



Year Ending
30th June 2022

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



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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 2021
AR Completion Date	30 th June 2022
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
D0	15/9/22	LT	TO/DT/OW/NW	LT
F0	26/09/22	LT	DT	TO
F1	29/09/2022	LT	DT	TO

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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 2021 to 30th June 2022.

During the report period 1,024,000 tonnes of product was transported off the site. The quarry remains above the depth limit of 685 m AHD, and no further land was cleared during the report period.

140 Eucalypts were planted in August 2021, in the lower overburden dump area, on the toe of the new dam wall.

There are 4 non-compliances reported against the SSD6084 consent conditions:

- Schedule 2, Condition 2A: not all conditions of consent are compliant;
- Schedule 3 Condition 1: Loading hours exceeded once;
- Schedule 3 Condition 16: pH exceeded twice.

2 Statement of Compliance

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

Table 1. Statement of Compliance at 30/06/2022

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: Loading hours exceeded (no material harm) Schedule 3 Condition 16: pH exceeded (no material harm)
EPL 12323	No – Condition 2.4: pH exceeded (no material harm) Condition 6.2: Loading 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 2022

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.			10
Schedule 3, 1 EPL12323 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.		Load ticketed at 22:06 15/10/2021. Hours of transport operations 04:00 to 22:00 Action: Changes to software of weighbridge	5.4
Schedule 3, 16 EPL12323 L2.4	The Applicant must comply with the discharge limits in any EPL, or Section 120 of the POEO Act. pH 6.5 – 8.5		Monitoring results for surface water discharges on 8/12/21 and 16/12/21 reported a pH reading of 8.6, which was outside of the range specified in the environmental protection licence (6.5 to 8.5). Action: Training in calibration of pH meter required	7.2

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

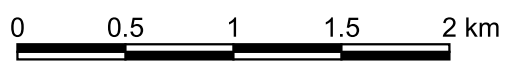
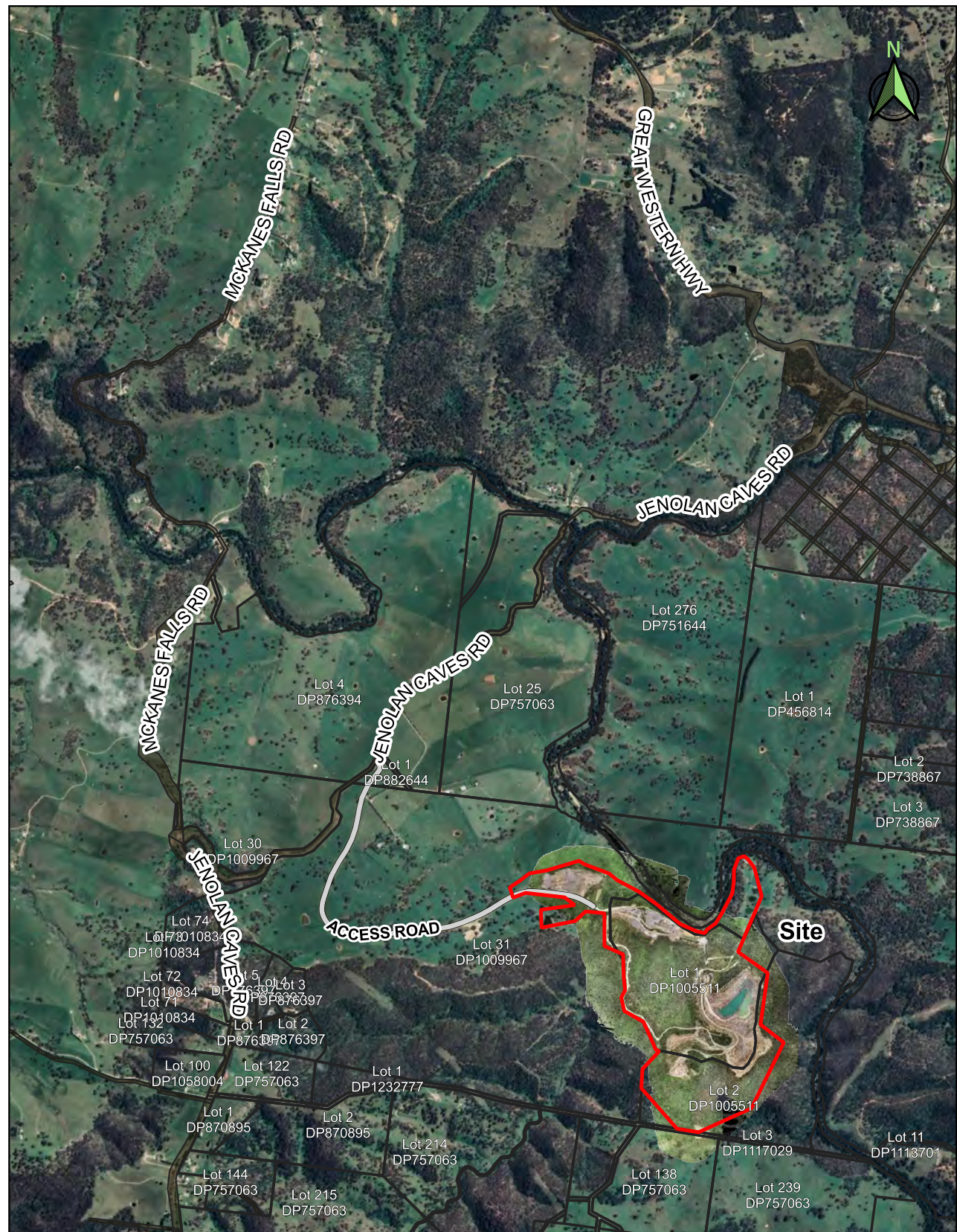
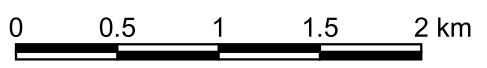
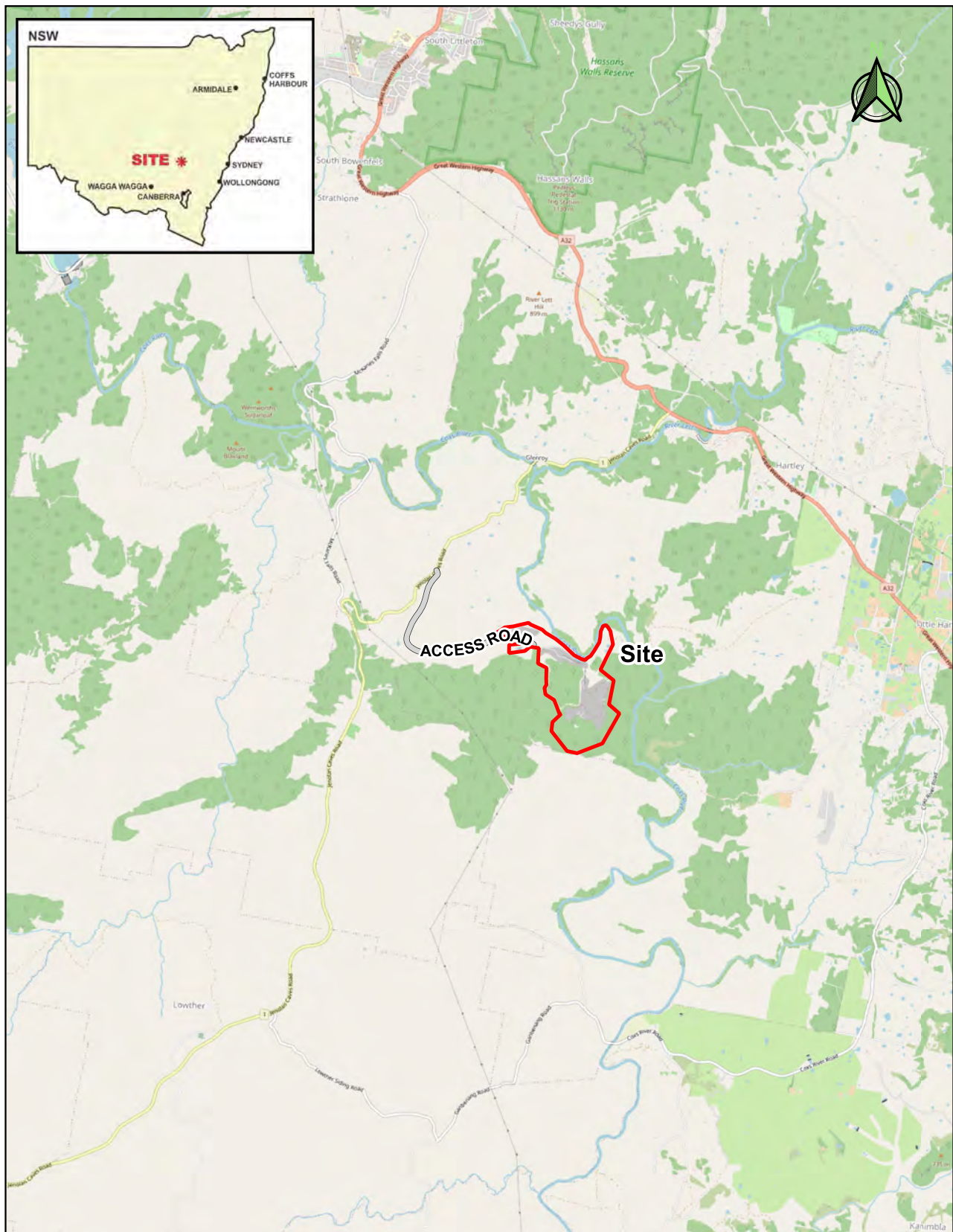
(f) describe what measures will be implemented over the current financial year to improve the environmental performance of the development.

This Annual Review summarises all site activities, condition compliance, environmental performance and rehabilitation progression during the reporting period 1st July 2021 to 30th June 2022.

Plan of:	Annual Review for the Austen Quarry Extension July 2021 to June 2022 - 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:	SK
Version/Date:	V0 23/08/2022	Tenure:	N/A	Projection:	GDA2020/MGA Zone 56 EPSG:7856	Office:	Thornton
Our Ref:	12423_HY_H_AR2021-22_Q001_V0_F1	Client:	Hy-Tec Industries Pty Ltd - Adelaide Brighton Limited	Contour Interval:	Not Applicable		



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Legend

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

[^] = Provided by Client Dated July 2019

3.4 SITE CONTACTS

Table 3. Site Contacts

Contact	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.

Note. the DPE requested a response to submissions by February 2022. After further consultation, the department was verbally advised that Hy-Tec were seeking additional legal advice and this would be submitted in due course.

4.1.2 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.

4.2 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

4.3 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. There is one non-compliance with condition 5 (which has been previously advised):

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.

Hy-Tec believes that the department was advised of the commencement however the correspondence cannot be found and the staff member involved has since left the company. The department is now notified of the commencement and no action is required. All other conditions are either compliant or not triggered.

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		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

The Extractive Minerals Return for the financial year ending 30th June 2021 and 30th June 2022 is included in [Appendix M](#).

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 706m AHD as surveyed on 11/08/2022, as shown on [Figure Three](#). This is 21 metres above the limit of 685 m AHD.

Plan of: Annual Review for the Austen Quarry Extension July 2021 to June 2022 - Activities During Reporting Period (with Aerial)

Figure: TWO

Version/Date: V0 23/08/2022

Our Ref: 12423_HY_H_AR2021-22_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 GIS & 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 EPSG:7856

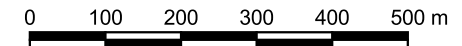
Contour Interval: Not Applicable

Plan By: SK/JD

Project Manager: SK



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Legend


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

[^] = Provided by Client Dated July 2019

Plan of:	Annual Review for the Austen Quarry Extension July 2021 to June 2022 - Spot Survey 3 May 2021	Location:	Off Jenolan Caves Road, Hartley, NSW	Source:	Client - SMARTCONSTRUCTION Integrated Support & Solutions - Pit Limits & Spot Heights Report Date 11/08/2022 & Survey Date 09/08/2022	Plan By:	JD
Figure:	THREE	Council:	Lithgow City Council	Survey:	Client - SMARTCONSTRUCTION Integrated Support & Solutions	Project Manager:	SK
Version/Date:	V0 23/08/2022	Tenure:	N/A	Projection:	MGA 94 ZONE 56	Office:	Thornton
Our Ref:	12423_HY_H_AR2021-2-_C001_V0_F4	Client:	Hy-Tec Industries Pty Ltd - Adelaide Brighton Limited	Contour Interval:	Not Applicable		

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		NOTE : Pit limits supplied by Hytec Quarry Supervisor in MGA94. Australian Government Geodetic Calculator used to convert to MG A2020 *Denote. Level at bottom of pit under water & unchanged from previous measurement	PROJECT: HYTEC AUSTEN LITTLE HARLEY
TITLE : Pit Limits and Spot Heights SURVEY DATE : 09/08/2022 Report Date: 11/08/2022 DRAWN BY : J. Mackenzie SCALE : 1:1000 DRAWING #			SMART CONSTRUCTION
DATUM : AHD71			
PROJECTION : MGA2020 Zone56			

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 transport / operating hours related non-compliance this report period, as detailed in section 5.4. There have been no transport related complaints this report period.

5.2.2 Monitoring Data

5.2.2.1 Truck Movements

Truck movements are monitored hourly, daily, weekly, monthly and annually, and reported on the website: <https://www.hy-tec.com.au/quarry-documentation> and summarised below.

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	Approved limit	Compliant?
Total movements during report period	24,498	26,078	27,805	32,256	-	Yes
Maximum laden trucks per weekday	*158	185	167	251	300	Yes
Maximum laden trucks per Saturday	*71	90	70	81	167	Yes
Maximum average laden trucks per weekday averaged over the total number of dispatch weekdays in any calendar month	*119	119	117	193	200	Yes

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

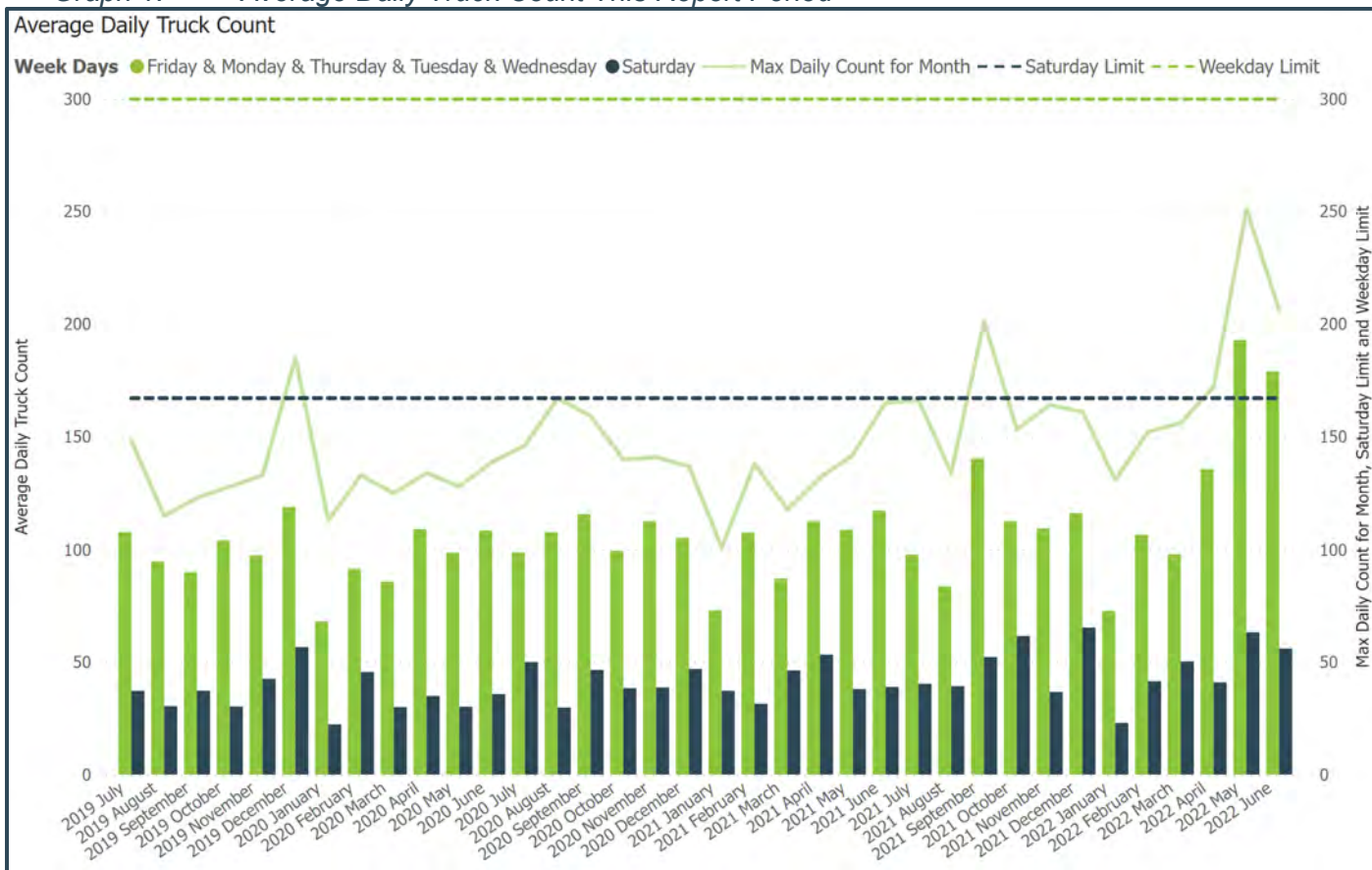
Table 9. Laden Trucks Per Day of Week

Day	Max Laden Trucks per Day of Week
Tuesday	251
Monday	246
Thursday	239
Wednesday	234
Friday	212
Saturday	81

Table 10. Average Laden Truck Movements on Weekdays Per Calendar Month

Year	Month	Average Week-Daily Truck Count
2022	May	193
2022	June	179
2021	September	141
2022	April	136
2021	December	116
2021	October	113
2021	November	109
2022	February	107
2022	March	98
2021	July	98
2021	August	84
2022	January	73

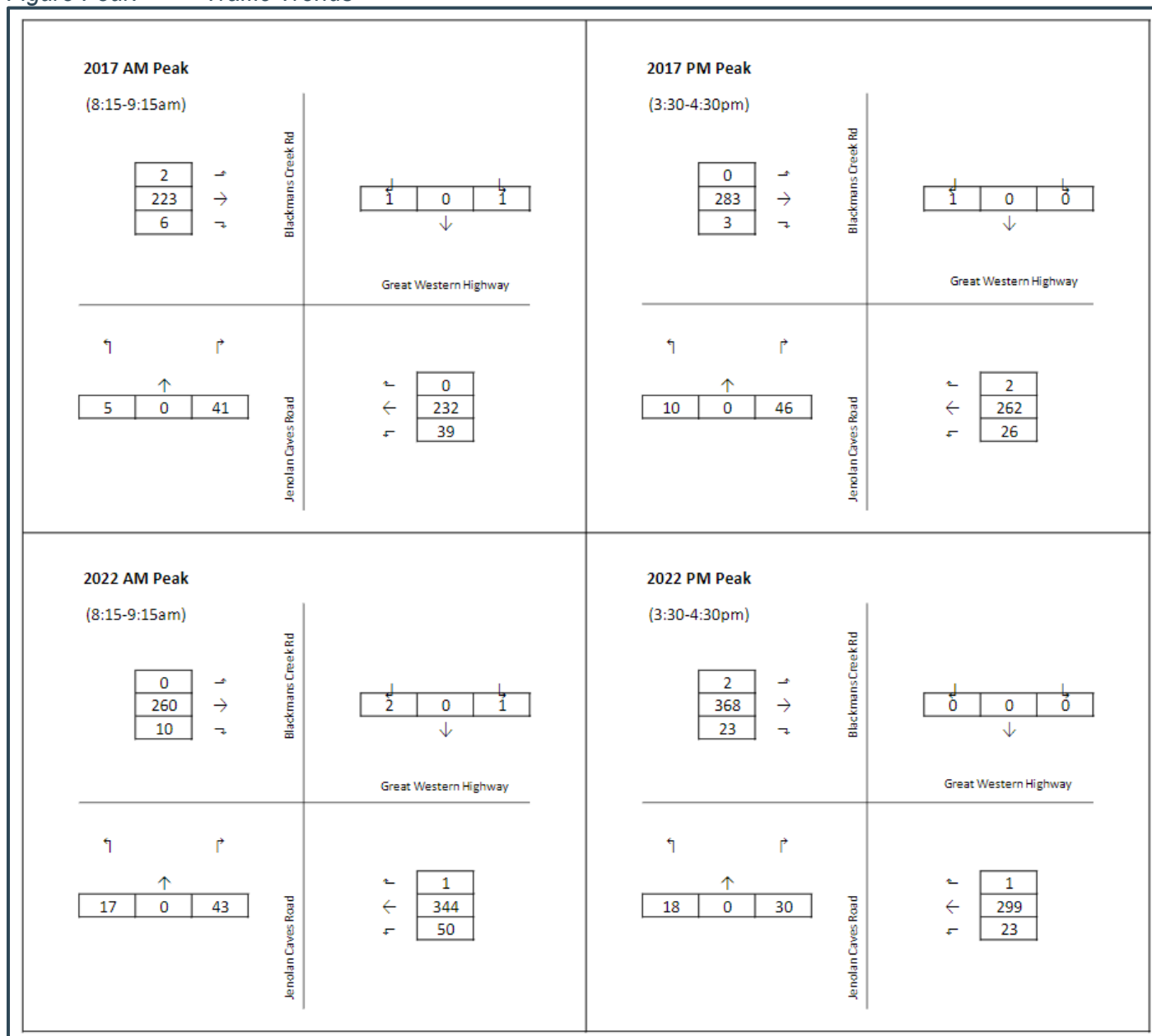
Graph 1. Average Daily Truck Count This Report Period



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. The report is included in *Appendix F* and summarised below.

Figure Four. Traffic Trends



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 again in 2024.

5.3 OPERATION OF PLANT AND EQUIPMENT

The operating plant used at the site are summarised in [Table 11](#).

Table 11. Plant and Equipment

Plant	Number	Purpose
PC 850 Excavator	1	Loading of haul trucks with extracted material.
HD325 Dump Truck	2	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.
475 Dozer	1	Overburden stripping and emplacement formation, Stockpile management
Volvo A40 Water Truck	1	Dust suppression
WA500 Front End Loader	3	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. The majority 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 12. Operating Hours

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

During a routine check of delivery dockets it was discovered that a load of material exited the site at 22:06 on Friday 15/10/2022, being outside the consented closing time of 22:00. A subsequent investigation discovered that there was a greater than 30 minute delay in loading the vehicle, therefore the normal lock-out time of 21:30 was not enough to ensure the truck was loaded and exited before the 22:00 close. The actions following the investigation entailed installing a software patch to the weighbridge system ensuring that no docket could be issued after 22:00, effectively aborting the loading process. A full report regarding this issue was supplied to the DPE and EPA on 29th October. As there was no material harm caused to the environment, this non-compliance was not deemed an incident.

Correspondence regarding this non-compliance is included in [Appendix O](#).

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 Five* and *Figure Six*. All management plans are available at <https://www.hy-tec.com.au/quarry-documentation>.

Plan of: Annual Review for the Austen Quarry Extension July 2021 to June 2022 - Environmental Monitoring Locations

Figure: FIVE

Version/Date: V0 23/08/2022

Our Ref: 12423_HY_H_AR2021-22_Q005_V0_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.

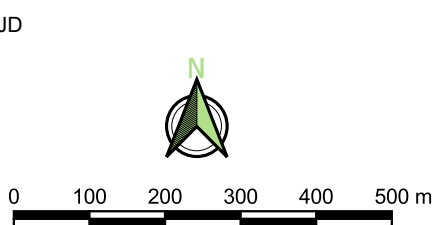
Survey: Not Applicable

Projection: GDA2020 EPSG:7856

Contour Interval: Not Applicable

Plan By: SK/JD

Project Manager: SK



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
 - Cocks River
 - Deep Creek
 - Yorkeys Creek
 - 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 2021 to June 2022 - Perimeter Monitoring Locations

Figure: SIX

Version/Date: V0 23/08/2022

Our Ref: 12423_HY_H_AR2021-22_Q006_V0_F6

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.

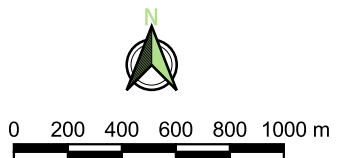
Survey: NSW Clip & Ship Cadastral

Projection: GDA2020 EPSG:7856

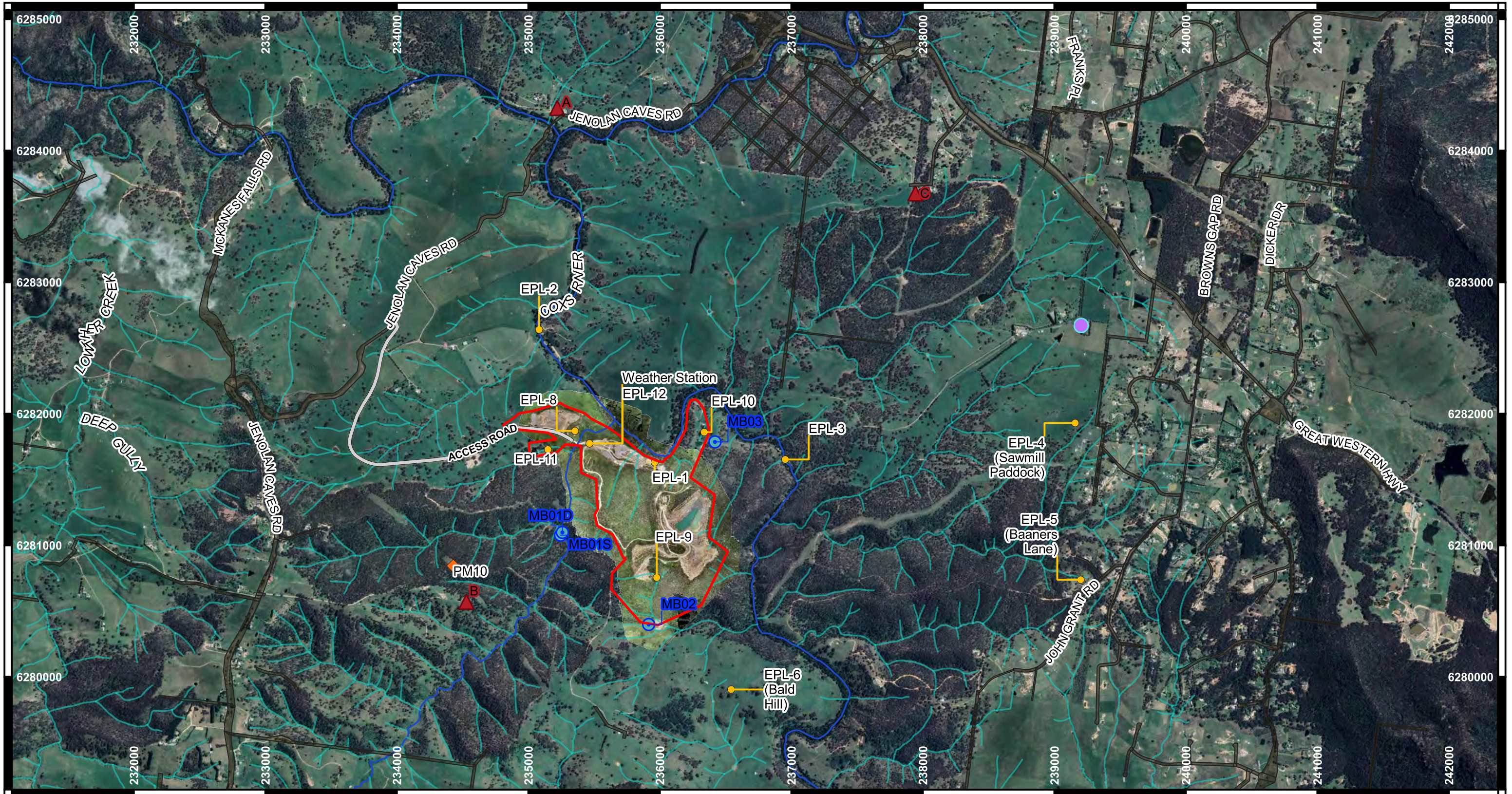
Contour Interval: Not Applicable

Plan By: SK/JD

Project Manager: SK



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
- Cadastral Information
- Dam/Sediment Dam or Basin
- Electricity Transmission Line Easement
- Drainage Line**
- Major Drainage Line
- Coxs River
- Deep Creek
- Yorkeys Creek
- Monitoring Bore
- ▲ Noise Monitoring Location
- ◆ PM10
- Blast Noise Monitoring Location

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

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, which is 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.

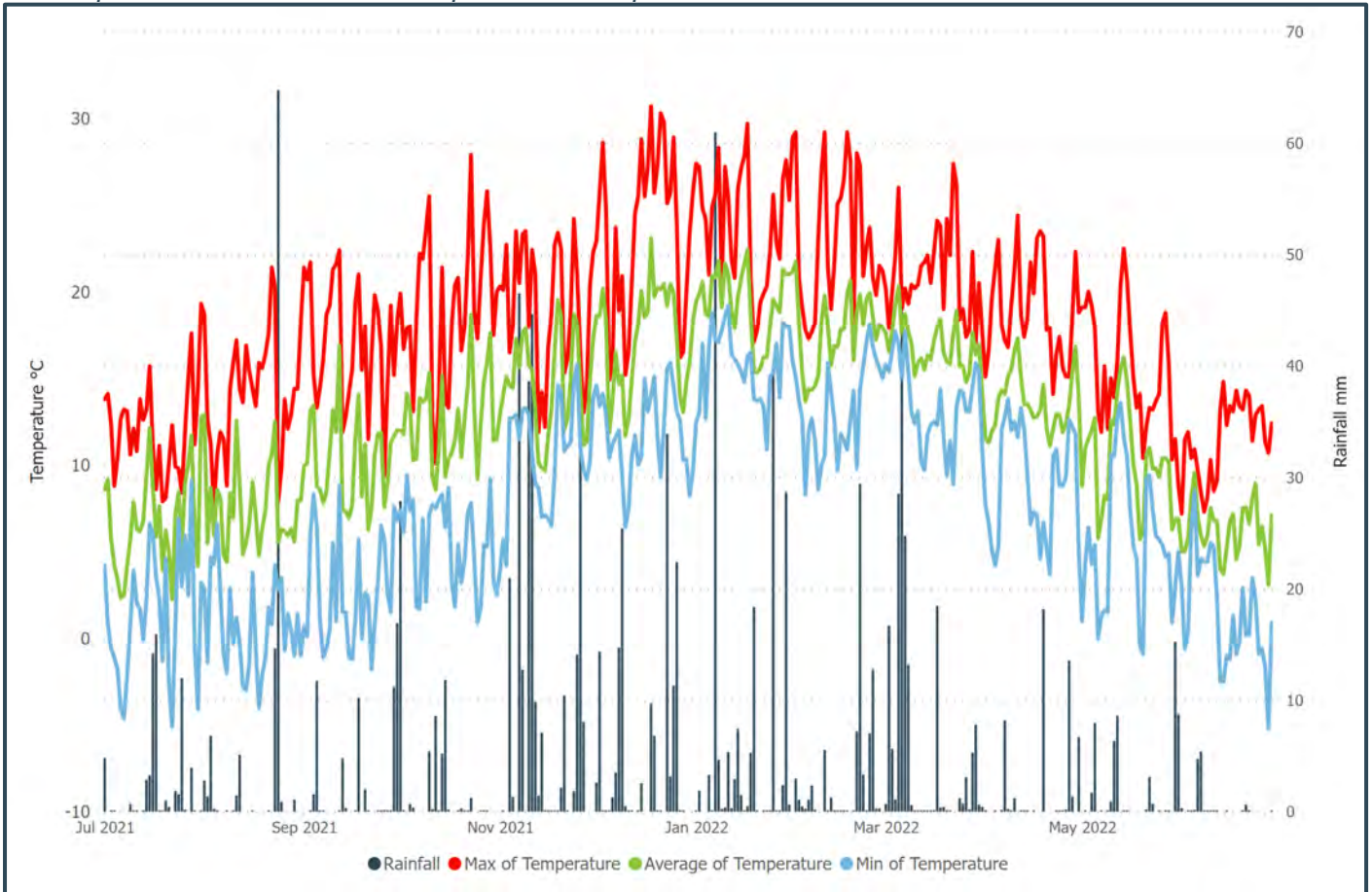
6.1.2 Monitoring

In summary, the weather during the report period is indicative of the La Nina conditions, with the site receiving significantly more rainfall than recent years. Minimum temperatures have been lower, and maximum temperatures have been lower than averages. Wind speeds have also been lower than averages.

Table 13. 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
Annual rainfall (mm)	972.9	264.4	362	648.7	907.0	1249.4
Minimum temperature (°C)	-3.6	-7.2	-7.0	-6.1	-4.0	-5.2
Maximum temperature (°C)	37.2	38.0	37.7	39.2	36.4	30.7
Mean 9am wind speed (m/s)	4.1	2.1	1.9	2.1	1.88	1.8
Mean 3pm wind speed (m/s)	4.8	3.2	3.0	3.3	2.75	2.7

Graph 2. Rainfall and Temperature in Report Period



Graph 3. Wind Roses

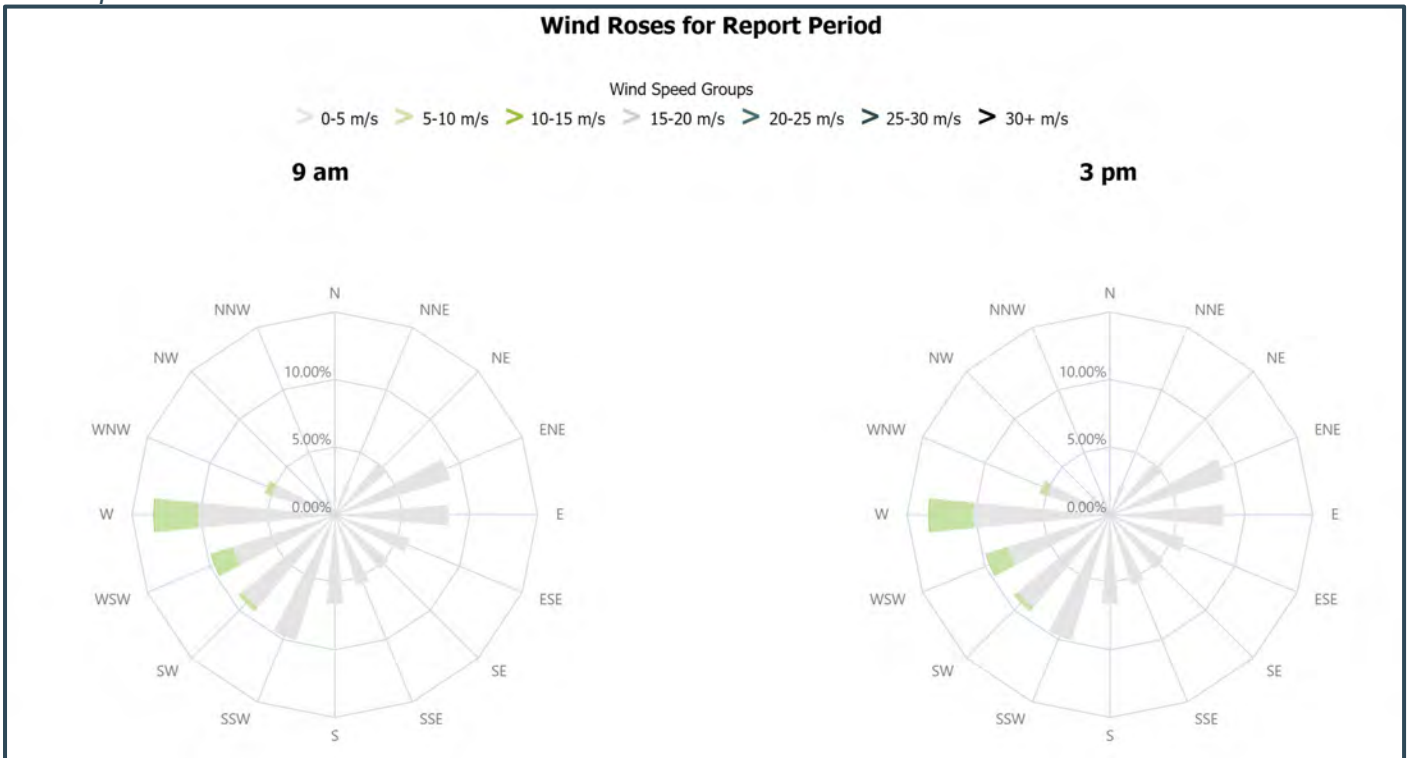


Table 14. Weather Summary Report Period

Year	Month	Total Rainfall mm	Min of Temperature °C	Average of Temperature °C	Max of Temperature °C	Average of Wind Speed m/s at 9am	Average of Wind Speed m/s at 3pm
2021	July	63.1	-5.1	6.7	19.3	2.1	3.1
2021	August	99.3	-4	7.5	21.4	1.5	3.7
2021	September	59.2	-1.8	10.2	22.4	2.1	3.2
2021	October	62.4	0.9	12.6	27.9	2.8	3.3
2021	November	259.6	3.9	14.6	24.2	2.2	2.7
2021	December	152.8	6.4	17.3	30.7	1.8	2.3
2022	January	184.5	10.9	19.4	29.7	1.3	2.2
2022	February	76.0	8.3	17.6	29.2	1.5	2.2
2022	March	177.0	8.9	16.9	27.4	1.1	1.9
2022	April	50.1	3.7	13.6	24.4	1.0	2.1
2022	May	53.9	-0.9	10.2	22.5	1.4	2.3
2022	June	11.6	-5.2	6.3	14.8	2.4	3.3
	Annual Total	1249.4					

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 2021 and March 2022, and the results are included in [Appendix G](#), and summarised below. Monitoring locations are shown on *Figure Six*.

Table 15. Noise Monitoring Summary

Location	Round	Quarry Noise Contribution	Noise Criteria SSD-6084 Mod 2
A	Day 17/08/2021 Evening 17/08/2021 Morning Shoulder 18/08/2021	<30 dB LA _{eq} (15 min) <32 dB LA _{eq} (15 min) <32 dB LA _{eq} (15 min)	35 dB LA _{eq} (15 min)
	Morning Shoulder (Sleep Disturbance)	<32 dB LA _{max}	52 LA _{max}
A	Day 22/03/2022 Evening 22/03/2022 Morning Shoulder 23/03/2022	<34 dB LA _{eq} (15 min) <34 dB LA _{eq} (15 min) <35 dB LA _{eq} (15 min)	35 dB LA _{eq} (15 min)
	Morning Shoulder (Sleep Disturbance)	<35 dB LA _{max}	52 LA _{max}
Location A 2018		Compliant	
Location A 2019		Compliant	
Location A 2020		Compliant	
Location A 2021		Compliant	
Location A 2022		Compliant	
B	Day 17/08/2021 Evening 17/08/2021 Morning Shoulder 18/08/2021	<20 dB LA _{eq} (15 min) <20 dB LA _{eq} (15 min) <30 dB LA _{eq} (15 min)	35 dB LA _{eq} (15 min)
	Morning Shoulder (Sleep Disturbance)	<30 dB LA _{max}	52 LA _{max}
B	Day 22/03/2022 Evening 22/03/2022 Morning Shoulder 23/03/2022	<28 dB LA _{eq} (15 min) <26 dB LA _{eq} (15 min) <25 dB LA _{eq} (15 min)	35 dB LA _{eq} (15 min)
	Morning Shoulder (Sleep Disturbance)	<33 dB LA _{max}	52 LA _{max}
Location B 2018		Compliant	
Location B 2019		Compliant	
Location B 2020		Compliant	
Location B 2021		Compliant	
Location B 2022		Compliant	
C	Day 17/08/2021 Evening 17/08/2021 Morning Shoulder 18/08/2021	<25 dB LA _{eq} (15 min) <25 dB LA _{eq} (15 min) <30 dB LA _{eq} (15 min)	35 dB LA _{eq} (15 min)
	Morning Shoulder (Sleep Disturbance)	<30 dB LA _{max}	52 LA _{max}
C	Day 22/03/2022 Evening 22/03/2022 Morning Shoulder 23/03/2022	<25 dB LA _{eq} (15 min) <21 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 2018		Compliant	
Location C 2019		Compliant	
Location C 2020		Compliant	
Location C 2021		Compliant	
Location C 2022		Compliant	

6.2.3 Interpretation of Results

Operator attended noise surveys were conducted in:

- 2018 on Tuesday 28th and Wednesday 29th August,
- 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.

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 G](#).

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 14 blasts during the reporting period. There were no monitoring exceedances. Condition 7 of Schedule 3 states that:

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

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

6.3.2 Monitoring Data

No results measured are greater than the relevant limit. No additional blasts occurred in the same calendar week. No blasts occurred outside of the hours 10:00 am and 3:00 pm Monday to Friday. Note, the time of the blasts are recorded in the post blast reports and are stored in a folder on-site.

Table 16. *Blasting Results*

Blasting	Date	Days Apart	Blast Number	Limits	Units of measure	Results - Hartley Village	2nd Monitor 781 Jenolan Caves Rd
Ground Vibration	Wednesday, 30 June 2021		204	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Wednesday, 30 June 2021		204	115 - Trigger point <88	dB	Nil Trigger	Nil Trigger
Ground Vibration	Friday, 16 July 2021	16	205	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Friday, 16 July 2021	16	205	115 - Trigger point <88	dB	Nil Trigger	Nil Trigger
Ground Vibration	Wednesday, 18 August 2021	33	206	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Wednesday, 18 August 2021	33	206	115 - Trigger point <88	dB	Nil Trigger	Nil Trigger
Ground Vibration	Tuesday, 31 August 2021	13	207 A & B	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Tuesday, 31 August 2021	13	207 A & B	115 - Trigger point <88	dB	Nil Trigger	Nil Trigger
Ground Vibration	Tuesday, 21 September 2021	21	208	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Tuesday, 21 September 2021	21	208	115 - Trigger point <88	dB	Nil Trigger	Nil Trigger
Ground Vibration	Wednesday, 13 October 2021	22	209 A & B	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Wednesday, 13 October 2021	22	209 A & B	115 - Trigger point <88	dB	Nil Trigger	Nil Trigger
Ground Vibration	Wednesday, 27 October 2021	14	210	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Wednesday, 27 October 2021	14	210	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger
Ground Vibration	Wednesday, 17 November 2021	21	211	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Wednesday, 17 November 2021	21	211	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger

Blasting	Date	Days Apart	Blast Number	Limits	Units of measure	Results - Hartley Village	2nd Monitor 781 Jenolan Caves Rd
Ground Vibration	Wednesday, 1 December 2021	14	212	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Wednesday, 1 December 2021	14	212	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger
Ground Vibration	Wednesday, 8 December 2021	7	213	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Wednesday, 8 December 2021	7	213	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger
Ground Vibration	Wednesday, 22 December 2021	14	214	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Wednesday, 22 December 2021	14	214	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger
Ground Vibration	Wednesday, 9 February 2022	49	215	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Wednesday, 9 February 2022	49	215	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger
Ground Vibration	Wednesday, 23 February 2022	14	216	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Wednesday, 23 February 2022	14	216	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger
Ground Vibration	Friday, 18 March 2022	23	217	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Friday, 18 March 2022	23	217	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger
Ground Vibration	Tuesday, 29 March 2022	11	218	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Tuesday, 29 March 2022	11	218	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger
Ground Vibration	Thursday, 21 April 2022	23	219	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Thursday, 21 April 2022	23	219	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger
Ground Vibration	Wednesday, 11 May 2022	20	220	5 - trigger point >0.51	mm/s	Nil Trigger	Nil Trigger
Overpressure	Wednesday, 11 May 2022	20	220	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger
Ground Vibration	Friday, 27 May 2022	16	221	5 - trigger point >0.51	dB	Nil Trigger	Nil Trigger
Overpressure	Friday, 27 May 2022	16	221	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger
Ground Vibration	Friday, 3 June 2022	7	222	5 - trigger point >0.51	dB	Nil Trigger	Nil Trigger
Overpressure	Friday, 3 June 2022	7	222	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger
Ground Vibration	Thursday, 23 June 2022	20	223	5 - trigger point >0.51	dB	Nil Trigger	Nil Trigger
Overpressure	Thursday, 23 June 2022	20	223	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger
Ground Vibration	Wednesday, 13 July 2022	20	224	5 - trigger point >0.51	dB	Nil Trigger	Nil Trigger

Blasting	Date	Days Apart	Blast Number	Limits	Units of measure	Results - Hartley Village	2nd Monitor 781 Jenolan Caves Rd
Overpressure	Wednesday, 13 July 2022	20	224	115 - Trigger point <100	dB	Nil Trigger	Nil Trigger

Table 17. 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 an 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		

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.'

The Ash and Combustible Matter results for May 2022 were not available due to faulty equipment in the laboratory. The Insoluble Solids results were not affected. The Ash and Combustible Matter analytes are not required by either the SSD or EPL conditions, and this is therefore not a non-compliance or incident, however the DPE and EPA were notified on the 30th May 2022. (see correspondence in [Appendix O](#)). No further action was required.

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. Total Suspended Particulates (TSP) is calculated from the PM₁₀ fraction, and PM_{2.5} are taken to be the same as the PM₁₀ fraction, in accordance with the AQMP.

The Air Quality Management Plan (AQMP) states that trigger alarms will be programmed into the real time particulate matter monitor to give feedback for when dust levels are approaching or likely to approach criteria levels. The alarms inform the monitor supplier and key Hy-Tec staff including the Quarry Manager and Quarry Supervisor of exceedances, or if dust levels are higher than existing trends or equipment failures. In addition, Hy-Tec staff monitor the online data at least weekly to ensure any exceedances or equipment failures are captured and actioned.

