and	Compliant	
	1 f)	(f) include: <input type="checkbox"/> references to any strategies, plans and programs approved under the conditions of this consent; and <input type="checkbox"/> 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: <input type="checkbox"/> 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: <input type="checkbox"/> impacts and environmental performance of the development; and <input type="checkbox"/> 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: <input type="checkbox"/> incidents; <input type="checkbox"/> Complaints; <input type="checkbox"/> non-compliances with statutory requirements; and <input type="checkbox"/> 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 2022 - 30th June 2023

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 30/6/2022	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: <ul style="list-style-type: none"> <input type="checkbox"/> relevant statutory requirements, limits or performance measures/criteria; <input type="checkbox"/> requirements of any plan or program required under this consent; <input type="checkbox"/> monitoring results of previous years; and <input type="checkbox"/> 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://www.hy-tec.com.au/quarry-documentation
	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: <ul style="list-style-type: none"> (a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary; 	Compliant Independent 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 : <ul style="list-style-type: none"> (a) make the following information publicly available on its website: <ul style="list-style-type: none"> <input type="checkbox"/> the documents listed in condition 2 of Schedule 2; <input type="checkbox"/> current statutory approvals for the development; <input type="checkbox"/> all approved strategies, plans and programs required under the conditions of this consent; <input type="checkbox"/> 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; <input type="checkbox"/> a Complaints register, updated monthly; <input type="checkbox"/> the annual reviews of the development; <input type="checkbox"/> any independent environmental audit, and the Applicant's response to the recommendations in any audit; and <input type="checkbox"/> any other matter required by the Secretary; and 	Compliant	https://www.hy-tec.com.au/quarry-documentation
	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 2022 - 30th June 2023

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 30/6/2022	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	NC with Sched 3 cond 1 on 18/01/2023, blast out of hours
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 2022 - 30th June 2023

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 30/6/2022	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 slopes where 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 2022 - 30th June 2023

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 30/6/2022	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 2022 - 30th June 2023

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 30/6/2022	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 2022 - 30th June 2023

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		1	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																																				
		<table border="1"> <thead> <tr> <th colspan="4">AIR</th> </tr> <tr> <th>EPA identification no.</th> <th>Type of Monitoring Point</th> <th>Type of Discharge Point</th> <th>Location Description</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>Ambient air monitoring</td> <td></td> <td>Dust monitoring location identified as "AQD-1" on Figure 1 Environment Protection Licence Monitoring Points - provided to EPA on 19/09/11 (DOC11/40371).</td> </tr> <tr> <td>5</td> <td>Ambient air monitoring</td> <td></td> <td>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.</td> </tr> <tr> <td>6</td> <td>Ambient air monitoring</td> <td></td> <td>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.</td> </tr> <tr> <td>12</td> <td>Weather Analysis</td> <td></td> <td>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.</td> </tr> </tbody> </table>	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												
	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.																																				
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.	Compliant																																					
	<table border="1"> <thead> <tr> <th colspan="4">Water and land</th> </tr> <tr> <th>EPA identification no.</th> <th>Type of Monitoring Point</th> <th>Type of Discharge Point</th> <th>Location Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Discharge to waters; Discharge quality monitoring</td> <td>Discharge to waters; Discharge quality monitoring</td> <td>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</td> </tr> <tr> <td>2</td> <td>Ambient water monitoring</td> <td></td> <td>Water monitoring location identified on Figure 6.1 of report entitled "Hartley Quarry - Annual Environmental Management Report" (2003), upstream of the processing area.</td> </tr> <tr> <td>3</td> <td>Ambient water monitoring</td> <td></td> <td>Water monitoring location identified on Figure 6.1 of report entitled "Hartley Quarry - Annual Environmental Management Report" (2003), downstream of the processing area.</td> </tr> <tr> <td>8</td> <td>Discharge to waters; Discharge quality monitoring</td> <td>Discharge to waters; Discharge quality monitoring</td> <td>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</td> </tr> <tr> <td>9</td> <td>Discharge to waters; Discharge quality monitoring</td> <td>Discharge to waters; Discharge quality monitoring</td> <td>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</td> </tr> <tr> <td>10</td> <td>Discharge to waters; Discharge quality monitoring</td> <td>Discharge to waters; Discharge quality monitoring</td> <td>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</td> </tr> <tr> <td>11</td> <td>Discharge to waters; Discharge quality monitoring</td> <td>Discharge to waters; Discharge quality monitoring</td> <td>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</td> </tr> </tbody> </table>	Water and land				EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description	1	Discharge to waters; Discharge quality monitoring	Discharge 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.	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	
Water and land																																							
EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description																																				
1	Discharge to waters; Discharge quality monitoring	Discharge 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.																																				
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																																				
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 2022 - 30th June 2023

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																								
	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																									
		<p>POINT 11,8,9,10,1</p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Units of Measure</th> <th>50 percentile concentration limit</th> <th>90 percentile concentration limit</th> <th>3DGM concentration limit</th> <th>100 percentile concentration limit</th> </tr> </thead> <tbody> <tr> <td>Oil and Grease</td> <td>milligrams per litre</td> <td></td> <td></td> <td></td> <td>10</td> </tr> <tr> <td>pH</td> <td>pH</td> <td></td> <td></td> <td></td> <td>6.5 - 8.5</td> </tr> <tr> <td>Total suspended solids</td> <td>milligrams per litre</td> <td></td> <td></td> <td></td> <td>30</td> </tr> </tbody> </table>	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	
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																							
	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																									
		<table border="1"> <thead> <tr> <th>Code</th> <th>Waste</th> <th>Description</th> <th>Activity</th> <th>Other Limits</th> </tr> </thead> <tbody> <tr> <td>NA</td> <td>Cured concrete waste from a batch plant</td> <td>Recycled concrete aggregate sourced from Hy-Tec Industries Pty Limited's concrete batching plants</td> <td>Resource recovery Waste processing (non-thermal treatment) Waste storage</td> <td>5,000 tonnes per year</td> </tr> <tr> <td>NA</td> <td>General or Specific exempted waste</td> <td>Waste that meets all the conditions of a resource recovery exemption under Clause 51A of the Protection of the Environment Operations (Waste) Regulation 2005</td> <td>As specified in each particular resource recovery exemption</td> <td>NA</td> </tr> </tbody> </table>	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										
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																								
	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	Section 6.2																								
	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.	Non Compliant	Section 6.3																								
	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	Section 6.3																								
	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	Section 6.3																								
	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	Section 6.3																								
	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 2022 - 30th June 2023

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 <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Units of measure</th> <th>Frequency</th> <th>Sampling Method</th> </tr> </thead> <tbody> <tr> <td>Particulates - Deposited Matter</td> <td>grams per square metre per month</td> <td>Continuous</td> <td>AM-19</td> </tr> </tbody> </table>	Pollutant	Units of measure	Frequency	Sampling Method	Particulates - Deposited Matter	grams per square metre per month	Continuous	AM-19	Compliant																									
Pollutant		Units of measure	Frequency	Sampling Method																																
Particulates - Deposited Matter		grams per square metre per month	Continuous	AM-19																																
2.3		POINT 1,8,9,10,11 <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Units of measure</th> <th>Frequency</th> <th>Sampling Method</th> </tr> </thead> <tbody> <tr> <td>Oil and Grease</td> <td>milligrams per litre</td> <td>Daily during any discharge</td> <td>Grab sample</td> </tr> <tr> <td>pH</td> <td>pH</td> <td>Daily during any discharge</td> <td>Grab sample</td> </tr> <tr> <td>Total suspended solids</td> <td>milligrams per litre</td> <td>Daily during any discharge</td> <td>Grab sample</td> </tr> </tbody> </table> POINT 2,3 <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Units of measure</th> <th>Frequency</th> <th>Sampling Method</th> </tr> </thead> <tbody> <tr> <td>Oil and Grease</td> <td>milligrams per litre</td> <td>Special Frequency 1</td> <td>Grab sample</td> </tr> <tr> <td>pH</td> <td>pH</td> <td>Special Frequency 1</td> <td>Grab sample</td> </tr> <tr> <td>Total suspended solids</td> <td>milligrams per litre</td> <td>Special Frequency 1</td> <td>Grab sample</td> </tr> </tbody> </table>	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	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	Compliant	
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																																	
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																																	
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 occurring 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 2022 - 30th June 2023

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																															
		<p>POINT 11,8,9,10,1</p> <table border="1"> <thead> <tr> <th>Frequency</th> <th>Unit of Measure</th> <th>Sampling Method</th> </tr> </thead> <tbody> <tr> <td>Daily during any discharge</td> <td>kilolitres per day</td> <td>Estimate</td> </tr> </tbody> </table>	Frequency	Unit of Measure	Sampling Method	Daily during any discharge	kilolitres per day	Estimate	Compliant																									
Frequency	Unit of Measure	Sampling Method																																
Daily during any discharge	kilolitres per day	Estimate																																
	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:	Compliant																															
		<table border="1"> <thead> <tr> <th>Parameter</th> <th>Units of Measure</th> <th>Frequency</th> <th>Averaging Period</th> <th>Sampling Method</th> </tr> </thead> <tbody> <tr> <td>Air temperature</td> <td>oC</td> <td>Continuous</td> <td>1 hour</td> <td>AM-4</td> </tr> <tr> <td>Wind Direction</td> <td>o</td> <td>Continuous</td> <td>15 minute</td> <td>AM-2 & AM-4</td> </tr> <tr> <td>Wind Speed</td> <td>m/s</td> <td>Continuous</td> <td>15 minute</td> <td>AM-2 & AM-4</td> </tr> <tr> <td>Sigma theta</td> <td>o</td> <td>Continuous</td> <td>15 minute</td> <td>AM-2 & AM-4</td> </tr> <tr> <td>Rainfall</td> <td>mm</td> <td>Continuous</td> <td>24 hour</td> <td>AM-4</td> </tr> </tbody> </table>	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	Compliant	
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 2022 - 30th June 2023

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 2022 - 30th June 2023

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 possible

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 2022 - 30th June 2023

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 2022 - 30th June 2023

WAL Conditions

Compliant
Non Compliant
Not Triggered

Non-compliance

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.

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 2022 - 30th June 2023

WAL Conditions

Compliant

Non Compliant

Not Triggered

Non-compliance

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.

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 2022 - 30th June 2023

WAL Conditions

Compliant
Non Compliant
Not Triggered

Non-compliance

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		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

15 July 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 1 in red type

July 2019 modification 2 in light blue type

TABLE OF CONTENTS

DEFINITIONS	3
ADMINISTRATIVE CONDITIONS	5
Obligation to Minimise Harm to the Environment.....	5
Terms of Consent	5
Lapsing of Consent.....	5
Limits on Consent	5
Surrender of Existing Development Consents	5
Structural Adequacy.....	6
Demolition.....	6
Protection of Public Infrastructure.....	6
Operation of Plant and Equipment.....	6
Updating and Staging of Strategies, Plans or Programs.....	6
Production Data	6
Identification of Approved Extraction Limits	6
Community Enhancement.....	7
Evidence of Consultation	7
Applicability of Guidelines	7
Compliance.....	7
ENVIRONMENTAL PERFORMANCE CONDITIONS	8
Noise.....	8
Blasting	9
Air Quality	10
Soil And Water.....	11
Transport	12
Aboriginal Heritage	13
Landscape And Rehabilitation	13
Visual	15
Waste.....	15
Liquid storage	15
Dangerous Goods.....	15
Bushfire.....	16
ADDITIONAL PROCEDURES.....	17
Notification of Landowners.....	17
Independent Review	17
ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING.....	18
Environmental Management.....	18
Reporting	19
Independent Environmental Audit	19
Access To Information	20
APPENDIX 1: DEVELOPMENT AREA	21
APPENDIX 2: DEVELOPMENT LAYOUT.....	22
APPENDIX 3: STATEMENT OF COMMITMENTS.....	23
APPENDIX 4: CONCEPTUAL FINAL LANDFORM.....	29
APPENDIX 5: DELETED.....	31
APPENDIX 6: DELETED.....	32
APPENDIX 7: PLANNING AGREEMENT	33

DEFINITIONS

<p>AHD Annual Review Applicant</p> <p>BCA BC Act BCT Conditions of consent Conservation Area H</p> <p>Construction</p> <p>Council</p> <p>Day</p> <p>Department Development</p> <p>DoI DRG EIS</p> <p>EPA EP&A Act EP&A Regulation EPL Evening Feasible GPS</p> <p>Incident</p> <p>Land</p> <p>Laden trucks</p> <p>Material harm</p>	<p>Australian Height Datum The review required by condition 4 of Schedule 5 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</p> <p>Building Code of Australia</p> <p>Biodiversity Conservation Act 2016 NSW Biodiversity Conservation Trust</p> <p>Conditions contained in Schedules 2 to 5 inclusive</p> <p>The 2.2 ha conservation area shown as 'easement for conservation maintenance work' in Appendix 2 and established in accordance with condition 7b of DA 103/94</p> <p>The demolition of buildings or works, carrying out of works and erection of buildings covered by this consent</p> <p>Lithgow City Council</p> <p>The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays</p> <p>Department of Planning, Industry and Environment</p> <p>The development as described in the documents listed in condition 2 of Schedule 2</p> <p>Department of Industry - Lands and Water Division of Resources and Geoscience within the Department</p> <p>Environmental Impact Statement titled <i>Environmental Impact Statement for the Austen Quarry Stage 2 Extension Project</i>, dated October 2014, as modified by the Response to Submissions titled, <i>Austen Quarry Stage 2 Extension Project Response to Submissions</i> dated January 2015</p> <p>NSW Environment Protection Authority <i>Environmental Planning and Assessment Act 1979</i> <i>Environmental Planning and Assessment Regulation 2000</i> Environment Protection Licence under the POEO Act</p> <p>The period from 6pm to 10pm</p> <p>Feasible relates to engineering considerations and what is practical to build</p> <p>Global Positioning System</p> <p>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</p> <p>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</p> <p>Trucks transporting quarry products from the site</p> <p>Is harm that:</p> <ul style="list-style-type: none"> • 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) <p>This definition excludes "harm" that is authorised under either this consent or any other statutory approval'</p> <p>NSW Minister for Planning and Public Spaces or delegate</p> <p>Activities associated with reducing the impacts of the development</p> <p>The period between 4 am and 7 am</p> <p>The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays</p> <p><i>Protection of the Environment Operations Act 1997</i></p> <p>Land that is not owned by a public agency or the Applicant (or its subsidiary)</p> <p>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.</p> <p>The extraction, processing and transportation of extractive materials on the site and the associated removal of vegetation, topsoil and overburden</p> <p>Includes all saleable quarry products, but excludes tailings and other wastes</p>
--	--

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 <i>Austen Quarry Stage 2 Extensions Project (MOD 1 – SSD 6084) Statement of Environmental Effects</i> , prepared by RW Corkery & Co Pty Limited, dated March 2018; including the Response to Submissions titled <i>Austen Quarry Stage 2 Extension Project (MOD 1 – SSD 6084) Response to Submissions</i> , prepared by RW Corkery & Co Pty Limited, dated June 2018
SEE (Mod 2)	Statement of Environmental Effects titled <i>Austen Quarry Overburden Emplacement Modification (MOD 2 – SSD 6084) Statement of Environmental Effects</i> , prepared by RW Corkery & Co Pty Limited, dated June 2019; additional information titled <i>Re: Austen Quarry (SSD 6084) Modification 2 – Response to Blue Mountains City Council</i> , prepared by RW Corkery & Co Pty Limited, dated 1 July 2019; and additional information titled <i>Re: Austen Quarry – Request for Information regarding Modification 2 to Development Consent SSD 6084</i> , prepared by RW Corkery & Co Pty Limited, dated 10 July 2019.
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 SEE (Mod 2); 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
<ul style="list-style-type: none"> • Extraction operations • Processing operations • Overburden Management • Stockpile Management 	<ul style="list-style-type: none"> • 6 am to 10 pm Monday to Friday; • 6 am to 3 pm Saturday; and • At no time on Sundays or public holidays.
<ul style="list-style-type: none"> • Blasting 	<ul style="list-style-type: none"> • 10 am to 3 pm Monday to Friday (except public holidays).
<ul style="list-style-type: none"> • Loading and dispatch 	<ul style="list-style-type: none"> • 4 am to 10 pm Monday to Friday; • 5 am to 3 pm Saturdays; and • At no time on Sundays or public holidays.
<ul style="list-style-type: none"> • Maintenance 	<ul style="list-style-type: none"> • 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) <i>LA max</i>
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:
- be prepared in consultation with EPA;
 - 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;
 - 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;
 - describe the proposed noise management system; and
 - 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**:
- 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;
 - operate a suitable system to enable the local community to get up-to-date information on the proposed blasting schedule on site; and
 - 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 agreed 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, **Dol** 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:
- 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;
 - 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;
 - 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;
 - 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:
- all work in the immediate vicinity of the suspected Aboriginal item or object ceases immediately;
 - a 10 m buffer area around the suspected item or object is cordoned off; and
 - 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 (<i>Eucalyptus pulverulenta</i>)	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)	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Decommissioned and removed, unless DRG agrees otherwise
Quarry Benches	<ul style="list-style-type: none"> • Landscaped and vegetated using native tree and understorey species
Quarry Pit Floor	<ul style="list-style-type: none"> • Landscaped and revegetated using native tree and understorey species
Final Void	<ul style="list-style-type: none"> • 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:
- 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;
 - provide details of the conceptual final landform and associated land uses for the site;
 - 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;
 - 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;
 - 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;
 - 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;
 - 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

38. 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

39. 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

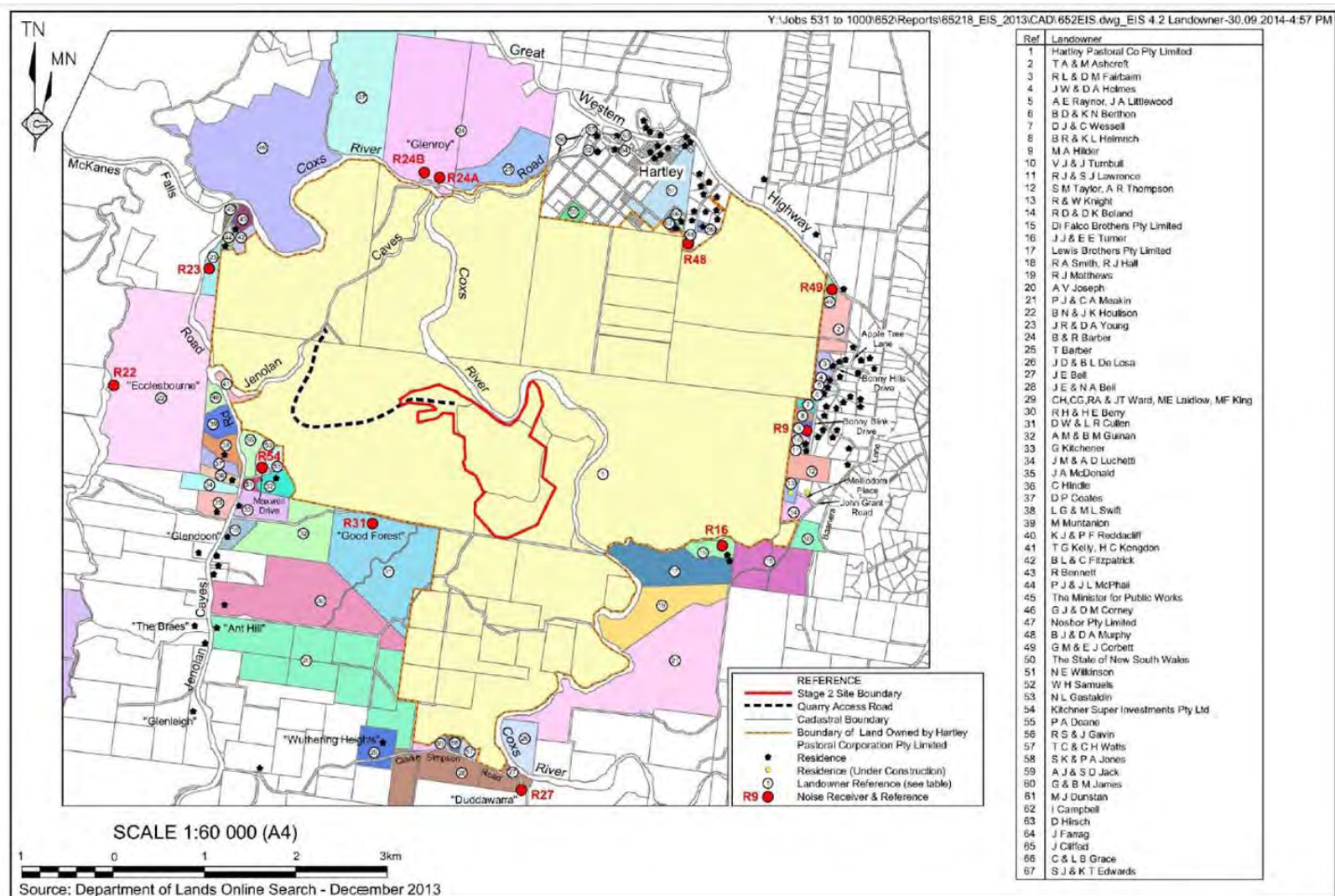


Figure 1: Development Area and nearby residences

APPENDIX 2 DEVELOPMENT LAYOUT

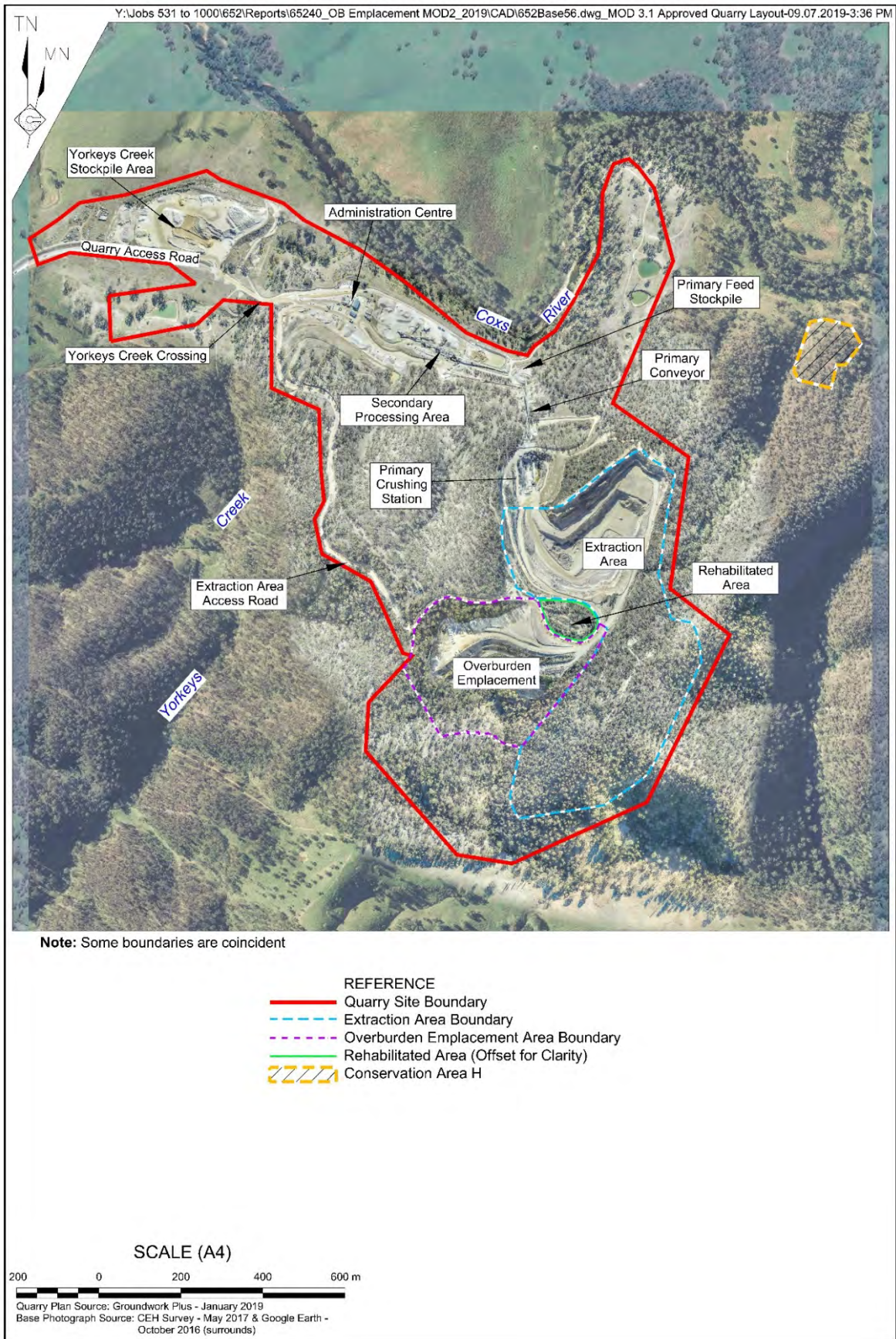


Figure 2: Development Layout of Austen Quarry and Conservation Area H

**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: <ul style="list-style-type: none"> • 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 <i>Eucalyptus pulverulenta</i> 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		
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.	Ongoing.
	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.

Desired Outcome	Action	Timing
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: <ul style="list-style-type: none"> 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. 	Ongoing. Ongoing. Ongoing. 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. <ul style="list-style-type: none"> 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 slopes where 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. <p>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.</p>	Prior to November 2015. Prior to November 2016. Ongoing. Ongoing. Ongoing. Ongoing. Ongoing. Ongoing.
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.
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 95 th percentile rainfall event.	Ongoing.
Manage the discharge of water	7.3 Apply procedures established in the Water Management Plan for the appropriate treatment of water that is to be	In the event off-site discharge is

Desired Outcome	Action	Timing
from the various sediment basins and storage dams.	discharged to natural drainage.	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 Dol .	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.
	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 <i>Guidelines for Fish Habitat Conservation and Management</i>	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	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	Ongoing.

Desired Outcome	Action	Timing
criteria nor significantly impact on neighbouring landowners and/or residents.	or below that nominated for noise modelling purposes (see <i>Table 5-1</i> of Benbow, 2014a).	
	11.3 Limit transportation noise by ensuring: i) All trucks under control of Hy-Tec, or accredited contractors would comply at all times with RMS noise limits.	Ongoing.
	j) All truck drivers would be required to sign a Code of Conduct that includes noise limiting behaviour. k) Comply with conditional limits on truck movements. l) The internal road network would be graded, as required, to limit body noise from empty trucks	Ongoing. Ongoing. 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: m) minimising use of haul trucks through use of an overland conveyor; n) minimising rehandling of overburden and products; o) maintaining and servicing equipment to ensure efficiency; p) minimising the quarry footprint to reduce land disturbance and travel distances; and q) optimising the design of the Processing Plant to	Ongoing. Ongoing. Ongoing. Ongoing.
	r) 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: s) the existing deposited dust gauges; and t) 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	14.1 Halt all works in the immediate area if cultural object(s)	Ongoing.

Desired Outcome	Action	Timing
potential for adverse Proposal-related impacts on historic heritage sites.	are found.	
	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 <i>Heritage Act 1977</i> .	
	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.
	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	Ongoing.

Desired Outcome	Action	Timing
	open cut, overburden emplacement and stockpiles.	
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 contractors	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**

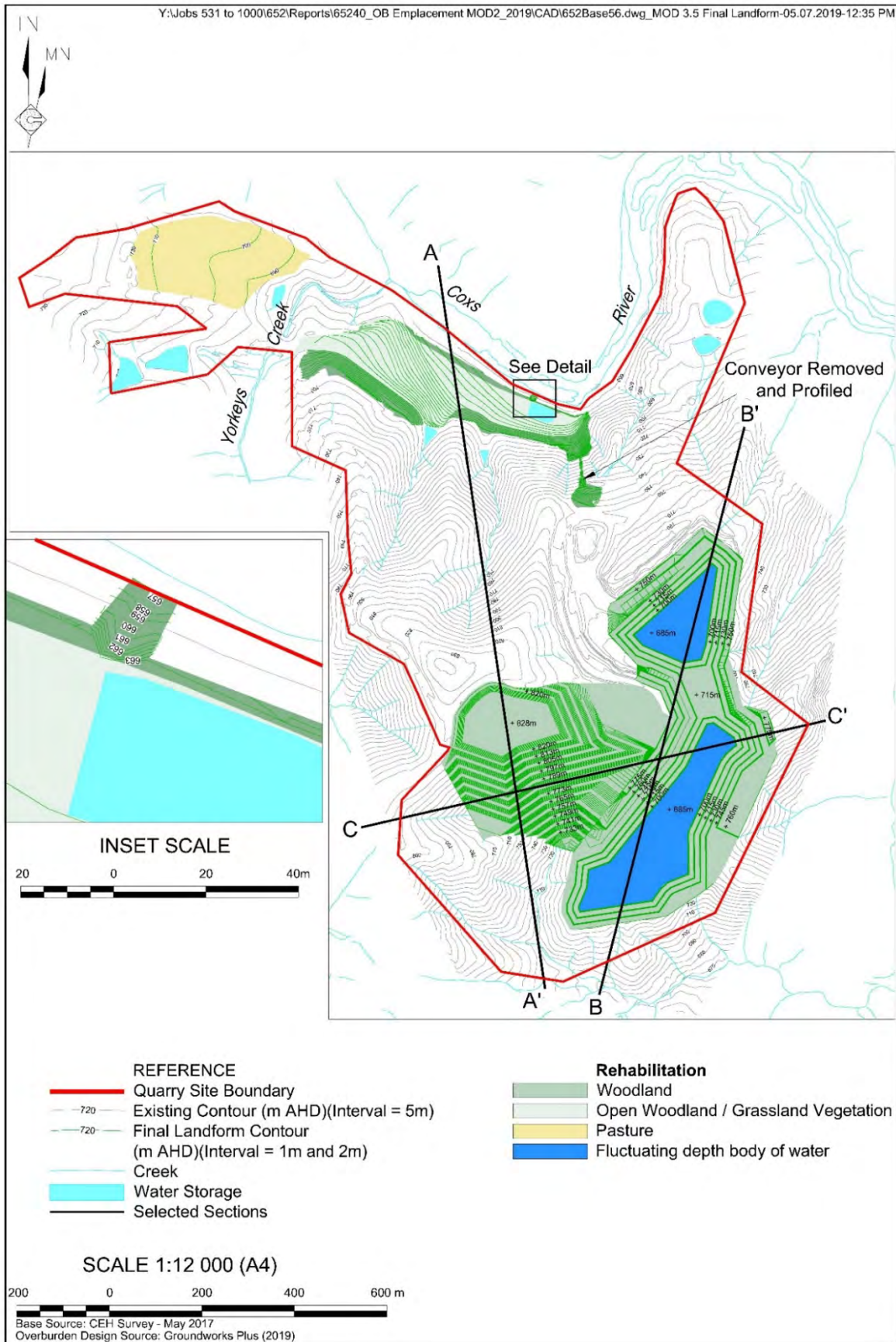


Figure 3: Conceptual Final Landform aerial view

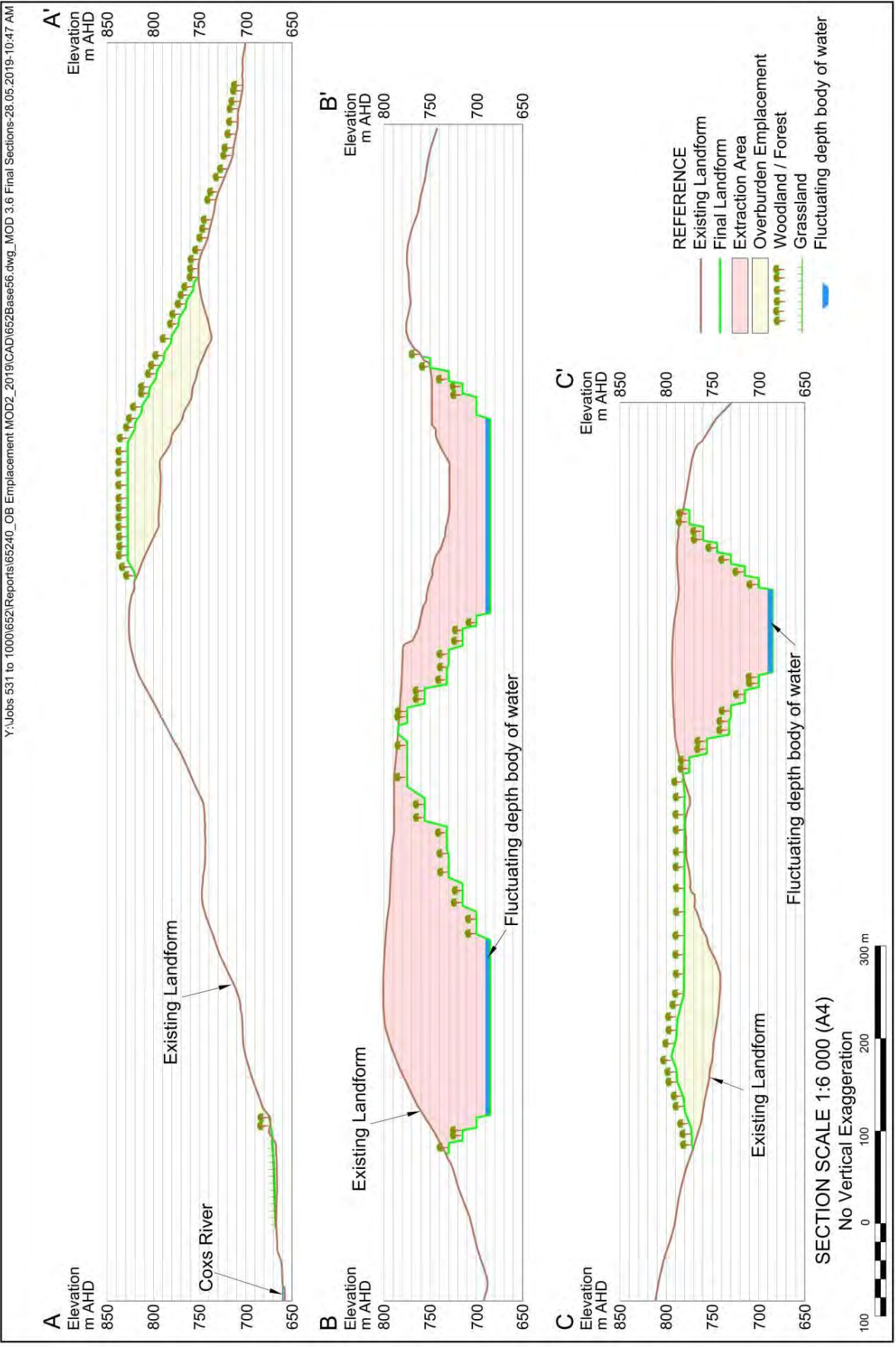


Figure 4: Conceptual Final Landform cross section view

APPENDIX 5:
DELETED

APPENDIX 6
DELETED

**APPENDIX 7
PLANNING AGREEMENT**

40. 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

AUS - 10 RHYOLITE PTY LIMITED

GPO BOX 2155

ADELAIDE SA 5001

Premises

AUS-10 QUARRY

391 JENOLAN CAVES ROAD

HARTLEY NSW 2790

Scheduled Activity

Extractive activities

Fee Based Activity

Land-based extractive activity

Scale

> 500000-2000000 T annual capacity
to extract, process or store

Region

Regional South - Bathurst

L102, 346 PANORAMA AVENUE

BATHURST NSW 2795

Phone: (02) 6333 3800

Fax: (02) 6333 3809

PO Box 1388

BATHURST NSW 2795



Environment Protection Licence

Licence - 12323

INFORMATION ABOUT THIS LICENCE	4
Dictionary	4
Responsibilities of licensee	4
Variation of licence conditions	4
Duration of licence	4
Licence review	4
Fees and annual return to be sent to the EPA	4
Transfer of licence	5
Public register and access to monitoring data	5
1 ADMINISTRATIVE CONDITIONS	6
A1 What the licence authorises and regulates	6
A2 Premises or plant to which this licence applies	6
A3 Information supplied to the EPA	6
2 DISCHARGES TO AIR AND WATER AND APPLICATIONS TO LAND	7
P1 Location of monitoring/discharge points and areas	7
3 LIMIT CONDITIONS	8
L1 Pollution of waters	8
L2 Concentration limits	8
L3 Waste	10
L4 Noise limits	10
L5 Blasting	10
L6 Hours of operation	11
4 OPERATING CONDITIONS	11
O1 Activities must be carried out in a competent manner	11
O2 Maintenance of plant and equipment	11
O3 Dust	12
O4 Other operating conditions	12
5 MONITORING AND RECORDING CONDITIONS	12
M1 Monitoring records	12
M2 Requirement to monitor concentration of pollutants discharged	13
M3 Testing methods - concentration limits	14
M4 Recording of pollution complaints	14
M5 Telephone complaints line	14
M6 Requirement to monitor volume or mass	15



Environment Protection Licence

Licence - 12323

M7	Blasting	15
M8	Other monitoring and recording conditions	15
6	REPORTING CONDITIONS	16
R1	Annual return documents	16
R2	Notification of environmental harm	17
R3	Written report	17
7	GENERAL CONDITIONS	18
G1	Copy of licence kept at the premises or plant	18
G2	Contact number for incidents and responsible employees	18
G3	Signage	18
DICTIONARY	19
	General Dictionary	19

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



Licence - 12323

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:

AUS - 10 RHYOLITE PTY LIMITED
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	> 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:

- 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
- the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

Environment Protection Licence



Licence - 12323

2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

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	Discharge to Waters; Discharge Quality Monitoring	Discharge 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

Environment Protection Licence



Licence - 12323

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.
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\ 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.

Environment Protection Licence



Licence - 12323

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\.

L2.4 Water and/or Land Concentration Limits

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).

Environment Protection Licence

Licence - 12323

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 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

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

Environment Protection Licence



Licence - 12323

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

Environment Protection Licence



Licence - 12323

- 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:

Environment Protection Licence

Licence - 12323

- 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:

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,

Environment Protection Licence



Licence - 12323

with the exception of when a discharge is occurring 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:
- any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or
 - 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
 - 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 2010* 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:
- the date and time of the complaint;
 - the method by which the complaint was made;
 - any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
 - the nature of the complaint;
 - the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
 - 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

Environment Protection Licence

Licence - 12323

- 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:
- the volume of liquids discharged to water or applied to the area;
 - the mass of solids applied to the area;
 - 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
- 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
 - 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

Environment Protection Licence



Licence - 12323

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').

Environment Protection Licence



Licence - 12323

- 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 the incident occurred.

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

Environment Protection Licence



Licence - 12323

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.

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.

Environment Protection Licence

Licence - 12323

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 <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
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 <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
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

Environment Protection Licence

Licence - 12323

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 Environment 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 described 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 months. 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 <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .

Environment Protection Licence



Licence - 12323

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

Mr Darryl Clift

Environment Protection Authority

(By Delegation)

Date of this edition: 01-July-2005

Environment Protection Licence

Licence - 12323

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

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

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.

Privacy: The information provided is limited to meet the requirements of section 57 of the Privacy and Personal Information Act 1998.

Exporting and printing: Search results show a maximum of 50 rows per page. Search results can only be printed page by page.

More information: Should you require further information or technical assistance, please submit your request to water.enquiries@dpi.nsw.gov.au or contact 1800 353 104.

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 Access Licence (WAL) Number

WAL

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

Disclaimer: The NSW Office of Water does not warrant the data is current nor does it warrant that the data or the data capturing processes are free from corruption or error.

Privacy: The information provided is limited to meet the requirements of section 57 of the Privacy and Personal Information Act 1998.

Exporting and printing: Search results show a maximum of 50 rows per page. Search results can only be printed page by page.

More information: Should you require further information or technical assistance, please submit your request to water.enquiries@dpi.nsw.gov.au or contact 1800 353 104.

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

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

- 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.

Disclaimer: The NSW Office of Water does not warrant the data is current nor does it warrant that the data or the data capturing processes are free from corruption or error.

Privacy: The information provided is limited to meet the requirements of section 57 of the Privacy and Personal Information Act 1998.

Exporting and printing: Search results show a maximum of 50 rows per page. Search results can only be printed page by page.

More information: Should you require further information or technical assistance, please submit your request to water.enquiries@dpi.nsw.gov.au or contact 1800 353 104.

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 Access Licence (WAL) Number

WAL

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.

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)
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

Disclaimer: The NSW Office of Water does not warrant the data is current nor does it warrant that the data or the data capturing processes are free from corruption or error.

Privacy: The information provided is limited to meet the requirements of section 57 of the *Privacy and Personal Information Act 1998*.

Exporting and printing: Search results show a maximum of 50 rows per page. Search results can only be printed page by page.

More information: Should you require further information or technical assistance, please submit your request to water.enquiries@dpi.nsw.gov.au or contact 1800 353 104.

Appendix E: EPBC Approval and Compliance Audit



Austen Quarry (EPBC Approval 2013/6967) – Review of Compliance 2022/2023

Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
<p>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.</p>	<p>Yes</p>	<p>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.</p> <p>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.</p>	<p>Subject to a proposed 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.</p>	<p>No action required.</p>
<p>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.</p> <p>The SLMGMP must contain:</p>	<p>Yes</p>	<p>The Silver-leaved Mountain Gum Management Plan (SLMGMP) was submitted on 15 July 2015 and was approved on 10 November 2016.</p> <p>Since that time, the Silver-leaved Mountain Gum within the disturbance areas have been managed in accordance with the SLMGMP, the Biodiversity</p>	<p>The offset area proposed in the BOMP and the RLMP has not been finalised and was the subject of a modification to SSD 6084.</p> <p>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</p>	<p>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-leaved Mountain</p>



Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
		Offset Management Plan (BOMP) and the Landscape and 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.	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 DCCEE 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: <ul style="list-style-type: none"> 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; c. is in accordance with the approved Conservation Advice. 	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 (1 st July 2021 to 30 th June 2022)). 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
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 (1 st July 2021 to 30 th June 2022)).	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.
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	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	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.	Once the proposed modification to SSD 6084 (MOD3) has been determined, an application to vary EPBC Approval 2013/6967 would be



Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
Management Plan (BOMP) for the proposed Offset Area, for the Ministers approval. The BOMP must be prepared by a suitably qualified person and:		offset area has yet to formally commence.	The area formerly approved as an offset area has been the subject of broader scale land management within the landowner’s holdings.	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 population of Silver-leaved Mountain Gum in this area, including:				
i) a description and timeframe of measures that would be implemented to improve the	Yes	See Section 3 of the BOMP	None	No action required.



Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
condition of the ecological communities on the site;				
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 (1 st July 2021 to 30 th June 2022)).	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.
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.



Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
<p>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:</p> <ul style="list-style-type: none"> 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. 	<p>Not Yet Required</p>	<p>The biodiversity offsetting arrangements for the Austen Quarry Stage 2 development are the subject of a modification application to SSD 6084 (MOD3). The offsetting arrangements are yet to be finalised and therefore this condition is not yet able to be satisfied.</p>	<p>Once the proposed modification to SSD 6084 (MOD3) has been determined, an update to the Biodiversity Offset Strategy would be submitted to DCCEE for review and approval.</p> <p>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.</p> <p>Land-based offsets adjacent to the Quarry are no longer proposed as an offset strategy.</p>	<p>Notice of satisfaction of the offsetting obligations of the Stage 2 Project would be submitted to DCCEE within 3 months of it becoming available.</p>
<p>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.</p>	<p>No</p>	<p>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.</p>	<p>This is an historical non-compliance that has been noted in previous audits of EPBC Approval 2013/6967.</p>	<p>No action is possible for this condition.</p>



Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
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 Department at the same time as the compliance report is published.	Yes	This audit	The anniversary date for the commencement of the action is 6 April.	No action required.
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	No action required.



Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
			DCCEEW, it is not necessary to notify the Department again.	
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 <i>carry out</i> 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 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.	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.
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,	Noted	None	None	No action required.



Condition No.	Compliance Achieved	Supporting Evidence	Observations / Commentary	Recommended Action
<p>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.</p>				
<p>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.</p>	Noted	The action was substantially commenced on 6 April 2017.	None	No action required.
<p>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 on the website within one (1) month of being approved.</p>	Yes	<p>The SLMGMP and the BOMP are available from the Hy-Tec website under the Quarry Documentation section.</p> <p>https://www.hy-tec.com.au/quarry-documentation</p>	None	No action required.

Appendix F: Noise Monitoring Reports

Noise Monitoring Assessment

Austen Quarry, Hartley, NSW
September 2022

Prepared for: RW Corkery & Co Pty Limited
September 2022
MAC170523RP12



Document Information

Noise Monitoring Assessment

Austen Quarry, Hartley, NSW

September 2022

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



Prepared by: Muller Acoustic Consulting Pty Ltd

PO Box 678, Kotara NSW 2289

ABN: 36 602 225 132

P: +61 2 4920 1833

www.mulleracoustic.com

Document ID	Date	Prepared By	Signed	Reviewed By	Signed
MAC170523RP12	28 September 2022	Nicholas Shipman		Oliver Muller	

DISCLAIMER

All documents produced by Muller Acoustic Consulting Pty Ltd (MAC) are prepared for a particular client's requirements and are based on a specific scope, circumstances and limitations derived between MAC and the client. Information and/or report(s) prepared by MAC may not be suitable for uses other than the original intended objective. No parties other than the client should use or reproduce any information and/or report(s) without obtaining permission from MAC. Any information and/or documents prepared by MAC is not to be reproduced, presented or reviewed except in full.

CONTENTS

1 INTRODUCTION.....5

2 NOISE CRITERIA7

 2.1 ATTENDED NOISE COMPLIANCE.....7

3 METHODOLOGY9

 3.1 LOCALITY9

 3.2 NOISE MONITORING LOCATIONS9

 3.3 ATTENDED MONITORING METHODOLOGY9

 3.4 UNATTENDED MONITORING METHODOLOGY 10

 3.5 OPERATIONAL LOGS 10

4 RESULTS 13

 4.1 ASSESSMENT RESULTS - LOCATION A..... 13

 4.2 ASSESSMENT RESULTS - LOCATION B..... 14

 4.3 ASSESSMENT RESULTS - LOCATION C 15

 4.4 UNATTENDED NOISE MONITORING RESULTS 16

5 NOISE COMPLIANCE ASSESSMENT 19

6 DISCUSSION 21

 6.1 DISCUSSION OF RESULTS - LOCATION A 21

 6.2 DISCUSSION OF RESULTS - LOCATION B 21

 6.3 DISCUSSION OF RESULTS - LOCATION C 21

7 CONCLUSION 23

APPENDIX A – GLOSSARY OF TERMS

APPENDIX B – OPERATIONAL LOGS

APPENDIX C – NOISE MONITORING CHARTS

This page has been intentionally left blank

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;
- RW Corkery & Co Pty Limited, Austen Quarry Noise Management Plan (NMP); and
- Australian Standard AS 1055:2018 - Acoustics - Description and measurement of environmental noise.

This assessment was completed on Tuesday 6 September 2022 and Wednesday 7 September 2022 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**.

This page has been intentionally left blank

2 Noise Criteria

2.1 Attended Noise Compliance

Schedule 3, Condition 3 of the Austen Quarry Development Consent (SSD-6084), approved and modified on 15 July 2019, outlines the applicable noise criteria for all privately owned residential receivers surrounding the quarry site. The operating criteria specified in SSD-6084 also aligns with criteria in EPL#12323 for the quarry at all receivers ie 35dB LAeq(15min).

Furthermore, SSD-6084 specifies an LAmax criteria for site operations of 52dBA during the morning shoulder period. **Table 1** presents the criteria for privately owned residential receivers surrounding the quarry, as outlined in SSD-6084 and EPL#12323.

Table 1 Noise Criteria				
Receiver	Day dB LAeq(15min)	Evening dB LAeq(15min)	Morning Shoulder dB LAeq(15min)	Morning Shoulder dB LAmax
All privately owned residences	35	35	35	52

This page has been intentionally left blank

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 Australian Standard 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 Tuesday 6 September 2022 and Wednesday 7 September 2022. The acoustic instrumentation used carries current NATA calibration and complies with AS 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 ± 0.5 dBA.

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 - 781 Jenolan Caves Road, was conducted in general accordance with the procedures described in Australian Standard 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 Tuesday 6 September 2022 and Tuesday 20 September 2022. 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 $\pm 0.5\text{dBA}$. 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. It is also noted that on 7 September 2022 the secondary crusher paused operations on several occasions due to blockages and other issues on the conveyer belt. The survey was undertaken to ensure maintenance operations also complied with the applicable noise criteria for the quarry. Morning shoulder measurements were conducted from 6am to 7am on Wednesday 7 September 2022 to capture the onsite operations at the nominated monitoring locations.

It is also noted that the primary crusher ceased activities at approximately 4.30pm daily for the past several months, with no evening time crushing undertaken during this period. This is due to the reduced product demand during the COVID19 shutdown. **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)
06/09/2022	07:00	16:35	N/A	N/A
07/09/2022	07:10	16:40	06:17	20:00

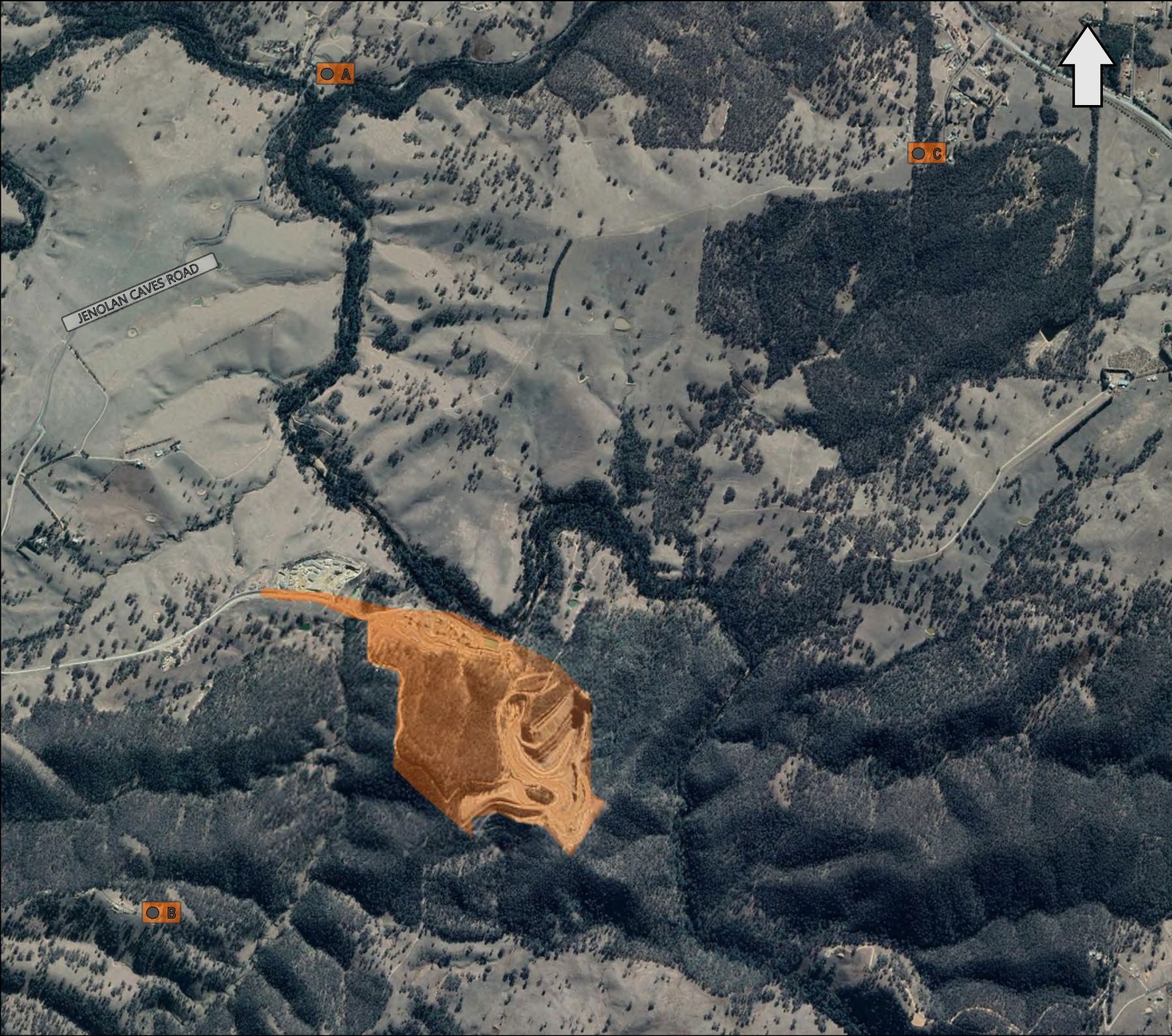


FIGURE 1
LOCALITY PLAN
REF: MAC170523



KEY	
	MONITORING LOCATION
	SITE LOCATION



This page has been intentionally left blank

4 Results

4.1 Assessment Results - Location A

Operational attended noise monitoring was completed in each assessment period at Location A, 200 Jenolan Caves Road on Tuesday 6 September 2022 and Wednesday 7 September 2022. **Table 3** presents the monitored noise level contributions and observed meteorological conditions for each measurement.

Table 3 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}								
06/09/2022	16:18 (Day)	80	60	44	WD: NE WS: 0.1m/s Rain: Nil	Birds 43-49						
						Traffic 44-80						
						Creek flow 43-44						
						Aircraft 43-52						
						Quarry inaudible						
Austen Quarry Contribution ¹						<34dB L _{Aeq} (15min)						
06/09/2022	18:30 (Evening)	79	59	45	WD: N WS: 0.2m/s Rain: Nil	Traffic 45-79						
						Creek flow 44-47						
						Quarry inaudible						
						Austen Quarry Contribution ¹						<35dB L _{Aeq} (15min)
						07/09/2022	06:21 (Morning Shoulder)	85	61	43	WD: N WS: 0.1m/s Rain: Nil	Dogs barking 49-58
Birds 43-56												
Creek flow 43-45												
Traffic 44-85												
Quarry inaudible												
Austen Quarry Contribution ¹						<33dB L _{Aeq} (15min)						
						<33dB L _{Amax}						

Note 1: Estimated quarry noise contribution.

4.2 Assessment Results - Location B

Operational attended noise monitoring was completed in each assessment period at Location B, 781 Jenolan Caves Road on Tuesday 6 September 2022 and Wednesday 7 September 2022. **Table 4** presents the monitored noise level contributions and observed meteorological conditions for each measurement.

Table 4 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}		
06/09/2022	15:50 (Day)	59	35	31	WD: NE	Birds 31-51
					WS: 0.1m/s	Aircraft 32-59
					Rain: Nil	Quarry mobile plant 30-32
Austen Quarry Contribution ¹						31dB L _{Aeq} (15min)
06/09/2022	18:00 (Evening)	50	33	25	WD: N	Traffic 23-26
					WS: 0.5m/s	Birds 24-50
					Rain: Nil	Livestock 23-29
Austen Quarry Contribution ¹						Quarry inaudible
						<20dB L _{Aeq} (15min)
07/09/2022	06:45 (Morning Shoulder)	60	39	26	WD: N	Birds 23-60
					WS: 0.1m/s	Traffic 23-26
					Rain: Nil	Quarry inaudible
Austen Quarry Contribution ¹						<20dB L _{Aeq} (15min)
						<20dB L _{Amax}

Note 1: Estimated quarry noise contribution.

4.3 Assessment Results - Location C

Operational attended noise monitoring was completed in each assessment period at Location C, 64 Carroll Drive on Tuesday 6 September 2022 and Wednesday 7 September 2022. Table 5 presents the monitored noise level contributions and observed meteorological conditions for each measurement.

Table 5 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}		
06/09/2022	16:43 (Day)	71	46	39	WD: NW	Traffic 36-44
					WS: 0.1m/s	Birds 37-71
					Rain: Nil	Quarry inaudible
Austen Quarry Contribution ¹						<29dB L _{Aeq} (15min)
06/09/2022	18:53 (Evening)	59	42	35	WD: N	Insects 31-33
					WS: 0.2m/s	Aircraft 39-44
					Rain: Nil	Traffic 31-59
Austen Quarry Contribution ¹						<25dB L _{Aeq} (15min)
07/09/2022	06:00 (Morning Shoulder)	64	47	37	WD: N	Birds 30-64
					WS: 0.1m/s	Traffic 30-52
					Rain: Nil	Quarry inaudible
Austen Quarry Contribution ¹						<27dB L _{Aeq} (15min)
						<27dB L _{Amax}

Note 1: Estimated quarry noise contribution.

4.4 Unattended Noise Monitoring Results

Unattended noise monitoring was conducted at Location B from Tuesday 6 September 2022 and Wednesday 7 September 2022 while the quarry was operational. A comparison of attended and unattended noise monitoring data has been completed. **Table 6** presents the result of this comparison, focusing on the 15-minute statistics for the corresponding measurement times.