6.4.2 Monitoring Data

Air quality dust depositional gauge 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 18. 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
2021	July	0.2	0.71	4
2021	September	0.8	0.70	4
2021	October	0.9	0.74	4
2021	November	0.7	0.55	4
2021	December	0.6	0.57	4
2022	January	4.3	0.89	4
2022	February	3.2	1.12	4
2022	March	0.5	1.08	4
2022	April	0.7	1.12	4
2022	May	1.2	1.20	4
2022	June	0.8	1.26	4

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

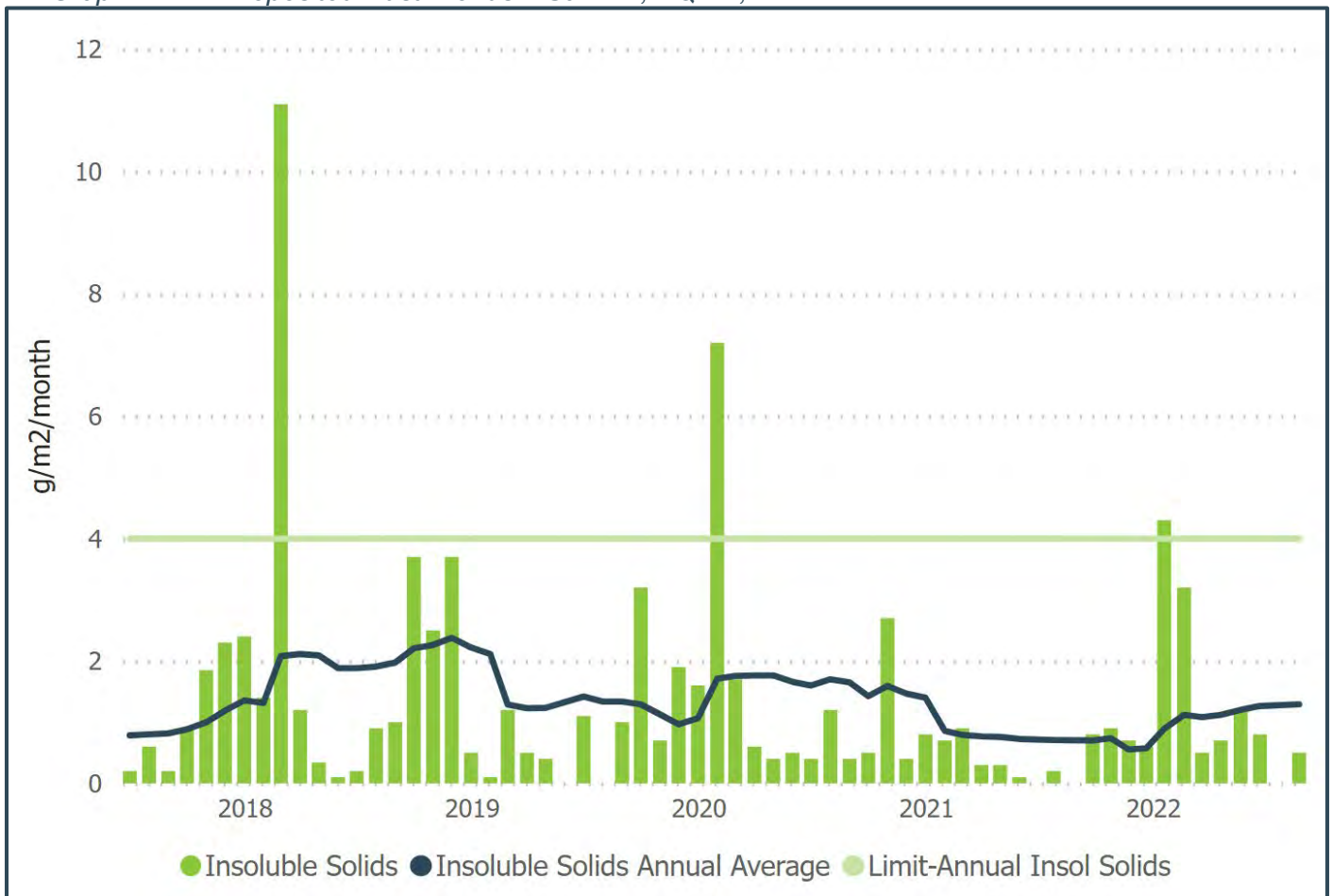


Table 19. Deposited Dust Results – Baaners Lane, AQD 2, EPL 5

Deposited Matter g/m ² /month				
Year	Month	Insoluble Solids	Insoluble Solids Annual Average	Limit-Annual Insol Solids
2021	July	0.5	0.37	4
2021	September	0.8	0.37	4
2021	October	0.9	0.44	4
2021	November	0.3	0.45	4
2021	December	0.7	0.47	4
2022	January	0.3	0.45	4
2022	February	0.3	0.44	4
2022	March	0.1	0.42	4
2022	April	0.4	0.44	4
2022	May	0.5	0.46	4
2022	June	0.9	0.52	4

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

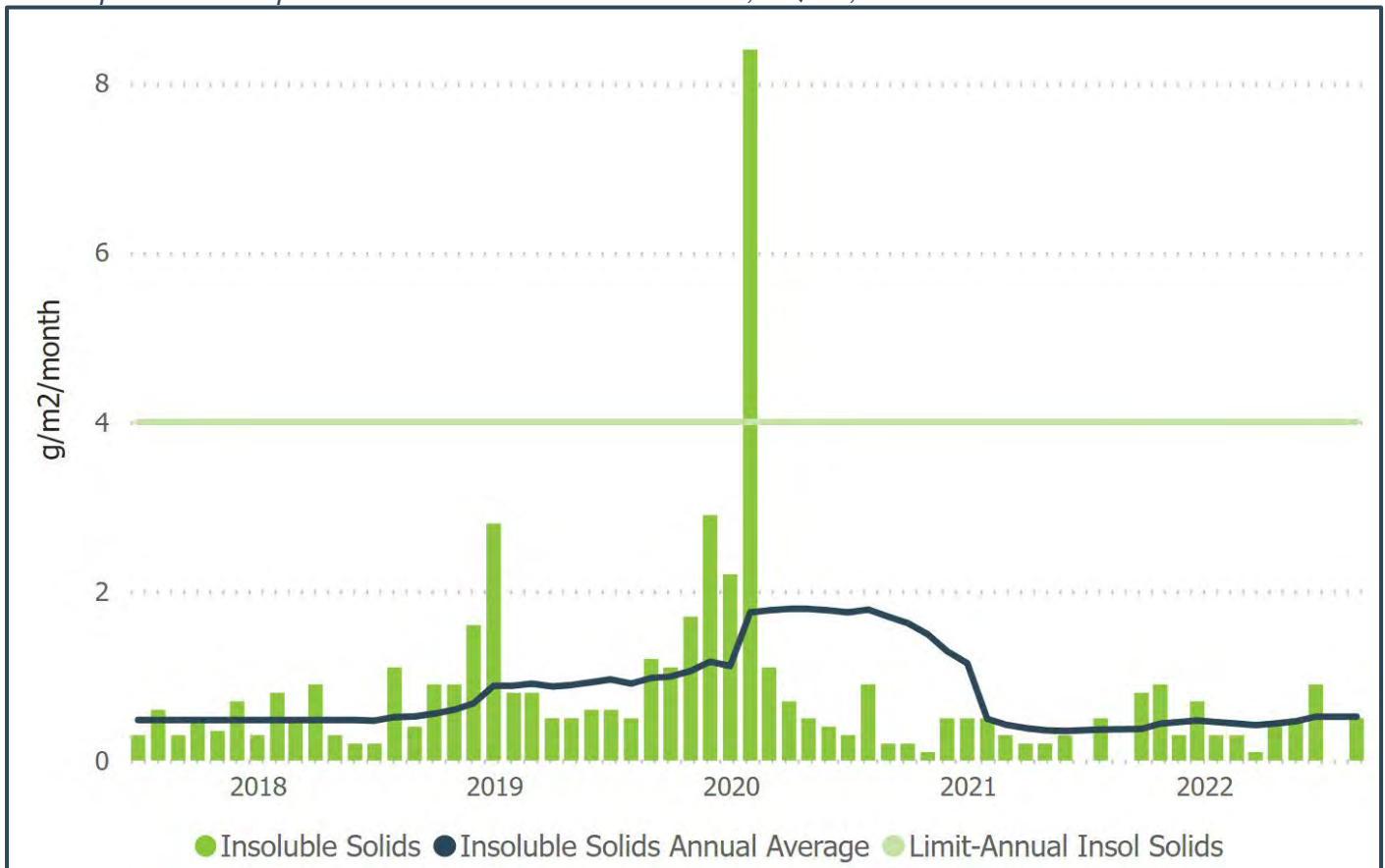


Table 20. Deposited Dust Results – Bald Hill, AQD 3, EPL 6

Deposited Matter g/m ² /month				
Year	Month	Insoluble Solids	Insoluble Solids Annual Average	Limit-Annual Insol Solids
2021	July	0.5	0.81	4
2021	September	1.4	0.86	4
2021	October	1.6	0.98	4
2021	November	0.7	0.98	4
2021	December	0.6	0.96	4
2022	January	0.3	0.85	4
2022	February	11.2	1.69	4
2022	March	0.4	1.64	4
2022	April	0.7	1.63	4
2022	May	2.0	1.80	4
2022	June	1.0	1.85	4

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

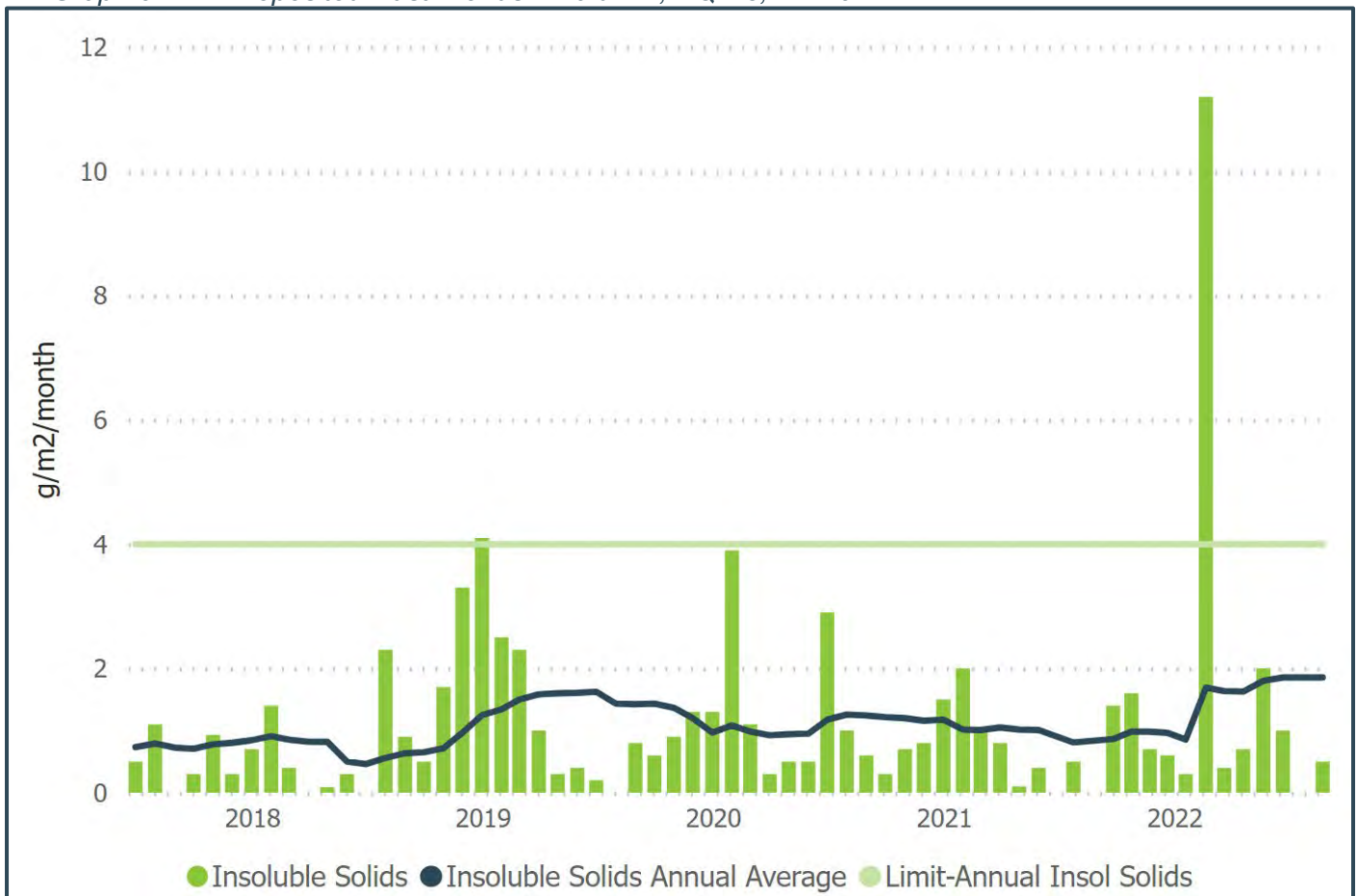


Table 21. Particulate Matter Annual Averages

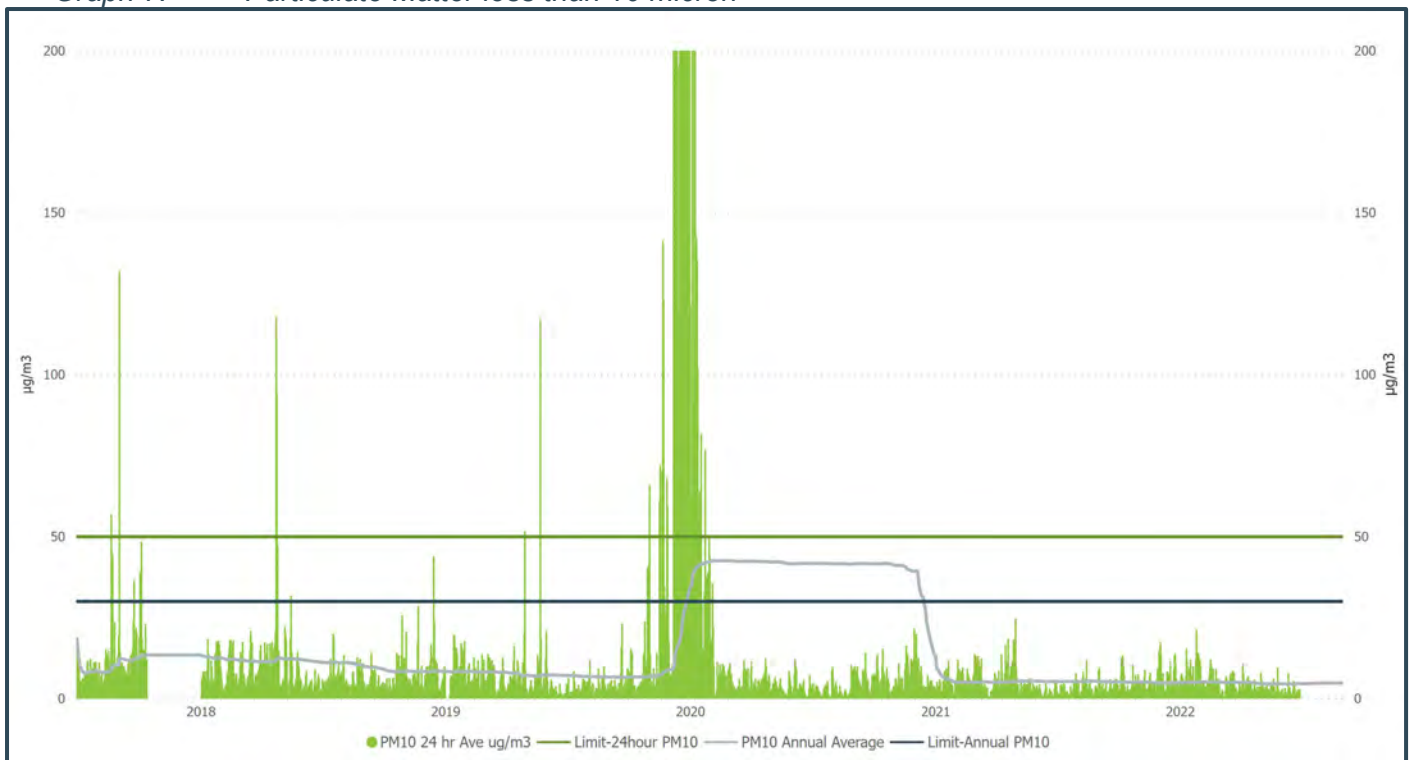
Annual Averages	PM ₁₀ µg/m ³	Surrogate PM _{2.5} µg/m ³	Calculated TSP µg/m ³
1/07/2019 – 30/06/2020	5.4	5.4	13.6
1/07/2020 – 30/06/2021*	5.28	5.28	13.2
1/07/2021 – 30/06/2022	4.56	4.56	11.4
Compliant with DA	Yes	Yes	Yes
Limit	25	8	90

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

Table 22. 24 Hour Maximum Particulate Exceedances

Date of Exceedance	PM ₁₀ µg/m ³	Surrogate PM _{2.5} µg/m ³
Nil exceedances		
Compliant with DA	Yes	Yes
Limit	50	25

Graph 7. 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 calculated Total Suspended Particulates also did not exceed the annual average. Particulate Matter less than 2.5 µm diameter is not directly measured, and the PM₁₀ results are used instead, in accordance with the AQMP. The PM_{2.5} results did not exceed either 24-hour average, nor the annual average.

The site's air quality management can be considered effective as there were nil-exceedances of limits and none of the non-compliances are due to site activities.

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 H](#), with the most recent given below.

Photoplate 1. Visual from Hassans Walls Lookout, July 2022 – 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 fire-fighting. 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.

The first controlled burn as a part of the Stage 2 development will be conducted within the next reporting period if conditions allow. Conditions were excessively wet for a controlled burn during the reporting year.

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 possible location of a BOA or options to satisfy these credits is currently being considered by Niche Environmental and Heritage. The currently proposed modification to SSD 6084 would see offsetting obligations staged to match progressive development of the Quarry and would reduce the credits required for the silver-leaved mountain gum in line with Hy-Tec's previous planting of this species. A dedicated planting area for the silver-leaved mountain gum is also proposed in this modification. Until the outcomes of the modification have been resolved, the immediate offsetting obligations are not known.

Hy-Tec had sought and was granted an extension to the deadline to satisfy its biodiversity offsetting obligations to 31 December 2021. DPE has indicated that no further extension will be granted and Hy-Tec accepts it is not compliant with its offsetting obligations. However, DPE is aware of the matter and Hy-Tec is working to restore compliance as soon as possible. Until the currently proposed modification is resolved and the offsetting obligations satisfied, Hy-Tec has committed to continued implementation of the approved management plans which include management of the BOA in the location it was previously approved.

The Biodiversity Offset Area (BOA) is currently being assessed following the revised approval. Management of any offset areas consists specifically of the conservation of native vegetation, fauna habitat and silver leaved mountain gum populations to offset the impacts of the Austen Quarry Stage 2 extension. Hy-Tec have implemented the environmental measures as described in the Biodiversity Offset Management Plan (available <https://www.hy-tec.com.au/quarry-documentation>).

Hy-Tec are engaged with the Hartley Pastoral Company in evaluating the required credits and potential offset areas and retirement of the credits. The Biodiversity Offsetting Strategy for the Quarry will be finalised and presented to OEH, DPIE in the next Annual Review. This process was delayed due to the Covid pandemic (*Appendix I*) as well as the Modification Application and will be finalised next report period.

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.

Spot spraying of weeds was undertaken in December 2021 and June 2022. Targeted aerial spraying was conducted in October 2020 and again in April 2022 for Serrated Tussock.

6.9.1.2 Pest Management Activities

Feral goats present a risk to rehabilitation activities on the site. The landowner undertook a campaign of mustering and culling during the report period.

Pigs have been trapped and baited, as well as shot when seen, on the property in conjunction with Local Land Services.

Baiting and shooting of foxes and wild dogs is undertaken by the property owner. Baiting programs are co-ordinated with surrounding properties several times per year.

6.9.2 Monitoring

Aquatic monitoring was undertaken during November 2021 by Niche Environment and Heritage ([Appendix K](#)). The results showed that:

“Water quality was improved in 2021 compared to 2020, with lower electrical conductivity and only minor and limited exceedances in other physiochemical measurements for all locations. The conclusions are similar to previous years that, in general, temporal variability across a broader spatial scale continues to be the major driver of changes in the macroinvertebrate assemblages...”

Macroinvertebrate assemblages and stream health indicators results show that the composition and ecological health of the river within the vicinity of the Quarry remains similar to and for some attributes potentially better, than other areas of the river not influenced by Quarry operations.”

Biodiversity monitoring was undertaken by EMM in November 2021 ([Appendix J](#)). The results showed:

“that some changes have occurred to flora and fauna communities surveyed at the site since the previous monitoring period. Weed invasion has slightly increased in some areas following better climatic conditions. Some native vegetation degradation has occurred at the Impact Ridge transects within the active quarry areas. Native vegetation within the new rehab has improved considerably in comparison to last years survey, with an emerging overstorey and thickened mid-storey...”

The report notes that bird species and amphibian numbers have decreased slightly, possible due to the unfavourable weather conditions during the site visit. Reptile and mammal numbers have remained steady, with wombat activity remaining high. Overall, no significant decline in fauna type or numbers was reported.

The Biodiversity Monitoring Report states:

“The purpose of the monitoring is to assess the indirect impacts of the quarry on fauna and fauna habitats adjacent to the quarry. No significant changes to species composition have occurred to date throughout the monitoring program. The active quarry operations show that the controls employed at the quarry are effective in controlling weeds which are a major cause of habitat degradation.”

Table 23. 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>).

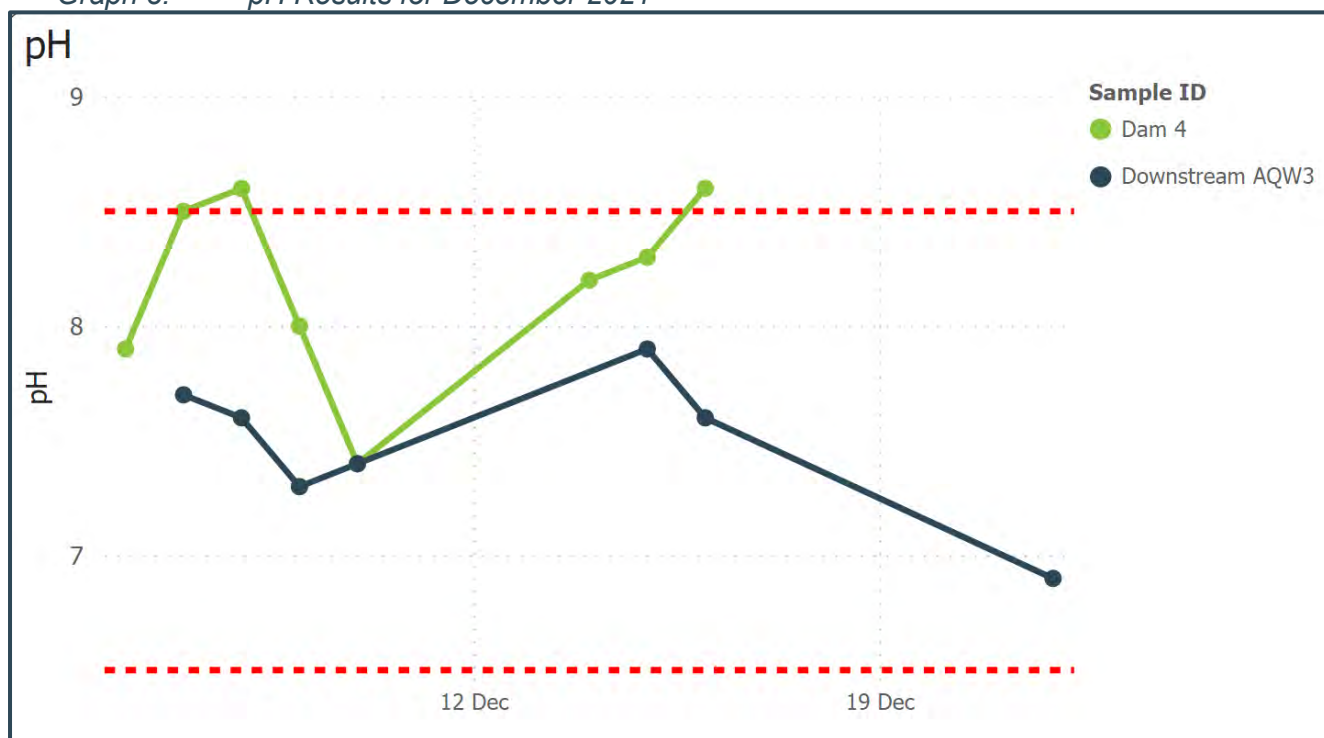
Surface water management and monitoring has continued in accordance with the EPL 12323. The controls and procedures undertaken to mitigate impacts on surface water at the site are considered effective. Monitoring of surface water pH levels using an onsite pH meter is undertaken to determine whether treatment 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](#).

Following 45mm of rainfall, controlled discharges were made between 7th and 16th December 2021. A review of the results from site EPL 10 (Dam 4) discovered that on the 8th and the 16th of December the pH was 8.6 (0.1 higher than the limit of 8.5). All tests on days before and after the 8th and 16th, as well as all downstream tests showed no non-compliances. A graph of the results for December is given below and full details are given in the correspondence in [Appendix O](#). No material harm was caused, as evidenced by the compliant results from the downstream monitoring site.

Graph 8. pH Results for December 2021



As result of this non-compliance, a procedure is now in place such that all water ready for elective discharge is tested on site using a calibrated meter, and all discharges are to be authorised by the Quarry Manager.

Table 24. 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)	Non-Compliant See explanation above	All water ready for elective discharge is to be tested on site using a calibrated meter, and all discharges are to be authorised by the Quarry Manager.
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. Consult with EPA regarding the need to establish alternative monitoring point in case of similar rainfall events.
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 Five* and *Figure Six*. 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.

Table 25. Discharge Dates during Reporting Period

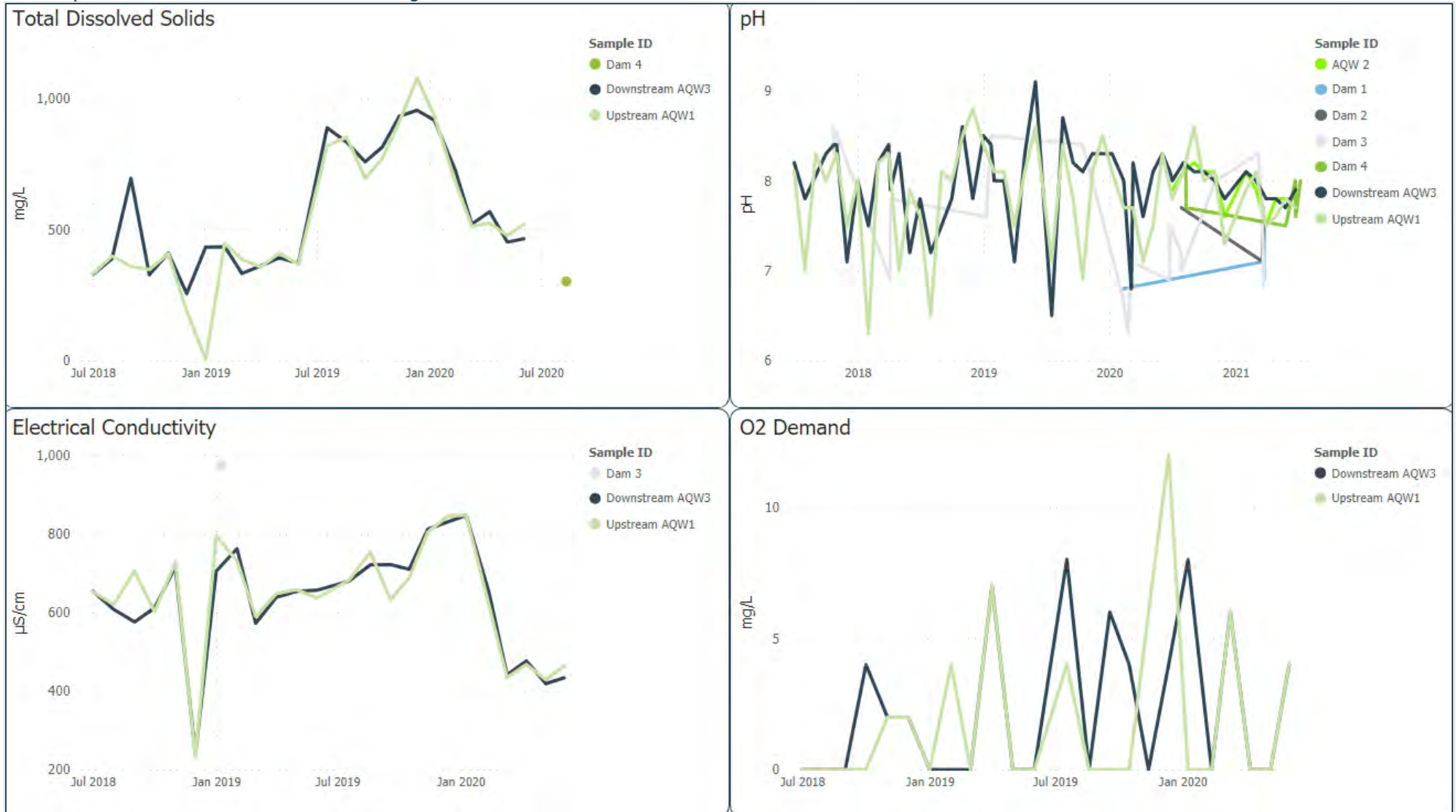
Point ID	Discharge dates during reporting period	Total no. of discharge days
Point 1 Dam 1	8-9/11/21, 12/11/21, 27/11/21-1/12/21, 7/1/22, 10-11/1/22, 6-12/3/22	18
Point 8 Dam 2	12/11/21, 7-8/3/22	3
Point 9 Dam 3	10-11/1/22, 4/5/22, 24/6/22	4
Point 10 Dam 4	9/7/21, 29/7/21, 11/8/21, 26-27/8/21, 3/9/21, 17/9/21, 28/9/21, 15/10/21, 22/10/21, 8-11/11/21, 27-29/11/21, 7-16/12/21, 7/1/22, 28-29/1/22, 9-11/3/22, 30/3/22, 3-4/5/22, 17-18/5/22, 24/6/22.	35
Point 11 Dam 5	Nil	Nil

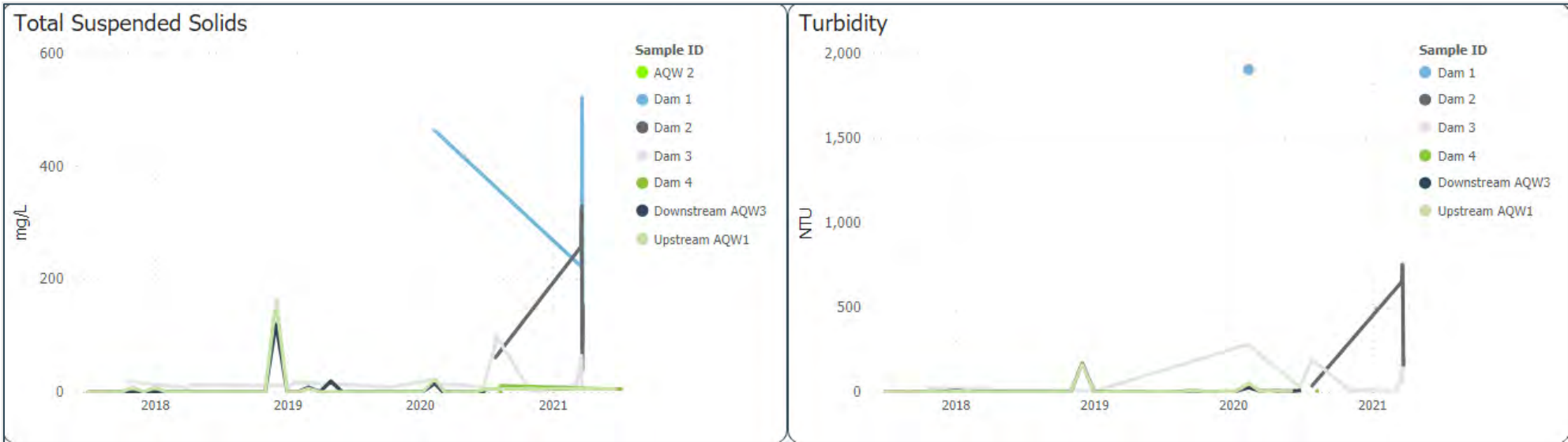
Table 26. Summary of Surface Water Results for Report Period

Sample ID	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)	Min of Oil & Grease (mg/L)	Average of Oil & Grease (mg/L)	Max of Oil & Grease (mg/L)
Dam 1	5.8	7.5	8.5	104	262	643	5.8	445.1	1,000.0	0	222	586	0	0	0
Dam 2	7.0	7.7	8.2	169	252	297	340.0	424.3	553.0	132	156	177	0	0	0
Dam 3	6.7	7.3	7.7	110	394	794	5.4	9.9	22.0	0	5	12	0	0	0
Dam 4	6.8	7.8	8.6	241	495	674	1.0	18.3	120.0	0	7	39	0	0	8
Downstream AQW3	5.8	7.4	8.1	132	241	387	0.2	13.5	75.0	0	14	108	0	0	7
Upstream AQW1	5.3	7.3	8.3	119	242	359	2.3	15.8	44.0	0	16	68	0	0	0

Note: This table is a summary of all results, not all sampling events resulted in a discharge.

Graph 9. Surface Water Monitoring Trends





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 9](#). 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.

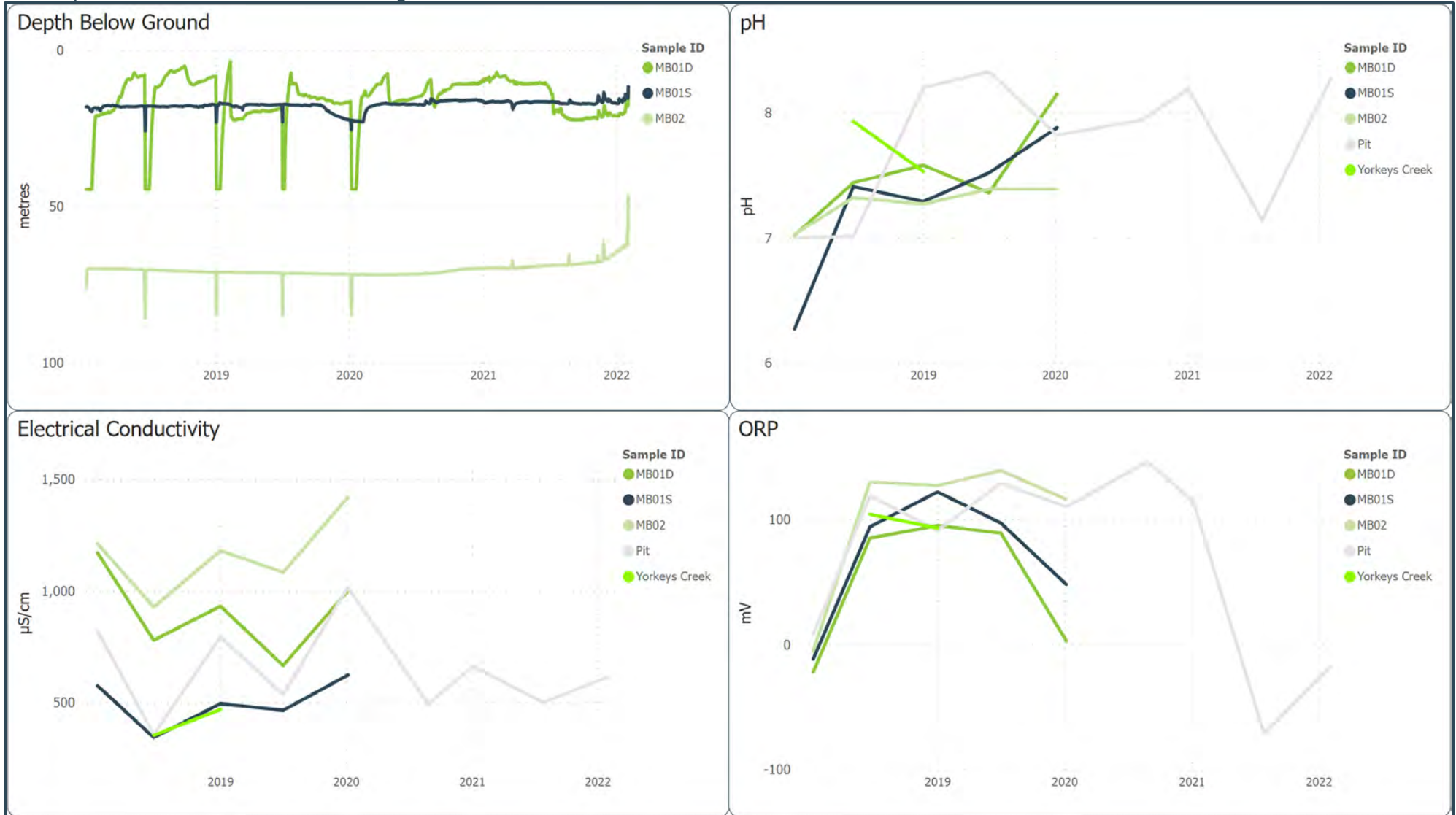
7.2.3 Groundwater Monitoring Data

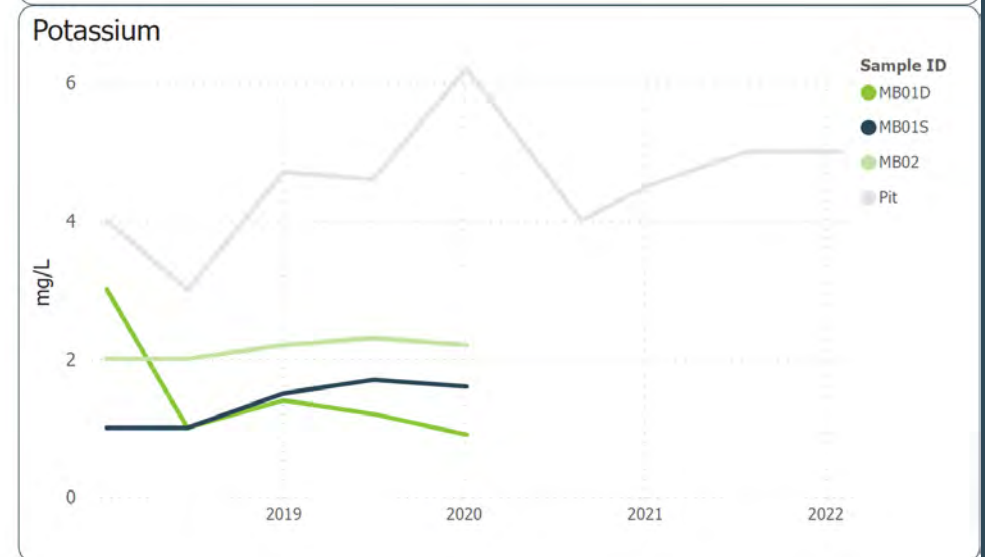
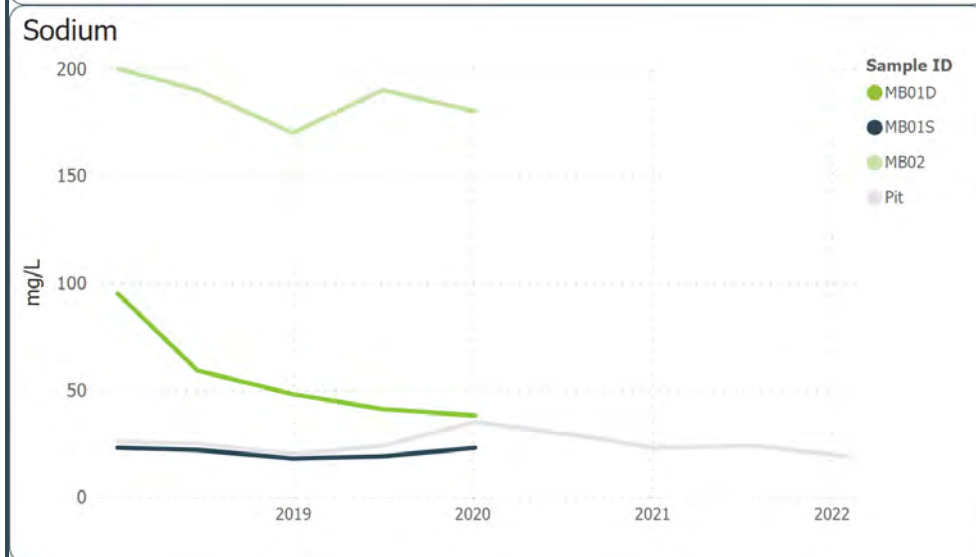
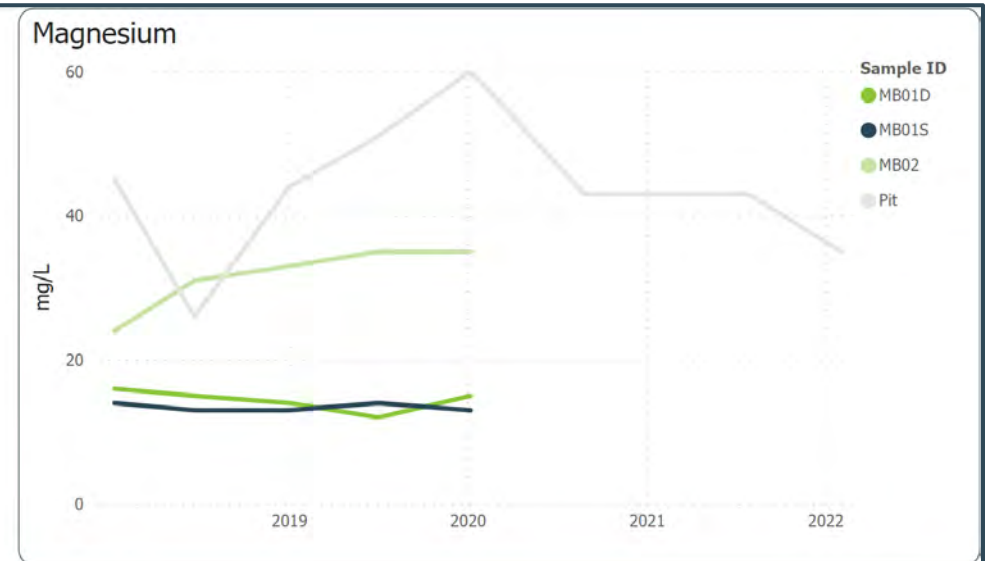
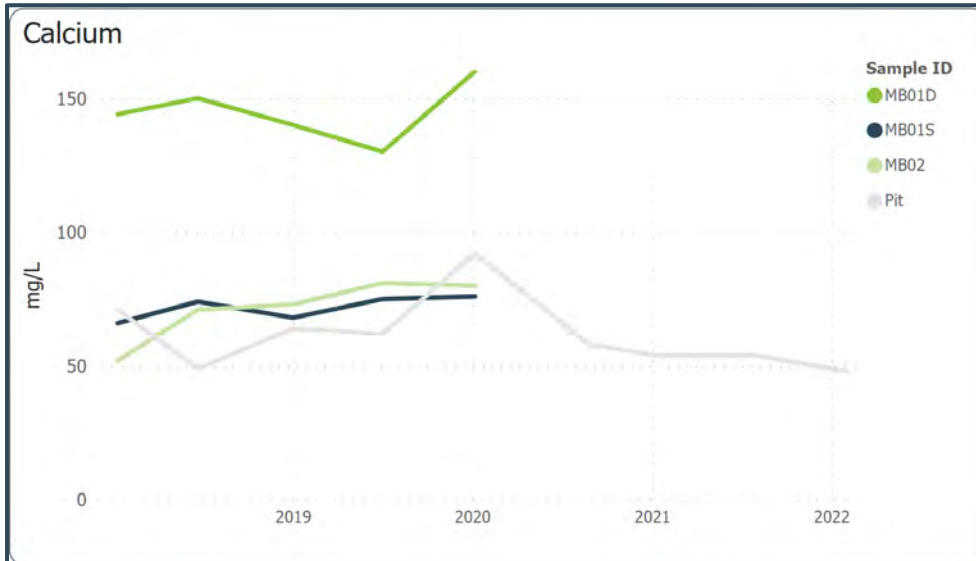
Groundwater quality was monitored in July 2021 and February 2022 for the following parameters:

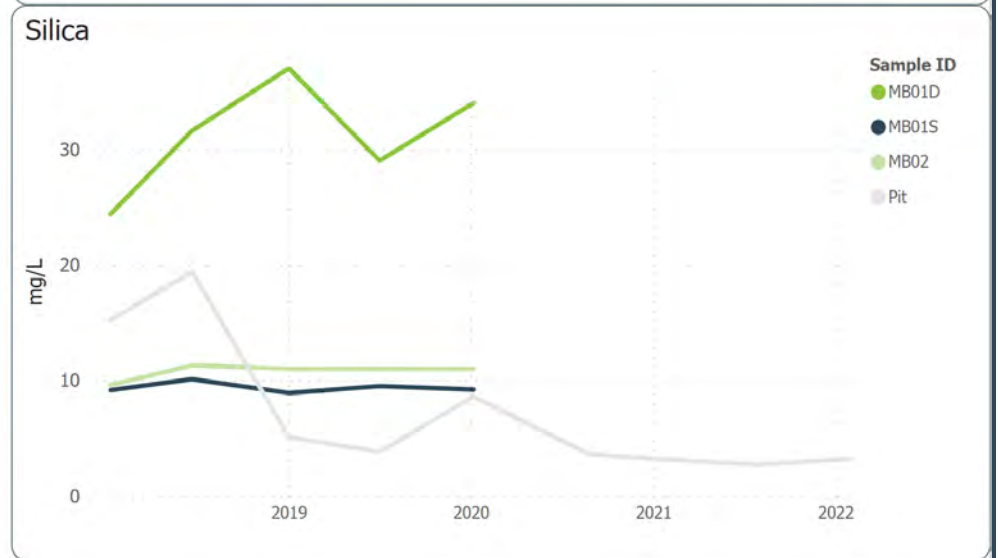
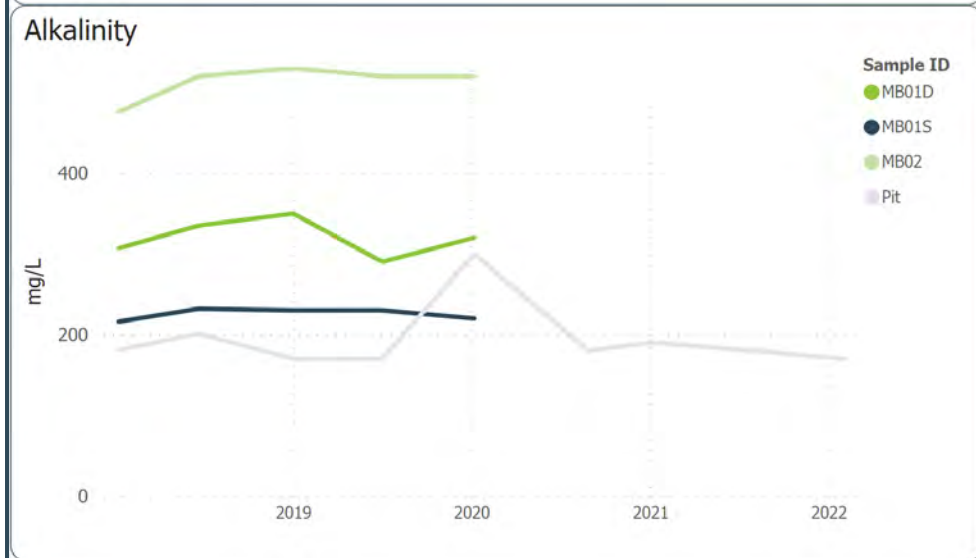
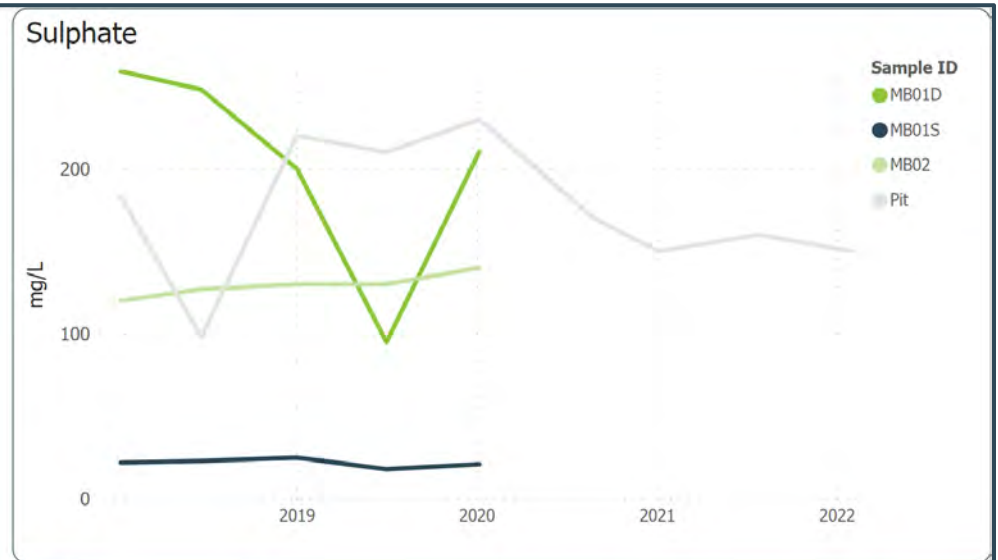
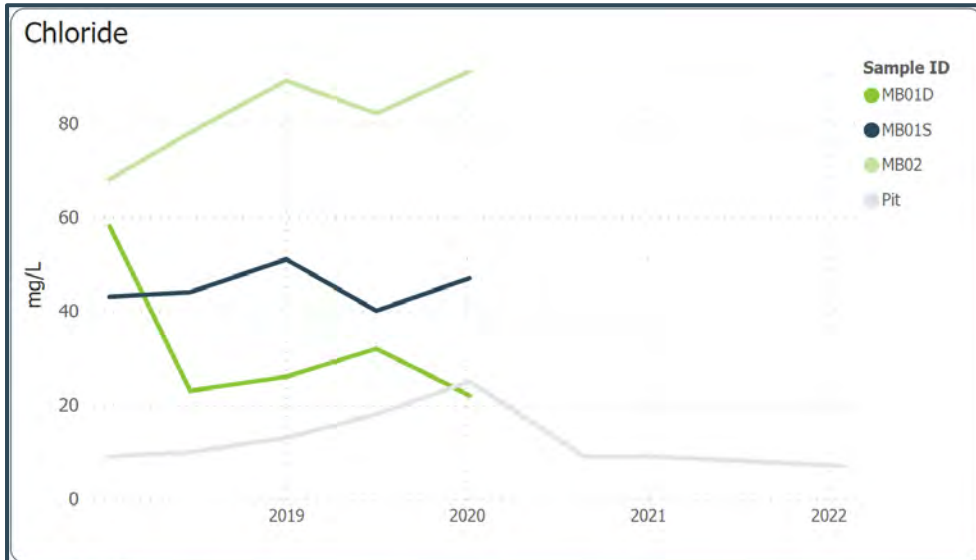
- pH, Electrical Conductivity, Oxidation Reduction Potential, Temperature
- Total Dissolved Solids
- Cations and anions
- Dissolved heavy metals
- Ammonia, Nitrate, Nitrite
- Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethyl Benzene, Xylenes (BTEX), Polyaromatic Hydrocarbons (PAHs) – pit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

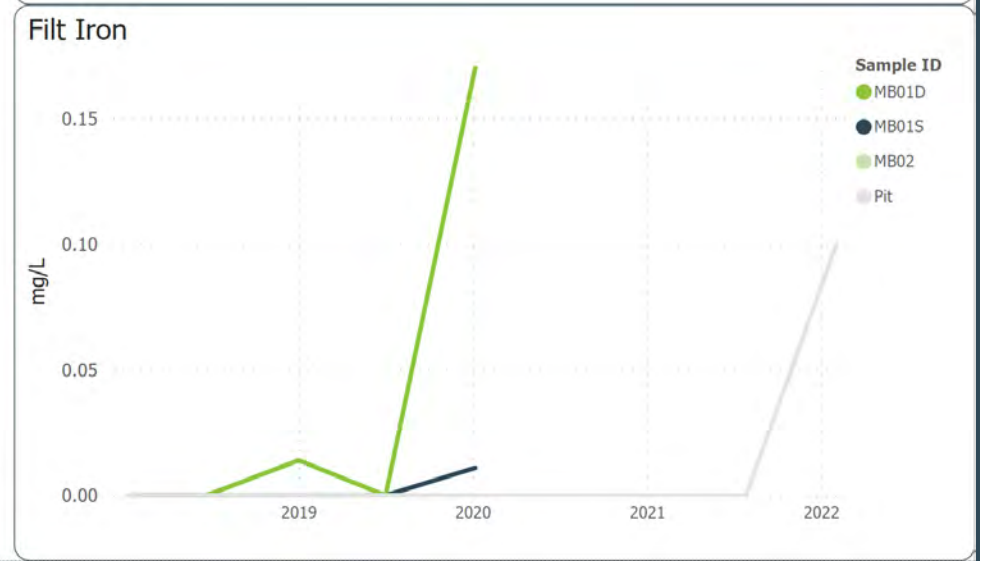
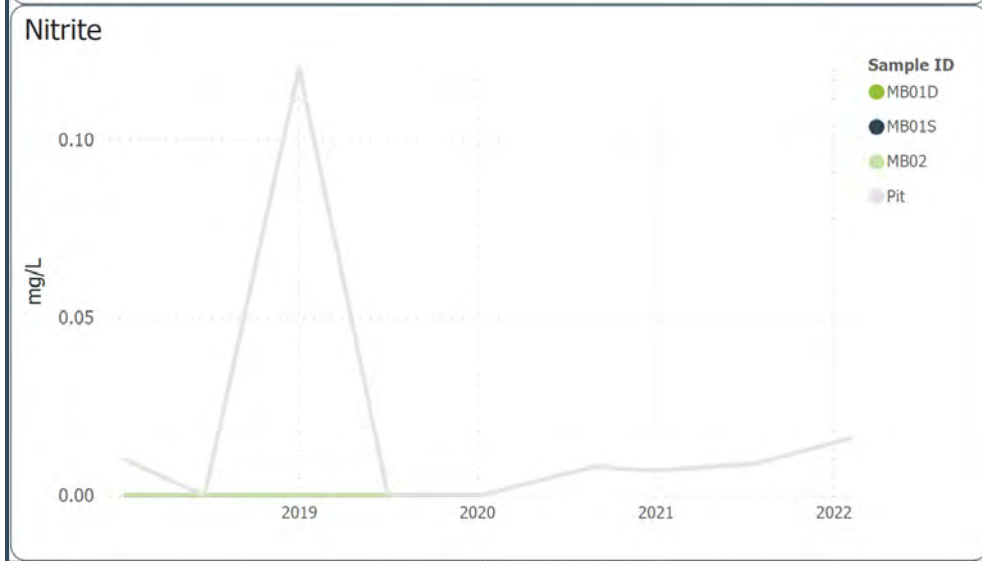
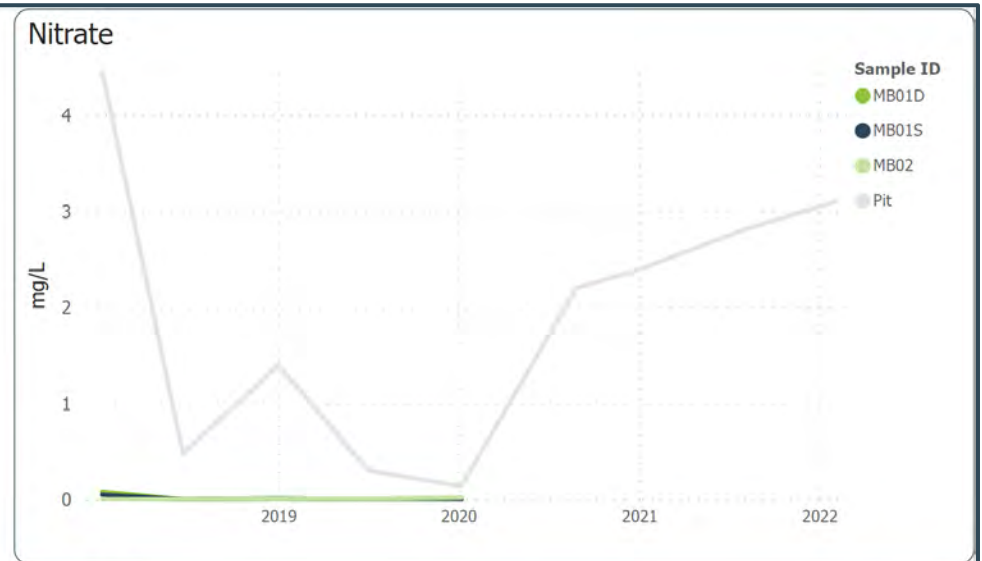
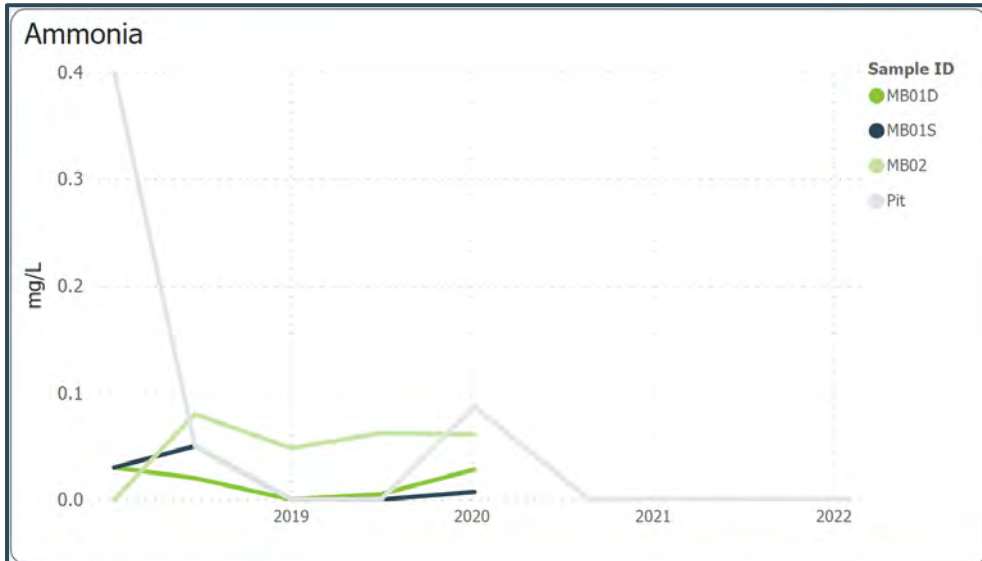
The reports are included in [Appendix M](#). Water quality trends are shown on the following graphs ([Graph 10](#)) where detectable parameters make this meaningful. There have been no organics detected in any monitoring round.

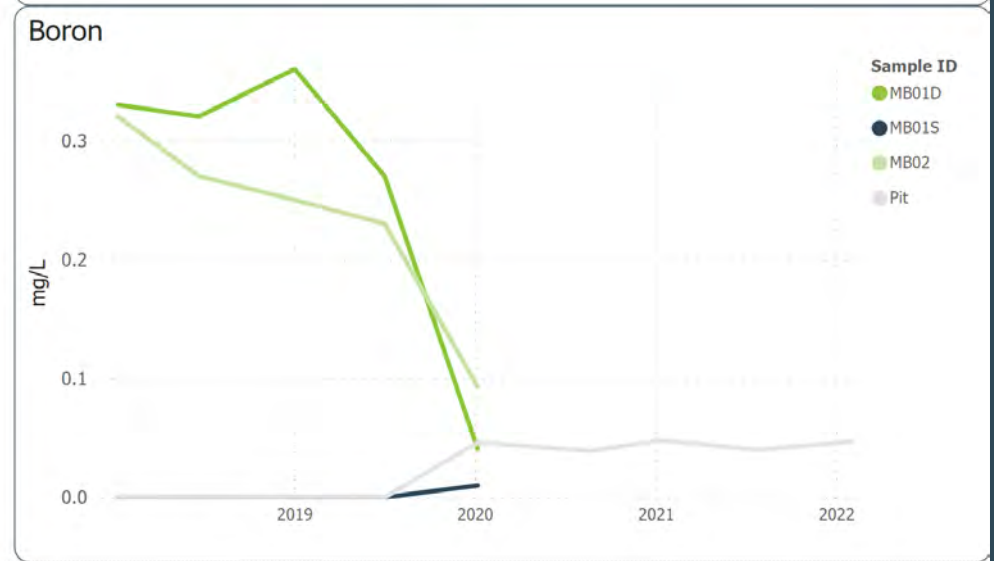
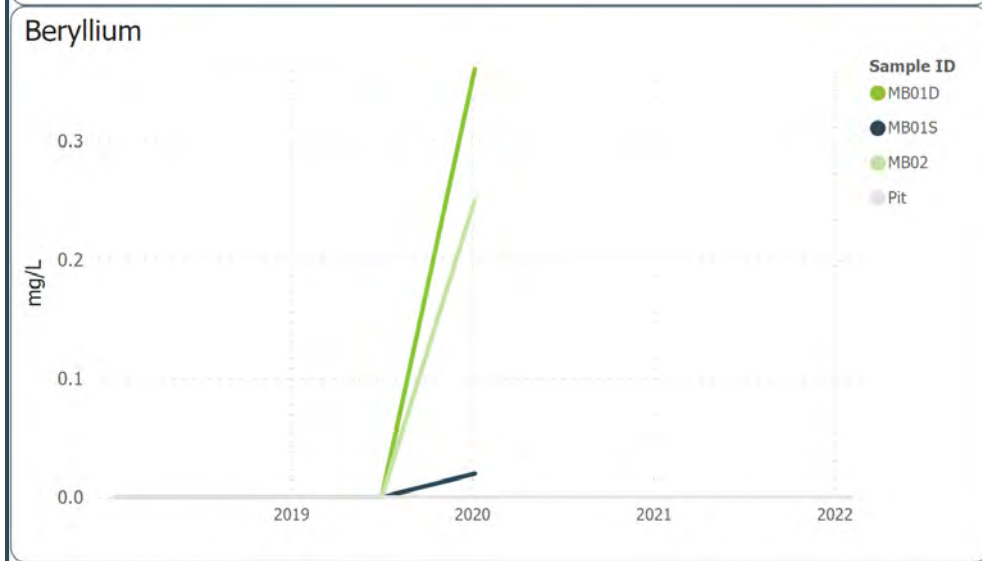
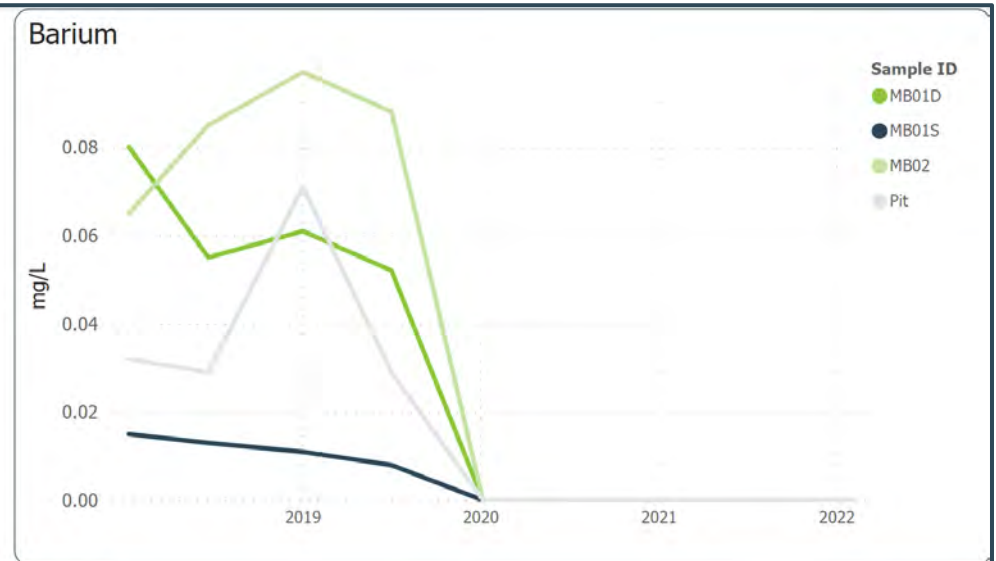
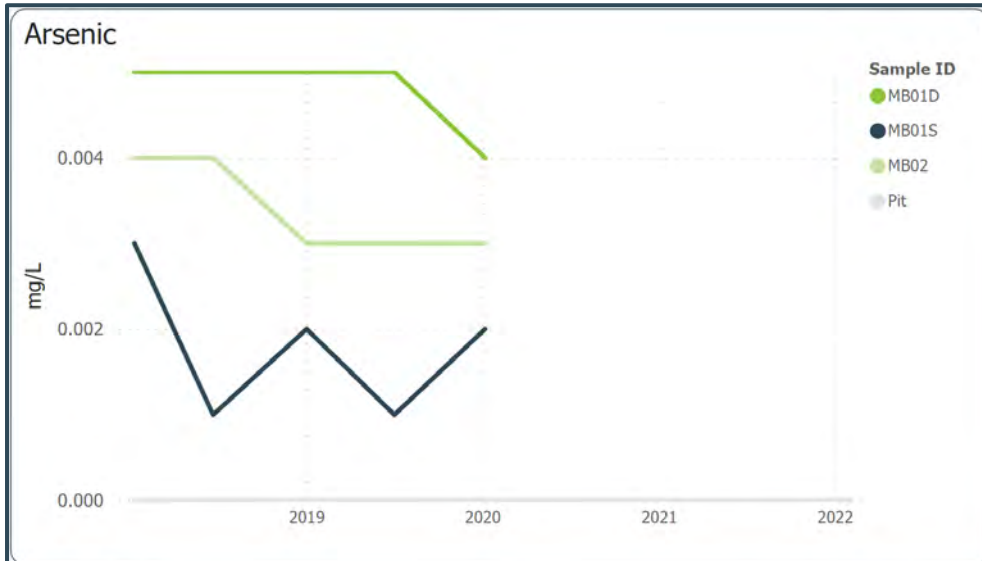
Graph 10. Groundwater Monitoring Trends

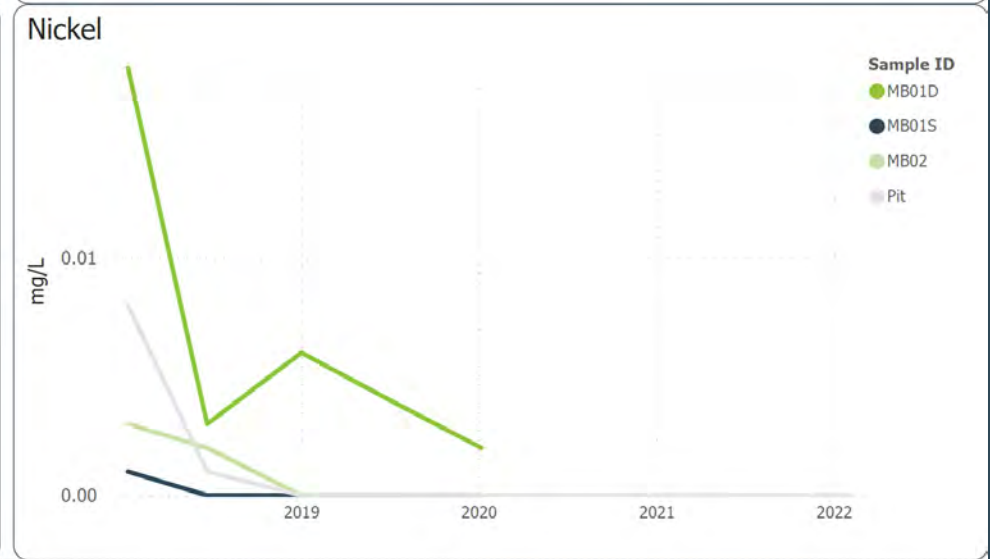
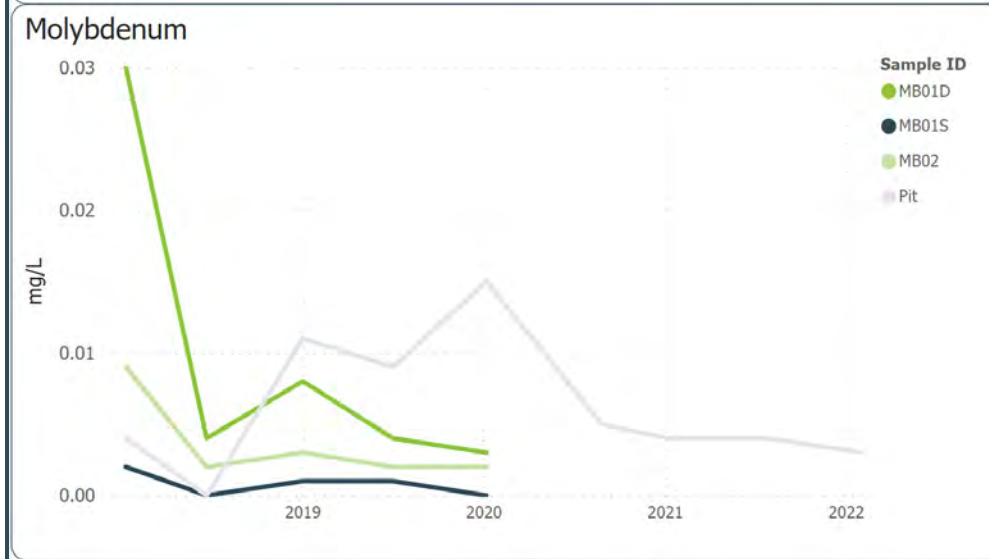
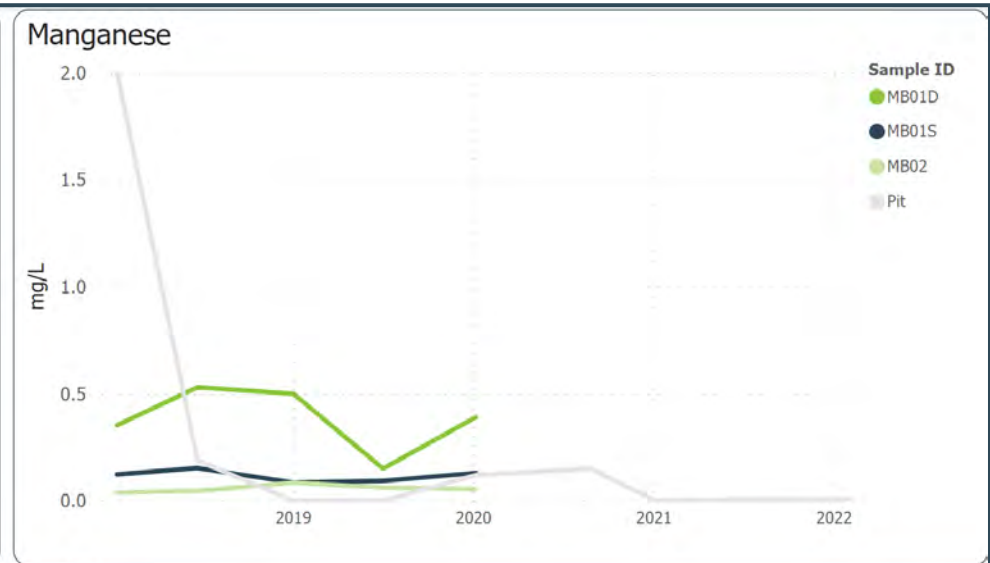
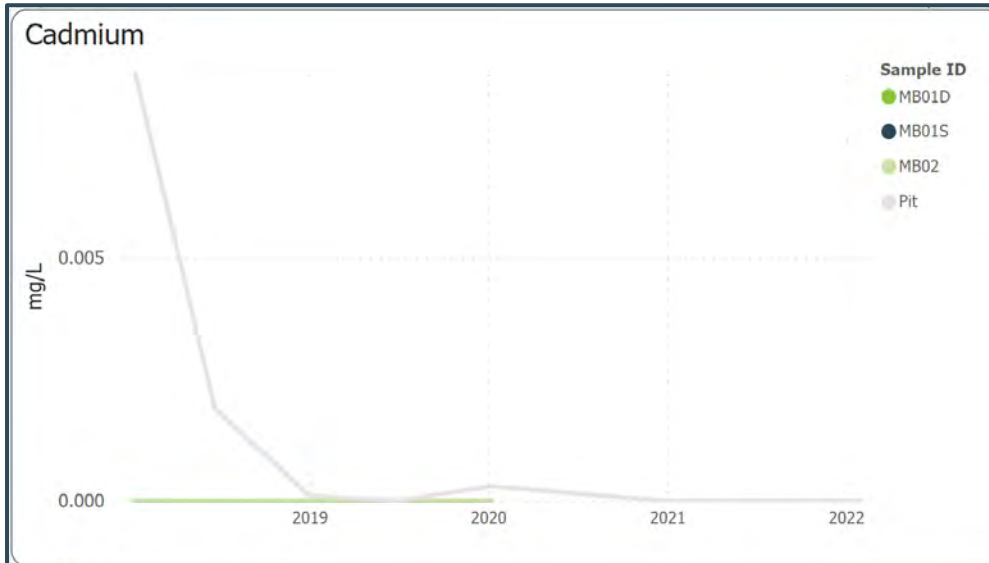


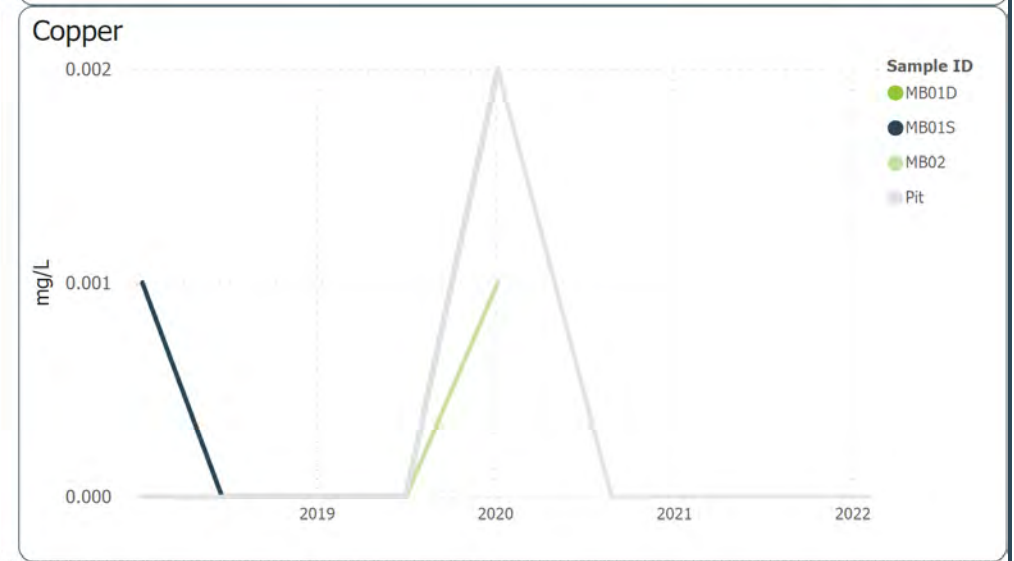
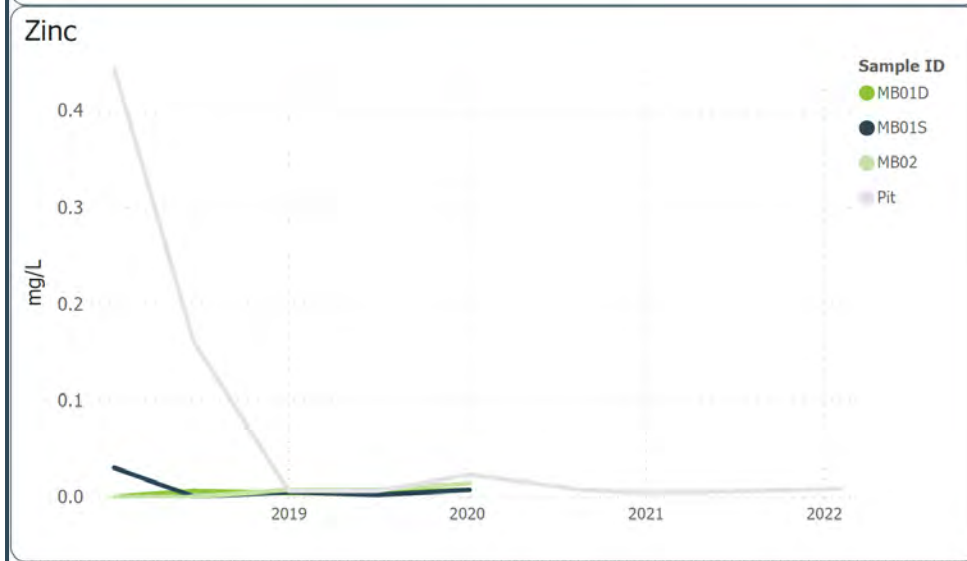
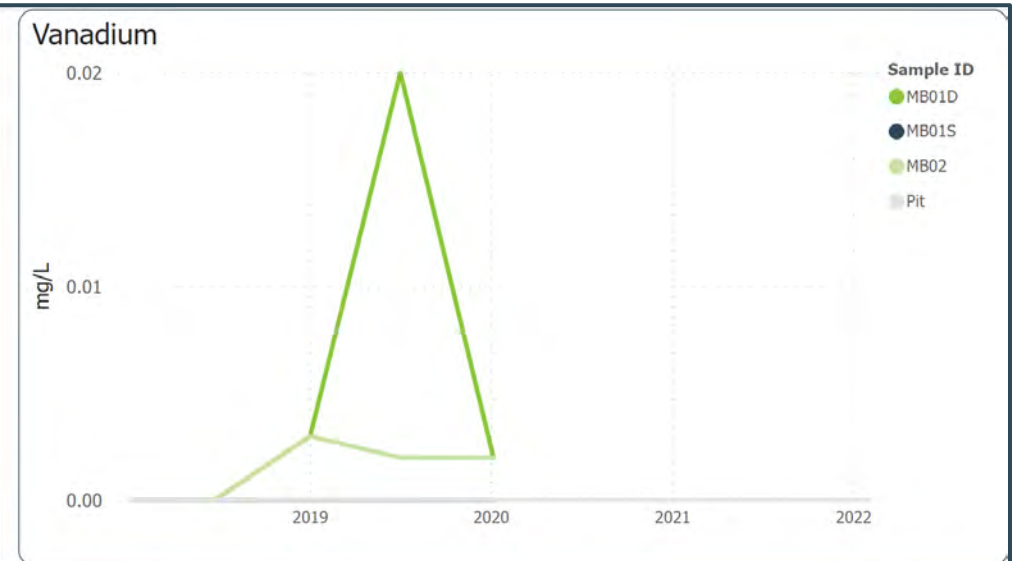
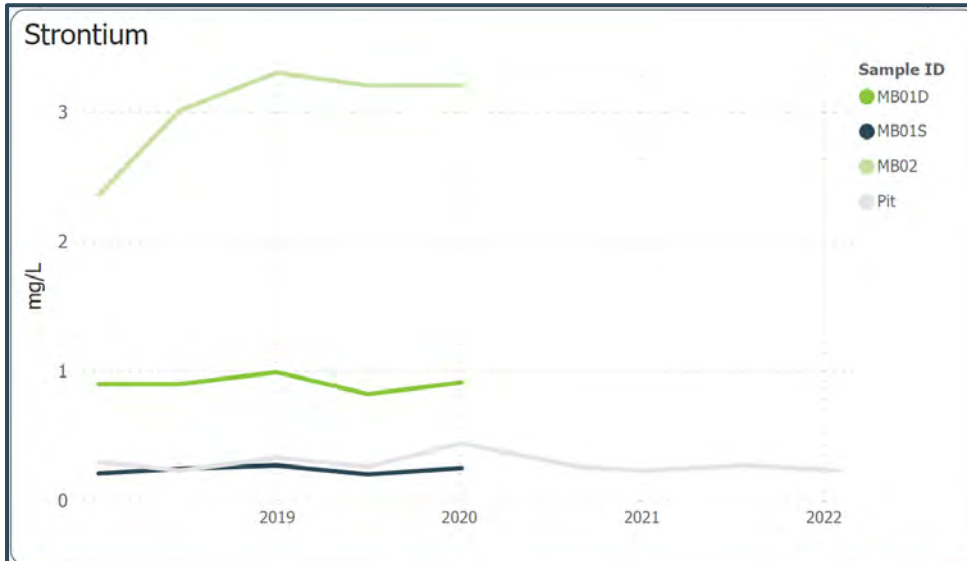












7.2.4 Interpretation of Groundwater Results

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 rose approximately 0.4m between the July 2021 monitoring event and the February 2022 monitoring event. Most of the observed rise occurred between November 2021 and February 2022. Several brief spikes in water level are apparent and correspond to rainfall events.

The water level within MB01D fell approximately 0.8m in the period July 2021 to October 2021. Water levels rose approximately 0.9m between October 2021 and February 2022 finishing the monitoring interval slightly higher than the July 2021 monitoring round. Similar to MB01S, water level was observed to spike several times over the monitoring interval in response to rainfall events.

The water level within MB02 rose approximately 1.6m over the monitoring interval. Most of the observed increase occurred in the period December 2021 to February 2022. Similar to water levels within other monitoring bores, brief spikes were evident in MB02 corresponding to rainfall events.

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. Reported concentrations of filtered iron, nitrate and nitrite were the highest recorded, but were only marginally higher than previously reported concentrations.

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 February 2021 monitoring report, as reproduced below.

Table 27. 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

Monitoring Event	Change in water Level	Description of Pit Conditions	Estimate of Groundwater Inflow
15-16 February 2022	No change observed	Pit floor approximately 6900m ² . Pit floor covered by water.	-
23-24 May 2022	No change observed	Pit floor approximately 6900m ² . Pit floor covered by water.	-

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 28. 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

Rehabilitation planting and maintenance was undertaken in August 2021 by Skillset Land Works. 140 new native plants were installed on the site across Yorkies Stockpile and Western Boundary revegetation zones. 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. The report is included in [Appendix N](#).

9 Community

There was one complaint 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 29. Complaints Summary

Review Period	Details	Action	Where Addressed in Report
2015-2016	No complaints	N/A	N/A
2016-2017	No complaints	N/A	N/A
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

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 are included in [Appendix P](#). These details are also included in the relevant sections in this report.

Table 30. Summary of Notifications in Report Period

Description	Condition	Date of Incident	Material Harm caused or threatened?	Non-compliance	Authority Notification	Site Action
Operations outside of hours	Sched 3 Cond 1	15/10/2021 22:06	No	Yes	29/10/21. Letter from DPIE dated 1/11/21: the report was being investigated. Letter from EPA dated 8/11/21: no further action required.	Software installed on weighbridge to prevent re-occurrence
pH exceedance of limit	Sched 3 Cond 16 L2.4 EPL	8/12/2021 (8.6) 16/12/21 (8.6)	No – pH of receiving environment unchanged	Yes	20/12/2021. DPIE requested information: RFI-34114058; submitted 17/1/22; letter from DPIE dated 28/2/22 requests update in Annual Review (Section 7.1). EPA letter dated 31/1/22 requested further information.	pH to be tested on site using a calibrated pH meter prior to discharge
Controlled discharge	L2.6 EPL	March 2022	No Allowable under EPL conditions	No Allowable under EPL conditions	21/3/22. DPIE EPA letter dated 25/3/22: no non-compliance, no further action	No further action
Ash and Combustible Matter results not available	Sched 3 Cond 10	May 2022	No There was no exceedance of criteria	No Insoluble Matter was tested and was compliant. Ash and Combustible Matter not required	30/5/22. DPIE letter dated 2/6/22: requesting update in Annual Review (Section 6.4.1)	Lab states that oven was placed out of service. No further action

10.2.1 Operations Outside Hours

During a routine check of delivery dockets it was discovered that a load of material exited the site at 22:06 on Friday 15/10/2022, being outside the consented closing time of 22:00. A subsequent investigation discovered that there was a greater than 30 minute delay in loading the vehicle, therefore the normal lock-out time of 21:30 was not enough to ensure the truck was loaded and exited before the 22:00 close. The actions following the investigation entailed installing a software patch to the weighbridge system ensuring that no docket could be issued after 22:00, effectively aborting the loading process. A full report regarding this issue was supplied to the DPE and EPA on 29th October. As there was no material harm caused to the environment, this non-compliance was not deemed an incident. Correspondence regarding this non-compliance is included in [Appendix P](#).

10.2.2 pH Exceedance

Following 45mm of rainfall, controlled discharges were made between 7th and 16th December 2021. A review of the results from site EPL 10 (Dam 4) discovered that on the 8th and the 16th of December the pH was 8.6 (0.1 higher than the limit of 8.5). All tests on days before and after the 8th and 16th, as well as all downstream tests showed no non-compliances. A graph of the results for December is given below and full details are given in the correspondence in [Appendix P](#). No material harm was caused, as evidenced by the compliant results from the downstream monitoring site.

Graph 11. pH Results for December 2021



10.2.3 Depositional Dust Result May 2022

The Ash and Combustible Matter results for May 2022 were not available due to faulty equipment in the laboratory. The Insoluble Solids results were not affected. The Ash and Combustible Matter analytes are not required by either the SSD or EPL conditions, and this is therefore not a non-compliance or incident, however the DPE and EPA were notified on the 30th May 2022. (see correspondence in [Appendix P](#)). No further action was required.

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 was dated 11/10/2021, and is included in [Appendix P](#).

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

Table 31. Actions Proposed in last Report Period

Proposal	Where Addressed
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 It is anticipated that the offsetting obligations of the Stage 2 Project will be satisfied by December 2022.
Ongoing management of the priority weed infestations to suppress the spread of these weeds into good quality vegetation surrounding the quarry. Care will 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	Section 6.9.1.1
A control program for feral animals will continue to be undertaken to ensure fox, rabbit and goat numbers do not increase at the site. A particular focus should be taken on containing the growing goat population, as animal grazing on silver-leaved mountain gums has notably increased in comparison to the previous monitoring survey	Section 6.9.1.2 Program to continue.
Controlled burn-off will be undertaken in conjunction with RFS is conditions are suitable.	Section 6.8 This did not occur due to wet conditions.
A Community Open Day may occur if COVID-19 restrictions permit.	Section 9 Open Day did not occur.
Commission and undertake monitoring of intersection performance at the Jenolan Caves Road and Great Western Highway intersection. Results to be provided to RMS.	Section 5.2.2 Report has been issued to RMS and comments are in the process of being addressed.
Consult with EPA on whether EPL Point 3 requires an alternative location in the event of unsafe sampling conditions, as experienced in March 2021.	EPA advised in Jan 22 that a variation application should be submitted via the eConnect portal in due course. (Appendix P)

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.
- 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.
- Controlled burn-off will be undertaken in conjunction with RFS if conditions are suitable.
- 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.
- Assuming the determination of the proposed modification in by the end of 2022, Hy-Tec would seek to satisfy its biodiversity offsetting obligations during the next reporting period. Should the modification be approved, this would include the Stage 1 offsetting requirements and all credits relating to the silver-leaved mountain gum.

Appendix A

Compliance Tables

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2021 - 30th June 2022

DA Conditions: SSD 6084 Mod 1

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		3		See Table Below
Not Triggered		13		
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 15/10/21 and Sched 3 cond 16 on 8/12/21 and 16/12/21.
	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	Details of DPIE request for further information on incidents in section 10.1
	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 15th September 2016	
	6	The Applicant must not extract extractive materials below a level of 685 m AHD.	Compliant	See Figures 3 and 4
	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	Appendix P
	17 b)	Include a copy of this data in the Annual Review (see condition 4 of Schedule 5).	Compliant	Appendix P

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2021 - 30th June 2022

DA Conditions: SSD 6084 Mod 1

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										
	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											
	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 • Processing operations • Overburden Management • Stockpile Management</td> <td>• 6 am to 10 pm Monday to Friday; • 6 am to 3 pm Saturday; and • At no time on Sundays or public holidays.</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; • 5 am to 3 pm Saturdays; and • 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 • Processing operations • Overburden Management • Stockpile Management	• 6 am to 10 pm Monday to Friday; • 6 am to 3 pm Saturday; and • At no time on Sundays or public holidays.	• Blasting	• 10 am to 3 pm Monday to Friday (except public holidays).	• Loading and dispatch	• 4 am to 10 pm Monday to Friday; • 5 am to 3 pm Saturdays; and • At no time on Sundays or public holidays.	• Maintenance	• Anytime.	1 Non Compliance Loaded truck left site at 10:06 pm on 18/10/21.	Section 5.4 and 10.2.1
Activity	Permissible Hours													
• Extraction operations • Processing operations • Overburden Management • Stockpile Management	• 6 am to 10 pm Monday to Friday; • 6 am to 3 pm Saturday; and • At no time on Sundays or public holidays.													
• Blasting	• 10 am to 3 pm Monday to Friday (except public holidays).													
• Loading and dispatch	• 4 am to 10 pm Monday to Friday; • 5 am to 3 pm Saturdays; and • At no time on Sundays or public holidays.													
• Maintenance	• Anytime.													
	2 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)_{L_{Aeq}(15 min)}</th> <th>Evening dB(A)_{L_{Aeq}(15 min)}</th> <th>Morning Shoulder dB(A)_{L_{Aeq}(15 min)}</th> <th>Morning Shoulder (Sleep Disturbance) L_{A max}</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) _{L_{Aeq}(15 min)}	Evening dB(A) _{L_{Aeq}(15 min)}	Morning Shoulder dB(A) _{L_{Aeq}(15 min)}	Morning Shoulder (Sleep Disturbance) L _{A max}	All privately-owned residences	35	35	35	52	Compliant	Section 6.2
Receiver	Day dB(A) _{L_{Aeq}(15 min)}	Evening dB(A) _{L_{Aeq}(15 min)}	Morning Shoulder dB(A) _{L_{Aeq}(15 min)}	Morning Shoulder (Sleep Disturbance) L _{A max}										
All privately-owned residences	35	35	35	52										
	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 2021, March 2022.	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											

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2021 - 30th June 2022

DA Conditions: SSD 6084 Mod 1

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 c)	describe the measures that would be implemented to ensure: <ul style="list-style-type: none"> <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																						
	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" style="margin-top: 10px;"> <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></td> <td>120</td> <td>10</td> <td>0%</td> </tr> <tr> <td>Any residence on privately-owned land</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		120	10	0%	Any residence on privately-owned land	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																						
	120	10	0%																						
Any residence on privately-owned land	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"> <input type="checkbox"/> protect the safety of people and livestock in the areas surrounding blasting operations; <input type="checkbox"/> protect public or private infrastructure/property in the surrounding area from damage from blasting operations and <input type="checkbox"/> 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" style="margin-top: 10px;"> <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																							
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Particulate matter < 2.5 µm (PM _{2.5})	Annual	a,d 8 µg/m ³																							
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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																					

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2021 - 30th June 2022

DA Conditions: SSD 6084 Mod 1

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
	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
	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	2 Non-compliances: pH of discharge was 8.6 on both 8 & 16/12/21.	Section 7.2 and 10.2.2
	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	
	20 b)	be prepared in consultation with the EPA, DoI and Water NSW;	Compliant	
	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;	Compliant	
	20 d)	include a: <ol style="list-style-type: none"> Site Water Balance ; Surface Water Management Plan, Groundwater Management Plan, Surface and Ground Water Contingency Strategy. The Applicant must implement the Water Management Plan as approved by the Secretary. 	Compliant WMP first submitted 15/6/16. V11 approved 23/8/19	
	21	The Applicant must keep accurate records of all laden truck movements to and from the site (hourly, daily, weekly, monthly and annually) and publish a summary of records on its website every 6 months.	Compliant	Section 5.2 and https://www.hytec.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	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2021 - 30th June 2022

DA Conditions: SSD 6084 Mod 1

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															
	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																
	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>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.</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 The retirement of credits has been deferred until 31 December 2021 in agreement with the DPIE.	
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																	
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	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 																		
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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																

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DA Conditions: SSD 6084 Mod 1

Compliant

Non Compliant

Non-compliance

Not Triggered

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Schedule	Condition	Condition Text	Details of compliance status at 30/6/2022	Where addressed in Annual Review
	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: <ul style="list-style-type: none"> <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	
	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 (Eucalyptus pulverulenta) (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	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2021 - 30th June 2022

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Schedule	Condition	Condition Text	Details of compliance status at 30/6/2022	Where addressed in Annual Review
	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	Not Triggered Mod 3 is underway and will require a review of the Rehabilitation Bond. The retirement of credits has been deferred until 31 December 2021 in agreement with the DPIE.	
	31 c)	performance of the implementation of any land based offset and rehabilitation of the site to date.	Not Triggered Mod 3 is underway and will require a review of the Rehabilitation Bond. The retirement of credits has been deferred until 31 December 2021 in agreement with the DPIE.	
	32	The Applicant must implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts of the development to the satisfaction of the Secretary.	Compliant	Section 6.6
	33 a)	The Applicant must manage on-site sewage treatment and disposal in accordance with the requirements of its EPL, and to the satisfaction of the EPA and Council;	Compliant	
	33 b)	minimise the waste generated by the development;	Compliant	
	33 c)	ensure that the waste generated by the development is appropriately stored, handled, and disposed of; and	Compliant	
	33 d)	report on waste management and minimisation in the Annual Review, to the satisfaction of the Secretary	Compliant	Section 6.7
	34	Except as expressly permitted in an EPL, the Applicant must not receive waste at the site for storage, treatment, processing, reprocessing or disposal.	Compliant None received	
	35	The Applicant must ensure that all tanks and similar facilities for storage of liquids (other than for water) are protected by appropriate bunding, which must exceed 110% of the stored volume of the liquid.	Compliant	
	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 pH exceedance notified to DPIE (land owner of Creek is Crown)	
	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	

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Schedule	Condition	Condition Text	Details of compliance status at 30/6/2022	Where addressed in Annual Review
	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	
	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 2021 Review submitted 29/9/21, approved 11/10/21	
	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: <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 4 notifications regarding 5 issues: 3 non-compliances, no incidents (ie no material harm caused or threatened)	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: (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 by AQUAS July 2020. Next audit due 2023.	
	8 b)	include consultation with the relevant agencies;	Compliant	

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2021 - 30th June 2022

DA Conditions: SSD 6084 Mod 1

Compliant

Non Compliant

Non-compliance

Not Triggered

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Schedule	Condition	Condition Text	Details of compliance status at 30/6/2022	Where addressed in Annual Review
	8 c)	assess the environmental performance of the development and whether it is complying with the relevant requirements in this consent and any relevant EPL or necessary water licences for the development (including any assessment, strategy, plan or program required under these approvals);	Compliant	
	8 d)	review the adequacy of strategies, plans or programs required under the abovementioned approvals;	Compliant	
	8 e)	recommend appropriate measures or actions to improve the environmental performance of the development, and/or any assessment, strategy, plan or program required under the abovementioned approvals; and	Compliant	
	8 f)	be conducted and reported to the satisfaction of the Secretary	Compliant	
	9	Within 6 weeks of completion of this audit, or as otherwise agreed by the Secretary, the Applicant must submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report.	Compliant	
	10 a)	Within 6 months of the date of this consent, the Applicant must : (a) make the following information publicly available on its website: <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 2021 - 30th June 2022

DA Conditions: SSD 6084 Mod 1- Appendix 3 Statement of Commitments

Compliant

Non Compliant

Non-compliance

Not Triggered

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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	Section 10.2, 7.1, 5.4
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 2021 - 30th June 2022

DA Conditions: SSD 6084 Mod 1- 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 2021 - 30th June 2022

DA Conditions: SSD 6084 Mod 1- 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 2021 - 30th June 2022

DA Conditions: SSD 6084 Mod 1- 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 2021 - 30th June 2022

EPL12323

Compliant

Non Compliant

Non-compliance

Not Triggered

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Schedule	Condition	Condition Text	Details of compliance status	Where addressed in Annual Review
Compliance Summary		Number of Conditions Non-compliant		
Non Compliant		2	See Table Below	See Table Below
Not Triggered		Nil		

General

A	1.1	This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation. Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition. Scheduled Activity Fee Based Activity Scale > 500000 - 2000000 T annual capacity to extract, process or store	Compliant																																				
	2.1	The licence applies to the following premises: Premises Details AUS-10 QUARRY 391 JENOLAN CAVES ROAD HARTLEY NSW 2790 LOT 1 DP 1005511, LOT 2 DP 1005511, LOT 31 DP 1009967	Compliant																																				
	3	Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence. In this condition the reference to "the licence application" includes a reference to: a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.	Compliant																																				
P	1.1	The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.	Compliant																																				
		<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												
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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																																					
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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 2021 - 30th June 2022

EPL12323

Compliant

Non Compliant

Non-compliance

Not Triggered

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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	Non Compliant pH 8.6 on 2 occasions in Dec 2021	Section 7.2 and Section 10.2
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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																									
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	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.	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.	Non-Compliant Loaded truck left site at 22:06 15/10/21	Section 5.2 and Section 10																								
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																									

Hy-Tec Industries Austen (Hartley) Quarry Conditions Compliance Summary 1st July 2021 - 30th June 2022

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	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																									
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	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 2021 - 30th June 2022

EPL12323

Compliant

Non Compliant

Non-compliance

Not Triggered

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Schedule	Condition	Condition Text	Details of compliance status	Where addressed in Annual Review																														
	4.2	The record must include details of the following: a) the date and time of the complaint; b) the method by which the complaint was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; d) the nature of the complaint; e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the licensee, the reasons why no action was taken.	Compliant																															
	4.3	The record of a complaint must be kept for at least 4 years after the complaint was made.	Compliant																															
	4.4	The record must be produced to any authorised officer of the EPA who asks to see them.	Compliant																															
	5.1	The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.	Compliant																															
	5.2	The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.	Compliant																															
	5.3	The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.	Compliant																															
	6.1	For each discharge point or utilisation area specified below, the licensee must monitor: a) the volume of liquids discharged to water or applied to the area; b) the mass of solids applied to the area; c) the mass of pollutants emitted to the air;	Compliant																															
		POINT 11,8,9,10,1 <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																									
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	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	
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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 2021 - 30th June 2022

EPL12323

Compliant

Non Compliant

Non-compliance

Not Triggered

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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 2021 - 30th June 2022

WAL Conditions

Compliant

Non Compliant

Non-compliance

Not Triggered

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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 2021 - 30th June 2022

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 2021 - 30th June 2022

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 2021 - 30th June 2022

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.