Table 6 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 LA _{max}	dB LA _{eq}	dB LA ₉₀	dB LA _{max}	dB LA _{eq}	dB LA ₉₀
06/09/2022	15:50	59	35	31	64	39	28
06/09/2022	18:00	50	33	25	47	30	25
07/09/2022	06:45	60	39	26	67	39	27

Results of the comparison identify that measured levels are generally consistent. Some variation in the metrics are expected due to the proximity of noise sources to the microphones, the moderate separation between the unattended and attended monitoring positions and the variance in the monitored 15-minute period.

Attended noise monitoring identified that quarry noise was audible only during the day 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 Tuesday 6 September 2022 and Tuesday 20 September 2022 is presented in Table 7. Appendix C presents the logger charts of the results of the unattended monitoring survey.

Table 7 Unattended Noise Logging Summary – Location B

Date	Unattended descriptors (dBA re 20 µPa)		
	dB LAeq		
	Day	Evening	Night
Tuesday, 6 September 2022	41	34	38
Wednesday, 7 September 2022	40	33	37
Thursday, 8 September 2022	43	33	38
Friday, 9 September 2022	43	44	41
Saturday, 10 September 2022	48	46	46
Sunday, 11 September 2022	44	39	41
Monday, 12 September 2022	44	32	36
Tuesday, 13 September 2022	39	31	36
Wednesday, 14 September 2022	45	35	39
Thursday, 15 September 2022	45	50	43
Friday, 16 September 2022	49	45	48
Saturday, 17 September 2022	50	48	62
Sunday, 18 September 2022	55	40	47
Monday, 19 September 2022	47	32	41
Tuesday, 20 September 2022	41	N/A	N/A

This page has been intentionally left blank

5 Noise Compliance Assessment

The compliance assessment for the nominated monitoring locations are presented in Table 8 to Table 11 for day, evening and morning shoulder assessment periods.

Table 8 Daytime LAeq(15min) Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB LAeq(15min)	dB LAeq(15min)	
A	<34	35	✓
B	31	35	✓
C	<29	35	✓

Table 9 Evening LAeq(15min) Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB LAeq(15min)	dB LAeq(15min)	
A	<35	35	✓
B	<20	35	✓
C	<25	35	✓

Table 10 Morning Shoulder LAeq(15min) Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB LAeq(15min)	dB LAeq(15min)	
A	<33	35	✓
B	<20	35	✓
C	<27	35	✓

Table 11 Morning Shoulder LAmax Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB LAmax	dB LAmax	
A	<33	52	✓
B	<20	52	✓
C	<27	52	✓

This page has been intentionally left blank

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 September 2022 survey. Other extraneous noise sources audible during the three attended surveys included birds, aircraft, creek flowing, birds and dog barking.

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 the day period. Quarry operations were audible during lulls and the estimated quarry noise contribution was measured at 31dB LAeq(15min). The quarry remained inaudible during the morning shoulder and evening periods at this monitoring location. Extraneous noise sources dominated the noise environment which included birds, aircraft, livestock and traffic.

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

Quarry noise was inaudible during all three survey periods at Location C, 64 Carroll Drive, Hartley, NSW, during the attended noise survey for the period of September 2022. Traffic, birds, insects and aircraft dominated the ambient noise environment.

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

This page has been intentionally left blank

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 Tuesday 6 September 2022 and Wednesday 7 September 2022 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.

This page has been intentionally left blank

Appendix A – Glossary of Terms

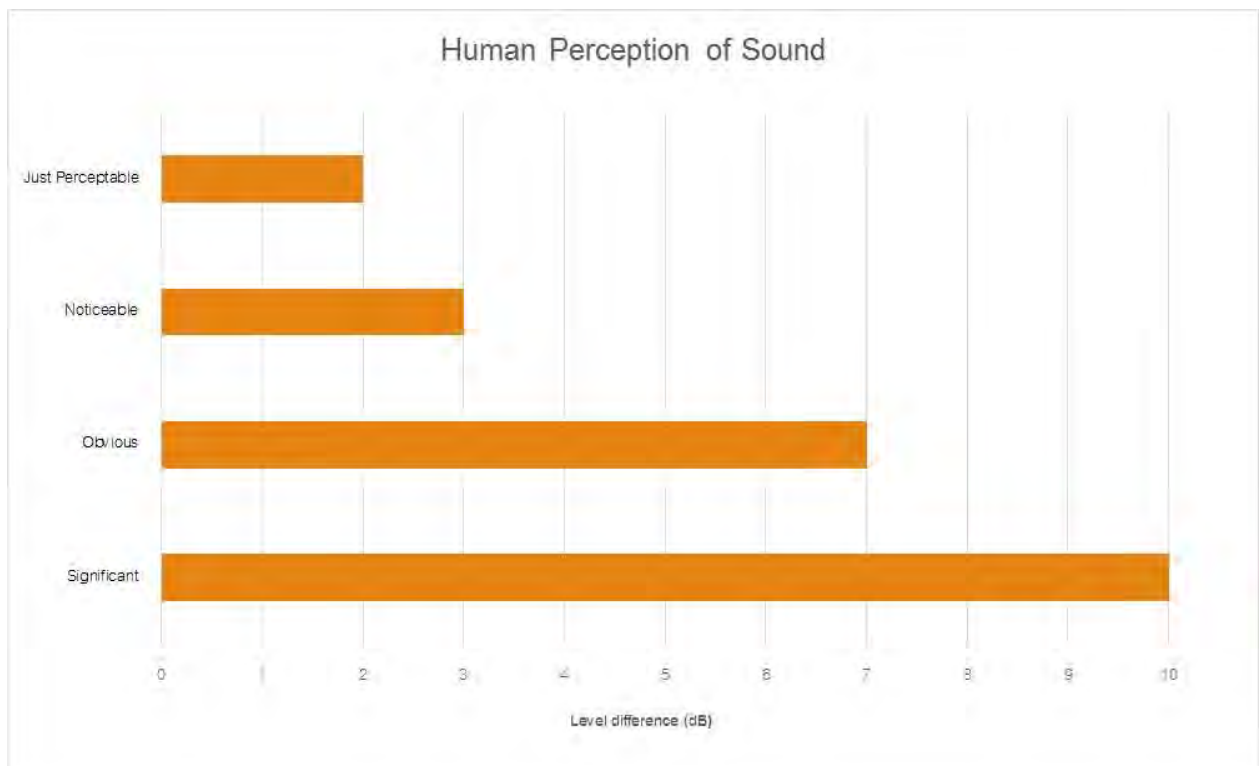
Table A1 provides a number of technical terms have been used in this report.

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.
LAm _{ax}	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 : $= 10 \cdot \log_{10} (W/W_0)$ <p>Where : W is the sound power in watts and W₀ is the sound reference power at 10-12 watts.</p>

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



This page has been intentionally left blank

Appendix B – Operational Logs



an ADBRI company

DAILY PRODUCTION LOG & CHECKLIST - PRIMARY

Date: 6/9/22 Operator: ARETT

Weather Conditions: FINE Quarry Bench ID: 730

Shift Start Time	<u>6 AM</u>	Shift Finish Time	<u>5 PM</u>
Crusher Start Time	<u>7 AM</u>	End of day Crusher stopped	<u>4:35</u>

Belt Weightometer Reading - Daily

Conveyor 1 Start	Conveyor 1 Finish	Total Tonnes Crushed
		<u>4920</u>

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

DT4 Loads to Boot	<u>46</u>	DT1 Loads to Boot	
DT6 Loads to Boot	<u>47 + 8</u>	Loader tonnes to Boot	<u>145 / 380</u>

Stoppages due to Trucks	Stoppages due to Jaw
<u>5454</u>	

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
	<u>4:48</u>		<u>Prestart / check CV1 & CV5 chutes / fool box / check GTV chute</u>
<u>1:00</u>	<u>1:20</u>	<u>20MIN</u>	<u>LUNCI</u>

Pre start checks;

Generator hours: 33563 Generator oil level: ✓

Plant Visual Pilot hours

COMMENTS

CV7 tripped on emergency stop fault on start up

First truck tipped 7:00



an ADBRI company

DAILY PRODUCTION LOG & CHECKLIST - PRIMARY

Date: 7/9/22 Operator: BAETT

Weather Conditions: FOG Quarry Bench ID. 730

Shift Start Time	<u>6 AM</u>	Shift Finish Time	<u>5 PM</u>
Crusher Start Time	<u>7:10</u>	End of day Crusher stopped	<u>4:40</u>

Belt Weightometer Reading - Daily

Conveyor 1 Start	Conveyor 1 Finish	Total Tonnes Crushed

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

DT4 Loads to Boot	<u>30</u>	DT1 Loads to Boot	
DT6 Loads to Boot	<u>34</u>	Loader tonnes to Boot	<u>144</u>

Stoppages due to Trucks	Stoppages due to Jaw

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
	<u>5:13</u>		<u>Pre start / check on 2 CV5 chutes / tool box / check GTU chute</u>
<u>11:15</u>	<u>1:30</u>	<u>2:15</u>	

Pre start checks;

Generator hours.33575..... Generator oil level..

Plant Visual Pilot hours

COMMENTS

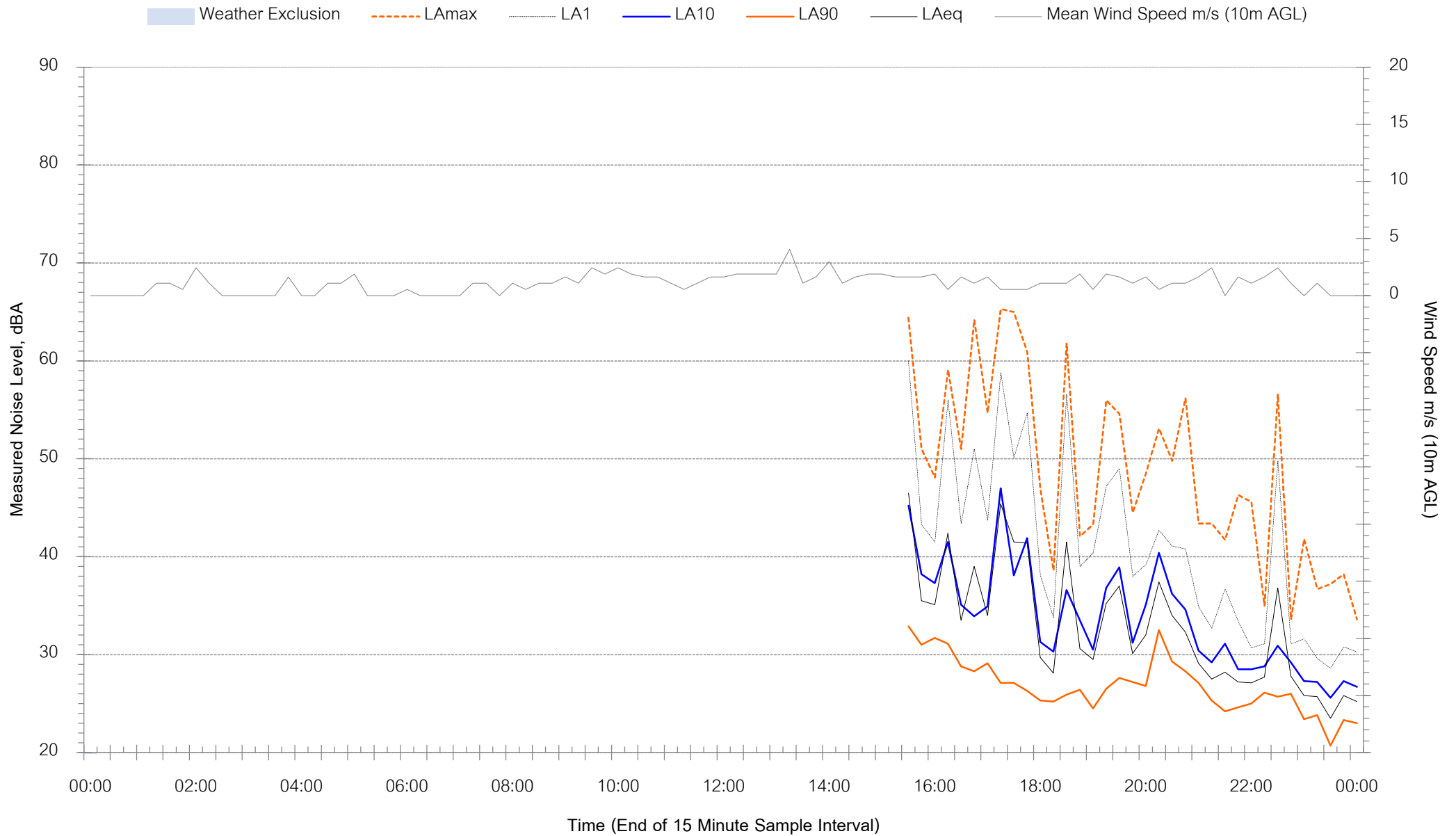
CV7 tripped on emergency stop on start up / CV3 under speed fault before it even starts belt x3

Appendix C – Noise Monitoring Charts



Background Noise Levels

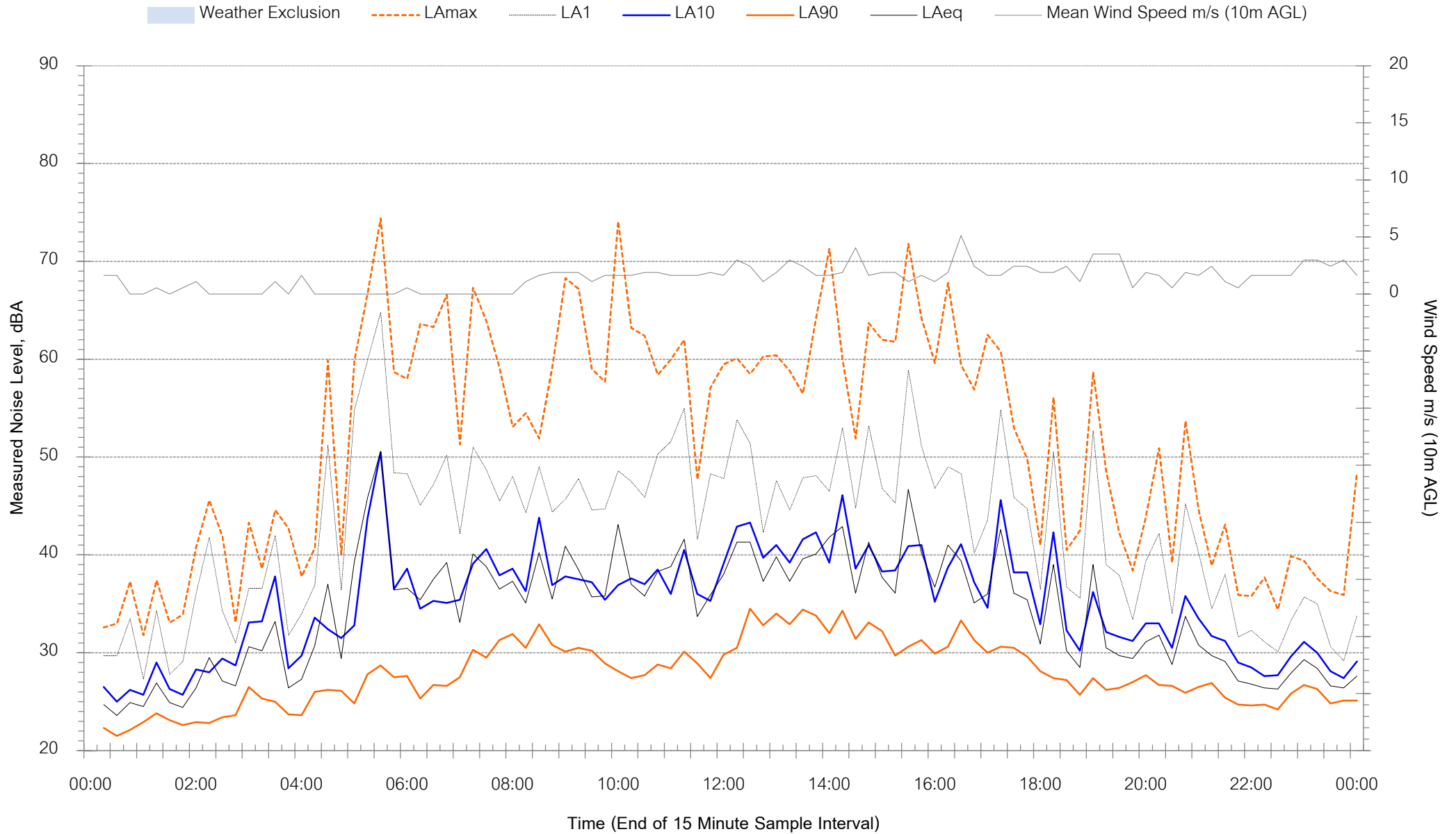
791 Jenolan Caves Road, Good Forest - Tuesday 6 September 2022





Background Noise Levels

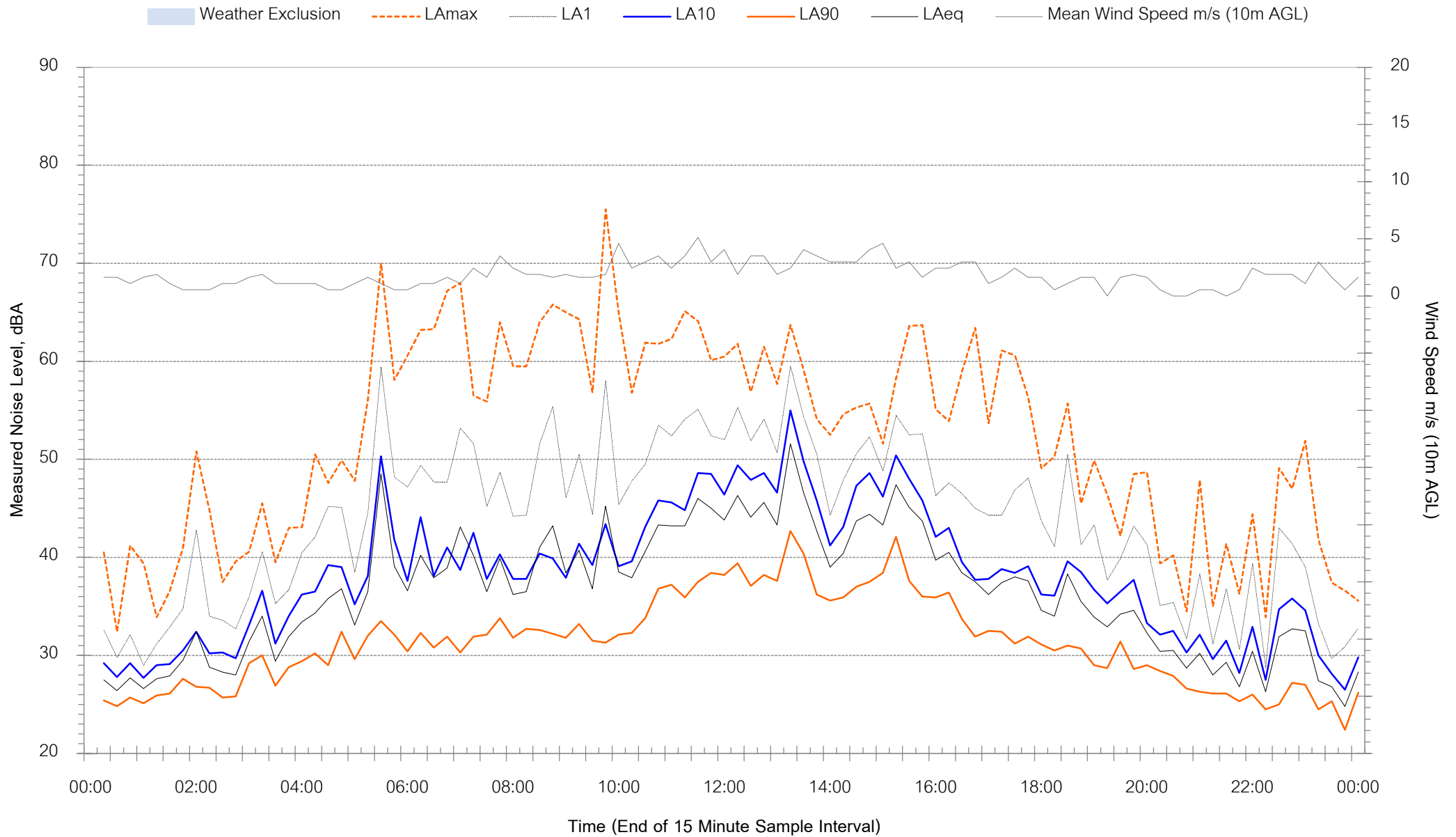
791 Jenolan Caves Road, Good Forest - Wednesday 7 September 2022





Background Noise Levels

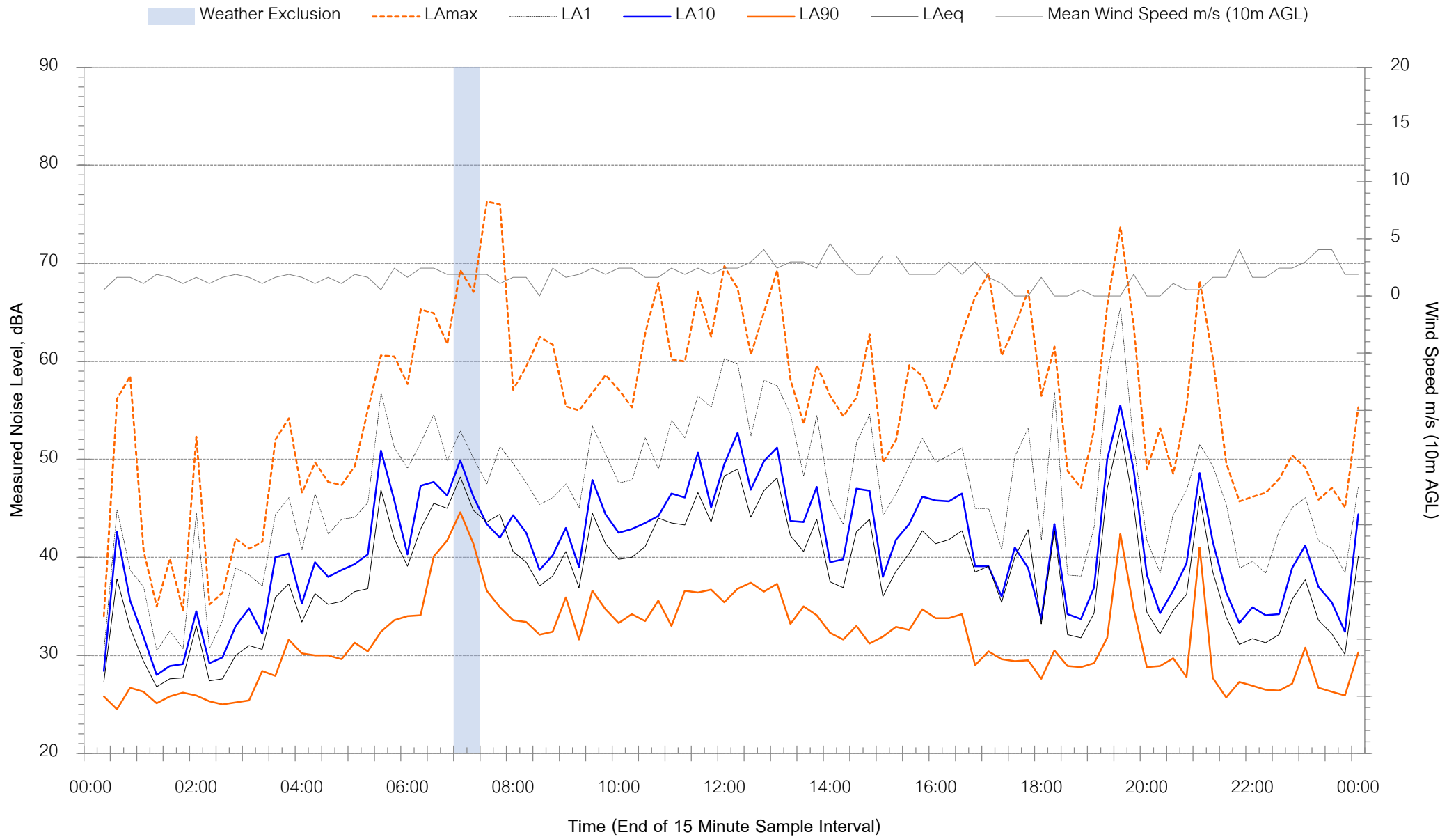
791 Jenolan Caves Road, Good Forest - Thursday 8 September 2022





Background Noise Levels

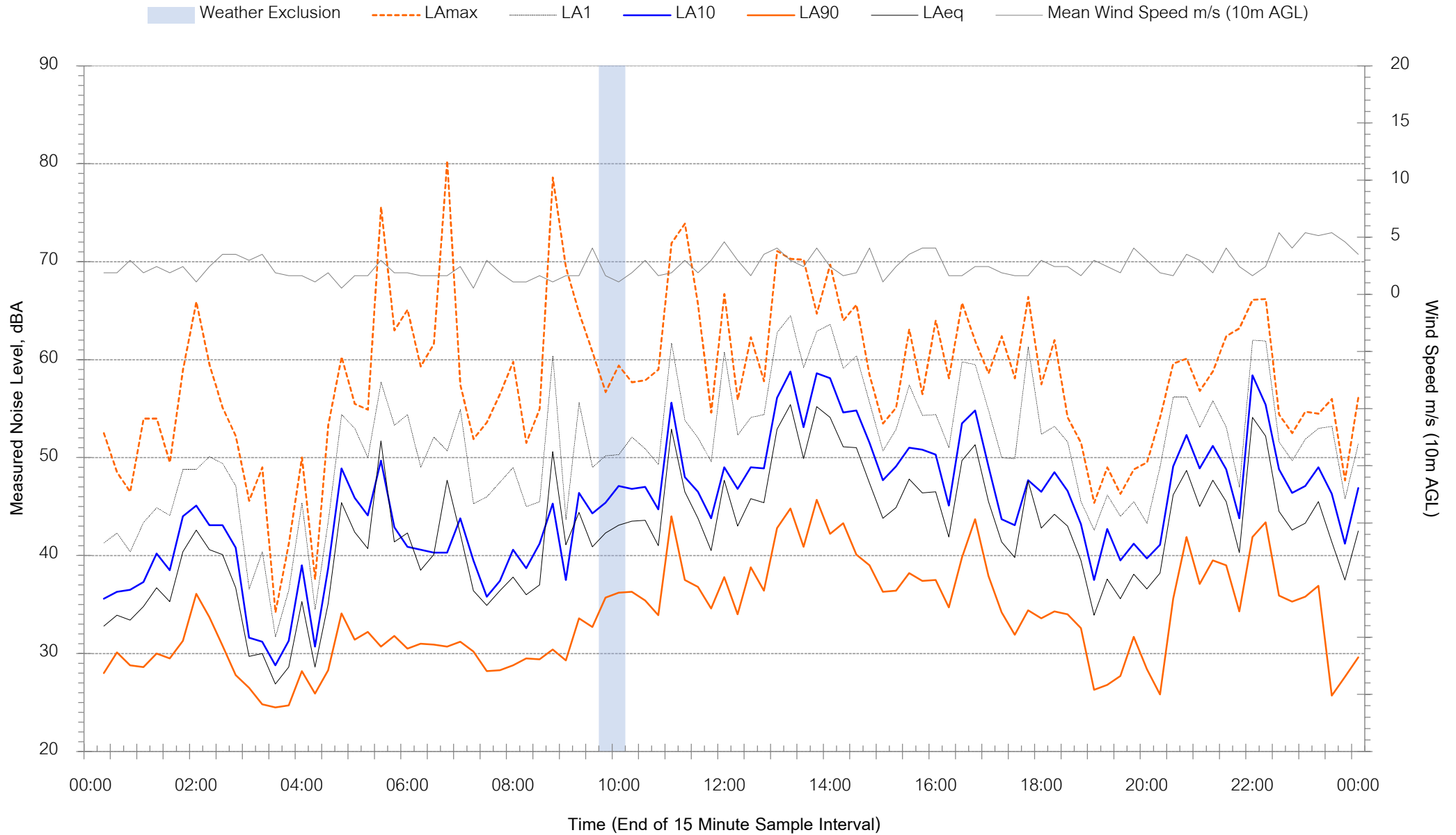
791 Jenolan Caves Road, Good Forest - Friday 9 September 2022





Background Noise Levels

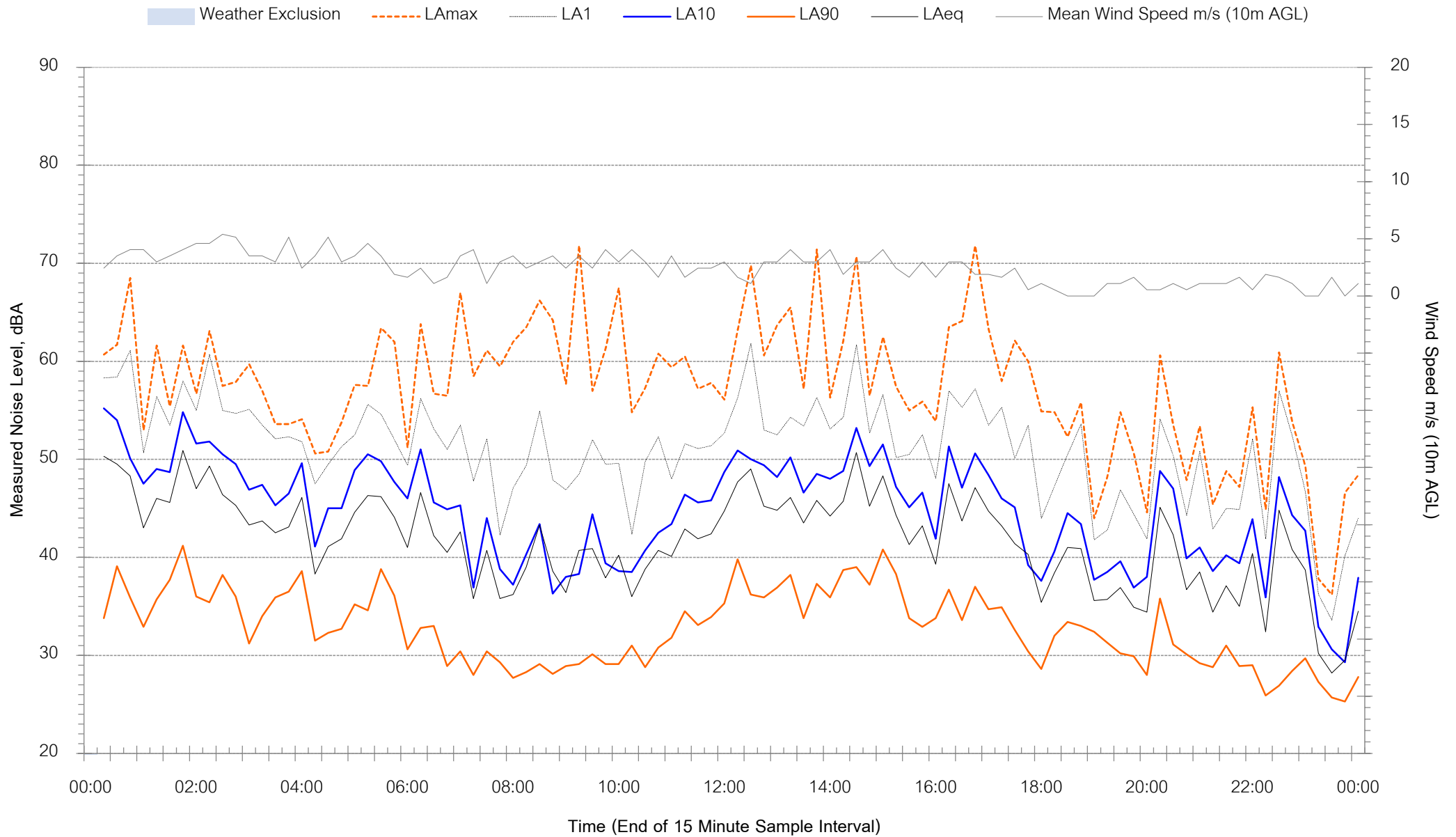
791 Jenolan Caves Road, Good Forest - Saturday 10 September 2022





Background Noise Levels

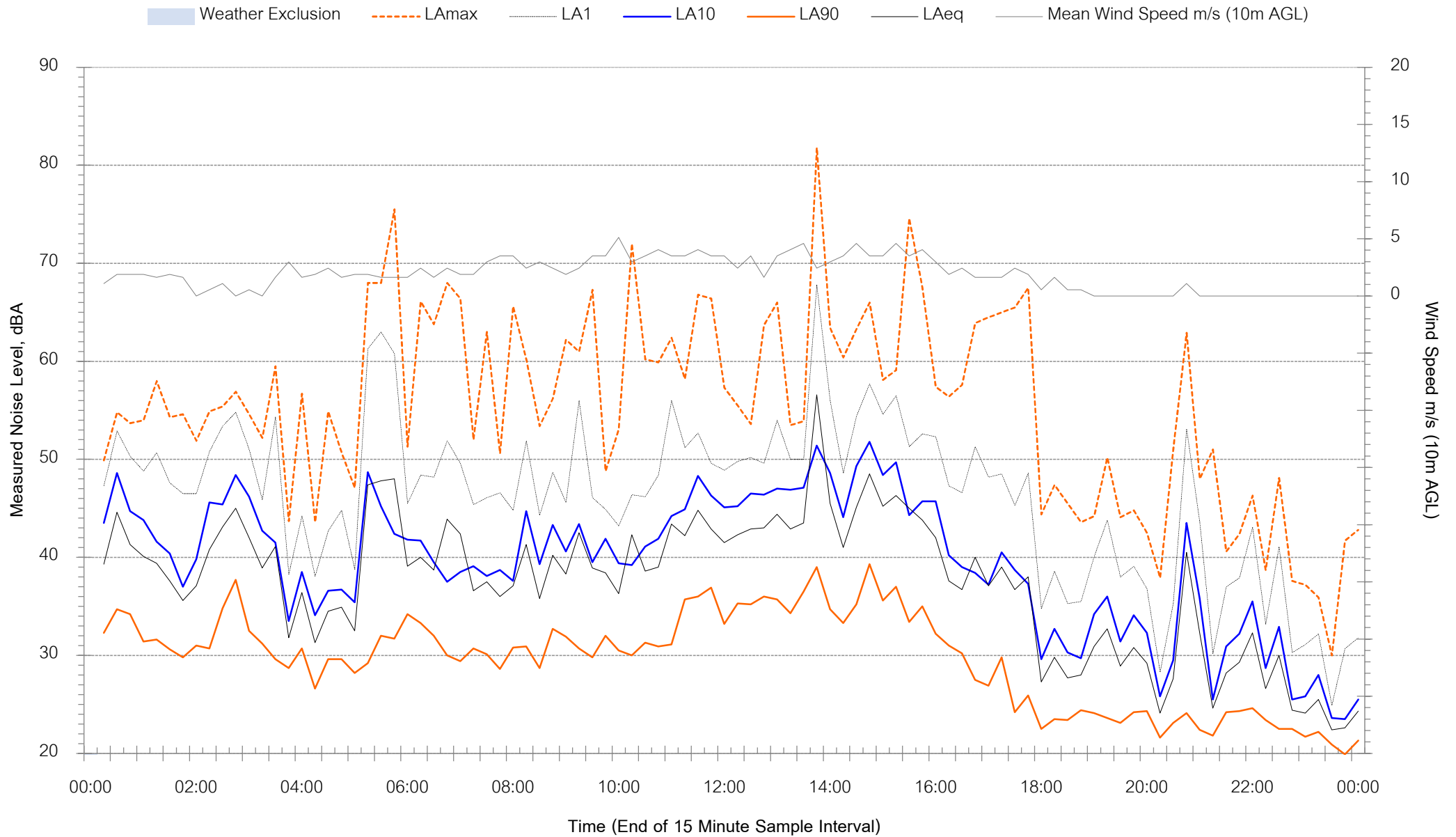
791 Jenolan Caves Road, Good Forest - Sunday 11 September 2022





Background Noise Levels

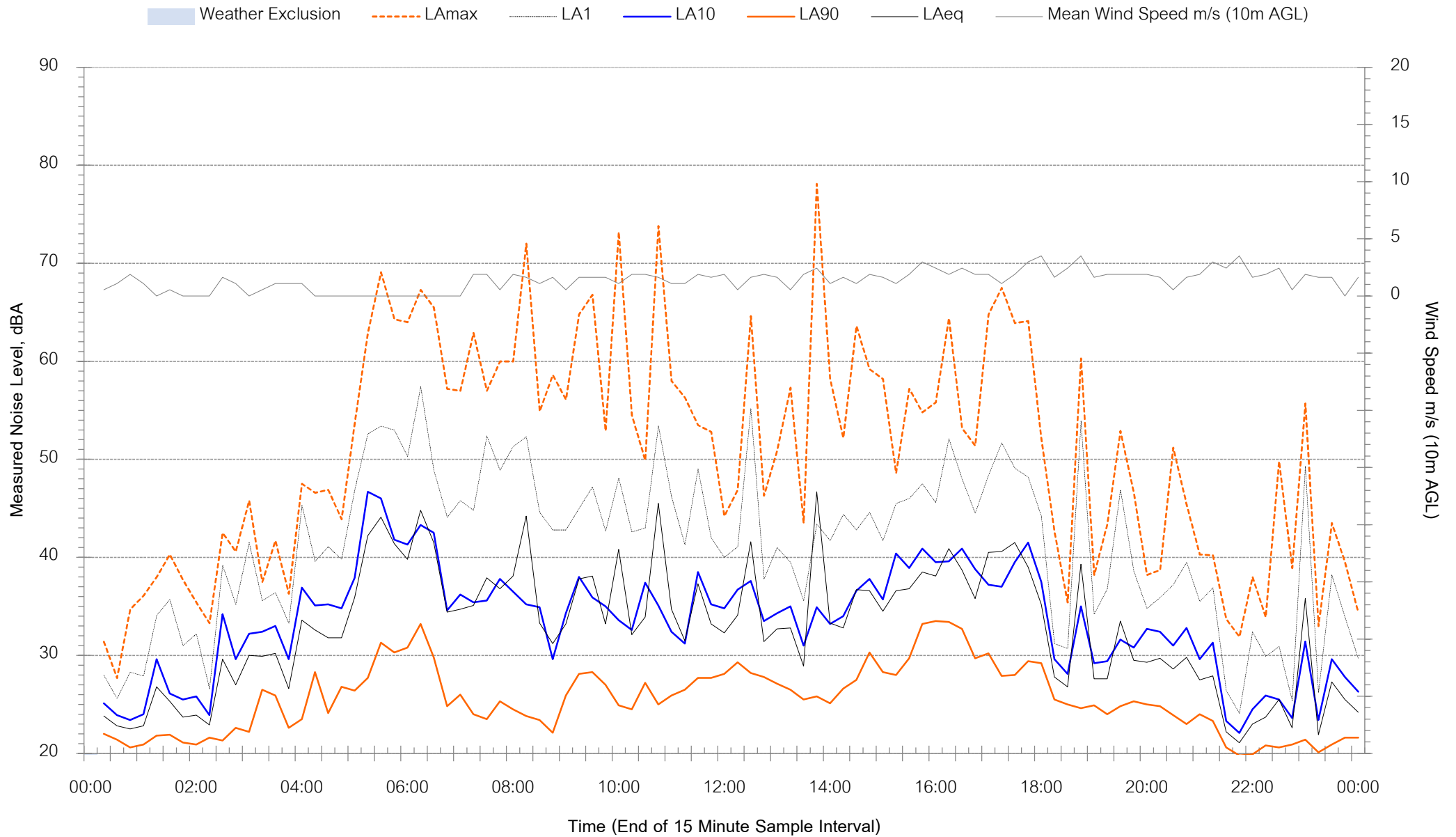
791 Jenolan Caves Road, Good Forest - Monday 12 September 2022





Background Noise Levels

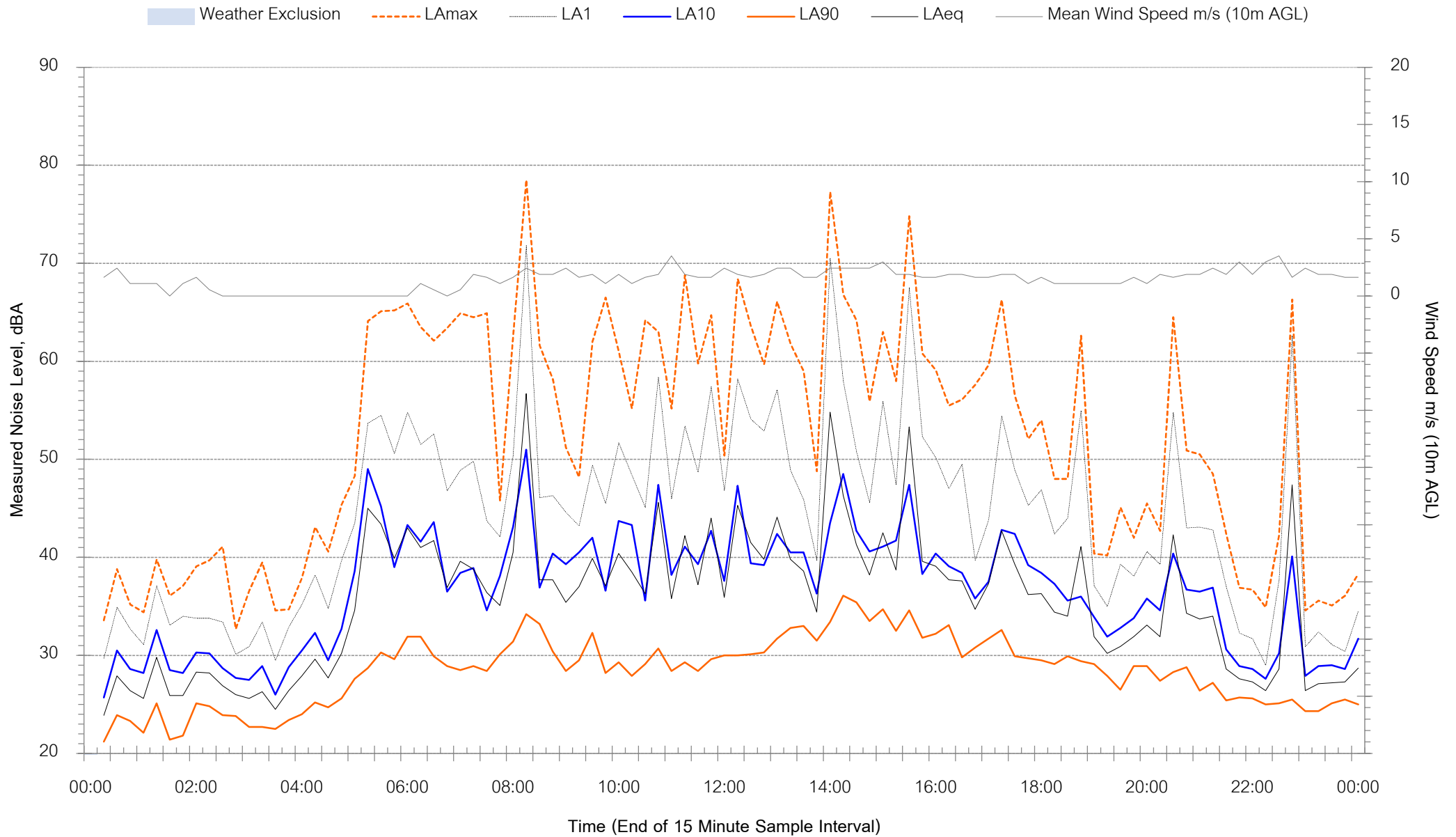
791 Jenolan Caves Road, Good Forest - Tuesday 13 September 2022





Background Noise Levels

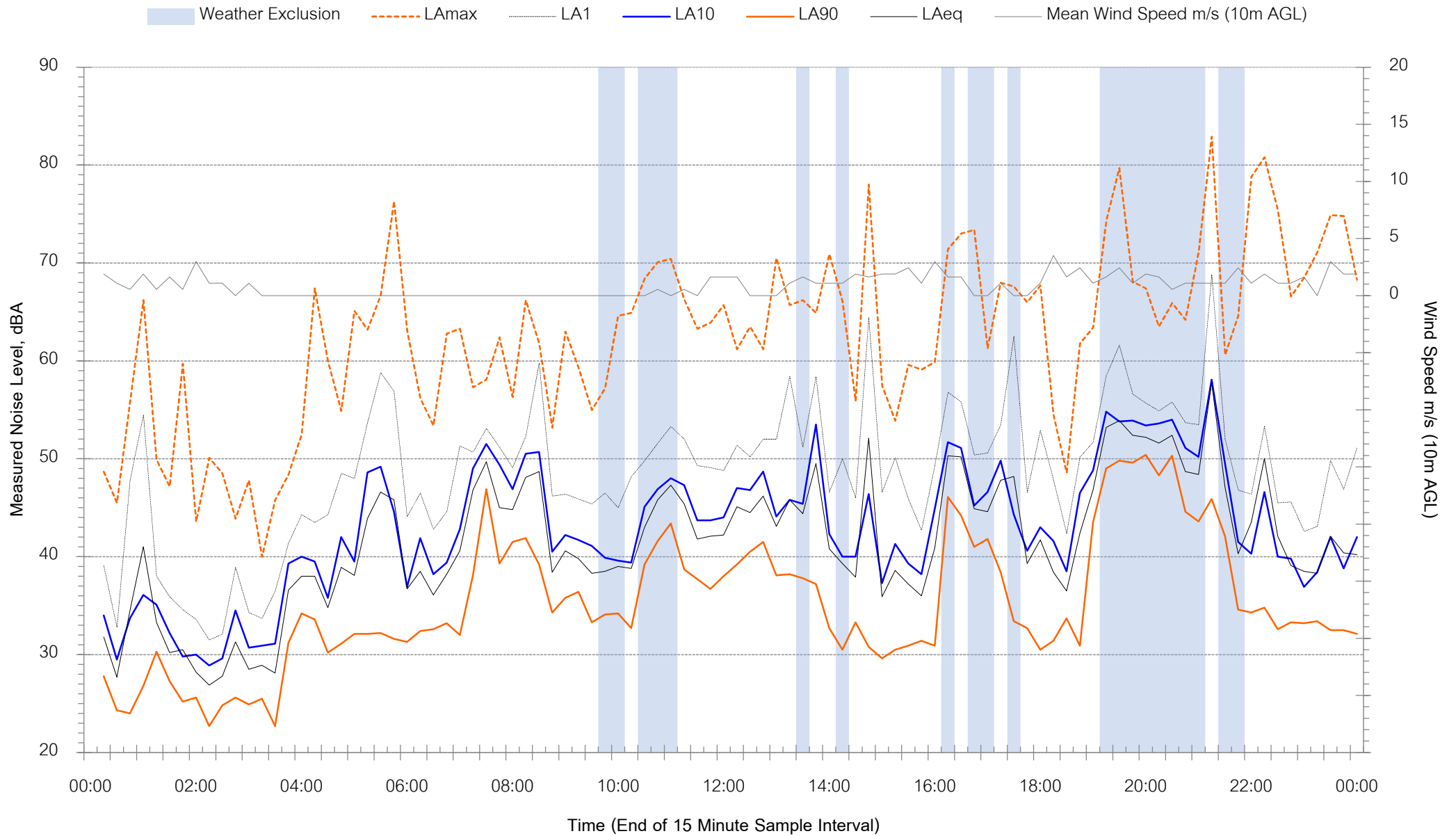
791 Jenolan Caves Road, Good Forest - Wednesday 14 September 2022





Background Noise Levels

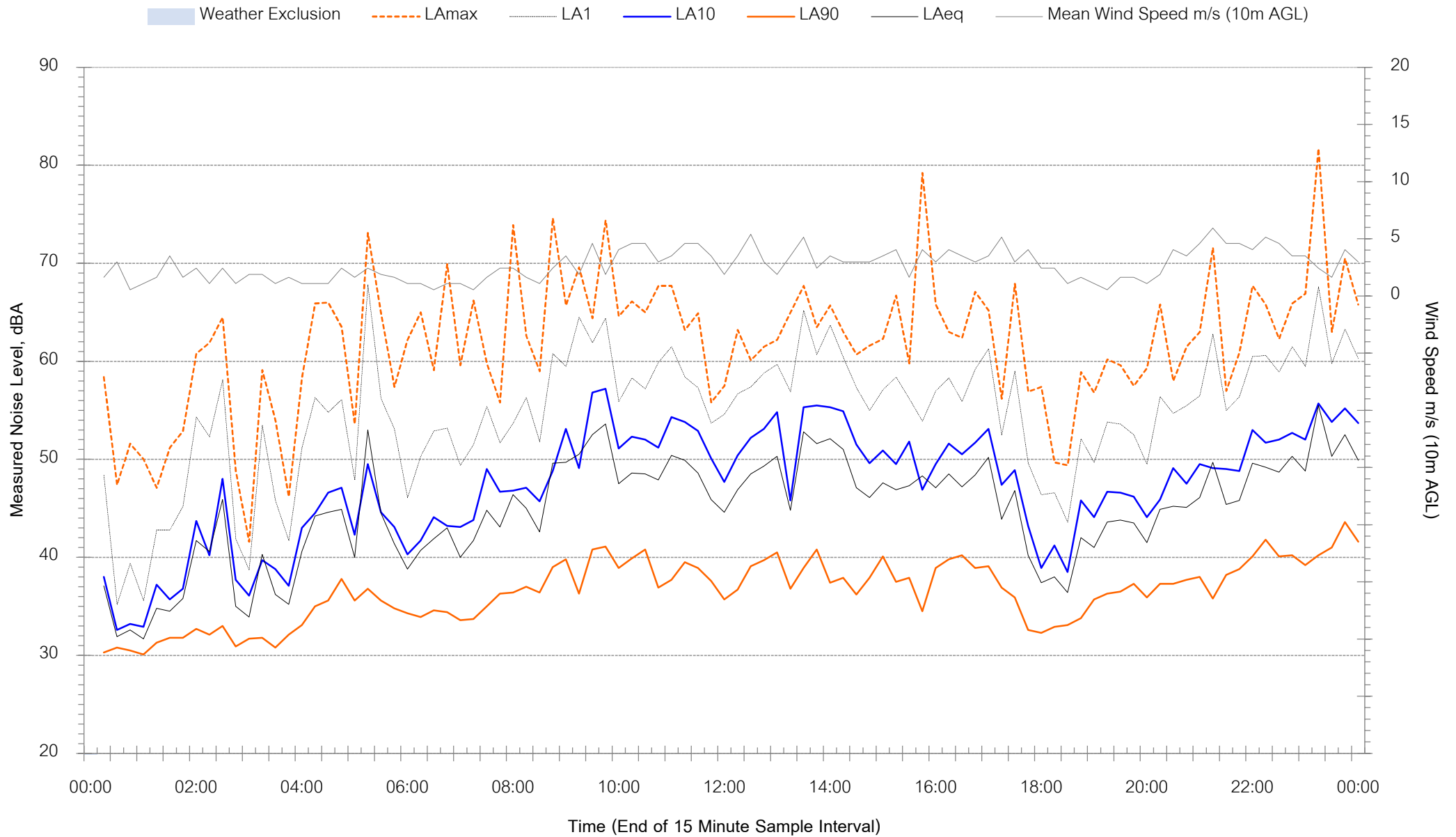
791 Jenolan Caves Road, Good Forest - Thursday 15 September 2022





Background Noise Levels

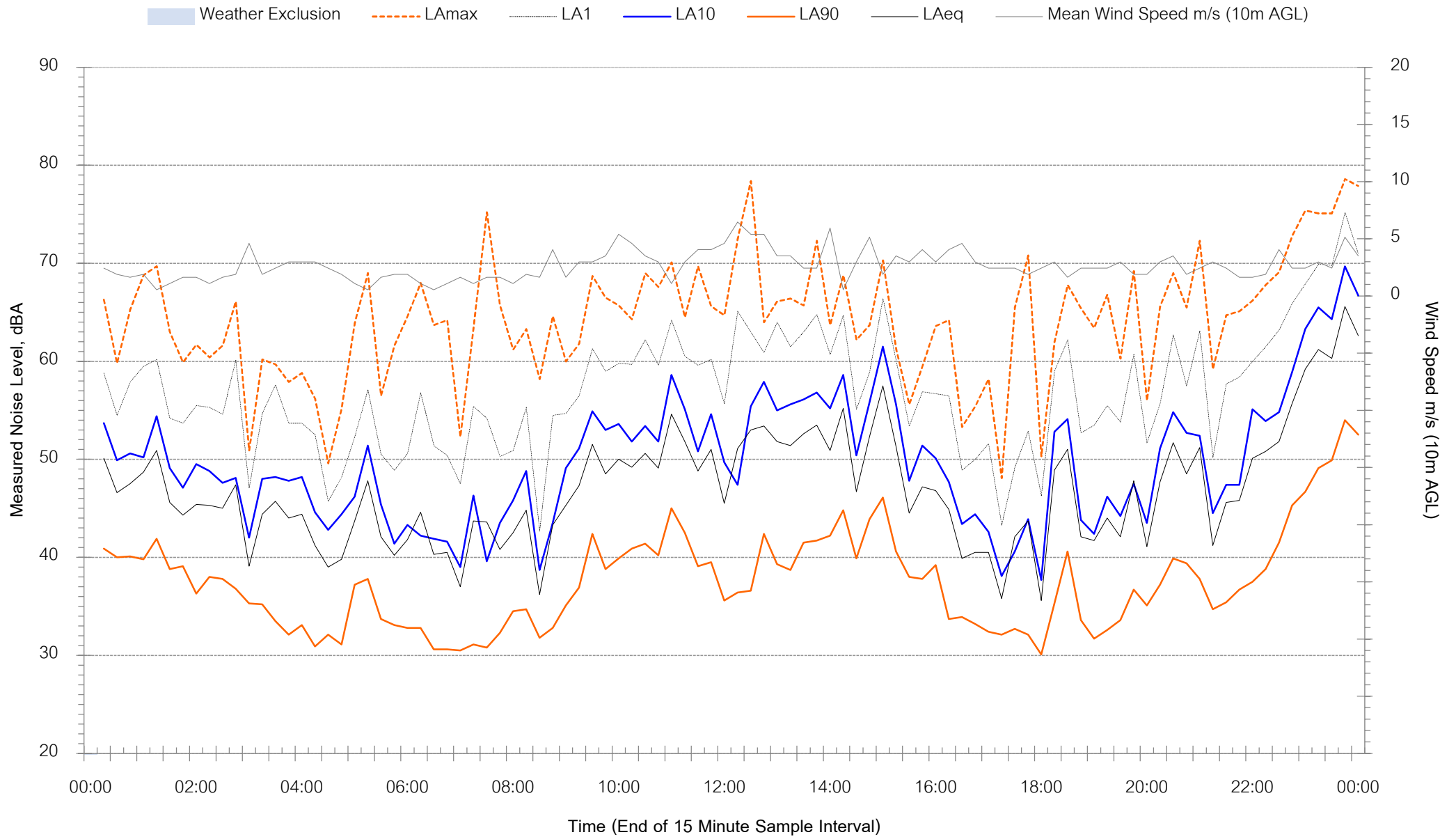
791 Jenolan Caves Road, Good Forest - Friday 16 September 2022





Background Noise Levels

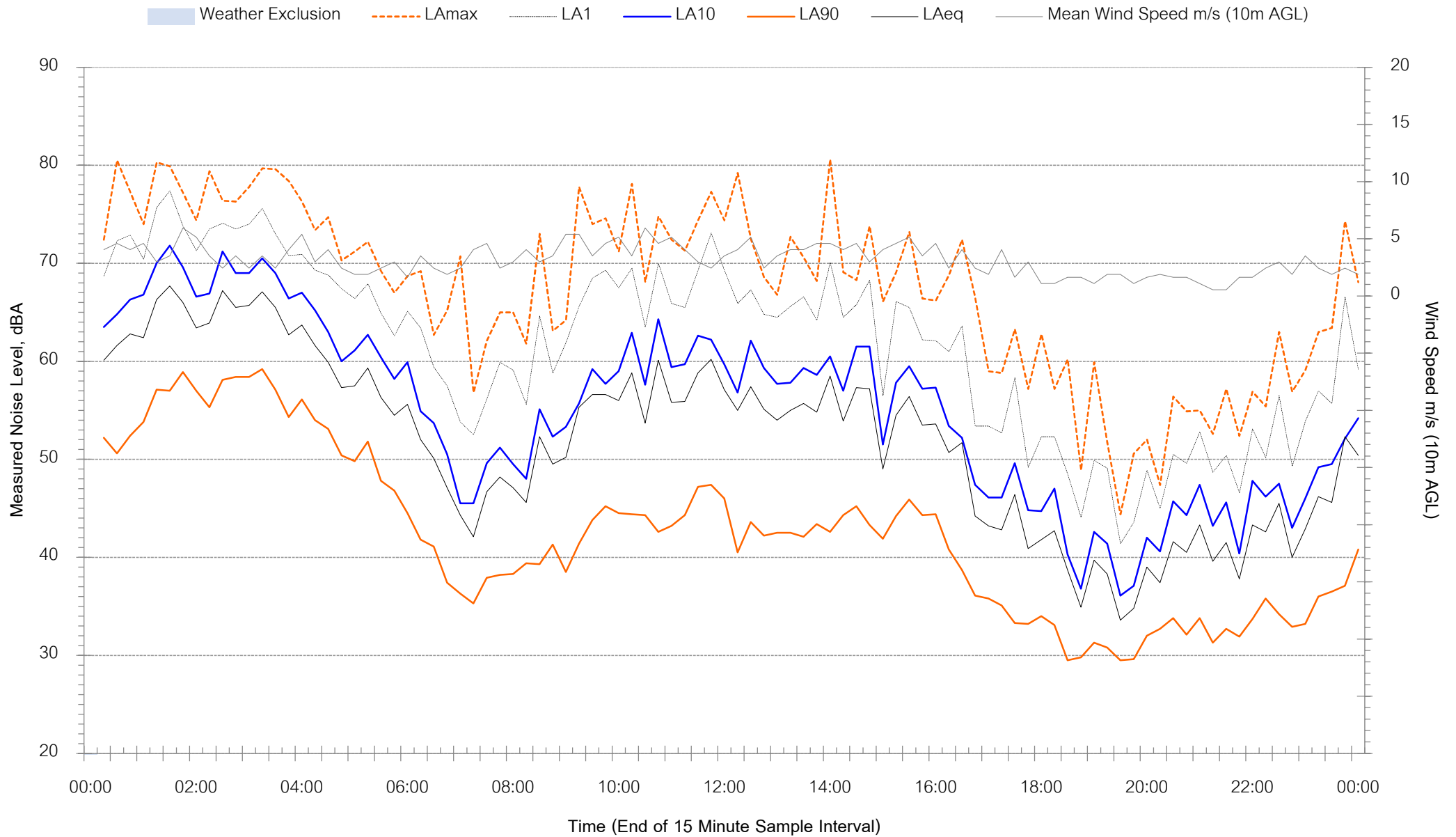
791 Jenolan Caves Road, Good Forest - Saturday 17 September 2022





Background Noise Levels

791 Jenolan Caves Road, Good Forest - Sunday 18 September 2022





Background Noise Levels

791 Jenolan Caves Road, Good Forest - Monday 19 September 2022

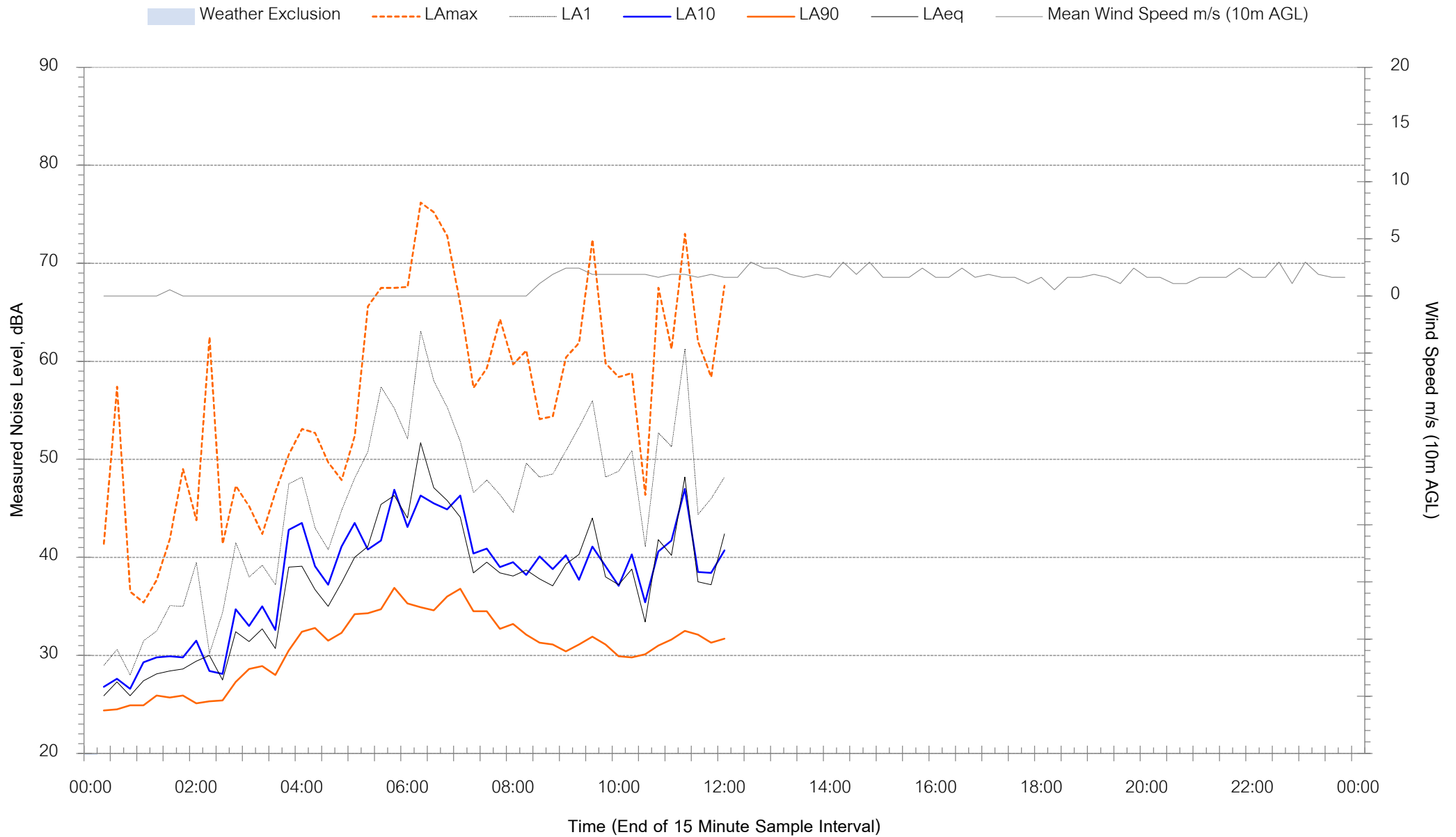
Weather Exclusion LAmax LA1 LA10 LA90 LAeq Mean Wind Speed m/s (10m AGL)





Background Noise Levels

791 Jenolan Caves Road, Good Forest - Tuesday 20 September 2022



Muller Acoustic Consulting Pty Ltd

PO Box 678, Kotara NSW 2289

ABN: 36 602 225 132

Ph: +61 2 4920 1833

www.mulleracoustic.com



Noise Monitoring Assessment

Austen Quarry, Hartley, NSW

March 2023



Document Information

Noise Monitoring Assessment

Austen Quarry, Hartley, NSW

March 2023

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



Prepared by: Muller Acoustic Consulting Pty Ltd

PO Box 678, Kotara NSW 2289

ABN: 36 602 225 132

P: +61 2 4920 1833

www.mulleracoustic.com

Document ID	Date	Prepared By	Signed	Reviewed By	Signed
MAC170523RP13	03 April 2023	Nicholas Shipman		Oliver Muller	

DISCLAIMER

All documents produced by Muller Acoustic Consulting Pty Ltd (MAC) are prepared for a particular client's requirements and are based on a specific scope, circumstances and limitations derived between MAC and the client. Information and/or report(s) prepared by MAC may not be suitable for uses other than the original intended objective. No parties other than the client should use or reproduce any information and/or report(s) without obtaining permission from MAC. Any information and/or documents prepared by MAC is not to be reproduced, presented or reviewed except in full.