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 2021 - 30th June 2022

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		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

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DEFINITIONS

<p>AHD Annual Review Applicant</p> <p>BCA</p> <p>BC Act BCT</p> <p>Conditions of consent Conservation Area H</p> <p>Construction</p> <p>Council</p> <p>Day</p> <p>Department Development</p> <p>Dol DRG</p> <p>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>
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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

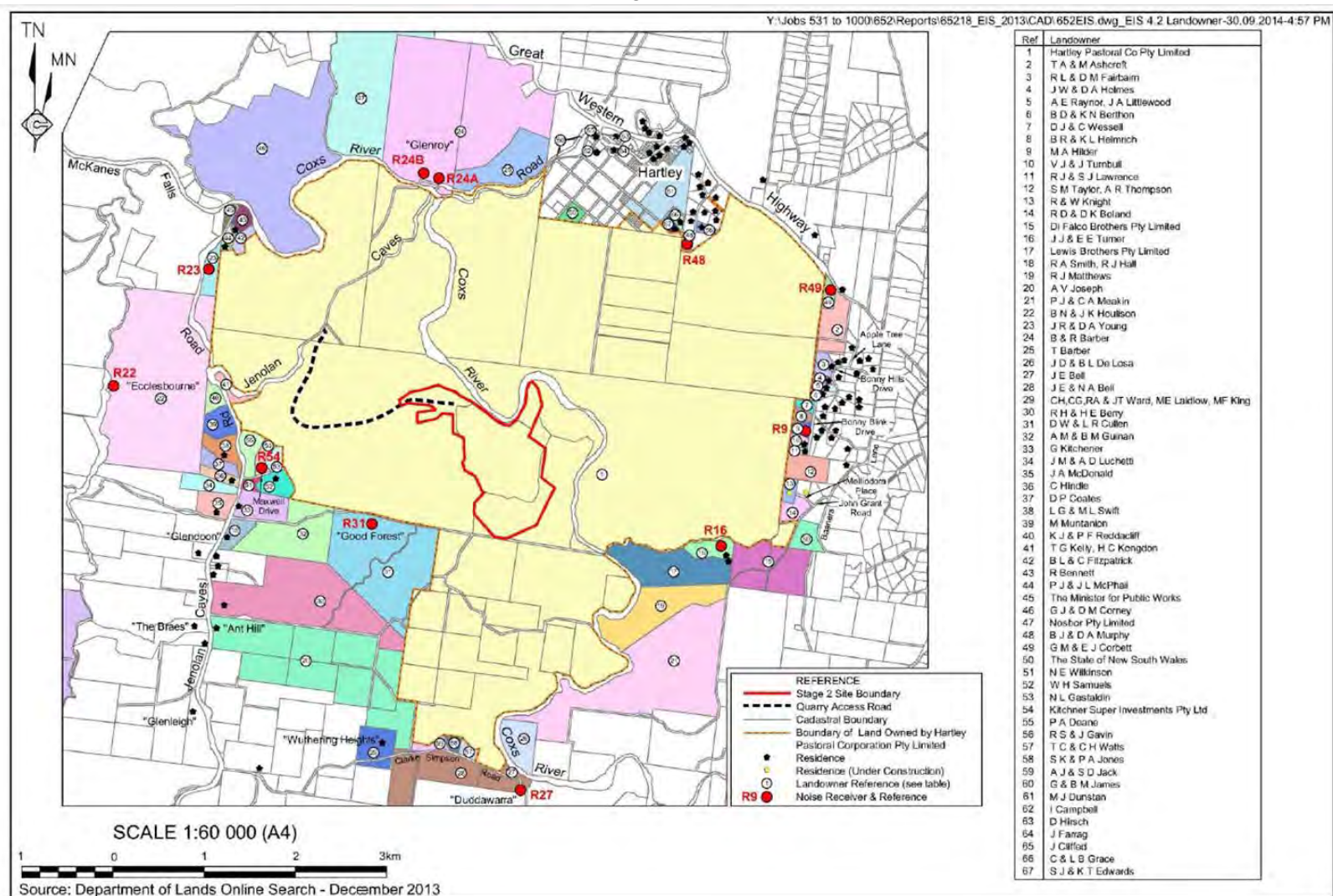


Figure 1: Development Area and nearby residences

APPENDIX 2 DEVELOPMENT LAYOUT

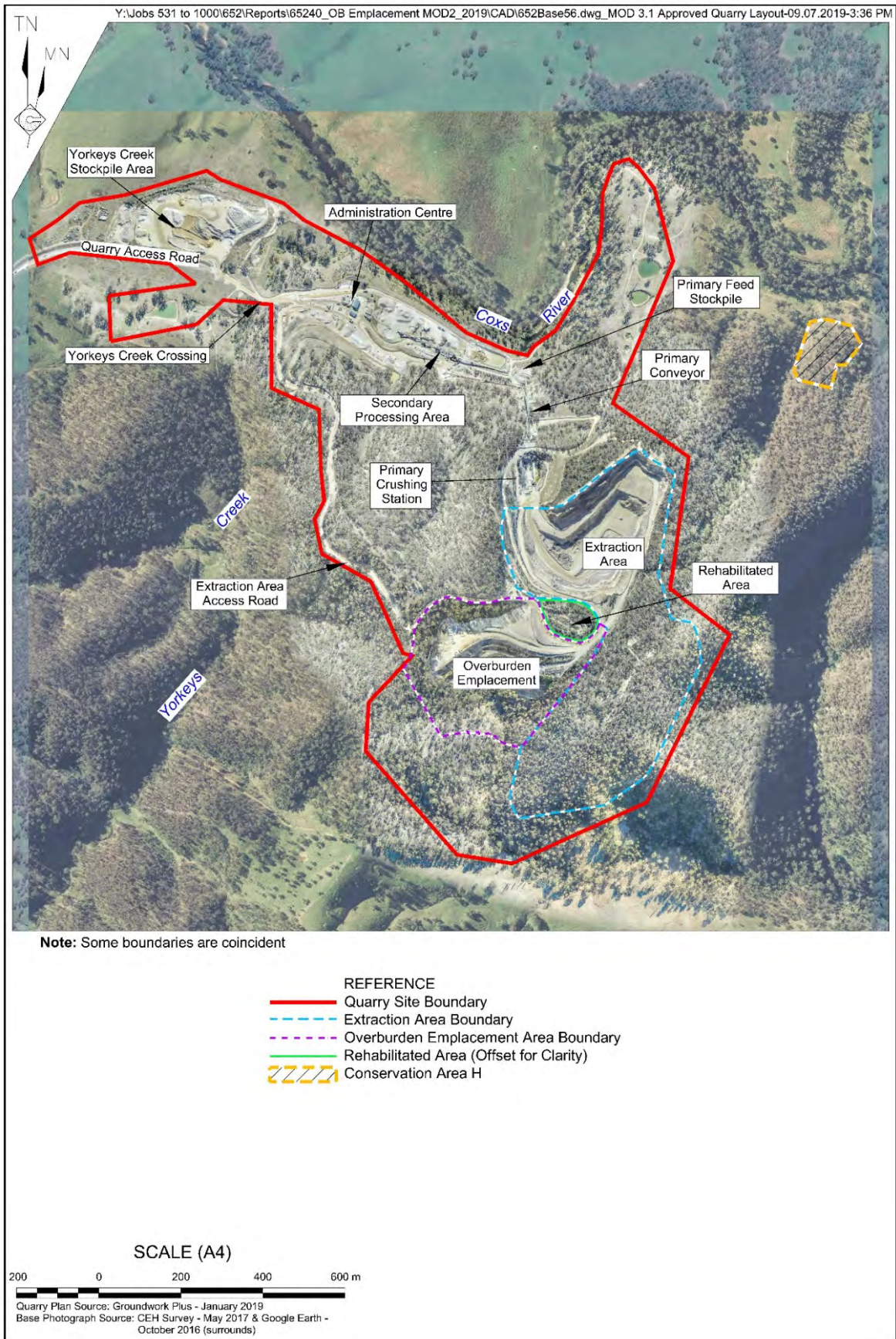


Figure 2: Development Layout of Austen Quarry and Conservation Area H

**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**

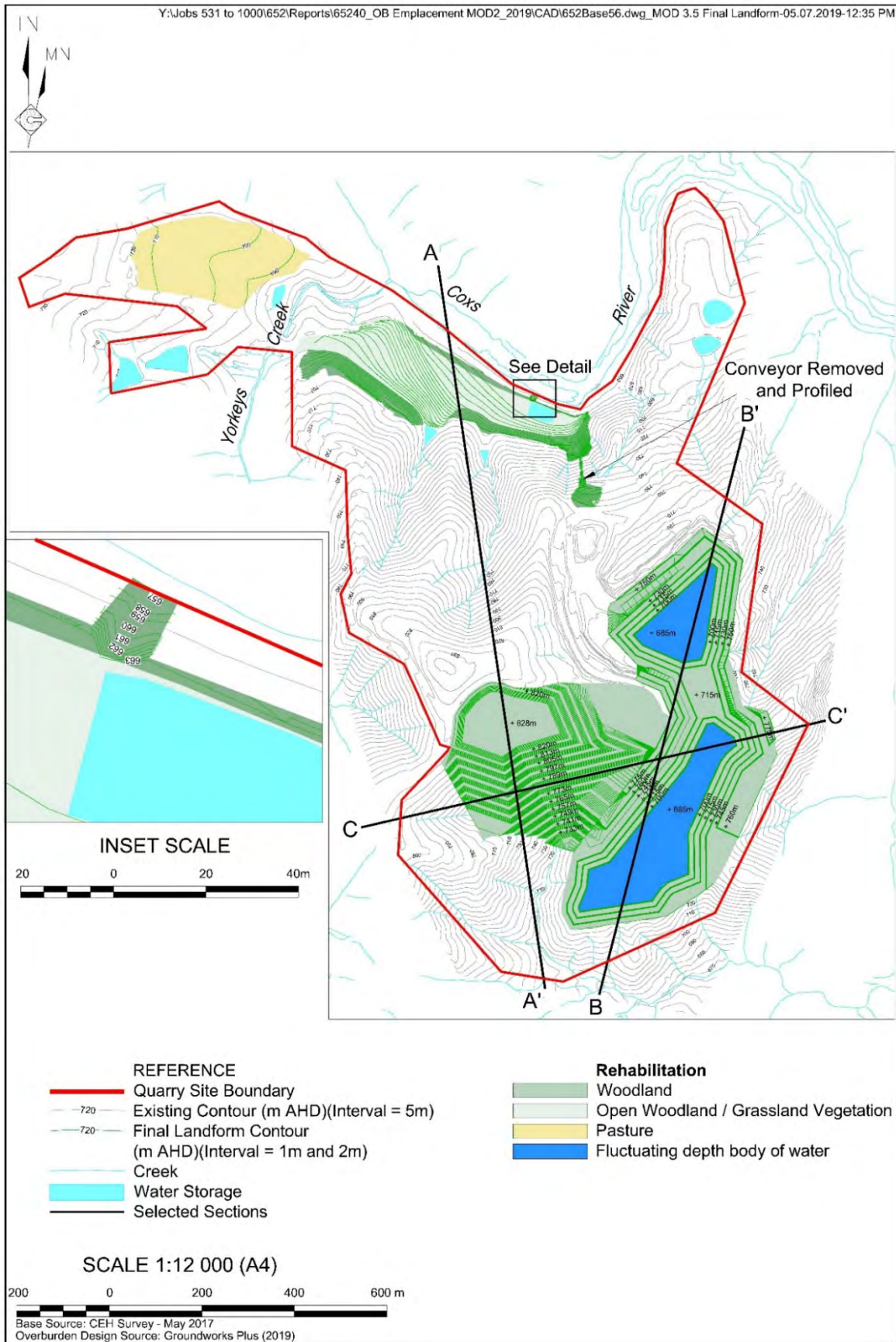


Figure 3: Conceptual Final Landform aerial view

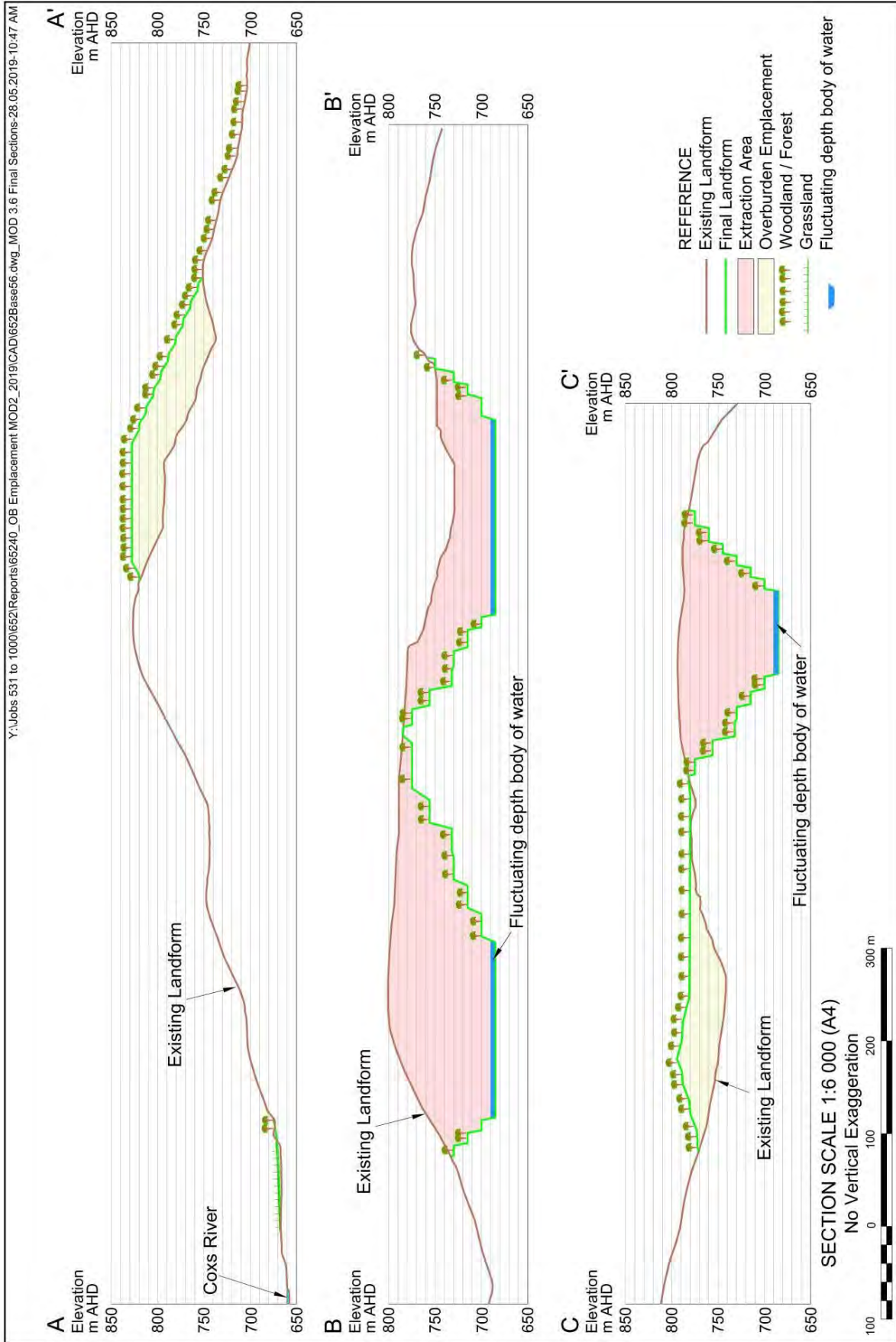


Figure 4: Conceptual Final Landform cross section view

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	Scale
Land-based extractive activity	> 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

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Environment Protection Licence

Licence - 12323



Information about this licence

Dictionary

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

Responsibilities of licensee

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

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

Variation of licence conditions

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

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

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

Duration of licence

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

Licence review

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

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

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

Environment Protection Licence



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

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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:

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- 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,

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

Note: The *Protection of the Environment Operations (Clean Air) Regulation 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:
- a) the date and time of the complaint;
 - b) the method by which the complaint was made;
 - c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
 - d) the nature of the complaint;
 - e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
 - f) if no action was taken by the licensee, the reasons why no action was taken.
- M4.3 The record of a complaint must be kept for at least 4 years after the complaint was made.
- M4.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M5 Telephone complaints line

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- 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

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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').

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- 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

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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.

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Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the <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

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flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the 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> .

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

Mr Darryl Clift

Environment Protection Authority

(By Delegation)

Date of this edition: 01-July-2005

Environment Protection Licence

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End Notes

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

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

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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.

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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

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Appendix E

EPBC Approval and Compliance Audit



Austen Quarry (EPBC Approval 2013/6967) – Review of Compliance 2020/2021 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 (forthcoming), 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</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</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</p>





		Biodiversity Offset Management Plan (BOMP) and the Landscape and Rehabilitation Management Plan (RLMP) (required under SSD 6084).	this, the area has been the 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.	of the Silver-leaved Mountain Gum to be incorporated into one plan. Once the Biodiversity Offset Strategy for the Silver-leaved Mountain Gum has been approved, an update to Silver-leaved Mountain Gum management would be incorporated into the relevant plan and submitted to DAWE 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 5.9 of the Annual Review for the Austen Quarry (1 st July 2019 to 30 th June 2020). 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





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 5.9.2 of the Annual Review for the Austen Quarry (1 st July 2019 to 30 th June 2020).	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 Management Plan (BOMP) for the proposed Offset Area, for the Ministers	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 would be 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 submitted. Once the Biodiversity Offset Strategy





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.	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 DAWE 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.	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 condition of the ecological communities on the site;	Yes	See Section 3 of the BOMP	None	No action required





COMPLIANCE AUDIT 2020/2021

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Austen Quarry – Stage 2 Extension Project

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 5.9.2 of the Annual Review for the Austen Quarry (1 st July 2019 to 30 th June 2020).	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	None	No action required





		Extension Project commenced on 6 April 2017.		
<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. 	Not Yet Required	The biodiversity offsetting arrangements for the Austen Quarry Stage 2 development will be the subject of a modification to SSD 6084 (MOD3). The offsetting arrangement are yet to be finalised and therefore this condition is not yet able to be satisfied.	<p>Once the proposed modification to SSD 6084 (MOD3) has been determined, an update to the Biodiversity Offset Strategy would be submitted to DAWE 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>	Notice of satisfaction of the offsetting obligations of the Stage 2 Project would be submitted to DAWE within 3 months of it becoming available.
<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>	No	The action commenced on 6 April 2017. No correspondence notifying the Department of the Environment and Energy of the commencement date can be located.	This is an historical non-compliance that has been noted in previous audits of EPBC Approval 2013/6967.	No action is possible for this condition





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Austen Quarry – Stage 2 Extension Project

<p>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.</p>	<p>Yes</p>	<p>A rehabilitation and revegetation monitoring check list for monitoring of all planting activities is implemented and retained.</p>	<p>Hy-Tec has planted over 4,000 SLMG within rehabilitation areas of the Quarry since the commencement of 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).</p>	<p>No action required</p>
<p>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.</p>	<p>Yes</p>	<p>This audit</p>	<p>None</p>	<p>No action required</p>
<p>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.</p>	<p>Noted</p>	<p>None</p>	<p>One historic non-compliance issue has been identified as a result of this review. Given this non-compliance has previously been notified to</p>	<p>No action required</p>





			DAWE, 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. Hy-Tec is currently preparing a further modification to SSD 6084 to finalise its offset strategy. Once the proposed modification to SSD 6084 (MOD3) has been determined, an application to vary EPBC Approval 2013/6967 would be submitted 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, the Minister may request that the approval holder make specified	Noted	None	None	No action required





COMPLIANCE AUDIT 2020/2021

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Austen Quarry – Stage 2 Extension Project

<p>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>	<p>Noted</p>	<p>The action was substantially commenced on 6 April 2017.</p>	<p>None</p>	<p>No action required</p>
<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>	<p>Yes</p>	<p>The SLMGMP and the BOMP are available from the Hy-Tec website under the Quarry Documentation section. https://www.hy-tec.com.au/quarry-documentation</p>	<p>None</p>	<p>No action required</p>



Appendix F Intersection Performance Monitoring Report

Our Ref: 22051

15 June 2022

Hy-Tec

By email: Darryl.Thiedeke@adbri.com.au

Attention: Mr Darryl Thiedeke

Dear Darryl,

**RE: AUSTEN QUARRY
TRAFFIC MONITORING AT THE JENOLAN CAVES ROAD AND GREAT WESTERN HIGHWAY
INTERSECTION**

TTPP prepared a road transport assessment in 2017 on behalf of Hy-Tec to modify the Development Consent SSD to increase the annual transport of quarry products and increase the average daily laden trucks from the site.

Austen Quarry's operation is required to comply with following condition:

Schedule 3, Condition 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".

This traffic statement outlines the methodology of traffic survey and compares the intersection performance in 2017 and 2022, in response to the above condition.

Methodology

The following methodology was adopted for collecting traffic data and traffic modelling as part of the traffic monitoring:

- Reviewed the weighbridge data recorded at the Hy-Tec site exit for the average and maximum daily number of truckloads between June 2021 and December 2021 and compared with the maximum allowed daily truckloads.

- TTPP commissioned an intersection count, queue length survey and movement delay survey at the Great Western Highway / Jenolan Caves Road intersection on Wednesday 11 May 2022 in the morning peak period (6:30am-9:30am) and afternoon peak period (3:30pm to 6:30pm). The purpose was to establish the existing traffic conditions in SIDRA modelling.
- Develop a SIDRA model based on the surveyed traffic volume, queue length, movement delay and the current intersection layout.
- Compare the 2017 and 2022 SIDRA modelling results.

Daily Truckload

According to the weighbridge data recorded at the Austen Quarry exit between 1 July 2021 and 31 December 2021, there were on average 104 truckloads per day on weekdays and 42 truckloads on Saturday as shown in Table 1. The maximum was 201 truckloads that occurred for one day in September 2021.

Table 1: Daily Truckload on Weighbridge between 1 July 2021 and 31 December 2021

Day	Average Daily Truckloads
Monday	109
Tuesday	112
Wednesday	108
Thursday	106
Friday	87
Saturday	42
Sunday	NIL
Average Weekday	104

This level of daily truckload is well below the maximum 300 truckloads per day and average 200 truckloads based on the currently approved production limit of 1.6Mt per annum.

The weighbridge data indicates that the average daily truckloads are similar between Monday and Thursday within the range of 106 to 112 daily truckloads, and lower average daily truckloads on Fridays (87 truckloads) and Saturdays (42 truckloads).

On this basis, the traffic surveys undertaken at the Great Western Highway / Jenolan Caves Road intersection on a Wednesday (11 May 2022) is representative for the purposes of SIDRA modelling given the hourly traffic volume would be similar during the AM and PM peak hours on any given weekdays, except for Friday.

2017 and 2022 Traffic Volumes

Table 2 provides a comparison of the traffic flows at the Great Western Highway / Jenolan Caves Road intersection on Thursday 16 February 2017 and Wednesday 11 May 2022.

The peak hours are determined to be the same as follows on both survey days:

- AM Peak (8:15-9:15am)
- PM Peak (3:30-4:30pm).

Table 2: Traffic Flows in 2017 and 2022

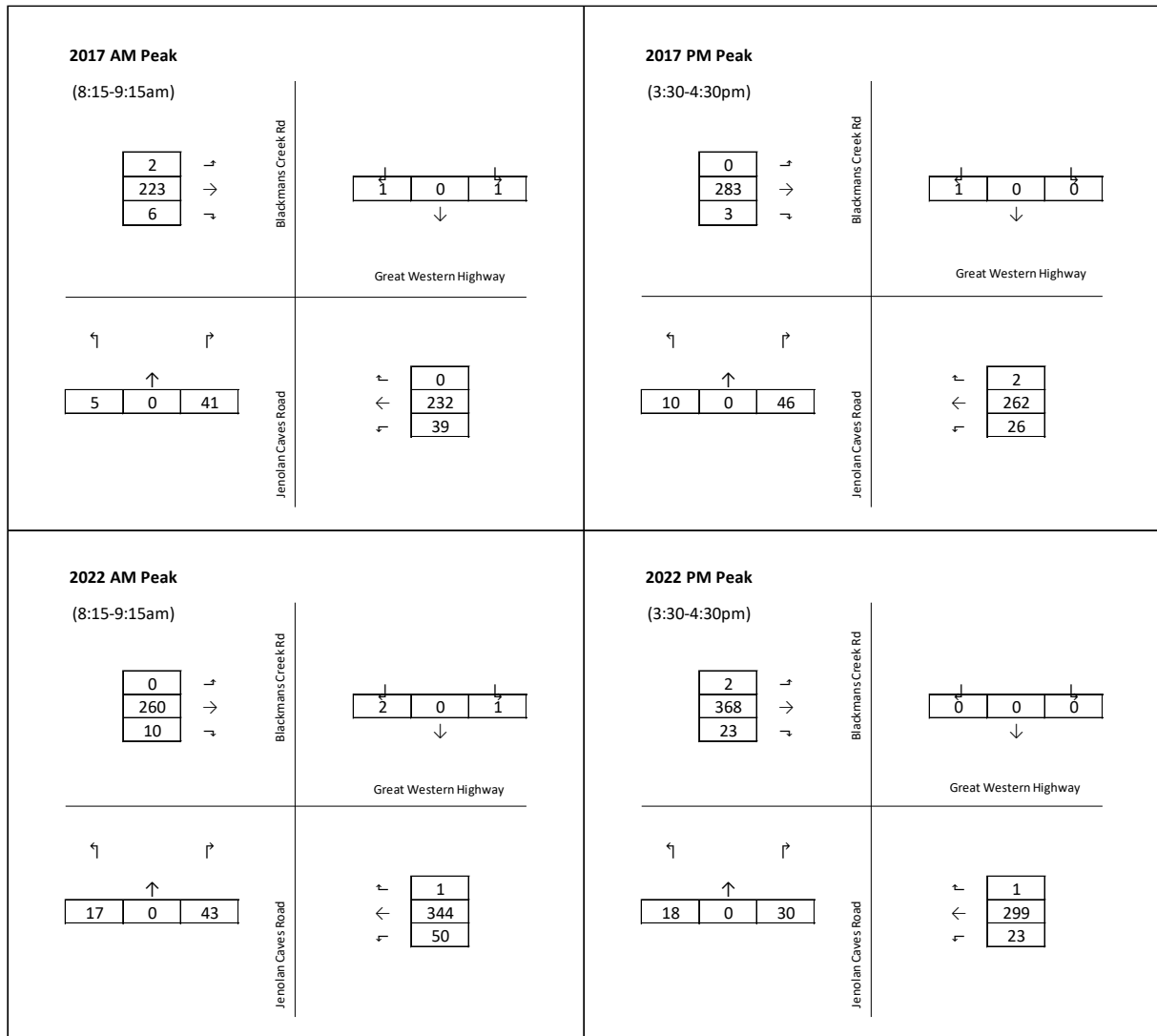
Peak Hour	Road Section	2017			2022			Difference		
		NB/EB	SB/WB	2-Way	NB/EB	SB/WB	2-Way	NB/EB	SB/WB	2-Way
AM Peak (8:15-9:15am)	Great Western Highway, east of Jenolan Caves Road	265	271	536	304	395	699	39	124	163
	Great Western Highway, west of Jenolan Caves Road	231	238	469	270	363	633	39	125	164
	Jenolan Caves Road, south of Great Western Highway	46	45	91	60	60	120	14	15	29
	Blackmans Creek Road, north of Great Western Highway	2	2	4	1	3	4	-1	1	0
PM Peak (3:30-4:30pm)	Great Western Highway, east of Jenolan Caves Road	329	290	619	398	323	721	69	33	102
	Great Western Highway, west of Jenolan Caves Road	286	273	559	393	317	710	107	44	151
	Jenolan Caves Road, south of Great Western Highway	56	29	85	48	46	94	-8	17	9
	Blackmans Creek Road, north of Great Western Highway	2	1	3	3	0	3	1	-1	0

Note: NB = northbound, EB = eastbound, SB = southbound and WB = westbound

While the recent traffic volume on Jenolan Caves Road is similar to that recorded in 2017 in the peak hours, the traffic volume on the Great Western Highway has increased by 125 vehicles in the westbound direction in AM peak hour and 107 vehicles in the eastbound direction in the PM peak hour.

Figure 1 shows the comparison of the 2017 and 2022 peak hour traffic volume at the Great Western Highway / Jenolan Caves Road intersection.

Figure 1: Intersection Traffic Volume in 2017 and 2022



SIDRA Modelling

TfNSW uses level of service (LoS) as a performance measure to indicate the operating efficiency of a given intersection. The level of service ranges from A to F. Level of service between A and D indicate the intersection is operating within capacity. With LoS A providing exceptionally good performance to LoS D indicating satisfactory performance, LoS E and F indicate the intersection is operating at or near capacity and generally would require intersection improvement works to maintain reasonable performance.

The level of service is directly related to the average delay experienced by vehicles travelling through the intersection. At signalised intersections, the average delay is the volume of weighted average delay over all movements. For roundabouts and priority (give way and stop sign) controlled intersections, the average delay relates to the movement with the highest average delay per vehicle.

Table 3 shows the criteria that TfNSW adopt in assessing the level of service at intersections.

Table 3: Intersection Level of Service Criteria

Level of Service (LoS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity; at signals incidents would cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode.
F	Greater than 70	Unsatisfactory, requires additional capacity	Unsatisfactory, requires other control mode or major treatment

The 2022 model has been calibrated based on the queue length survey and movement delay survey undertaken at the Great Western Highway / Jenolan Caves Road intersection to reasonably replicate the existing conditions in the AM and PM peak hours.

Table 4 shows the comparison of LoS of the Great Western Highway / Jenolan Caves Road intersection between February 2017 and May 2022.

Table 4: Intersection Performance in 2017 and 2022

Intersection	2017				2022			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay (sec/veh)	Level of Service	Delay (sec/veh)	Level of Service	Delay (sec/veh)	Level of Service	Delay (sec/veh)	Level of Service
Great Western Highway/ Jenolan Caves Road	25	B	21	B	30	C	27	B

As a result of the traffic increase on the Great Western Highway, the intersection currently operates at LoS C in the AM peak and LoS B in the PM peak, as opposed to LoS B in both peaks in 2017. The traffic increase on the Great Western Highway would leave less gaps in the traffic stream on the Great Western Highway, and hence increasing the average delay by up to six seconds for the turning movements at the intersection.

The worst movement in the AM peak is the right turn movement from Jenolan Caves Road to Great Western Highway with an average delay of 30 seconds (LoS C).

The worst movement in the PM peak hour is the right turn movement from Blackmans Creek Road to Great Western Highway with an average delay of 27 seconds (LoS B), followed by the right turn movement from Jenolan Caves Road to Great Western Highway with an average delay of 21 seconds (LoS B).

The intersection currently operates satisfactorily at LoS C or better in the peak hours, and would have spare capacity to accommodate for future traffic growth.

Summary and Conclusion

Austen Quarry is currently operating within the approved production limit with an average truckload of 104 trucks per day on weekdays and 42 trucks per day on Saturdays, based on the weighbridge data collected between 1 July 2021 and 31 December 2021. This is within the maximum 300 truckloads per day and average 200 truckloads in accordance with the currently approved production limit of 1.6Mt per annum.

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 C or better in the peak hours, with spare capacity to cater for the future traffic growth at the intersection.

Intersection performance would be monitored once every two years to meet the requirement for Schedule 3, Condition 22A of the approval.

We trust the above is to your satisfaction. Should you have any queries regarding the above or require further information, please do not hesitate to contact the undersigned on 8437 7800.

Yours sincerely,



Ken Hollyoak
Director

8/09/2022

WST08/00023/17 | SF2022/12017114

The Manager
RW Corkery & Co
62 Hill Street
ORANGE NSW 2800

Attention: Nick Warren

Dear Mr Warren,

SSD6084_ MOD 1: Austen Quarry, Lots 1 & 2 DP 1000511, Lot 31 DP 1009967 & Lot 4 DP 876394 DP816020; Jenolan Caves Road, Hartley -Intersection Monitoring

Thank you for the referral the Traffic Monitoring Report (dated 15 June 2022 -Ref 22051-L01v01-220615) (TMR) via the NSW Major Projects Portal inviting comment from Transport for NSW (TfNSW) in accordance with Schedule 3 Condition 22A of SSD6084.

TfNSW has reviewed the TMR and provides the following comments to be addressed in the plan.

1. The report provides details of the average truckloads and a single reference to a maximum number of daily truckloads without reference to the day of week the maximum occurred. Schedule 2 Condition 8 provides

“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. “

The report is to provide detail of compliance with parts (b) and (c) including addressing whether any exceedance occurred during the operation of the quarry from commencement of Mod 1 to the date of the report including distinction between any maximum truckload exceedance on weekdays separately to Saturday.

2. Schedule 3 Condition 21 requires the accurate record keeping of all laden truck movements including hourly, daily, weekly, monthly and annually. The TMR only reports truck movements for the period 1 July 2021 to 31 December 2021. The report is to clarify the period of operation of the Quarry in accordance with the Mod 1 approval and report on any exceedance during the period of operation.

If the period of operation exceeds the period reported justification for reporting truck movement for a six month period only is to be provided.

TfNSW looks forward to reviewing an amended version of the TMR addressing these points. If you wish to discuss this matter further, please contact the undersigned on 0417125741.

Yours faithfully

A handwritten signature in black ink, appearing to read 'H. Orr', written in a cursive style.

**Howard Orr
Team Leader
Development Services West
Regional and Outer Metropolitan**

Appendix G

Noise Monitoring Reports

Noise Monitoring Assessment

Austen Quarry, Hartley, NSW

August 2021

Document Information

Noise Monitoring Assessment

Austen Quarry, Hartley, NSW

August 2021

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

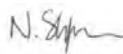

Prepared by: Muller Acoustic Consulting Pty Ltd

PO Box 678, Kotara NSW 2289

ABN: 36 602 225 132

P: +61 2 4920 1833

www.mulleracoustic.com

Document ID	Status	Date	Prepared By	Signed	Reviewed By	Signed
MAC170523RP10	Final	7 September 2021	Nicholas Shipman		Oliver Muller	

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APPENDIX C – NOISE MONITORING CHARTS

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1 Introduction

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

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

The assessment was conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- Environment Protection Licence EPL#12323;
- 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 undertaken on Tuesday 17 August 2021 and Wednesday 18 August 2021 and forms part of the noise monitoring program to address conditions of EPL#12323, Austen Quarry Development Consent SSD 6084 (SSD-6084) and the Noise Management Plan.

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

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2 Noise Criteria

2.1 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

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3 Methodology

3.1 Locality

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

3.2 Noise Monitoring Locations

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

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

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

3.3 Attended Monitoring Methodology

The attended noise surveys were conducted in general accordance with the procedures described in 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 17 August 2021 and Wednesday 18 August 2021. 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, undertaken at Location A - 200 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 from Tuesday 17 August 2021 to Wednesday 25 August 2021. 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.

A 60-second audio sample was recorded at the commencement of each 15-minute monitoring period to identify the dominant noise sources contributing to the ambient noise environment at that time. 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 transportation activities commence at 5am and 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 during that the primary crusher ceased operation at 11:05am on the 17 August 2021 due to a fault in the jaw crusher, halting crushing operations. 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 18 August 2021 to capture the onsite operations at the nominated monitoring locations.

It is also noted that the secondary crushing ceased 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	Ceased Crushing	Commenced Crushing	Ceased Crushing
17/08/2021	06:55	16:05	06:05	16:30
18/08/2021	Not Operational		08:55	16:45



FIGURE 1
LOCALITY PLAN
REF: MAC170523



KEY	
	MONITORING LOCATION
	SITE LOCATION



*Imagery Source: nearmaps

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4 Results

4.1 Assessment Results - Location A, 200 Jenolan Caves Road

Operational attended noise monitoring was completed in each assessment period at Location A on Tuesday 17 August 2021 and Wednesday 18 August 2021. **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)	Period	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
			L _{Amax}	L _{Aeq}	L _{A90}		
17/08/2021	13:27	Day	88	62	40	WD: SW	Creek 38-39
						WS: 0.6m/s	Birds 38-64
						Rain: Nil	Traffic 38-88
Austen Quarry Contribution ¹							Quarry Inaudible
							<30dB L _{Aeq} (15min)
17/08/2021	18:31	Evening	72	52	42	WD: SW	Creek 42-43
						WS: 0.2m/s	Traffic 43-72
						Rain: Nil	Insects <42
Austen Quarry Contribution ¹							Aircraft 43-46
							Quarry Inaudible
							<32dB L _{Aeq} (15min)
18/08/2021	06:23	Shoulder	82	63	42	WD: SW	Creek 39-41
						WS: 0.1m/s	Traffic 39-82
						Rain: Nil	Birds 41-58
Austen Quarry Contribution ¹							Quarry Inaudible
							<32dB L _{Aeq} (15min)
							<32dB L _{Amax}

Note 1: Estimated quarry noise contribution.

4.2 Assessment Results - Location B, 781 Jenolan Caves Road

Operational attended noise monitoring was completed in each assessment period at Location B on Tuesday 17 August 2021 and Wednesday 18 August 2021. **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)	Period	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
			L _{Amax}	L _{Aeq}	L _{A90}		
17/08/2021	14:03	Day	57	33	25	WD: SW WS: 0.6m/s Rain: Nil	Birds 22-57
							Dog 22-48
							Wind in trees 22-42
							Traffic 22-38
Austen Quarry Contribution ¹							Quarry Inaudible
Austen Quarry Contribution ¹							<20dB L _{Aeq} (15min)
17/08/2021	18:04	Evening	66	41	23	WD: SW WS: 0.4m/s Rain: Nil	Livestock 40-66
							Insects 20-25
							Dog bark 20-38
							Local residential noise 20-36
Austen Quarry Contribution ¹							Aircraft 20-53
Austen Quarry Contribution ¹							Quarry Inaudible
Austen Quarry Contribution ¹							<20dB L _{Aeq} (15min)
18/08/2021	06:48	Shoulder	60	39	33	WD: SW WS: 0.1m/s Rain: Nil	Livestock 29-60
							Birds 29-54
							Traffic 29-43
							Quarry Inaudible
Austen Quarry Contribution ¹							<30dB L _{Aeq} (15min)
Austen Quarry Contribution ¹							<30dB L _{Amax}

Note 1: Estimated quarry noise contribution.

4.3 Assessment Results - Location C, 64 Carroll Drive

Operational attended noise monitoring was completed in each assessment period at Location C on Tuesday 17 August 2021 and Wednesday 18 August 2021. **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)	Period	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
			L _{Amax}	L _{Aeq}	L _{A90}		
17/08/2021	13:04	Day	57	35	28	WD: SW WS: 1.2m/s Rain: Nil	Wind in trees 25-40
							Traffic 25-38
							Birds 25-57
Austen Quarry Contribution ¹							<25dB L _{Aeq} (15min)
17/08/2021	18:52	Evening	64	40	26	WD: SW WS: 0.2m/s Rain: Nil	Traffic 23-64
							Insects 23-26
							Quarry Inaudible
Austen Quarry Contribution ¹							<25dB L _{Aeq} (15min)
18/08/2021	06:00	Shoulder	60	42	37	WD: SW WS: 0.1m/s Rain: Nil	Traffic 33-48
							Birds 33-60
							Quarry Inaudible
Austen Quarry Contribution ¹							<30dB L _{Aeq} (15min)
							<30dB L _{Amax}

Note 1: Estimated quarry noise contribution.

4.4 Unattended Noise Monitoring Results

Unattended noise monitoring was conducted at Location A from Tuesday 17 August 2021 and Wednesday 25 August 2021 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 A

Date	Time (hrs)	Attended descriptors (dBA re 20 µPa)			Un-attended descriptors (dBA re 20 µPa)		
		dB LA _{max}	dB LA _{eq}	dB LA ₉₀	dB LA _{max}	dB LA _{eq}	dB LA ₉₀
17/08/2021	13:27	88	62	40	77	55	36
17/08/2021	18:31	72	52	42	65	46	37
18/08/2021	06:23	82	63	42	75	55	38

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 generally inaudible at Location A. 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 17 August 2021 and Wednesday 25 August 2021 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 A

Date	Unattended descriptors (dBA re 20 µPa)		
	dB LA _{eq}		
	Day	Evening	Night
Tuesday, 17 August 2021	N/A	48	53
Wednesday, 18 August 2021	57	51	53
Thursday, 19 August 2021	56	51	53
Friday, 20 August 2021	57	48	52
Saturday, 21 August 2021	52	42	47
Sunday, 22 August 2021	46	46	54
Monday, 23 August 2021	57	51	54
Tuesday, 24 August 2021	57	51	53
Wednesday, 25 August 2021	56	N/A	N/A

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	<30	35	✓
B	<20	35	✓
C	<25	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	<32	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	<32	35	✓
B	<30	35	✓
C	<30	35	✓

Table 11 Morning Shoulder LAmax Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB LAmax	dB LAmax	
A	<32	52	✓
B	<30	52	✓
C	<30	52	✓

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6 Discussion

6.1 Discussion of Results - Location A

Monitoring conducted at Location A, 200 Jenolan Caves Road, Hartley, NSW, was dominated by passing traffic. Traffic included trucks from Austen Quarry, adjacent (non-project) quarries and several transport firms. Local light vehicle traffic also contributed to the overall ambient environment. Quarry noise emissions were inaudible during all three monitoring periods during the August 2021 survey. Other extraneous noise sources audible during the three attended surveys included birds, aircraft, the creek flowing and insects.

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, 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 at this monitoring location during the monitoring periods. Extraneous noise sources dominated the noise environment which included birds, dogs, wind in trees, local residential noise, livestock, aircraft, distant traffic hum and insect noise.

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 August 2021. Highway traffic, birds and insects 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.

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7 Conclusion

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

Operator attended noise monitoring was undertaken on Tuesday 17 August 2021 and Wednesday 18 August 2021 at the nominated monitoring locations with quarry noise contributions compared against the relevant criteria.

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

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Appendix A – Glossary of Terms

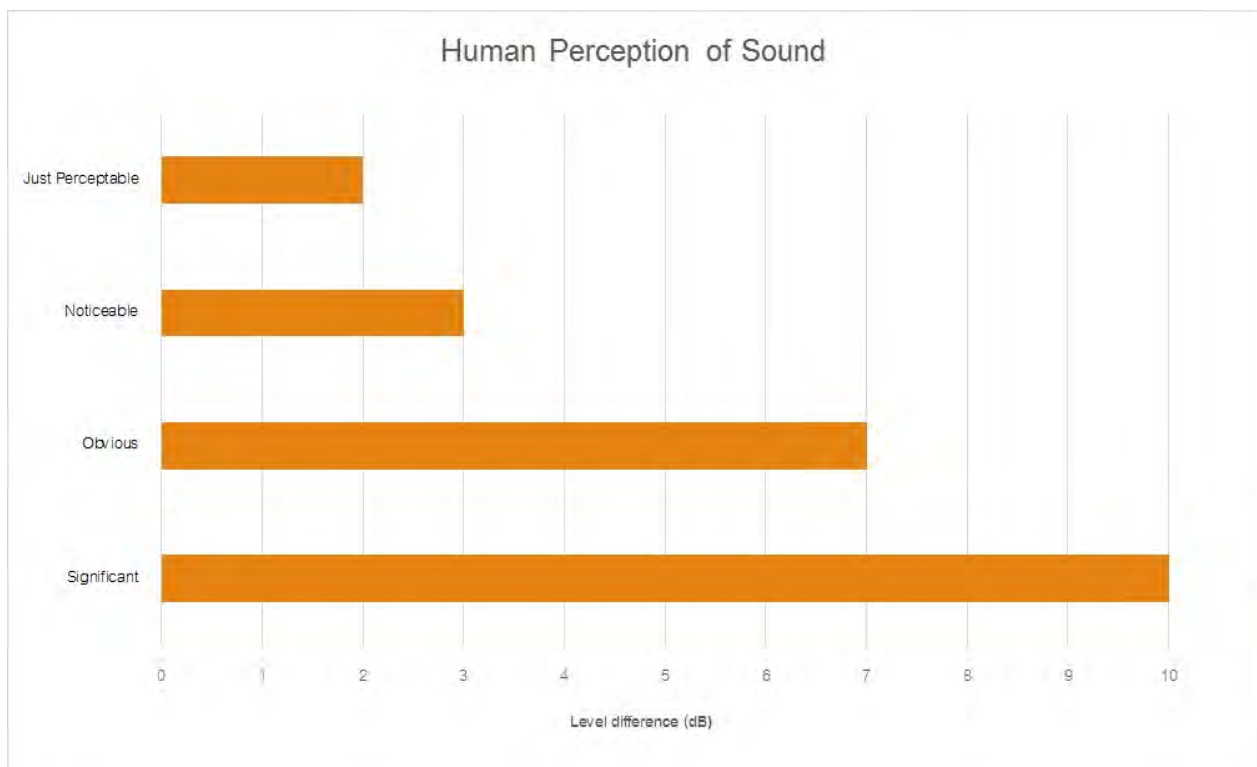
Table A1 provides a number of technical terms have been used in this report.

Table A1 Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
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 : $= 10 \cdot \log_{10} (W/W_0)$ 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



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Appendix B – Operational Logs



DAILY PRODUCTION LOG & CHECKLIST - PRIMARY

Date: 17.8.21 Operator: Kiran

Weather Conditions: fine Quarry Bench ID: 730

Shift Start Time	6:00	Shift Finish Time	1:36
Crusher Start Time	6:55	End of day Crusher stopped	11:05

Belt Weightometer Reading - Daily

Conveyor 1 Start	Conveyor 1 Finish	Total Tonnes Crushed
Conveyor 6 Scalps Start	Conveyor 6 Scalps Finish	Total Tonnes Stockpiled

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

KK1 Loads to Boot	19	KK3 Loads to Boot	
KK2 Loads to Boot	19	Contractor Loads to Boot	

Stoppages due to Trucks	Stoppages due to Jaw
-------------------------	----------------------

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
6:00	6:40	40	tool box - CV3 General Fault?
9:25	9:55	30m	smoke.
11:05			belts of crusher - end crusher

Pre start checks;

Generator hours: 30649 Generator oil level: ✓

Plant Visual: ✓ Pilot hours:

COMMENTS

Owner: Quarry Manager	HY-TEC CONCRETE & QUARRIES	Form: HTQY-P-SFT-035
Forms & Templates	Revision: 3	Status: Approved
		Issue Date: 14.02.12

DAILY PRODUCTION LOG & CHECKLIST - SECONDARY

Date: 18-8-21 Operator: Brendan / Peter

Weather Conditions; Frost / fine

8:36

Shift Start Time	<u>5:30am</u>	Shift Finish Time	<u>10:00am</u>
Crusher Start Time	<u>8:55am</u>	End of day Crusher stopped	<u>4:45</u>

Weightometer Reading; Start: 4562811 Finish: 4565630

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
<u>5:30am</u>	<u>8:55</u>	<u>2hrs 25M</u>	<u>bolter Present Frost</u>
<u>9:27</u>	<u>9:48</u>	<u>21 min</u>	<u>Airsep blocked</u>
<u>1:58pm</u>	<u>2PM</u>	<u>2</u>	<u>Adj 450 + 550</u>
<u>3:15</u>	<u>3:35</u>	<u>20M</u>	<u>Metal detector Alarm Nil found. Went off twice <u>PLEASE FIX IT</u></u>

PRODUCTION SUMMARY

165

Belts	Size	Description	Total	Gate open	Comments
CV 8	20 mm	Concrete Aggregate	<u>1273</u>		
CV 20	Course Sand 4-0mm	Manufactured Sand	<u>664</u>		
CV19*	10-7mm Blend*	Concrete Blend	<u>704</u>		
CV19	7mm	Concrete Aggregate			
CV17	10mm	Concrete Aggregate			
CV15	14mm	Concrete Aggregate			
CV5	Ballast/40mm	Non Spec Aggregate			

2806

COMMENTS

Owner: Quarry Manager	HY-TEC CONCRETE & QUARRIES	Form: HTQY-P-SFT-035
Forms & Templates	Revision: 3	Status: Approved
		Issue Date: 14.02.12

DAILY PRODUCTION LOG & CHECKLIST - SECONDARY

Date: 17-8-21 Operator: BRENDEN

Weather Conditions; Fine

Shift Start Time	<u>5:30am</u>	Shift Finish Time	<u>8:36</u> <u>10PM</u>
Crusher Start Time	<u>6:05</u>	End of day Crusher stopped	<u>4:30</u>

Weightometer Reading; Start: 4560689 Finish: 4562811

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
<u>5:30am</u>	<u>6:05</u>	<u>35m</u>	<u>-bolbox present</u>
<u>6:05</u>	<u>6:23</u>	<u>18m</u>	<u>Estop CV18</u>
<u>7:32</u>	<u>12:00pm</u>	<u>4hrs 28m</u>	<u>Inspect CV8 snub roller and remove it</u>
<u>12:43</u>	<u>12:47</u>	<u>4m</u>	<u>450 Hydraulics tripped</u>
<u>1:14</u>	<u>1:15</u>	<u>1m</u>	<u>Adj 450 + 550</u>
<u>12:4</u>	<u>1:30</u>	<u>6m</u>	<u>Check CRUSHER</u>
<u>3PM</u>	<u>3:02</u>	<u>2m</u>	<u>Adj 450 + 550</u>

PRODUCTION SUMMARY

Belts	Size	Description	Total	Gate open	Comments
CV 8	20 mm	Concrete Aggregate	<u>932</u>		
CV 20	Course Sand 4-0mm	Manufactured Sand	<u>542</u>		
CV19*	10-7mm Blend*	Concrete Blend	<u>547</u>		
CV19	7mm	Concrete Aggregate			
CV17	10mm	Concrete Aggregate			
CV15	14mm	Concrete Aggregate	<u>30</u>		
CV5	Ballast/40mm	Non Spec Aggregate			

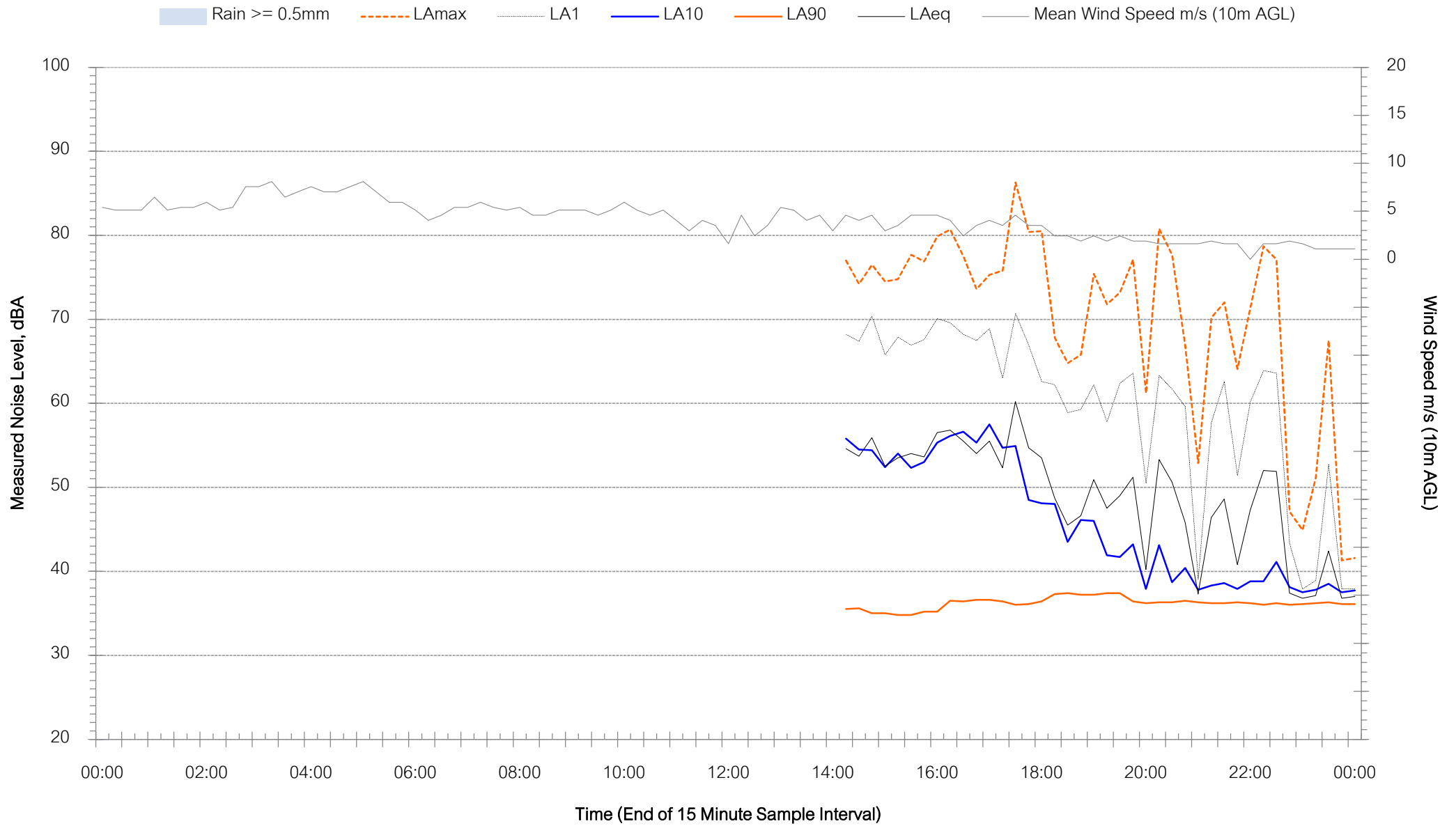
101
2152

COMMENTS

Appendix C – Noise Monitoring Charts

Background Noise Levels

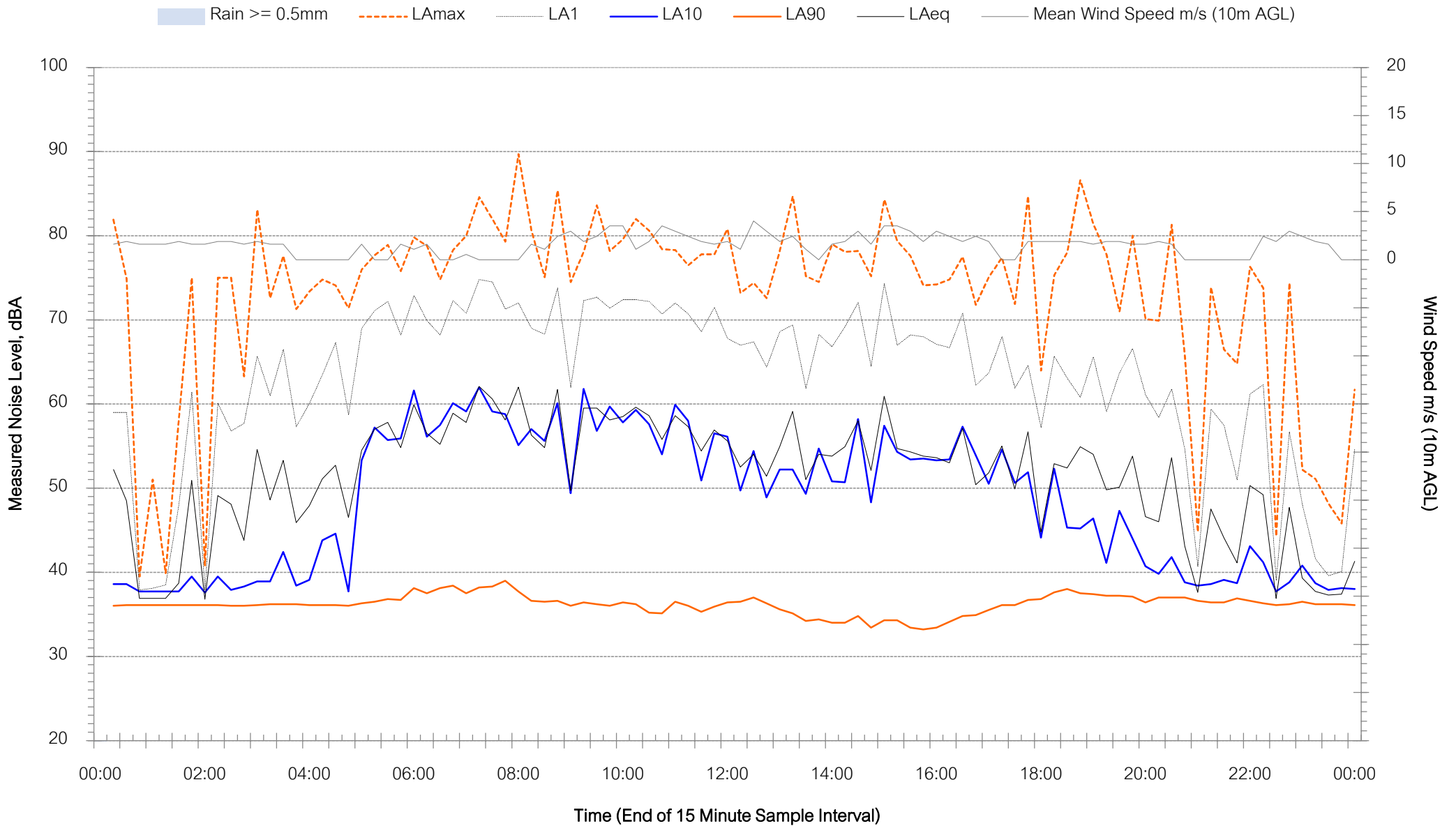
200 Jenolan Caves Road, Hartley - Tuesday 17 August 2021





Background Noise Levels

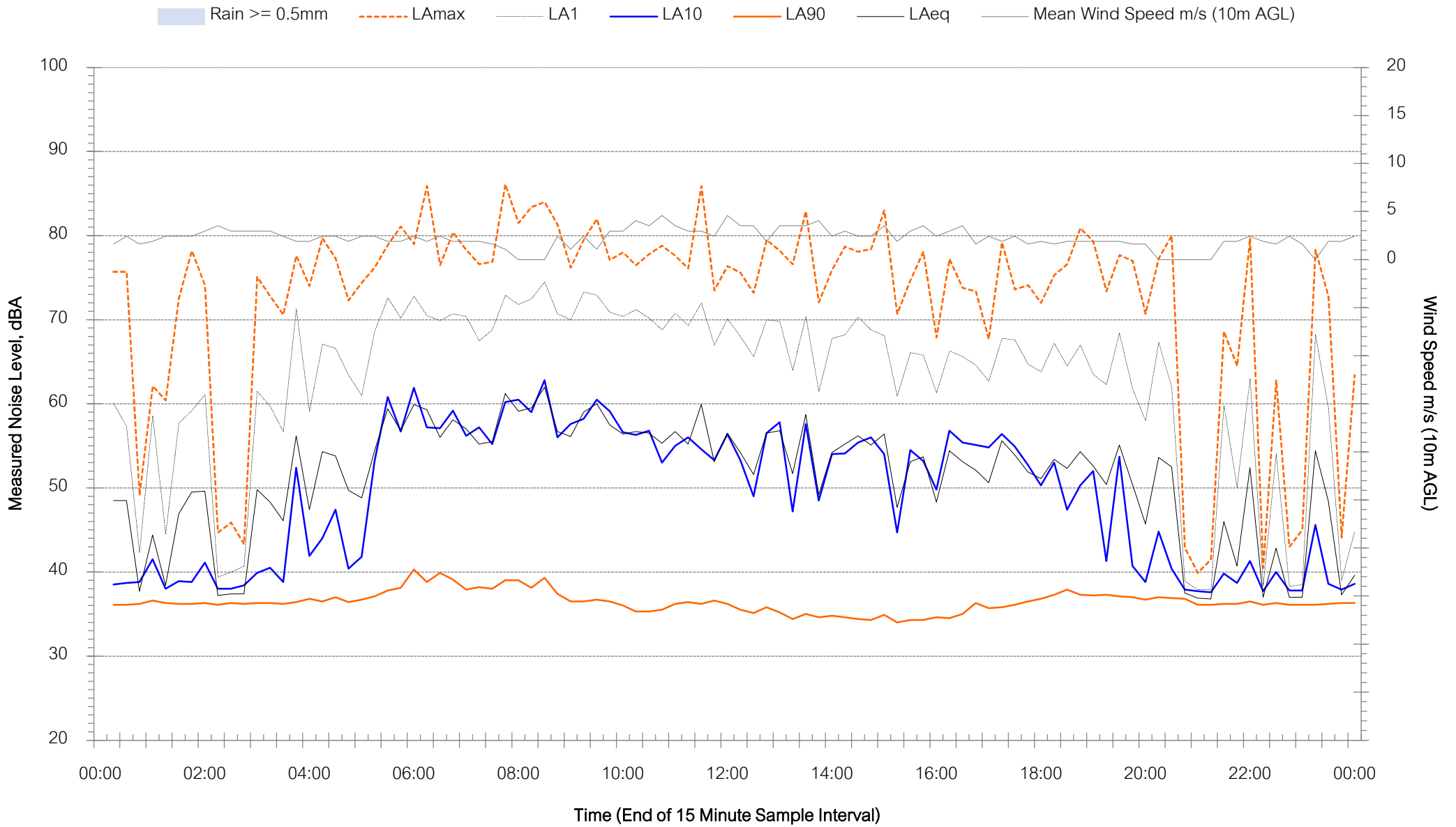
200 Jenolan Caves Road, Hartley - Wednesday 18 August 2021





Background Noise Levels

200 Jenolan Caves Road, Hartley - Thursday 19 August 2021





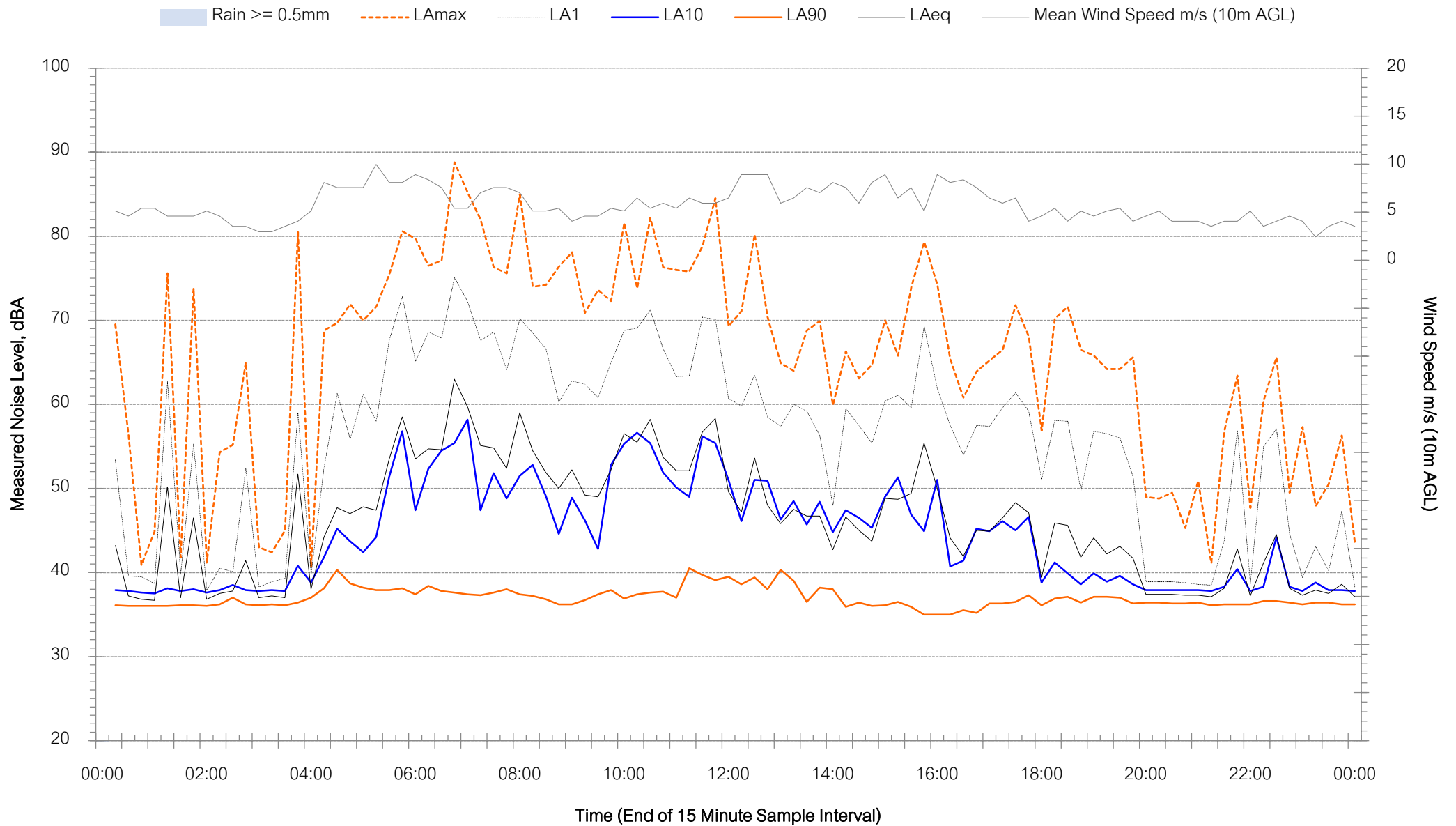
Background Noise Levels

200 Jenolan Caves Road, Hartley - Friday 20 August 2021



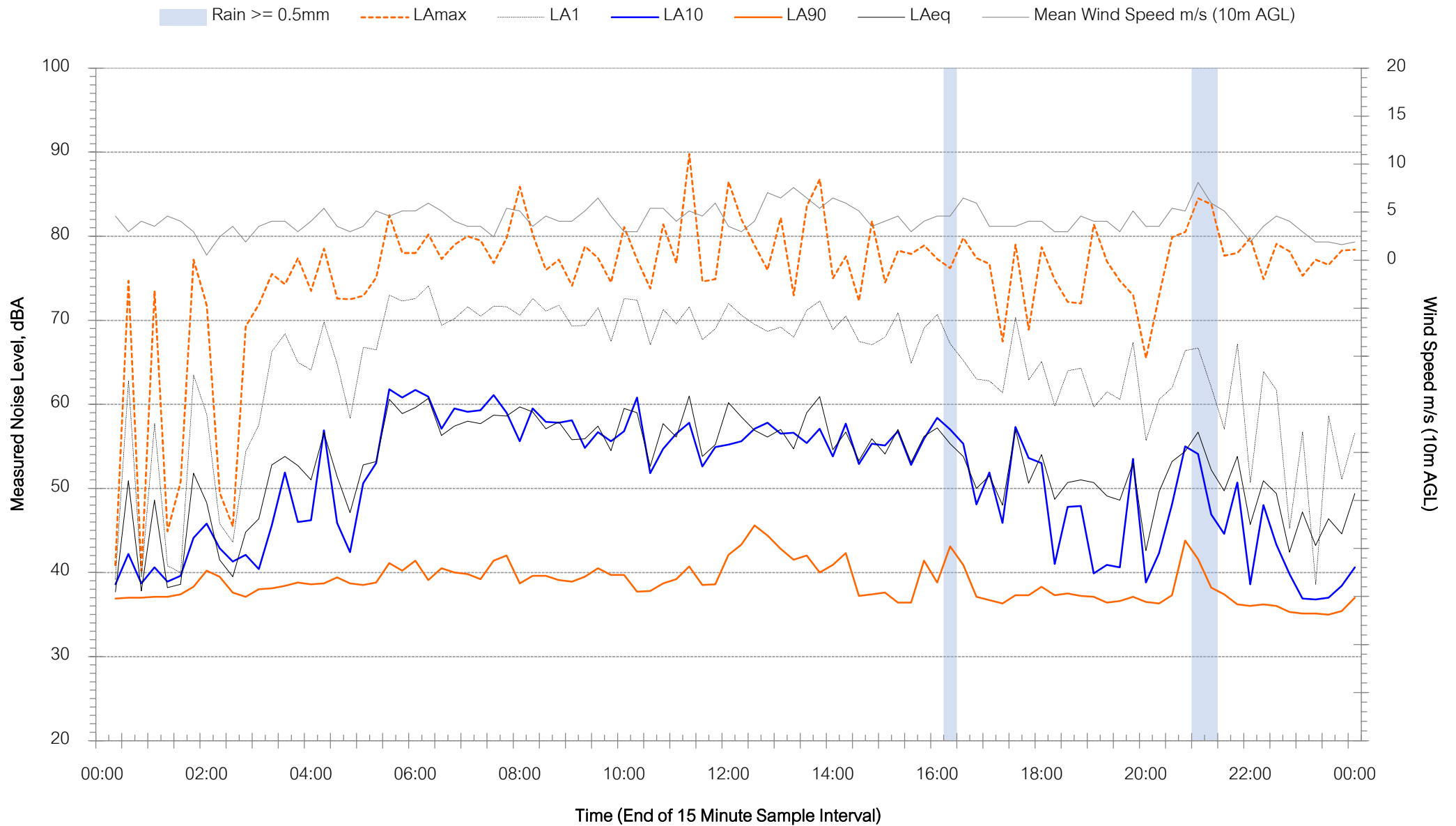
Background Noise Levels

200 Jenolan Caves Road, Hartley - Saturday 21 August 2021



Background Noise Levels

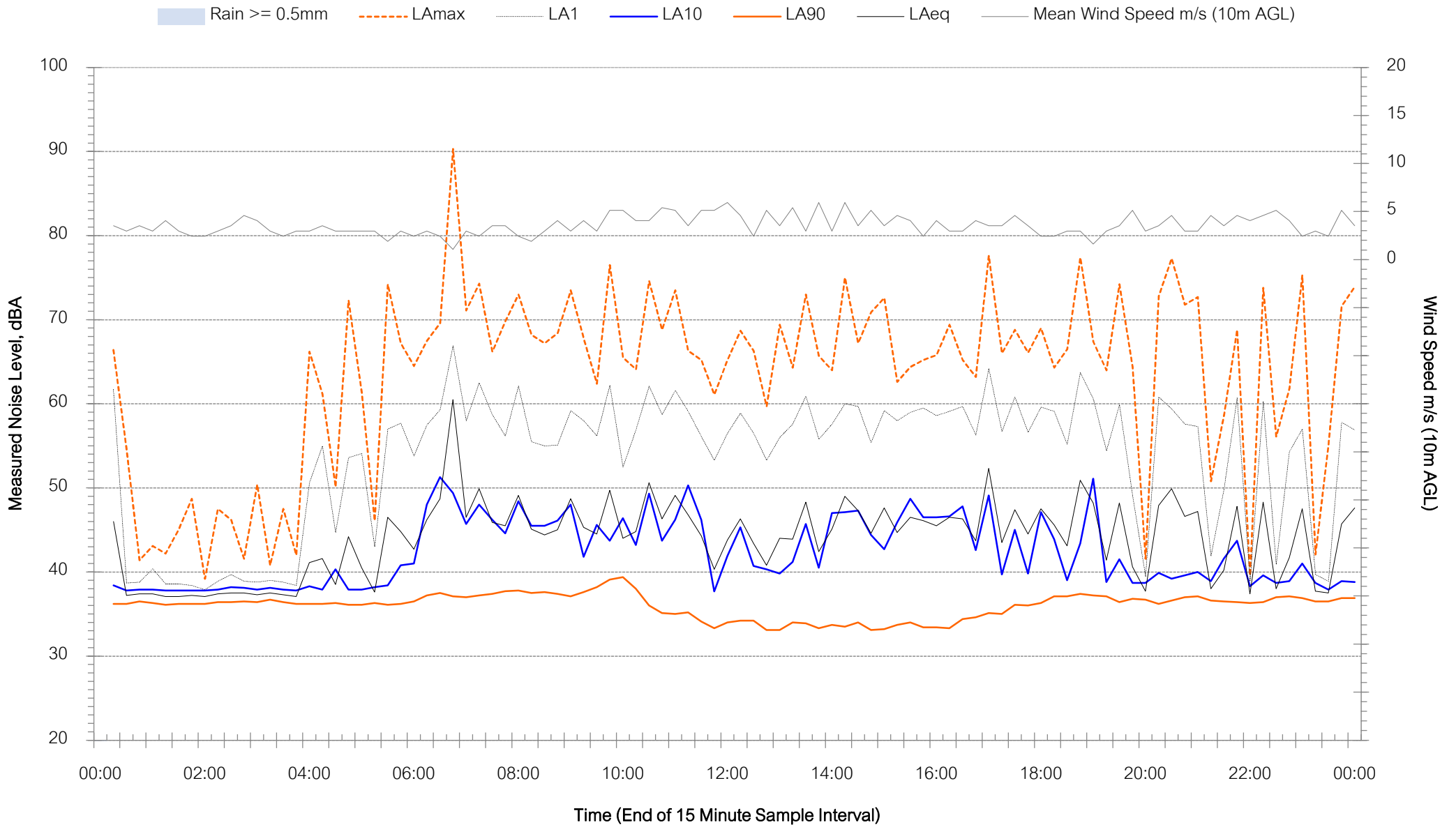
200 Jenolan Caves Road, Hartley - Monday 23 August 2021





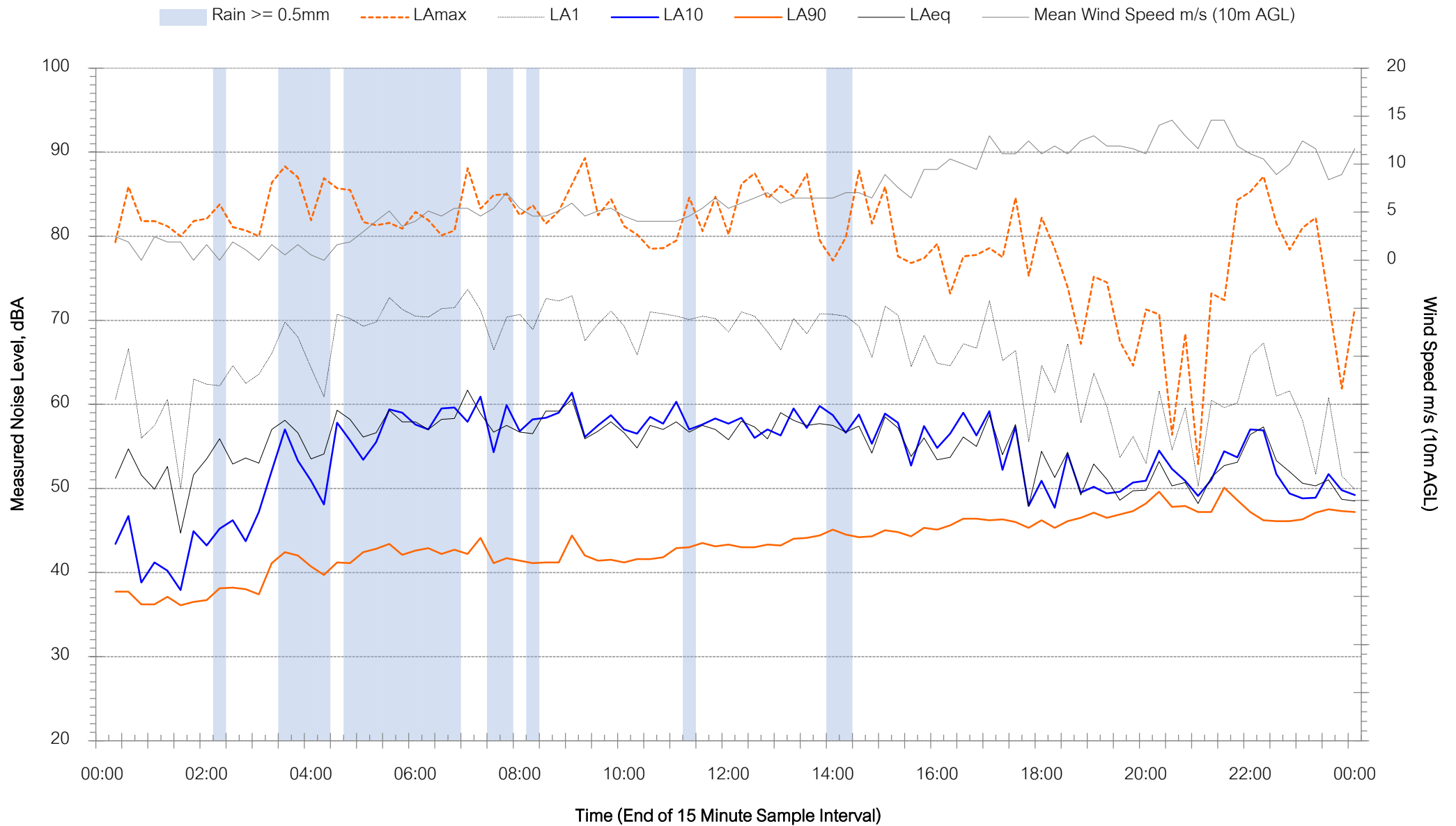
Background Noise Levels

200 Jenolan Caves Road, Hartley - Sunday 22 August 2021



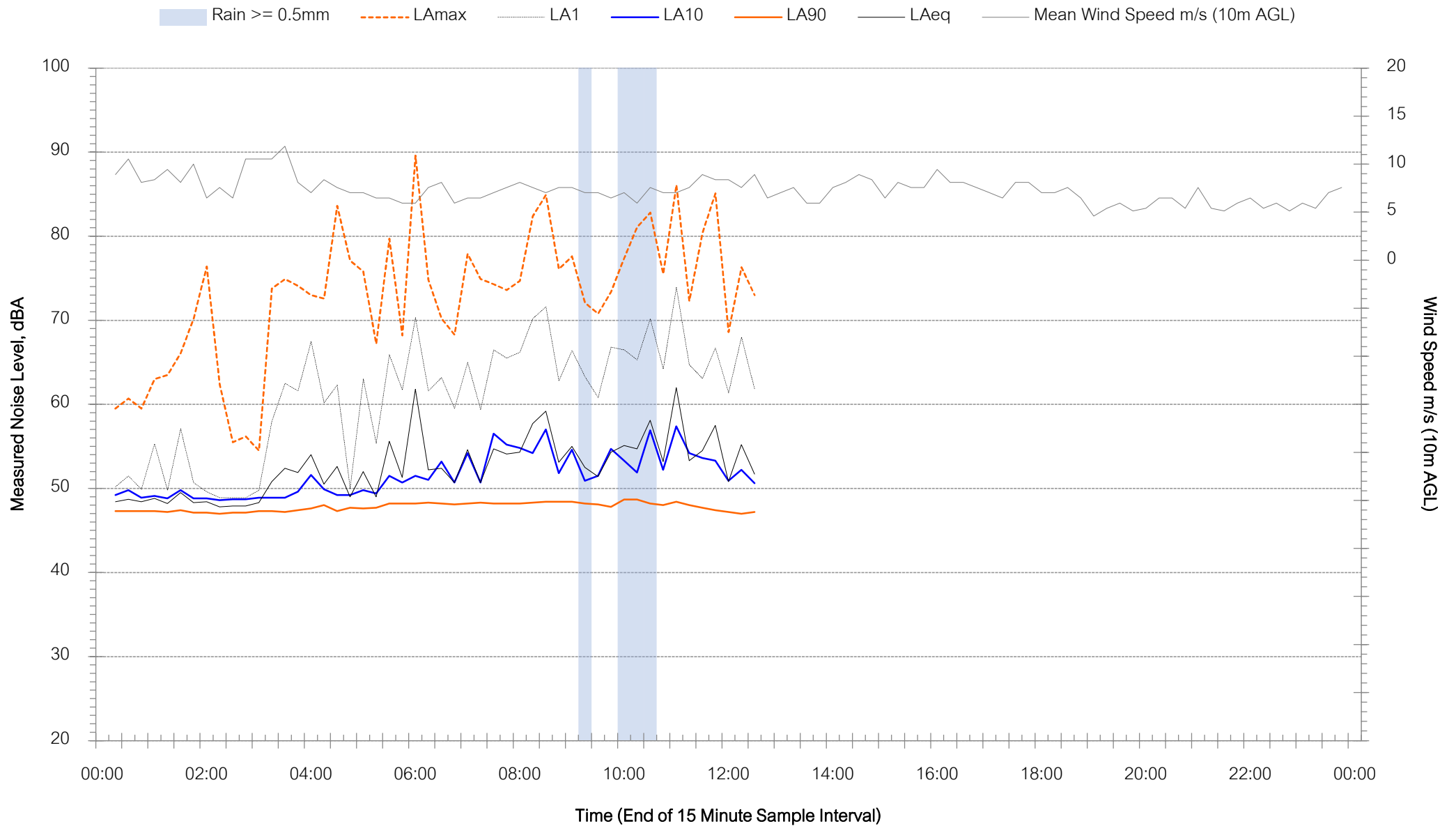
Background Noise Levels

200 Jenolan Caves Road, Hartley - Tuesday 24 August 2021



Background Noise Levels

200 Jenolan Caves Road, Hartley - Wednesday 25 August 2021



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 2022



Document Information

Noise Monitoring Assessment

Austen Quarry, Hartley, NSW

March 2022

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

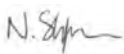

Prepared by: Muller Acoustic Consulting Pty Ltd

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
MAC170523RP11	8 April 2022	Nicholas Shipman		Oliver Muller	

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APPENDIX A – GLOSSARY OF TERMS

APPENDIX B – OPERATIONAL LOGS

APPENDIX C – NOISE MONITORING CHARTS

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1 Introduction

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

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

The assessment was conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- Environment Protection Licence EPL#12323;
- 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 undertaken on Tuesday 22 March 2022 and Wednesday 23 March 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**.

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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

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3 Methodology

3.1 Locality

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

3.2 Noise Monitoring Locations

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

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

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

3.3 Attended Monitoring Methodology

The attended noise surveys were conducted in general accordance with the procedures described in 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 22 March 2022 and Wednesday 23 March 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, undertaken at Location A - 200 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 22 March 2022 and Thursday 31 March 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 ± 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 transportation activities commence at 5am and 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 between 07.30am and 12.00pm on 23 March 2022 the primary crusher paused operations on several occasions due to blockages 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 23 March 2022 to capture the onsite operations at the nominated monitoring locations.

It is also noted that the secondary crushing ceased 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)
22/03/2022	07:42	16:47	06:40	16:37
23/03/2022	07:15	17:00	06:39	16:40



FIGURE 1
LOCALITY PLAN
REF: MAC170523



KEY	
	MONITORING LOCATION
	SITE LOCATION



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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 22 March 2022 and Wednesday 23 March 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}		
22/03/2022	17:08 (Day)	82	59	44	WD: E WS: 0.1m/s Rain: Nil	Traffic 55-82
						Insects 30-32
						Creek 42-45
						Birds 42-45
						Quarry inaudible
Austen Quarry Contribution ¹						<34dB L _{Aeq} (15min)
22/03/2022	18:24 (Evening)	82	60	44	WD: E WS: 0.1m/s Rain: Nil	Local residential noise 35-40
						Creek 44-45
						Birds 40-46
						Insects <35
						Traffic 55-82
Austen Quarry Contribution ¹						<34dB L _{Aeq} (15min)
23/03/2022	06:20 (Morning shoulder)	79	59	46	WD: ESE WS: 0.2m/s Rain: Nil	Traffic 52-79
						Creek 45-48
						Insects <35
						Birds 45-58
						Quarry inaudible
Austen Quarry Contribution ¹						<35dB L _{Aeq} (15min) <35dB 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 22 March 2022 and Wednesday 23 March 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}		
22/03/2022	16:38 (Day)	59	40	38	WD: E WS: 0.1m/s Rain: Nil	Birds 38-59
						Livestock 34-37
						Wind in vegetation 41-45
						Traffic 35-40
Austen Quarry Contribution ¹						Quarry inaudible
						<28dB L _{Aeq} (15min)
22/03/2022	18:52 (Evening)	73	44	36	WD: E WS: 0.1m/s Rain: Nil	Birds 34-73
						Traffic 34-38
						Local residential noise 44-54
						Quarry inaudible
Austen Quarry Contribution ¹						Quarry inaudible
						<26dB L _{Aeq} (15min)
23/03/2022	06:45 (Morning shoulder)	65	42	34	WD: E WS: 0.8m/s Rain: Nil	Insects 35-37
						Traffic 40-45
						Wind in vegetation 42-65
						Quarry reverse alarms 28-33 (95 seconds)
Austen Quarry Contribution ¹						Quarry inaudible
						<25dB L _{Aeq} (15min)
						<33dB 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 22 March 2022 and Wednesday 23 March 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}		
22/03/2022	17:32 (Day)	59	38	34	WD: E WS: 0.1m/s Rain: Nil	Insects 30-35
						Birds 33-45
						Traffic 30-36
						Dog barking 42-59
Austen Quarry Contribution ¹						<25dB L _{Aeq} (15min)
22/03/2022	18:00 (Evening)	66	44	31	WD: E WS: 0.2m/s Rain: Nil	Traffic 30-66
						Insects 28-30
						Birds 33-45
						Local residential noise 33-61
Austen Quarry Contribution ¹						<21dB L _{Aeq} (15min)
23/03/2022	06:10 (Morning shoulder)	78	45	38	WD: ESE WS: 2.1m/s Rain: Nil	Traffic 35-43
						Wind in vegetation 37-48
						Insects <35
						Birds 42-78
Austen Quarry Contribution ¹						<28dB L _{Aeq} (15min)
						<28dB L _{Amax}

Note 1: Estimated quarry noise contribution.

4.4 Unattended Noise Monitoring Results

Unattended noise monitoring was conducted at Location B from Tuesday 22 March 2022 and Wednesday 30 March 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 μ Pa)			Unattended descriptors (dBA re 20 μ Pa)		
		dB LA _{max}	dB LA _{eq}	dB LA ₉₀	dB LA _{max}	dB LA _{eq}	dB LA ₉₀
22/03/2022	16:38	59	40	38	70	45	34
22/03/2022	18:52	73	44	36	51	37	35
23/03/2022	06:45	65	42	34	68	44	34

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 generally inaudible at Location B. 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 22 March 2022 and Wednesday 30 March 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 μ Pa)		
	dB LA _{eq}		
	Day	Evening	Night
Tuesday, 22 March 2022	N/A	40	40
Wednesday, 23 March 2022	43	39	32
Thursday, 24 March 2022	42	37	34
Friday, 25 March 2022	42	40	38
Saturday, 26 March 2022	42	38	35
Sunday, 27 March 2022	42	42	32
Monday, 28 March 2022	44	46	42
Tuesday, 29 March 2022	45	38	39
Wednesday, 30 March 2022	43	42	37

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	<28	35	✓
C	<25	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	<34	35	✓
B	<26	35	✓
C	<21	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	<35	35	✓
B	<25	35	✓
C	<28	35	✓

Table 11 Morning Shoulder LAmax Noise Compliance Assessment

Receiver No.	Quarry Noise Contribution	Quarrying Noise Criteria	Compliant
	dB LAmax	dB LAmax	
A	<35	52	✓
B	<33	52	✓
C	<28	52	✓

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6 Discussion

6.1 Discussion of Results - Location A

Monitoring conducted at Location A, 200 Jenolan Caves Road, Hartley, NSW, was dominated by passing traffic. Traffic included trucks from Austen Quarry, adjacent (non-project) quarries and several transport firms. Local light vehicle traffic also contributed to the overall ambient environment. Quarry noise emissions were inaudible during all three monitoring periods for the March 2022 survey. Other extraneous noise sources audible during the three attended surveys included insects, creek flowing, birds and local residential noise.

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 morning shoulder period. Reverse alarms were audible for approximately 95 seconds and the estimated quarry noise contribution was measured at $<25\text{dB LAeq}(15\text{min})$ and $<33\text{ LAmax}$, respectively. The quarry remained inaudible during the day and evening periods at this monitoring location. Extraneous noise sources dominated the noise environment which included birds, livestock, wind in vegetation, traffic and local residential noise.

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 March 2022. Insects, birds, traffic, dogs barking, wind in vegetation and local residential noise 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.

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7 Conclusion

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

Operator attended noise monitoring was undertaken on Tuesday 22 March 2022 and Wednesday 23 March 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.

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Appendix A – Glossary of Terms

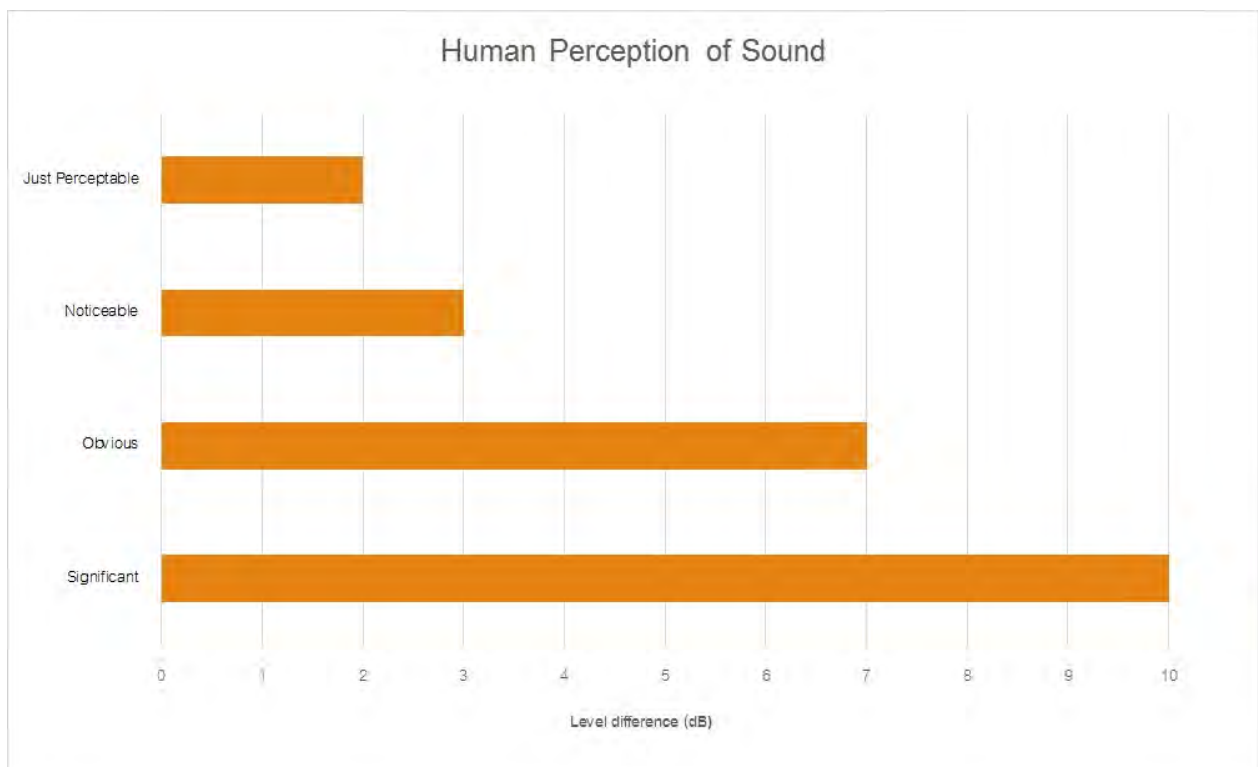
Table A1 provides a number of technical terms have been used in this report.

Table A1 Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
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 : $= 10 \cdot \log_{10} (W/W_0)$ 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



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Appendix B – Operational Logs



an ADBRI company

DAILY PRODUCTION LOG & CHECKLIST - PRIMARY

Date: 23/3/22 Operator: Pauly Horner

Weather Conditions; Quarry Bench ID. 785

Table with Shift Start Time, Shift Finish Time, Crusher Start Time, and End of day Crusher stopped.

Belt Weightometer Reading - Daily

Table with Conveyor 1 Start, Conveyor 1 Finish, and Total Tonnes Crushed.

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

Table with DT4 Loads to Boot, DT1 Loads to Boot, DT6 Loads to Boot, and Loader tonnes to Boot.

Table with Stoppages due to Trucks and Stoppages due to Jaw.

Table with Plant Stopped, Plant Started, Downtime (Hrs/Min), and Reason.

Pre start checks;

Generator hours. 32238 Generator oil level.

Plant Visual Pilot hours

COMMENTS

first truck tipped 6:55



an ADBRI company

DAILY PRODUCTION LOG & CHECKLIST - PRIMARY

Date: 22/3/22 Operator: Dylan

Weather Conditions; Quarry Bench ID. 785

Shift Start Time	<u>0600</u>	Shift Finish Time	<u>1700</u>
Crusher Start Time	<u>0742</u>	End of day Crusher stopped	<u>1647</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

5160

DT4 Loads to Boot	<u>38</u>	DT1 Loads to Boot	<u>13</u>
DT6 Loads to Boot	<u>40</u>	Loader tonnes to Boot	

Stoppages due to Trucks	Stoppages due to Jaw

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
<u>6:00</u>	<u>6:36</u>		<u>Pre start / tool box</u>
<u>9:30</u>	<u>9:40</u>		<u>Smoke</u>
<u>1:00</u>	<u>1:20</u>		<u>lunch</u>

Pre start checks;

Generator hours. 32228 Generator oil level.