CONTENTS

1 INTRODUCTION 5

2 NOISE CRITERIA 7

 2.1 ENVIRONMENTAL PROTECTION LICENSE NOISE LIMITS 7

 2.2 STATE SIGNIFICANT DEVELOPMENT CONSENT NOISE LIMITS 7

 2.3 NOISE LIMITS SUMMARY 7

3 METHODOLOGY 9

 3.1 LOCALITY 9

 3.2 NOISE MONITORING LOCATIONS 9

 3.3 ATTENDED MONITORING METHODOLOGY 9

 3.4 UNATTENDED MONITORING METHODOLOGY 10

 3.5 OPERATIONAL LOGS 10

4 RESULTS 13

 4.1 METEOROLOGICAL CONDITIONS - LOCATION B 13

 4.2 ASSESSMENT RESULTS - LOCATION A 14

 4.3 ASSESSMENT RESULTS - LOCATION B 15

 4.4 ASSESSMENT RESULTS - LOCATION C 16

 4.5 UNATTENDED NOISE MONITORING RESULTS 17

5 NOISE COMPLIANCE ASSESSMENT 19

6 DISCUSSION 21

 6.1 DISCUSSION OF RESULTS - LOCATION A 21

 6.2 DISCUSSION OF RESULTS - LOCATION B 21

 6.3 DISCUSSION OF RESULTS - LOCATION C 21

7 CONCLUSION 23

APPENDIX A – GLOSSARY OF TERMS

APPENDIX B – OPERATIONAL LOGS

APPENDIX C – NOISE MONITORING CHARTS

This page has been intentionally left blank

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
- Australian Standard AS 1055:2018 - Acoustics - Description and measurement of environmental noise.

This assessment was completed on Thursday 16 March 2023 and Friday 17 March 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**.

This page has been intentionally left blank

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 LAeq(15min). Furthermore, SSD-6084 specifies an LAmax 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 LAeq(15min)	Evening dB LAeq(15min)	Morning Shoulder dB LAeq(15min)	Morning Shoulder dB LAmax
All privately owned residences	35	35	35	52

This page has been intentionally left blank

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 Australian Standard 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 16 March 2023 and Friday 17 March 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 ± 0.5 dBA.

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 was conducted in general accordance with the procedures described in Australian Standard 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 16 March 2023 and Thursday 23 March 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 ± 0.5 dBA. 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 17 March 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)
16/03/2023	06:45	20:00	06:00	17:00
17/03/2023	06:45	15:00	06:00	19:00

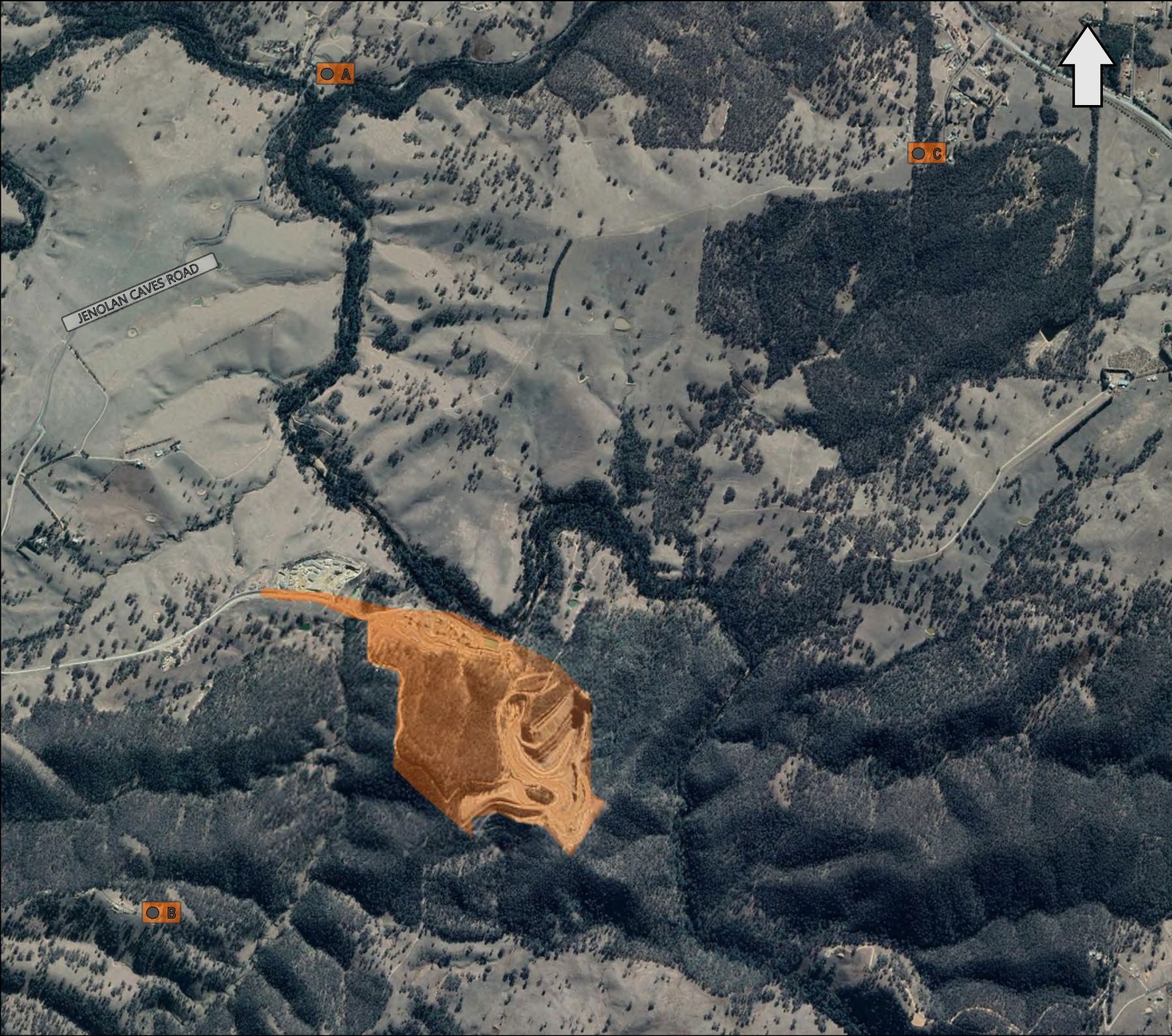


FIGURE 1
LOCALITY PLAN
REF: MAC170523



KEY	
	MONITORING LOCATION
	SITE LOCATION



This page has been intentionally left blank

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				
Time & Date	Onsite Weather Station		Operator Measured Weather	
	Station #3490		EPL Monitoring Location	
	(10mAGL)		(1.8m AGL)	
	Wind Direction	Wind (m/s)	Wind Direction	Wind (m/s)
16:12, 16/03/2023	W	4.4	W	2.6
18:30, 16/03/2023	W	1.8	W	1.6
06:01, 17/03/2023	S	0.3	E	0.6

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 16 March 2023 and Friday 17 March 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}		
16/03/2023	15:45 (Day)	84	63	47	WD: W WS: 2.5m/s Rain: Nil	Insects <45
						Birds <48
						Traffic 45-84
						Wind 45-56
Austen Quarry Contribution ¹						Quarry inaudible
						<35dB L _{Aeq} (15min)
16/03/2023	18:56 (Evening)	79	57	38	WD: W WS: 1.4m/s Rain: Nil	Traffic 37-79
						Insects <38
						Creek flow 38-41
						Birds 39-49
						Wind 38-46
						Quarry inaudible
Austen Quarry Contribution ¹						<28dB L _{Aeq} (15min)
17/03/2023	06:28 (Morning Shoulder)	85	67	41	WD: W WS: 0.1m/s Rain: Nil	Traffic 38-85
						Birds 38-44
						Creek flow 38-40
						Quarry inaudible
Austen Quarry Contribution ¹						<31dB L _{Aeq} (15min)
						<31dB 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 16 March 2023 and Friday 17 March 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}		
16/03/2023	16:12 (Day)	76	55	42	WD: W WS: 2.6m/s Rain: Nil	Insects <39
						Wind 42-58
						Aircraft 44-51
						Local residential noise 42-76
Austen Quarry Contribution ¹						Quarry inaudible
						<32dB L _{Aeq} (15min)
16/03/2023	18:30 (Evening)	65	42	32	WD: W WS: 1.6m/s Rain: Nil	Insects <29
						Wind 29-36
						Birds 38-65
						Livestock 30-34
						Aircraft 29-38
						Quarry inaudible
Austen Quarry Contribution ¹						<22dB L _{Aeq} (15min)
17/03/2023	06:01 (Morning Shoulder)	51	35	31	WD: W WS: 0.6m/s Rain: Nil	Traffic 28-47
						Wind 30-34
						Birds 32-51
						Quarry inaudible
Austen Quarry Contribution ¹						<21dB L _{Aeq} (15min)
						<21dB 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 16 March 2023 and Friday 17 March 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}			
16/03/2023	16:44 (Day)	71	54	46	WD: W	Wind 44-64	
					WS: 2.6m/s	Traffic 44-71	
					Rain: Nil	Insects <44	
						Quarry inaudible	
		Austen Quarry Contribution ¹					<35dB L _{Aeq} (15min)
16/03/2023	18:00 (Evening)	70	51	45	WD: W	Traffic 42-70	
					WS: 2.4m/s	Insects <42	
					Rain: Nil	Wind 42-58	
						Quarry inaudible	
		Austen Quarry Contribution ¹					<35dB L _{Aeq} (15min)
17/03/2023	06:49 (Morning Shoulder)	61	43	38	WD: W	Birds 38-61	
					WS: 1m/s	Traffic 36-56	
					Rain: Nil	Dog bark 34-39	
						Quarry inaudible	
		Austen Quarry Contribution ¹					<28dB L _{Aeq} (15min)
						<28dB L _{Amax}	

Note 1: Estimated quarry noise contribution.

4.5 Unattended Noise Monitoring Results

Unattended noise monitoring was conducted at Location A from Thursday 16 March 2023 and Thursday 23 March 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 A							
Date	Time (hrs)	Attended descriptors (dBA re 20 µPa)			Unattended descriptors (dBA re 20 µPa)		
		dB LAmax	dB LAeq	dB LA90	dB LAmax	dB LAeq	dB LA90
16/03/2023	15:45	84	63	47	66	51	47
16/03/2023	18:56	79	57	38	61	44	37
17/03/2023	06:28	85	67	41	63	48	38

Results of the comparison identify that the unattended results are generally lower due to the offset to the road, although results remain relatively 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 16 March 2023 and Thursday 23 March 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 A			
Date	Unattended descriptors (dBA re 20 µPa)		
	dB LAeq		
	Day	Evening	Night
Thursday, 16 March 2023	50	44	44
Wednesday, 17 March 2023	47	44	41
Thursday, 18 March 2023	51	43	41
Friday, 19 March 2023	43	42	45
Saturday, 20 March 2023	48	42	43
Sunday, 21 March 2023	49	41	44
Monday, 22 March 2023	49	57	44
Tuesday, 23 March 2023	49	N/A	N/A

This page has been intentionally left blank

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 LAeq(15min) Noise Compliance Assessment			
Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB LAeq(15min)	dB LAeq(15min)	
A	<35	35	✓
B	<35	35	✓
C	<35	35	✓

Table 10 Evening LAeq(15min) Noise Compliance Assessment			
Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB LAeq(15min)	dB LAeq(15min)	
A	<28	35	✓
B	<22	35	✓
C	<35	35	✓

Table 11 Morning Shoulder LAeq(15min) Noise Compliance Assessment			
Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB LAeq(15min)	dB LAeq(15min)	
A	<31	35	✓
B	<21	35	✓
C	<28	35	✓

Table 12 Morning Shoulder LAmax Noise Compliance Assessment			
Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB LAmax	dB LAmax	
A	<31	52	✓
B	<21	52	✓
C	<28	52	✓

This page has been intentionally left blank

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 March 2023 survey. Other extraneous noise sources audible during the three attended surveys included insects, birds, traffic, wind 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 remained inaudible during all three assessment periods. Extraneous noise sources dominated the noise environment which included insects, wind, aircraft, local residential noise, 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. Extraneous noise sources dominated the noise environment which included 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.

This page has been intentionally left blank

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 16 March 2023 and Friday 17 March 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.

This page has been intentionally left blank

Appendix A – Glossary of Terms

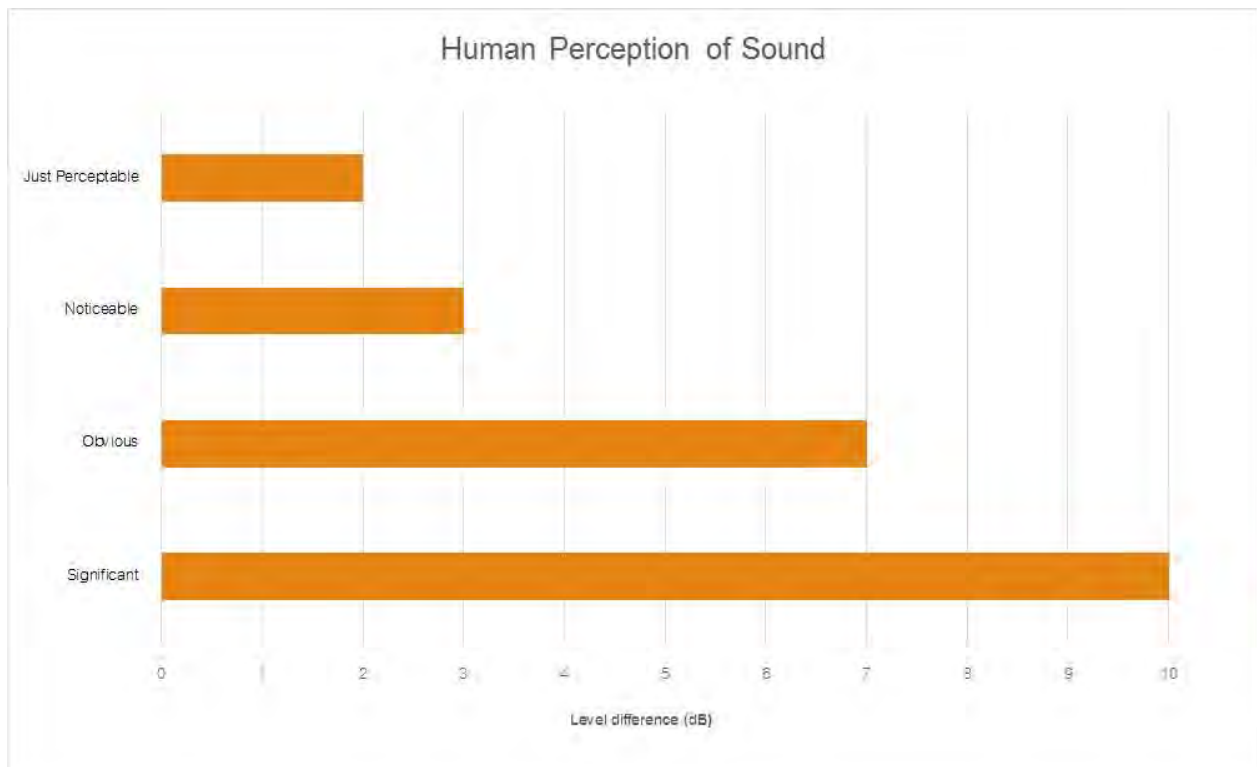
Table A1 provides a number of technical terms have been used in this report.

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.
LAm _{ax}	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 (L _W)	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 : $= 10 \cdot \log_{10} (W/W_0)$ Where : W is the sound power in watts and W ₀ 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



This page has been intentionally left blank

Appendix B – Operational Logs



DAILY PRODUCTION LOG & CHECKLIST - PRIMARY

Date: 16/3/23 Operator: A. R. ETT

Weather Conditions; FINE Quarry Bench ID. 745

Shift Start Time	<u>6 AM</u>	Shift Finish Time	
Crusher Start Time	<u>6:45</u>	End of day Crusher stopped	<u>8:23 pm</u> <u>8:00</u>

Belt Weightometer Reading - Daily

Conveyor 1 Start	Conveyor 1 Finish	Total Tonnes Crushed
		<u>7054</u>

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

DU4 Loads to Boot	<u>115 + 4 + 17</u>	DU1 Loads to Boot	
DU6 Loads to Boot	<u>136</u>	Contractor Loads to Boot	<u>272</u>

LAT 769 37 - 999

Stoppages due to Trucks	Stoppages due to Jaw
<u>734</u>	

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
		<u>1/1</u>	<u>Pre start / tool box / grease plant / Both lanyards cv2, dismantle one to get to reset / CV3 General Fault when trying to start</u>
	<u>5:50</u>	<u>1/5</u>	
<u>8:05 pm</u>	<u>9:52 pm</u>	<u>53 min</u>	<u>CV7 under speed fault and drift switch</u>

Pre start checks;

Generator hours. 35022 Generator oil level. ✓

Plant Visual Pilot hours

COMMENTS



DAILY PRODUCTION LOG & CHECKLIST - PRIMARY

Date: 17/3/23 Operator: ADETT

Weather Conditions; FINE Quarry Bench ID. 745

Shift Start Time	<u>6 AM</u>	Shift Finish Time	<u>3:30</u>
Crusher Start Time	<u>6:45</u>	End of day Crusher stopped	<u>3:00</u>

Belt Weightometer Reading - Daily

Conveyor 1 Start	Conveyor 1 Finish	Total Tonnes Crushed
		<u>4355</u>

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

DU4 Loads to Boot	<u>46</u>	DU1 Loads to Boot	
DU6 Loads to Boot	<u>45</u>	Contractor Loads to Boot	

Stoppages due to Trucks	Stoppages due to Jaw
<u>49/4</u>	

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
	<u>6:45</u>	<u>.45</u>	<u>Startup</u>
<u>3:00</u>		<u>.5</u>	<u>Shutdown</u>

Pre start checks;

Generator hours. 75038 Generator oil level. ✓

Plant Visual Pilot hours

COMMENTS

DAILY PRODUCTION LOG & CHECKLIST - SECONDARY



an ADBRI company

Date: 16-3-23 Operator: NETC G

Weather Conditions: Fine

Shift Start Time	<u>5 AM</u>	Shift Finish Time	<u>10 PM</u>
Crusher Start Time	<u>6.0 am</u>	End of day Crusher stopped	<u>5 PM</u>

Weightometer Reading; Start: 6298489 Finish: 6302675 = 4186

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
	<u>6.0 am</u>		
<u>6.0 am</u>	<u>8.2 am</u>	<u>2.22</u>	<u>No Surge P.1c Pak</u>
<u>9.21</u>	<u>9.22</u>	<u>.1</u>	<u>450 ADJUST (7 teeth)</u>
<u>9.32</u>	<u>9.33</u>	<u>.1</u>	<u>550 ADJUST (12 teeth)</u>
<u>11.20</u>	<u>12.1</u>	<u>.1</u>	<u>450 + 550 ADJ</u>
<u>1.45</u>	<u>1.55</u>	<u>.10</u>	<u>Clear PRC Head Box Metal a term</u>
<u>2.44</u>	<u>2.46</u>	<u>.2</u>	<u>ADJ 450 + 530</u>
<u>3.20</u>	<u>3.26</u>	<u>.6</u>	<u>Metal alarm</u>
<u>4.30</u>	<u>4.31</u>	<u>.1</u>	<u>ADJ 450 + 550</u>
<u>5:00</u>		<u>5.</u>	<u>Run P.P</u>

625733600

PRODUCTION SUMMARY

Belts	Size	Description	Total Tonnes	Comments
CV 8	20 mm	Concrete Aggregate	<u>1100</u>	
CV 20	Course Sand 4-0mm	Manufactured Sand	<u>1000</u>	
CV 20	Old Man Sand	Man sand By-Pass Air-Sep		
CV 21	Super Fine -50micron	Super Fine Sand	<u>80</u>	
CV19*	10-7mm Blend*	Concrete Blend	<u>1200</u>	
CV19	7mm	Concrete Aggregate		
CV17	10mm	Concrete Aggregate		
CV15	14mm	Concrete Aggregate	<u>250</u>	
CV5	Ballast/40mm	Non Spec Aggregate		

DAILY PRODUCTION LOG & CHECKLIST - SECONDARY



an ADBRI company

Date: 17-3-23

Operator: NETI G

Weather Conditions; FINE

Shift Start Time	<u>5AM</u>	Shift Finish Time	<u>10 PM</u>
Crusher Start Time	<u>6:01am</u>	End of day Crusher stopped	

Weightometer Reading; Start: 6302675 Finish: 6309440 = 6765

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
	<u>6:01am</u>		
<u>6:01am</u>	<u>7:10am</u>	<u>1.10</u>	<u>PRC lanyard trouble</u>
<u>9:08am</u>	<u>9:09am</u>	<u>.1</u>	<u>450 Adjust (5 teeth)</u>
	<u>9:25</u>		<u>550 Adjust (5 teeth)</u>
<u>10:10</u>	<u>10:19</u>	<u>.9</u>	<u>metal detector</u>
			<u>Adjustment 450 + 550</u>
<u>12:17</u>	<u>12:27</u>	<u>.10</u>	<u>metal detector</u>
<u>1:41</u>	<u>1:42</u>	<u>.1</u>	<u>ADJ 450 + 550</u>
<u>1:55</u>	<u>2:41</u>	<u>.46</u>	<u>CV4 Motion Sensor fault PTE Fixed IT</u>
<u>2:50</u>	<u>2:52</u>	<u>.2</u>	<u>Adj 450 + 550</u>
<u>6 PM</u>	<u>6:15</u>	<u>.15</u>	<u>CV2 EMERGENCY STOP Lanyard.</u>
<u>6:50</u>	<u>6:51</u>	<u>.1</u>	<u>Adj 450</u>

PRODUCTION SUMMARY

Belts	Size	Description	Total Tonnes	Comments
CV 8	20 mm	Concrete Aggregate	<u>1800</u>	
CV 20	Course Sand 4-0mm	Manufactured Sand	<u>1600</u>	
CV 20	Old Man Sand	Man sand By-Pass Air-Sep		
CV 21	Super Fine -50micron	Super Fine Sand	<u>250</u>	
CV19*	10-7mm Blend*	Concrete Blend	<u>1600</u>	
CV19	7mm	Concrete Aggregate		
CV17	10mm	Concrete Aggregate		
CV15	14mm	Concrete Aggregate	<u>500</u>	
CV5	Ballast/40mm	Non Spec Aggregate		

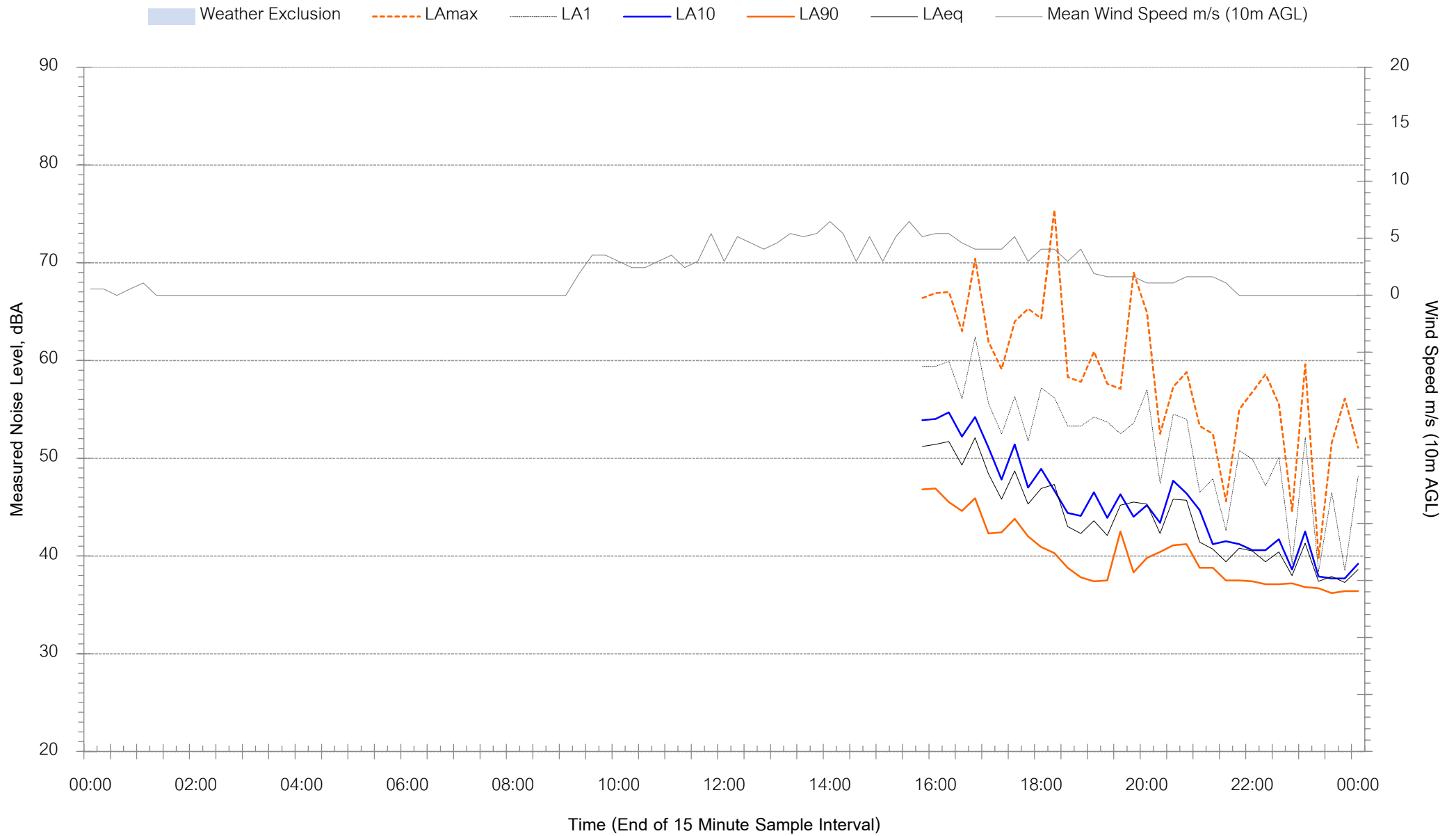
5750

Appendix C – Noise Monitoring Charts



Background Noise Levels

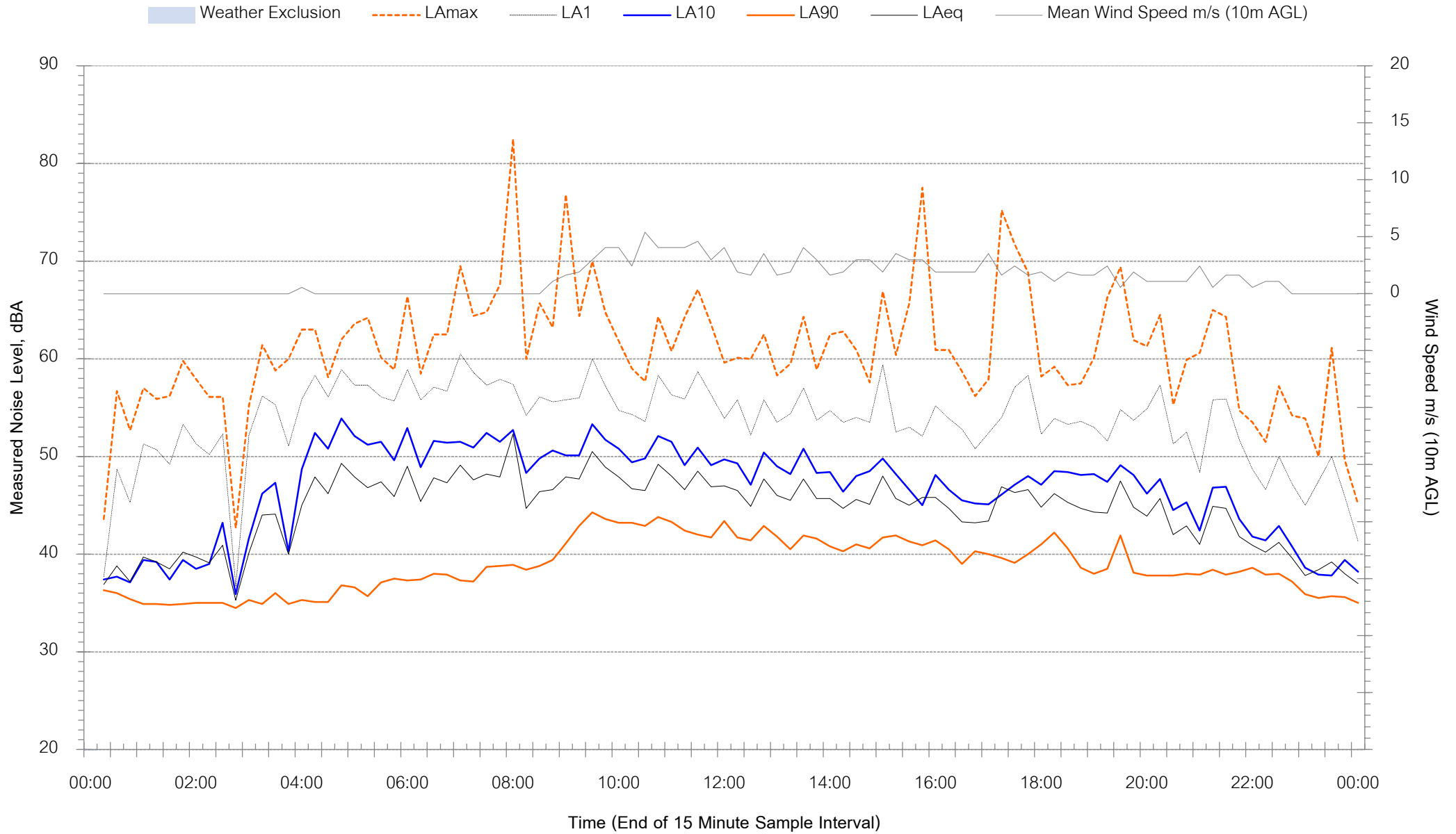
Location A - 200 Jenolan Caves Road, Hartley - Thursday 16 March 2023





Background Noise Levels

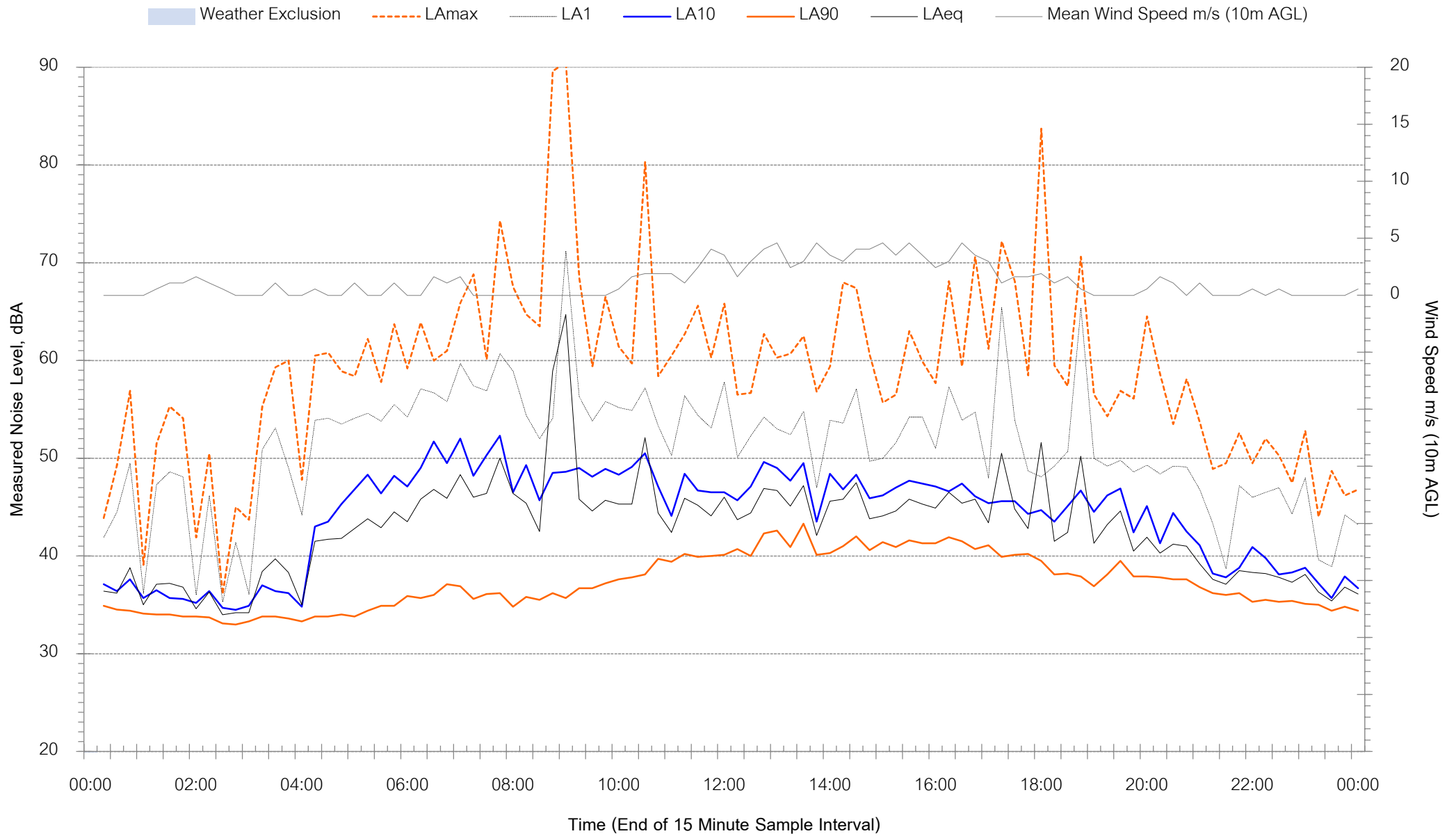
Location A - 200 Jenolan Caves Road, Hartley - Friday 17 March 2023





Background Noise Levels

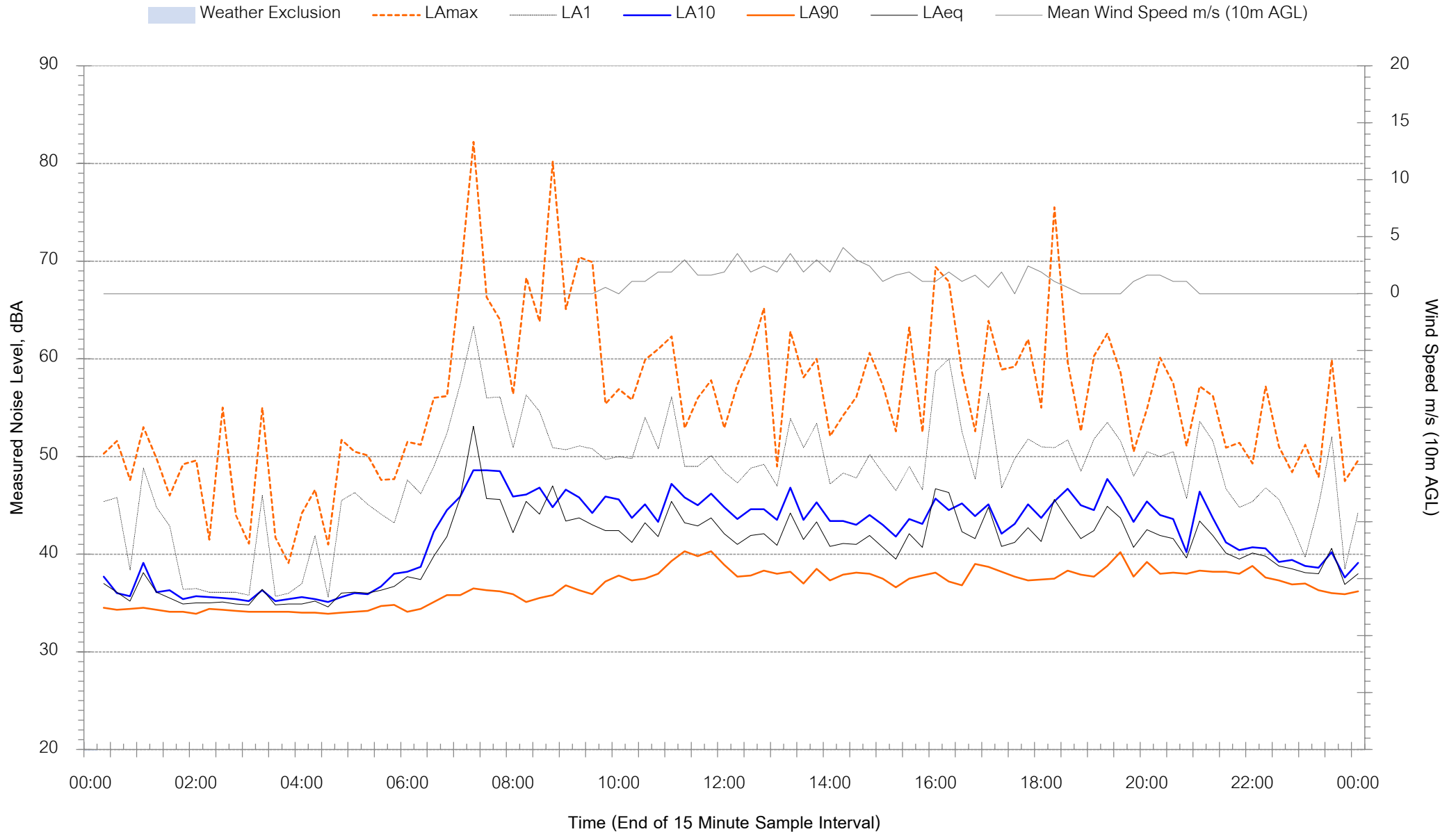
Location A - 200 Jenolan Caves Road, Hartley - Saturday 18 March 2023





Background Noise Levels

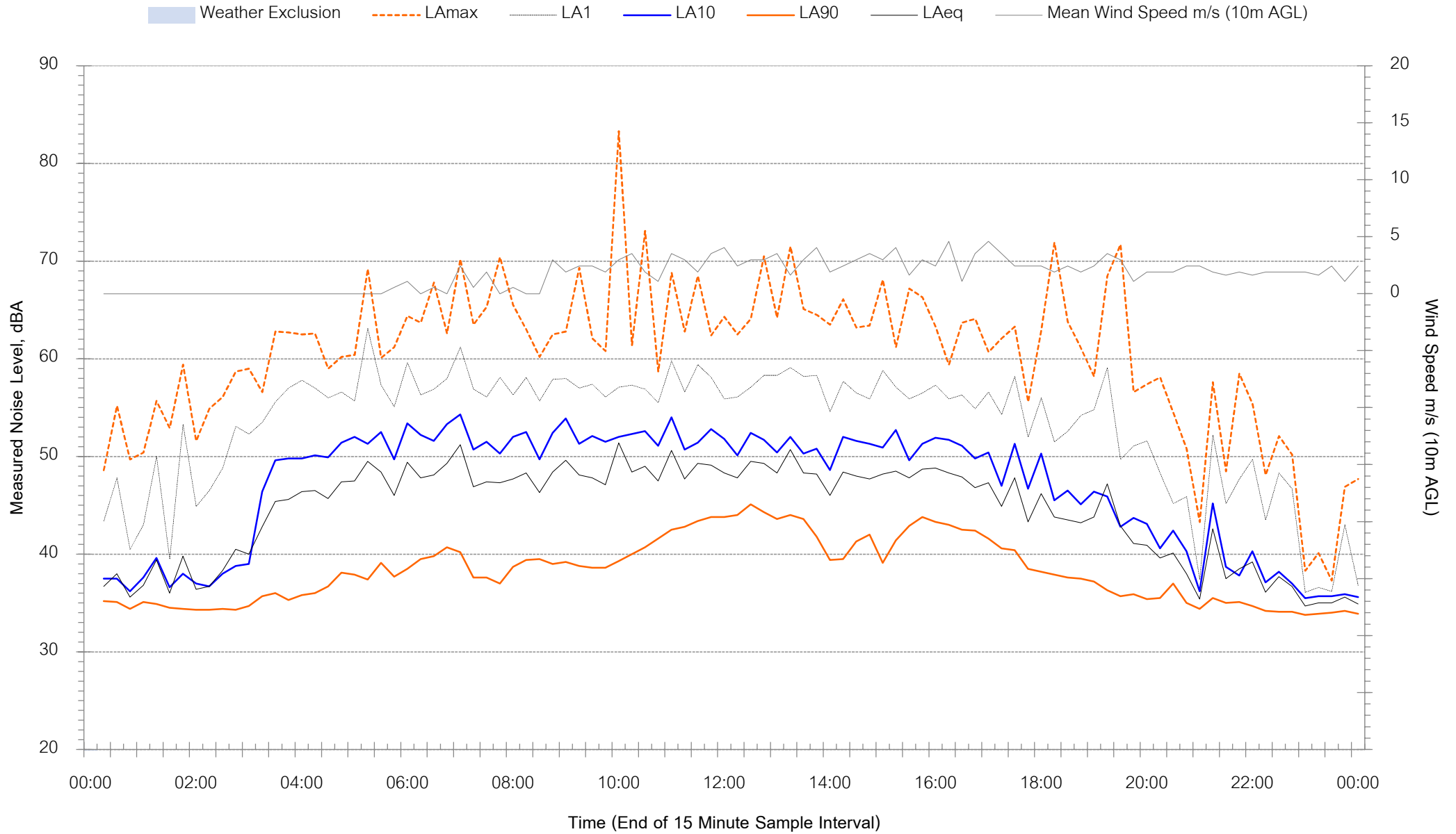
Location A - 200 Jenolan Caves Road, Hartley - Sunday 19 March 2023





Background Noise Levels

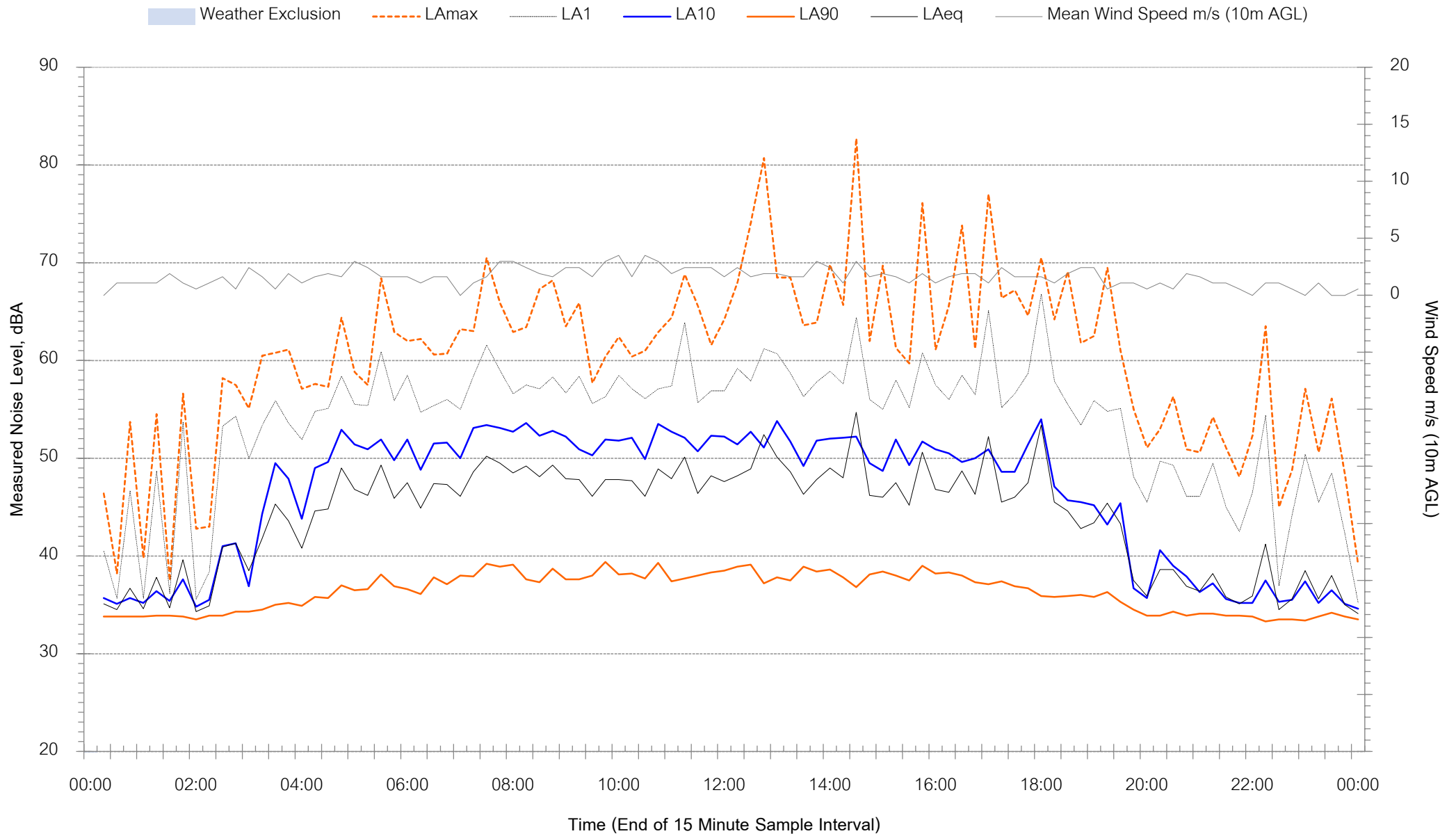
Location A - 200 Jenolan Caves Road, Hartley - Monday 20 March 2023





Background Noise Levels

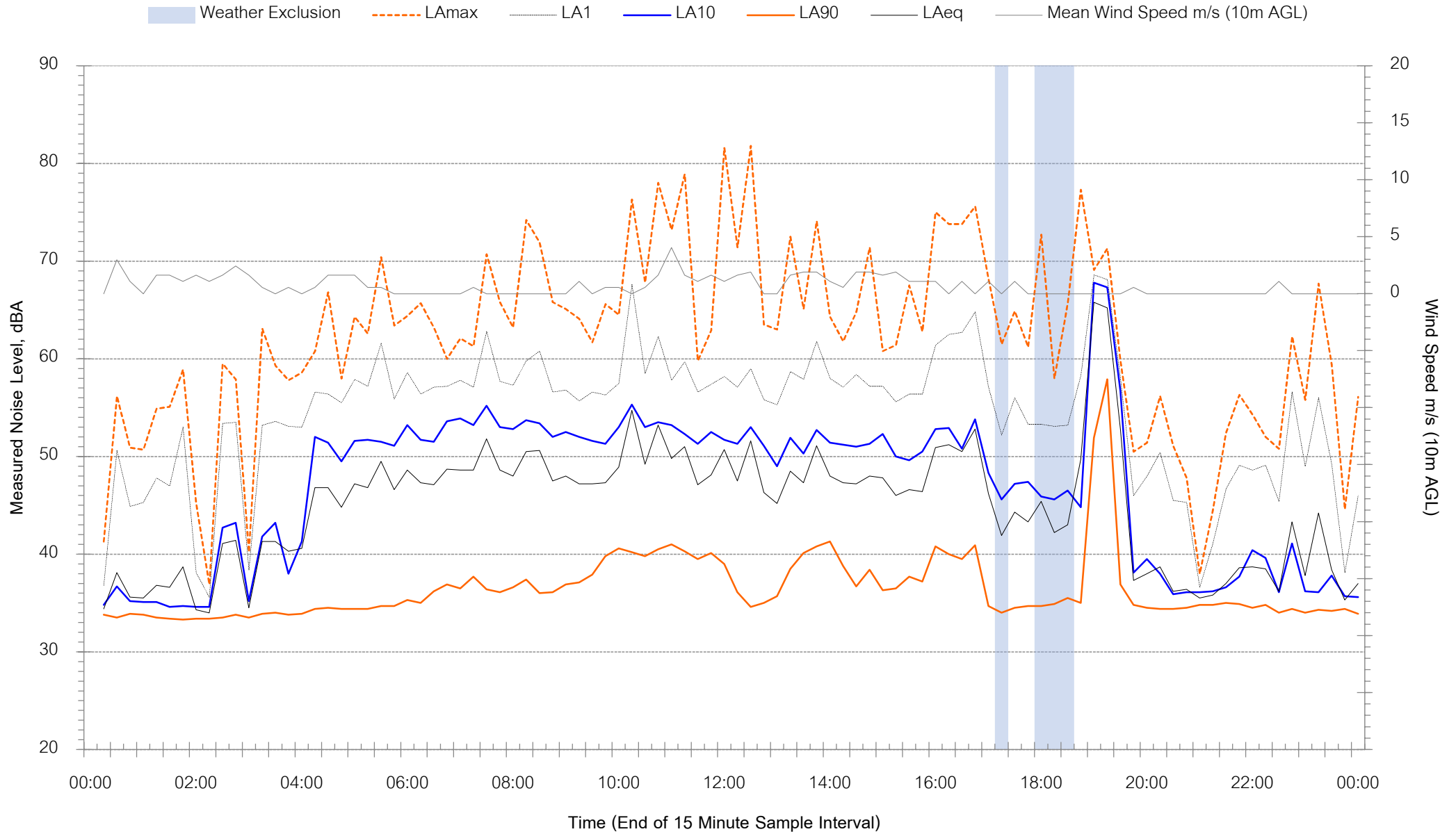
Location A - 200 Jenolan Caves Road, Hartley - Tuesday 21 March 2023





Background Noise Levels

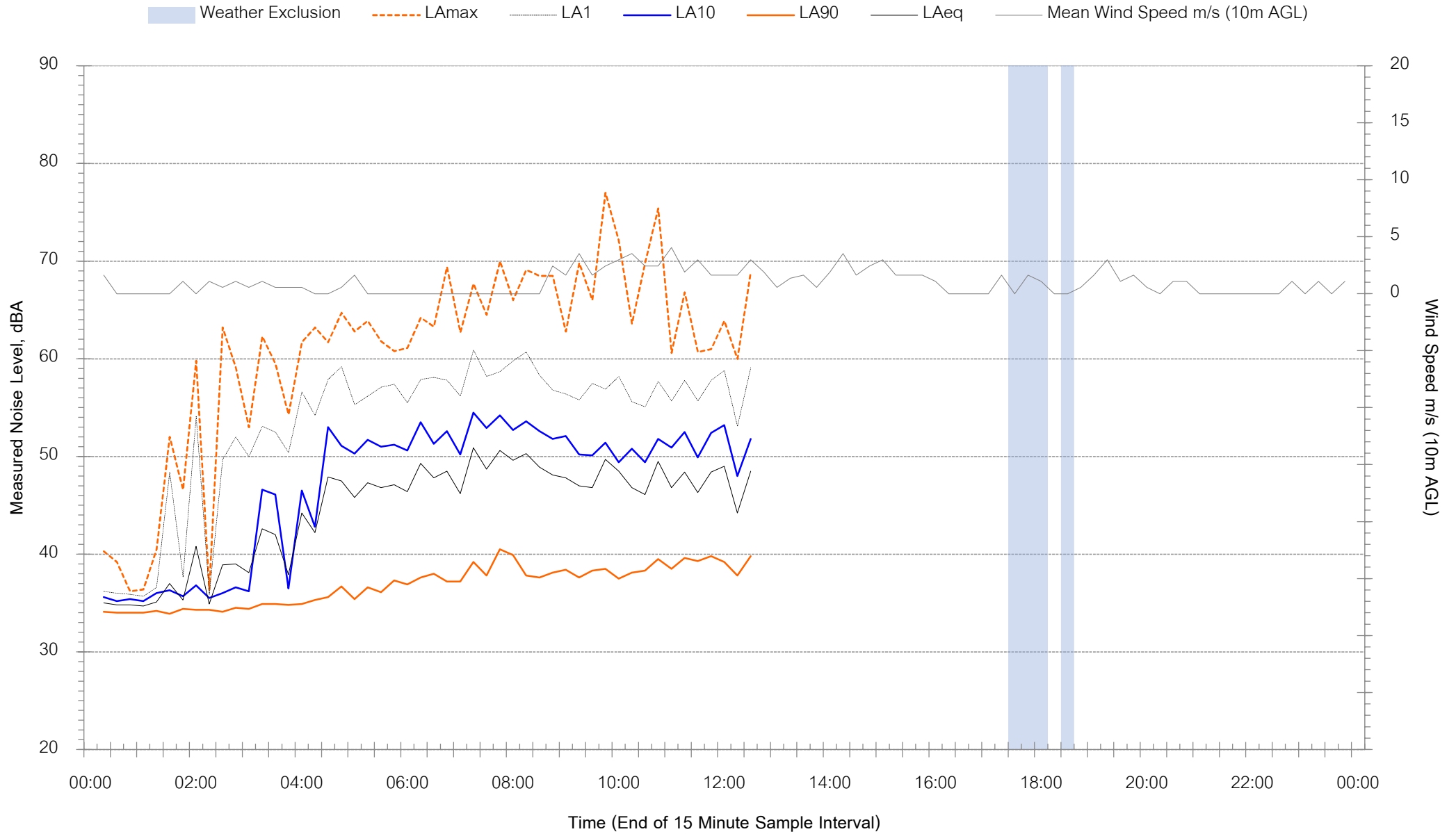
Location A - 200 Jenolan Caves Road, Hartley - Wednesday 22 March 2023





Background Noise Levels

Location A - 200 Jenolan Caves Road, Hartley - Thursday 23 March 2023



Muller Acoustic Consulting Pty Ltd

PO Box 678, Kotara NSW 2289

ABN: 36 602 225 132

Ph: +61 2 4920 1833

www.mulleracoustic.com



Appendix G: Visual Monitoring

Plan of:	Annual Review for the Austen Quarry Extension July 2022 to June 2023 - Photoplates Showing Focal Length Comparisons	Version/Date:	V0 23/08/2022	Location:	Off Jenolan Caves Road, Hartley, NSW	Tenure:	Not Applicable	Source:	Client	Project Manager:	LT
Figure:	Photoplate ONE	Our Ref:	12536_HY_H_AR2022-23_C001_V0_P1	Council:	Lithgow City Council	Client:	Hy-Tec Industries Pty Ltd - Adelaide Brighton Limited	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	42mm	50 - 52mm	85mm
June 2019				
July 2020				
Aug 2021				
July 2022				
July 2023				

Appendix H: Biodiversity Monitoring

Austen Quarry Biodiversity Monitoring Report 2022

Prepared for Austen Hy-Tec

April 2023

Austen Quarry Biodiversity Monitoring Report 2022

Austen Hy-Tec

E220050 RP#1

April 2023

Version	Date	Prepared by	Approved by	Comments
1	25 January 2023	Madeleine Hunt	Sarah Perry	Draft
2	14 April 2023	Jennifer Lindsay Madeleine Hunt	Sarah Perry	Final

Approved by



Sarah Perry

Associate Ecologist

14 April 2023

Level 3 175 Scott Street
Newcastle NSW 2300

This report has been prepared in accordance with the brief provided by Austen Hy-Tec and, in its preparation, EMM has relied upon the information collected at the times and under the conditions specified in this report. All findings, conclusions or recommendations contained in this report are based on those aforementioned circumstances. The contents of this report are private and confidential. This report is only for Austen Hy-Tec's use in accordance with its agreement with EMM and is not to be relied on by or made available to any other party without EMM's prior written consent. Except as permitted by the Copyright Act 1968 (Cth) and only to the extent incapable of exclusion, any other use (including use or reproduction of this report for resale or other commercial purposes) is prohibited without EMM's prior written consent. Except where expressly agreed to by EMM in writing, and to the extent permitted by law, EMM will have no liability (and assumes no duty of care) to any person in relation to this document, other than to Austen Hy-Tec (and subject to the terms of EMM's agreement with Austen Hy-Tec).

© EMM Consulting Pty Ltd, Ground Floor Suite 01, 20 Chandos Street, St Leonards NSW 2065. [2023]

TABLE OF CONTENTS

1	Introduction	1
1.1	Background	1
1.2	Project description	1
1.3	Surrounding landscape	1
1.4	Purpose and objectives	1
2	Survey Methodology	3
2.1	Personnel	3
2.2	Methods	3
3	Results	6
3.1	Flora results	6
3.2	Silver-leaved Mountain Gum	7
3.3	Rehabilitation sites	8
3.4	Priority environmental weeds	12
3.5	Fauna survey results	14
3.6	Wildlife camera monitoring	20
4	Discussion	23
4.1	Flora	23
4.2	Weeds	23
4.3	Fauna	23
5	Recommendations	24
6	References	25

Appendices

Appendix A	Survey species list	A.1
Appendix B	Biometric survey results	B.1
Appendix C	Declared weeds of Central Tablelands	C.1
Appendix D	Threatened Species Database search	D.1

Tables

Table 3.1	Priority weeds relative abundance 2022	12
Table C.1	Priority weeds for the Central Tablelands 23/12/2022	C.2

Figures

Figure 2.1	Biometric monitoring map	5
Figure 3.1	December 2022 flora survey data	6
Figure 3.2	Silver-leaved Mountain Gum Monitoring Results	7
Figure 3.3	Rehab New site monitoring 2022	9
Figure 3.4	Rehab Old site monitoring 2022	9
Figure 3.5	Priority weeds relative abundance 2022	13
Figure 3.6	Amphibian monitoring results	14
Figure 3.7	Reptile monitoring results	15
Figure 3.8	Mammal monitoring results	15
Figure 3.9	Birds monitoring results	16
Figure 3.10	Birds of prey monitoring results	16
Figure 3.11	Nocturnal birds monitoring results	17
Figure 3.12	Riverine birds monitoring results	17
Figure 3.13	Parrots monitoring results	18
Figure 3.14	Forest/woodland insectivore monitoring results	18
Figure 3.15	Robins, wrens, and finches monitoring results	19
Figure 3.16	Honeyeaters monitoring results	19
Figure B.1	South Ridge biometric survey results	B.2
Figure B.2	Impact Ridge biometric survey results	B.2
Figure B.3	Control Ridge biometric survey results	B.3
Figure B.4	Impact Creek biometric survey results	B.3
Figure B.5	Control Creek biometric survey results	B.4
Figure B.6	Silver-leaved Mountain Gum survey data	B.4
Figure B.7	Rehab New survey results	B.5
Figure B.8	Rehab Old survey results	B.5

Photographs

Photograph 3.1	View of Silver-leaved Mountain Gum plantings at the New Rehab site 2020	10
Photograph 3.2	View of Silver-leaved Mountain Gum plantings at the New Rehab site 2021	10
Photograph 3.3	View of Silver-leaved Mountain Gum plantings at the New Rehab site 2022	11
Photograph 3.4	Wombat observed at Camera 1, northwest of Control Ridge 2	21
Photograph 3.5	Fox observed near Impact Creek 2 (Camera 2)	21
Photograph 3.6	Red-Necked Wallaby observed at South Ridge 1 (Camera 3)	22
Photograph 3.7	Echidna observed at South Ridge 1 (Camera 3)	22

1 Introduction

1.1 Background

EMM Consulting Pty Limited (EMM) were engaged by Hy-Tec Concrete and Aggregates (Hy-Tec) to conduct annual environmental monitoring at Austen Quarry (the Quarry), based on the methods defined in the Austen Quarry Landscape and Rehabilitation Management Plan (LRMP) (R.W. Corkery & Co., 2019). Monitoring was previously undertaken by Onsite Environmental Management from 2003 to 2017, with EMM commencing annual monitoring of the Quarry in 2018 as per methods defined in the LRMP (R.W. Corkery & Co., 2019).

1.2 Project description

Development of the Quarry was granted by Lithgow City Council in 1995 (DA 104/93), with a modification approved for the operation under the *Environmental Planning and Assessment Act 1979* (EP&A Act) in July 2015 (SSD_6084). Condition 29 of this approval required the preparation and approval of a Landscape and Rehabilitation Management Plan. This 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).

The Quarry is located approximately 3.5 km south-west of the village of Hartley, west of the Blue Mountains Escarpment. The elevation of the Quarry varies from approximately 650 to 750 metres (m) above sea level. The Quarry is approximately 12.9 hectares (ha) comprising; the mining lease area containing, an active mining pit, processing and workshop area and material stockpile area.

1.3 Surrounding landscape

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, Yorkeys Creek, occurs just west of the Quarry, joining the Coxs River just north-east of the processing area.

1.4 Purpose and objectives

EMM has prepared an environmental monitoring program to satisfy the requirements of Sections 10.2 and 10.3 of the Austen Quarry LRMP (R.W. Corkery & Co., 2019), including:

- annual monitoring of Silver-leaved Mountain Gum (*Eucalyptus pulverulenta*) within the Biodiversity Offset Area (BOA) to assess the health of the species and log percentage cover of weed species
- annual flora and fauna surveys at control and impact sites (for ridge and riverine environments) within and surrounding the Quarry.

This monitoring report details the following:

- methodology of ecological sampling program, including flora and fauna surveys
- detail any threatened species or communities which have been newly listed since the previous monitoring and are relevant to the Quarry
- present results of flora and fauna surveys
- assess compliance with the biodiversity related consent conditions under which the Quarry operates
- provide management recommendations to preserve significant ecology that may be present on the Quarry and minimise negative impacts to the local ecology in general.

The 2022 annual monitoring surveys were conducted in line with the LRMP (R.W. Corkery & Co., 2019) and the survey locations in accordance with previous year's monitoring (EMM, 2021; EMM, 2020).

2 Survey Methodology

2.1 Personnel

Flora and Fauna surveys were conducted by EMM ecologist Ross Davey and environmental sub-consultant Callan Douchkov and over a three-day and two-night period between 19 and 21 December 2022. Weather conditions during the surveys included mild mornings and warm weather throughout the day, ranging between 16 and 32 degrees. The wind at the Quarry was mostly calm, with no rain recorded.

2.2 Methods

The spring/summer season is targeted year on year to provide consistency across annual trends and generally coincides with higher levels of faunal activity and larger numbers of flora species in flower.

The focus of the survey work 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. Therefore, the same transects (for ridge and riverine environments) are surveyed year on year to allow analysis of trends. Refer to Figure 2.1 for transect locations.

2.2.1 Flora survey methods

i Impact and control site surveys

Flora surveys were conducted within each vegetation community survey location using two 50 x 10 m transects (Figure 2.1) to record vegetation composition, bare areas, rock, and leaf litter. Each were recorded at 5 m intervals along the transect line for a total of 22 survey points.

The 'impact creek' transects along the Coxs River are to the north of the active quarry site, with 'upstream creek' transects to the north-west of the Quarry. These areas are surveyed to examined to determine the degree of impact of the quarry operations (i.e. using the upstream site as a unimpacted reference site).

The 'south ridge impact' transects are south-west of the active quarry area, with the 'control ridge' to the north-east of the Quarry. These areas are surveyed to examined to determine the degree of impact of the quarry operations (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 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.

ii Silver-leaved Mountain Gum surveys

Silver-leaved Mountain Gum surveys were conducted to the east of the Quarry and comprised two 50 x 10 m transects (Figure 2.1). Biometric data was gathered at 5 m intervals along each transect including plant count, plant condition, evidence of animal grazing, new growth, frittering, flowering and average plant height.

iii Rehabilitation site surveys

Two 50 x 10 m transects were undertaken within rehabilitation vegetation areas adjacent to the haul road near the intersection and pit lookouts. The 'Rehab 1' transect was undertaken amongst old plantings in the revegetated 'island' encapsulated by the haul road. The 'Rehab 2' transect was undertaken amongst new plantings on the slope between the haul road and overburden dump.

2.2.2 Fauna Survey Techniques

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 two nights in all vegetation communities and included:

- spotlight transects
- motion-activated fauna cameras with bait stations.



Source: EMM (2022); DFSI (2017); GA (2011); ASGC (2006)

\\emmsvr1\EMM\2\2022\E220050 - Austen Quarry Biodiversity Monitoring 2022\GIS\02_Maps\G001_BiometricMonitoring_20230113_02.mxd 13/01/2023

KEY

- | | |
|--|---|
| ● Fauna camera | INSET KEY |
| Biometric monitoring | Main road |
| <i>Eucalyptus pulverulenta</i> | NPWS reserve |
| Major road | State forest |
| Vehicular track | |
| Watercourse/drainage line | |

Biodiversity monitoring 2022

Hy-Tec - Austen Quarry
Biodiversity Monitoring 2022
Figure 2.1



3 Results

3.1 Flora results

In comparison to previous years (EMM, 2020; EMM, 2021), Figure 3.1 shows that impact ridge sites have experienced a decrease in both introduced and native species recorded. Similar to the 2021 monitoring survey, there continues to be more native species recorded than introduced species. As shown in Figure 2.1, impact ridge sites are located on the east-facing slope above the quarry’s existing overburden dump.

A notable contrast in condition was observed between the eastern and western facing slopes of the Impact ridge survey location, shown as ‘Impact Ridge’ and ‘South Ridge’ in Figure 3.1 respectively. The quarry-facing eastern slope was noted to have a much higher abundance of introduced species than the western-facing slope of the same ridge. The large, scattered cluster of Strawberry Broomrape (*Orobanche* sp.) reported in previous years (EMM, 2021; EMM, 2020) for this transect site was not recorded. This is likely due to management actions completed after last year’s survey.

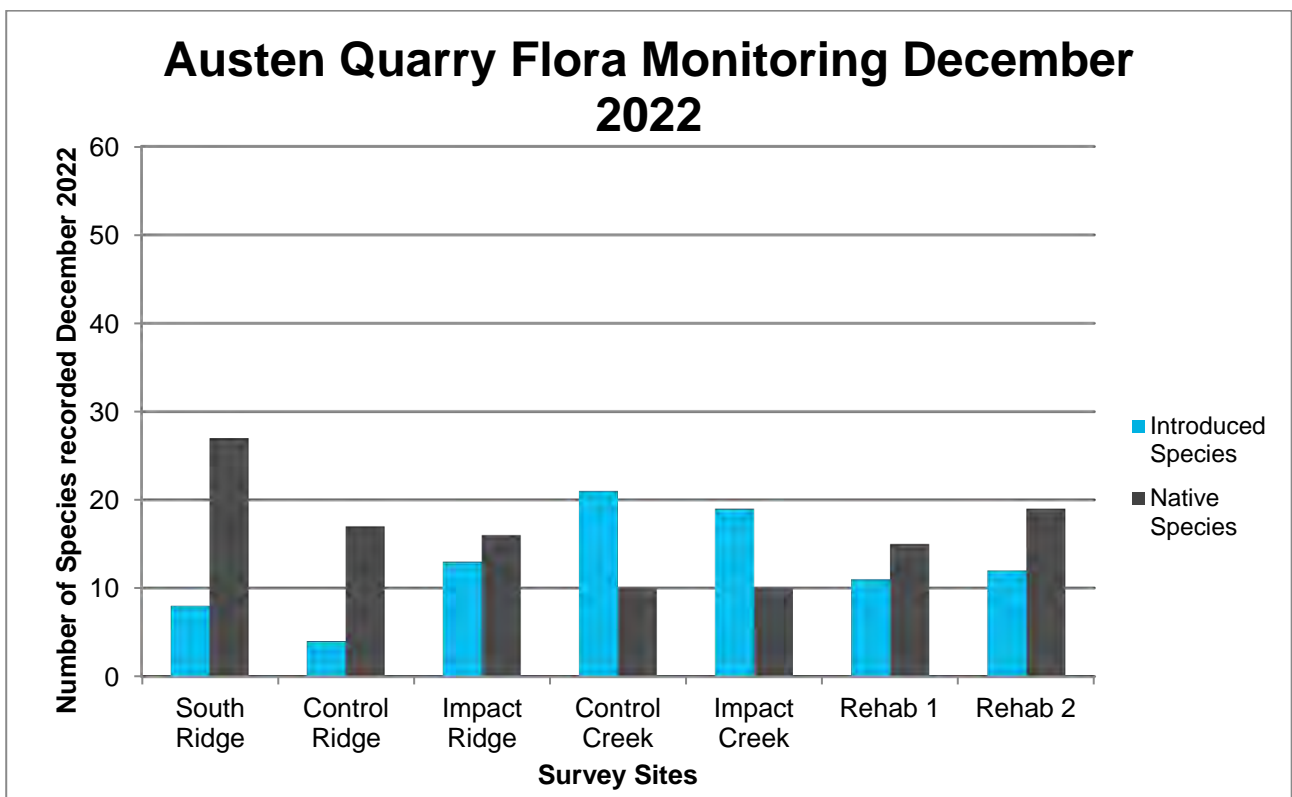


Figure 3.1 December 2022 flora survey data

The river sites continue to show a trend of higher weed concentrations, with introduced species occurring in higher abundance than native species at both sites. Very little native groundcovers exist in these areas to suppress the spread of weed and pasture species from adjacent grazing areas. Exotic species dominate the ground layers; however, the large, established canopy trees are mostly native. Native species at both river sites have decreased slightly since the 2021 monitoring survey (EMM, 2021).

A slight increase in native species and a slight decrease in introduced species was observed at the old rehab monitoring site (Rehab 1). In comparison, a stabilisation of native species and a slight increase in introduced species was observed at the new rehab site (Rehab 2). Both rehab monitoring sites are comparable to the results of previous monitoring periods.

Biometric monitoring data for all sites is included in Appendix B.

The following general changes between the 2021 and 2022 monitoring survey data sets were noted including:

- decreases in both introduced and native species recorded at Impact Ridge and Control Ridge sites
- decreases in both introduced and native species recorded at Impact Creek and Control Creek sites
- increases in native species and decreases in introduced species at the old rehab site (Rehab 1)
- increases in introduced species at the new rehab site (Rehab 2).

3.2 Silver-leaved Mountain Gum

Two 50 x 10 m transects were undertaken within the Silver-leaved Mountain Gum Mallee Woodland vegetation community to the east 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 Gums within the vegetation community. Biometric data was gathered at 5 m intervals along each transect. Results of these transects are shown in Figure 3.2 below.

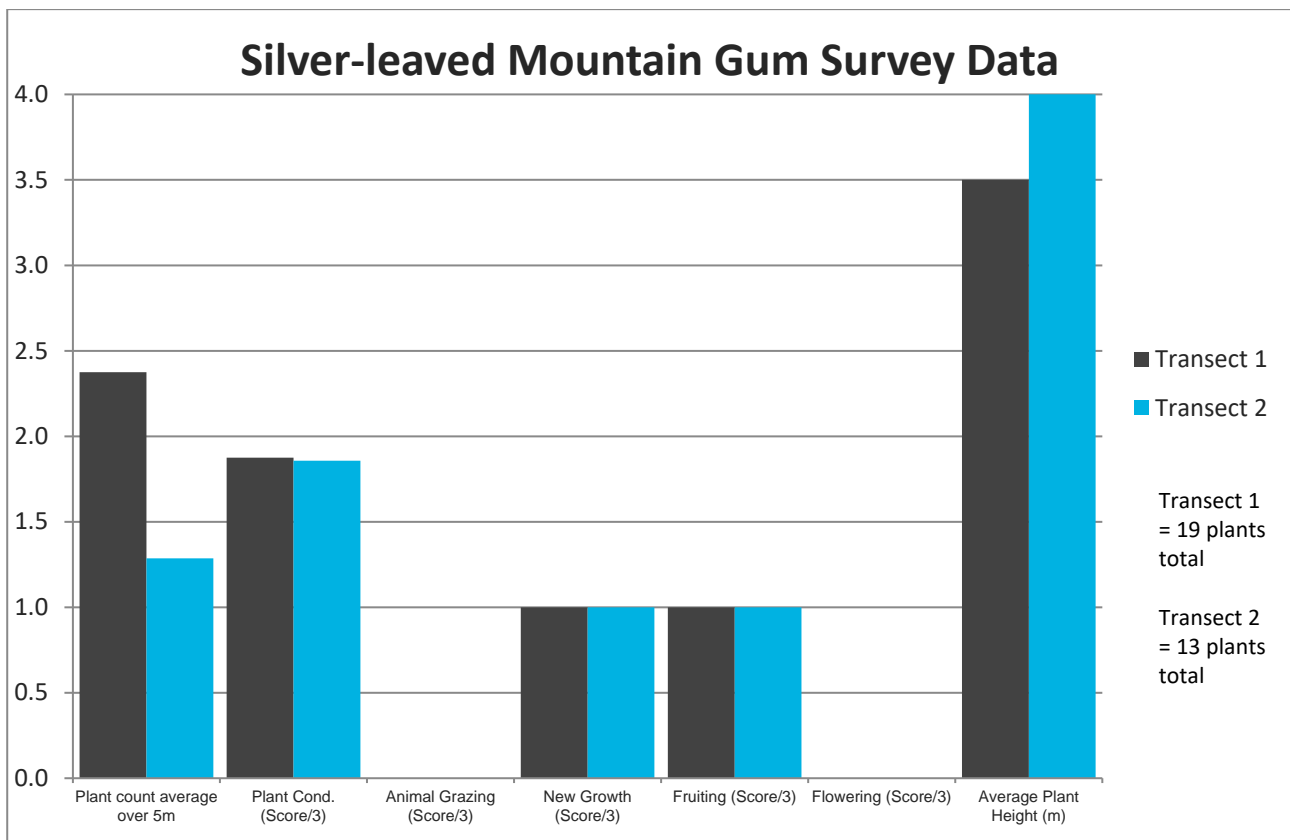


Figure 3.2 Silver-leaved Mountain Gum Monitoring Results

Vegetation is scored 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, with an increase in the total number of plants from previous monitoring years. Most Silver-leaved Mountain Gums observed along both transects were noted to be in good condition and exhibited no evidence of dieback. Insect damage was observed in both Silver-leaved Mountain Gum transects. Presence of new growth was observed to have decreased in comparison to previous monitoring years. No animal grazing was recorded in either transect.

3.3 Rehabilitation sites

Results of these transects are shown in Figure 3.3 and Figure 3.4 below, and with comparative photographs showing 2020 through to 2022 (Photograph 3.1, Photograph 3.2 and Photograph 3.3).

Rehab Old was observed to be in comparable condition to results from previous monitoring years. An increase in the native over-storey cover was observed, as plants which had previously been captured occupying the mid-storey tier continue to develop into the over-storey. Bare ground cover has decreased over the previous monitoring period, and weed abundance is comparable to previous monitoring years.

Rehab New has improved over the previous monitoring period, with an increased coverage of native mid-storey and ground-cover species. A considerable amount of bare ground remains as a dominant feature of the Rehab New 2 transect; however, the increased native vegetation cover over the previous monitoring period has lessened the amount of bare ground. Weed abundance is comparable to previous monitoring years.

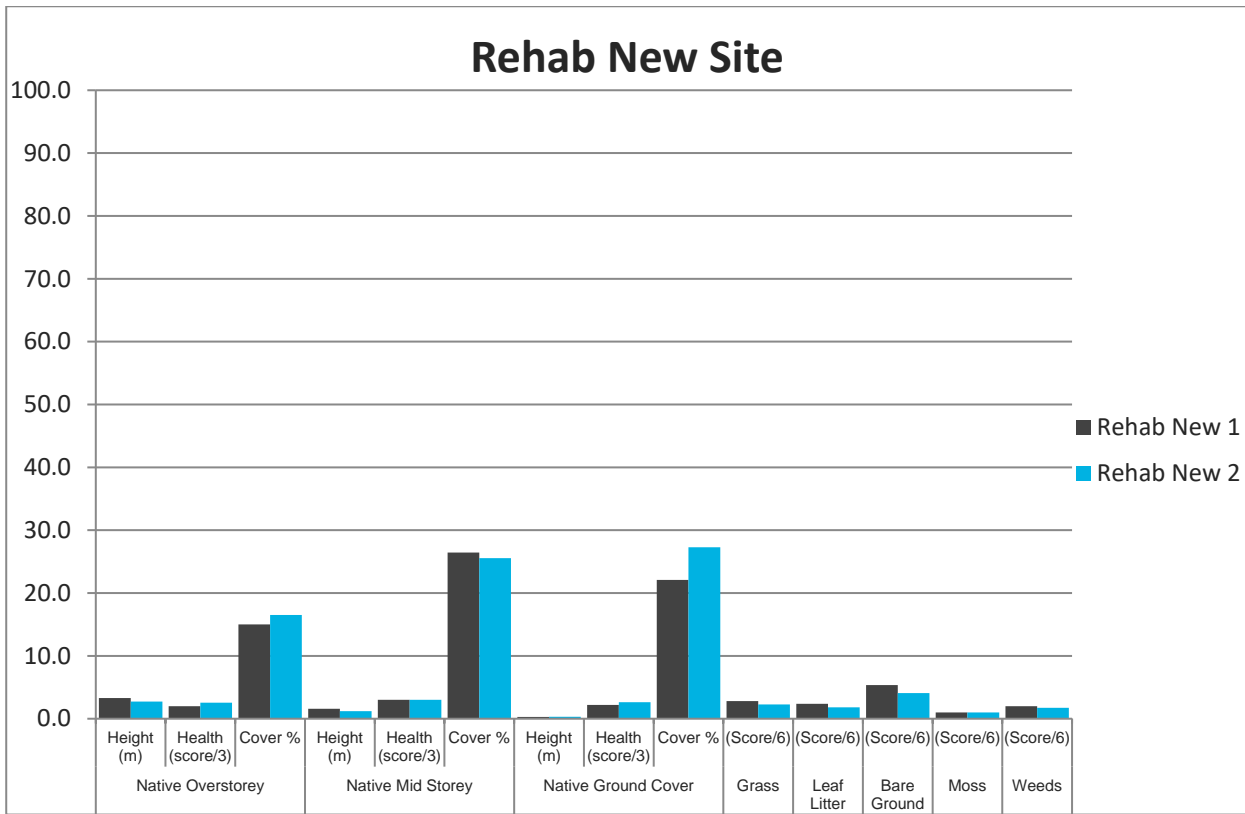


Figure 3.3 Rehab New site monitoring 2022

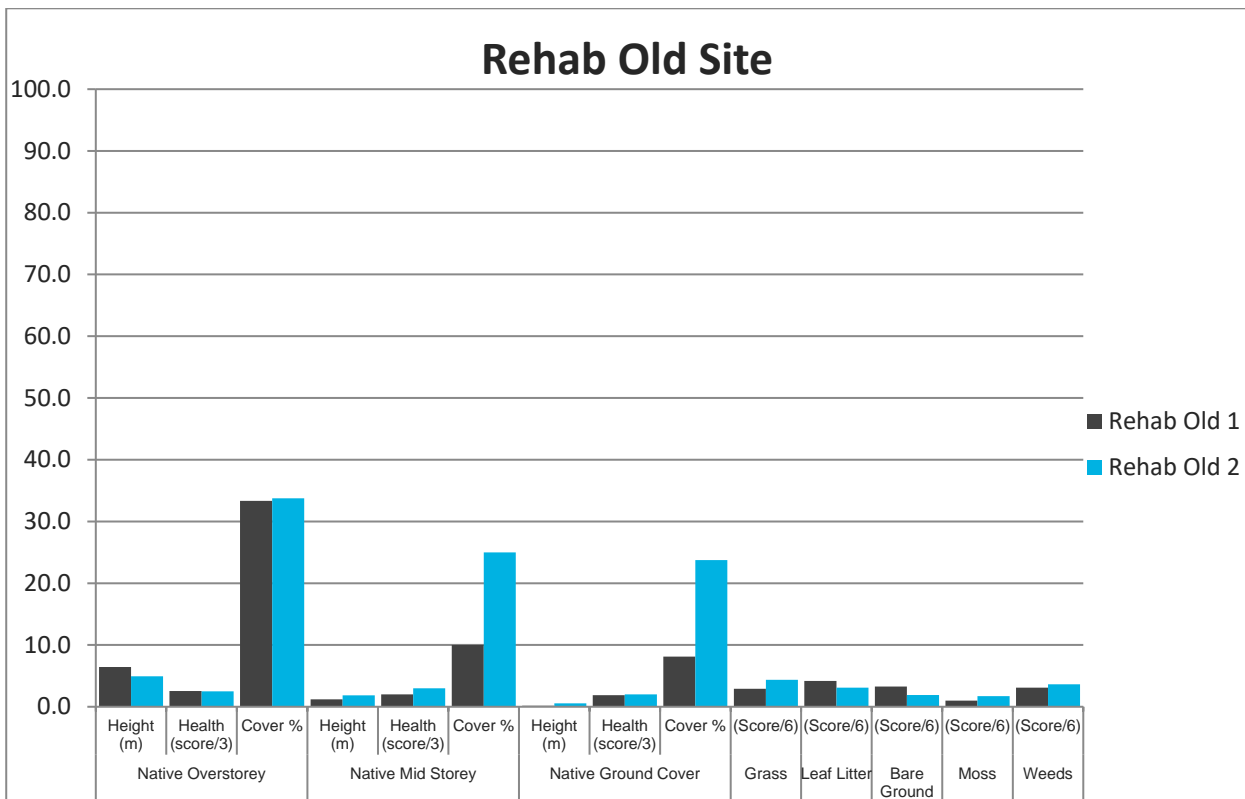


Figure 3.4 Rehab Old site monitoring 2022



Photograph 3.1 View of Silver-leaved Mountain Gum plantings at the New Rehab site 2020



Photograph 3.2 View of Silver-leaved Mountain Gum plantings at the New Rehab site 2021



Photograph 3.3 View of Silver-leaved Mountain Gum plantings at the New Rehab site 2022

3.4 Priority environmental weeds

The assessment of priority weeds across all transects is displayed in Table 3.1 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.

- 1- Less than %5 cover <3 individuals
- 2 – Less than 5% cover </10 individuals
- 3 – 5% - 25%
- 4 – 25% - 50%
- 5 – 50% - 75%
- 6 - >75%

Table 3.1 Priority weeds relative abundance 2022

Scientific Name	Common Name	Control Ridge	Impact Ridge	Control Creek	Impact Creek	Rehab 1	Rehab 2
<i>Cytisus scoparius</i>	Scotch Broom						
<i>Eragrostis curvula</i>	African Love Grass				2		
<i>Lycium ferocissimum</i>	African Boxthorn						
<i>Nassella trichotoma</i>	Serrated Tussock					1	
<i>Orobanche sp.</i>	Broomrape						
<i>Rubus fruticosus</i>	Blackberry			2	1		1
<i>Salix sp.</i>	Willow						
<i>Senecio madagascarinensis</i>	Fireweed						
<i>Hypericum perforatum</i>	St. Johns Wort		2.5		2		1

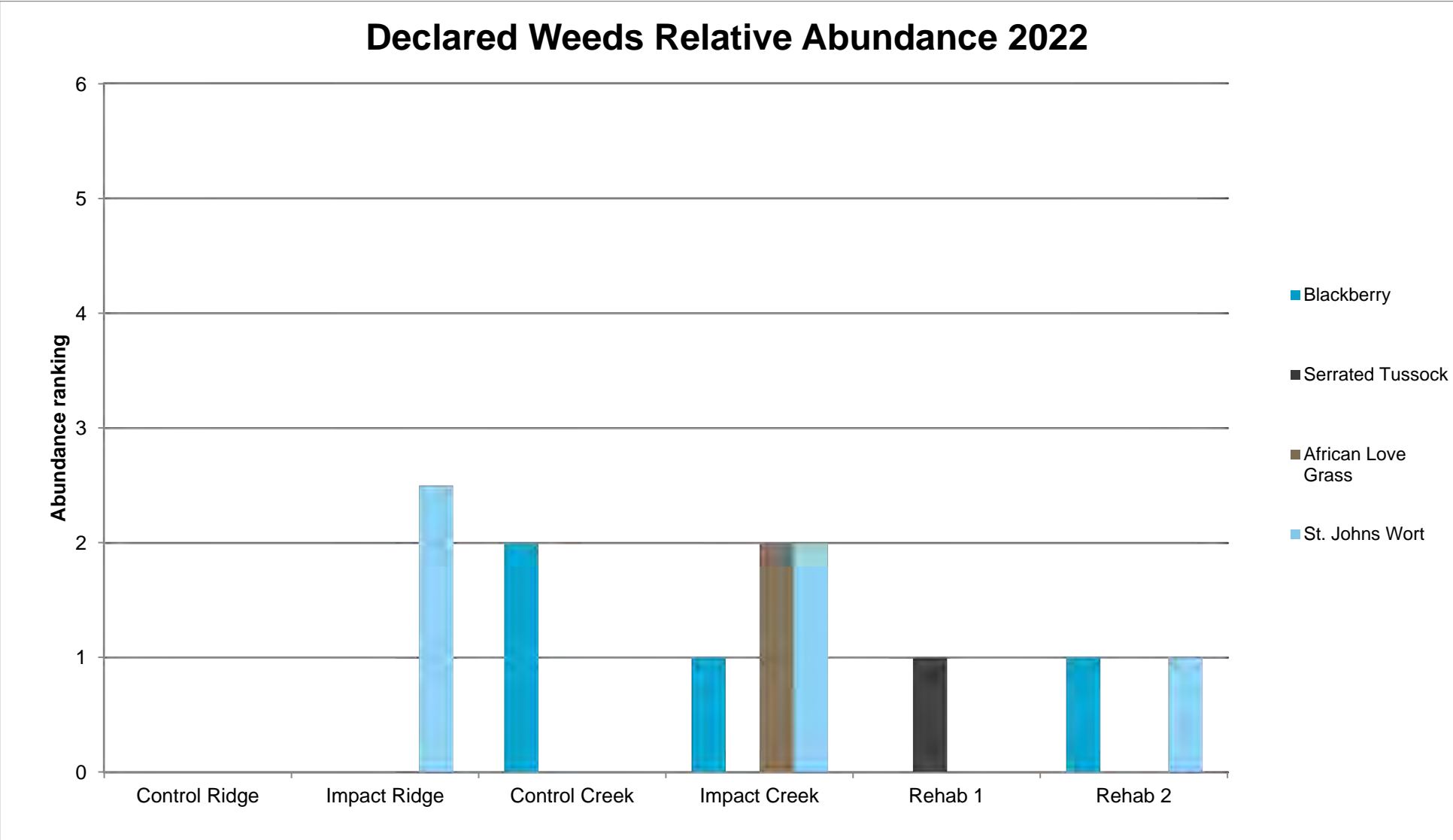


Figure 3.5 Priority weeds relative abundance 2022

3.5 Fauna survey results

The results presented in Figure 3.6 to Figure 3.16 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.