Plant Visual Pilot hours

COMMENTS

first track tipped

DAILY PRODUCTION LOG & CHECKLIST - SECONDARY



Date: 23.3.22 Operator: Shan

Weather Conditions;

Shift Start Time	6.00	Shift Finish Time	
Crusher Start Time	6.39	End of day Crusher stopped	

Weightometer Reading; Start: 5077454 Finish:

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
6.00	6.39	39	Pre start / tool box
7.26	7.32	8	Adj 450/550 / Reset 450
7.49	10.18	2hrs 24m	stopped no rock HAD To open 450 crusher
10.31	10.32	1	Adj 450 + 550
11.40	11.41	1	Adj 450 + 550
12.30	12.35	5	changed gate to make 10/7
2.36	2.53	17	Metall detector
4.21	4.23	2	Adj 450 + 550
4.26	4.40	14	Clean 10/7 chate.
7.19	7.20	1	Adj 450
8.50		50	Out of Rock

* 6.30pm switched to feeder 2+3

PRODUCTION SUMMARY

Belts	Size	Description	Total Tonnes	Comments
CV 8	20 mm	Concrete Aggregate	2074	
CV 20	Course Sand 4-0mm	Manufactured Sand	857	
CV 20	Old Man Sand	Man sand By-Pass Air-Sep		
CV 24	Super Fine -50micron	Super Fine Sand	161	
CV19*	10-7mm Blend*	Concrete Blend	1464	
CV19	7mm	Concrete Aggregate	178	
CV17	10mm	Concrete Aggregate		
CV15	14mm	Concrete Aggregate	273	
CV5	Ballast/40mm	Non Spec Aggregate		

5007

DAILY PRODUCTION LOG & CHECKLIST - SECONDARY



Date: 22322

Operator: Shan

Weather Conditions: Fin

Shift Start Time	6.00	Shift Finish Time	10PM
Crusher Start Time	6.40	End of day Crusher stopped	4:37

Weightometer Reading; Start: 5073559 Finish: 5077454

Plant Stopped	Plant Started	Downtime (Hrs/Min)	Reason
6.00	6.40	40	Tool Box / pre start / Top up oils
7.40	8.00	20	Hose CV10 Snub / Clean Screens
9.40	9.50	10	Metal Detector
11.05	11.25	20	check S3
12.09	12.11	2	Adj 450 + 550

PRODUCTION SUMMARY

Belts	Size	Description	Total Tonnes	Comments
CV 8	20 mm	Concrete Aggregate	1538	
CV 20	Course Sand 4-0mm	Manufactured Sand	572	
CV 20	Old Man Sand	Man sand By-Pass Air-Sep		
CV 21	Super Fine -50micron	Super Fine Sand	137	
CV19*	10-7mm Blend*	Concrete Blend		
CV19	7mm	Concrete Aggregate	560	
CV17	10mm	Concrete Aggregate	1086	
CV15	14mm	Concrete Aggregate	323	
CV5	Ballast/40mm	Non Spec Aggregate		

4216

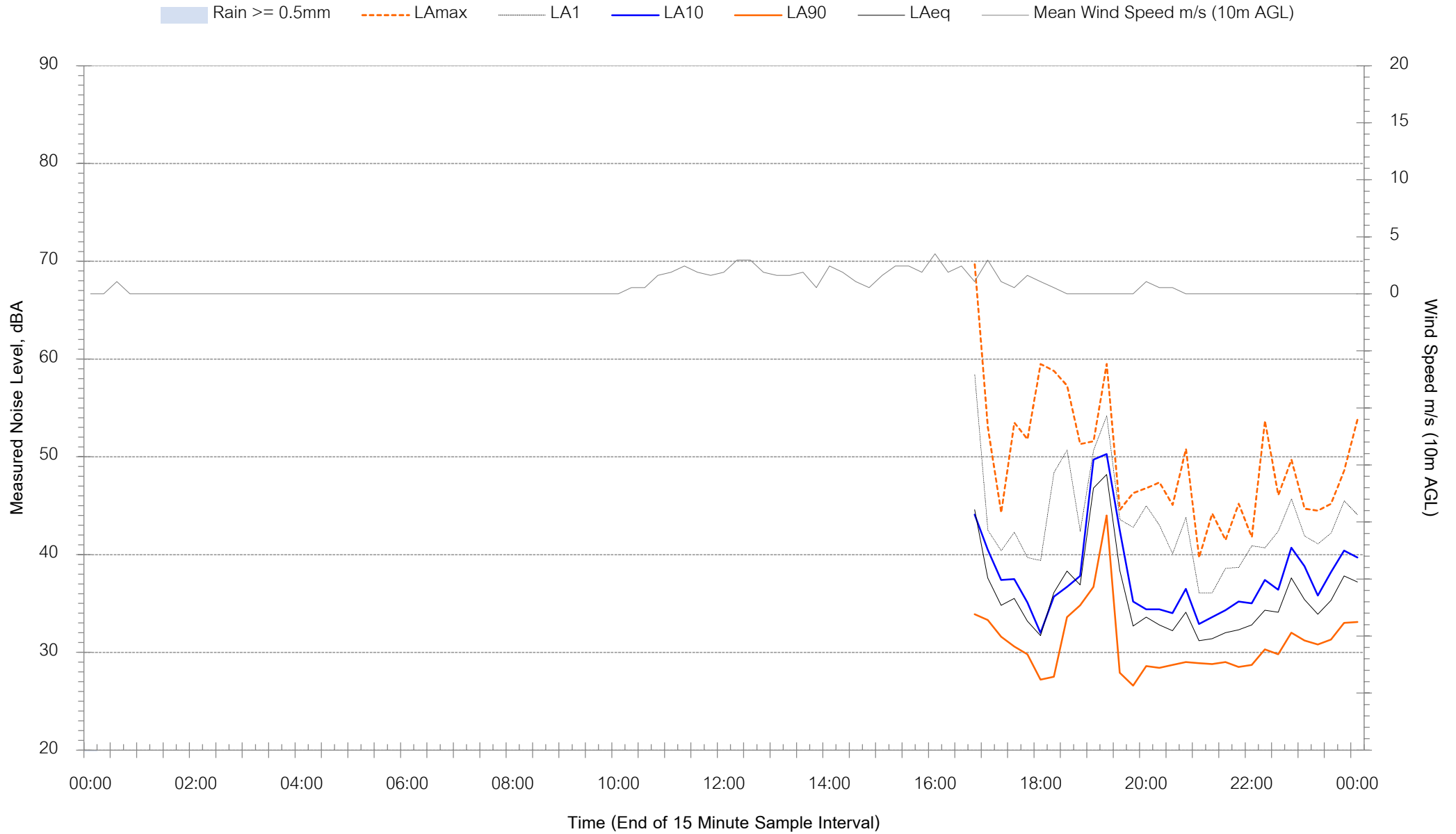
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Appendix C – Noise Monitoring Charts



Background Noise Levels

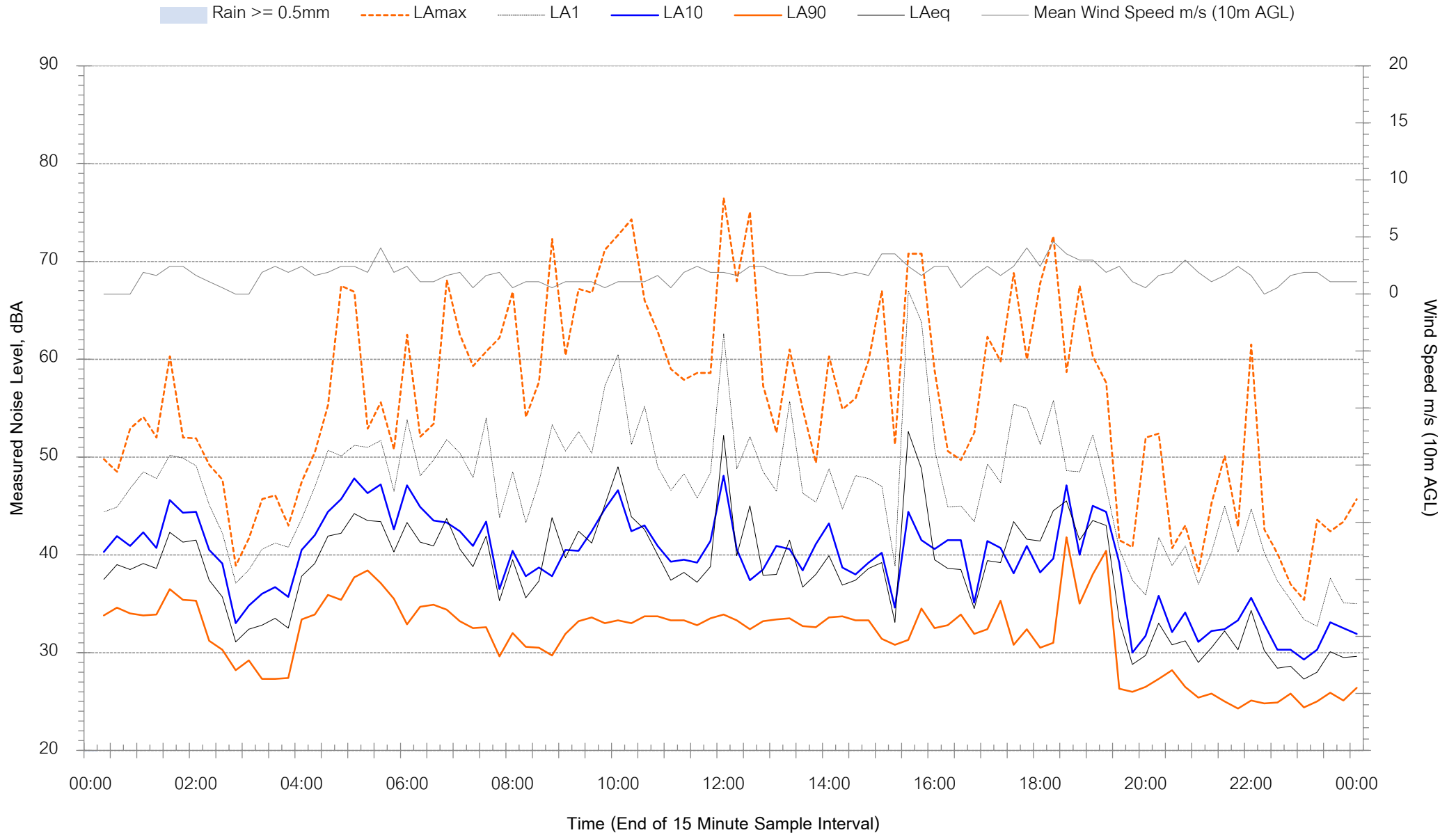
200 Jenolan Caves Road, Hartley - Tuesday 22 March 2022





Background Noise Levels

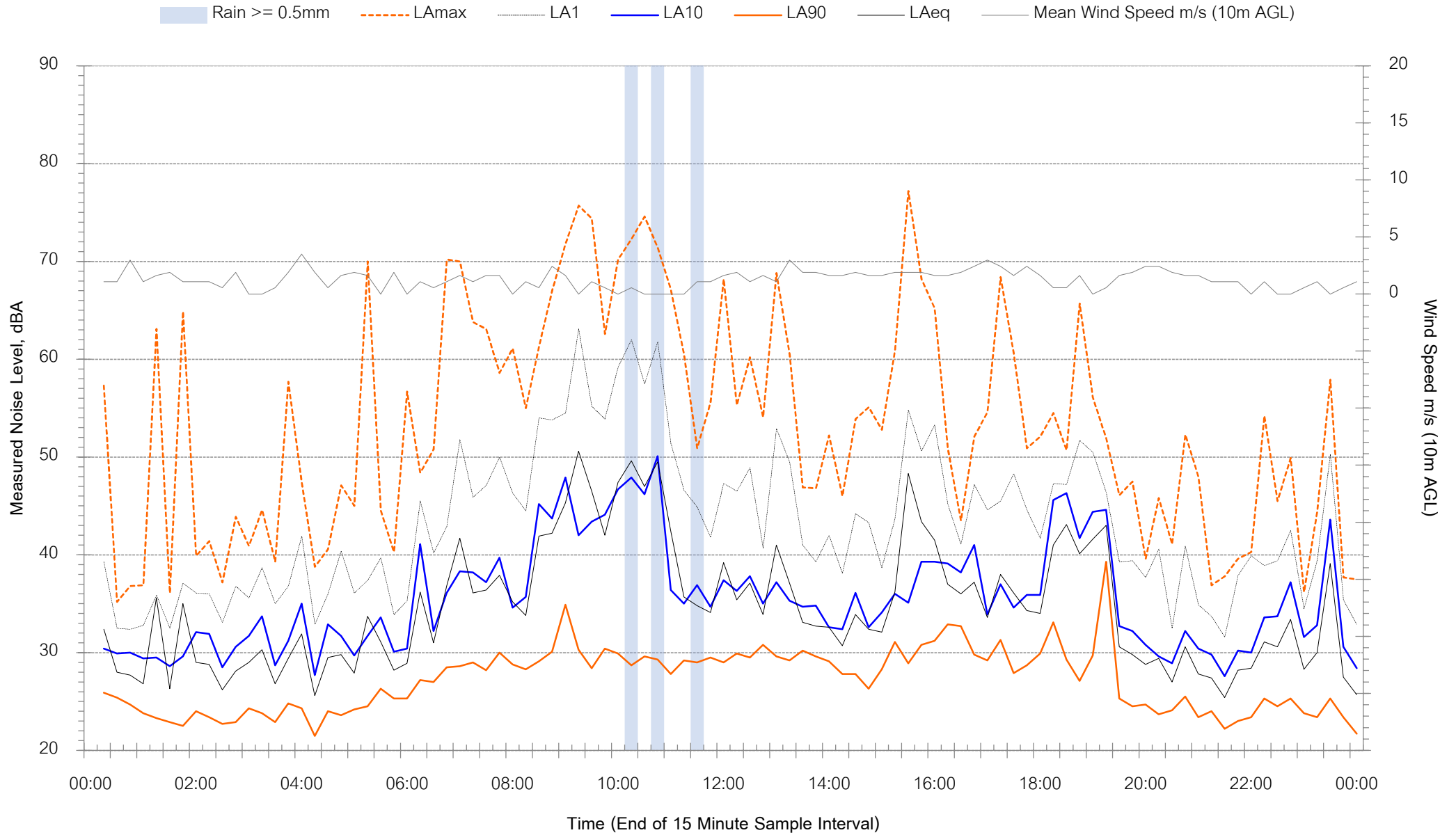
200 Jenolan Caves Road, Hartley - Wednesday 23 March 2022





Background Noise Levels

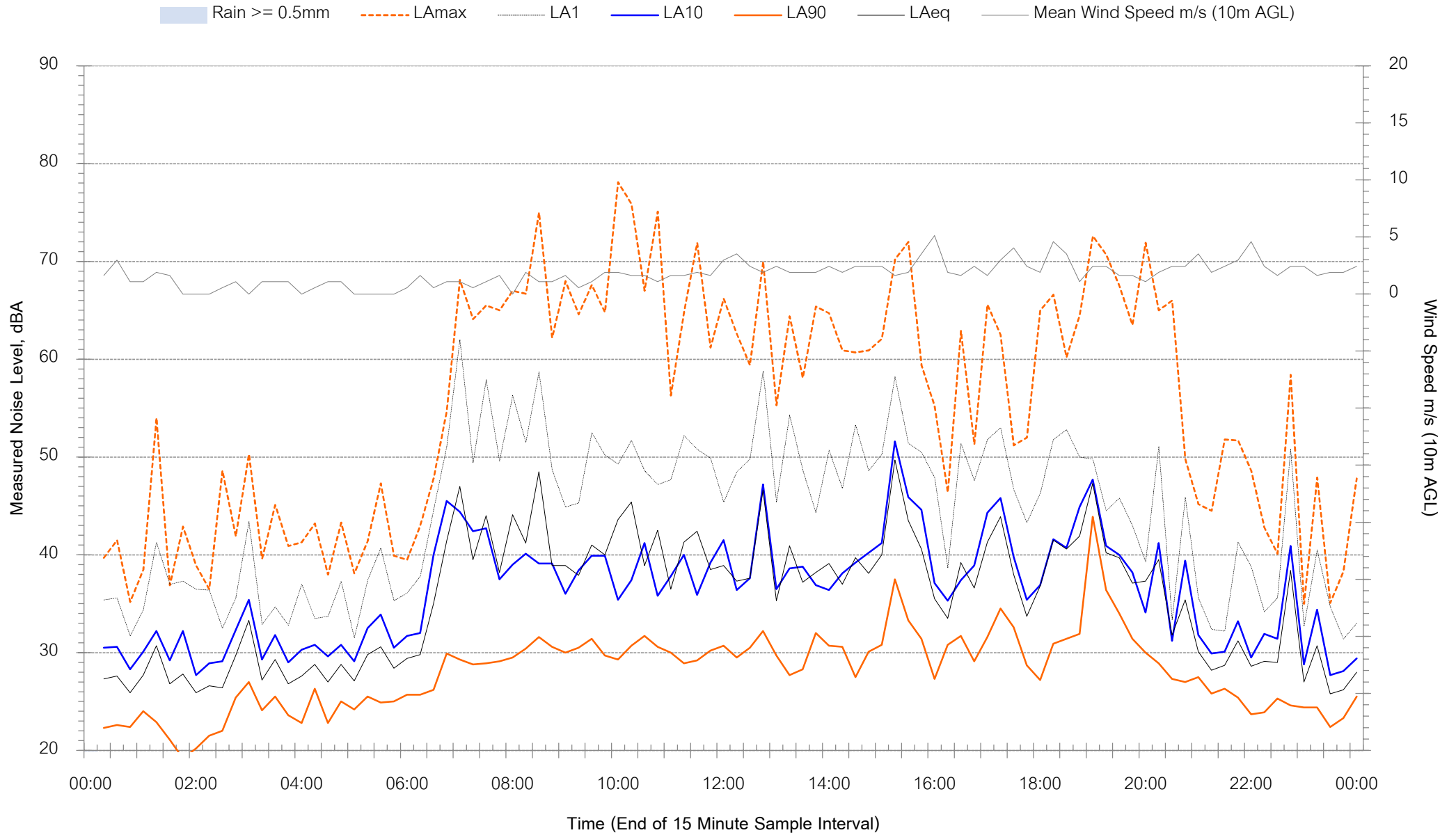
200 Jenolan Caves Road, Hartley - Thursday 24 March 2022





Background Noise Levels

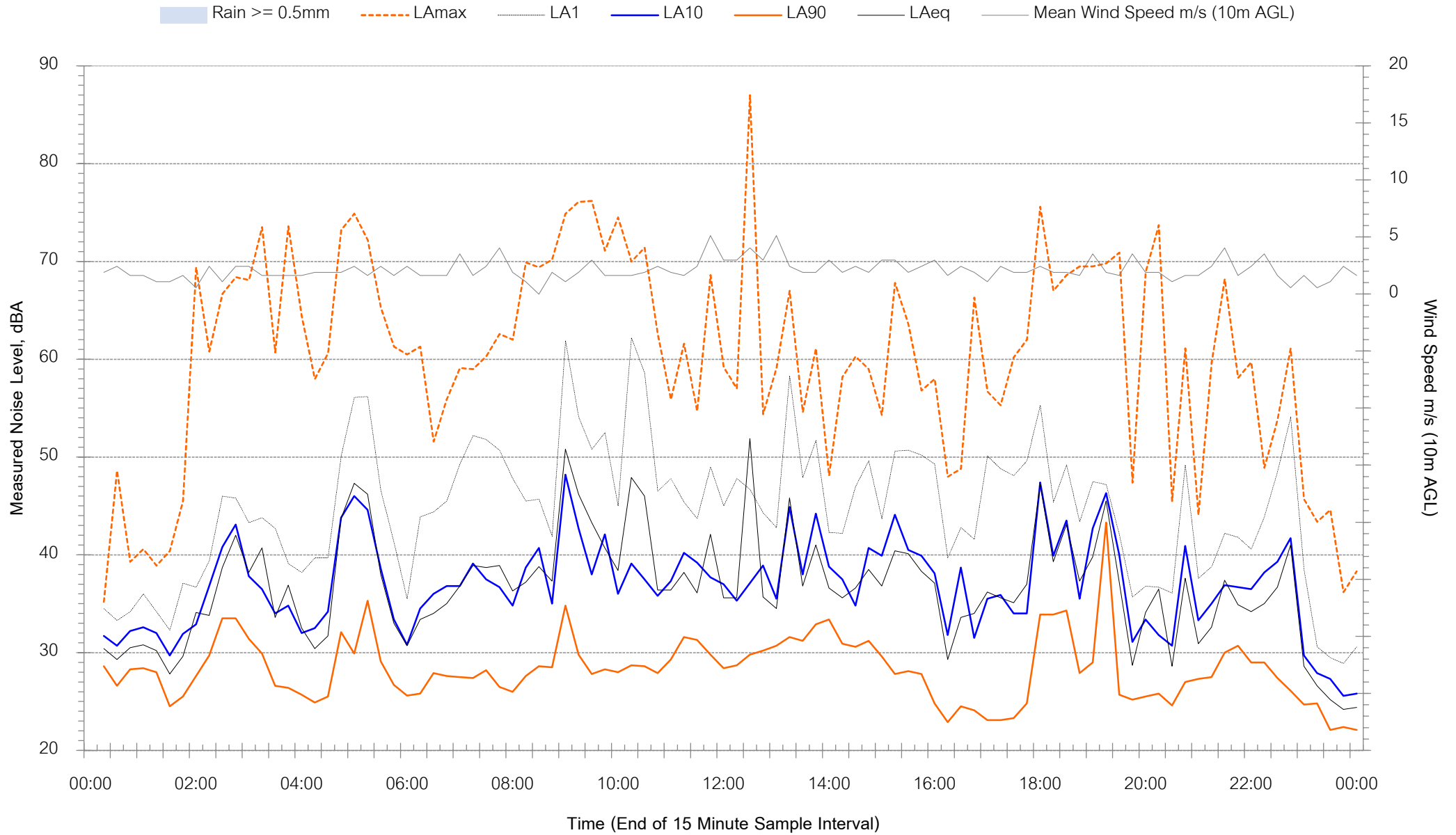
200 Jenolan Caves Road, Hartley - Friday 25 March 2022





Background Noise Levels

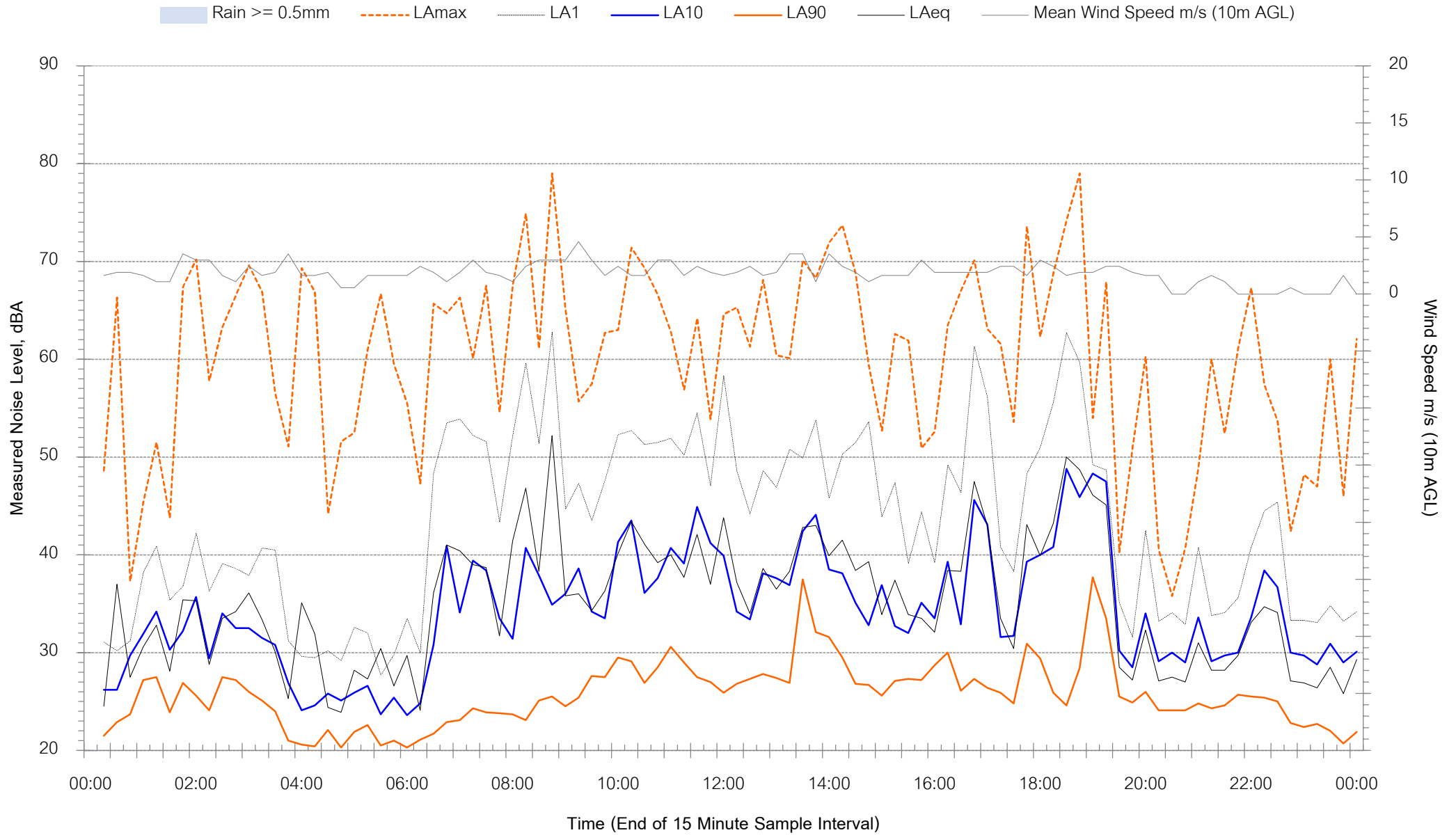
200 Jenolan Caves Road, Hartley - Saturday 26 March 2022





Background Noise Levels

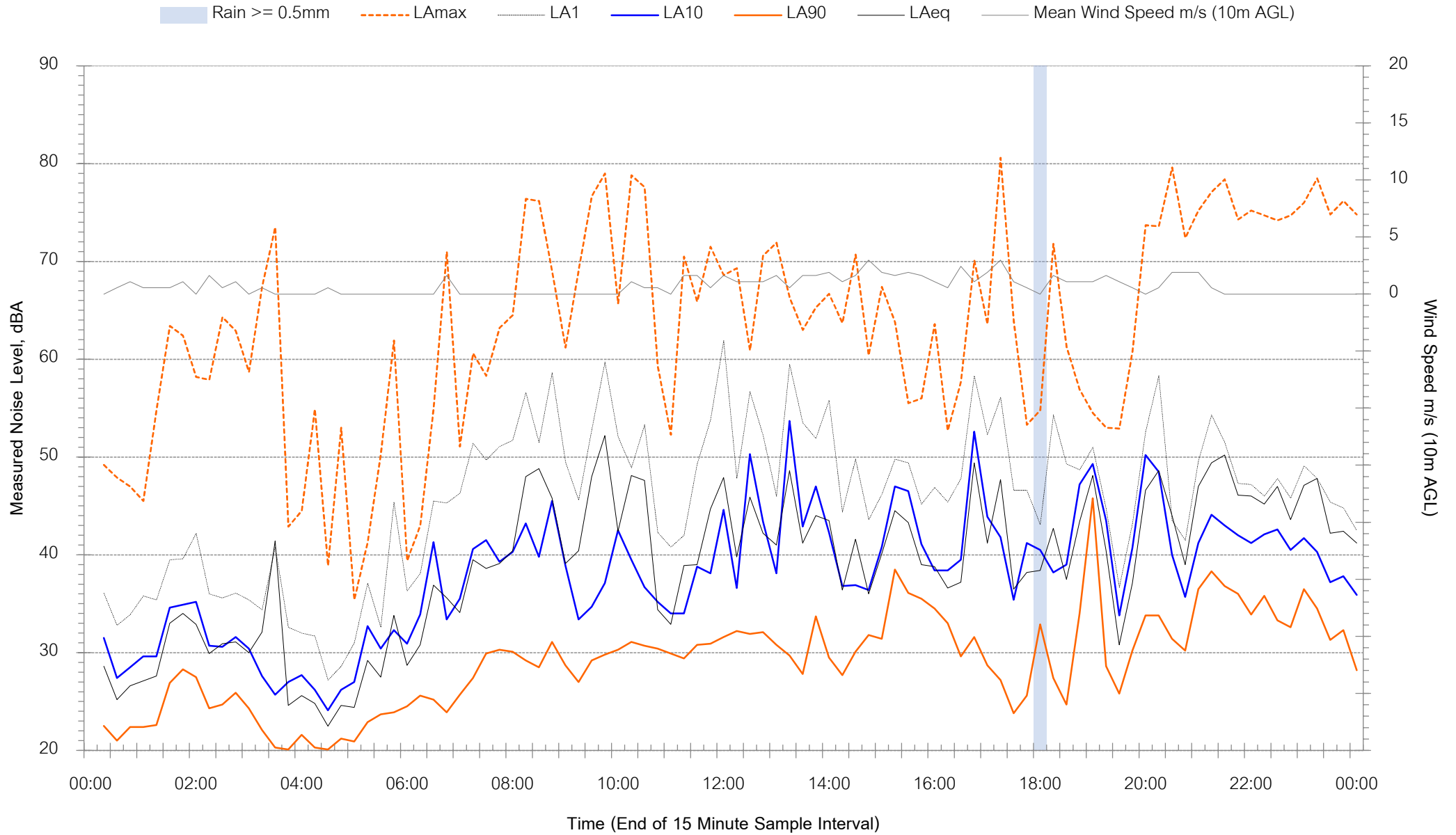
200 Jenolan Caves Road, Hartley - Sunday 27 March 2022





Background Noise Levels

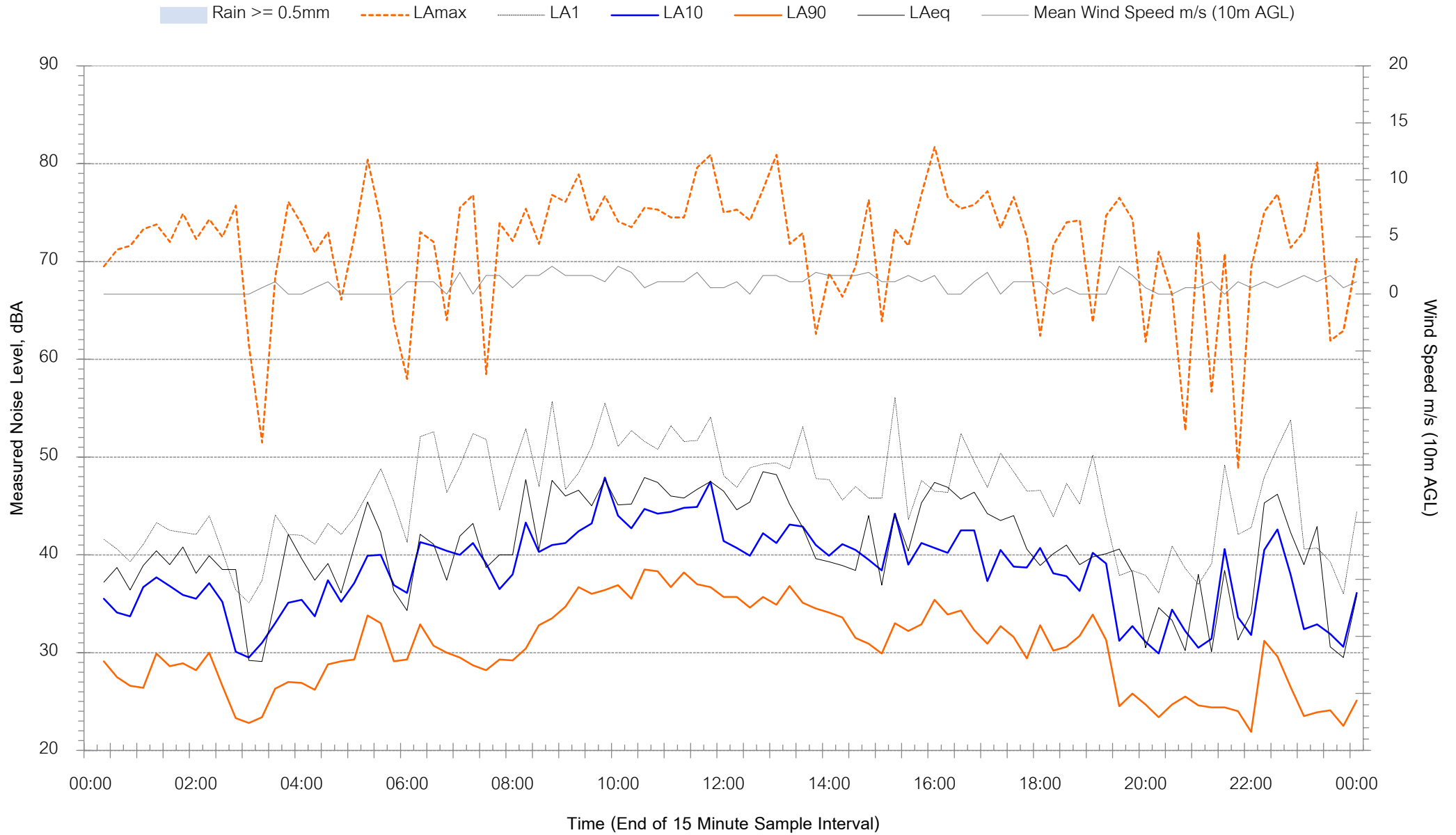
200 Jenolan Caves Road, Hartley - Monday 28 March 2022





Background Noise Levels

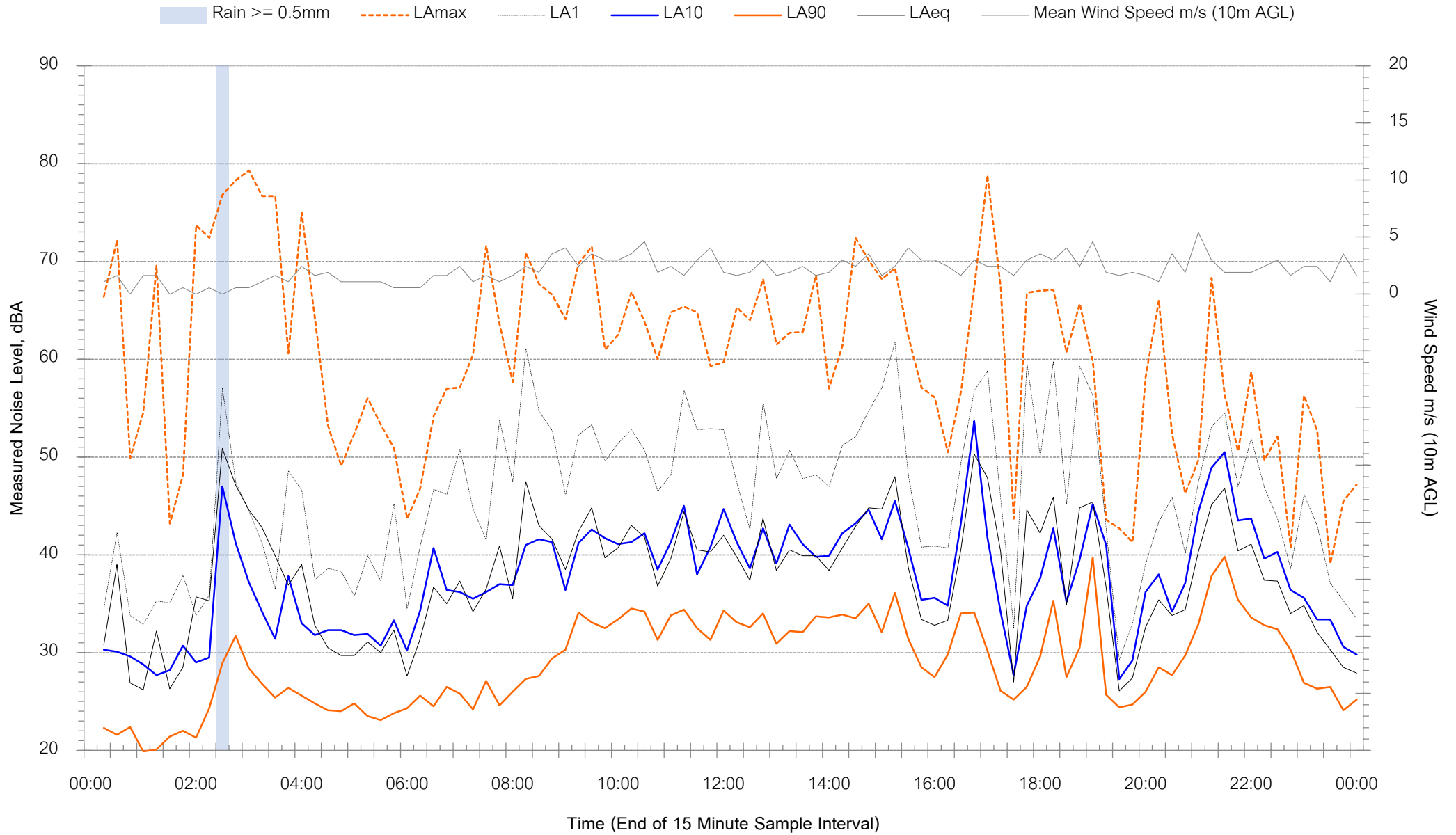
200 Jenolan Caves Road, Hartley - Tuesday 29 March 2022





Background Noise Levels

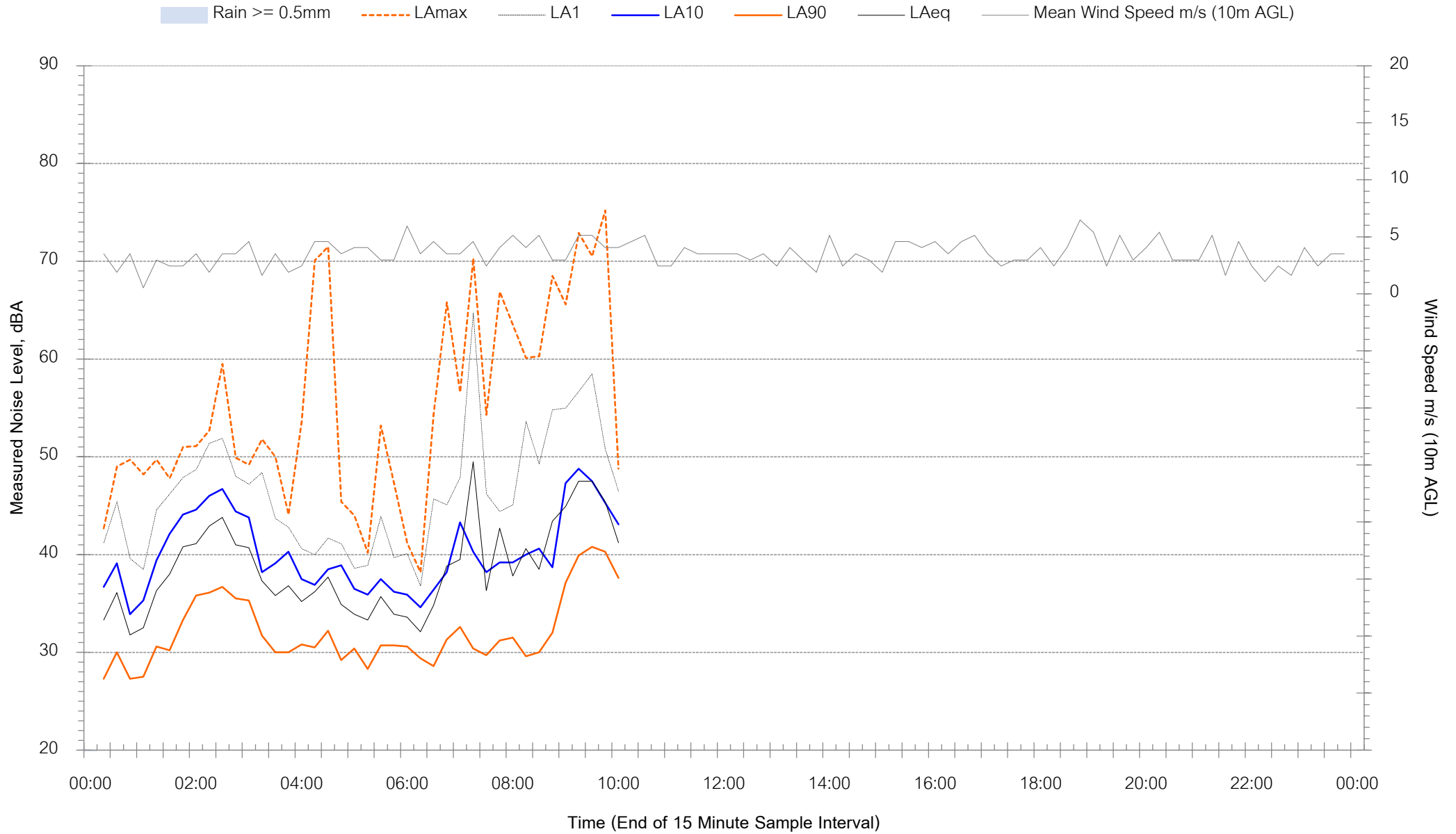
200 Jenolan Caves Road, Hartley - Wednesday 30 March 2022





Background Noise Levels

200 Jenolan Caves Road, Hartley - Thursday 31 March 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



Appendix H

Visual Monitoring

Plan of:	Annual Review for the Austen Quarry Extension July 2021 to June 2022 - 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:	SK
Figure:	Photoplate ONE	Our Ref:	12423_HY_H_AR2021-2-_C001_V0_F4	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
July 2018				
June 2019				
July 2020				
Aug 2021				
July 2022				

Appendix I Communication Regarding Biodiversity Credits



2 July 2021

Matthew Sprott
Director Resource Assessments
Department of Planning, Industry and Environment
4 Parramatta Square,
12 Darcy Street
PARRAMATTA NSW 2124

Sent by email to:
matthew.sprott@planning.nsw.gov.au

Dear Matthew

Re: Austen Quarry (SSD 6084): Deadline extension for retirement of offsetting obligations

The purpose of this letter is to provide you with an update on the progress of arrangements to satisfy the biodiversity offsetting obligations provided by SSD 6084. I refer to your letter dated 16 November 2021 extending the deadline to finalise the biodiversity offset obligations under SSD 6084 to 30 June 2021. As you are aware, Hy-Tec is proposing to modify SSD 6084 (MOD3). There are a number of matters the subject of the modification application that delay resolution of the Biodiversity Offset Strategy for the Project.

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 by the 611 plants planted by Hy-Tec in the Stage 2 expansion area.
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. Minor modifications to reconfigure aspects of the processing and stockpiling area layout, with no additional surface disturbance required.

The first component of MOD3 would see the offsetting obligations relating to the SLMG substantially reduced to include only those naturally occurring individuals that would be cleared and not the areas planted by Hy-Tec. As we have discussed, the current arrangements penalise Hy-Tec for proactive regeneration of a threatened species. As a result of this pending application, Hy-Tec is not in a position to finalise offsetting of the SLMG for the Project.

The second component relates to timing for satisfaction of offsetting obligations directly as it is proposed to separate the overall obligation into three likely stages to ensure that offsetting obligations are satisfied as the impact occurs and Hy-Tec has the opportunity (and incentive) to reduce vegetation clearing as the development progresses. This has already occurred as was the

Brooklyn Office:
First Floor, 12 Dangar Road, PO Box 239, BROOKLYN NSW 2083
Telephone: (02) 9985 8511 Email: brooklyn@rwcorkery.com

Orange Office:
62 Hill Street, ORANGE NSW 2800
Telephone: (02) 6362 5411 Email: orange@rwcorkery.com

Brisbane Office:
Suite 5, Building 3, Pine Rivers Office Park, 205 Leitchs Road, BRENDALD QLD 4500
Telephone: (07) 3205 5400 Email: brisbane@rwcorkery.com

subject of a previous modification to SSD 6084 (approved 15 August 2018). Therefore, until MOD3 is determined, Hy-Tec will not know the quantum or timing of offsetting obligations.

Hy-Tec is working with RWC and Niche Environment and Heritage to complete the work required to submit MOD3, with delivery of this application expected by the end of July 2021. Once this application is determined, Hy-Tec would finalise a Biodiversity Offset Strategy for the Stage 2 Project and submit this with an update to the Rehabilitation and Landscape Management Plan for the operation.

We understand that it is not possible to predict the timing for determination of the MOD3 application and therefore request a 6-month extension to 31 December 2021 to finalise the offsetting obligations of the Stage 2 Project.

Please note that Hy-Tec has continued to manage the land within and adjacent to the Quarry to ensure that biodiversity-related impacts are avoided or mitigated as much as possible. Discussions with the Hartley Pastoral Company have continued but it clear that a land-based offset is no longer an option. The planting campaigns for the SLMG now extend to more than 4,000 individual plants with Quarry personnel developing an excellent understanding of the conditions for successful growth including preliminary ground preparation that seems to be most important for this species. When compared to the approval to remove 701 individual species (90 of these were occurring naturally with the remaining 87% planted by Hy-Tec), it is obvious that Hy-Tec has achieved well above a like-for-like outcome for the species with this to further improve over time. Our offer remains for you to visit the Quarry and see the extent of successful planting for yourself.

We trust you will accept our justification for a further extension of time and thank you for past considerations on this matter.

Yours sincerely



Nick Warren
Principal Environmental Consultant

Copy: Hy-Tec Industries Pty Limited



Mr Nick Warren
Principal Environmental Consultant
RW Corkery & Co Pty Limited
PO Box 239
Brooklyn, NSW, 2083

30/07/2021

Dear Mr Warren

**Austen Quarry Extension (SSD-6084)
Extension of Time to Finalise Biodiversity Offset Credits**

I refer to your letter of 05 July 2021 requesting an extension of time to 31 December 2021 to finalise the retirement of biodiversity offset credits required under condition 25 of schedule 3 of the Austen Quarry Extension (SSD-6084) development consent.

I am advised a previous extension of time to 30 June 2021 was granted to allow Hy-Tec, the operator of Austen Quarry, to progress with its negotiations and finalisation of an agreement with the landowner of the intended offset land. You have now advised that Hy-Tec's discussions with this landowner has led it to conclude that a land-based offset to retire the required biodiversity credit obligations of Austen Quarry is no longer suitable.

You also advise that Hy-Tec will be seeking to modify Condition 25 of Schedule 3 of the consent SSD-6084 (Modification 3) to amend Austen Quarry's biodiversity credit obligations. The Department notes that the current forecast date for submission of Modification 3 is 13 August 2021. The Department requires a timely submission of the modification application to ensure that Austen Quarry's biodiversity offset credit obligations would be finalised within reasonable timeframes.

Given the above commitment I grant an extension of time until 31 December 2031 for the finalisation and retirement of biodiversity offset credits required under condition 25 of schedule 3 under SSD-6084.

If you wish to discuss the matter further, please contact Nagindar Singh on 8289 6873 or via email at nagindar.singh@planning.nsw.gov.au.

Yours sincerely

A handwritten signature in black ink that reads 'C. Dumbleton'.

Carl Dumbleton
A/Director
Resource Assessments (Coal & Quarries)

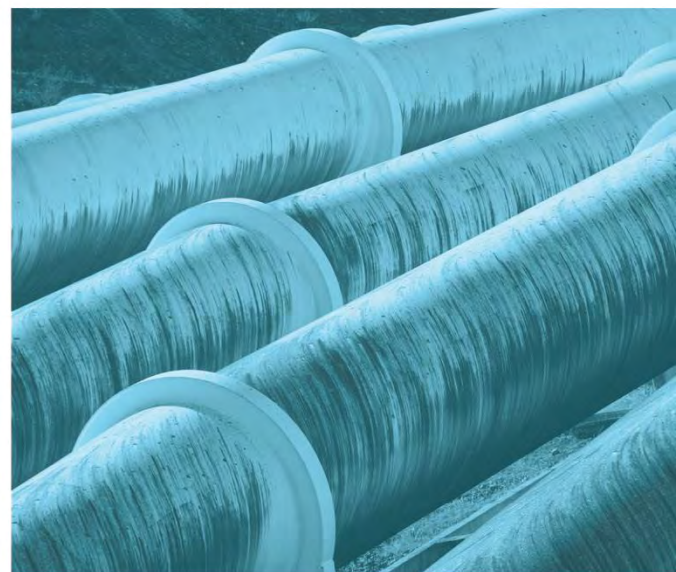
As nominee of the Planning Secretary

Appendix J Biodiversity Monitoring



Austen Biodiversity Monitoring 2021

Prepared for Austen Hy-Tec
February 2022





Servicing projects throughout Australia and internationally

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

ADELAIDE

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

MELBOURNE

Ground floor, 188 Normanby Road
Southbank VIC 3006
T 03 9993 1900

PERTH

Level 9, Suite 2, 109 St Georges Terrace
Perth WA 6000

CANBERRA

PO Box 9148
Deakin ACT 2600

Austen Biodiversity Monitoring 2021

Prepared for Austen Hy-Tec
February 2022

EMM Newcastle
Level 3, 175 Scott Street
Newcastle NSW 2300

T 02 4907 4800
E info@emmconsulting.com.au

www.emmconsulting.com.au

Austen Biodiversity Monitoring 2021

Report Number

E210620 RP1

Client

Austen Hy-Tec

Date

11 February 2022

Version

v1.0 Final

Prepared by**Approved by**



Callan Douchkov
Environmental Scientist
11 February 2022



David Bone
Associate Director
11 February 2022

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

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1 Introduction

1.1 Introduction

The objective of this assessment is to:

- Undertake an ecological sampling program to provide the data required to assess whether the quarry is compliant with the consent conditions under which it operates;
- Sample flora and fauna species at representative sites;
- Conduct flora and fauna surveys across all parts of the quarry lease area to assess areas to be impacted during the upcoming seasons;
- Identify any threatened species or communities occurring in the vicinity of the quarry which have been newly listed since the previous survey;
- Analyse the data and determine if the quarry site is having any indirect impacts on the ecology of the surrounding area; and,
- Provide management recommendations to preserve significant ecology that may be present on the project site and minimise negative impacts to the local ecology in general.

1.2 Site Visit

Flora and Fauna surveys were conducted by EMM Consultants Callan Douchkov and Ryl Parker over a three-day period between 10 and 12 November 2021. Weather conditions during the surveys were mild mornings and cool weather throughout the day, ranging between 12-25 degrees. Rain events occurred throughout Wednesday and Thursday, with moderate to heavy falls throughout the afternoons of both days. Average wind speeds on site were mostly calm.

2 Background Information

2.1 Existing Site Description

The project site comprises the mining lease area which contains an active mining area, processing and workshop area, material stockpiles, and steep rocky woodland areas. The site is approximately 12.9 hectares (ha). To the immediate north and east of the site is the Cox's River. The river is sparsely vegetated upstream of the quarry areas as a result of active grazing activities and the quarry development. The river currently has a thin strip of vegetation along its banks approximately 20 to 50 metres wide. Downstream of the quarry the river vegetation broadens out on the rivers southern side with grazing properties continuing to the north of the river for the entire lease. As the river bends to the south, natural bushland dominates on all sides of the river due to the very steep nature of the terrain.