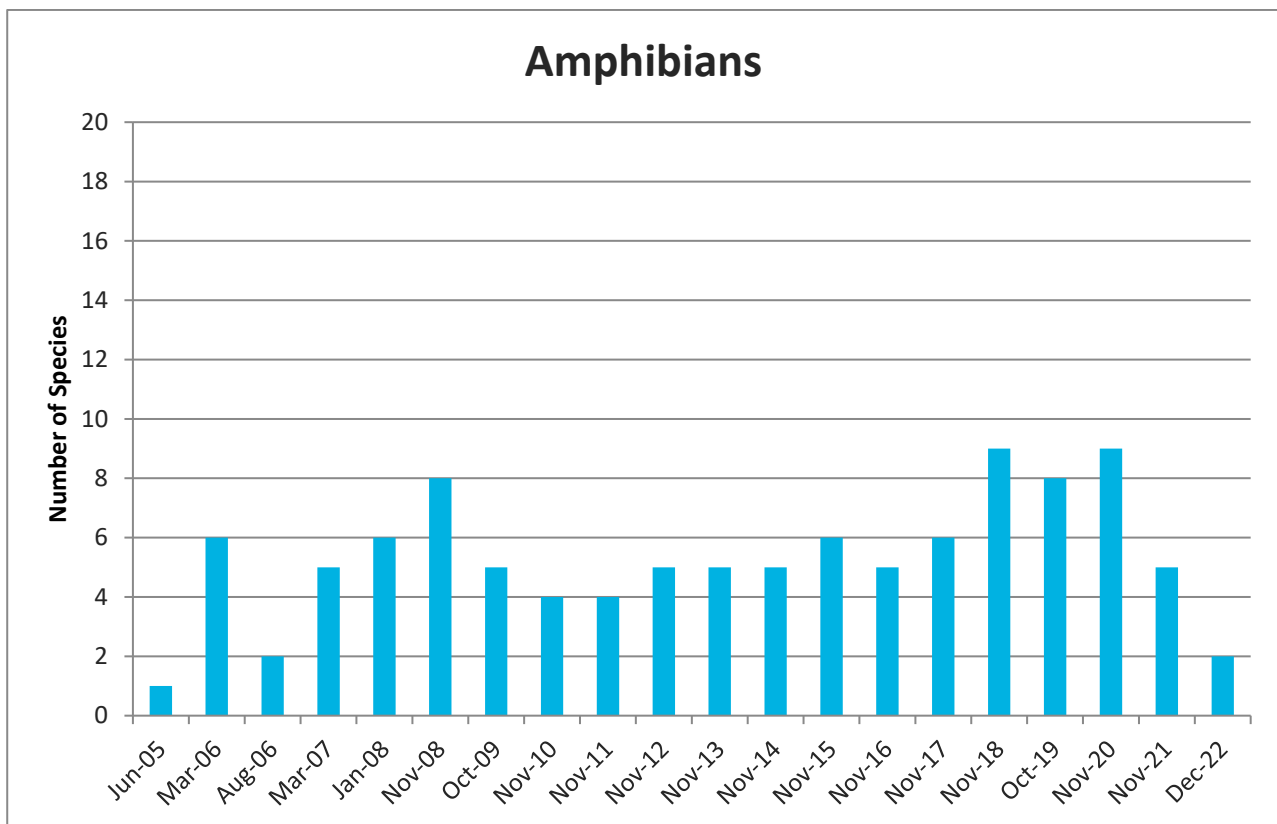


Figure 3.6 Amphibian monitoring results

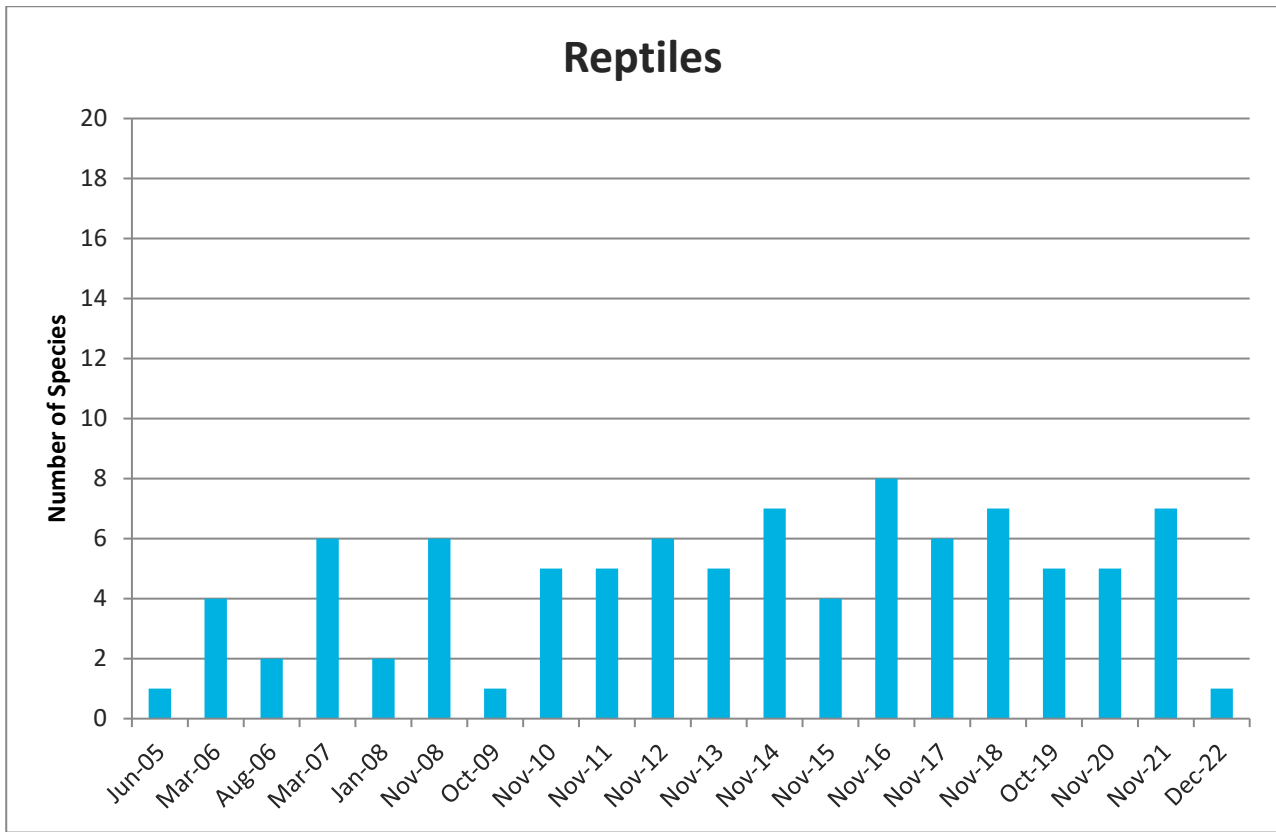


Figure 3.7 Reptile monitoring results

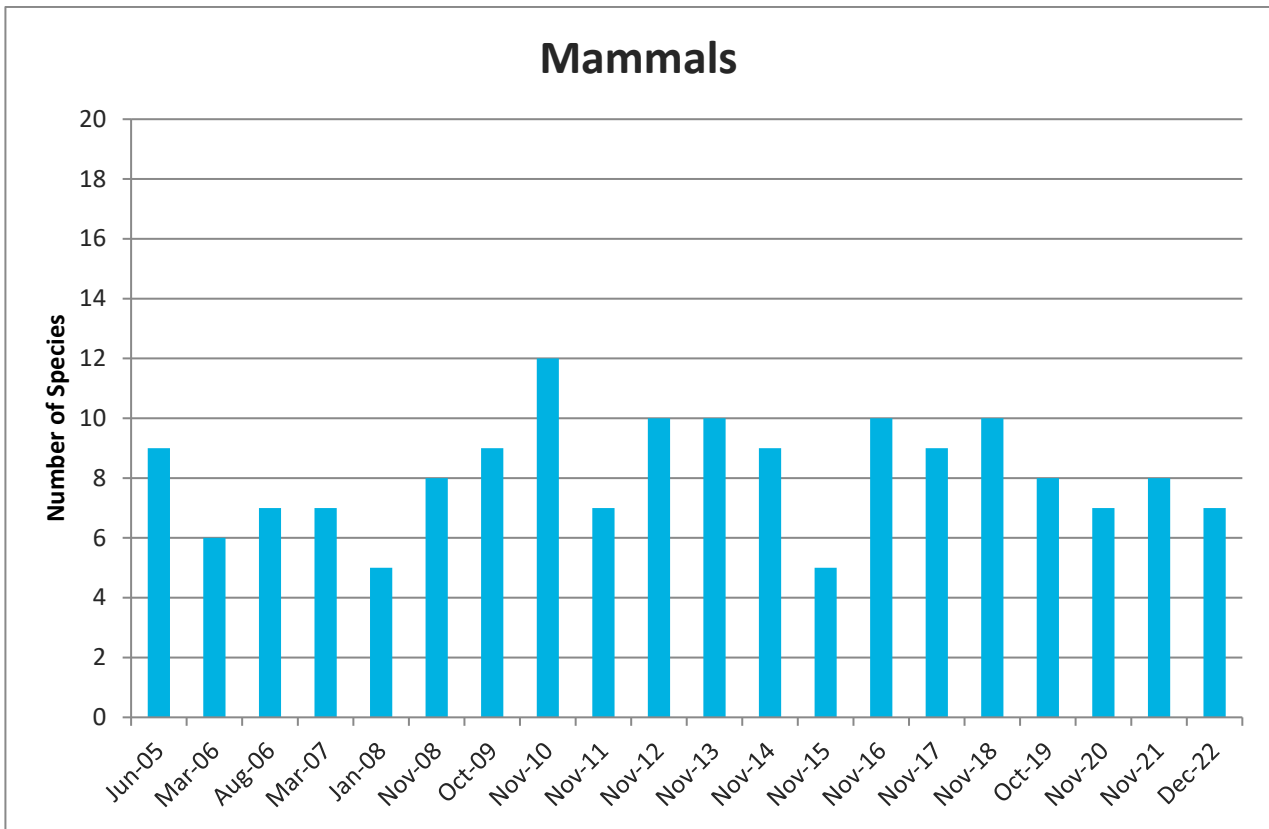


Figure 3.8 Mammal monitoring results

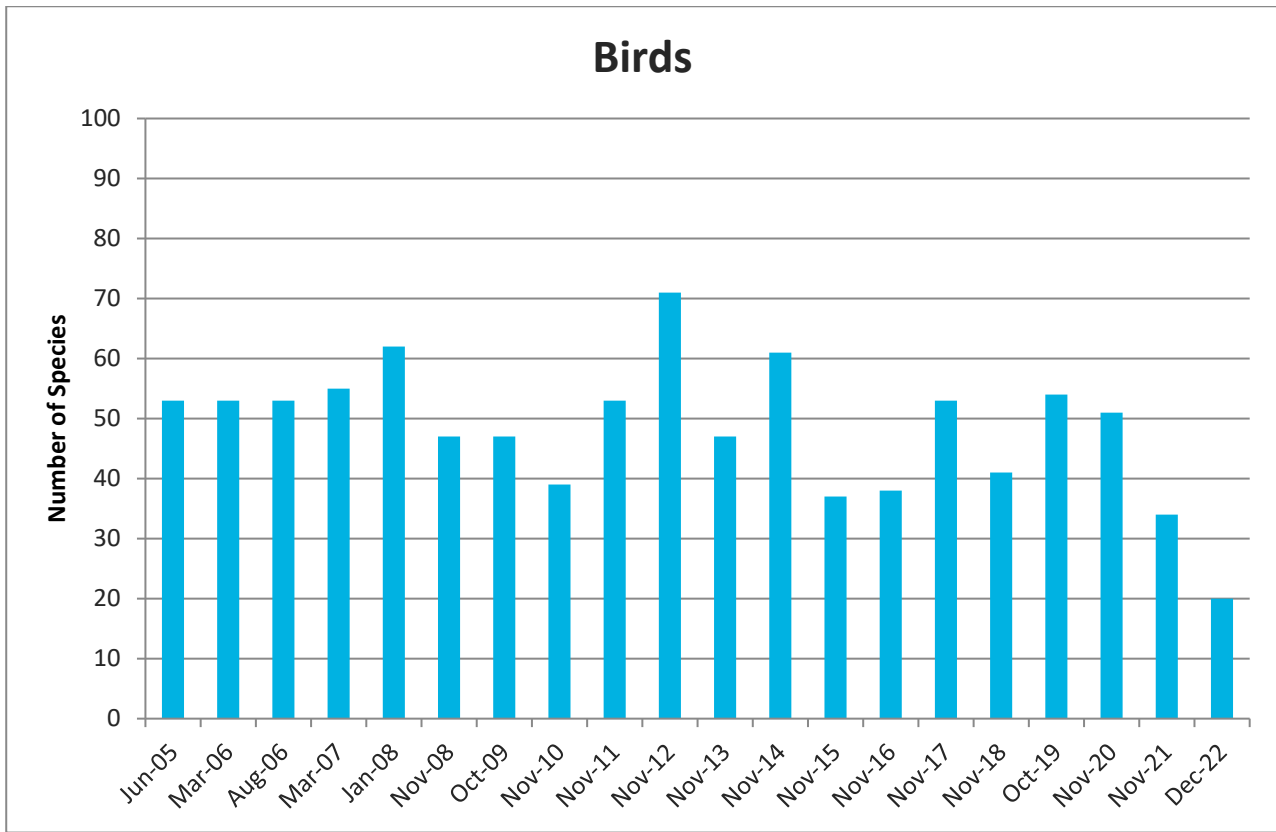


Figure 3.9 Birds monitoring results

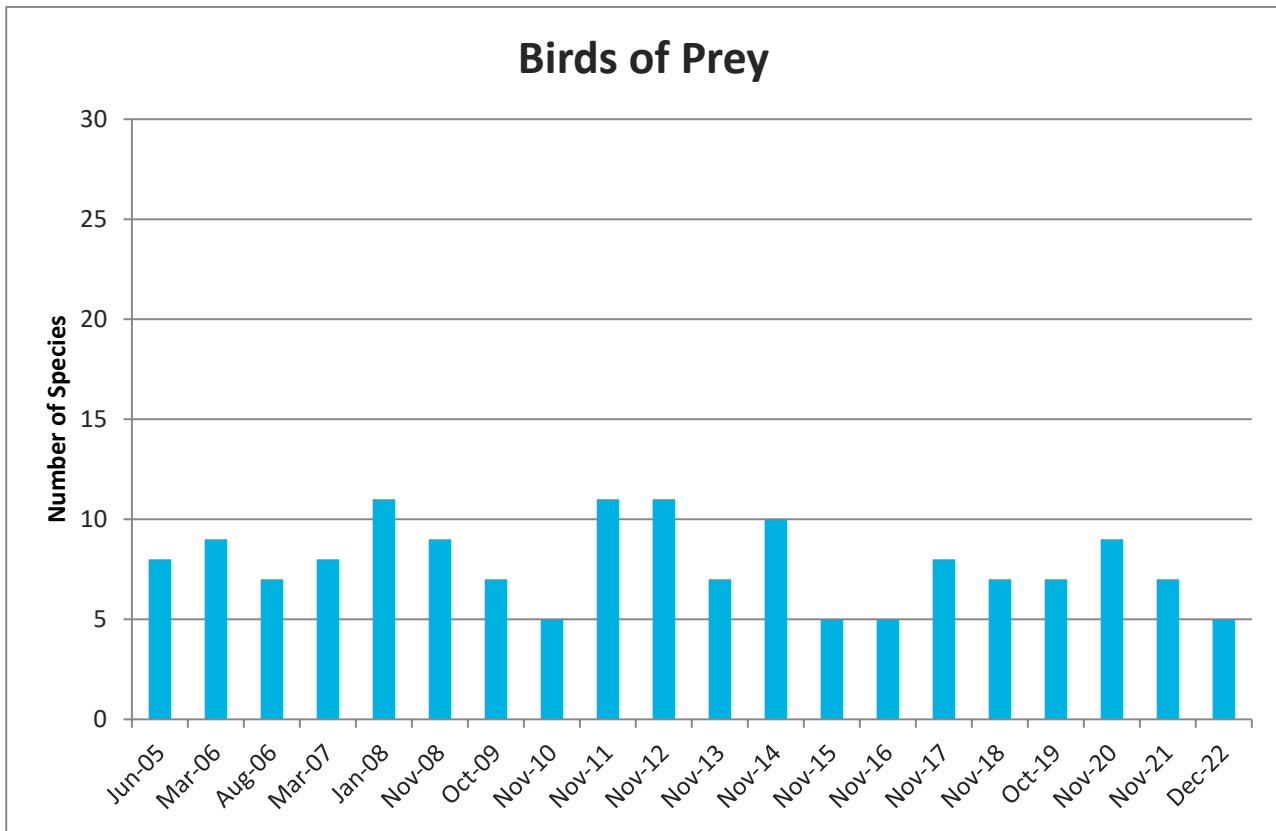


Figure 3.10 Birds of prey monitoring results

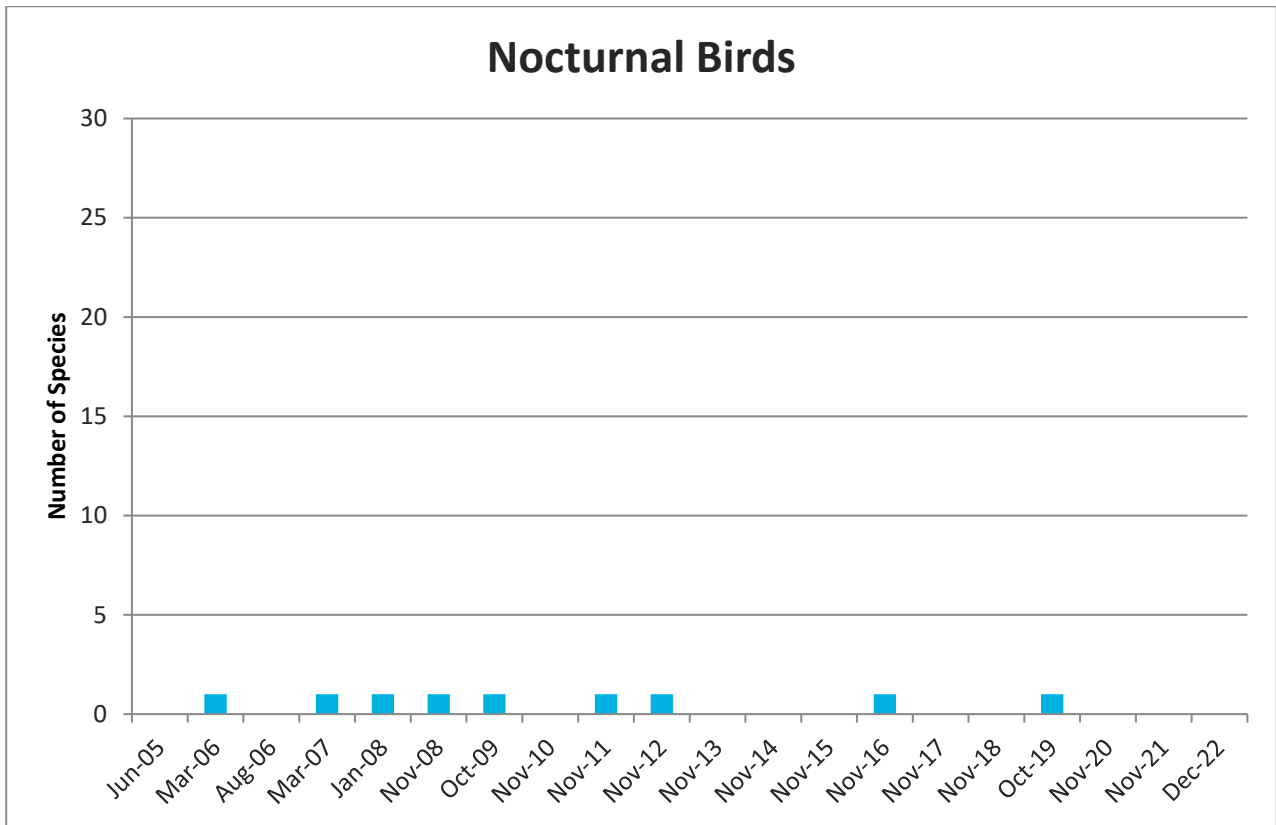


Figure 3.11 Nocturnal birds monitoring results

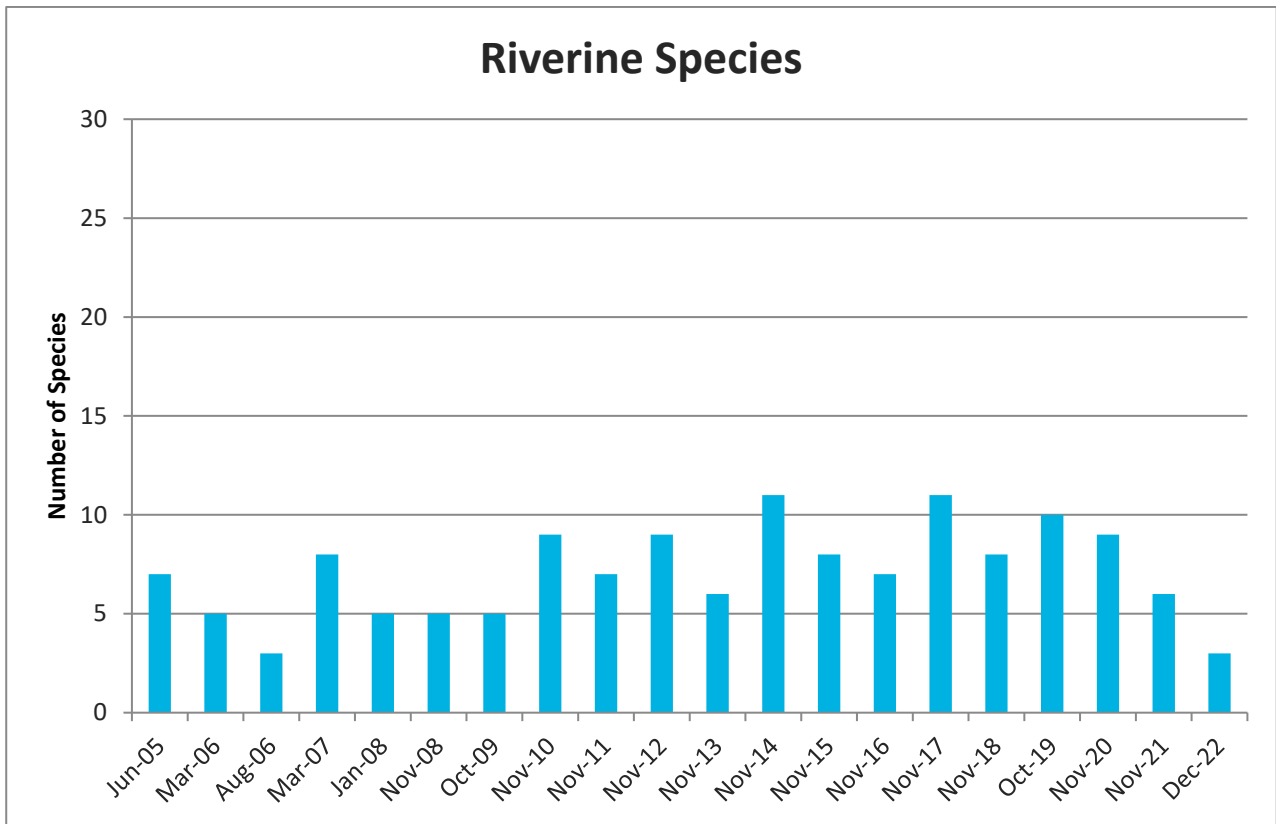


Figure 3.12 Riverine birds monitoring results

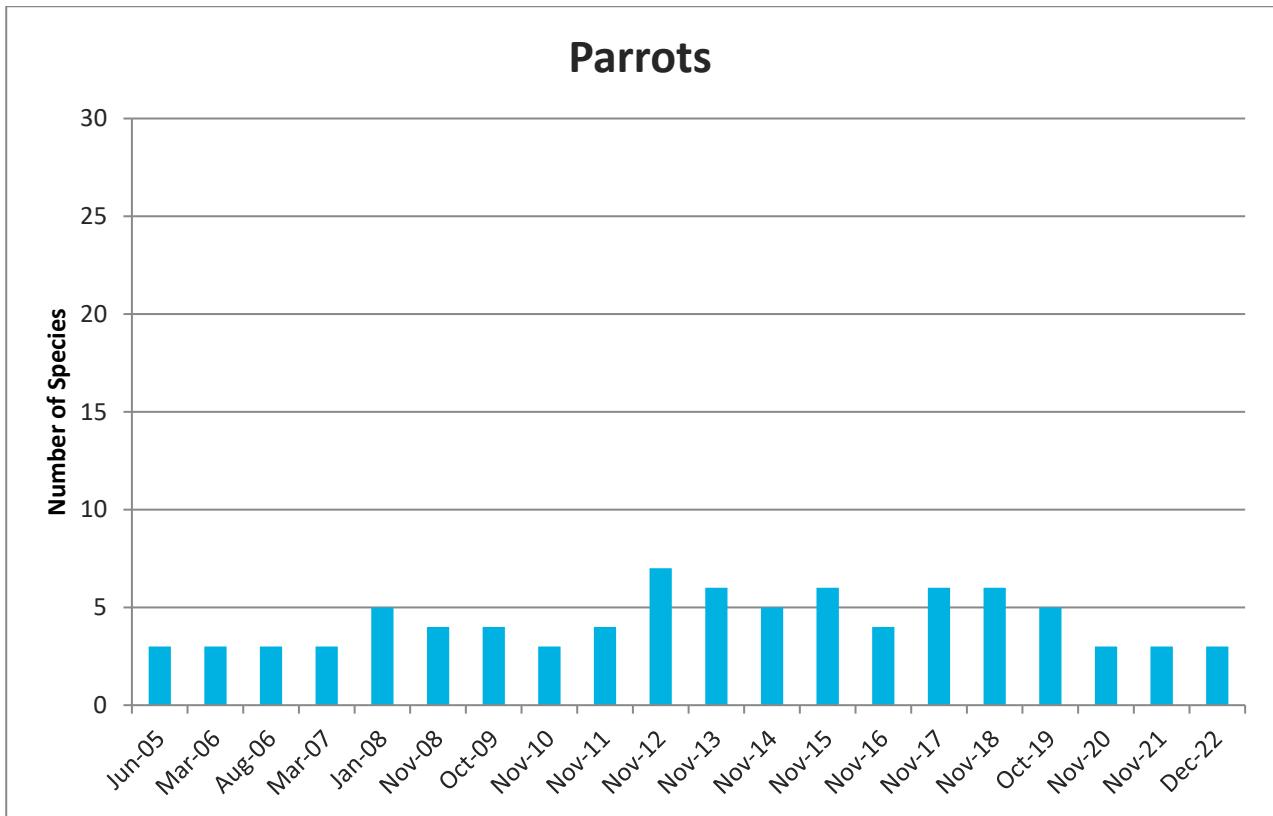


Figure 3.13 Parrots monitoring results

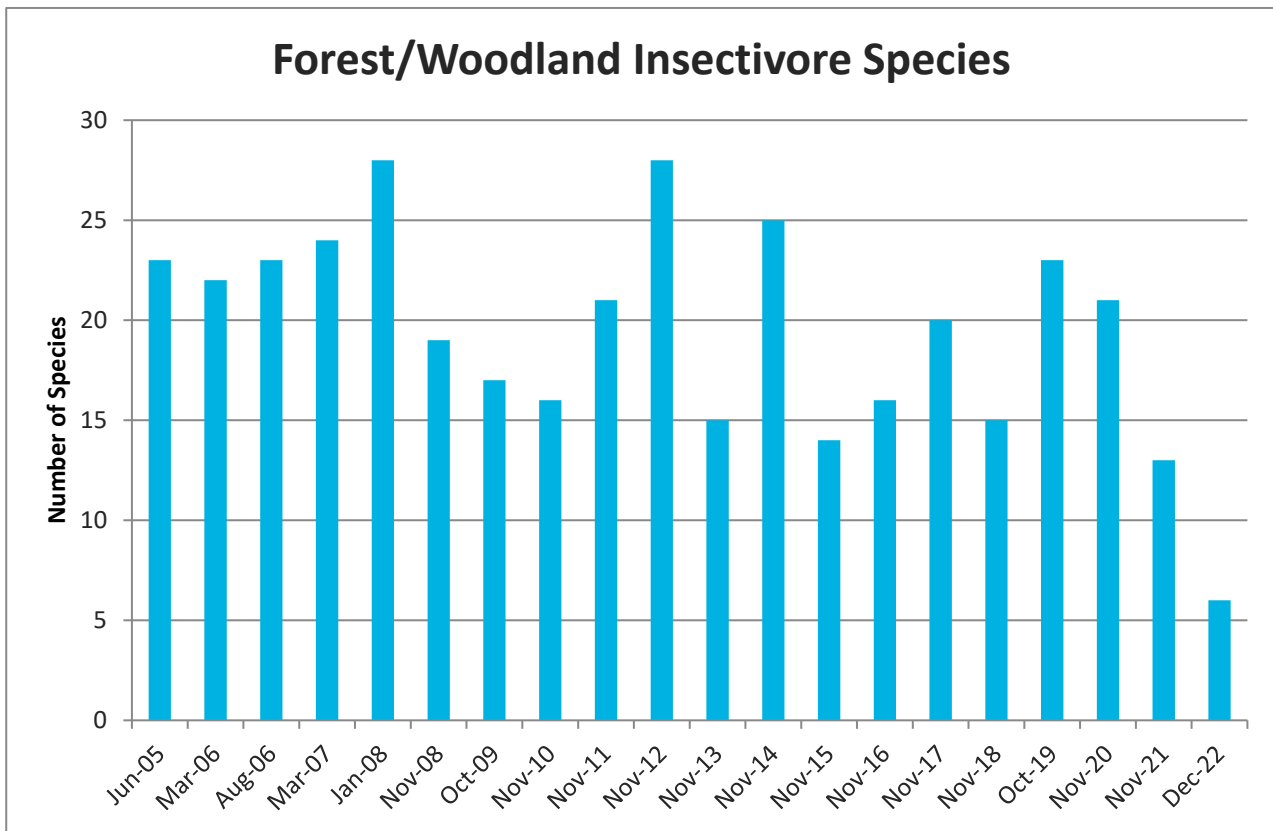


Figure 3.14 Forest/woodland insectivore monitoring results

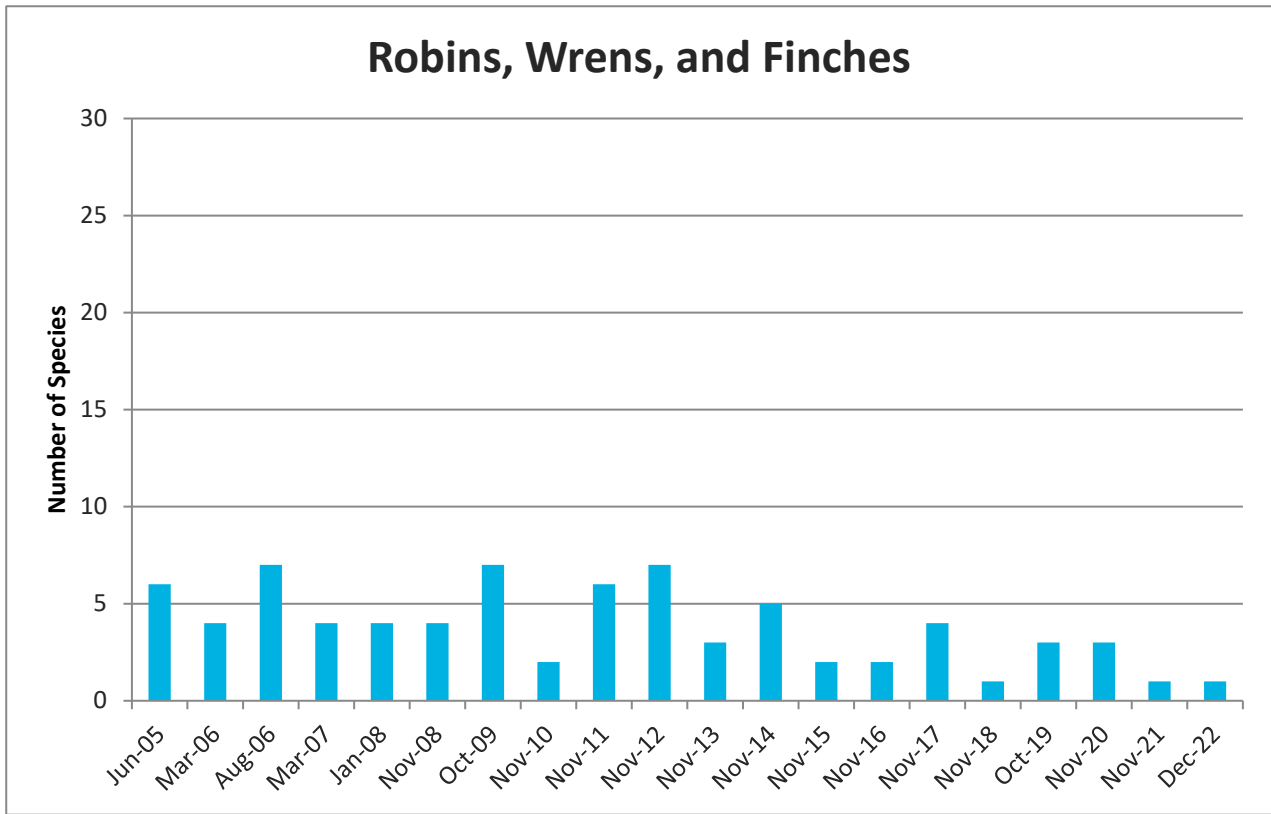


Figure 3.15 Robins, wrens, and finches monitoring results

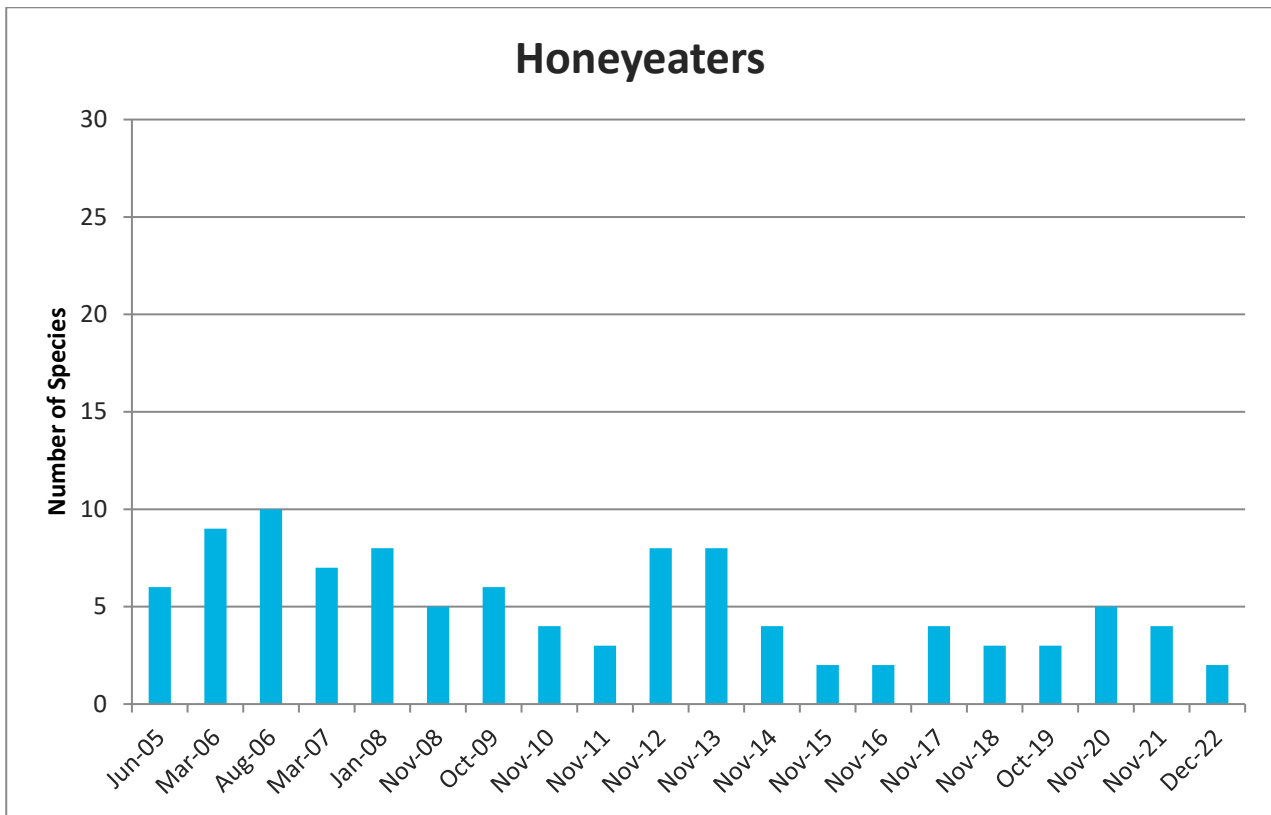


Figure 3.16 Honeyeaters monitoring results

3.5.1 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 as of 22 December 2022:

- Pilot Bird (*Pycnoptilus floccosus*) – Vulnerable
- Yellow-Bellied Glider (*Petaurus australis*) – Vulnerable.

The threatened species list and database searches are included in Appendix D.

3.6 Wildlife camera monitoring

Three motion-activated fauna cameras and bait stations were installed in strategic locations (Figure 2.1) in each community at the beginning of survey activities. Fauna camera monitoring is primarily utilised to detect human-wary nocturnal species which hide during spotlighting activities such as foxes, feral cats, and wombats.

Species observed comprised Red Necked Wallabies, Foxes, Wombats and Echidna.

Photographs taken from installed cameras are shown below in Photograph 3.4–Photograph 3.7.

Locations of cameras are shown in Figure 2.1.



Photograph 3.4 Wombat observed at Camera 1, northwest of Control Ridge 2



Photograph 3.5 Fox observed near Impact Creek 2 (Camera 2)



Photograph 3.6 Red-Necked Wallaby observed at South Ridge 1 (Camera 3)



Photograph 3.7 Echidna observed at South Ridge 1 (Camera 3)

4 Discussion

Biodiversity monitoring was undertaken in December 2022 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 2021 (EMM, 2021). Weed invasion has decreased at all sites except for the new rehab site (Rehab 2). Weed invasion has decreased in comparison to previous monitoring years with a similar decrease in presence of native vegetation at all ridge and creek sites.

A slight increase in native vegetation has occurred at the Old Rehab transects, with comparable numbers being observed to previous years at the New Rehab site within the active quarry areas. The occurrence of Strawberry Broomrape (*Orobanche* sp.) that was prevalent in previous monitoring years was not observed in this survey, likely due to management actions employed following last year's survey.

An increase in the number of individuals of Silver-leaved Mountain Gum was noted during this monitoring period, with the height and conditions of the individuals remaining comparable to previous monitoring years. No individuals were observed to be in flower, while a small number of individuals were observed with new growth and evidence of fruiting.

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

4.2 Weeds

Weed invasion at the Impact Creek site has decreased from previous monitoring years, and pasture management was being undertaken.

Numbers of Serrated Tussock have decreased since previous monitoring years. 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. The population at the Impact Creek site was not recorded in the survey this year, with the only noted population being recorded at the Rehab Old site.

Blackberry presence is noted to be rising across the Quarry 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 property management and in co-ordination with DPI Agriculture weed programs in the local area.

4.3 Fauna

The number of bird species observed has decreased in comparison to previous monitoring years. However, the number of parrot, robin, wren, and finch species have remained comparable to last year's survey. The habitat condition hasn't changed significantly; therefore, the overall decrease in bird species numbers is not expected. The surveys were conducted in December compared to November in previous years, and this may be a cause for the difference in numbers.

Amphibian and reptile numbers have decreased in comparison to previous monitoring periods. Mammal numbers have remained comparable in relation to the previous year. Wombat activity remains high with several active burrows and individuals observed around the river and ridge sites.

The monitoring data from 2023 will be vital to understand if changes are a downward trend or natural fluctuations.

5 Recommendations

The following tasks are recommended for the 2023 monitoring period:

- Ongoing management of the priority weed infestations of African Lovegrass/ Serrated Tussock at the riverine and ridge sites is required to suppress 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 is noted to be rising across the Quarry 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.
- Conduct 2023 monitoring in November to match previous years timing, and closely analyse fluctuations in species diversity across the Quarry.

6 References

EMM. (2020). Austen Quarry Annual Biodiversity Monitoring Report. EMM Consulting Pty Ltd.

EMM. (2021). *Austen Quarry Biodiversity Monitoring Report*. EMM Consulting Pty Ltd.

OEH. (2011). BioMetric. Sydney: Office of Environment and Heritage.

R.W. Corkery & Co. (2016). Austen Quarry Landscape and Rehabilitation Management Plan.

R.W. Corkery & Co. (2019). Austen Quarry Landscape and Rehabilitation Management Plan.

Appendix A

Survey species list

			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
	Pied Currawong	<i>Strepera graculina</i>	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
Cacatuidae	Galah	<i>Cacatua roseicapilla</i>	1	1	1	1	1	1				1	1	1	1	1	1	1	1	1	1	1
	Gang-gang Cockatoo	<i>Calocephalon fimbriatum</i>			1	1	1			1		1	1	1	1	1	1	1	1	1	1	1
	Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	1	1	1	1	1	1			1	1	1	1	1	1	1	1	1	1	1	1
	Yellow-tailed Black-Cockatoo	<i>Calyptorhynchus funereus</i>	1	1										1				1				
Campephagidae	Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	1	1	1	1	1	1		1	1	1	1				1	1	1		1	
	Cicada Bird	<i>Coracina tenuirostris</i>											1						1			
	White-Winged Triller	<i>Lalage tricolor</i>											1						1			
Charadriidae	Masked Lapwing	<i>Vanelus miles</i>		1			1			1	1	1	1	1	1	1	1	1	1	1	1	1
	Black-fronted dotterel	<i>Euseyornis melanops</i>									1			1	1	1	1	1	1	1	1	1
Cinclosomatidae	Eastern Whipbird	<i>Psophodes olivaceus</i>			1		1	1		1	1			1	1	1	1	1	1	1	1	1
Climacteridae	White-throated Treecreeper	<i>Cornobates leucophaeus</i>	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
Columbidae	Bar-shouldered Dove	<i>Geopelia humeralis</i>					1															
	Common Bronzewing	<i>Phaps ehaloptera</i>				1					1										1	
	Crested Pigeon	<i>Ocyphaps lophotes</i>	1	1	1		1					1										
	Peaceful Dove	<i>Geopelia striata</i>	1	1								1				1						
Coraciidae	Dollarbird	<i>Eurystomus orientalis</i>					1	1		1	1	1	1	1	1	1		1	1	1	1	1
Corcoracidae	White-winged Chough	<i>Corcorax melanorhamphos</i>	1		1	1	1	1		1	1	1	1	1	1	1		1	1	1	1	1
Corvidae	Australian Raven	<i>Corvus coronoides</i>	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
	Little Raven	<i>Corvus mellori</i>		1								1										
	Torresian Crow	<i>Corvus orru</i>									1	1	1					1				
Cuculidae	Fan-tailed Cuckoo	<i>Cacomantis flabelliformis</i>		1	1	1	1					1		1				1		1		
	Eastern Koel	<i>Eudynamis orientalis</i>																			1	
Dicaeidae	Mistletoebird	<i>Dicaeum hirundinaceum</i>	1		1		1							1								
Dicruridae	Grey Fantail	<i>Rhipidura fuliginosa</i>	1	1	1	1	1	1		1	1	1	1	1	1	1		1	1	1	1	1
	Restless Flycatcher	<i>Myiagra inquieta</i>	1	1	1		1					1										
	Satin Flycatcher	<i>Myiagra cyanoleuca</i>					1				1	1										
	Willie Wagtail	<i>Rhipidura leucophrys</i>	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
	Leaden Flycatcher							1			1	1										
Falconidae	Brown Falcon	<i>Falco berigora</i>	1																			
	Peregrine Falcon	<i>Falco peregrinus</i>		1																		
Halcyonidae	Laughing Kookaburra	<i>Dacelo novaeguineae</i>	1	1	1	1	1			1	1	1	1	1	1	1	1	1	1	1	1	1
	Sacred Kingfisher	<i>Todiramphus sanetus</i>		1			1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
	Forest Kingfisher	<i>Todiramphus macleayii</i>																				
Hirundinidae	Unidentified Martin	<i>Hirundo sp.</i>				1		1									1				1	
	Welcome Swallow	<i>Hirundo neoxena</i>		1		1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
Maluridae	Superb Fairy-wren	<i>Malurus cyaneus</i>	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
	Vari-gated Fairy-wren	<i>Malurus lamberti</i>	1		1						1	1										
Meliphagidae	Brown-headed Honeyeater	<i>Melithreptus valli-rostris</i>		1	1		1															1
	Red Wattlebird	<i>Anthochaera carunculata</i>																				
	Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>	1	1	1	1	1					1										
	Noisy Miner	<i>Manorina melanoccephala</i>	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
	New Holland	<i>Phylidonyris novaehollandiae</i>		1	1	1	1					1	1									
	Noisy Friarbird	<i>Philemon corniculatus</i>		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
	Red Wattlebird	<i>Anthochaera carunculata</i>	1	1	1	1	1					1	1	1	1	1	1	1	1	1	1	1
	White-eared Honeyeater	<i>Lichenostomus leucotis</i>	1	1	1							1	1								1	
	White-naped Honeyeater	<i>Melithreptus lunatus</i>	1	1	1	1	1					1										
	White-plumed Honeyeater	<i>Lichenostomus penicillatus</i>			1					1							1					
	Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
	Lewins Honeyeater	<i>Meliphaga lewinii</i>						1				1	1				1				1	
	Black-chinned Honeyeater	<i>Melithreptus gularis</i>											1								1	
	Rainbow Bee-eater	<i>Merops ornatus</i>						1					1									
Motacillidae	Richard's Pipit	<i>Anthus novaeseelandiae</i>	1	1									1	1	1				1		1	
	Brown Songlark							1					1									
Muscicapidae	Australian Reed-Warbler	<i>Acrocephalus australis</i>					1			1	1	1	1	1	1	1	1					
	Clamorous Reed-Warbler	<i>Acrocephalus stentoreus</i>																1	1	1		
Neosittidae	Varied Sittella	<i>Daphoenositta chrysoptera</i>				1				1												
Oriolidae	Olive-backed Oriole	<i>Oriolus sagittatus</i>										1		1						1		
Pachycephalidae	Golden Whistler	<i>Pachycephala pectoralis</i>	1		1	1	1	1				1	1	1	1	1	1	1	1	1	1	1
	Grey Shrike-thrush	<i>Callurcinia harmonica</i>	1	1	1	1	1				1	1	1	1	1	1	1	1	1	1	1	1
	Rufous Whistler	<i>Pachycephala rufiventris</i>		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
Pardalotidae	Brown Thornbill	<i>Acanthiza pusilla</i>	1	1	1	1	1	1			1	1	1	1	1	1	1	1	1	1	1	1
	Buff-rumped Thornbill	<i>Acanthiza reguloides</i>	1		1		1					1	1	1	1	1	1	1	1	1	1	1
	Spotted Pardalote	<i>Pardalotus punctatus</i>	1	1	1	1	1	1				1	1	1	1	1	1	1	1	1	1	1
	Striated Pardalote	<i>Pardalotus striatus</i>	1	1	1	1	1	1				1	1	1	1	1	1	1	1	1	1	1
	Striated Thornbill	<i>Acanthiza lineata</i>			1	1	1	1				1	1	1	1	1	1	1	1	1	1	1
	White-browed Scrubwren	<i>Sericornis frontalis</i>	1		1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
	Brown Gerygone	<i>Gerygone mouki</i>							1									1				
	White-throated Gerygone	<i>Gerygone olivacea</i>		1										1					1			1
	Yellow Thornbill	<i>Acanthiza nana</i>	1	1	1		1				1	1	1	1	1	1	1	1	1	1	1	1
	Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>	1	1		1	1			1	1	1	1	1	1	1	1	1	1	1	1	1
Passeridae	Double-barred Finch	<i>Taeniopygia bichenovii</i>	1	1	1	1	1	1		1												
	Red-browed Finch	<i>Neochmia temporalis</i>	1	1	1	1	1	1			1	1	1	1	1	1	1	1	1	1	1	1
Petroicidae	Eastern Yellow Robin	<i>Eopsaltria australis</i>		1	1	1					1	1	1	1	1	1	1	1	1	1	1	1
	Flame Robin	<i>Petroica phoenicea</i>	1									1										
	Jacky Winter	<i>Microeca fascians</i>	1									1		1								
	Rose Robin	<i>Petroica rosea</i>																				

Transect no.	Surveyor	Abundant Ross Davey							
Date		1 = Less than 5% Cover <=10 individuals							
		2 = Less than 5% Cover <=10 individuals							
		3 = 5%-25%							
		4 = 25%- 50%							
		5 = 50% - 75%							
		6 = >75%							
Flora Detected within Survey sites 2022		South Ridge	Control Ridge	Impact Ridge	Control Creek	Impact Creek	Rehab 1	Rehab 2	
Native Species		27	17	16	10	10	15	19	
Scientific	Common								
Acacia buxifolia	Box-leaf Wattle							4	
Acacia clandestina	Gold-dust Wattle								
Acacia dealbata	Silver Wattle						2	3	
Acacia falciformis	Hickory Wattle								
Acacia homalophylla	Yarran								
Acacia implexa	Hickory Wattle								
Acacia longissima	Long-leaved Wattle								
Acacia melanoxylon	Blackwood	2		2.5			2.5	1	
Acacia myrtifolia	Myrtle Wattle								
Acacia obtusata	Bluntleaf Wattle								
Acacia uilicifolia	Prickly Moses	2	2	1					
Acaena ovina	Sheeps Burr			2			1	1	
Actinotus helianthi	Flannel Flower								
Adiantum aethiopicum	Maiden Hair Fern								
Allocasuarina distyla	Scrub She-oak								
Allocasuarina littoralis	Black She-oak						1.5		
Alternanthera denticulata	Lesser Joy-weed								
Angophora floribunda	Rough-barked Apple								
Anisopogon avenaceus	Oat Spear Grass								
Aristida ramosa var. ramosa	Purple Wiregrass	1							
Aristida vagans	Threeawn Speargrass								
Asplenium flabellifolium	Spleenwort								
Austrodanthonia caespitosa		2							
Austrodanthonia penicillata	Wallaby Grass								
Austrodanthonia racemosa var. racemosa	Wallaby Grass	1						1	
Austrodanthonia spp.	Wallaby Grass								
Austrodanthonia tenuior	Wallaby Grass								
Austrostipa pubescens	Speargrass								
Austrostipa ramosissima	Speargrass	2							
Austrostipa rudis ssp. australis	Speargrass								
Austrostipa rudis ssp. rudis	Speargrass								
Austrostipa scabra ssp. falcata	Speargrass	1							
Austrostipa scabra ssp. scabra	Speargrass	2						2	
Austrostipa aristiglumis	Speargrass					1			
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	1							

Flora Detected within Survey sites 2022		South Ridge	Control Ridge	Impact Ridge	Control Creek	Impact Creek	Rehab 1	Rehab 2
Bulbine bulbosa	Native Leek							
Bursaria spinosa ssp. <i>spinosa</i>	Blackthorn							
Caesia parviflora var vittata	Pale Grass Lily							
Caladenia spp.	Spider Orchid							
Callistemon sp.	Bottle Brush						2	
Calochilus sp	Beard Orchid							
Calytrix tetragona	Fringe Myrtle						2.5	1
Carex appressa	Tall Sedge				3			
Carex fascicularis	Tassel Sedge							
Carex inversa								
Carex spp.								
Cassinia uncata	Sticky Cassinia						2	2
Cassytha glabella f. <i>glabella</i>	Devils Twine							
Casuarina cunninghamiana ssp. <i>cunninghamiana</i>	River Oak				3	3		
Cheilanthes distans	Rock Fern							
Cheilanthes sieberi ssp. <i>sieberi</i>	Rock Fern		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. <i>sieberiana</i>	Stonecrop							
Cryptandra amara	Bitter Cryptandra							
Cymbonotus lawsonianus	Bears-ear							
Cymbopogon refractus	Barbed Wire Grass							
Cyperus gracilis	Slender Flat Sedge				1		1	
Daviesia acicularis	Bitter Pea							
Desmodium brachypodium	Tick-trefoil							
Desmodium spp.	Tick-trefoil							
Desmodium varians	Tick-trefoil							
Dianella revoluta var. <i>revoluta</i>	Flax Lily	2		1				1
Dichelachne inaequiglumis	Plumegrass							
Dichelachne micrantha	Plumegrass		2.5					
Dichelachne spp.	Plumegrass	2						
Dichondra repens	Kidney Weed	1						
Digitaria brownii	Cotton Panic Grass							
Digitaria parviflora	Finger Grass							
Dillwynia phyllicoides								
Dillwynia phyllicoides A.Cunn species complex								
Diuris aurea								
Diuris sulphurea	Tiger Orchid							
Drosera binata	Sundew							
Echinopogon caespitosus var. <i>caespitosus</i>	Hedgehog Grass							
Echinopogon ovatus	Hedgehog Grass	1	2			1		
Echinopogon spp.	Hedgehog Grass							
Einadia hastata	Saltbush			1			1	
Einadia nutans ssp. <i>nutans</i>	Saltbush							
Einadia trigonos ssp. <i>trigonos</i>	Saltbush							

Flora Detected within Survey sites 2022		South Ridge	Control Ridge	Impact Ridge	Control Creek	Impact Creek	Rehab 1	Rehab 2
Lepidosperma viscidum					2			
Leptospermum parvifolium								
Leptospermum polygalifolium ssp. <i>polygalifolium</i>							1	
Leptospermum trinervium								
Leucopogon appressus								
Leucopogon ericoides	Pink Beard-heath							
Lindsaea linearis	Screw Fern							
Lissanthe strigosa ssp. <i>strigosa</i>	Peach Heath							
Lomandra filiformis ssp. <i>coriacea</i>	Wattle Matt-rush							
Lomandra filiformis ssp. <i>filiformis</i>	Wattle Matt-rush	2						
Lomandra glauca	Pale Matt-rush							
Lomandra longifolia	Spiny Matt-rush	2	6	2	1.5	1		
Lomandra multiflora ssp. <i>multiflora</i>								
Lomandra spp.	Matt Rush							
Lomatia myricoides	River Lomatia							
Mentha diemenica	Slender Mint							
Microlaena stipoides	Weeping Meadow Grass							
Mirbelia platylobioides								
Monotoca elliptica	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							
Panicum effusum	Hairy Panic							
Panicum simile	Two-colour Panic		1		1			
Paspalum distichum	Water Couch							
Patersonia sericea	Silky Purple Flag							
Persicaria decipiens	Knotweed							
Persicaria hydropiper	Knotweed							
Persicaria praetermissa	Knotweed							
Persicaria strigosa	Knotweed				2	2		
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. <i>labillardierei</i>	Tussock Grass							
Poa sieberiana		1.5						
Pomaderris spp.								
Pomax umbellata			1					2
Poranthera microphylla			1					
Portulaca oleracea	Pigweed							
Prasophyllum spp.	Leek Orchid							
Prostathera incana	Velvet Mint-bush							

Flora Detected within Survey sites 2022		South Ridge	Control Ridge	Impact Ridge	Control Creek	Impact Creek	Rehab 1	Rehab 2
<i>Pteridium esculentum</i>	Bracken							
<i>Pterostylis reflexa</i>	Greenhood Orchid							
<i>Pultanea</i> sp.								
<i>Ranunculus lappaceus</i>	Common Buttercup					3		
<i>Rubus parvifolius</i>	Silky Bramble							
<i>Rumex brownii</i>	Swamp Dock							
<i>Samolus valerandi</i>	Brookweed							
<i>Schoenoplectus validus</i>	River Club Rush							
<i>Schoenus ericetorum</i>	Bog-rush					1		
<i>Schoenus moorei</i>	Bog-rush							
<i>Scutellaria humilis</i>	Dwarf Scullcap			1				
<i>Senecio diaschides</i>	Fireweed							
<i>Senecio hispidulus</i>	Fireweed			1				
<i>Senecio hispidulus</i> var. <i>hispidulus</i>	Fireweed							
<i>Senecio quadridentatus</i>	Fireweed			2			1	
<i>Sigesbeckia orientalis</i>	Indian Weed							
<i>Solanum americanum</i>	Glossy Nightshade							
<i>Solanum chenopodium</i>								
<i>Solanum cinereum</i>	Narrawa Burr							
<i>Solanum prinophyllum</i>	Forest Nightshade	1		1				
<i>Solanum pungentium</i>	Eastern Nightshade							
<i>Stellaria pungens</i>	Prickly Starwort			1				
<i>Stylidium</i> sp.	Trigger Plant							
<i>Styandra glauca</i>	Nodding Blue-lily		2					2
<i>Thelymitra</i> sp.	Sun Orchid							
<i>Themeda australis</i>	Kangaroo Grass	2						
<i>Thysanotus juncifolius</i>	Fringe Lily							
<i>Typha domingensis</i>	Cumbungi							
<i>Urtica incisa</i>	Stinging Nettle							
<i>Veronica plebeia</i>	Speedwell							
<i>Viola betonicifolia</i>	Native Violet							
<i>Vittadinia cuneata</i> var. <i>cuneata</i> f. <i>cuneata</i>	Fuzzweed							
<i>Wahlenbergia gracilis</i>	Bluebell	1	1					
<i>Wahlenbergia planiflora</i>	Bluebell							
<i>Wahlenbergia</i> spp.								
<i>Wahlenbergia stricta</i> ssp. <i>stricta</i>	Bluebell							
<i>Wahlenbergia victoriensis</i>	Bluebell							
<i>Xerochrysum bracteatum</i>	Golden Everlasting							

Transect no.
Date

Surveyor

Abundanc Ross Davey

1 = Less th 19-21 December 2022

2 = Less than 5% Cover <=/=10 individuals

3 = 5%-25%

4 = 25%- 50%

5 = 50% - 75%

6 = >75%

Flora Detected within Survey sites 2022		South Ridge	Control Ridge	Impact Ridge	Control Creek	Impact Creek	Rehab 1	Rehab 2
Introduced Species		8	4	13	21	19	11	12
Scientific	Common							
*Acetosella vulgaris	Sheep Sorrel			3			1	
*Aira cupaniana	Silvery Hair Grass							
*Alternanthera spp.								
*Ambrosia artemisiifolia	Annual Tagweed							
*Anagallis arvensis	Scarlet Pimpernel			1.5	1.5	1		1
*Anthoxanthum odoratum	Sweet Vernal Grass	1.5	1	2	1.5	3	2	1
*Aster subulatus	Wild Aster							
*Avena barbata	Oats							
*Brassica fruticulosa	Twiggy Turnip							
*Brassica rapa spp sylvestris	Wild Turnip							
*Briza maxima	Blowfly Grass					1		
*Briza minor	Shivery Grass							
*Bromus catharticus	Prairie Grass				2			
*Bromus diandrus	Great Brome				2			
*Bromus hordeaceus	Soft Brome							
*Carduus pycnocephalus	Slender Thistle							
*Carthamus lanatus	Saffron Thistle							
*Centaureum tenuiflorum	Centaury	2						1
*Cerastium glomeratum	Chickweed							
*Chenopodium album	Fat Hen							
*Chenopodium pumilio	Small Crumbweed							
*Chenopodium spp.								
*Chondrilla juncea	Skeleton Weed							
*Cirsium vulgare	Spear Thistle	1		2.5		2	1	1
*Conium maculatum	Hemlock				1	2		
*Conyza bonariensis	Fleabane	1.5	1	2	1		2	
*Conyza sumatrensis	Fleabane							
*Crataegus monoguna	Hawthorn							
*Cymbopogon refractus	Barbed Wire Grass							
*Cynodon dactylon	Couch				3			
*Cyperus eragrostis	Cyperus							
*Cyperus sp.	Cyperus					2.5		
*Cytisus scoparius ssp.scoparius	Scotch Broom							
*Dactylis glomerata	Cocksfoot							
*Digitaria sanguinalis	Summer Grass							
*Echium plantagineum	Pattersons Curse							
*Echium vulgare	Vipers Bugloss			3	1	1		
*Ehrharta erecta	Ehrharta							
*Eleusine indica	Crowsfoot Grass							
*Eleusine tristachya	Goose Grass							
*Eragrostis curvula	African Love Grass					2		
*Eragrostis tenuifolia	Elastic Grass							

Flora Detected within Survey sites 2022		South Ridge	Control Ridge	Impact Ridge	Control Creek	Impact Creek	Rehab 1	Rehab 2
*Erodium cicutarium	Storksbill							
*Euphorbia lathyris	Caper Spurge					2		
*Euphorbia peplus	Petty Spurge							
*Foeniculum vulgare	Fennel							
*Fumaria muralis	Fumaria							
*Fumaria spp.	Fumaria							
*Galium tricomutum	Galium							
*Genista monspessulana	Montpellier Broome							
*Gnaphalium sp.	Cudweed							
*Herschfeldia incana	Buchan Weed							1
*Holcus lanatus	Yorkshire Fog				2	2	1	
*Hydrocotyle bonariensis	Pennywort							
*Hypericum perforatum	St. Johns Wort	1		2.5		2		1
*Hypochaeris radicata	Flatweed	1.5	1	1	2		1	1
*Lactuca serriola	Prickly Lettuce							
*Lepidium spp.	Peppergrass							
*Lepidium virginicum	Virginian Peppergrass							
*Lolium perenne	Perennial Ryegrass				2			
*Lycium ferocissimum	African Boxthorn							
*Lythrum hyssopifolia	Hyssop Loosestrife							
*Malus spp.	Apple							
*Malva parviflora	Small-flowered Mallow							
*Medicago arabica	Spotted Burr Medic							
*Medicago sativa	Lucerne							
*Modiola caroliniana	Red-flowered Mallow							
*Myosotis spp.	Forget-me-not							
*Nassella trichotoma	Serrated Tussock	1					1	
*Oenothera mollissima	Evening Primrose							
*Onopordum acanthium	Scotch Thistle							
*Orobanche sp.	Broomrape							
*Oxalis corniculata	Yellow Wood Sorrel			1				
*Panicum maximum	Green Panic							
*Papaver somniferum	Poppy							
*Parentucellia latifolia	Red Bartsia							
*Paronychia brasiliiana	Brasilian Witlow							
*Paspalum dilatatum	Paspalum							
*Pennisetum clandestinum	Kikuyu							
*Petrorhagia nanteuillii	Childing Pink							
*Phalaris aquatica	Phalaris				2			
*Phytolacca octandra	Inkweed			1			1	1
*Plantago lanceolata	Plantain				2	2	1	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 fruticosus	Blackberry				2	1		1
*Rumex conglomeratus	Clustered Dock					1		
*Rumex crispus	Curled Dock					1		
*Rumex obtusifolius	Broadleaf Dock				2.5	2		

Flora Detected within Survey sites 2022		South Ridge	Control Ridge	Impact Ridge	Control Creek	Impact Creek	Rehab 1	Rehab 2
*Rumex spp.	Dock			1				
*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							
*Sonchus oleraceus	Sowthistle	2	1	1	1	1		1
*Sporobolus spp.	Parramatta Grass							
*Stenotaphrum secundatum	Buffalo Grass							
*Tagetes minuta	Stinking Roger							
*Taraxacum officinale	Dandelion				1			
*Trifolium angustifolium	Narrow Leaved Clover							
*Trifolium arvense	Haresfoot Clover				2		2	
*Trifolium repens	White Clover							
*Urtica urens	Stinging Nettle							
*Verbascum thapsus	Great Mullein							
*Verbascum virgatum	Twiggy Mullein							
*Verbena bonariensis	Purpletop				2	1		1
*Verbena rigida	Purpletop							
*Veronica anagallis-aquatica	Blue Water Speedwell				1			
*Veronica persica	Creeping Speedwell							
*Vicia satava	Vetch							
*Vulpia bromoides	Silver Grass						1	

Appendix B

Biometric survey results

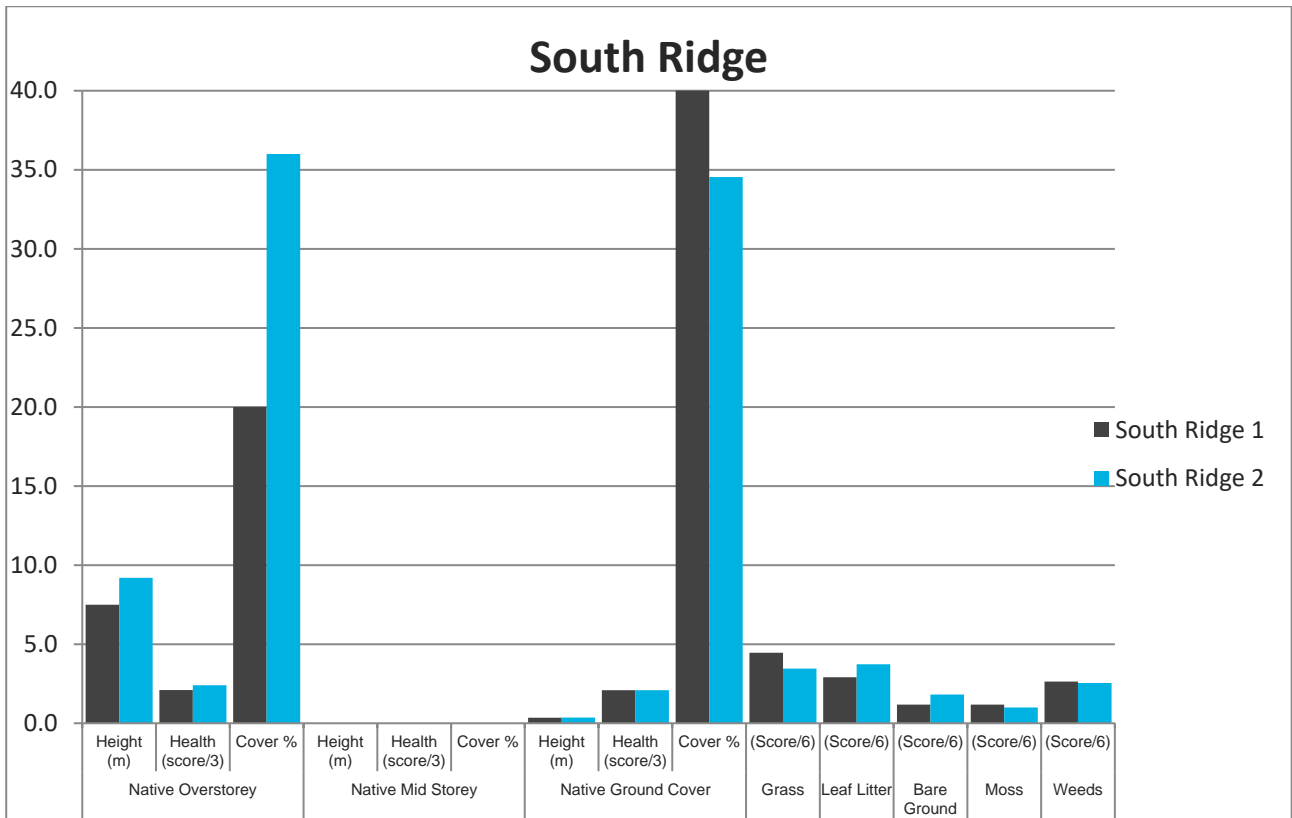


Figure B.1 South Ridge biometric survey results

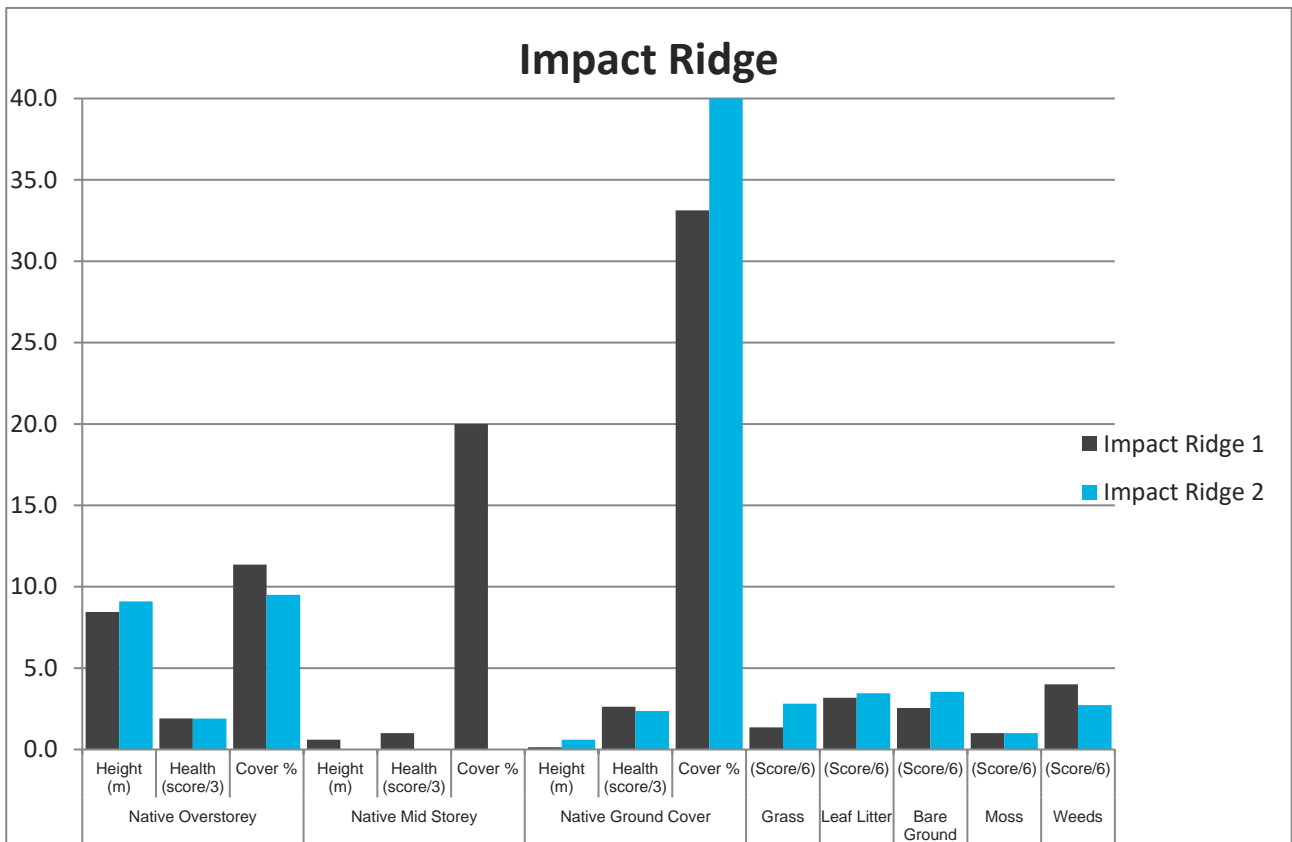


Figure B.2 Impact Ridge biometric survey results

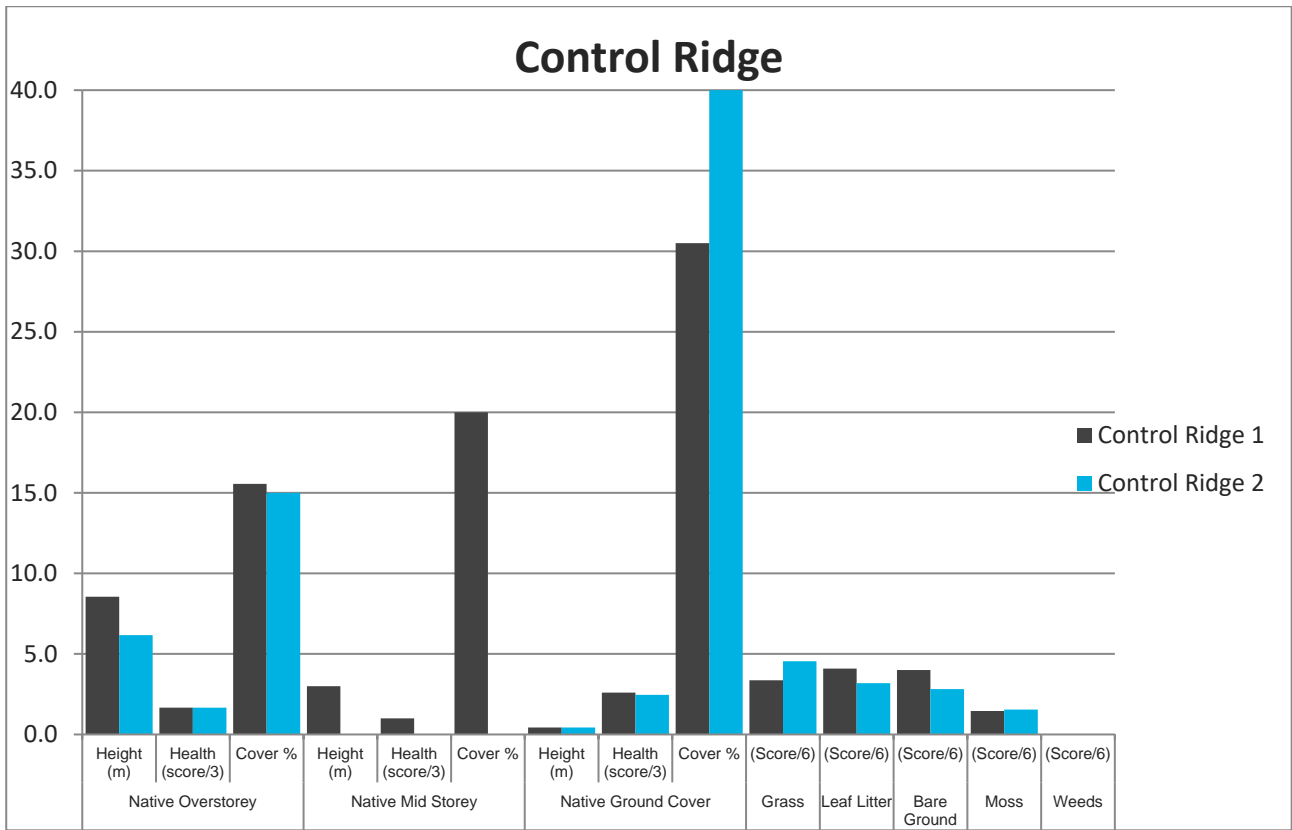


Figure B.3 Control Ridge biometric survey results

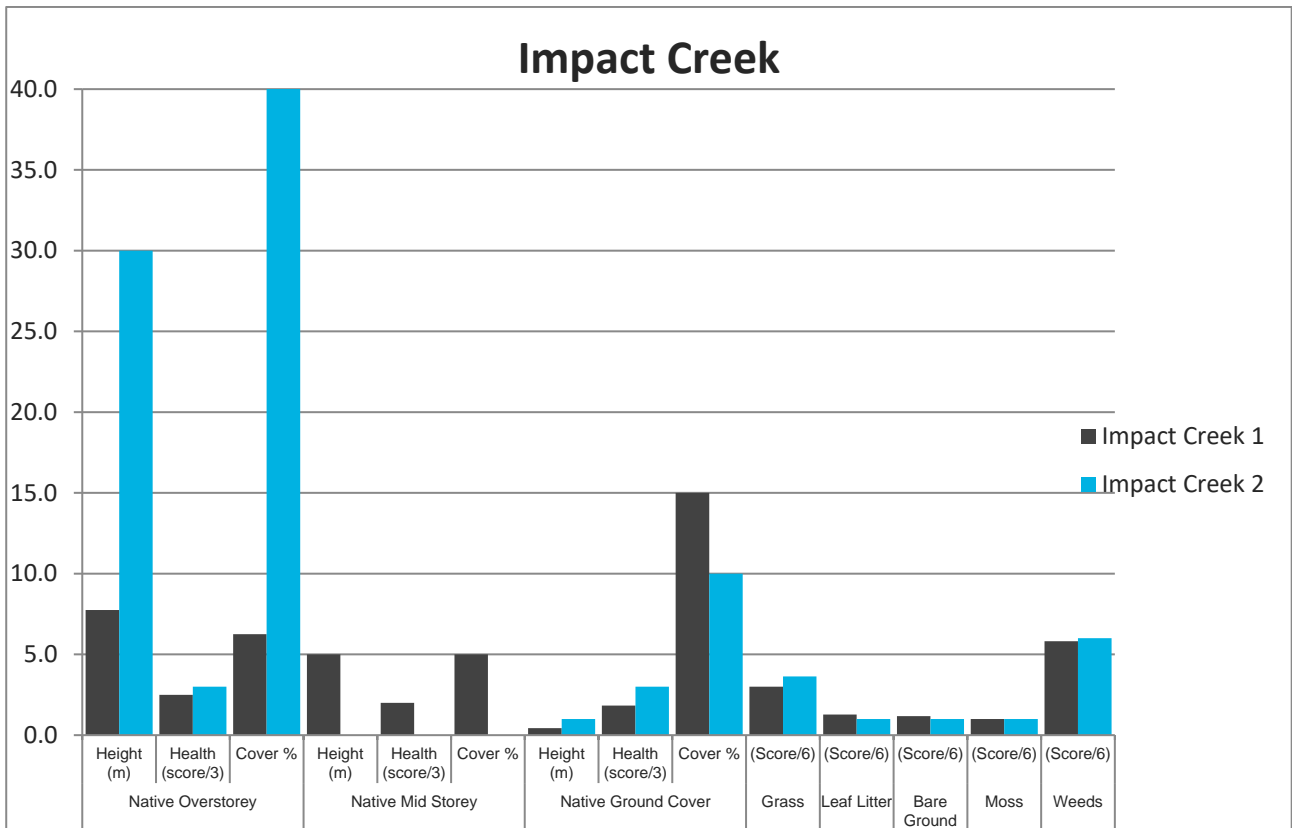


Figure B.4 Impact Creek biometric survey results

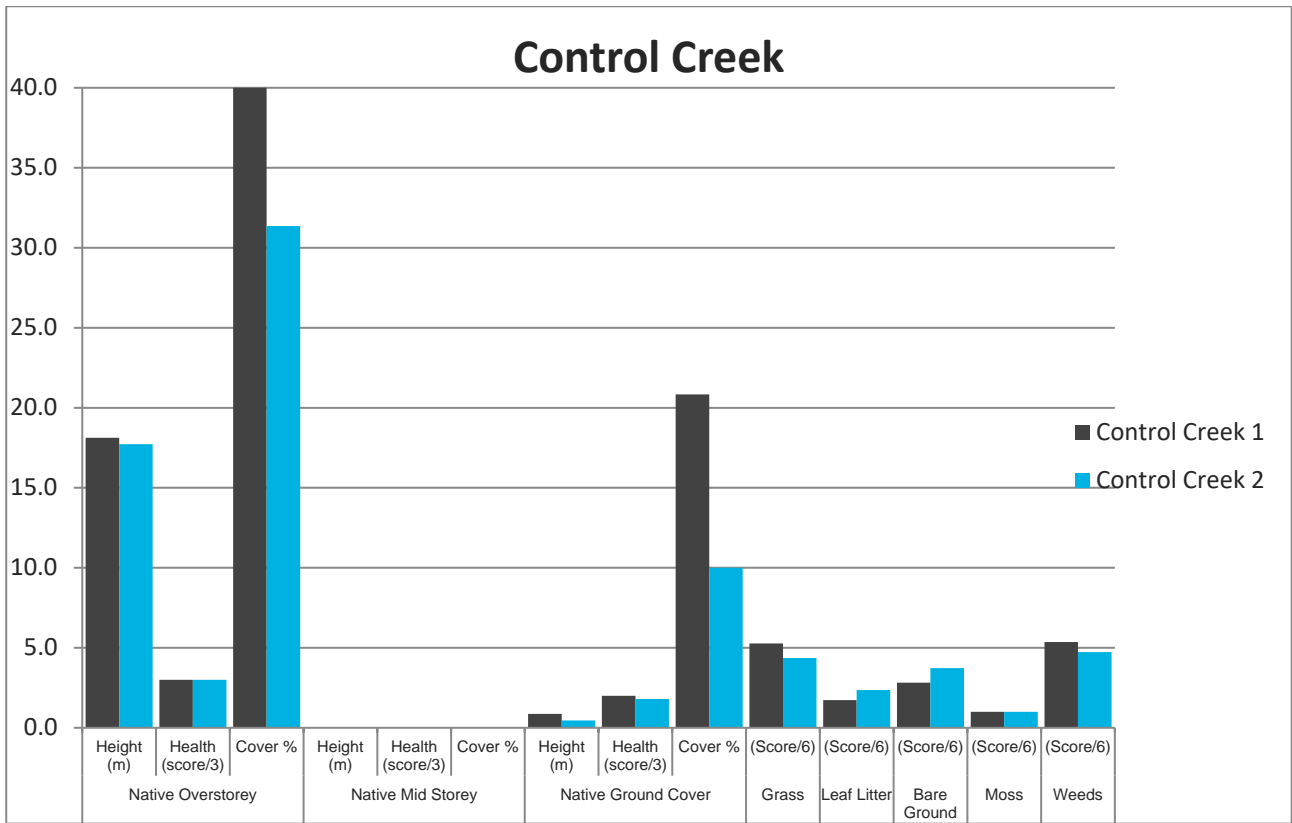


Figure B.5 Control Creek biometric survey results

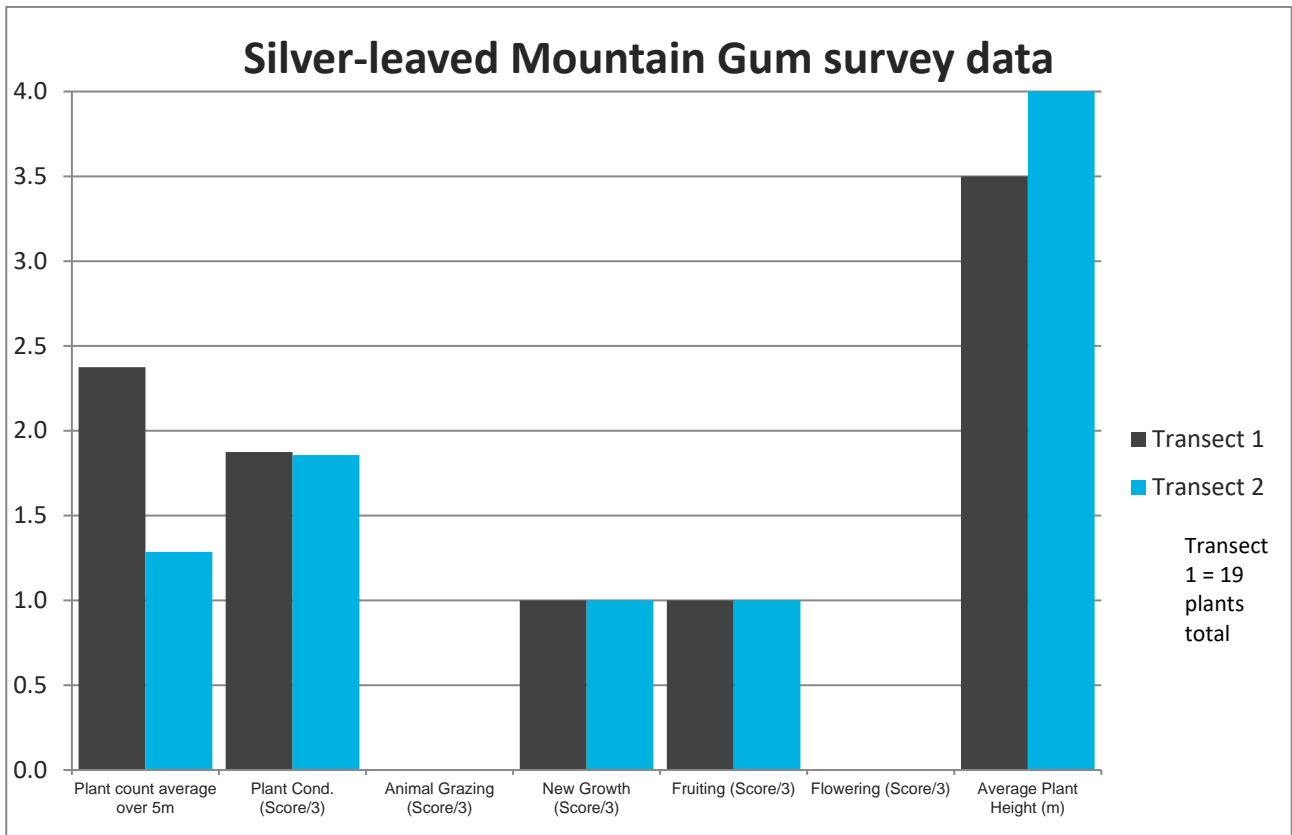


Figure B.6 Silver-leaved Mountain Gum survey data

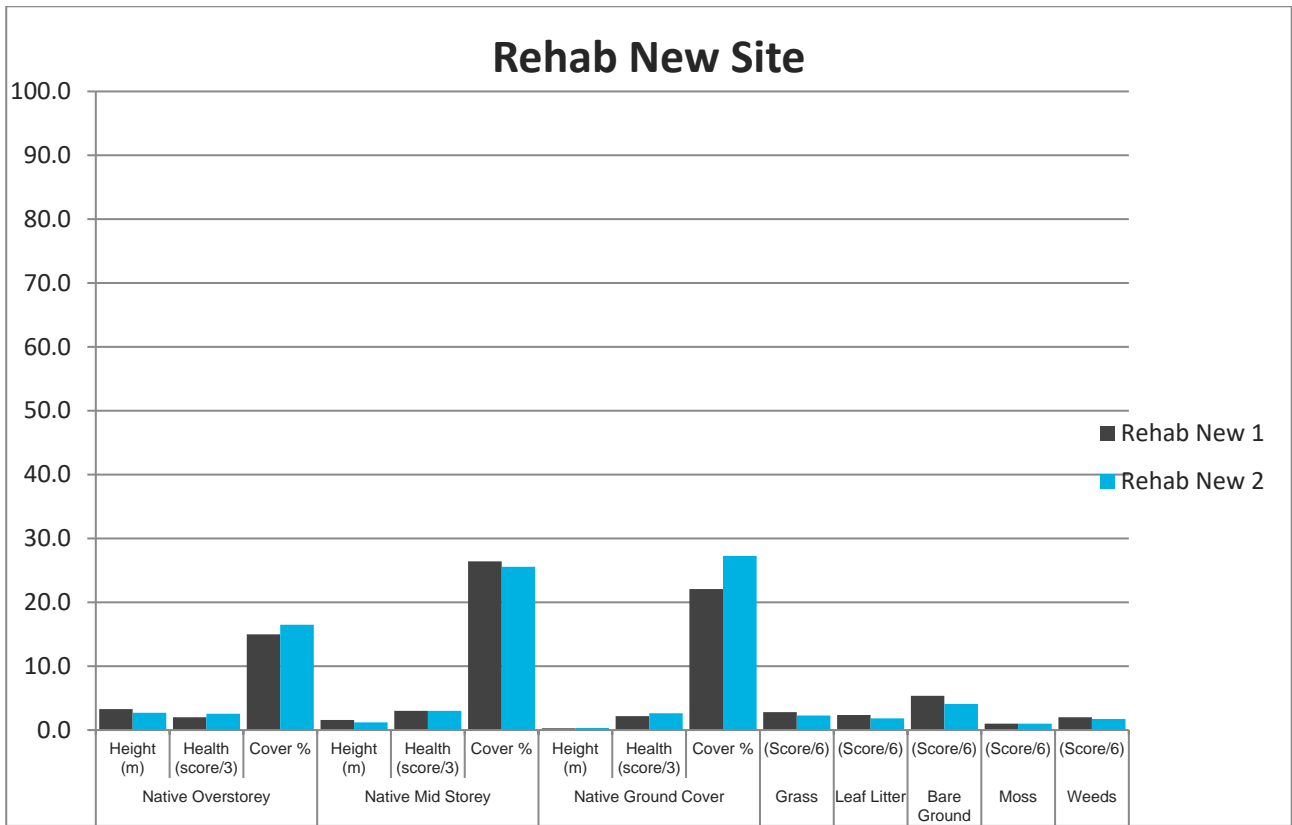


Figure B.7 Rehab New survey results

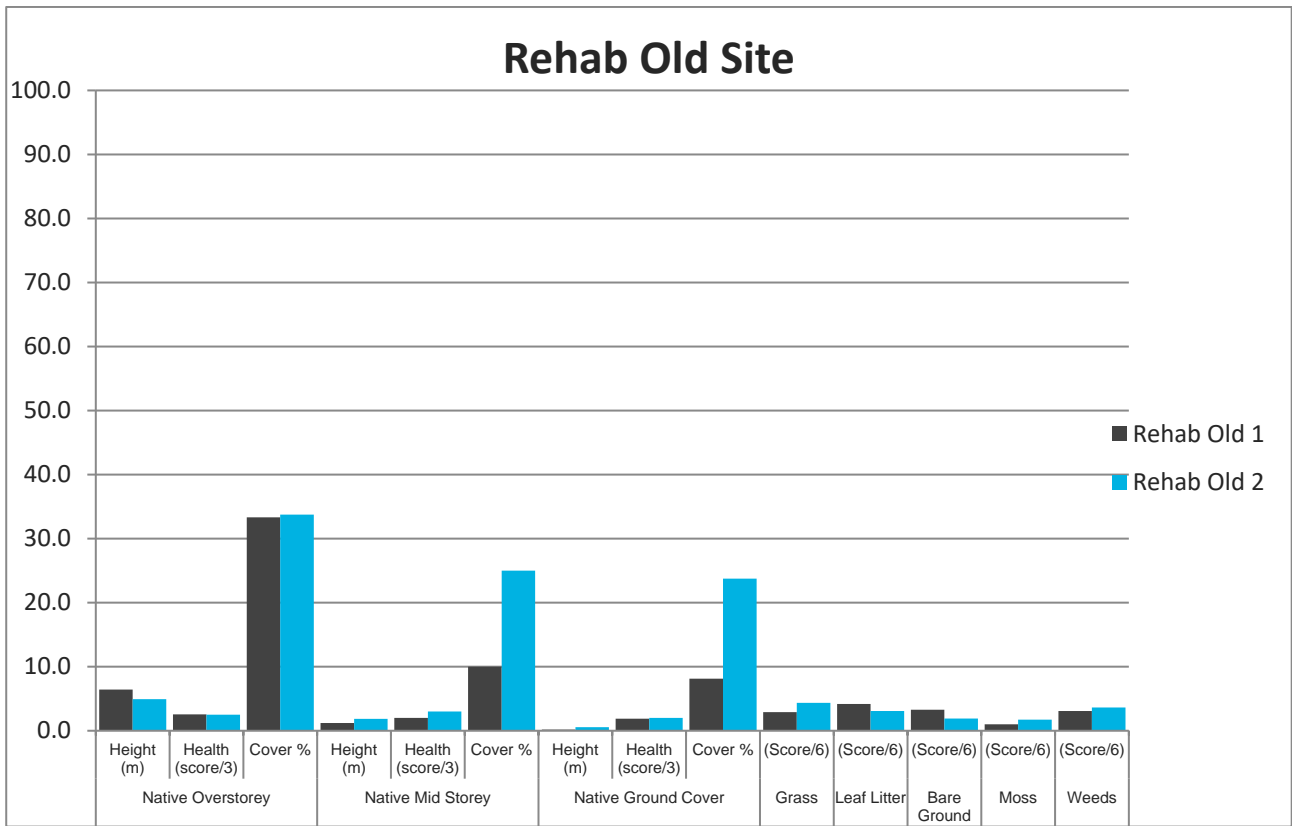


Figure B.8 Rehab Old survey results

Appendix C

Declared weeds of Central Tablelands

Table C.1 Priority weeds for the Central Tablelands 23/12/2022

Weed	Duty
All plants	<p>General Biosecurity Duty</p> <p>All plants are regulated with a general biosecurity duty to prevent, eliminate, or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated, or minimised, so far as is reasonably practicable.</p>
Aaron's beard prickly pear <i>Opuntia leucotricha</i>	<p>Prohibition on certain dealings</p> <p>Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p>
African boxthorn <i>Lycium ferocissimum</i>	<p>Prohibition on certain dealings</p> <p>Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p> <p>Regional Recommended Measure</p> <p>Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried, or released into the environment.</p> <p>Protect primary production lands that are free of African boxthorn</p>
African olive <i>Olea europaea</i> subsp. <i>cuspidata</i>	<p>Regional Recommended Measure</p> <p>Exclusion zone: whole region except the core infestation area of the Cowra Council area Whole region: The plant should not be bought, sold, grown, carried, or released into the environment. Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land. Core infestation area: Land managers should mitigate spread from their land. Land managers reduce impacts from the plant on priority assets.</p>
Alligator weed <i>Alternanthera philoxeroides</i>	<p>Prohibition on certain dealings</p> <p>Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p> <p>Biosecurity Zone</p> <p>The Alligator Weed Biosecurity Zone is established for all land within the state except land in the following regions: Greater Sydney; Hunter (but only in the local government areas of City of Lake Macquarie, City of Maitland, City of Newcastle, or Port Stephens).</p> <p>Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone</p>
Anchored water hyacinth <i>Eichhornia azurea</i>	<p>Prohibited Matter</p> <p>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</p>
Athel pine <i>Tamarix aphylla</i>	<p>Prohibition on certain dealings</p> <p>Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p>
Bellyache bush <i>Jatropha gossypifolia</i>	<p>Prohibition on certain dealings</p> <p>Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p>

Table C.1 Priority weeds for the Central Tablelands 23/12/2022

Weed	Duty
<p>Bitou bush <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i></p>	<p>Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p> <p>Biosecurity Zone The Bitou Bush Biosecurity Zone is established for all land within the State except land within 10 kilometres of the mean high water mark of the Pacific Ocean between Cape Byron in the north and Point Perpendicular in the south. Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone</p>
<p>Black knapweed <i>Centaurea x moncktonii</i></p>	<p>Prohibited Matter A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</p>
<p>Black willow <i>Salix nigra</i></p>	<p>Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p>
<p>Blackberry <i>Rubus fruticosus</i> species aggregate</p>	<p>Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged, or offered for sale. All species in the <i>Rubus fruticosus</i> species aggregate have this requirement, except for the varieties Black Satin, Chehalem, Chester Thornless, Dirksen Thornless, Loch Ness, Murrindindi, Silvan, Smooth Stem, and Thornfree</p> <p>Regional Recommended Measure Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment. Protect conservation areas, natural environments and primary production lands that are free of blackberry</p>
<p>Blind cactus <i>Opuntia rufida</i></p>	<p>Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p>
<p>Boneseed <i>Chrysanthemoides monilifera</i> subsp. <i>monilifera</i></p>	<p>Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p> <p>Control Order Boneseed Control Zone: Whole of NSW Boneseed Control Zone (Whole of NSW): Owners and occupiers of land on which there is boneseed must notify the local control authority of new infestations; immediately destroy the plants; ensure subsequent generations are destroyed; and ensure the land is kept free of the plant. A person who deals with a carrier of boneseed must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant.</p>
<p>Boxing glove cactus <i>Cylindropuntia fulgida</i> var. <i>mamillata</i></p>	<p>Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p> <p>Regional Recommended Measure Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried, or released into the environment. Notify local control authority if found.</p> <p>Excludes cultivated plants</p>

Table C.1 Priority weeds for the Central Tablelands 23/12/2022

Weed	Duty
Bridal creeper <i>Asparagus asparagoides</i>	<p>Prohibition on certain dealings</p> <p>Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p> <p>*This requirement also applies to the Western Cape form of bridal creeper</p> <p>Regional Recommended Measure</p> <p>Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment.</p> <p>Protect conservation areas and natural environments that are free of bridal creeper</p>
Bridal veil creeper <i>Asparagus declinatus</i>	<p>Prohibited Matter</p> <p>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</p>
Broomrapes <i>Orobanche species</i>	<p>Prohibited Matter</p> <p>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</p> <p>All species of Orobanche are Prohibited Matter in NSW, except Clover broomrape, Orobanche minor and Australian broomrape, Orobanche cernua var. australiana.</p>
Bunny ears cactus <i>Opuntia microdasys</i>	<p>Prohibition on certain dealings</p> <p>Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p>
Burr ragweed <i>Ambrosia confertiflora</i>	<p>Regional Recommended Measure</p> <p>Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried, or released into the environment. Notify local control authority if found.</p>
Cabomba <i>Cabomba caroliniana</i>	<p>Prohibition on certain dealings</p> <p>Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p>
Cane cactus <i>Austrocylindropuntia cylindrica</i>	<p>Prohibition on certain dealings</p> <p>Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p> <p>All species in the Austrocylindropuntia genus have this requirement</p>
Cape broom <i>Genista monspessulana</i>	<p>Prohibition on certain dealings</p> <p>Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p> <p>Regional Recommended Measure</p> <p>Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried, or released into the environment.</p> <p>Protect conservation areas and natural environments that are free of Cape broom</p>
Cat's claw creeper <i>Dolichandra unguis-cati</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p>
Chicken dance cactus <i>Opuntia schickendantzii</i>	<p>Prohibition on certain dealings</p> <p>Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p>

Table C.1 Priority weeds for the Central Tablelands 23/12/2022

Weed	Duty
Chilean needle grass <i>Nassella neesiana</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p> <p>Regional Recommended Measure</p> <p>Exclusion zone: whole region except for the core infestation area of Bathurst Council, Blayney Council, Lithgow Council, Oberon Council, Cabonne Council and Cowra Council</p> <p><i>Whole region: The plant should not be bought, sold, grown, carried, or released into the environment.</i></p> <p><i>Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate spread from their land. Land managers reduce impacts from the plant on priority assets.</i></p>
Chinese violet <i>Asystasia gangetica</i> subsp. <i>micrantha</i>	<p>Control Order</p> <p>Owners and occupiers of land on which there is Chinese violet must notify the local control authority for the area if the Chinese violet is part of a new infestation on the land, destroy all Chinese violet on the land ensuring that subsequent generations of Chinese violet are destroyed; and keep the land free of Chinese violet. A person who deals with a carrier of Chinese violet must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant on the land, or on or in a carrier.</p>
Climbing asparagus <i>Asparagus africanus</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p>
Climbing asparagus fern <i>Asparagus plumosus</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p>
Common pear <i>Opuntia stricta</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p>
Coolatai grass <i>Hyparrhenia hirta</i>	<p>Regional Recommended Measure</p> <p>Exclusion zone: whole region except for the core infestation areas of Lithgow Council and Mid-Western Regional Council areas</p> <p><i>Whole region: The plant should not be bought, sold, grown, carried, or released into the environment.</i></p> <p><i>Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land.</i></p> <p><i>Core infestation area: Land managers should mitigate spread from their land. Land managers reduce impacts from the plant on priority assets.</i></p>
Eurasian water milfoil <i>Myriophyllum spicatum</i>	<p>Prohibited Matter</p> <p><i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i></p>
Eve's needle cactus <i>Austrocylindropuntia sublata</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p>

Table C.1 Priority weeds for the Central Tablelands 23/12/2022

Weed	Duty
Fireweed <i>Senecio madagascariensis</i>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p> <p>Regional Recommended Measure Exclusion zone: Whole region except for the core infestation area of Bylong Valley and Kanimbla Valley (lower Cox River Catchment) <i>Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate spread from their land. Land managers reduce impacts from the plant on priority assets.</i></p>
Flax-leaf broom <i>Genista linifolia</i>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p>
Foxtail fern <i>Asparagus densiflorus</i>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p>
Frogbit <i>Limnobium laevigatum</i>	<p>Prohibited Matter <i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i></p> <p>All species of <i>Limnobium</i> are Prohibited Matter</p>
Gamba grass <i>Andropogon gayanus</i>	<p>Prohibited Matter <i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i></p>
Giant Parramatta grass <i>Sporobolus fertilis</i>	<p>Regional Recommended Measure <i>Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried, or released into the environment. Notify local control authority if found.</i></p>
Giant reed <i>Arundo donax</i>	<p>Regional Recommended Measure Exclusion zone: whole region except for the core infestation area of Bathurst Council, Cabonne Council and Cowra Council areas <i>Whole region: The plant should not be bought, sold, grown, carried, or released into the environment.</i> <i>Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land.</i> <i>Core infestation area: Land managers should mitigate spread from their land. Land managers reduce impacts from the plant on priority assets.</i></p>
Gorse <i>Ulex europaeus</i>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p> <p>Regional Recommended Measure Exclusion zone: whole region except for the core infestation area of Bathurst Council, Blayney Council, Lithgow Council and Oberon Council <i>Whole region: The plant should not be bought, sold, grown, carried, or released into the environment.</i> <i>Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land.</i> <i>Core infestation area: Land managers should mitigate spread from their land. Land managers reduce impacts from the plant on priority assets.</i></p>

Table C.1 Priority weeds for the Central Tablelands 23/12/2022

Weed	Duty
Green cestrum <i>Cestrum parqui</i>	<p>Regional Recommended Measure</p> <p><i>Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried, or released into the environment.</i></p> <p>Contain within riparian areas to protect grazing land that is free of green cestrum</p>
Grey Sallow <i>Salix cinerea</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p>
Ground asparagus <i>Asparagus aethiopicus</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p>
Harrisia cactus <i>Harrisia species</i>	<p>Regional Recommended Measure</p> <p><i>Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried, or released into the environment. Notify local control authority if found.</i></p> <p>This Regional Recommended Measure does not apply to cultivated plants.</p>
Hawkweeds <i>Pilosella species</i>	<p>Prohibited Matter</p> <p><i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i></p> <p>All species in the genera <i>Pilosella</i> and <i>Hieracium</i> are Prohibited Matter except for <i>Hieracium murorum</i>.</p>
Honey locust <i>Gleditsia triacanthos</i>	<p>Regional Recommended Measure</p> <p>Exclusion zone: whole region except for the core infestation area of the Capertree Valley and Orange urban areas</p> <p><i>Whole region: The plant should not be bought, sold, grown, carried, or released into the environment.</i></p> <p><i>Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land.</i></p> <p><i>Core infestation area: Land managers should mitigate spread from their land. Land managers reduce impacts from the plant on priority assets.</i></p>
Horsetails <i>Equisetum species</i>	<p>Regional Recommended Measure</p> <p><i>Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried, or released into the environment. Notify local control authority if found.</i></p>
Hudson pear <i>Cylindropuntia pallida</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p> <p>Regional Recommended Measure</p> <p><i>Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried, or released into the environment. Notify local control authority if found.</i></p> <p>This Regional Recommended Measure applies to all species of <i>Cylindropuntia</i>.</p>

Table C.1 **Priority weeds for the Central Tablelands 23/12/2022**

Weed	Duty
Hydrocotyl <i>Hydrocotyle ranunculoides</i>	Prohibited Matter <i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i>
Hygrophila <i>Hygropila costata</i>	Regional Recommended Measure <i>Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried, or released into the environment. Notify local control authority if found.</i>
Hymenachne <i>Hymenachne amplexicaulis</i> and hybrids	Prohibition on dealings <i>Must not be imported into the State or sold</i>
Karoo acacia <i>Vachellia karoo</i>	Prohibited Matter <i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i>
Kochia <i>Bassia scoparia</i>	Prohibited Matter <i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i> Excluding the subspecies <i>trichophylla</i>
Koster's curse <i>Clidemia hirta</i>	Prohibited Matter <i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i>
Lagarosiphon <i>Lagarosiphon major</i>	Prohibited Matter <i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i>
Lantana <i>Lantana camara</i>	Prohibition on dealings <i>Must not be imported into the State or sold</i>
Long-leaf willow primrose <i>Ludwigia longifolia</i>	Regional Recommended Measure <i>Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried, or released into the environment. Notify local control authority if found.</i>
Ludwigia <i>Ludwigia peruviana</i>	Regional Recommended Measure <i>Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried, or released into the environment. Notify local control authority if found.</i>
Madeira vine <i>Anredera cordifolia</i>	Prohibition on dealings <i>Must not be imported into the State or sold</i>

Table C.1 **Priority weeds for the Central Tablelands 23/12/2022**

Weed	Duty
Mesquite <i>Prosopis</i> species	Prohibition on dealings <i>Must not be imported into the State or sold</i> All species in the genus <i>Prosopis</i> have this requirement
Mexican feather grass <i>Nassella tenuissima</i>	Prohibited Matter <i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i>
Miconia <i>Miconia</i> species	Prohibited Matter <i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i> All species of <i>Miconia</i> are Prohibited Matter in NSW
Mikania vine <i>Mikania micrantha</i>	Prohibited Matter <i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i> All species in the genus <i>Mikania</i> are Prohibited Matter in NSW
Mimosa <i>Mimosa pigra</i>	Prohibited Matter <i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i>
Mother-of-millions <i>Bryophyllum</i> species	Regional Recommended Measure <i>Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried, or released into the environment,</i> Protect conservation areas, natural environments and grazing land that is free of mother-of-millions
Ox-eye daisy <i>Leucanthemum vulgare</i>	Regional Recommended Measure <i>Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried, or released into the environment.</i> Protect conservation areas, natural environments and primary production lands that are free of ox-eye daisy
Parkinsonia <i>Parkinsonia aculeata</i>	Prohibition on dealings <i>Must not be imported into the State or sold</i> Control Order Parkinsonia Control Zone: Whole of NSW <i>Parkinsonia Control Zone (Whole of NSW): Owners and occupiers of land on which there is parkinsonia must notify the local control authority of new infestations; immediately destroy the plants; ensure subsequent generations are destroyed; and ensure the land is kept free of the plant. A person who deals with a carrier of parkinsonia must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant.</i>

Table C.1 Priority weeds for the Central Tablelands 23/12/2022

Weed	Duty
Parthenium weed <i>Parthenium hysterophorus</i>	<p>Prohibited Matter</p> <p>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries.</p> <p>Prohibited Matter</p> <p>The following equipment must not be imported into NSW from Queensland: grain harvesters (including the comb or front), comb trailers (including the comb or front), bins used for holding grain during harvest operations, augers or similar for moving grain, vehicles used to transport grain harvesters, support vehicles driven in paddocks during harvest operations, mineral exploration drilling rigs and vehicles used to transport those rigs, unless set out as an exception in Division 5, Part 2 of the Biosecurity Order (Permitted Activities) 2017</p>
Pond apple <i>Annona glabra</i>	<p>Prohibited Matter</p> <p>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</p>
Prickly acacia <i>Vachellia nilotica</i>	<p>Prohibited Matter</p> <p>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</p>
Prickly pears – Austrocylindropuntias <i>Austrocylindropuntia</i> species	<p>Prohibition on dealings</p> <p>Must not be imported into the State or sold</p> <p>All species in the <i>Austrocylindropuntia</i> genus have this requirement</p>
Prickly pears – Cylindropuntias <i>Cylindropuntia</i> species	<p>Prohibition on dealings</p> <p>Must not be imported into the State or sold</p> <p>All species in the <i>Cylindropuntia</i> genus have this requirement</p> <p>Regional Recommended Measure</p> <p>Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. Notify local control authority if found.</p> <p>This Regional Recommended Measure does not apply to cultivated plants</p>
Prickly pears – Opuntias <i>Opuntia</i> species	<p>Prohibition on dealings</p> <p>Must not be imported into the State or sold</p> <p>Except for <i>Opuntia ficus-indica</i> (Indian fig)</p>
Privet – broad-leaf <i>Ligustrum lucidum</i>	<p>Regional Recommended Measure</p> <p>Exclusion zone: urban areas of Bathurst Council, Blayney Council, Lithgow Council, Oberon Council, and Orange City Council</p> <p>Whole region: The plant should not be bought, sold, grown, carried, or released into the environment.</p> <p>Exclusion zone: The plant is prevented from flowering and fruiting. Land managers should mitigate spread from their land. Land managers should mitigate the risk of the plant being introduced to their land.</p> <p>Outside exclusion zone: Land managers reduce impacts from the plant on priority assets.</p>

Table C.1 Priority weeds for the Central Tablelands 23/12/2022

Weed	Duty
Privet – European <i>Ligustrum vulgare</i>	<p>Regional Recommended Measure</p> <p>Exclusion zone: urban areas of Bathurst Council, Blayney Council, Lithgow Council, Oberon Council, and Orange City Council</p> <p><i>Whole region: The plant should not be bought, sold, grown, carried, or released into the environment.</i></p> <p><i>Exclusion zone: Land managers reduce impacts from the plant on priority assets.</i></p>
Privet – narrow-leaf <i>Ligustrum sinense</i>	<p>Regional Recommended Measure</p> <p>Exclusion zone: urban areas of Bathurst Council, Blayney Council, Lithgow Council, Oberon Council, and Orange City Council</p> <p><i>Whole region: The plant should not be bought, sold, grown, carried, or released into the environment.</i></p> <p><i>Exclusion zone: Land managers reduce impacts from the plant on priority assets.</i></p>
Riverina pear <i>Opuntia elata</i>	<p>Prohibition on certain dealings</p> <p>Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p> <p>For all Opuntia species except for Opuntia ficus-indica (Indian fig).</p>
Rope pear <i>Cylindropuntia imbricata</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p> <p>All species in the <i>Cylindropuntia</i> genus have this requirement</p> <p>Regional Recommended Measure</p> <p><i>Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.</i></p> <p>This Regional Recommended Measure applies to all species of <i>Cylindropuntia</i></p>
Rubber vine <i>Cryptostegia grandiflora</i>	<p>Prohibited Matter</p> <p><i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i></p>
Sagittaria <i>Sagittaria platyphylla</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p> <p>Regional Recommended Measure</p> <p><i>Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released not the environment. Notify local control authority if found.</i></p>
Salvinia <i>Salvinia molesta</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p>
Scotch broom <i>Cytisus scoparius</i> subsp. <i>scoparius</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p> <p>Regional Recommended Measure</p> <p><i>Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried, or released into the environment.</i></p> <p>Protect conservation and natural environments that are free of Scotch broom</p>

Table C.1 Priority weeds for the Central Tablelands 23/12/2022

Weed	Duty
Serrated tussock <i>Nassella trichotoma</i>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p> <p>Regional Recommended Measure <i>Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried, or released into the environment.</i></p> <p>Protect conservation areas, natural environments and primary production lands that are free of serrated tussock</p>
Siam weed <i>Chromolaena odorata</i>	<p>Prohibited Matter <i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i></p>
Silverleaf nightshade <i>Solanum elaeagnifolium</i>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p> <p>Regional Recommended Measure Exclusion zone: whole region except the core infestation area of Cowra Council, Caonne Council and Mid-Western Regional Council <i>Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land.</i> <i>Core infestation area: Land managers should mitigate spread from their land. Land Managers reduce impacts from the plant on priority assets.</i></p>
Smooth tree pear <i>Opuntia monacantha</i>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p>
Snakefeather <i>Asparagus scandens</i>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p>
Spanish heath <i>Erica lusitanica</i>	<p>Regional Recommended Measure Exclusion zone: whole region except for the core infestation area of Lithgow Council <i>Whole region: The plant should not be bought, sold, grown, carried, or released into the environment.</i> <i>Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land.</i> <i>Core infestation areas: Land managers should mitigate spread from their land. Land managers reduce impacts from the plant on priority assets.</i></p>
Spiny burrgrass – longispinus <i>Cenchrus longispinus</i>	<p>Regional Recommended Measure Exclusion zone: whole region except the core infestation area of Mid-Western Regional Council, Bathurst Council, Cabonne Council and Cowra Council areas <i>Whole region: The plant should not be bought, sold, grown, carried, or released into the environment.</i> <i>Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land.</i> <i>Core infestation areas: Land managers should mitigate spread from their land. Land managers reduce impacts from the plant on priority assets.</i></p>

Table C.1 Priority weeds for the Central Tablelands 23/12/2022

Weed	Duty
Spiny burrgrass – spinifex <i>Cenchrus spinifex</i>	<p>Regional Recommended Measure</p> <p>Exclusion zone: whole region except the core infestation area of Mid-Western Regional Council, Bathurst Council, Cabonne Council and Cowra Council areas</p> <p><i>Whole region: The plant should not be bought, sold, grown, carried, or released into the environment.</i></p> <p><i>Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land.</i></p> <p><i>Core infestation areas: Land managers should mitigate spread from their land. Land managers reduce impacts from the plant on priority assets.</i></p>
Spongeplant <i>Limnobium spongia</i>	<p>Prohibited Matter</p> <p><i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i></p> <p>All species of <i>Limnobium</i> are Prohibited Matter</p>
Spotted knapweed <i>Centaurea stoebe</i> subsp. <i>micranthos</i>	<p>Prohibited Matter</p> <p><i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i></p>
St. John’s wort <i>Hypericum perforatum</i>	<p>Regional Recommended Measure</p> <p><i>Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried, or released into the environment.</i></p> <p>Protect grazing land that is free of St. John’s wort</p>
Sticky nightshade <i>Solanum sisymbriifolium</i>	<p>Regional Recommended Measure</p> <p>Exclusion zone: whole of region except core infestation area of Belubula River Catchment in Blayney Council, Cabonne Council and Cowra Shire Council areas.</p> <p><i>Whole region: The plant should not be bought, sold, grown, carried, or released into the environment. Exclusion zone: The plant is eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land. Core infestation: Land managers reduce impacts from the plant on priority assets. Land managers should mitigate spread from their land.</i></p>
Tiger pear <i>Opuntia aurantiaca</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p> <p>Regional Recommended Measure</p> <p><i>Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried, or released into the environment.</i></p> <p>Protect unimproved grazing lands that are free of tiger pear</p>
Tropical soda apple <i>Solanum viarum</i>	<p>Control Order</p> <p>Tropical Soda Apple Control Zone: Whole of NSW</p> <p><i>Tropical Soda Apple Control Zone (Whole of NSW): Owners and occupiers of land on which there is tropical soda apple must notify the local control authority of new infestations; destroy the plants including the fruit; ensure subsequent generations are destroyed; and ensure the land is kept free of the plant. A person who deals with a carrier of tropical soda apple must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant on the land, or on or in a carrier.</i></p>

Table C.1 Priority weeds for the Central Tablelands 23/12/2022

Weed	Duty
Tutsan <i>Hypericum androsaemum</i>	<p>Regional Recommended Measure</p> <p><i>Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried, or released into the environment.</i></p> <p>Protect conservation areas, natural environments and primary production land that is free of tutsan</p>
Velvety tree pear <i>Opuntia tomentosa</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p>
Water caltrop <i>Trapa</i> species	<p>Prohibited Matter</p> <p><i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i></p> <p>All species in the <i>Trapa</i> genus are Prohibited Matter in NSW</p>
Water hyacinth <i>Eichhornia crassipes</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p> <p>Biosecurity Zone</p> <p>The Water Hyacinth Biosecurity Zone applies to all land within the State, except for the following regions: Greater Sydney or North Coast, North West (but only the local government area of Moree Plains), Hunter (but only in the local government areas of City of Cessnock, City of Lack Macquarie, MidCoast, City of Maitland, City of Newcastle or Port Stephens), South East (but only in the local government areas of Eurobodalla, Kiama, City of Shellharbour, City of Shoalhaven or City of Wollongong).</p> <p><i>Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone</i></p>
Water soldier <i>Stratitotes aloides</i>	<p>Prohibited Matter</p> <p><i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i></p>
Wheel cactus <i>Opuntia robusta</i>	<p>Prohibition on certain dealings</p> <p>Must not be imported into the state, sold, bartered, exchanged, or offered for sale.</p>
Willows <i>Salix</i> species	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p> <p>All species in the <i>Salix</i> genus have this requirement, except <i>Salix babylonica</i> (weeping willows), <i>Salix x calodendron</i> (pussy willow) and <i>Salix x reichardtii</i> (sterile pussy willow)</p>
Witchweeds <i>Striga</i> species	<p>Prohibited Matter</p> <p><i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i></p> <p>All species in the <i>Striga</i> genus are Prohibited Matter in NSW, except the native <i>Striga parviflora</i></p>
Yellow burrhead <i>Limnocharius flava</i>	<p>Prohibited Matter</p> <p><i>A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i></p>

Appendix D

Threatened Species Database search

D.1 Protected Matters Search Tool Threatened Species Database results

Common Name	Scientific Name	Habitat Requirements	EPBC Act listing
Threatened 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
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 1200 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	<i>Euphrasia arguta</i>	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
Cotoneaster Pomaderris	<i>Pomaderris cotoneaster</i>	Usually growing on shallow soils with outcropping rock, often associated with cliffines (above, on or below) or riverbanks. The species occurs in dry, shrubby open forest on north-west to south-west facing slopes.	Endangered
Hoary Sunray	<i>Leucochrysum albicans</i> subsp. <i>tricolor</i>	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
Eastern Underground Orchid	<i>Rhizanthella slateri</i>	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
Silver-leaved Mountain Gum	<i>Eucalyptus pulverulenta</i>	The Silver-leaved 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 (<i>Eucalyptus mannifera</i>), Red Stringybark (<i>E. macrorhynca</i>), Broad-leaved Peppermint (<i>E. dives</i>), Silvertop Ash (<i>E. sieberi</i>) and Apple Box (<i>E. bridgesiana</i>).	Vulnerable
Flockton Wattle	<i>Acacia flocktoniae</i>	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

Common Name	Scientific Name	Habitat Requirements	EPBC Act listing
Black Gum	<i>Eucalyptus aggregata</i>	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 (<i>Eucalyptus pauciflora</i>), Manna or Ribbon Gum (<i>E. viminalis</i>), Candlebark (<i>E. rubida</i>), Black Sallee (<i>E. stellulata</i>) and Swamp Gum (<i>E. ovata</i>). Black Gum usually occurs in an open woodland formation with a grassy groundlayer dominated either by River Tussock (<i>Poa labillardierei</i>) or Kangaroo Grass (<i>Themeda australis</i>), 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
Austral Toadflax	<i>Thesium australe</i>	Occurs in grassland or grassy woodland. Often found in damp sites in association with Kangaroo Grass (<i>Themeda australis</i>). A root parasite that takes water and some nutrient from other plants, especially Kangaroo Grass.	Vulnerable
Bynoe's Wattle	<i>Acacia bynoeana</i>	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
Cabbage Kunzea	<i>Kunzea cabbagei</i>	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
Fauna			
Fish			
Macquarie Perch	<i>Macquaria australasica</i>	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
Australian Grayling	<i>Prototroctes maraena</i>	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
Amphibians			
Booroolong Frog	<i>Litoria booroolongensis</i>	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

Common Name	Scientific Name	Habitat Requirements	EPBC Act listing
Insects			
Bathurst Copper Butterfly	<i>Paralucia spinifera</i>	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			
Eastern Curlew	<i>Numenius madagascariensis</i>	The Eastern Curlew is found intertidal mudflats and sandflats, often with beds of seagrass, on sheltered coasts, especially estuaries, mangrove swamps, bays, harbours, and lagoons.	Critically Endangered
Swift Parrot	<i>Lathamus discolor</i>	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, <i>E. sideroxylon</i> and White Box. Commonly used lerp infested trees include <i>E. microcarpa</i> , Grey Box and Blackbutt.	Critically Endangered
Curlew Sandpiper	<i>Calidris ferruginea</i>	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
Regent Honeyeater	<i>Anthochaera phrygia</i>	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 (<i>Amyema cabbagei</i>) 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
Australian Painted Snipe	<i>Rostratula australis</i>	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 mud-flats and in shallow water. Feeds on worms, molluscs, insects, and some plant-matter.	Endangered

Common Name	Scientific Name	Habitat Requirements	EPBC Act listing
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	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
Australasian Bittern	<i>Botaurus poiciloptilus</i>	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
South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>	Inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000 m in which stands of she-oak species, particularly Black She-oak (<i>Allocasuarina littoralis</i>), Forest She-oak (<i>A. torulosa</i>) or Drooping She-oak (<i>A. verticillata</i>) 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
Painted Honeyeater	<i>Grantiella picta</i>	Inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	Vulnerable
Grey Falcon	<i>Falco hypoleucos</i>	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 utilizes 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
Superb Parrot	<i>Polytelis swainsonii</i>	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
Pilotbird	<i>Pycnoptilus floccosus</i>	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

Common Name	Scientific Name	Habitat Requirements	EPBC Act listing
White-throated Needletail	<i>Hirundapus caudacutus</i>	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			
Greater Glider (southern and central)	<i>Petauroides volans</i>	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 <i>E. obliqua</i> . 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
Spot-tailed Quoll	<i>Dasyurus maculatus maculatus</i> (SE mainland population)	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
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	<i>Phascolarctos cinereus</i> (combined populations of Qld, NSW and the ACT)	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
Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>	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

Common Name	Scientific Name	Habitat Requirements	EPBC Act listing
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (<i>Hirundo ariel</i>), 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.	Vulnerable
New Holland Mouse	<i>Pseudomys novaehollandiae</i>	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
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	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
Yellow-bellied Glider (south-eastern)	<i>Petaurus australis australis</i>	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	<i>Aprasia parapulchella</i>	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (<i>Themeda australis</i>). 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

Australia

SYDNEY

Ground floor 20 Chandos Street
St Leonards NSW 2065
T 02 9493 9500

NEWCASTLE

Level 3 175 Scott Street
Newcastle NSW 2300
T 02 4907 4800

BRISBANE

Level 1 87 Wickham Terrace
Spring Hill QLD 4000
T 07 3648 1200

CANBERRA

Suite 2.04 Level 2
15 London Circuit
Canberra City ACT 2601

ADELAIDE

Level 4 74 Pirie Street
Adelaide SA 5000
T 08 8232 2253

MELBOURNE

Suite 8.03 Level 8
454 Collins Street
Melbourne VIC 3000
T 03 9993 1900

PERTH

Suite 9.02 Level 9
109 St Georges Terrace
Perth WA 6000
T 08 6430 4800

Canada

TORONTO

2345 Yonge Street Suite 300
Toronto ON M4P 2E5
T 647 467 1605

VANCOUVER

60 W 6th Ave
Vancouver BC V5Y 1K1
T 604 999 8297



[linkedin.com/company/emm-consulting-pty-limited](https://www.linkedin.com/company/emm-consulting-pty-limited)



emmconsulting.com.au

Appendix I: Aquatic Ecology Monitoring

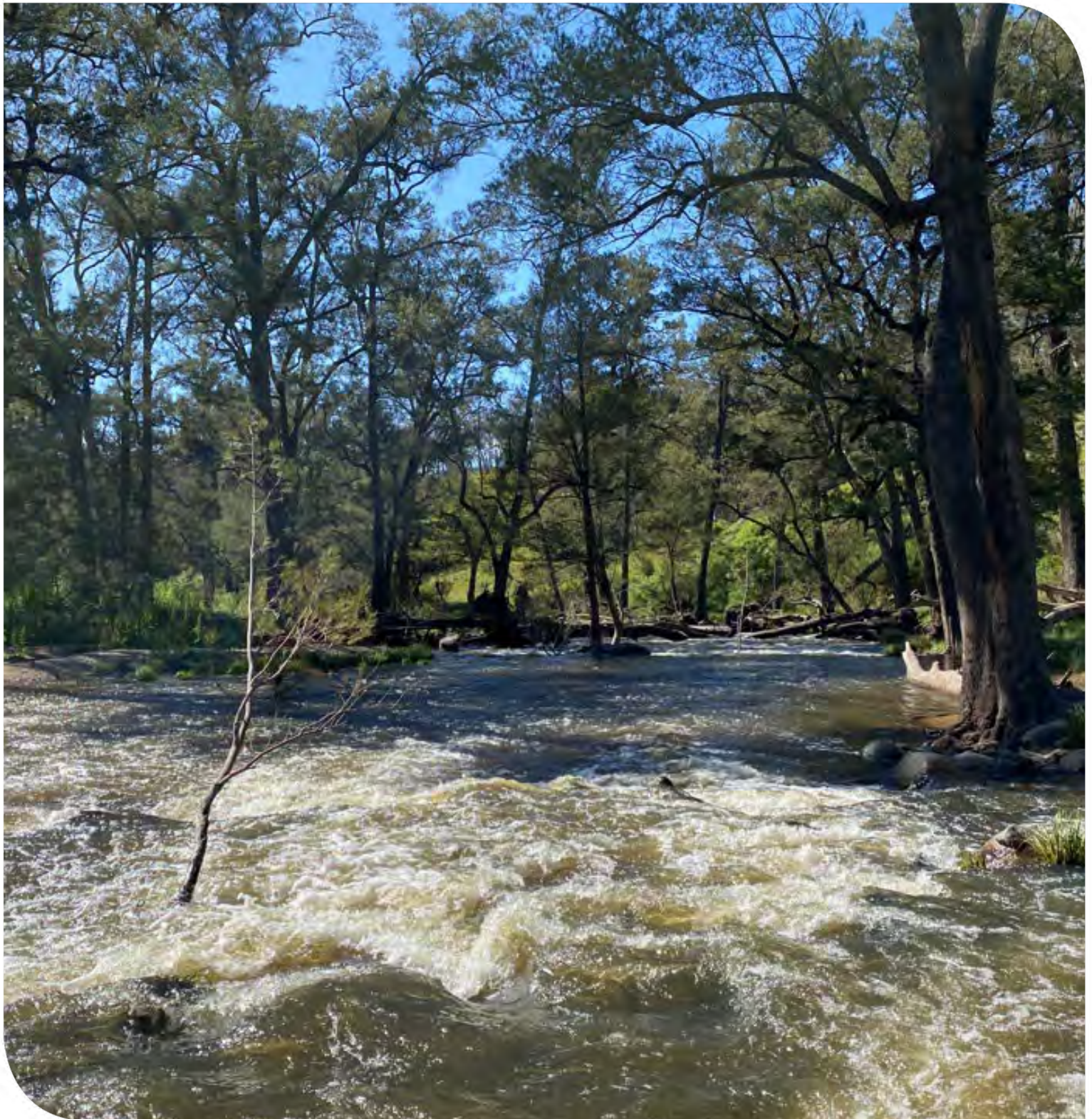
Excellence in your environment



Aquatic Monitoring Report

Spring 2022

Prepared for Austen Quarry Pty Ltd | 13 March 2023



Document control

Project number	Client	Project manager	LGA
7556	Hy-Tech	David Wilkinson	Lithgow

Version	Author	Review	Status	Date
D0	David Wilkinson Luke Stone	Luke Stone Kayla McGregor	Draft	08/03/2023
D1	David Wilkinson	Luke Stone	Draft	10/03/2023
R0	David Wilkinson		Review	13/03/2023

© Niche Environment and Heritage Pty Ltd (ACN 137 111 721) 2018

Copyright protects this publication. All rights reserved. Except for purposes permitted by the Australian Copyright Act 1968, reproduction, adaptation, electronic storage, transmission and communication to the public by any means is prohibited without our prior written permission. Any third party material, including images, contained in this publication remains the property of the specified copyright owner unless otherwise indicated, and is used subject to their licensing conditions.

Disclaimer

While Niche Environment and Heritage Pty Ltd uses care and diligence in the preparation of this report, it is not responsible or liable for any mistakes, misprints, omissions or typographical errors. None of Niche Environment and Heritage Pty Ltd, nor its editors or authors are responsible for the results of any actions taken on the basis of information in this publication. Niche Environment and Heritage Pty Ltd and its editors and authors expressly disclaim all and any liability and responsibility to any person or organisation in respect of, or as a consequence of, anything done or omitted to be done by any person or organisation in reliance, whether wholly or partially, upon the whole or part of any of the contents of this publication, including any photographs, statements or descriptions. No representation is made as to the suitability of this publication for any particular purpose. The views expressed in this publication are not necessarily endorsed by this publication, its editors or authors, or the owners or management of Niche Environment and Heritage Pty Ltd.

Enquiries should be addressed to:

Sydney Head Office
Niche Environment and Heritage
 02 9630 5658
 info@niche-eh.com
 PO Box 2443 North Parramatta
 NSW 1750 Australia

Executive summary

Hy-Tec Industries Pty Ltd (Hy-Tec) commissioned Niche Environment and Heritage Pty Ltd (Niche) to undertake the spring 2022 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 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.

The purpose of this aquatic monitoring is to assess stream health at sites above and below 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 2022 as part of the spring sampling period. Sampling was conducted at two Quarry Processing sites, two Quarry Control sites and two Upstream Control sites in a wet period, with high antecedent flows. 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 Processing sites, two Quarry Control sites and two Upstream Control sites in a wet period, with high flows. The key findings from the monitoring results are:

- Water quality readings were within ANZG DTVs at all sites.
- Pool edge and riffle habitat macroinvertebrate assemblages were overall 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 2022 data.
- The spring 2022 pool edge and riffle stream health results are lower than recent years of monitoring.
- Notably the number of taxa recorded in 2022 were significantly lower than previous years of monitoring at pool edge, and riffle habitats. The SIGNAL2 results were also particularly low at riffle habitats across all sites.
- Statistical analysis of the pool edge data found that significant differences were identified in a number of stream health results, particularly for the Year term.
 - The number of taxa recorded in 2022 were significantly different (lower) than all previous years of monitoring.
 - The multivariate analysis of assemblage structure also identified significant differences for Year, and the interaction of Year x Location for assemblage structure.
 - Pairwise comparisons however did not detect any significant differences for, or within, comparisons for Location. Indicating that while there were significant differences between 2022 and previous years, there were no significant differences between control and impact sites in 2022.

- Statistical analysis of the riffle habitat data identified significant differences in a number of stream health results, particularly for the Year and Year x Location interaction term, however these were variable across the stream health indices.
 - While some differences were identified within the interaction term between the Quarry Treatment and Control groups, these were not consistent with the results indicating differences between both the Upstream Control and Quarry Control sites.
 - Significant differences were also detected between the Upstream Control and Quarry Control sites for OE50 taxa.

The spring 2022 biological monitoring results reflect the prevailing high rainfall and stream flow conditions through the year and are reduced when compared to previous year monitoring results. This reflects the prevailing harsh physical conditions, rather than any reduced water quality conditions or impacts.

Importantly, both pool edge and riffle habitats recorded comparable stream health results in spring 2022, with no outright spatially significant differences among site groups. 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 2022.

Table of Contents

Executive summary	i
Table of Contents	iii
Glossary and abbreviations	6
1. Introduction	7
1.1 Background.....	7
1.2 Purpose and objectives of this report	7
2. Methods	8
2.1 Survey methods.....	8
2.2 Sampling locations and study design.....	8
2.3 Water quality sampling.....	10
2.4 Macroinvertebrate survey.....	10
2.5 Data analysis.....	11
2.6 Statistical Analysis	12
3. Results	14
3.1 Hydrology.....	14
3.2 Water quality.....	16
3.3 Macroinvertebrates.....	17
4. Discussion	23
4.1 Key findings summary.....	23
4.2 Discussion of 2022 findings	23
5. Conclusion	25
6. References	26
Appendix 1. Macroinvertebrate data	28
Macroinvertebrates recorded at survey sites: spring 2022	28
Appendix 2: Statistical analysis – edge habitat	29
Statistical Results for Total Taxa.....	29
Statistical Results for OOSIGNAL.....	30
Statistical Results for OE50SIGNAL.....	31
Statistical Results for OE50Taxa	32
Statistical Results for Multivariate Analysis of the Assemblage.....	33
Appendix 3: Statistical analysis - riffle habitat	35
Statistical Results for Total Taxa.....	35

Statistical Results for OOSIGNAL.....	36
Statistical Results for OE50SIGNAL.....	38
Statistical Results for OE50Taxa	40
Statistical Results for Multivariate Analysis of the Assemblage.....	41
Appendix 4 – Plates.....	43

List of Figures

Figure 1: Location of monitoring sites.....	9
Figure 2: Daily mean stream flow at Coxs River downstream Lake Lyell – Gauge 212011	14
Figure 3: Average daily mean stream flow at Coxs River downstream Lake Lyell – Gauge 212011 in 2022 ..	15
Figure 4: Comparison of average Total Taxa (\bar{x} , \pm SE) between Years for edge habitat.....	18
Figure 5: PCoA plot with vector overlays of taxa based on Spearman’s Correlation ($r^2 > 0.7$) for the edge habitat assemblages within Year.....	19
Figure 6: Comparison of average Total Taxa (\bar{x} , \pm SE) between Years.....	20
Figure 7: Comparison of Total Taxa recorded between locations in 2022.....	21
Figure 8: PCoA plot with vector overlays of taxa based on Spearman’s Correlation ($r^2 > 0.50$) of riffle habitat assemblages for Year.....	22

List of Plates

Plate 1: Riffle habitats and sampling during 2022.....	16
Plate 2: Site 1 (Quarry Processing Area). A) Upstream B) Downstream.	43
Plate 3: Site 2 (Quarry Processing Area). A) Upstream B) Downstream.	43
Plate 4: Site 4 (Upstream Control). A) Upstream B) Downstream.	44
Plate 5: Site 5 (Upstream Control). A) Upstream B) Downstream.	44
Plate 6: Site 7 (Quarry Control). A) Upstream B) Downstream.	45
Plate 7: Site 8 (Quarry Control). A) Upstream B) Downstream.	45

List of Tables

Table 1 Location of aquatic ecology sampling sites	8
Table 2: AUSRIVAS band interpretation	12

Table 3 Guide to interpreting the SIGNAL2 scores.....	12
Table 4: Mean yearly flow at Coxs River downstream Lake Lyell – Gauge 212011	14
Table 5 Water quality results for spring 2022	16
Table 6 AUSRIVAS results for edge habitat (2022)	17
Table 7: AUSRIVAS results for riffle habitat (2022)	19

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.
DTVs	Default Trigger 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 2022 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 Matthew Russell (Associate Aquatic Ecologist) over two days (10/11/2022 and 11/11/2022). 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.