To the east of the quarry area is naturally vegetated steep and rocky ridgelines. To the south and west of the site the steep naturally vegetated ridgelines continue with cleared grazing land on flatter sections and at the bases of the ridges on adjoining private properties. These cleared areas are over two kilometres (km) from the quarry to the south. The project site and surrounds can be seen in Figure 3.1.

The site is located approximately 3.5km south of the village of Hartley which sits to the west of the Blue Mountains Escarpment. The elevation of the site varies from approximately 650 to 750 metres (m) above sea level. Yorkey's Creek, a tributary of the Cox's River enters from the south near the processing area and flows north to the Cox's River.

2.2 History of Monitoring Programs

Development for the quarry was granted by Lithgow City Council in 1993 (DA 104/93).

A modification was approved for the operation under the EP&A Act 1979 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. The quarry currently operates under Version 2.2 of this plan, approved in September 2019.

This report has been prepared to satisfy the requirements of this plan. EMM has undertaken the annual monitoring program from 2018.. The approach undertaken by EMM for this survey has been to survey the sites using the techniques nominated in the 2019 approved Landscape and Rehabilitation Management Plan.

To assess the indirect impact of quarry activities on flora, fauna, and their habitats the following approach was undertaken.

Species are surveyed across a range of habitats present on the site in both disturbed and undisturbed (by quarry activities) sites. The species identified and their abundance is analysed against previous years data to assess if species were present or absent during that time of year and if the abundance of dominant species has changed. The single survey season is only able to detect species active during that season, however the purpose of the assessment is to check on the indirect impacts of the quarry, and not to compile a complete species inventory for the site. The spring/summer season was chosen to coincide with higher levels of faunal activity usually present at this time of the year in this area, as compared with the autumn/winter period which is often subject to very cold and wet conditions including snow. Floristic survey in late Spring early Summer has proved to be able to detect a large number of species and has been repeated now since 2006.

Flora species are surveyed in the same transect areas established in 2006 with the analysis focusing on the abundance of weed species present in each area. Fauna census are undertaken along the flora transects and are supported by nocturnal survey and baited remote camera points in each main community.

3 Survey Methodology

3.1 Survey Timing

The ecological survey was conducted mid-November 2021 over a three-day period from 10 November to 12 November. This period has proven to be a suitable time of the year to conduct a comprehensive flora and fauna survey due to favourable weather conditions and most flora species in flower or above ground, and foraging resources to be at a peak for fauna species.

Mild to cool weather conditions prevailed throughout the survey period. Rain events occurred throughout the first and second survey days from mid-afternoon on both days. Site conditions were wet with considerable rainfall occurring throughout the week prior to survey (from 4 November to 8 November) and throughout the nights of 10 and 11 November.

3.2 Fauna Survey Techniques

Fauna surveys were conducted using point census methods at established flora transect locations for diurnal species. Nocturnal surveys were unable to be undertaken due to prevailing wet and rainy conditions throughout both survey nights.

Diurnal fauna survey included:

- 20-minute bird census periods at discrete points along flora transects in each community
- Opportunistic survey along flora transects.

Nocturnal fauna survey included:

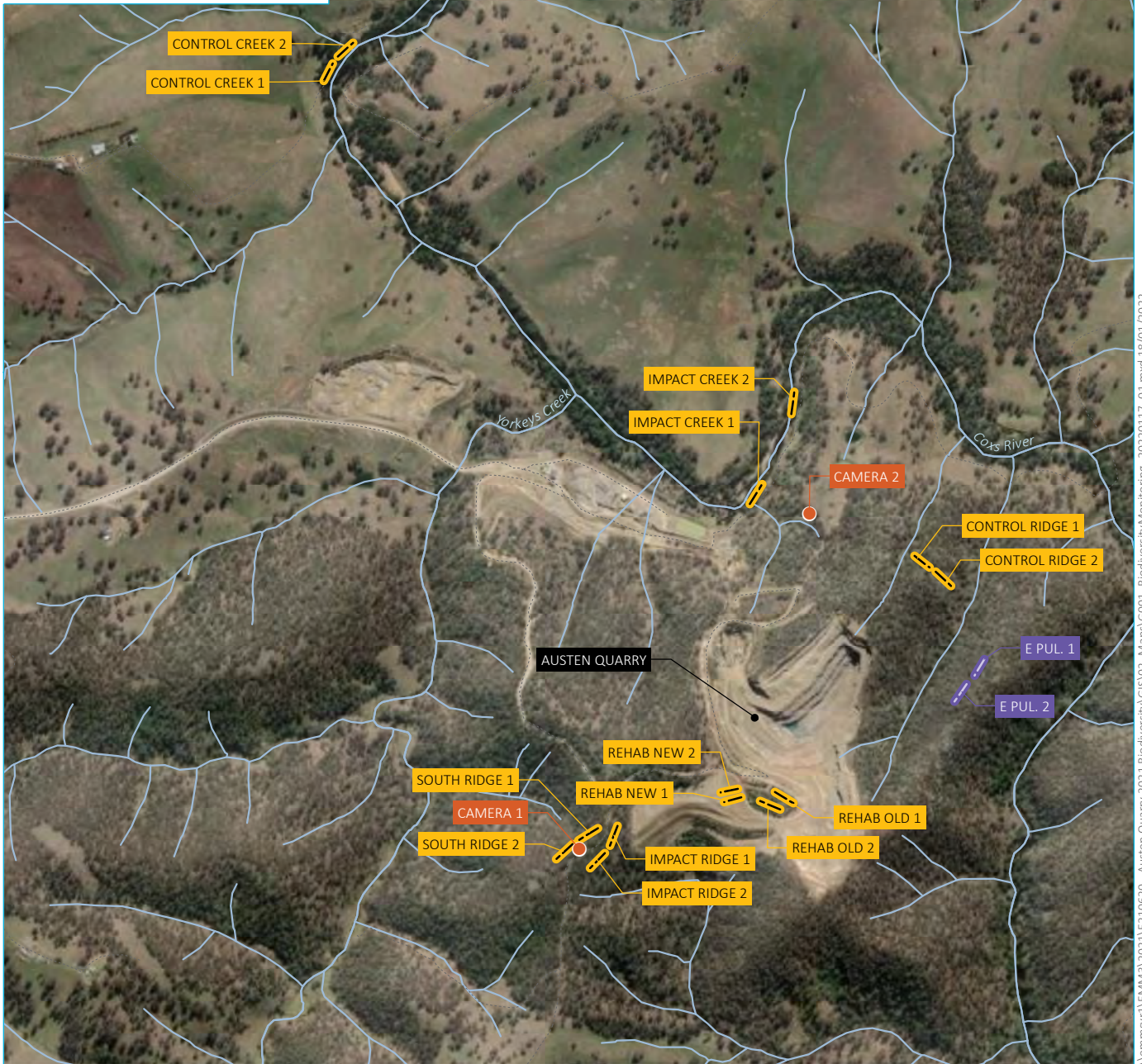
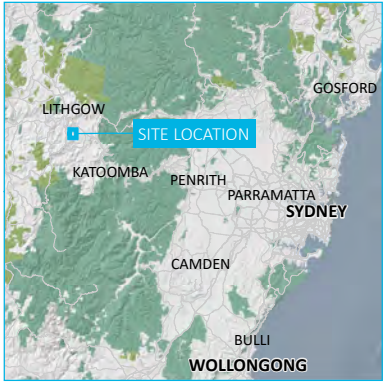
- Motion-activated fauna cameras with bait stations set up in each community over two nights.

3.3 Flora Survey Techniques

Flora surveys were conducted using two 50x10m transects within each vegetation community survey location. Location of transects are shown in Figure 3.1.

Within each survey location two 50m line transects were set up and the presence of vegetation (weeds and natives), bare areas, rock and leaf litter were recorded at 5 m intervals along the transect to provide 22 survey points. In addition to this, all plant species present were recorded using 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 an average score is recorded.

The 20 x 20m plots located along each line transect also record the relative abundance of each species identified. This data is used to prepare the cumulative data analysis against the previous years of survey. Most plant species were identified in the field with the aid of field keys and from experience.



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

KEY

- Fauna camera
- Biometric monitoring
- Eucalyptus pulverulenta*
- Existing environment
- Major road
- Vehicular track
- Watercourse/drainage line

- INSET KEY**
- Main road
 - NPWS reserve
 - State forest

Biodiversity monitoring 2021

Hy-Tec - Austen Quarry
Biodiversity Monitoring 2021
Figure 3.1



\\emmsvr1\EMM\3\2021\E210620 - Austen Quarry 2021 Biodiversity Monitoring_G001_Maps\G001_BiodiversityMonitoring_20220117_01.mxd 18/01/2022

4 Results

4.1 Flora Communities

There are two distinct Plant Community Types (PCT) present on the lease:

- PCT 85, River Oak forest and woodland wetland of the NSW South Western Slopes and South Eastern Highlands Bioregion along the Cox’s River.
- PCT 1093, Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands; South Eastern Highlands Bioregion on the ridges around the quarry.

The transects along the Cox’s River lie generally to the north of the active quarry site. Two areas are examined to determine the degree of impact of the quarry operations, upstream of the quarry (to the north-west) and downstream of the active quarry (to the north).

The control ridge sites lie to the north-east and south-west of the active quarry area. Impact ridge sites are located to the southwest of the quarry overburden dump.

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

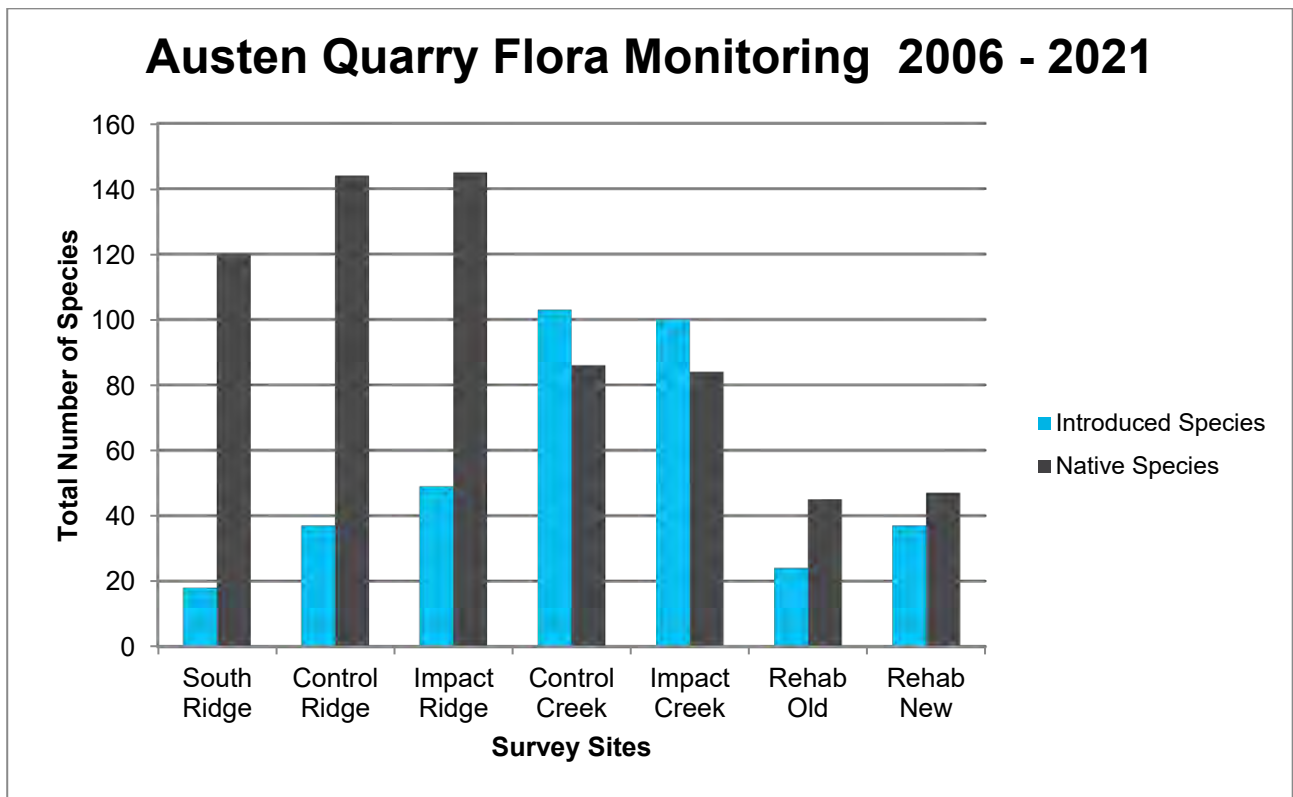


Figure 4.1 Cumulative Flora Survey Data 2006 - 2021

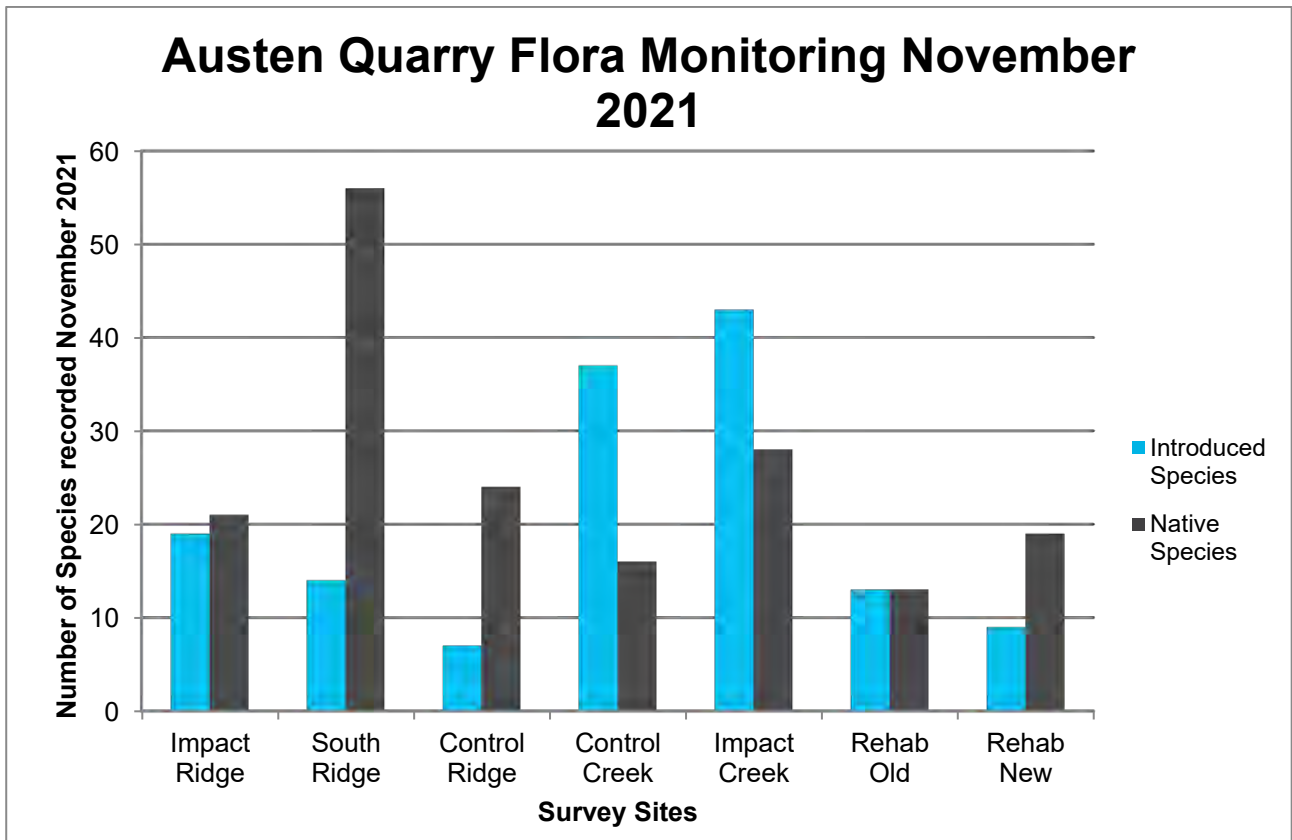


Figure 4.2 November 2021 Flora Survey Data

In comparison to previous years, Figure 4.2 shows that impact ridge sites have recovered slightly from weed invasion, with less invasive and more native species recorded. As shown in Figure 3.1, impact ridge sites are located on the east-facing slope above the quarry’s existing overburden dump. This site is within the total disturbance footprint of the approved overburden dump and will continue to become more impacted by quarry activities. As mentioned in the 2020 annual biodiversity monitoring report (EMM 2020), consideration was made to move this monitoring point 100-200 m further south due to expansion of the overburden dump, however quarry activities have not progressed to a point where relocating this transect is required.

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 4.2 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. A large, scattered cluster of strawberry broomrape (*Orobanche sp.*) as reported in the 2020 annual biodiversity monitoring report was observed to remain on the eastern-facing slope of Impact Ridge. The extent of this species was observed to remain consistent with the extent observed in the 2020 survey and was not observed at any other transect sites.

The river sites continue to show a trend of higher weed concentrations, with the presence of introduced species being far higher than that of 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. No significant difference in native species numbers was recorded at either site. Therefore, there is no indication that quarry operations are having an impact on species diversity in this area.

A slight decrease in both introduced and native species was observed at the old rehab monitoring site, and a slight increase in introduced species at the new rehab site. 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 2020 and 2021 monitoring survey data sets were noted including:

- Increase in native species recorded at Impact Ridge sites.
- Increase in introduced species and decrease in native species at Control Ridge sites.
- Establishment of 'South Ridge' as separate monitoring site.

4.2 Priority environmental weeds

Priority environmental weeds are also being closely monitored, with an assessment undertaken of their presence and abundance over all monitoring sites. This is displayed in Table 4.1 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 4.1 Priority Weeds Relative Abundance 2021

Scientific Name	Common Name	Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek	Rehab Old	Rehab New
<i>Cytisus scoparius</i>	Scotch Broom							
<i>Eragrostis curvula</i>	African Love Grass				4	2		
<i>Lycium ferocissimum</i>	African Boxthorn							
<i>Nassella trichotoma</i>	Serrated Tussock	1	1			4	1	
<i>Orobanche sp.</i>	Broomrape	1						
<i>Rubus fruticosus</i>	Blackberry				1	1		

Table 4.1 **Priority Weeds Relative Abundance 2021**

Scientific Name	Common Name	Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek	Rehab Old	Rehab New
<i>Salix sp.</i>	White/Weeping Willow					1		
<i>Senecio madagascariensis</i>	Fireweed							
<i>Hypericum perforatum</i>	St. Johns Wort	1			1	3		

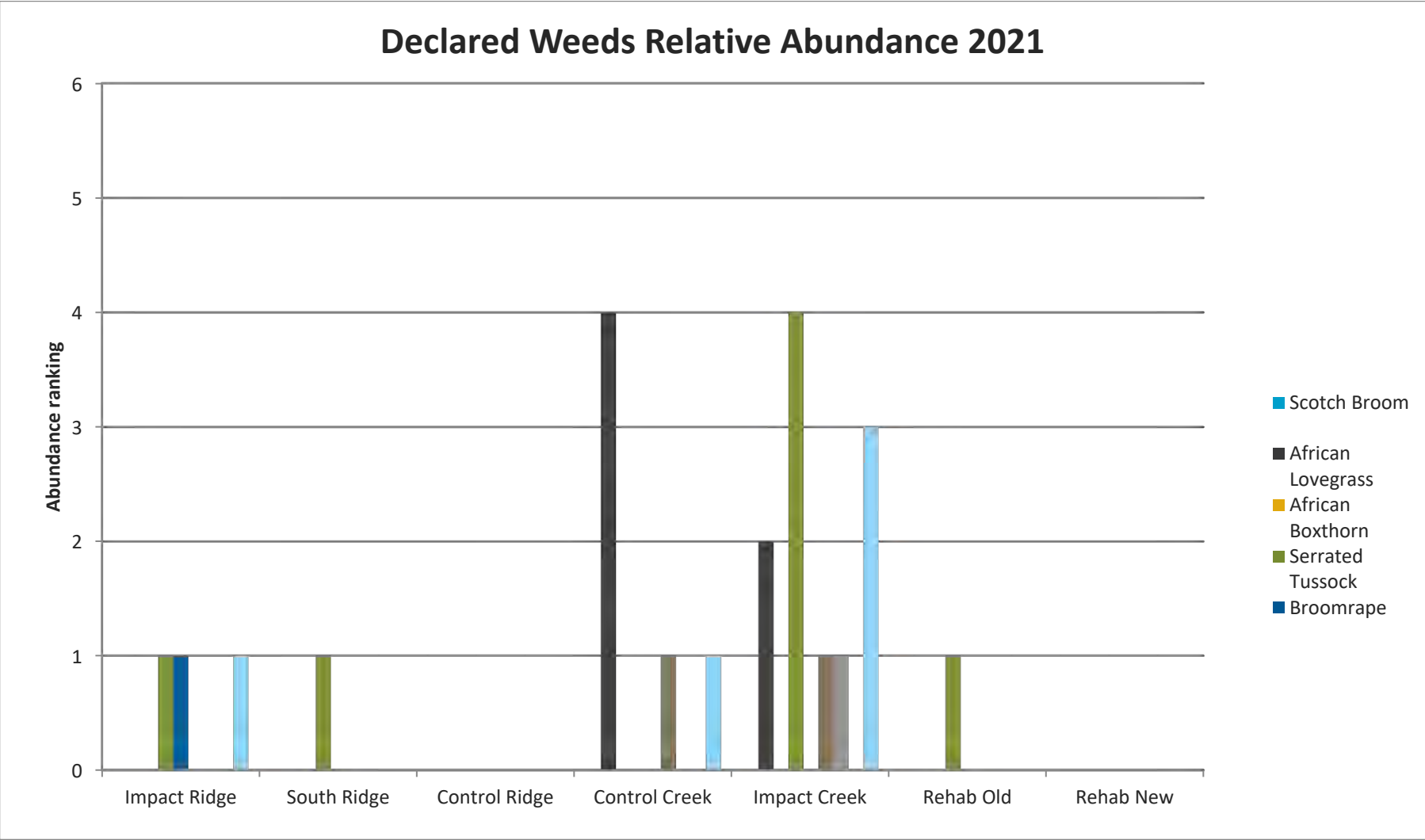


Figure 4.3 Priority Weeds Relative Abundance 2021

4.3 Fauna Survey Results

The results presented in Figures 4.4 to 4.14 have been broken up into the following groups or assemblages:

- Amphibians
- Reptiles
- Mammals
- Total birds
- Birds of Prey (including magpies, crows etc)
- Nocturnal birds
- Riverine birds (ducks, coots, moorhens, egrets etc)
- Parrots
- Forest woodland species (whipbirds, kingfishers, pigeons and doves, pipits and song larks, quails, starlings and mynas)
- Robins, wrens and finches
- Honeyeaters