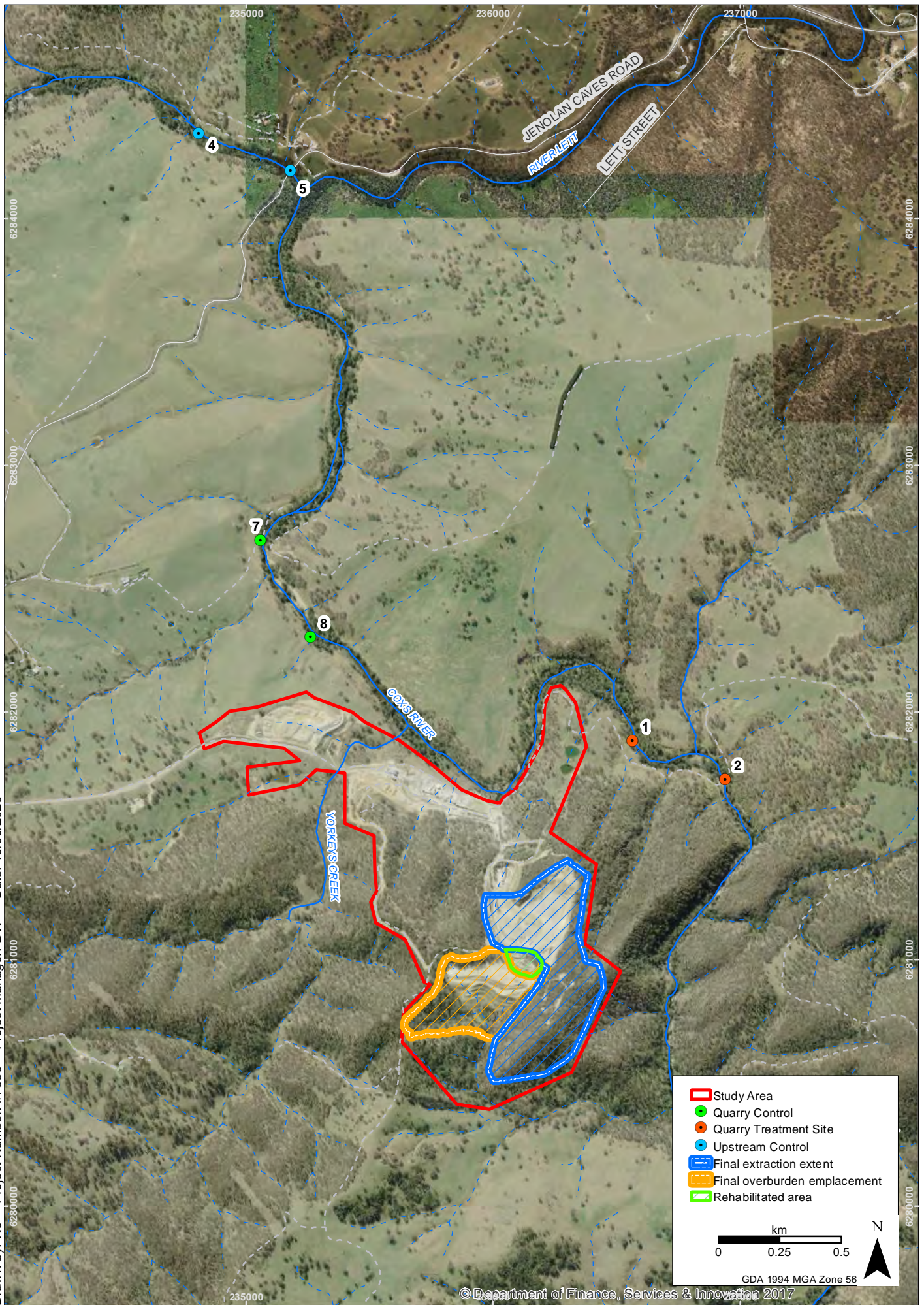
2.2 Sampling locations and study design

A total of six sites were sampled during the current survey (Figure 1, Table 1). These sites are 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



Spring 2022 Aquatic Monitoring Program - Austen Quarry

Location of monitoring sites

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 CaCO₃/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 Trigger Values (DTVs) for the region as a benchmark for comparison for the program. Currently, no updated ANZG DTVs for the region have been provided. As such the DTVs 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

OOSignal (Stream Invertebrate Grade Number Average Level) scores

This is the observed OOSignal (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 (9 levels: 2011, 2014, 2015, 2016, 2017, 2019, 2020, 2021 and 2022)
- Location (3 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 2020). 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, OOSignal, 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 (OOSignal, 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 far higher in comparison to mean yearly flows since 2010 (Figure 2, Table 4), recording the highest total annual discharge volume since 2010, beyond which the continuous dataset is incomplete. Only 2012 recorded a higher peak flow event, but 2022 was characterised by more frequent high flow events (Figure 2) and much higher average daily discharge volumes (Table 4). These factors contributed to overall greater levels of discharge over the year.

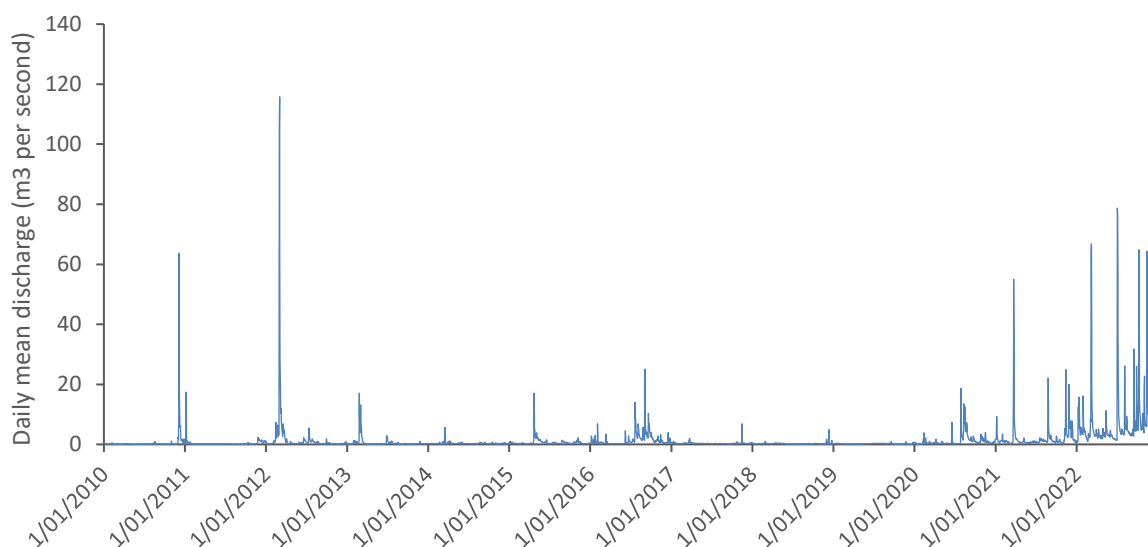


Figure 2: Daily mean stream flow at Coxs River downstream Lake Lyell – Gauge 212011

Source <http://www.bom.gov.au/waterdata/>

A total discharge of 203,960.95 Megalitres was recorded in 2022, the highest recorded between 2010 and 2022 and almost 5 times the mean of 42,167.51 Megalitres throughout this period (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

Year	Total annual discharge volume (ML)	Average daily mean discharge (m ³ per second)
2020	37,625.69	1.19
2021	68,467.50	2.17
2022	203,960.95	6.43

Source <http://www.bom.gov.au/waterdata/>

Stream flows in 2022 were highest in July (winter) and October and November (spring), with higher flows also recorded in March (Figure 3).

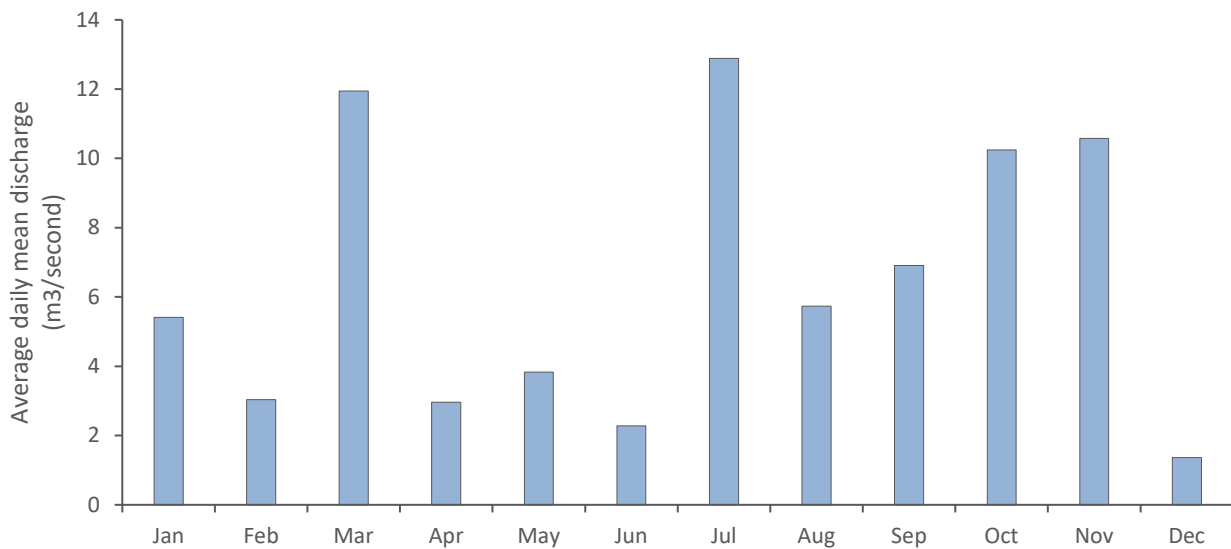


Figure 3: Average daily mean stream flow at Coxs River downstream Lake Lyell – Gauge 212011 in 2022

Source <http://www.bom.gov.au/waterdata/>

Stream flows were high at the time of sampling. Riffle habitats were substantially modified from previous surveys due to high stream flow. Specifically, riffle habitats were subject to significantly increased stream flows and as a result were limited in extent and submerged to a far greater degree. In addition to this, the area of riffle that could be safely accessed for sampling was also limited (Plate 1). The macroinvertebrate riffle habitat results must therefore be interpreted in this context and is likely to reflect a greater degree of spatial variation and impoverished conditions when compared to previous monitoring.



Plate 1: Riffle habitats and sampling during 2022.

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 Trigger Values (DTVs) in spring 2022.

Table 5 Water quality results for spring 2022

Location	DTV's	Quarry Processing		Upstream Control		Quarry Control	
Site		1	2	4	5	7	8
Temperature °C	-	13.86	13.77	16.96	15.35	14.18	14.59
Electrical conductivity (µS/cm)	30-350	163	163	168	166	164	164
Turbidity (NTU)	2-25	9.4	9.9	8	15	8.6	8.4
Dissolved Oxygen (% sat)	90-110	95.8	95.8	98	99.2	97.0	100.9
Dissolved Oxygen (mg/L)	-	9.92	9.92	9.48	9.98	9.91	10.2
pH	6.5-8	7.57	7.57	7.86	7.85	7.72	7.74
Alkalinity (mg CaCO ₃ /L)	-	40	40	40	40	40	40

Text in bold indicate those variables that exceed the default trigger values.

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 21 different taxa were collected from the pool sampling, with the number of taxa collected at each site ranging between 11-15. Pool edges were dominated numerically by Leptophlebiidae (mayflies), Caenidae (mayflies) and Chironominae (true flies), which collectively made up 63% of the total number of macroinvertebrates collected from this habitat.

In comparison to reference site data used by the AUSRIVAS model, edge habitat macroinvertebrate assemblages at the majority of sites were 'significantly impaired', recording OE50 scores within Band B. Only Upstream Control site 5 recorded an OE50 score within Band A, indicating 'similar to reference' conditions. For SIGNAL2, sites ranged between 3.73 and 4.73. All sites except Quarry Control Site 7 recorded SIGNAL2 scores between 4–5, indicating macroinvertebrate assemblages that are dominated by taxa that are able to withstand moderate levels of pollution. Whereas Site 7 recorded a lower SIGNAL2 score, reflecting a dominance of macroinvertebrate taxa tolerant of moderate to severe pollution; indicating poor water quality conditions at this site. In terms of the number of taxa recorded at each site, Upstream Control Site 5 recorded the highest (15), with the lowest (11) recorded at the Quarry Control Site 7 and 8 as well as Quarry Treatment Site 2.

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 (2022)

Status	Quarry Treatment		Upstream Control		Quarry Control	
Site	1	2	4	5	7	8
OE50	0.63	0.71	0.76	0.85	0.64	0.64
Band	B	B	B	A	B	B
No of taxa	14	11	13	15	11	11
SIGNAL2 (OOSIGNAL)	4.43	5.00	4.08	4.47	3.73	4.73
OE50SIGNAL	1.14	1.06	0.96	0.96	0.81	1.01

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 2022 and all previous years of sampling, with the total number of taxa recorded in 2022 being significantly lower than the number of taxa in previous years (Figure 4).

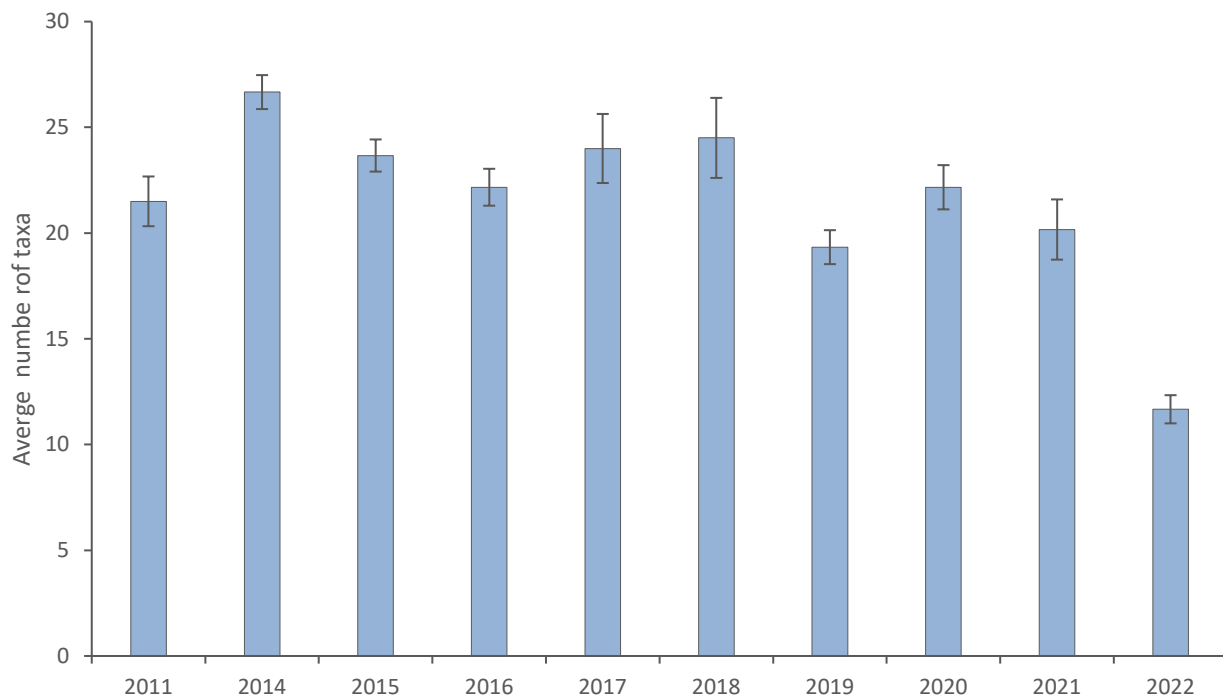


Figure 4: Comparison of average Total Taxa (\bar{x} , \pm SE) between Years for edge habitat

No significant differences were detected for OOSignal (Appendix 2) as such no further analysis was conducted.

Significant differences for OE50SIGNAL were detected for the term Year. Pairwise comparisons indicated that these differences did not include any significant differences between 2022 and previous Years. That is, significant differences were confined to comparisons between previous Years (Appendix 2).

Significant differences were also detected in OE50 Taxa for the Year term. Pairwise comparisons identified significant differences between 2022 and all previous years, except 2021 and 2022 (Appendix 2).

Assemblage Structure

Significant differences were detected for Year, and the interaction of Year x Location for assemblage structure (Appendix 2). Pairwise comparisons however did not detect any significant differences for, or within, comparisons for Location. Indicating that while there were significant differences between 2022 and previous years, there were no significant differences between control and impact sites in 2022.

Pairwise tests (Appendix 2) did not identify any significant differences at the Quarry Treatment sites for the interaction of Year x Location. Significant differences were detected for the Upstream Control sites between 2022 and 2014, 2022 and 2016. Significant differences were also detected for the Quarry Control sites between 2022 and 2014.

The PCO analysis for 2022 data found that that the first two axes explain 32.8% of the variation (Figure 5 5), with 2022 showing separation from previous years of monitoring for all samples.

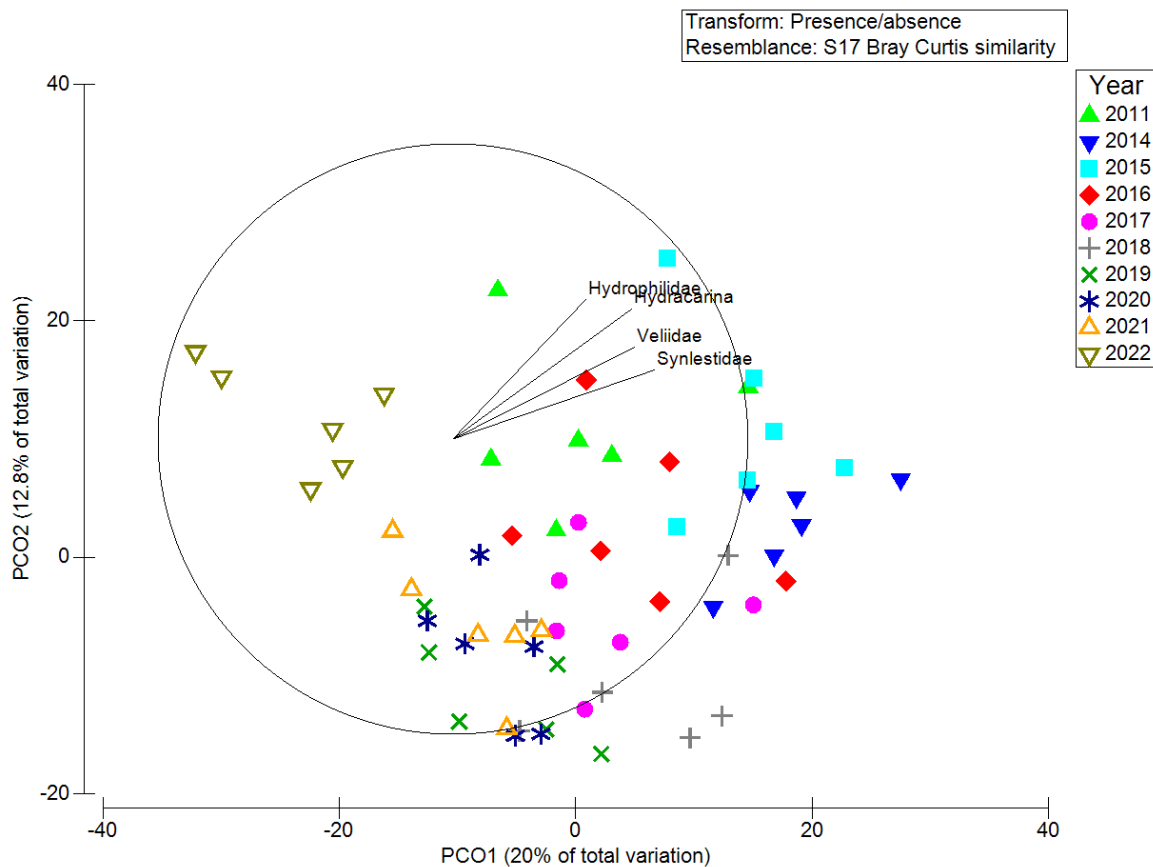


Figure 5: PCoA plot with vector overlays of taxa based on Spearman’s Correlation ($r^2 > 0.7$) for the edge habitat assemblages within Year

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, 20 different taxa were collected with the number of taxa collected ranging between 11-13 at each site. Riffle habitat was dominated numerically by Tanipodinae (true flies), Gripopterygidae (Stoneflies) and Leptophlebiidae (mayflies), which together made up 86% of the total number of macroinvertebrates collected from this habitat.

In comparison to the AUSRIVAS model 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 below 4, indicating they were dominated by species that are able to withstand severe levels of pollution (Table 7). The SIGNAL2 scores are relatively consistent across the sites but are significantly lower than previous results. The overall numbers of taxa were consistent across the sites, ranging between 11 and 13.

Table 7: AUSRIVAS results for riffle habitat (2022)

Status	Quarry Treatment		Upstream Control		Quarry Control	
Site	1	2	4	5	7	8
OE50	0.80	0.53	0.59	0.76	0.65	0.49
Band	B	B	B	B	B	B
No. of taxa	13	12	11	13	12	11
SIGNAL2 (OOSIGNAL)	0.98	0.94	0.97	1.04	0.92	0.88

Status	Quarry Treatment		Upstream Control		Quarry Control	
Site	1	2	4	5	7	8
OE50SIGNAL	1.05	1.10	1.05	1.05	1.01	1.01

Statistical analysis

The statistical analysis found significant differences for Number of Taxa (Appendix 3) when comparing both Year and Location, but not for the Year x Location interaction term. Pairwise tests for the Year term identified that 2022 was significantly different to all previous years of monitoring, recording significantly fewer Total Taxa (Figure 6). Pairwise tests for the Location term also identified that there were significant differences between the Quarry Treatment sites and the Upstream Control sites, as well as the Quarry Control sites and the Upstream Control sites. Although it seems that this relates to a somewhat marginally greater number of taxa (an average of 1 taxa) being recorded at the Quarry Treatment sites compared to the Upstream Control sites (Figure 7). No significant difference was identified between the Quarry Control sites and the Quarry Treatment sites.

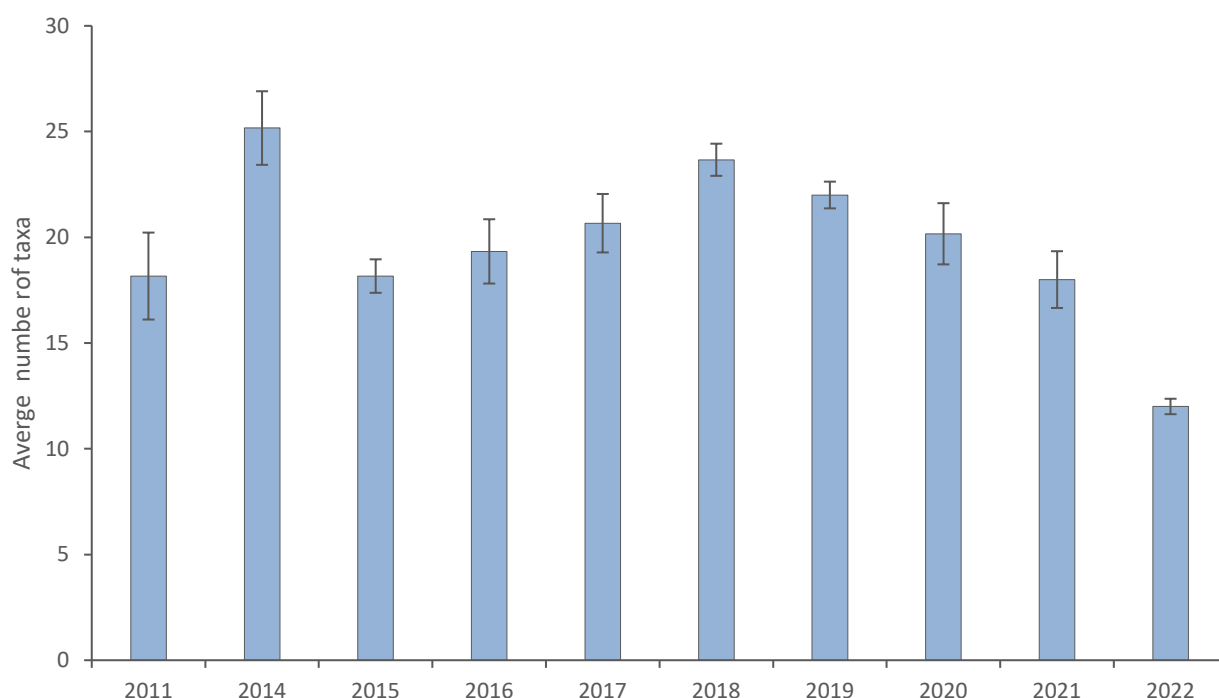


Figure 6: Comparison of average Total Taxa (\bar{x} , \pm SE) between Years

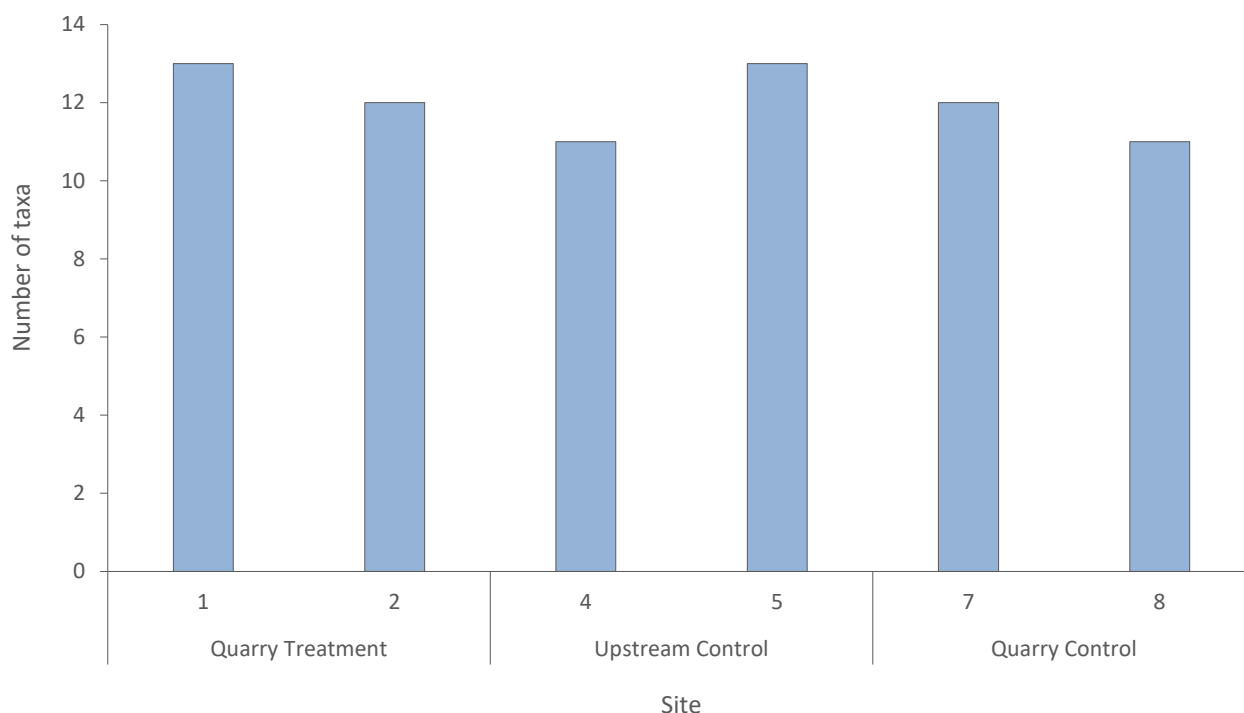


Figure 7: Comparison of Total Taxa recorded between locations in 2022

Significant differences were detected for OOSIGNAL for the Year term, Location Term, and the interaction of Year x Location (Appendix 3). Pairwise comparisons for the Year x Location interaction term identified a significant difference at the Upstream Control sites for 2022 when compared to 2011. Significant differences were also identified between the Quarry Treatment and Upstream Control sites, as well as the Quarry Treatment and Quarry Control sites in 2022.

Significant differences were detected for OE50 SIGNAL for the Year term, Location Term, and the interaction of Year x Location (Appendix 3). Pairwise comparisons for the interaction of Year x Location indicated a significant difference at the Upstream Control sites between 2022 with 2011, 2015, 2016, 2018 and 2021. Significant differences for the interaction of Year x Location were also identified between the Quarry Treatment and Quarry Control sites in 2022.

Significant differences were detected for OE50 taxa for the Year and Location term, but not the interaction term (Appendix 3). Pairwise comparisons indicated that these differences were between the 2022 and all previous years of monitoring. Significant differences were also detected between the Upstream Control sites and Quarry Control sites in 2022.

Assemblage structure

Multivariate analysis of the riffle habitat assemblages detected significant differences for both Year, Location, and the interaction term (Appendix 3). Pairwise comparisons for the interaction term indicated that the Quarry Control sites were significantly different in 2022 to 2011, 2015 and 2018. Pairwise comparisons also identified a significant difference between the Upstream Control sites in 2022 when compared to 2017.

The PCO analysis for 2022 data found that that the first two axes explain 38.3% of the variation (Figure 8 5), with 2022 samples showing separation from previous years of monitoring.

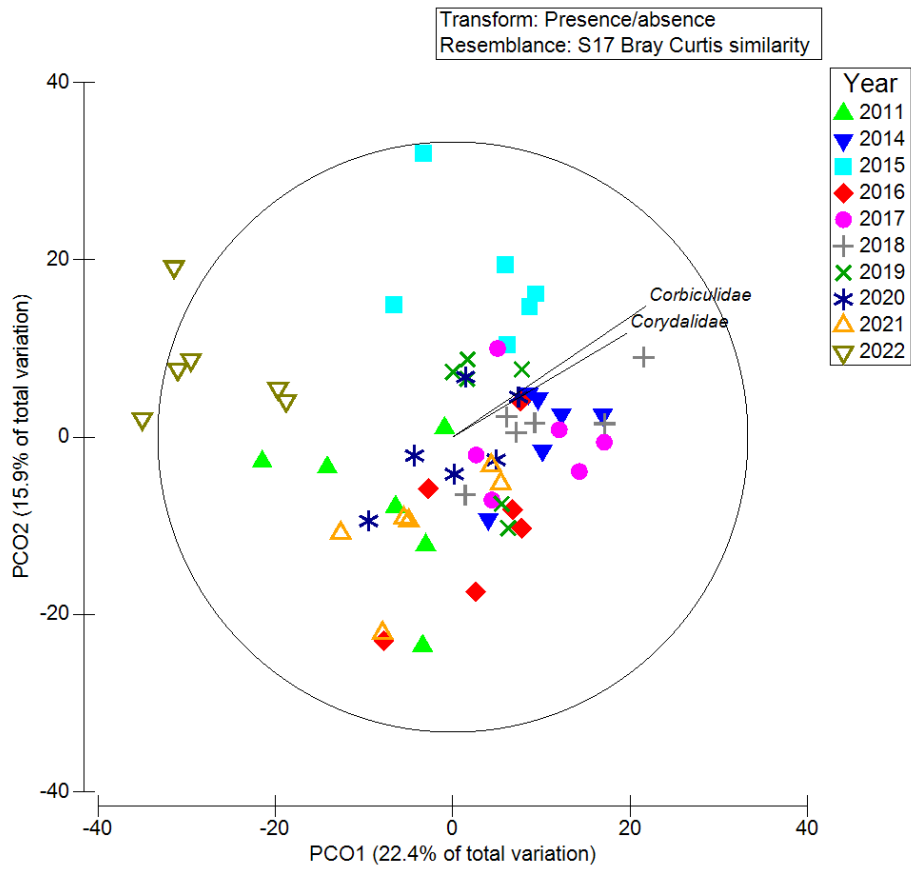


Figure 8: PCoA plot with vector overlays of taxa based on Spearman's Correlation ($r^2 > 0.50$) of riffle habitat assemblages for Year

4. Discussion

4.1 Key findings summary

Sampling was conducted at two Quarry Processing 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 DTVs at all sites.
- Pool edge and riffle habitat macroinvertebrate assemblages were overall 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 2022 data.
- The spring 2022 pool edge and riffle stream health results are lower than recent years of monitoring.
- Notably the number of taxa recorded in 2022 were significantly lower than previous years of monitoring at pool edge, and riffle habitats. The SIGNAL2 results were also particularly low at riffle habitats across all sites.
- Statistical analysis of the pool edge data found that significant differences were identified in a number of stream health results, particularly for the Year term.
 - The number of taxa recorded in 2022 were significantly different (lower) than all previous years of monitoring.
 - The multivariate analysis of assemblage structure also identified significant differences for Year, and the interaction of Year x Location for assemblage structure.
 - Pairwise comparisons however did not detect any significant differences for, or within, comparisons for Location. Indicating that while there were significant differences between 2022 and previous years, there were no significant differences between control and impact sites in 2022.
- Statistical analysis of the riffle habitat data identified significant differences in a number of stream health results, particularly for the Year and Year x Location interaction term, however these were variable across the stream health indices.
 - While some differences were identified within the interaction term between the Quarry Treatment and Control groups, these were not consistent with no results indicating differences between both the Upstream Control and Quarry Control sites.
 - Significant differences were also detected between the Upstream Control and Quarry Control sites for OE50 taxa.

4.2 Discussion of 2022 findings

In 2022 all water quality variables were within DTVs and similar values were observed across all locations. This indicates that there were no 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 high 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 2022 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 2022 sampling.

The stream health results are low in comparison to previous years, across the monitoring sites, particularly for riffle habitats. This is attributed to the harsh physical conditions prevailing at the time of sampling (high flows) and should not be interpreted as being driven by a decline in water quality. Rather it reflects the catchment scale processes operating at the time of sampling. The high flows reduce the number of microhabitats available thereby reducing the diversity of microhabitats available, and consequently the number of macroinvertebrate taxa. The conditions also directly negatively affect some macroinvertebrate guilds that are not adapted to high flow conditions (e.g. slow swimmers). It is anticipated that as flows return to more nominal conditions, the diversity of microhabitats will return, and macroinvertebrate taxa will recolonise these habitats. Riffle habitats have been more heavily impacted by these than pool edge habitats due to their instream nature and the riffle habitat sampling results should therefore be interpreted in this context and with a greater degree of caution as they are likely to experience a greater degree of variation.

The statistical analysis of stream health indices support the interpretation of biological stream health indices results. The analyses indicate that differences in the pool edge data are primarily associated with the Year term, with 2022 representing a significantly lower number of taxa and macroinvertebrate assemblage to previous monitoring years. This temporal variation is driven by the significant rainfall and stream flows that occurred through 2022, including during the Spring 2022 sampling.

A higher degree of spatial variation is observed across the riffle habitats. A higher degree of variation is expected at the riffle habitats as these are affected to a greater degree than pool edge habitats, which also explains the significantly lower Signal2 scores recorded in these habitats in 2022. However, the dominant factor is temporal differences rather than spatial differences. This is reflective of the significant rainfall and stream flow events occurring in 2022. The inclusion of a semi-quantitative rapid habitat assessment such as HABSCORE (Barbour et al. 1999), in future iterations of the monitoring program may assist in describing localised habitat changes or differences spatially, as well as differentiating these changes from water quality influences on stream health.

Overall, the monitoring results in spring 2022 reflect the prevailing environmental conditions (high rainfall and stream flows). These factors have resulted in reduced stream health index results, particularly at riffle habitats. This does not indicate a reduction in water quality, rather the harsh physical conditions present during spring 2022. 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, driven by the prevailing high rainfall and stream flow conditions, was the major factor explaining differences in the macroinvertebrate assemblages in spring 2022.

The spring 2022 biological monitoring results reflect the prevailing high rainfall and stream flow conditions, being reduced when compared to previous year monitoring results. This reflects the harsh physical conditions, rather than any reduced water quality conditions.

Importantly, both pool edge and riffle habitats recorded comparable stream health results in spring 2022, with no outright spatially significant differences among site groups. 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 2022.

6. References

- Anderson M.J., Gorley, R.N., and Clarke K.R. (2008). PERMANOVA+ for PRIMER – Guide to software and Statistical Methods. PRIMER-E: Plymouth, UK.
- AquaScience (2017). Austen Quarry Aquatic Ecology Monitoring – Spring 2016. Report Prepared for Hy Tec March 2017.
- Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) (2000). National water quality management strategy and assessment guidelines: Australian and New Zealand guidelines for fresh and marine water quality ANZECC/ARMCANZ. Environment Australia.
- Barbour, M.T., Gerritsen J., Snyder B.D., and Stribling J.B. (1999). Rapid bioassessment protocols for use in streams and wadeable rivers: periphyton, benthic macroinvertebrates and fish. U.S. Environmental Protection Agency, Office of Water, Washington. No. 841-B-99-002
- Chessman, B.C. (1995). Rapid Assessment of rivers using macroinvertebrates: a procedure based on habitat-specific sampling, family-level identification and a biotic index. *Australian Journal of Ecology*, 20: 122-9.
- Chessman, B.C., Growns, J.E. and Kotlash, A.R., (1997). Objective derivation of macroinvertebrate family sensitivity grade numbers for the SIGNAL biotic index: application to the Hunter River system, New South Wales. *Marine and Freshwater Research* 48: 159-172.
- Chessman B.C. (2003). Signal 2. A scoring system for macroinvertebrates ('water bugs') in Australian rivers user manual. Department of Environment and Heritage.
- Dean, J., Rosalind, M., St Clair, M., and Cartwright, D. (2004). Identification keys to Australian families and genera of caddis-fly larvae (Trichoptera). Cooperative Research Centre for Freshwater Ecology.
- Gooderham, J. and Tsyrlin, E. (2002). The Waterbug Book: A guide to the Freshwater Macroinvertebrates of Temperate Australia, CSIRO Publishing.
- Hawking and Theischinger (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. *Museum Victoria Science Reports* 12: 1-31.
- Madden, C. (2011). Draft identification key to families of Diptera larvae of Australian inland waters. La Trobe University.
- Murray darling freshwater research Centre- <http://www.mdfrc.org.au/bugguide/>.
- Niche (2020). Austen Quarry Aquatic Ecology Monitoring – Spring 2019. Report Prepared for Hy Tec January 2020.
- Niche (2021). Austen Quarry Aquatic Ecology Monitoring – Spring 2020. Report Prepared for Hy Tec
- Smith, B. (1996). Identification keys to the families and genera of bivalve and gastropod molluscs found in Australian inland waters. Murray Darling Freshwater Research Centre.

Turak, E., Waddel, I N., and Johnstone, G. (2004). New South Wales Australian River Assessment System (AUSRIVAS): Sampling and Processing Manual, 2004. Natural Heritage Trust, Department of Environment and Conservation NSW.

Wood., P.J. and Armitage, P.D.(1997). Biological Effects of Fine Sediment in the Lotic Environment. *Environmental Management*. 21 (2): 203–217.

Appendix 1. Macroinvertebrate data

Macroinvertebrates recorded at survey sites: spring 2022

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	3	0	1	2	0	3	0	5	0	9	13
Atyidae	2	0	1	0	4	0	0	0	0	0	0	0
Corbiculidae	0	0	0	0	0	0	1	0	0	0	0	0
Physidae	1	0	0	0	3	0	2	0	0	0	0	0
Baetidae	1	4	2	1	4	2	5	7	7	3	7	2
Caenidae	19	14	22	1	21	0	22	7	22	0	21	1
Leptophlebiidae	34	15	24	7	16	5	10	9	1	16	8	13
Gomphidae	2	0	0	3	0	1	0	0	0	2	0	1
Telephlebiidae	0	0	0	0	0	0	0	1	0	0	0	0
Gripopterygidae	5	11	2	61	1	54	5	27	0	51	3	47
Corydalidae	0	1	0	0	0	0	0	0	0	0	0	0
Dytiscidae	0	0	0	0	1	0	4	0	2	1	0	0
Elmidae	1	6	1	0	0	0	1	4	0	0	0	0
Psephenidae	0	2	0	1	0	1	0	1	0	0	0	0
Scirtidae	0	0	0	0	1	0	1	0	0	0	0	0
Ceratopogonidae	0	0	0	1	0	2	0	0	2	0	0	1
Chironominae	17	5	5	0	7	1	48	11	22	30	4	4
Tanipodinae	5	20	2	5	4	49	16	8	7	5	15	35
Simuliidae	0	1	0	2	0	0	0	14	0	1	2	4
Tipulidae	1	0	0	0	0	1	1	2	2	0	4	0
Ecnomidae	0	0	0	0	0	0	0	0	0	2	0	0

Appendix 2: Statistical analysis – edge habitat

Statistical Results for 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	9	808.33	89.815	13.54	0.0001	9642
Lo	2	13.633	6.8167	1.0276	0.3703	9637
YexLo	18	204.37	11.354	1.7116	0.0951	9900
Res	30	199	6.6333			
Total	59	1225.3				

Pairwise comparisons for Year (2022)

Groups	t	P(perm)	Unique perms	P(MC)
2011, 2022	8.5381	0.0006	2869	0.0002
2014, 2022	11.902	0.0015	3813	0.0001
2015, 2022	12.442	0.0008	2866	0.0001
2016, 2022	10.589	0.0007	2810	0.0001
2017, 2022	8.983	0.0001	4517	0.0002
2018, 2022	6.0421	0.0007	3795	0.0008
2019, 2022	7.8905	0.0005	1677	0.0005
2020, 2022	13.671	0.0002	2216	0.0001
2021, 2022	4.4679	0.0065	1706	0.0041

Statistical Results for OOSIGNAL

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	9	1.3143	0.14603	1.3238	0.2645	9947
Lo	2	0.66333	0.33166	3.0066	0.0643	9951
YexLo	18	2.1555	0.11975	1.0856	0.403	9916
Res	30	3.3094	0.11031			
Total	59	7.4425				

Statistical Results for 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	9	0.14917	1.66E-02	4.6999	0.0007	9924
Lo	2	1.41E-02	7.04E-03	1.9967	0.1555	9906
YexLo	18	0.12232	6.80E-03	1.9269	0.0561	9932
Res	30	0.1058	3.53E-03			
Total	59	0.39137				

Pairwise comparisons for Year (2022)

Groups	t	P(perm)	Unique perms	P(MC)
2011, 2022	0.31476	0.768	928	0.768
2014, 2022	1.4923	0.194	917	0.204
2015, 2022	0.55584	0.605	931	0.609
2016, 2022	1.1962	0.314	935	0.275
2017, 2022	0.68726	0.498	918	0.515
2018, 2022	1.2277	0.27	932	0.283
2019, 2022	2.2823	0.054	833	0.067
2020, 2022	1.5849	0.178	956	0.166
2021, 2022	0.24454	0.801	908	0.82

Statistical Results for 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	9	0.85453	9.49E-02	5.2265	0.0005	9938
Lo	2	2.83E-03	1.42E-03	7.79E-02	0.9275	9955
YexLo	18	0.1563	8.68E-03	0.47799	0.9457	9937
Res	30	0.545	1.82E-02			
Total	59	1.5587				

Pairwise comparisons for Year (2022)

Groups	t	P(perm)	Unique perms	P(MC)
2011, 2022	3.0236	0.0225	7705	0.025
2014, 2022	12.544	0.0002	4501	0.0001
2015, 2022	8.1886	0.001	8719	0.0004
2016, 2022	3.8345	0.0113	8590	0.0085
2017, 2022	7.9945	0.0003	7704	0.0005
2018, 2022	3.9027	0.0064	8598	0.0078
2019, 2022	2.7938	0.0368	1602	0.0329
2020, 2022	2.4425	0.0606	7751	0.0566
2021, 2022	1.916	0.11	6636	0.1041

Statistical Results for Multivariate Analysis of the 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	9	21555	2.40E+03	5.1822	0.0001	9854
Lo	2	1.82E+03	9.11E+02	1.97E+00	0.0093	9905
YexLo	18	11935	6.63E+02	1.4346	0.0026	9816
Res	30	13865	4.62E+02			
Total	59	49176				

Pairwise comparisons for Year x Location (2022)

Term 'YexLo' for pairs of levels of factor 'Year'

Level	Comparison	t	P(perm)	Unique perms	P(MC)
Quarry Treatment	2011, 2022	2.0364	0.3294	3	0.0962
Quarry Treatment	2014, 2022	2.1838	0.3281	3	0.0901
Quarry Treatment	2015, 2022	1.9882	0.3347	3	0.0971
Quarry Treatment	2016, 2022	1.9928	0.322	3	0.1014
Quarry Treatment	2017, 2022	1.6689	0.3321	3	0.1722
Quarry Treatment	2018, 2022	1.4889	0.3335	3	0.2071
Quarry Treatment	2019, 2022	1.8195	0.339	3	0.1441
Quarry Treatment	2020, 2022	1.7566	0.3356	3	0.143
Quarry Treatment	2021, 2022	1.4351	0.3418	3	0.2173
Upstream Control	2011, 2022	1.8857	0.3363	3	0.131
Upstream Control	2014, 2022	3.7641	0.3271	3	0.0238
Upstream Control	2015, 2022	2.0081	0.3316	3	0.1067
Upstream Control	2016, 2022	3.4912	0.3349	3	0.0405
Upstream Control	2017, 2022	2.484	0.3432	3	0.0619
Upstream Control	2018, 2022	2.0205	0.3322	3	0.1092
Upstream Control	2019, 2022	2.1683	0.3387	3	0.0922
Upstream Control	2020, 2022	1.8835	0.3289	3	0.1218
Upstream Control	2021, 2022	1.0104	0.6744	3	0.4321
Quarry Control	2011, 2022	1.5927	0.3345	3	0.1699
Quarry Control	2014, 2022	3.2568	0.3305	3	0.0358
Quarry Control	2015, 2022	2.5445	0.3337	2	0.0606
Quarry Control	2016, 2022	1.8109	0.3292	2	0.1189
Quarry Control	2017, 2022	2.598	0.3354	3	0.0575
Quarry Control	2018, 2022	2.1882	0.3375	3	0.1031
Quarry Control	2019, 2022	1.9756	0.3323	2	0.0984
Quarry Control	2020, 2022	1.8972	0.3375	3	0.1128

Level	Comparison	t	P(perm)	Unique perms	P(MC)
Quarry Control	2021, 2022	2.0084	0.3299	3	0.095
2022	Quarry Treatment, Upstream Control	1.2503	0.3323	3	0.3145
2022	Quarry Treatment, Quarry Control	1.2965	0.333	3	0.2725
2022	Upstream Control, Quarry Control	1.5467	0.3279	3	0.1931

Appendix 3: Statistical analysis - riffle habitat

Statistical Results for 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	9	714.4	7.94E+01	9.641	0.0001	9781
Lo	2	6.46E+01	3.23E+01	3.93E+00	0.0314	9626
YexLo	18	201.7	1.12E+01	1.361	0.2257	9904
Res	30	247	8.23E+00			
Total	59	1227.7				

Pairwise comparisons for Year (2022)

Groups	t	P(perm)	Unique perms	P(MC)
2011, 2022	4.3911	0.0006	1878	0.0049
2014, 2022	6.7494	0.002	4062	0.0003
2015, 2022	6.6454	0.0022	1322	0.0005
2016, 2022	5.8797	0.0017	2093	0.0011
2017, 2022	5.3072	0.0039	2476	0.0022
2018, 2022	11.068	0.0016	1465	0.0001
2019, 2022	17.321	0.0011	1703	0.0001
2020, 2022	6.1734	0.0011	2466	0.0015
2021, 2022	6	0.0002	1349	0.0013

Pairwise comparisons for Location

Groups	t	P(perm)	Unique perms	P(MC)
Quarry Treatment, Upstream Control	2.375	0.0251	6222	0.0283
Quarry Treatment, Quarry Control	0.127	0.9097	5550	0.8993
Upstream Control, Quarry Control	2.203	0.0375	6327	0.0429

Statistical Results for OOSIGNAL

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	9	2.26E+00	2.52E-01	4.9396	0.0009	9953
Lo	2	5.80E-01	2.90E-01	5.6999	0.0094	9935
YexLo	18	2.73E+00	1.52E-01	2.9755	0.0048	9941
Res	30	1.53E+00	5.09E-02			
Total	59	7.10E+00				

Pairwise comparisons for and within Year x Location (2022)

Level	Groups	t	P(perm)	Unique perms	P(MC)
Quarry Treatment	2011, 2022	1.463	0.3347	3	0.2825
Quarry Treatment	2014, 2022	1.738	0.3362	3	0.2253
Quarry Treatment	2015, 2022	1.9206	0.3338	3	0.1924
Quarry Treatment	2016, 2022	0.52031	0.6588	3	0.6601
Quarry Treatment	2017, 2022	1.3507	0.6671	2	0.3094
Quarry Treatment	2018, 2022	0.11588	1	3	0.9214
Quarry Treatment	2019, 2022	2.3297	0.328	3	0.1465
Quarry Treatment	2020, 2022	2.7401	0.3275	3	0.1137
Quarry Treatment	2021, 2022	1.3435	0.6608	3	0.3151
Upstream Control	2011, 2022	3.7928	0.3318	3	0.0642
Upstream Control	2014, 2022	5.3627	0.3342	3	0.034
Upstream Control	2015, 2022	3.3613	0.3362	3	0.0759
Upstream Control	2016, 2022	2.8324	0.3351	3	0.1051
Upstream Control	2017, 2022	1.1706	0.6665	3	0.3579
Upstream Control	2018, 2022	1.4524	0.3379	3	0.2801
Upstream Control	2019, 2022	1.834	0.3266	3	0.2098
Upstream Control	2020, 2022	1.7269	0.3295	3	0.2248
Upstream Control	2021, 2022	2.6374	0.3404	3	0.114
Quarry Control	2011, 2022	0.29402	0.6677	3	0.7943
Quarry Control	2014, 2022	0.82496	0.6676	3	0.4965
Quarry Control	2015, 2022	1.6339	0.3389	3	0.242
Quarry Control	2016, 2022	3.3942	0.3291	3	0.0736
Quarry Control	2017, 2022	0.96886	0.669	3	0.4341
Quarry Control	2018, 2022	0.8	0.6715	3	0.5048
Quarry Control	2019, 2022	2.1344	0.3284	3	0.1709
Quarry Control	2020, 2022	0.052058	1	3	0.9644

Level	Groups	t	P(perm)	Unique perms	P(MC)
Quarry Control	2021, 2022	1.9576	0.3294	3	0.1913
2022	Quarry Treatment, Upstream Control	6.6359	0.3339	3	0.0222
2022	Quarry Treatment, Quarry Control	5.0374	0.3303	3	0.0364
2022	Upstream Control, Quarry Control	0.78446	0.6619	3	0.5212

Statistical Results for 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	9	2.31E-02	2.57E-03	5.9464	0.0002	9361
Lo	2	6.52E-03	3.26E-03	7.556	0.0019	8951
YexLo	18	2.20E-02	1.22E-03	2.837	0.0063	9839
Res	30	1.30E-02	4.32E-04			
Total	59	6.46E-02				

Pairwise comparisons Year x Location (2022)

Level	Groups	t	P(perm)	Unique perms	P(MC)
Quarry Treatment	2011, 2022	2.3534	0.3274	3	0.1427
Quarry Treatment	2014, 2022	2.0925	0.3383	3	0.1682
Quarry Treatment	2015, 2022	1.1767	0.6747	2	0.3624
Quarry Treatment	2016, 2022	2.744	0.3294	3	0.1121
Quarry Treatment	2017, 2022	2.6	0.327	2	0.1271
Quarry Treatment	2018, 2022	2.3534	0.335	3	0.139
Quarry Treatment	2019, 2022	3.43	0.3368	3	0.0727
Quarry Treatment	2020, 2022	2.655	0.3282	3	0.1184
Quarry Treatment	2021, 2022	3.4	0.3382	2	0.0747
Upstream Control	2011, 2022	4.3333	0.3257	2	0.0486
Upstream Control	2014, 2022	Denominator is 0			
Upstream Control	2015, 2022	9	0.3321	2	0.0135
Upstream Control	2016, 2022	11	0.3312	2	0.0072
Upstream Control	2017, 2022	Denominator is 0			
Upstream Control	2018, 2022	17	0.3285	2	0.002
Upstream Control	2019, 2022	Denominator is 0			
Upstream Control	2020, 2022	Denominator is 0			
Upstream Control	2021, 2022	4.3333	0.3416	2	0.0457
Quarry Control	2011, 2022	Denominator is 0			
Quarry Control	2014, 2022	0.2	1	2	0.8637
Quarry Control	2015, 2022	0.33333	1	2	0.771
Quarry Control	2016, 2022	8.232E-09	1	2	1
Quarry Control	2017, 2022	1.8	0.3358	2	0.2132
Quarry Control	2018, 2022	1	1	1	0.4171
Quarry Control	2019, 2022	3.6667	0.3243	2	0.069

Level	Groups	t	P(perm)	Unique perms	P(MC)
Quarry Control	2020, 2022	Denominator is 0			
Quarry Control	2021, 2022	2	0.331	2	0.1815
2022	Quarry Treatment, Upstream Control	1.8974	0.333	3	0.1934
2022	Quarry Treatment, Quarry Control	11	0.3316	2	0.0083
2022	Upstream Control, Quarry Control	1.6667	0.3408	2	0.2374

Statistical Results for 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	9	6.95E-01	7.72E-02	7.4737	0.0001	9930
Lo	2	8.46E-02	4.23E-02	4.0942	0.0255	9951
YexLo	18	6.50E-02	3.61E-03	0.34942	0.9917	9927
Res	30	3.10E-01	1.03E-02			
Total	59	1.15E+00				

Pairwise comparisons for Year (2022)

Groups	t	P(perm)	Unique perms	P(MC)
2011, 2022	5.3414	0.0047	4437	0.002
2014, 2022	4.8706	0.0065	8496	0.0032
2015, 2022	3.6487	0.0132	3101	0.011
2016, 2022	4.5967	0.0058	7391	0.0045
2017, 2022	5.0849	0.0036	4552	0.0025
2018, 2022	5.6013	0.0043	7952	0.0017
2019, 2022	5.0849	0.0046	8044	0.0028
2020, 2022	3.8428	0.0127	6739	0.0075
2021, 2022	4.3229	0.0087	7865	0.0038

Pairwise comparisons for Location

Groups	t	P(perm)	Unique perms	P(MC)
Quarry Treatment, Upstream Control	1.079	0.3001	9539	0.2959
Quarry Treatment, Quarry Control	1.5901	0.1318	9420	0.1279
Upstream Control, Quarry Control	3.1769	0.0048	9553	0.0054

Statistical Results for Multivariate Analysis of the 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	9	19229	2136.6	5.9061	0.0001	9837
Lo	2	1764	882.01	2.4381	0.0012	9911
YexLo	18	8540.6	474.48	1.3116	0.0326	9823
Res	30	10853	361.76			
Total	59	40387				

Pairwise comparisons Year x Location (2022)

Level	Groups	t	P(perm)	Unique perms	P(MC)
Quarry Treatment	2011, 2022	3.1195	0.3349	2	0.0454
Quarry Treatment	2014, 2022	2.8554	0.3419	3	0.0518
Quarry Treatment	2015, 2022	3.4883	0.3339	3	0.0398
Quarry Treatment	2016, 2022	2.513	0.3272	3	0.0633
Quarry Treatment	2017, 2022	3.1515	0.3222	3	0.0549
Quarry Treatment	2018, 2022	2.8622	0.3252	3	0.0478
Quarry Treatment	2019, 2022	2.2967	0.3324	3	0.0924
Quarry Treatment	2020, 2022	1.4245	0.3246	3	0.2316
Quarry Treatment	2021, 2022	1.9824	0.3335	3	0.1167
Upstream Control	2011, 2022	2.1037	0.3431	3	0.09
Upstream Control	2014, 2022	2.7821	0.3341	3	0.0557
Upstream Control	2015, 2022	1.8335	0.3358	3	0.1403
Upstream Control	2016, 2022	2.3754	0.3255	3	0.0724
Upstream Control	2017, 2022	2.9833	0.3315	3	0.0478
Upstream Control	2018, 2022	2.6397	0.3362	3	0.0619
Upstream Control	2019, 2022	1.946	0.3302	3	0.1185
Upstream Control	2020, 2022	2.267	0.3226	3	0.07
Upstream Control	2021, 2022	2.2587	0.3343	3	0.0735
Quarry Control	2011, 2022	0.76119	1	3	0.6366
Quarry Control	2014, 2022	2.2937	0.3354	3	0.0709
Quarry Control	2015, 2022	1.9345	0.3394	3	0.1046
Quarry Control	2016, 2022	2.37E+00	0.3351	3	0.0721
Quarry Control	2017, 2022	1.9699	0.3344	3	0.1034
Quarry Control	2018, 2022	2.1547	0.3297	3	0.0888
Quarry Control	2019, 2022	1.9622	0.3266	3	0.0962
Quarry Control	2020, 2022	1.8925	0.3329	3	0.139
Quarry Control	2021, 2022	1.9236	0.3416	3	0.1286

Level	Groups	t	P(perm)	Unique perms	P(MC)
2022	Quarry Treatment, Upstream Control	1.9621	0.3401	2	0.1082
2022	Quarry Treatment, Quarry Control	1.1972	0.3316	3	0.3371
2022	Upstream Control, Quarry Control	0.89663	0.6704	3	0.5294

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.

Contact Us

Niche Environment and Heritage
02 9630 5658
info@niche-eh.com

NSW Head Office – Sydney
PO Box 2443 North Parramatta
NSW 1750 Australia

QLD Head Office – Brisbane
PO Box 540 Sandgate
QLD 4017 Australia

Sydney
Illawarra
Central Coast
Newcastle
Mudgee
Port Macquarie
Brisbane
Cairns



Our services

Ecology and biodiversity

Terrestrial
Freshwater
Marine and coastal
Research and monitoring
Wildlife Schools and training

Heritage management

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	O2 demand	Turbidity (NTU)	Total Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Oil & Grease (mg/L)	Volume Discharged (kL)
3/07/2022	Dam 1	7.4	113		2600	1353		0	2000
3/07/2022	Dam 2	7.4	124		4900	2678		0	1000
3/07/2022	Downstream AQW3	6.6	103		400	352		0	
3/07/2022	Upstream AQW1	6.8	108		460	309		0	
4/07/2022	Dam 1	7.0	145		800	190		0	2000
4/07/2022	Dam 2	7.0	151		2600	994		0	1000
4/07/2022	Downstream AQW3	7.0	140		90	115		0	
4/07/2022	Upstream AQW1	7.1	140		100	105		0	
5/07/2022	Dam 1	7.0	130		280	143		0	2000
5/07/2022	Dam 2	6.5	137		1200	355		0	2000
5/07/2022	Dam 3	6.8	338		130	78		0	2000
5/07/2022	Dam 5	6.2	67		120	94		0	1000
5/07/2022	Downstream AQW3	6.8	130		110	120		0	
5/07/2022	Upstream AQW1	6.3	132		100	164		0	
6/07/2022	Dam 1	7.2	122		340	241		0	2000
6/07/2022	Dam 2	7.0	194		550	258		0	1000
6/07/2022	Dam 3	5.8	68		70	34		0	1000
6/07/2022	Dam 5	6.1	69		70	32		0	1000
6/07/2022	Downstream AQW3	6.6	1358		55	54		0	
6/07/2022	Upstream AQW1	7.0	140		55	53		0	
7/07/2022	Dam 1	7.4	315		430	303		0	1000
7/07/2022	Dam 2	6.4	254		194	86		0	1000
7/07/2022	Dam 3	6.1	71		56	20		0	1000
7/07/2022	Dam 5	5.8	70		52	11		0	2000
7/07/2022	Downstream AQW3	6.6	144		41	36		0	
7/07/2022	Upstream AQW1	6.7	146		38	40		0	
8/07/2022	Dam 1	8.1	408		78	55		0	2000
8/07/2022	Dam 3	7.3	113		38	10		0	1000
8/07/2022	Dam 5	7.2	94		39	8		0	1000
8/07/2022	Downstream AQW3	7.7	161		31	27		0	
8/07/2022	Upstream AQW1	7.7	165		40	24		0	

Date	Sample ID	pH	Conductivity	O2 demand	Turbidity (NTU)	Total Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Oil & Grease (mg/L)	Volume Discharged (kL)
9/07/2022	Dam 1	7.8	406		137	107		0	2000
9/07/2022	Downstream AQW3	7.9	166		24	18		0	
9/07/2022	Upstream AQW1	7.9	197		29	19		0	
25/07/2022	Downstream AQW3	7.5	175	0	12	7	114	0	
25/07/2022	Upstream AQW1	7.5	174	3	12	6	124	0	
24/08/2022	Downstream AQW3	7.7	162	0	10	5	106	0	
24/08/2022	Upstream AQW1	7.7	242	0	8.2	7	148	0	
21/09/2022	Downstream AQW3	7.7	179	0	5.4	5	109	0	
21/09/2022	Upstream AQW1	8.0	181	0	6.1	7	109	0	
9/10/2022	Dam 1	8.7	210		500	212		0	2000
9/10/2022	Downstream AQW3	7.9	167		65	114		0	
9/10/2022	Upstream AQW1	8.3	169		80	117		0	
10/10/2022	Dam 1	7.6	260		160	106		0	1000
10/10/2022	Downstream AQW3	7.5	172		26	26		0	
10/10/2022	Upstream AQW1	7.7	180		29	24		0	
11/10/2022	Dam 1	7.6	316		230	141		0	1000
11/10/2022	Downstream AQW3	7.5	173		17	17		0	
11/10/2022	Upstream AQW1	7.7	177		21	25		0	
21/10/2022	Downstream AQW3	7.0	172	6	16	16	168	0	
21/10/2022	Upstream AQW1	6.7	175	7	15	25	116	0	
14/11/2022	Dam 1	7.5	208		2800	1218		0	3000
14/11/2022	Dam 2	7.5	189		4900	2056		0	2000
14/11/2022	Dam 4	7.4	527		13	10		0	2000
14/11/2022	Downstream AQW3	7.6	126		280	364		0	
14/11/2022	Upstream AQW1	7.6	130		270	192		0	
15/11/2022	Dam 1	7.9	273		600	333		0	1000
15/11/2022	Dam 2	7.7	241		1300	524		0	1000
15/11/2022	Dam 4	7.8	508		72	57		0	1000
15/11/2022	Downstream AQW3	7.9	192		24	23		0	
15/11/2022	Upstream AQW1	7.9	186		27	26		0	
16/11/2022	Dam 1	7.0	238		247	136		0	1000

Date	Sample ID	pH	Conductivity	O2 demand	Turbidity (NTU)	Total Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Oil & Grease (mg/L)	Volume Discharged (kL)
16/11/2022	Dam 2	7.1	436		600	293		0	1000
16/11/2022	Dam 4	7.5	461		50	37		0	1000
16/11/2022	Downstream AQW3	7.1	176		25	22		0	
16/11/2022	Upstream AQW1	7.1	179		25	24		0	
17/11/2022	Dam 1	6.9	199		484	278		0	1000
17/11/2022	Dam 4	7.7	429		38	30		0	1000
17/11/2022	Downstream AQW3	7.3	167		17	16		0	
17/11/2022	Upstream AQW1	7.3	209		19	16		0	
21/11/2022	Downstream AQW3	7.6	143	0	12	6	112	0	
21/11/2022	Upstream AQW1	8.0	156	0	20	12	144	0	
19/12/2022	Downstream AQW3	8.1	197	0	2.8	0	116	0	
19/12/2022	Upstream AQW1	7.9	372	0	2.6	0	178	0	
18/01/2023	Downstream AQW3	6.4	193	0	3.6	0	131	0	
18/01/2023	Upstream AQW1	6.6	181	0	4	0	130	0	
17/02/2023	Downstream AQW3	7.8	193	0	2.4	0	128	0	
17/02/2023	Upstream AQW1	7.7	189	0	6.1	0	128	0	
20/03/2023	Downstream AQW3	7.6	198	0	2.4	0	162	0	
20/03/2023	Upstream AQW1	7.4	192	0	2.3	0	151	0	
19/04/2023	Downstream AQW3	7.7	199	0	2.4	0	122	0	
19/04/2023	Upstream AQW1	7.2	200	0	4.5	0	135	0	
19/05/2023	Downstream AQW3	7.5	251	2	1.2	0	145	0	
19/05/2023	Upstream AQW1	7.2	258	2	1.2	0	144	0	
16/06/2023	Downstream AQW3	7.6	199	0	2	5	138	0	
16/06/2023	Upstream AQW1	7.2	230	0	3.2	0	135	0	

Appendix K: Groundwater Monitoring Reports



Ground Doctor Pty Ltd

ABN: 32 160 178 656

22 Tamworth Street
PO Box 6278
DUBBO NSW 2830

Ph: 0407 875 302
Fax: (02) 8607 8122
admin@grounddoc.com.au

5 September 2022

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: AUGUST 2022 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 23 August 2022.

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 23 August 2022. 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 the water level loggers were downloaded at the time of gauging on 23 August 2022. 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 23 August 2022. 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 transported to Envirolab (Sydney) by an overnight courier service. The samples were sent on the afternoon of 23 August 2022 and were logged as being received by Envirolab on 24 August 2022.

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 (°C)	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

6 Analytical Results

A summary of analytical data is presented in *Table B1* of *Attachment B*. The summary table presents February 2022 results against preliminary triggers outlined in the Water Management Plan (Groundwork Plus, 2017) and analytical data from previous monitoring rounds spanning January 2018 to August 2022.

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 23 August 2022.

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 August 2022.

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 (February 2022 to August 2022) were as follows.

7.1 MB01S

The water level in MB01S fluctuated several times during the monitoring interval but typically returned to the long term average level between 4m and 4.5m below ground level. Significant water level spikes were apparent in early March 2022 and early July 2022 which corresponded to significant rainfall events.

7.2 MB01D

In the period February 2022 to June 2022 the water level was close to 4.5m most of the time but was observed to spike in early March 2022 at the same time as the water level in MB01S. A second significant groundwater level spike occurred in early July 2022. This was followed by a period of general water level decline to approximately 5.5m below top of casing.

7.3 MB02

The water level within MB02 rose approximately 2.1m over the monitoring interval. The long term trend was a steady increase over the monitoring interval. Several small spikes were observed over the monitoring interval, most likely associated with recharge associated with significant rainfall events.

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 February 2022 to August 2022.

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 6900m².

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 air mass.

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 February 2022 to August 2022.

Table 3: Summary of Pit Inflow Estimates February 2022 to August 2022

Monitoring Event	Change in Water Level	Description of Pit Conditions	Estimate of Groundwater Inflow
15-16 February 2022	No change in water level. 2.5mm Evaporation Loss	Pit floor approximately 6900m ² . Pit floor covered by water.	6.3ML/yr
23-24 May 2022	No change in water level. 0.3mm evaporation loss.	Pit floor approximately 6900m ² . Pit floor covered by water.	0.8ML/yr
Average Inflow Estimate For February 2022 to August 2022			3.5ML/yr

The average estimate of groundwater inflow across the monitoring period was 3.5ML/yr. Hy-tec's licensed groundwater use is 20ML/yr.

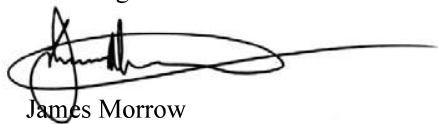
9 Conclusions

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 August 2022 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) (2011) *Australian Drinking Water Guidelines*.

Attachment A

Figure



Figure 1

Groundwater Monitoring Bore Locations

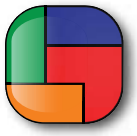
Project Name: August 2022 Groundwater Monitoring Round

Project Number: 2018-GD001

Ground Doctor Pty Ltd

PO Box 6278
22 Tamworth Street
Dubbo NSW 2830

ABN: 32 160 178 656
E: admin@grounddoc.com.au
W: www.grounddoc.com.au



1:9,028
0 100 200m

Attachment B

Analytical Results Summary Table

Table B1
Analytical Data Summary - Pit Water - January 2018 to August 2022

Sampling Date	Sample Location	ANZECC DGV 2018 (Fresh)	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	Units
			2011	2011											
Major Cations (mg/L)	Calcium	-	-	71	49	64	62	92	58	54	54	48	56	mg/L	
	Magnesium	-	-	45	26	44	51	60	43	43	43	35	39	mg/L	
	Sodium	-	-	26	25	20	24	35	28	23	24	19	19	mg/L	
	Potassium	-	-	4	3	4.7	4.6	6.2	4	4	4.5	5	5	mg/L	
	Sulphate	-	-	183	98	220	210	230	170	170	150	160	150	mg/L	
	Chloride	-	-	9	10	13	18	25	9	9	9	8	7	mg/L	
	Hydroxide as CaCO3	-	-	<1	<1	<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	mg/L
	Bicarbonate as CaCO3	-	-	181	201	170	170	300	180	180	190	180	170	180	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	mg/L
Major Anions (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	mg/L	
	Barium	-	2	0.032	0.029	0.071	0.029	0.046	0.039	0.048	0.040	0.047	0.035	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	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	mg/L	
	Cadmium	0.0002	0.002	0.0088	0.0019	0.0001	<0.001	0.0003	0.0001	0.0001	<0.001	<0.001	<0.001	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	mg/L	
	Chromium as CrO3	-	-	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/L	
	Cobalt	-	-	<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	mg/L	
	Iron	-	-	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.100	<0.01	mg/L
Heavy Metals (Dissolved) (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	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	mg/L	
	Mercury	0.6	0.001	<0.001	<0.001	<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	0.005	0.004	0.003	0.003	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	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	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	mg/L	
	Strontium	-	-	0.298	0.231	0.330	0.260	0.440	0.260	0.260	0.230	0.270	0.230	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	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	mg/L
Silicon (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	mg/L	
	Silicon	-	-	15.2	19.4	5.1	3.8	8.6	3.6	3.2	2.7	3.2	3.9	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	mg/L	
	Nitrite	-	-	0.010	<0.01	0.012	<0.005	<0.005	0.008	0.007	0.009	0.016	<0.005	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	mg/L	
	TRH	-	-	<EQL	<EQL	<EQL	<EQL	<EQL	<EQL	<EQL	<EQL	<EQL	<EQL	ug/L	
Hydrocarbons (ug/L)	Benzene	950	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	ug/L	
	Ethylbenzene	-	300	<2	<2	<1	<1	<1	<1	<1	<1	<1	<1	ug/L	
	Xylene	200	600	<2	<2	<3	<3	<3	<3	<3	<3	<3	<3	ug/L	
	Naphthalene	16	-	<5	<5	<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	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-Aug 22
Envirolab Reference	303906
Date Sample Received	24/08/2022
Date Instructions Received	24/08/2022
Date Results Expected to be Reported	31/08/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	6
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: ahie@envirolab.com.au

Jacinta Hurst

Phone: 02 9910 6200
Fax: 02 9910 6201
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.

CERTIFICATE OF ANALYSIS 303906

Client Details

Client	Ground Doctor Pty Ltd
Attention	James Morrow
Address	PO Box 6278, Dubbo, NSW, 2830

Sample Details

Your Reference	<u>Hytec Austen Quarry Groundwater Monitoring-Aug 22</u>
Number of Samples	1 Water
Date samples received	24/08/2022
Date completed instructions received	24/08/2022

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	31/08/2022
Date of Issue	31/08/2022
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
 Kyle Gavrily, Senior Chemist
 Liam Timmins, Organic Instruments Team Leader
 Priya Samarawickrama, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Water		
Our Reference		303906-1
Your Reference	UNITS	Pit
Date Sampled		23/08/2022
Type of sample		Water
Date extracted	-	26/08/2022
Date analysed	-	27/08/2022
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	%	102
Surrogate toluene-d8	%	95
Surrogate 4-BFB	%	98

svTRH (C10-C40) in Water		
Our Reference		303906-1
Your Reference	UNITS	Pit
Date Sampled		23/08/2022
Type of sample		Water
Date extracted	-	30/08/2022
Date analysed	-	31/08/2022
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	%	98

PAHs in Water		
Our Reference		303906-1
Your Reference	UNITS	Pit
Date Sampled		23/08/2022
Type of sample		Water
Date extracted	-	30/08/2022
Date analysed	-	30/08/2022
Naphthalene	µg/L	<1
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 <i>p</i> -Terphenyl-d14	%	98

All metals in water-dissolved		
Our Reference		303906-1
Your Reference	UNITS	Pit
Date Sampled		23/08/2022
Type of sample		Water
Date prepared	-	25/08/2022
Date analysed	-	25/08/2022
Aluminium-Dissolved	µg/L	<10
Arsenic-Dissolved	µg/L	<1
Boron-Dissolved	µg/L	<20
Barium-Dissolved	µg/L	35
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	240
Titanium-Dissolved	µg/L	<1
Vanadium-Dissolved	µg/L	<1
Zinc-Dissolved	µg/L	2

Ion Balance		
Our Reference		303906-1
Your Reference	UNITS	Pit
Date Sampled		23/08/2022
Type of sample		Water
Date prepared	-	25/08/2022
Date analysed	-	25/08/2022
Calcium - Dissolved	mg/L	56
Potassium - Dissolved	mg/L	5.1
Sodium - Dissolved	mg/L	19
Magnesium - Dissolved	mg/L	39
Hardness	mgCaCO ₃ /L	300
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	180
Carbonate Alkalinity as CaCO ₃	mg/L	<5
Total Alkalinity as CaCO ₃	mg/L	180
Sulphate, SO ₄	mg/L	130
Chloride, Cl	mg/L	7
Ionic Balance	%	5.0

Metals in Waters - Dissolved		
Our Reference		303906-1
Your Reference	UNITS	Pit
Date Sampled		23/08/2022
Type of sample		Water
Date digested	-	26/08/2022
Date analysed	-	26/08/2022
Silicon*- Dissolved	mg/L	3.9

Miscellaneous Inorganics		
Our Reference		303906-1
Your Reference	UNITS	Pit
Date Sampled		23/08/2022
Type of sample		Water
Date prepared	-	25/08/2022
Date analysed	-	25/08/2022
Ammonia as N in water	mg/L	0.078
Nitrate as N in water	mg/L	2.6
Nitrite as N in water	mg/L	<0.005
Total Dissolved Solids (grav)	mg/L	350

Client Reference: Hytec Austen Quarry Groundwater Monitoring-Aug 22

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.
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.
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.

Client Reference: Hytec Austen Quarry Groundwater Monitoring-Aug 22

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			26/08/2022	[NT]	[NT]	[NT]	[NT]	26/08/2022	[NT]
Date analysed	-			27/08/2022	[NT]	[NT]	[NT]	[NT]	27/08/2022	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	114	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	114	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	115	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	116	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	104	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate toluene-d8	%		Org-023	95	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-BFB	%		Org-023	97	[NT]	[NT]	[NT]	[NT]	99	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring-Aug 22

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			30/08/2022	[NT]	[NT]	[NT]	[NT]	30/08/2022	[NT]
Date analysed	-			31/08/2022	[NT]	[NT]	[NT]	[NT]	31/08/2022	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	113	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	112	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	129	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	113	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	112	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	129	[NT]
Surrogate o-Terphenyl	%		Org-020	103	[NT]	[NT]	[NT]	[NT]	119	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring-Aug 22

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			30/08/2022	[NT]	[NT]	[NT]	[NT]	30/08/2022	[NT]
Date analysed	-			30/08/2022	[NT]	[NT]	[NT]	[NT]	30/08/2022	[NT]
Naphthalene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	101	[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]	97	[NT]
Fluorene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Phenanthrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	104	[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]	102	[NT]
Pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	111	[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]	93	[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]	82	[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	94	[NT]	[NT]	[NT]	[NT]	99	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring-Aug 22

QUALITY CONTROL: All metals in water-dissolved				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			25/08/2022	1	25/08/2022	25/08/2022		25/08/2022	[NT]
Date analysed	-			25/08/2022	1	25/08/2022	25/08/2022		25/08/2022	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	<10	1	<10	[NT]		104	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		104	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	1	<20	[NT]		110	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	1	35	[NT]		96	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	1	<0.5	[NT]		111	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	[NT]		102	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		99	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		100	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		105	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	1	<10	[NT]		102	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		99	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	1	<5	[NT]		103	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	98	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	1	3	[NT]		101	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		105	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		102	[NT]
Silver-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		97	[NT]
Strontium-Dissolved	µg/L	1	Metals-022	<1	1	240	[NT]		100	[NT]
Titanium-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		102	[NT]
Vanadium-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		102	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	2	[NT]		105	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring-Aug 22

QUALITY CONTROL: Ion Balance				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			25/08/2022	[NT]	[NT]	[NT]	[NT]	25/08/2022	[NT]
Date analysed	-			25/08/2022	[NT]	[NT]	[NT]	[NT]	25/08/2022	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	114	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	107	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	104	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	120	[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]	107	[NT]
Sulphate, SO ₄	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring-Aug 22

QUALITY CONTROL: Metals in Waters - Dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			26/08/2022	[NT]	[NT]	[NT]	[NT]	26/08/2022	[NT]
Date analysed	-			26/08/2022	[NT]	[NT]	[NT]	[NT]	26/08/2022	[NT]
Silicon*- Dissolved	mg/L	0.2	Metals-020	<0.2	[NT]	[NT]	[NT]	[NT]	116	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring-Aug 22

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			25/08/2022	[NT]	[NT]	[NT]	[NT]	25/08/2022	[NT]
Date analysed	-			25/08/2022	[NT]	[NT]	[NT]	[NT]	25/08/2022	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	[NT]	[NT]	105	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	96	[NT]
Nitrite as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	96	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	[NT]	[NT]	[NT]	[NT]	104	[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.

CHAIN OF CUSTODY - Client

Client: Ground Doctor Pty Ltd
Contact person: James Morrow ph: 0407 875 302
Project Mgr: James Morrow
Sampler: James Morrow
Address: Austen Quarry, 391 Jenolan Caves Road, Hartley, NSW
Phone: -- **Mob:** 0407875302
Fax: --
Email: --

Client Project Name / Number / Site etc (ie-report title):
 Hytec Austen Quarry Groundwater Monitoring - Aug 22
PO No.:
Envirolab Quote No.: Standard TAT
Or choose: standard / same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharge applies
Lab comments:

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												
①	Pit	-	23-Aug-22	Water	X	X												Provide as much information about the sample as you can

Relinquished by (company): James Morrow
Print Name: James Morrow
Date & Time: 23/8/22 1200
Signature: JRM

Received by (company): *BAALD*
Print Name: *BAALD*
Date & Time: *24/8/22 1130*
Signature: *[Signature]*

Lab use only:
 Samples Received: Cooler or Ambient: (circle one)
 Temperature Received at: 6 (if applicable)
 Transported by: Hand delivered / courier

White - Lab copy / Blue - Client copy / Pink - Retain in Book Page No: 1 of 1

3029106

2024106

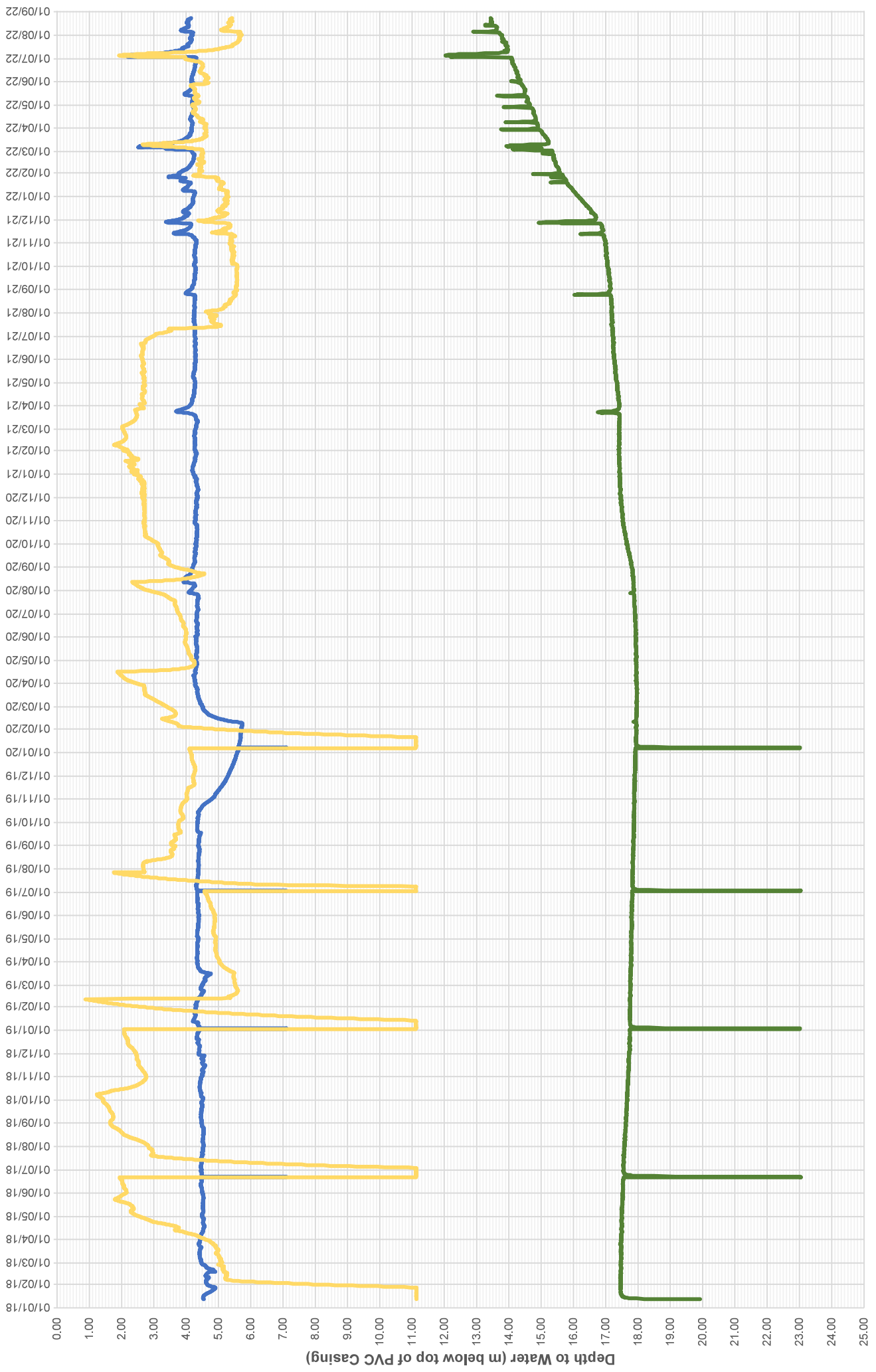
Dissolved Solids	Total Dissolved Solids
Major Cations	Magnesium Calcium Sodium Potassium
Major Anions	Sulphate Chloride Hydroxide as CaCO ₃ Carbonate as CaCO ₃ Bicarbonate as CaCO ₃
Heavy Metals (Dissolved)	Aluminium Arsenic Boron Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Molybdenum Nickel Selenium Silicon Silver Strontium Titanium Vanadium Zinc
Nutrients	Ammonia Nitrate Nitrite

Attachment D

Groundwater Level Chart

Depth to Water vs Time

— MB01S — MB01D — MB02





Ground Doctor Pty Ltd

ABN: 32 160 178 656

22 Tamworth Street
PO Box 6278
DUBBO NSW 2830

Ph: 0407 875 302
Fax: (02) 8607 8122
admin@grounddoc.com.au

17 July 2023

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 2023 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 3 January 2023.

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 3 January 2023. 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 3 January 2023. 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 3 January 2023. 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 transported to Envirolab (Sydney) by an overnight courier service. The samples were sent on the afternoon of 3 January 2023 and were logged as being received by Envirolab on 4 January 2023.

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 (°C)	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

6 Analytical Results

A summary of analytical data is presented in *Table B1* of *Attachment B*. The summary table presents January 2023 results against preliminary triggers outlined in the Water Management Plan (Groundwork Plus, 2017) and analytical data from previous monitoring rounds spanning January 2018 to August 2022.

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 3 January 2023.

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 2023.

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 (August 2022 to January 2023) were as follows.

7.1 MB01S

The water level in MB01S fluctuated several times during the monitoring interval but typically returned to the long term average level between 4.0m and 4.5m below ground level. Significant water level spikes were apparent in early October 2022 and mid-November 2022 which corresponded to significant rainfall events.

7.2 MB01D

In the period August 2022 to January 2023 the water level within MB01D spiked several times, but was between 4.5m and 5.5m below top of casing for most of the monitoring interval, with an upward trend over the interval. Several temporary groundwater elevation spikes were observed within MB01D at times which correlate to similar spikes in the nearby shallow monitoring well (MB01S). The most significant spikes occurred in early October 2022 and mid-November 2022.

7.3 MB02

The water level within MB02 rose approximately 1.0m over the August 2022 to January 2023 monitoring interval. The long term trend was a steady increase over the monitoring interval. Several small spikes were observed over the monitoring interval, most likely caused by recharge associated with significant rainfall events. There was continuation of the increased trend in groundwater elevation which has occurred since November 2021.

8 Estimated Groundwater Inflow to Pit

There was no groundwater inflow monitoring data available at the time of the January 2023 monitoring round. Data collected between May 2022 and January 2022 will be reviewed as part of the July 2023 monitoring report.

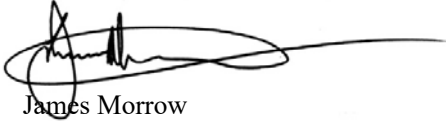
9 Conclusions

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 2023 monitoring round did not exceed any of the relevant triggers outlined in the Water Management Plan (Groundwork Plus, 2017).

Estimated inflow data for the 12 month period to June 2023 will be presented and reviewed as part of the July 2023 report.

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



1:9,028
0 100 200m



Ground Doctor Pty Ltd

ABN: 32 160 178 656
E: admin@grounddoc.com.au
W: www.grounddoc.com.au

PO Box 6278
22 Tamworth Street
Dubbo NSW 2830

Project Name: August 2022 Groundwater Monitoring Round

Project Number: 2018-GD001

Figure 1

Groundwater Monitoring Bore Locations

Attachment **B**

Analytical Results Summary Table

Table B1
Analytical Data Summary - Pit Water - January 2018 to January 2023

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	Units	
Sample Location		DGV 2018 (Fresh)	2011	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	mg/L	
	Magnesium	-	-	45	26	44	51	60	43	43	43	35	39	30	mg/L	
	Sodium	-	-	26	25	20	24	35	28	23	24	19	19	16	mg/L	
	Potassium	-	-	4	3	4.7	4.6	6.2	4	4.5	5	5	5.1	4	mg/L	
Major Anions (mg/L)	Sulphate	-	-	183	98	220	210	230	170	150	160	150	130	130	mg/L	
	Chloride	-	-	9	10	13	18	25	9	9	8	7	7	14	mg/L	
	Hydroxide as CaCO3	-	-	<1	<1	<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	mg/L	
	Bicarbonate as CaCO3	-	-	181	201	170	170	300	180	190	180	170	180	180	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	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	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	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	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	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	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	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	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	mg/L	
	Iron	-	-	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.100	<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	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	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	mg/L	
	Molybdenum	-	0.05	0.004	<0.001	0.011	0.009	0.015	0.005	0.004	0.004	0.004	0.003	0.003	0.003	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	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	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	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	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	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	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	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	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	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	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	mg/L	
Hydrocarbons (ug/L)	TRH	-	-	<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	ug/L	
	Toluene	-	800	<2	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/L	
	Ethylbenzene	-	300	<2	<2	<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	ug/L	
	Naphthalene	16	-	<5	<5	<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	ug/L	

Attachment **C**

Laboratory Certificate of Analysis

SAMPLE RECEIPT ADVICE

Client Details

Client	Ground Doctor Pty Ltd
Attention	James Morrow

Sample Login Details

Your reference	Hytec Austen Quarry Groundwater Monitoring-Jan 23
Envirolab Reference	313976
Date Sample Received	04/01/2023
Date Instructions Received	04/01/2023
Date Results Expected to be Reported	11/01/2023

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	4
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: ahie@envirolab.com.au

Jacinta Hurst

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



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 313976

Client Details

Client	Ground Doctor Pty Ltd
Attention	James Morrow
Address	PO Box 6278, Dubbo, NSW, 2830

Sample Details

Your Reference	<u>Hytec Austen Quarry Groundwater Monitoring-Jan 23</u>
Number of Samples	1 Water
Date samples received	04/01/2023
Date completed instructions received	04/01/2023

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 11/01/2023

Date of Issue 11/01/2023

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

Hannah Nguyen, Metals Supervisor

Kyle Gavrily, Senior Chemist

Liam Timmins, Organic Instruments Team Leader

Loren Bardwell, Development Chemist

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Water		
Our Reference		313976-1
Your Reference	UNITS	Pit
Date Sampled		3/01/2023
Type of sample		Water
Date extracted	-	05/01/2023
Date analysed	-	05/01/2023
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	%	105
Surrogate toluene-d8	%	75
Surrogate 4-BFB	%	96

svTRH (C10-C40) in Water		
Our Reference		313976-1
Your Reference	UNITS	Pit
Date Sampled		3/01/2023
Type of sample		Water
Date extracted	-	09/01/2023
Date analysed	-	09/01/2023
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	%	84

PAHs in Water		
Our Reference		313976-1
Your Reference	UNITS	Pit
Date Sampled		3/01/2023
Type of sample		Water
Date extracted	-	09/01/2023
Date analysed	-	09/01/2023
Naphthalene	µg/L	<1
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 <i>p</i> -Terphenyl-d14	%	72

All metals in water-dissolved		
Our Reference		313976-1
Your Reference	UNITS	Pit
Date Sampled		3/01/2023
Type of sample		Water
Date prepared	-	06/01/2023
Date analysed	-	06/01/2023
Aluminium-Dissolved	µg/L	<10
Arsenic-Dissolved	µg/L	<1
Boron-Dissolved	µg/L	<20
Barium-Dissolved	µg/L	45
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	240
Titanium-Dissolved	µg/L	<1
Vanadium-Dissolved	µg/L	<1
Zinc-Dissolved	µg/L	2

Ion Balance		
Our Reference		313976-1
Your Reference	UNITS	Pit
Date Sampled		3/01/2023
Type of sample		Water
Date prepared	-	05/01/2023
Date analysed	-	05/01/2023
Calcium - Dissolved	mg/L	47
Potassium - Dissolved	mg/L	4
Sodium - Dissolved	mg/L	16
Magnesium - Dissolved	mg/L	30
Hardness	mgCaCO ₃ /L	240
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	180
Carbonate Alkalinity as CaCO ₃	mg/L	<5
Total Alkalinity as CaCO ₃	mg/L	180
Sulphate, SO ₄	mg/L	130
Chloride, Cl	mg/L	14
Ionic Balance	%	-11

Metals in Waters - Dissolved		
Our Reference		313976-1
Your Reference	UNITS	Pit
Date Sampled		3/01/2023
Type of sample		Water
Date digested	-	05/01/2023
Date analysed	-	06/01/2023
Silicon*- Dissolved	mg/L	4.2

Miscellaneous Inorganics		
Our Reference		313976-1
Your Reference	UNITS	Pit
Date Sampled		3/01/2023
Type of sample		Water
Date prepared	-	04/01/2023
Date analysed	-	04/01/2023
Ammonia as N in water	mg/L	0.087
Nitrate as N in water	mg/L	1.9
Nitrite as N in water	mg/L	0.006
Total Dissolved Solids (grav)	mg/L	370

Client Reference: Hytec Austen Quarry Groundwater Monitoring-Jan 23

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.
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.
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.

Client Reference: Hytec Austen Quarry Groundwater Monitoring-Jan 23

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			05/01/2023	1	05/01/2023	06/01/2023		05/01/2023	[NT]
Date analysed	-			05/01/2023	1	05/01/2023	06/01/2023		05/01/2023	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	1	<10	<10	0	87	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	1	<10	<10	0	87	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	80	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	83	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	88	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	91	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	88	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	112	1	105	103	2	104	[NT]
Surrogate toluene-d8	%		Org-023	104	1	75	104	32	101	[NT]
Surrogate 4-BFB	%		Org-023	100	1	96	106	10	101	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring-Jan 23

QUALITY CONTROL: svTRH (C10-C40) in Water				Duplicate			Spike Recovery %			
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			09/01/2023	1	09/01/2023	09/01/2023		09/01/2023	[NT]
Date analysed	-			09/01/2023	1	09/01/2023	09/01/2023		09/01/2023	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	1	<50	<50	0	93	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	1	<100	<100	0	111	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	1	<100	<100	0	100	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	1	<50	<50	0	93	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	1	<100	<100	0	111	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	1	<100	<100	0	100	[NT]
Surrogate o-Terphenyl	%		Org-020	87	1	84	79	6	83	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring-Jan 23

QUALITY CONTROL: PAHs in Water				Duplicate			Spike Recovery %			
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			09/01/2023	1	09/01/2023	09/01/2023		09/01/2023	[NT]
Date analysed	-			09/01/2023	1	09/01/2023	09/01/2023		09/01/2023	[NT]
Naphthalene	µg/L	1	Org-022/025	<1	1	<1	<1	0	67	[NT]
Acenaphthylene	µg/L	1	Org-022/025	<1	1	<1	<1	0	[NT]	[NT]
Acenaphthene	µg/L	1	Org-022/025	<1	1	<1	<1	0	69	[NT]
Fluorene	µg/L	1	Org-022/025	<1	1	<1	<1	0	72	[NT]
Phenanthrene	µg/L	1	Org-022/025	<1	1	<1	<1	0	73	[NT]
Anthracene	µg/L	1	Org-022/025	<1	1	<1	<1	0	[NT]	[NT]
Fluoranthene	µg/L	1	Org-022/025	<1	1	<1	<1	0	69	[NT]
Pyrene	µg/L	1	Org-022/025	<1	1	<1	<1	0	69	[NT]
Benzo(a)anthracene	µg/L	1	Org-022/025	<1	1	<1	<1	0	[NT]	[NT]
Chrysene	µg/L	1	Org-022/025	<1	1	<1	<1	0	101	[NT]
Benzo(b,j+k)fluoranthene	µg/L	2	Org-022/025	<2	1	<2	<2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-022/025	<1	1	<1	<1	0	78	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-022/025	<1	1	<1	<1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-022/025	<1	1	<1	<1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-022/025	<1	1	<1	<1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	72	1	72	67	7	76	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring-Jan 23

QUALITY CONTROL: All metals in water-dissolved				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			06/01/2023	[NT]	[NT]	[NT]	[NT]	06/01/2023	[NT]
Date analysed	-			06/01/2023	[NT]	[NT]	[NT]	[NT]	06/01/2023	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	94	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	[NT]	[NT]	[NT]	[NT]	88	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	97	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	92	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	[NT]	[NT]	[NT]	[NT]	95	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	90	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Silver-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Strontium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Titanium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Vanadium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring-Jan 23

QUALITY CONTROL: Ion Balance				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			05/01/2023	[NT]	[NT]	[NT]	[NT]	05/01/2023	[NT]
Date analysed	-			05/01/2023	[NT]	[NT]	[NT]	[NT]	05/01/2023	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	92	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	87	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	83	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	91	[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]	101	[NT]
Sulphate, SO ₄	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring-Jan 23

QUALITY CONTROL: Metals in Waters - Dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			05/01/2023	[NT]	[NT]	[NT]	[NT]	05/01/2023	[NT]
Date analysed	-			06/01/2023	[NT]	[NT]	[NT]	[NT]	06/01/2023	[NT]
Silicon*- Dissolved	mg/L	0.2	Metals-020	<0.2	[NT]	[NT]	[NT]	[NT]	105	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring-Jan 23

QUALITY CONTROL: Miscellaneous Inorganics				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			04/01/2023	[NT]	[NT]	[NT]	[NT]	04/01/2023	[NT]
Date analysed	-			04/01/2023	[NT]	[NT]	[NT]	[NT]	04/01/2023	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	[NT]	[NT]	108	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	104	[NT]
Nitrite as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	94	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	[NT]	[NT]	[NT]	[NT]	97	[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.

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 ✓

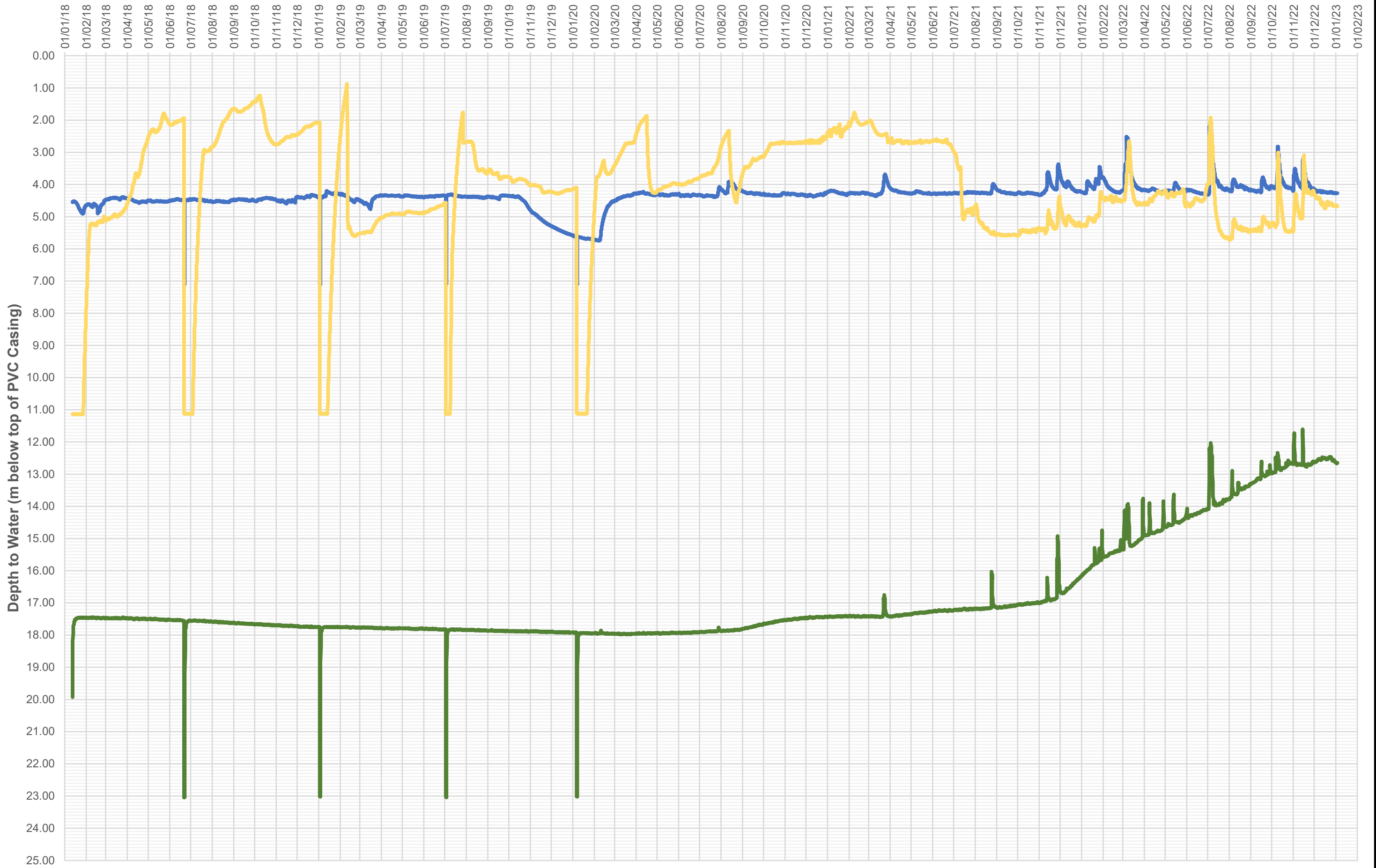
* 313 9760 ✓
4/1/23

Attachment D

Groundwater Level Chart

Depth to Water vs Time

— MB01S — MB01D — MB02



Appendix L: Correspondence Regarding Non- Compliances

Mr Daryl Thiedeke
National Planning and Development Manager
AUS - 10 Rhyolite Pty Limited
Unit 4, 63-79 Parramatta Road
LIDCOMBE, NSW, 2141

20/01/2023

Dear Mr Thiedeke

**Austen Quarry Extension (SSD 6084)
Non-Compliance Notification Blasting Outside the Approved Hours of Operation**

I refer to the non-compliance notification for Austen Quarry Extension (the development), submitted for the Secretary's consideration, as required under Schedule 5, Condition 6 of SSD 6084, as modified (the consent), in relation to firing a blast on 18 January 2023, outside of the approved hours of operation.

I also refer to a telephone conversation with the department's compliance officer on 20 January 2023.

I note that:

- the blast was fired on 18 January 2023 at 16:25pm, outside of the approved hours of operation, stipulated in Schedule 3, Condition 1, due to a delay associated with the explosive truck breakdown whilst loading the blast;
- blast was fired on the day instead of delaying the next day due to safety concerns associated with the thunderstorms forecasted for the afternoon;
- blast monitoring results complied with blasting impact assessment criteria stipulated in Schedule 3, Condition 6; and
- no known community complaints were received in relation to the incident.

The department has assessed non-compliance with Schedule 3, Condition 1 in accordance with the department's Compliance Policy and in this instance has determined to record the breach in our system. At this stage, no further enforcement actions are proposed. Please be aware that recording of this breach does not preclude the department from taking alternative enforcement actions, if it becomes apparent that an alternative response is more appropriate.

Please also note that this non-compliance will be taken into consideration in the assessment of any future breaches of the approval, in accordance with the department's Compliance Policy. A copy of the Compliance Policy is available at <https://www.planning.nsw.gov.au/-/media/Files/DPE/Plans-and-policies/compliance-and-enforcement-compliance-policy-2018-04.pdf>.

Lastly, please ensure you record the non-compliance, including a status on any actions taken to prevent from future occurrences, in the next Annual Review, in accordance with Schedule 5, Condition 4 of the consent.

Department of Planning and Environment



Should you need to discuss the above, please contact Georgia Dragicevic, Senior Compliance Officer, on (02) 4247 1852 or by email to Georgia.Dragicevic@planning.nsw.gov.au.

Yours sincerely

A handwritten signature in black ink, appearing to read "K. O'Reilly".

Katrina O'Reilly
Team Leader - Compliance
Compliance

As nominee of the Planning Secretary

Appendix M: Correspondence Regarding Request for Increase in Vehicle Movements



Department of Planning and Environment

Mr Darryl Thiedeke
National Planning and Development Manager
Aus - 10 Rhyolite Pty Limited
3-79 Parramatta Road
SILVERWATER, NSW, 2128

Contact: Georgia Dragicevic
Phone: 4247 1852
Fax: 4224 9470
Email: Georgia.Dragicevic@planning.nsw.gov.au

Dear Mr Thiedeke,

Austen Quarry (SSD 6084) Request for increase in vehicle movements

I refer to your letter dated 21 July 2022, seeking an increase in laden vehicle movements, specified in Schedule 2, Condition 8 of the development consent SSD 6084, as modified (the consent), for the Austen Quarry (the development).

The department acknowledges that Blue Mountains and Lithgow regions and its residents have been significantly impacted by the recent flooding and associated impacts to infrastructure and that there is a shortage and an increased demand on materials for the current disaster recovery works.

The department notes Austen Quarry is seeking an increase in the laden trucks dispatched from the site per weekday, averaged over the total number of dispatch weekdays in any calendar month, from 200 laden trucks up to 250 laden trucks for a period up to 31 December 2022.

Further, the department notes that any trucks used in excess of the 200 laden truck consent limit would be smaller, 12 to 15 tonne trucks (as opposed to the 30 to 35 tonne trucks). The department understands that the increase is sought to aid in disaster recovery works in Blue Mountains and Lithgow regions.

The department has considered your request and provides assurance that it will not take enforcement action for the exceedance in laden trucks dispatched from the site per weekday, averaged over the total number of dispatch weekdays in any calendar month for a period until 31 December 2022.

However, the department requests that Austen Quarry:

- complies with the yearly transportation limit of 1.6 million tonnes of quarry products, specified in Schedule 2, Condition 8;
- complies with the hours of operation, specified in Schedule 3, Condition 1;
- complies with the relevant impact assessment criteria for the development;
- complies with the relevant Management Plans, required under the consent;
- records the total number of laden trucks dispatched from the site;
- notifies the local residents, likely to be impacted by the increased number of laden trucks dispatched from the site;
- records any complaints, and actions taken to resolve the complaints, in accordance with the

- complaint's register and procedure; and
- submits a monthly report to the department advising of a total number of:
 - laden trucks dispatched from the site per weekday, averaged over the total number of dispatch weekdays in any calendar month; and
 - complaints received, actions taken to resolve those complaints and response provided to complainants.

Notwithstanding, the department reserves the right to review the situation and withdraw its assurance that it will not take enforcement action, should complaints be received or for other reasons.

Should you have any enquiries in relation to this matter, please contact Georgia Dragicevic, A/Team Leader Compliance, on 4247 1852 or by email to Georgia.Dragicevic@planning.nsw.gov.au

Yours sincerely



27.7.2022

Ben Harrison
Director Compliance
as nominee of the Planning Secretary

Appendix N: Extractive Minerals Return

Extractive Materials Return

2022-2023



Regional
NSW

Form S1 – Period Ending 30 June 2023

Quote RIMS ID in all correspondence

Quarry Id: Rims ID: 400891	Inquiries please telephone: (02) 4063 6713 Completed or Nil Returns Email – mineral.royalty@planning.nsw.gov.au Postal Address (see below)
Operators Name: AUS-10 RHYOLITE PTY LTD Address: PO BOX 6770 SILVERWATER NSW 1811	Please amend name, postal address and location of mine or quarry if incorrect or incomplete.
Email: darryl.thiedeke@hy-tec.com.au Quarry Name: AUSTEN QUARRY, LIDDLETON Quarry Address: 391 JENOLAN CAVES RD, HARTLEY NSW 2790	

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 2022**. 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 27.09.2023

- CONTACT PERSON for this return Darryl Thiedeke
- NAME (Block letters) DARRYL THIEDEKE Telephone 02 97517130

Extractive Materials Return

2022-2023



Regional
NSW

Form S1 – Period Ending 30 June 2023

Sales During 2021-2022

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		19,876
Over 30mm to 75mm		12,879
5mm to 30mm		741,764
Under 5mm		0
Natural Sand		0
Manufactured Sand		221,772
Prepared Road Base & Sub Base		432,502
Other Unprocessed Materials		
Recycled Materials		
Crushed Coarse Aggregates		
Over 75mm		
Over 30mm to 75mm		
5mm to 30mm	Recycled roadbase	3,030
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		1,431,823
Gross Value (\$) of all Sales		\$33.994M
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.

Appendix O: Truck Movement Data

Austen Quarry 2022 / 2023

Jul-22 Daily Average Truck Movements		Aug-22 Daily Average Truck Movements		Sep-22 Daily Average Truck Movements		Oct-22 Daily Average Truck Movements		Nov-22 Daily Average Truck Movements		Dec-22 Daily Average Truck Movements	
1	126	1	130	1	166	Sat 1	25	1	169	1	160
Sat 2	22	2	177	2	159	2	0	2	199	2	170
3	0	3	160	Sat 3	54	3	0	3	167	Sat 3	97
4	89	4	124	4	0	4	197	4	142	4	0
5	78	5	89	5	159	5	163	Sat 5	106	5	168
6	69	Sat 6	52	6	185	6	79	6	0	6	185
7	107	7	0	7	149	7	62	7	181	7	154
8	153	8	172	8	156	Sat 8	10	8	198	8	145
Sat 9	61	9	153	9	134	9	0	9	185	9	181
10	0	10	158	Sat 10	41	10	129	10	198	Sat 10	101
11	165	11	151	11	0	11	177	11	188	11	0
12	182	12	104	12	156	12	181	Sat12	81	12	140
13	149	Sat 13	30	13	187	13	214	13	0	13	145
14	165	14	0	14	162	14	177	14	174	14	148
15	142	15	133	15	166	Sat 15	62	15	158	15	166
Sat 16	58	16	141	16	130	16	0	16	158	16	158
17	0	17	163	Sat 17	62	17	184	17	141	Sat 17	79
18	194	18	143	18	0	18	196	18	122	18	0
19	181	19	129	19	184	19	196	Sat 19	91	19	158
20	170	Sat 20	52	20	173	20	163	20	0	20	135
21	128	21	0	21	181	21	173	21	153	21	137
22	90	22	157	22	0	Sat 22	34	22	183	22	145
Sat 23	48	23	157	23	123	23	0	23	176	23	31
24	0	24	96	Sat 24	46	24	147	24	154	Sat 24	0
25	138	25	248	25	0	25	145	25	165	25	0
26	144	26	187	26	176	26	203	Sat 26	88	26	0
27	158	Sat 27	51	27	177	27	192	27	0	27	0
28	145	28	0	28	164	28	215	28	125	28	0
29	134	29	186	29	197	Sat 29	61	29	128	29	0
Sat 30	45	30	192	30	142	30	0	30	141	30	0
31	0	31	190	Sat 31	0	31	173	TOTAL	3971	Sat 31	0
TOTAL	3141	TOTAL	3725	TOTAL	3629	TOTAL	3558	Number of Despatch Days	26	TOTAL	2803
Number of Despatch Days	26	Number of Despatch Days	27	Number of Despatch Days	25	Number of Despatch Days	25	Daily Movements averaged over Monday to Friday per month - Max 200 - Despatched days	138	Number of Despatch Days	20
Daily Movements averaged over Monday to Friday per month - Max 200 - Despatched days	138	Daily Movements averaged over Monday to Friday per month - Max 200 - Despatched days	154	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	160	Daily Movements averaged over Monday to Friday per month - Max 200 - Despatched days	164	Daily Movements averaged over Monday to Friday per month - Max 200 - Despatched days	115
Daily Movements averaged over total despatch days per month	121	Daily Movements averaged over total despatch days per month	138	Daily Movements averaged over total despatch days per month	145	Daily Movements averaged over total despatch days per month	142	Daily Movements averaged over total despatch days per month	153	Daily Movements averaged over total despatch days per month	140
Maximum number of dispatched laden trucks - Max 300	194	Maximum number of dispatched laden trucks - Max 300	248	Maximum number of dispatched laden trucks - Max 300	197	Maximum number of dispatched laden trucks - Max 300	215	Maximum number of dispatched laden trucks - Max 300	199	Maximum number of dispatched laden trucks - Max 300	185
Maximum number of laden truck movements on a Saturday - Max 167	61	Maximum number of laden truck movements on a Saturday - Max 167	52	Maximum number of laden truck movements on a Saturday - Max 167	62	Maximum number of laden truck movements on a Saturday - Max 167	62	Maximum number of laden truck movements on a Saturday - Max 167	106	Maximum number of laden truck movements on a Saturday - Max 167	101
Total Monthly Movements	3141	Total Monthly Movements	3725	Total Monthly Movements	3629	Total Monthly Movements	3558	Total Monthly Movements	3971	Total Monthly Movements	2803

Jul - Dec 2022 - Maximums	164
	153
	248
	106

Austen Quarry 2022 / 2023

Jan-23 Daily Average Truck Movements		Feb-23 Daily Average Truck Movements		Mar-23 Daily Average Truck Movements		Apr-23 Daily Average Truck Movements		May-23 Daily Average Truck Movements		Jun-23 Daily Average Truck Movements	
1	0	1	180	1	205	Sat 1	66	1	153	1	182
2	0	2	153	2	201	2	0	2	164	2	162
3	70	3	159	3	181	3	161	3	185	Sat 3	72
4	64	Sat 4	97	Sat 4	67	4	179	4	204	4	0
5	62	5	0	5	0	5	208	5	225	5	164
6	52	6	180	6	185	6	160	Sat 6	80	6	168
Sat 7	25	7	176	7	178	7	0	7	0	7	158
8	0	8	184	8	172	Sat 8	0	8	195	8	183
9	104	9	165	9	160	9	0	9	250	9	161
10	109	10	201	10	166	10	0	10	190	Sat 10	27
11	94	Sat 11	111	Sat 11	87	11	201	11	198	11	0
12	62	12	0	12	0	12	156	12	215	12	0
13	75	13	183	13	163	13	187	Sat 13	63	13	149
Sat 14	56	14	175	14	159	14	219	14	0	14	161
15	0	15	163	15	164	Sat 15	67	15	171	15	153
16	152	16	193	16	195	16	0	16	234	16	127
17	177	17	191	17	134	17	139	17	166	Sat 17	33
18	170	Sat 18	69	Sat 18	65	18	180	18	153	18	0
19	163	19	0	19	0	19	196	19	166	19	119
20	140	20	177	20	168	20	202	Sat 20	55	20	148
Sat 21	69	21	202	21	195	21	204	21	0	21	141
22	0	22	187	22	234	Sat 22	54	22	140	22	151
23	166	23	190	23	226	23	0	23	193	23	103
24	168	24	208	24	200	24	132	24	172	Sat 24	23
25	146	Sat 25	80	Sat 25	62	25	0	25	165	25	0
26	0	26	0	26	0	26	179	26	152	26	130
27	120	27	216	27	194	27	201	Sat 27	59	27	143
Sat 28	35	28	182	28	212	28	183	28	0	28	126
29	0			29	223	Sat 29	26	29	180	29	85
30	167			30	234	30	0	30	171	30	112
31	194			31	166	TOTAL	3300	31	188	TOTAL	3181
TOTAL	2640	TOTAL	4022	TOTAL	4596	Number of Despatch Days	21	TOTAL	4487	TOTAL	3181
Number of Despatch Days	24	Number of Despatch Days	24	Number of Despatch Days	27	Number of Despatch Days	21	Number of Despatch Days	27	Number of Despatch Days	25
Daily Movements averaged over Monday to Friday per month - Max 200 - Despatched days	112	Daily Movements averaged over Monday to Friday per month - Max 200 - Despatched days	183	Daily Movements averaged over Monday to Friday per month - Max 200 - Despatched days	188	Daily Movements averaged over Monday to Friday per month - Max 200 - Despatched days	154	Daily Movements averaged over Monday to Friday per month - Max 200 - Despatched days	184	Daily Movements averaged over Monday to Friday per month - Max 200 - Despatched days	138
Daily Movements averaged over total despatch days per month	110	Daily Movements averaged over total despatch days per month	168	Daily Movements averaged over total despatch days per month	170	Daily Movements averaged over total despatch days per month	157	Daily Movements averaged over total despatch days per month	166	Daily Movements averaged over total despatch days per month	127
Maximum number of dispatched laden trucks - Max 300	194	Maximum number of dispatched laden trucks - Max 300	216	Maximum number of dispatched laden trucks - Max 300	234	Maximum number of dispatched laden trucks - Max 300	219	Maximum number of dispatched laden trucks - Max 300	250	Maximum number of dispatched laden trucks - Max 300	183
Maximum number of laden truck movements on a Saturday - Max 167	69	Maximum number of laden truck movements on a Saturday - Max 167	111	Maximum number of laden truck movements on a Saturday - Max 167	87	Maximum number of laden truck movements on a Saturday - Max 167	67	Maximum number of laden truck movements on a Saturday - Max 167	80	Maximum number of laden truck movements on a Saturday - Max 167	72
Total Monthly Movements	2640	Total Monthly Movements	4022	Total Monthly Movements	4596	Total Monthly Movements	3300	Total Monthly Movements	4487	Total Monthly Movements	3181

Jan - Jun 2023 - Maximums	2022 - 2023 Yearly maximums
	188
	170
	250
	111



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