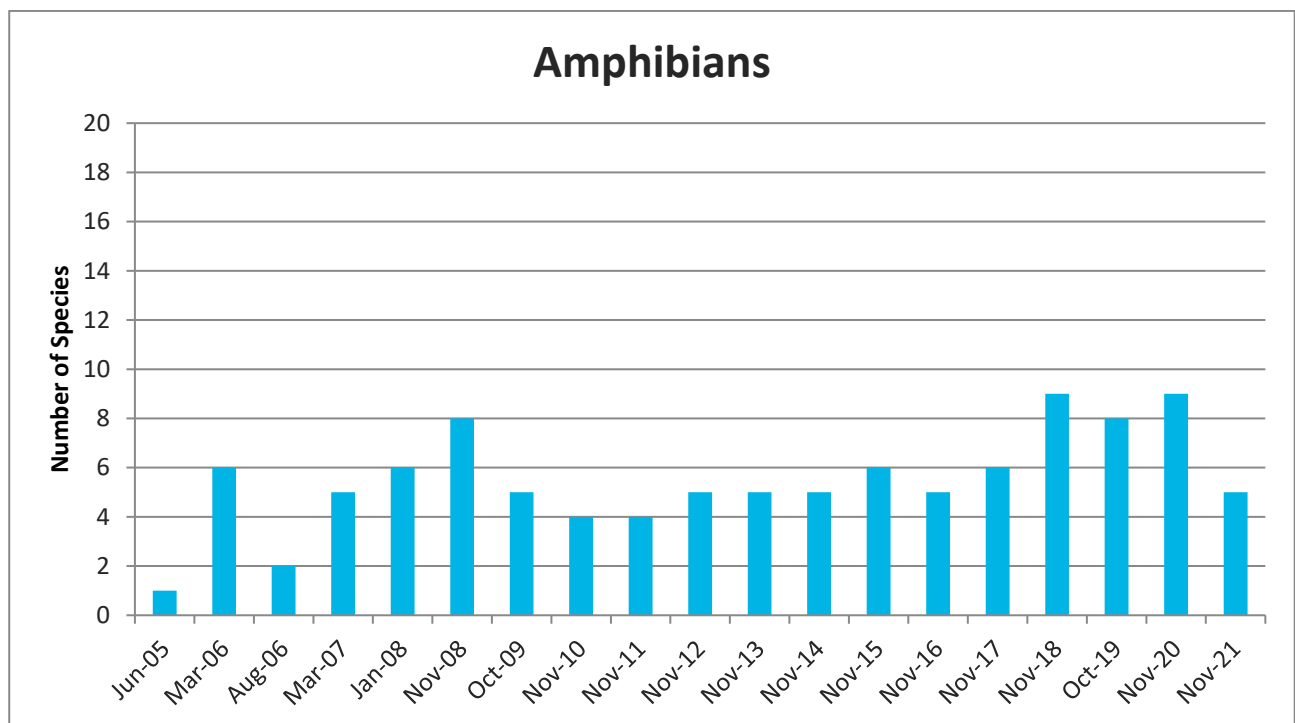


Figure 4.4 Amphibian Monitoring Results

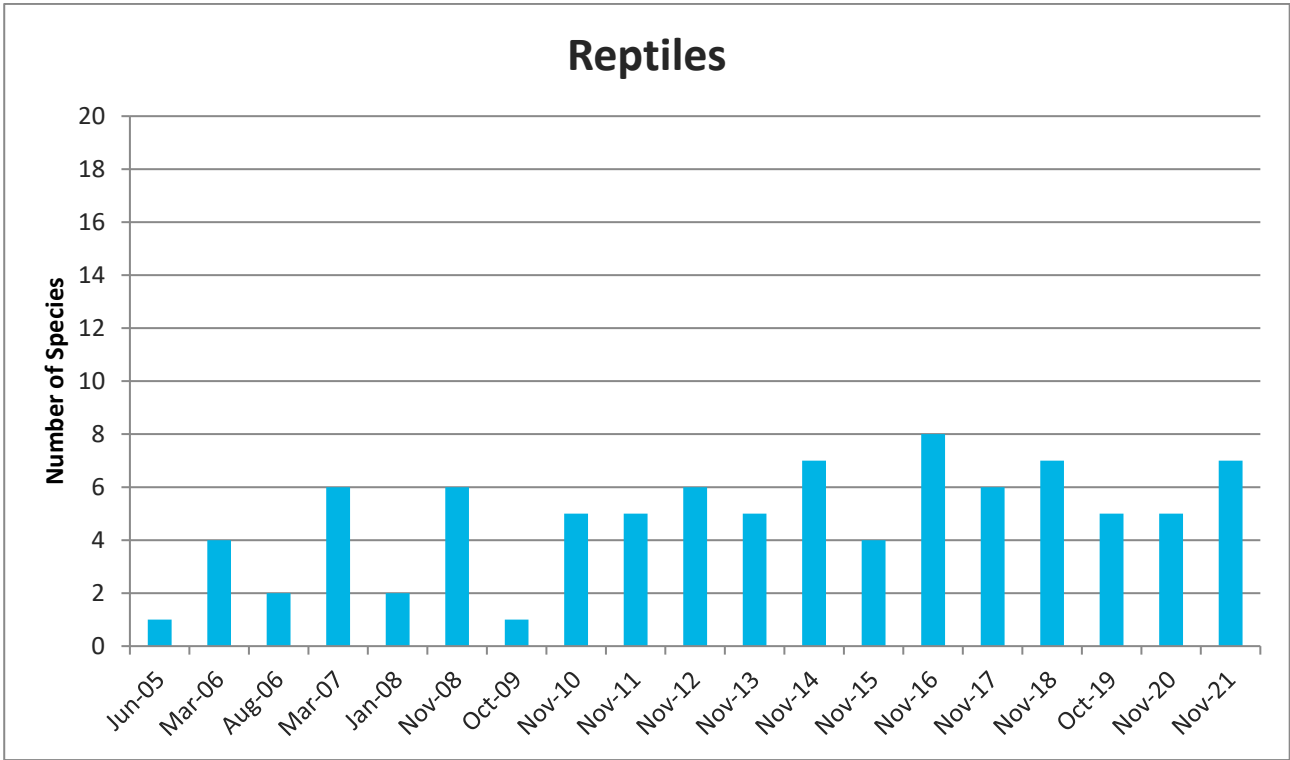


Figure 4.5 Reptile Monitoring Results

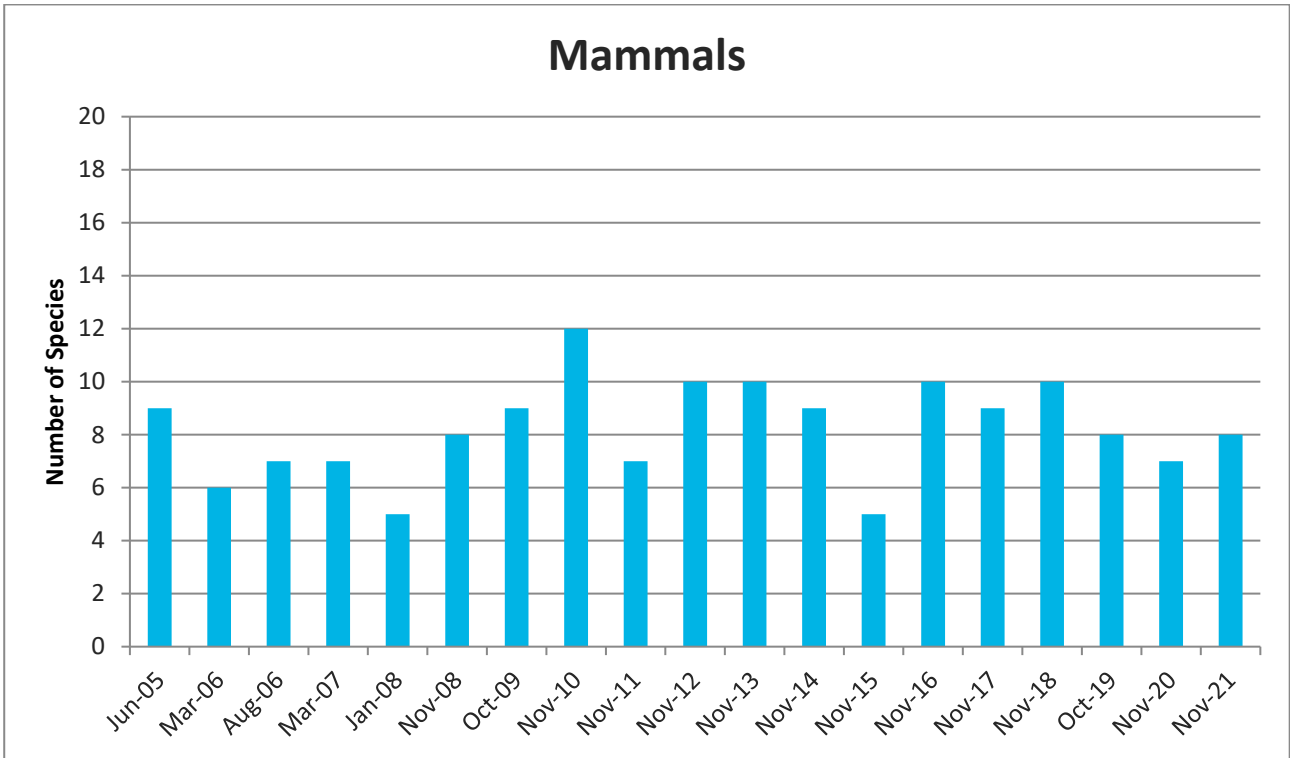


Figure 4.6 Mammal Monitoring Results

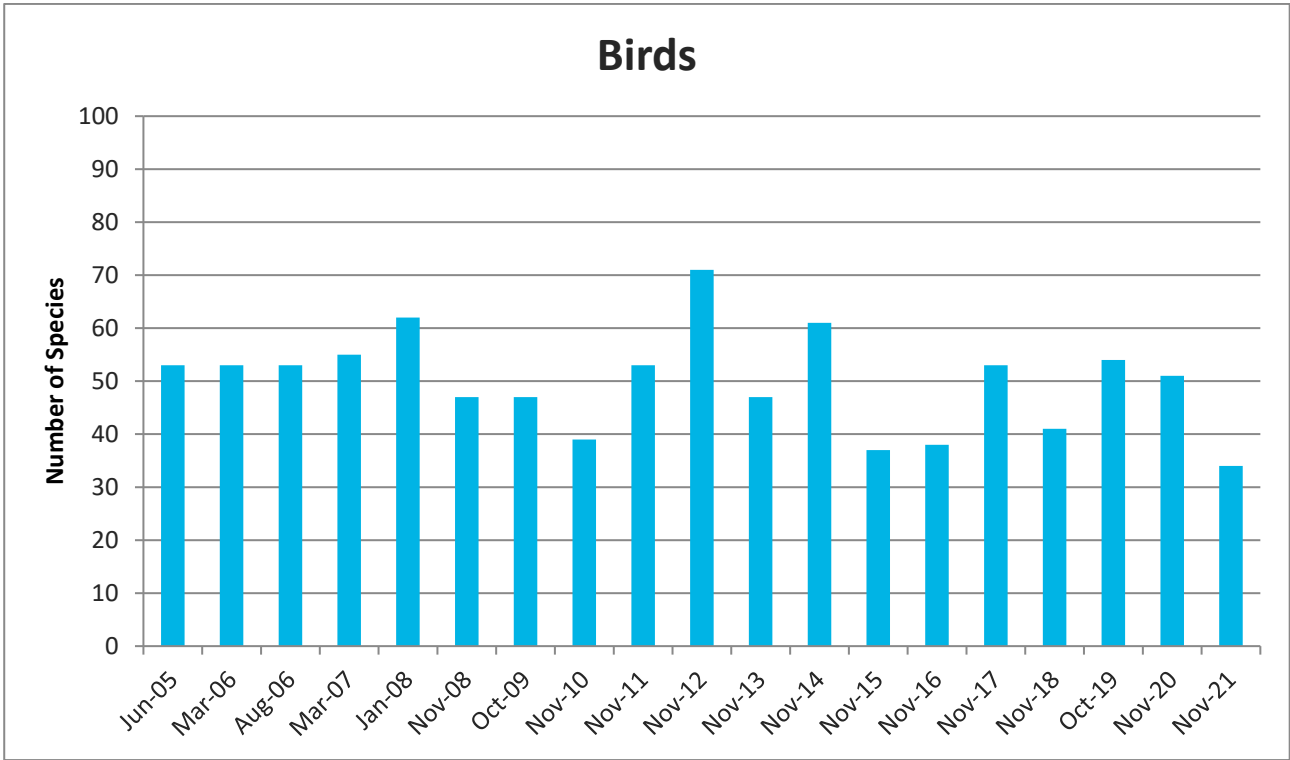


Figure 4.7 Bird Monitoring Results

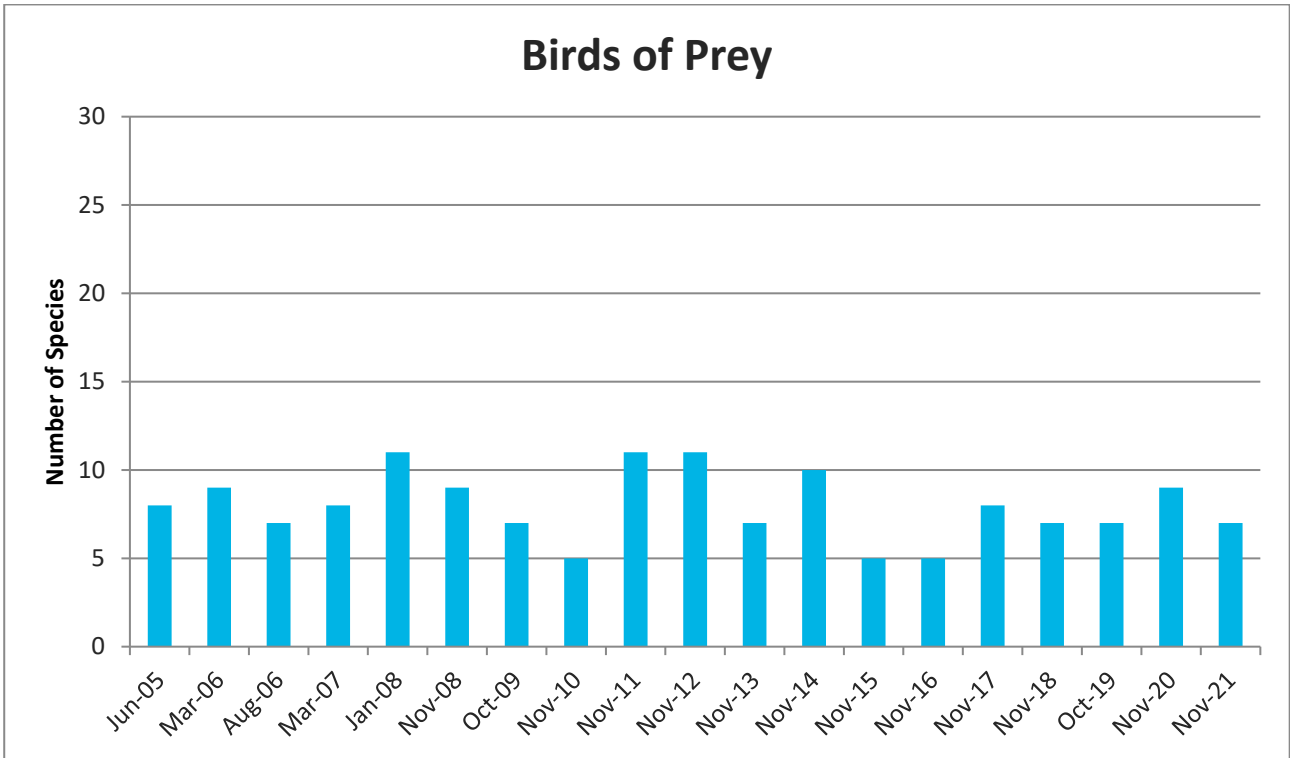


Figure 4.8 Bird of Prey Monitoring Results

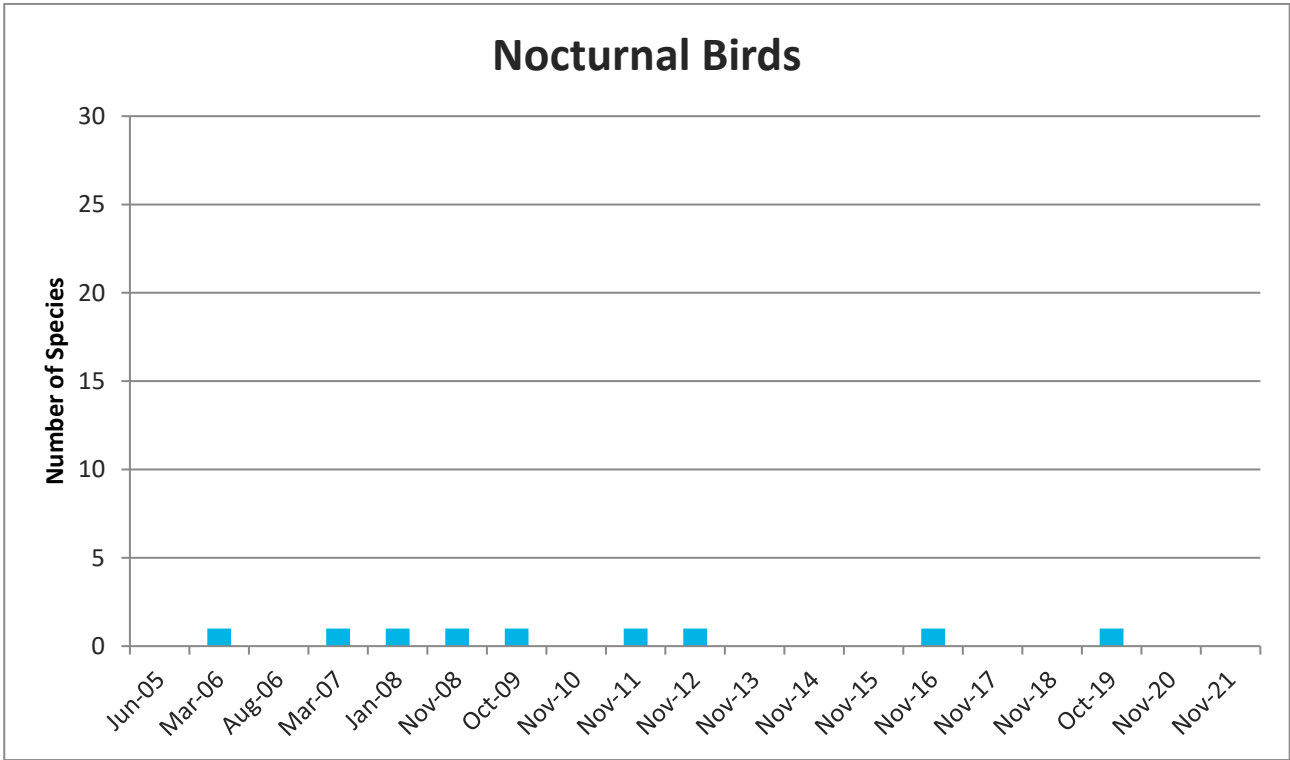


Figure 4.9 Nocturnal Bird Monitoring Results

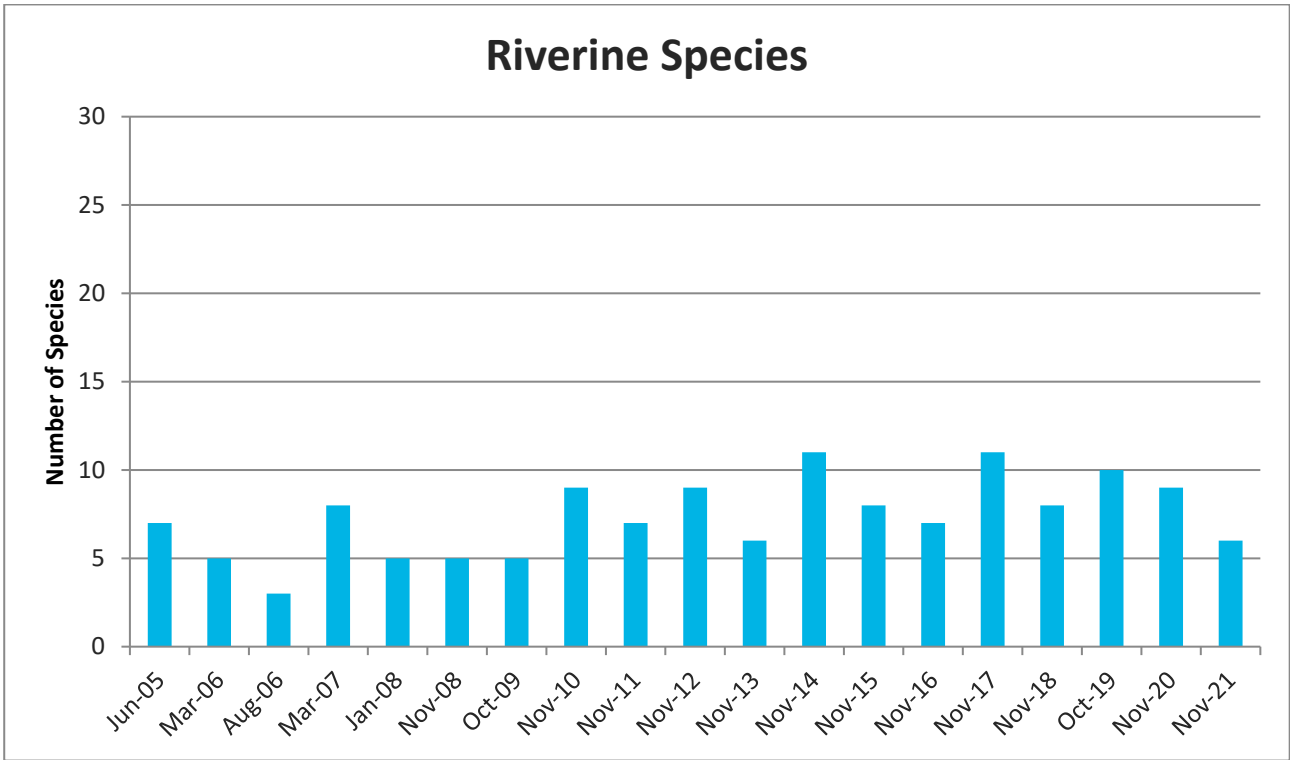


Figure 4.10 Riverine Bird Species Monitoring Results

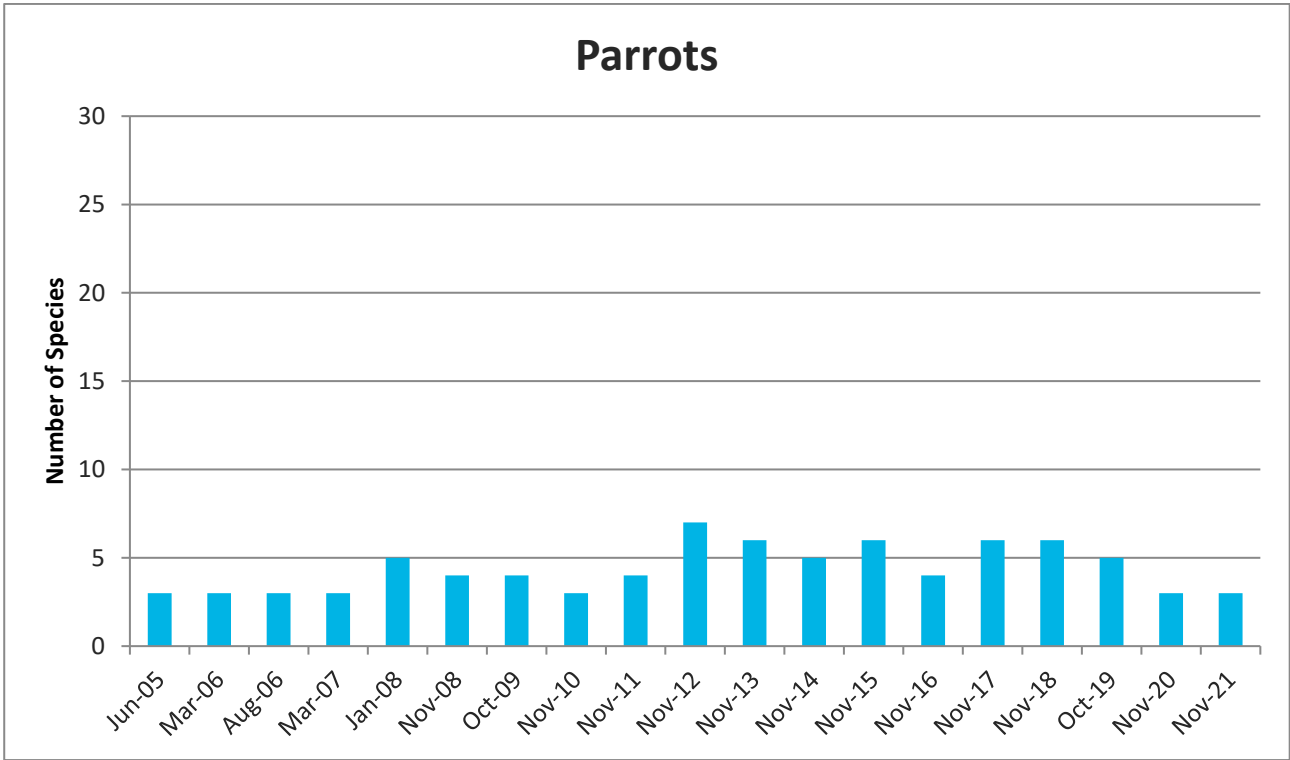


Figure 4.11 Parrot Monitoring Results

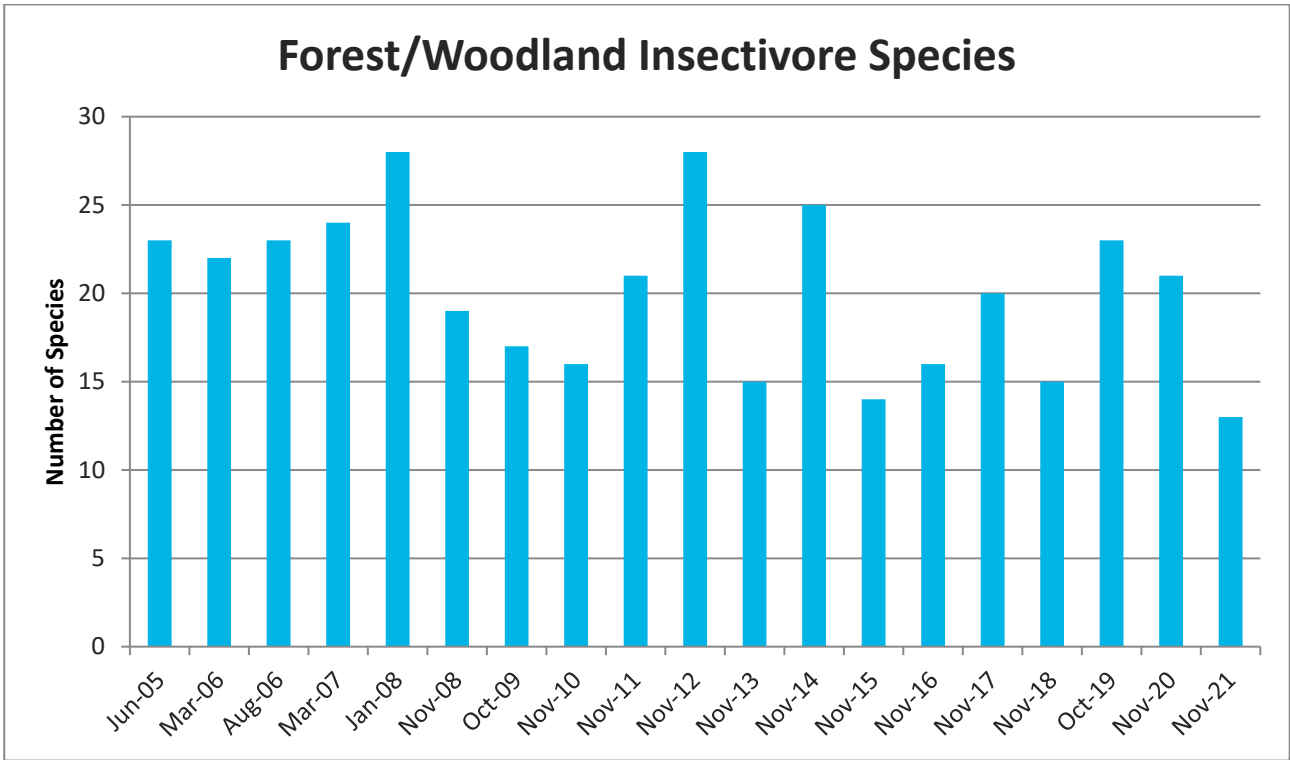


Figure 4.12 Forest/ Woodland Bird Species Monitoring Results

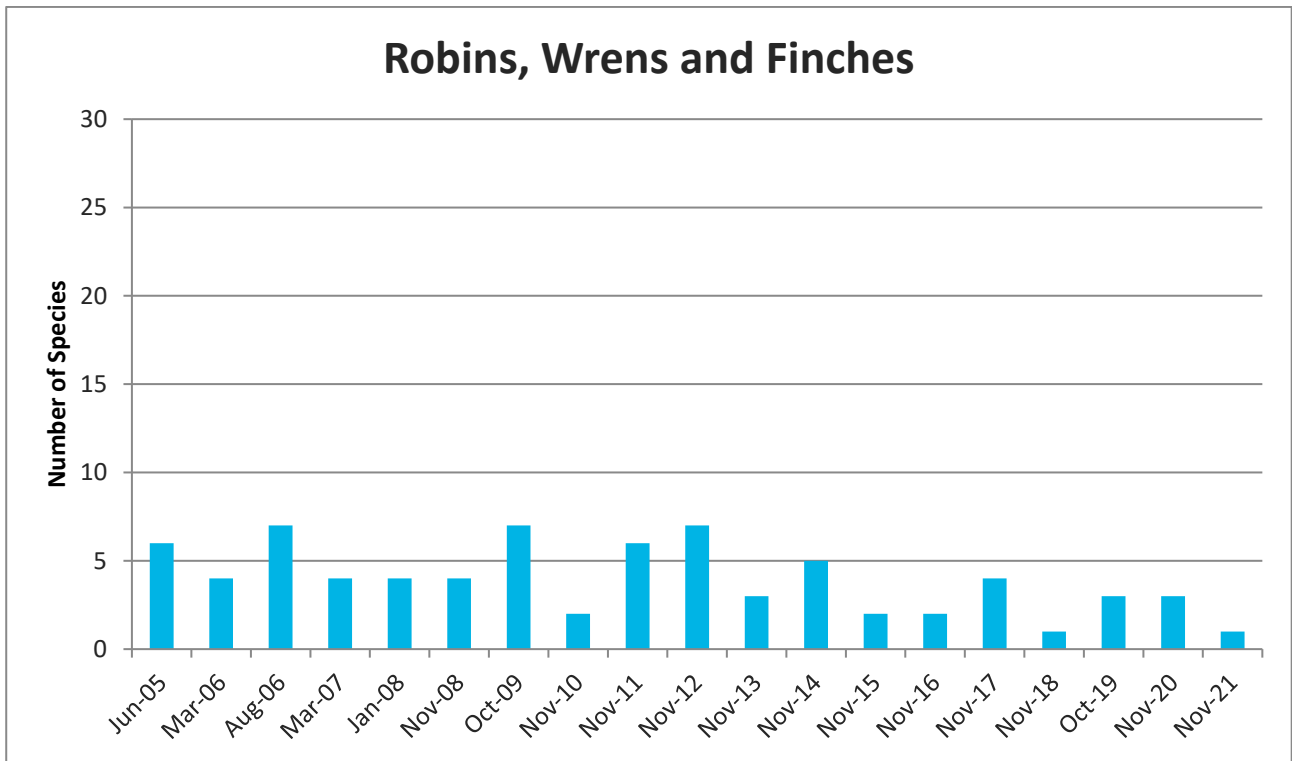


Figure 4.13 Robins, Wrens and Finches Monitoring Results

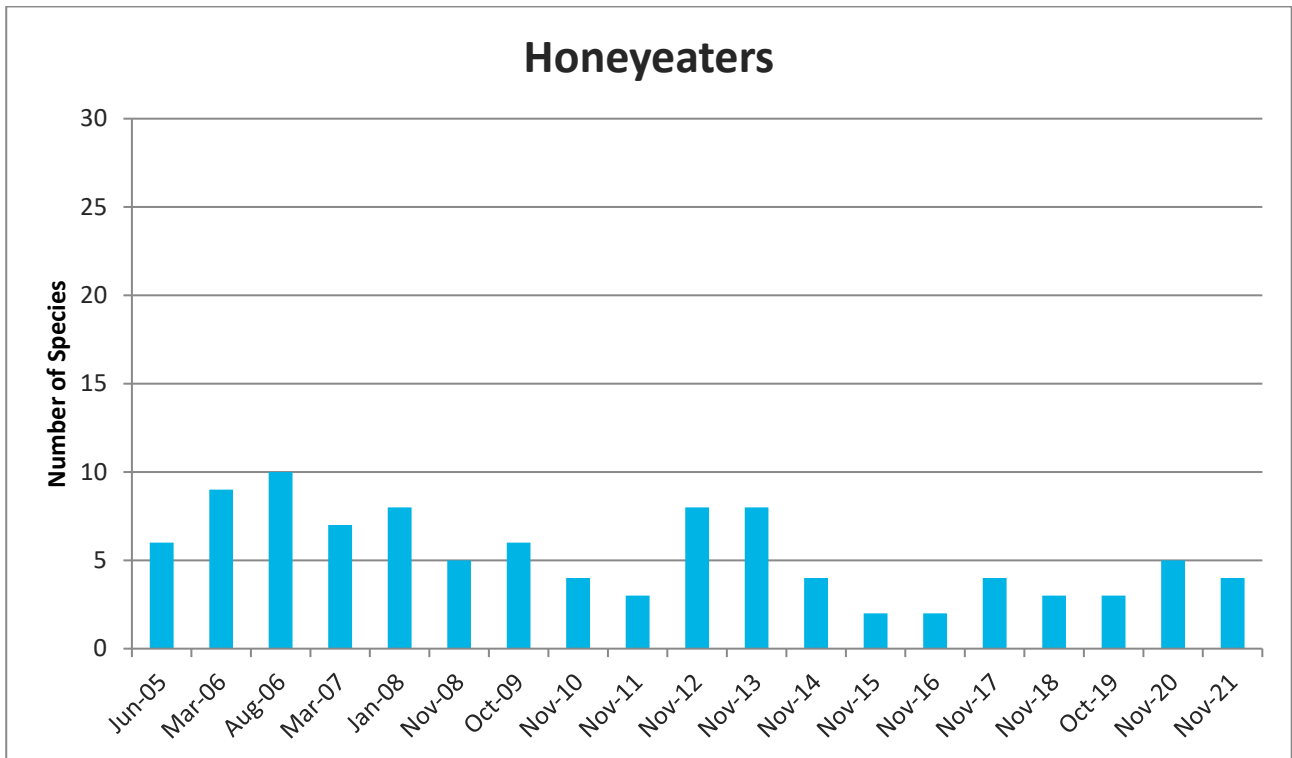


Figure 4.14 Honeyeater Monitoring Results

4.4 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 05/11/21:

4.4.1 Fauna

i Birds

- Superb Parrot (*Polytelis swainsonii*) – Vulnerable

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

4.5 Wildlife Camera Monitoring

Two motion-activated fauna cameras and bait stations were installed in strategic locations 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.

No fauna species were observed on fauna cameras over the study period.

Locations of cameras are shown in Figure 3.1.

4.6 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 Landscape Rehabilitation Management Plan. 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.

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, though slightly less total number of plants compared to 2021 monitoring was noted. Most Silver-leaved Mountain Gums observed along both transects were noted to be in good condition and exhibited no evidence of dieback. A small amount of insect damage was observed across both Silver leaved mountain gum transects. Presence of new growth was observed to be high across all both transects. Fruiting and flowering was observed in both transects. Results of these transects are shown in Figure 4.15.

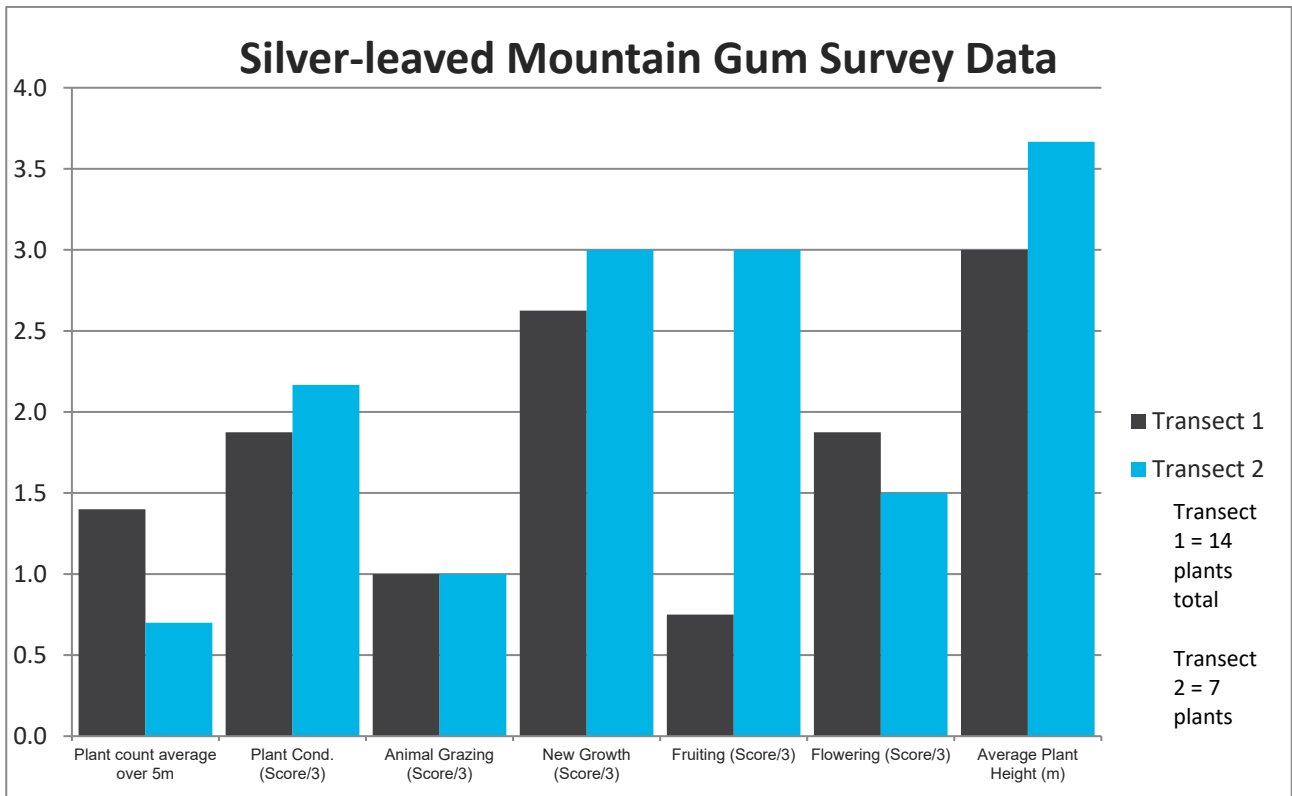


Figure 4.15 Silver-leaved Mountain Gum Monitoring Results

4.7 Rehab

A total of four 50x10 m transects were undertaken at rehab vegetation areas adjacent to the haul road near the intersection and pit lookouts. Two transects were undertaken amongst old plantings in the revegetation ‘island’ encapsulated by the haul road (Rehab Old), and another two undertaken amongst new plantings on the slope between the haul road and overburden dump (Rehab New).

Rehab Old was observed to be in comparable condition to results from previous monitoring years. Plants which had previously been captured occupying the mid-storey tier continue to develop into over-storey, and native ground cover uptake continues to increase in comparison to previous years monitoring. Weeds abundance remains comparable to previous years monitoring. Grazing of native understorey plants by kangaroos and wallabies continues to occur, however this is comparable to previous monitoring periods.

Rehab New has improved considerably over the previous monitoring period, with the establishment of an emerging over-storey, and 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 transect, however the increased native vegetation cover over the previous monitoring period has lessened the amount of bare ground exposed. A minor uptake of weeds was observed in the Rehab New transect.

Comparison photographs of the New Rehab sites between the 2020 and 2021 monitoring periods are shown in photographs 4.1 through 4.4 below.

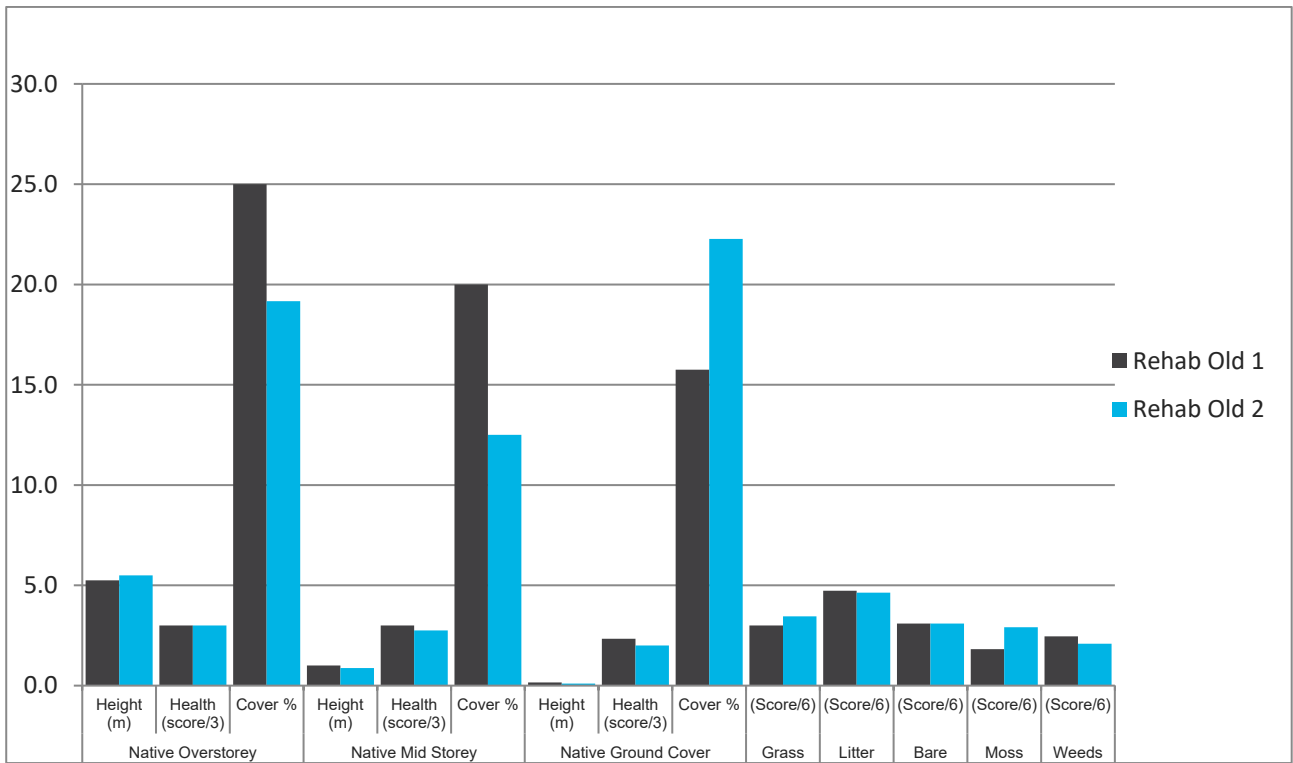


Figure 4.16 Rehab Old Site Monitoring 2021

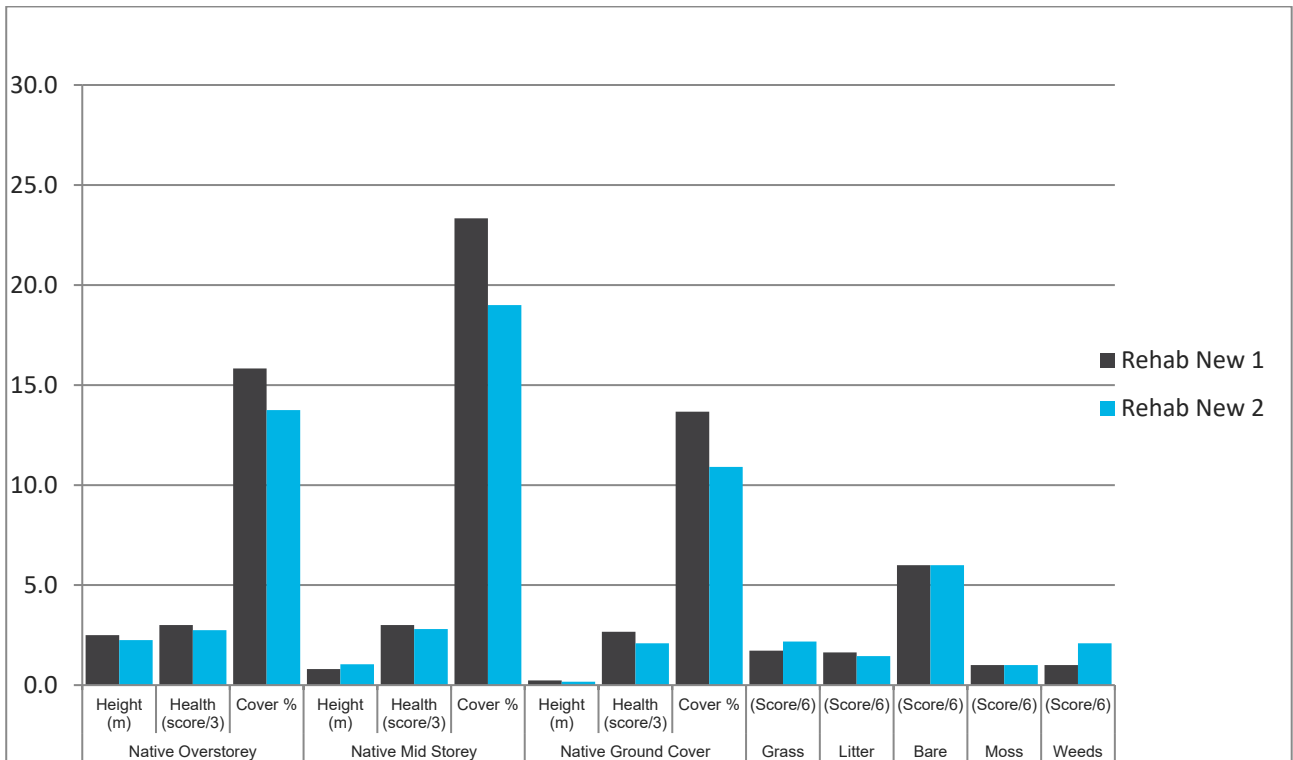


Figure 4.17 Rehab New Site Monitoring 2021



Photograph 4.1 View across New Rehab site looking East 2020



Photograph 4.2 View across New rehab site looking East 2021



Photograph 4.3 View of Silver-leaved Mountain Gum plantings at the New Rehab site 2020



Photograph 4.4 View of Silver-leaved Mountain Gum plantings at the New Rehab site 2021

5 Discussion

The requirement of the condition of approval that the indirect impacts of the quarrying operations on flora and fauna habitats being monitored was undertaken in November 2021.

The results show that some changes have occurred to flora and fauna communities surveyed at the site since the previous monitoring period. Weed invasion has slightly increased in some areas following better climatic conditions. Some native vegetation degradation has occurred at the Impact Ridge transects within the active quarry areas. Native vegetation within the new rehab has improved considerably in comparison to last years survey, with an emerging overstorey and thickened mid-storey.

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 Impact Creek site has significant growth of pasture weeds upslope of the site, including (Twiggy Turnip and Viper Bugloss). These heavy infestations may cause an influx of these species in riverine transects.

Bird species numbers have decreased slightly in comparison to previous monitoring periods. Very wet and rainy conditions which prevailed throughout the monitoring survey provided unfavourable conditions for bird sightings due to less bird activity and bird calls unable to be heard above rain noise. Overall, the number of bird species recorded across each group has remained relatively consistent throughout the monitoring program.

Amphibian numbers have decreased in comparison to the previous monitoring period. This reduction in amphibian numbers is considered attributable to the cancellation of spotlighting works, as amphibians have been typically detected during spotlighting efforts in previous years.

Reptile and mammal numbers have remained relatively steady in relation to the previous year.

Wombat activity remains high with several active burrows and individuals observed around the river and ridge sites.

A decrease in nocturnal species numbers in comparison to the previous years survey was noted, as adverse weather conditions which prevailed throughout this year's survey prevented spotlighting efforts to detect nocturnal species.

Overall fluctuations in species numbers within each fauna type have been small over the entire monitoring program, with no significant decline in species number of each fauna type.

Records of feral animals have remained consistent with previous monitoring periods. The goat population has risen in comparison to previous years survey, with several groups observed and heard throughout the quarry lease during this years survey.

As reported in the previous year's survey, Serrated Tussock management was reported to be ongoing on the lease area with the worst areas noted to be around the dams above the Impact Creek site. The species is noted to have the highest abundance along the Impact Creek site which is in close proximity to the large infestation at the dams. Access to the dams should be controlled to avoid tracking vehicles and equipment through infested areas to slow the spread and assist with control programs.

St. Johns Wort presence is noted to be rising across the site and is also present in large numbers within the Impact Creek sites and along the access road. 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.

A slight reduction in the number of individuals of Silver-leaved Mountain Gum was noted during the 2021 survey, however coverage remains consistent with previous years survey. No priority weeds were observed within the Silver-leaved Mountain Gum Mallee Woodland vegetation community and the biodiversity offset area was noted to be in good health. Roughly half of all Silver-leaved Mountain Gums surveyed within the Silver-leaved Mountain

Gum Mallee Woodland vegetation community were observed to be in flower, and most were observed with new growth and evidence of fruiting.

The purpose of the monitoring is to assess the indirect impacts of the quarry on flora, fauna and their habitats adjacent to the quarry. No significant changes to species and community composition has occurred to date throughout the monitoring program. The active quarry operations show that the controls employed at the quarry are effective in controlling weeds which are a major cause of habitat degradation.

6 Recommendations

The following tasks are recommended for the 2021 period:

- Ongoing management of the priority weed infestations of African Lovegrass, Serrated Tussock and St Johns Wort 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.
- Vehicle access should be restricted to the impact ridge site to reduce risk of spreading the strawberry broomrape cluster which has established in this area. If walking through strawberry broomrape is unavoidable, brush down of boots and boot cleaning should be implemented to stop the spread of the species to new areas.
- Pest control efforts as undertaken in previous years should be reinstated to relocate or suppress the goat population which has increased in number over the previous year.

Appendix A

Survey Species List

Family	common name	scientific name	New species recorded																			
			65	71	64	75	77	71	4	4	4	2	6	0	2	0	74	68	76	72	55	
			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	
Amphibians			1	6	2	5	6	8	5	4	4	5	5	5	6	5	6	9	8	9	5	
Hylidae	Brown Tree Frog	<i>Litoria ewingii</i>		1	1		1											1	1	1		
	Lesueur's Frog	<i>Litoria lesueuri</i>		1		1	1										1	1	1	1	1	
	Peron's Tree Frog	<i>Litoria peronii</i>		1				1		1	1	1	1	1	1	1	1	1	1	1	1	
	Leaf-green Tree Frog	<i>Litoria phyllochroa</i>					1															
	Verreaux's Tree Frog	<i>Litoria verreauxii</i>						1										1		1		
	Keferstein's Tree Frog	<i>Litoria dentata</i>						1		1		1	1	1	1	1		1	1	1	1	
	Dwarf Green Tree Frog	<i>Litoria fallax</i>										1					1		1	1	1	
Myobatrachidae	Common Eastern Froglet	<i>Crinia signifera</i>	1	1	1	1	1	1			1	1	1	1	1	1	1	1	1	1	1	
	Eastern Banjo Frog	<i>Limnodynastes dumerilii</i>		1		1		1			1	1				1	1					
	Spotted Grass Frog	<i>Limnodynastes tasmaniensis</i>		1		1	1	1				1						1		1		
	Striped Marsh Frog	<i>Limnodynastes peronii</i>				1	1	1					1	1	1	1	1	1	1	1	1	
	Keferstein Smooth Toadlet	<i>Uperoria laevigata</i>						1		1	1	1		1	1			1				
			Jun-05	Mar-06	Aug-06	Mar-07	Jan-08	Nov-08	Oct-09	Nov-10	Nov-11	Nov-12	Nov-13	Nov-14	Nov-15	Nov-16	Nov-17	Nov-18	Oct-19	Nov-20	Nov-21	
Reptiles			1	4	2	6	2	6	1	5	5	6	5	7	4	8	6	7	5	5	7	
Agamidae																						
	Eastern Water Dragon	<i>Physignathus iesueurii</i>		1		1	1			1	1	1		1	1	1	1	1	1	1	1	
	Jacky Lizard	<i>Amphibolurus muricatus</i>				1						1	1	1				1				
	Goanna	<i>Varanus varius</i>						1				1				1	1	1	1	1	1	
Chelidae	Eastern Long-necked Turtle	<i>Chelodina longicollis</i>				1				1				1	1	1	1	1	1	1	1	
Elapidae	Eastern Brown Snake	<i>Pseudonaja textilis</i>				1										1		1			1	
	Red-Bellied Black Snake	<i>Pseudechis porphyriacus</i>							1		1				1	1		1			1	
Scincidae	Copper-tailed Skink	<i>Ctenotus taeniolatus</i>		1	1	1		1		1			1			1	1					
	Eastern Water Skink	<i>Eulamprus quoyii</i>		1			1	1		1	1	1	1	1		1	1		1	1	1	
	Delicate Skink	<i>Lampropholis delicata</i>	1	1		1		1		1	1	1	1	1							1	
	Grass Skink	<i>Lampropholis guichenoti</i>						1				1	1	1	1	1	1	1	1	1	1	
	Blue Tongue Lizard	<i>Tiliqua scincoides</i>						1			1			1				1				
Typhlopidae	Blind Snake	<i>Ramphotyphiops</i> sp.			1																	
Birds total			53	53	53	55	62	47	47	39	53	71	47	61	37	38	53	41	54	51	34	
Birds of prey			8	9	7	8	11	9		7	5	11	11	7	10	5	5	8	7	7	9	7
Nocturnal Birds			0	1	0	1	1	1														
Riverine Species			7	4	3	8	4	5														
Parrots			3	3	3	3	5	4														
Forest/Woodland insectivores			10	10	9	11	12	10														
Robins, Wrens, Finches etc			19	17	21	17	21	13														
Honeyeaters			6	9	10	7	8	5														
			53	53	53	55	62	47														
Birds of Prey			Jun-05	Mar-06	Aug-06	Mar-07	Jan-08	Nov-08	Oct-09	Nov-10	Nov-11	Nov-12	Nov-13	Nov-14	Nov-15	Nov-16	Nov-17	Nov-18	Oct-19	Nov-20	Nov-21	
			8	9	7	8	11	9	7	5	11	11	7	10	5	5	8	7	7	9	7	
Nocturnal Birds			Jun-05	Mar-06	Aug-06	Mar-07	Jan-08	Nov-08	Oct-09	Nov-10	Nov-11	Nov-12	Nov-13	Nov-14	Nov-15	Nov-16	Nov-17	Nov-18	Oct-19	Nov-20	Nov-21	
			0	1	0	1	1	1	1	0	1	1	0	0	0	1	0	0	1	0	0	
Riverine Birds			Jun-05	Mar-06	Aug-06	Mar-07	Jan-08	Nov-08	Oct-09	Nov-10	Nov-11	Nov-12	Nov-13	Nov-14	Nov-15	Nov-16	Nov-17	Nov-18	Oct-19	Nov-20	Nov-21	
			7	5	3	8	5	5	5	9	7	9	6	11	8	7	11	8	10	9	6	
Parrots			Jun-05	Mar-06	Aug-06	Mar-07	Jan-08	Nov-08	Oct-09	Nov-10	Nov-11	Nov-12	Nov-13	Nov-14	Nov-15	Nov-16	Nov-17	Nov-18	Oct-19	Nov-20	Nov-21	
			3	3	3	3	5	4	4	3	4	7	6	5	6	4	6	6	5	3	3	
Forest Woodland Species			Jun-05	Mar-06	Aug-06	Mar-07	Jan-08	Nov-08	Oct-09	Nov-10	Nov-11	Nov-12	Nov-13	Nov-14	Nov-15	Nov-16	Nov-17	Nov-18	Oct-19	Nov-20	Nov-21	
			23	22	23	24	28	19	17	16	21	28	15	25	14	16	20	15	23	21	13	
Robins Wrens Finches			Jun-05	Mar-06	Aug-06	Mar-07	Jan-08	Nov-08	Oct-09	Nov-10	Nov-11	Nov-12	Nov-13	Nov-14	Nov-15	Nov-16	Nov-17	Nov-18	Oct-19	Nov-20	Nov-21	
			6	4	7	4	4	4	7	2	6	7	3	5	2	2	4	1	3	3	1	
Honeyeaters			Jun-05	Mar-06	Aug-06	Mar-07	Jan-08	Nov-08	Oct-09	Nov-10	Nov-11	Nov-12	Nov-13	Nov-14	Nov-15	Nov-16	Nov-17	Nov-18	Oct-19	Nov-20	Nov-21	
			6	9	10	7	8	5	6	4	3	8	8	4	2	2	4	3	3	5	4	
Birds																						
Accipitridae	Black-shouldered Kite	<i>Elanus axillaris</i>	1	1		1	1	1			1					1			1			
	Brown Goshawk	<i>Accipiter fasciatus</i>					1								1							
	Collared Sparrowhawk	<i>Accipiter cirrhocephalus</i>					1							1						1		
	Nankeen Kestrel	<i>Falco cenchroides</i>			1		1	1			1	1		1	1				1	1	1	
	Wedge-tailed Eagle	<i>Aquila audax</i>	1	1		1		1			1	1		1			1	1		1	1	
	White-bellied Sea-eagle	<i>Haliaeetus leucogaster</i>					1	1											1			

			Jun-05	Mar-06	Aug-06	Mar-07	Jan-08	Nov-08	Oct-09	Nov-10	Nov-11	Nov-12	Nov-13	Nov-14	Nov-15	Nov-16	Nov-17	Nov-18	Oct-19	Nov-20	Nov-21
Aegothelidae	Australian Owlet-nightjar	<i>Aegotheles cristatus</i>		1			1								1						
	Tawny Frogmouth	<i>Podargus strigoides</i>						1			1	1									
Alcedinidae	Azure Kingfisher	<i>Alcedo azurea</i>	1			1				1		1									
Anatidae	Australian Wood Duck	<i>Chenonetta jubata</i>	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1
	Chestnut Teal	<i>Anas castanea</i>	1									1		1		1	1	1		1	
	Grey Teal	<i>Anas gracilis</i>				1									1		1	1	1		
	Hardhead	<i>Aythya australis</i>				1				1					1			1	1		
	Pacific Black Duck	<i>Anas superciliosa</i>	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1
Ardeidae	White-faced Heron	<i>Egretta novaehollandiae</i>	1	1		1				1		1	1	1			1		1	1	
Artamidae	Australian Magpie	<i>Gymnorhina tibicen</i>	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1		1	1
	Dusky Woodswallow	<i>Artamus cyanopterus</i>			1	1	1	1		1	1	1	1	1		1	1	1	1	1	1
	White-browed Woodswallow	<i>Artamus superciliosus</i>													1						
	Grey Butcherbird	<i>Cracticus torquatus</i>	1	1	1	1	1				1	1	1	1							
	Pied Butcherbird	<i>Cracticus nigrogularis</i>									1	1	1	1						1	1
	Magpie-lark	<i>Grallina cyanoleuca</i>	1	1	1	1	1	1		1	1	1	1	1	1		1	1	1	1	1
	Pied Currawong	<i>Strepera graculina</i>	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						
	Gang-gang Cockatoo	<i>Calocephalon fimbriatum</i>			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
	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								
	White-Winged Triller	<i>Lalage tricolor</i>												1						1	
Charadriidae	Masked Lapwing	<i>Vanellus miles</i>		1			1			1		1		1		1	1	1	1		1
	black fronted dotterel	<i>Elseya melanops</i>									1			1		1	1		1	1	
Cincosomatidae	Eastern Whipbird	<i>Psophodes olivaceus</i>			1		1	1		1	1			1		1	1		1		1
Climacteridae	White-throated Treecreeper	<i>Cormobates leucophaeus</i>	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														1
	Common Bronzewing	<i>Phaps ehaloptera</i>									1										
	Crested Pigeon	<i>Ocyphaps lophotes</i>	1	1	1	1	1					1									
	Peaceful Dove	<i>Geopelia striata</i>	1	1				1				1		1		1					
Coraciidae	Dollarbird	<i>Eurystomus orientalis</i>					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
Corvidae	Australian Raven	<i>Corvus coronoides</i>	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	1
	Eastern Koel	<i>Eudynamis orientalis</i>																			1
Dicaeidae	Mistletoebird	<i>Dicaeum hirundinaceum</i>	1		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
	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
	Leaden Flycatcher							1			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
	Sacred Kingfisher	<i>Todiramphus sanetus</i>		1			1	1		1	1	1	1	1	1	1	1	1	1	1	1
	Forest Kingfisher	<i>Todiramphus macleayi</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
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
	Variagated Fairy-wren	<i>Malurus lamberti</i>	1		1						1	1									
Meliphagidae	Brown-headed Honeyeater	<i>Meliphaga validirostris</i>		1	1		1														1
	Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>	1	1	1	1	1					1									
	Noisy Miner	<i>Manorina melanocephala</i>	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
	Red Wattlebird	<i>Anthochaera carunculata</i>	1	1	1	1	1						1		1				1	1	1
	White-eared Honeyeater	<i>Lichenostomus ieucois</i>	1	1	1							1	1							1	
	White-naped Honeyeater	<i>Meliphaga lunata</i>	1	1	1	1	1					1									
	White-plumed Honeyeater	<i>Lichenostomus penicillatus</i>			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
	Lewins Honeyeater	<i>Meliphaga lewinii</i>						1				1		1			1			1	
	Black-chinned Honeyeater	<i>Meliphaga gularis</i>											1								
	Rainbow Bee-eater	<i>Merops ornatus</i>						1					1					1			
Motacillidae	Richard's Pipit	<i>Anthus novaeseelandiae</i>	1	1									1	1			1		1	1	

			Jun-05	Mar-06	Aug-06	Mar-07	Jan-08	Nov-08	Oct-09	Nov-10	Nov-11	Nov-12	Nov-13	Nov-14	Nov-15	Nov-16	Nov-17	Nov-18	Oct-19	Nov-20	Nov-21
	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	
Neositidae	Varied Sitella	<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	
	Grey Shrike-thrush	<i>Colluricincla harmonica</i>	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
Pardalotidae	Brown Thornbill	<i>Acanthiza pusilla</i>	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		
	Spotted Pardalote	<i>Pardalotus punctatus</i>	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	
	Striated Thornbill	<i>Acanthiza lineata</i>			1	1	1	1		1	1	1		1		1	1	1	1	1	1
	White-browed Scrubwren	<i>Sericomis frontalis</i>	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		
	Yellow Thornbill	<i>Acanthiza nana</i>	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	
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	
Petroicidae	Eastern Yellow Robin	<i>Eopsaltria australis</i>		1	1	1					1	1	1	1	1		1		1	1	
	Flame Robin	<i>Petroica phoenicea</i>	1									1		1							
	Jacky Winter	<i>Microeca fascinans</i>	1									1		1							
	Rose Robin	<i>Petroica rosea</i>			1						1										
	Scarlet Robin	<i>Petroica multicolor</i>			1		1						1			1	1				
	Hooded Robin	<i>Melanodryas cucullata</i>						1		1	1										
Phalacrocoracidae	Little Pied Cormorant	<i>Phalacrocorax melanoleucos</i>						1						1			1		1	1	
	Pied Cormorant	<i>Phalacrocorax varius</i>				1															
Phasianidae	Stubble Quail	<i>Coturnix pectoralis</i>	1																		
Podicipedidae	Australasian Grebe	<i>Tachybaptus novaehollandiae</i>								1		1		1	1		1	1	1	1	1
Psittacidae	Crimson Rosella	<i>Platycercus elegans</i>					1	1		1	1	1	1	1	1	1	1	1	1	1	1
	Eastern Rosella	<i>Platycercus eximius</i>					1	1		1	1	1	1	1	1	1	1	1	1	1	1
	Rainbow Lorikeet	<i>Trichoglossus haematodus</i>											1								
	Australian King Parrot	<i>Alisterus scapularis</i>										1			1		1				1
	Red-rumped Parrot	<i>Psephotus haematonotus</i>								1	1			1	1	1	1	1	1	1	
Rallidae	Dusky Moorhen	<i>Gallinula tenebrosa</i>	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1
	Eurasian Coot	<i>Fulica atra</i>	1					1		1	1		1	1	1			1	1	1	1
Strigidae	Southern Boobook	<i>Ninox novaeseelandiae</i>				1													1		
Zosteropidae	Silyereye	<i>Zosterops lateralis</i>		1	1	1	1					1	1						1		
Sturnidae	Common Myna	<i>Acridotheres tristis</i>	1	1	1	1															
	Common Starling	<i>Sturnus vulgaris</i>	1		1	1		1			1							1	1		

			Jun-05	Mar-06	Aug-06	Mar-07	Jan-08	Nov-08	Oct-09	Nov-10	Nov-11	Nov-12	Nov-13	Nov-14	Nov-15	Nov-16	Nov-17	Nov-18	Oct-19	Nov-20	Nov-21
Mammals			9	6	7	7	5	8	9	12	7	10	10	9	5	10	9	10	8	7	8
Macropodidae	Common Wallaroo	<i>Macropus robustus</i>	1	1	1	1	1	1		1	1	1	1					1			
	Eastern Grey Kangaroo	<i>Macropus giganteus</i>	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1
	Swamp Wallaby	<i>Wallabia bicolor</i>	1		1						1	1		1		1	1	1	1	1	1
	Red Necked Wallaby	<i>Macropus rufogriseus</i>									1	1	1		1						1
Molossidae	White-striped Freetail-bat	<i>Tadarida australis</i>		1		1		1				1		1		1	1		1		
Muridae	Unidentified Bush Rat	<i>Rattus sp.</i>				1						1	1								
	Water-rat	<i>Hydromys chrysogaster</i>		1		1	1														
Ornithorhynchidae	Platypus	<i>Ornithorhynchus anatinus</i>	1					1				1	1					1			
Petauridae	Feathertail Glider	<i>Acrobates pygmaeus</i>		1						1	1				1						
	Sugar Glider	<i>Petaurus breviceps</i>												1				1	1		
Phalangeridae	Common Brushtail Possum	<i>Trichosurus vulpecula</i>			1	1		1		1	1	1		1		1	1	1	1	1	1
Pseudocheiridae	Common Ringtail Possum	<i>Pseudocheirus peregrinus</i>	1		1			1		1		1	1	1		1	1	1	1	1	1
Tachyglossidae	Echidna	<i>Tachyglossus aculeatus</i>							1	1			1		1	1					1
Vespertilionidae	Gould's Long-eared Bat	<i>Nyctophilus gouldii</i>							1	1							1				
	Western Broad-nosed Bat	<i>Scotorepens balstoni</i>								1						1					
	Chocolate Wattled Bat	<i>Chalinolobus morio</i>								1				1			1				
Vombatidae	Common Wombat	<i>Vombatus ursinus</i>	1							1	1	1	1	1	1	1	1	1	1	1	1
Ferals														1							
Bovidae	*Goat	<i>Carpe hircus</i>																1	1		1
Canidae	*Fox	<i>Vulpes vulpes</i>	1		1		1	1	1	1			1				1	1		1	
Felidae	*Cat	<i>Felis catus</i>							1					1		1					

Transect no. Surveyor
Date

Flora Detected within Survey sites 2021		Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek	Old Rehab	New Rehab
Introduced Species		19	14	7	37	43	13	9
Scientific	Common							
*Acetosella vulgaris	Sheep Sorrel	1	1				1	
*Aira cupaniana	Silvery Hair Grass		1					
*Alternanthera spp.								
*Ambrosia artemisiifolia	Annual Tagweed				1			
*Anagallis arvensis	Scarlet Pimpernel	1			2	1		1
*Anthoxanthum odoratum	Sweet Vernal Grass	5	1	1	6	5	2	1
*Aster subulatus	Wild Aster							
*Avena barbata	Oats							
*Brassica fruticulosa	Twiggy Turnip					3		
*Brassica rapa spp sylvestris	Wild Turnip							
*Briza maxima	Blowfly Grass					1		
*Briza minor	Shivery Grass							
*Bromus catharticus	Prairie Grass				3	4		
*Bromus diandrus	Great Brome				4			
*Bromus hordeaceus	Soft Brome					4		
*Carduus pycnocephalus	Slender Thistle							
*Carthamus lanatus	Saffron Thistle							
*Centaureum tenuiflorum	Centaury	1		1			1	
*Cerastium glomeratum	Chickweed				1			
*Chenopodium album	Fat Hen							
*Chenopodium pumilio	Small Crumbweed							
*Chenopodium spp.								
*Chondrilla juncea	Skeleton Weed							
*Cirsium vulgare	Spear Thistle	1	1		4	2	1	
*Conium maculatum	Hemlock				2	4		
*Conyza bonariensis	Fleabane	1	1	1	4	2	1	
*Conyza sumatrensis	Fleabane							
*Crataegus monoguna	Hawthorn							
*Cymbopogon refractus	Barbed Wire Grass							
*Cynodon dactylon	Couch				5	3		1
*Cyperus eragrostis	Cyperus							
*Cyperus sp.	Cyperus							
*Cytisus scoparius ssp.scopar	Scotch Broom							
*Dactylis glomerata	Cocksfoot	1	1					
*Digitaria sanguinalis	Summer Grass							
*Echium plantagineum	Pattersons Curse							
*Echium vulgare	Vipers Bugloss				4	2		
*Ehrharta erecta	Ehrharta							
*Eleusine indica	Crowsfoot Grass							
*Eleusine tristachya	Goose Grass							
*Eragrostis curvula	African Love Grass				4	2		
*Eragrostis tenuifolia	Elastic Grass							

Flora Detected within Survey sites 2021		Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek	Old Rehab	New Rehab
*Erodium cicutarium	Storksbill					1		
*Euphorbia lathyris	Caper Spurge				4	3		
*Euphorbia peplus	Petty Spurge				4	1		
*Foeniculum vulgare	Fennel					1		
*Fumaria muralis	Fumaria							
*Fumaria spp.	Fumaria							
*Galium tricomutum	Galium				1			
*Genista monspessulana	Montpellier Broome							
*Gnaphalium sp.	Cudweed		1		2	3		
*Herschfeldia incana	Buchan Weed							1
*Holcus lanatus	Yorkshire Fog							
*Hydrocotyle bonariensis	Pennywort							
*Hypericum perforatum	St. Johns Wort	1			1	3		
*Hypochaeris radicata	Flatweed	1	1	1	5	3	1	1
*Lactuca serriola	Prickly Lettuce							
*Lepidium spp.	Peppercress							
*Lepidium virginicum	Virginian Peppercress							
*Lolium perenne	Perennial Ryegrass				4	5		
*Lycium ferocissimum	African Boxthorn							
*Lythrum hyssopifolia	Hyssop Loosestrife							
*Malus spp.	Apple							
*Malva parviflora	Small-flowered Mallow				1	1		
*Medicago arabica	Spotted Burr Medic				4	2	1	
*Medicago satavia	Lucerne							
*Modiola caroliniana	Red-flowered Mallow				1			
*Myosotis spp.	Forget-me-not					1		
*Nassella trichotoma	Serrated Tussock	1	1			4	1	
*Oenothera mollissima	Evening Primrose							
*Onopordum acanthium	Scotch Thistle							
*Orobanche sp.	Broomrape	1						
*Oxalis corniculata	Yellow Wood Sorrel	1				1	1	
*Panicum maximum	Green Panic							
*Papaver somniferum	Poppy				1			
*Parentucellia latifolia	Red Bartsia							
*Paronychia brasiliiana	Brasilian Witlow	1		1	2			
*Paspalum dilatatum	Paspalum					1		
*Pennisetum clandestinum	Kikuyu							
*Petrohragia nanteuilii	Childing Pink		1			1		
*Phalaris aquatica	Phalaris					2		
*Phytolacca octandra	Inkweed					1		1
*Plantago lanceolata	Plantain	1			4	2	1	1
*Polygonum aviculare	Wireweed							
*Prunella vulgaris	Self-heal							
*Prunus spp.	Peach/Nectarine							
*Pyracantha spp.	Firethorn							
*Ranunculus lappaceus	Common Buttercup				1	1		
*Rorippa palustris	Yellow Cress							
*Rosa sp.	Rose							
*Rubus fruticosus	Blackberry				1	1		
*Rumex conglomeratus	Clustered Dock							
*Rumex crispus	Curled Dock							
*Rumex obtusifolius	Broadleaf Dock				3	2		

Flora Detected within Survey sites 2021		Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek	Old Rehab	New Rehab
*Rumex spp.	Dock							
*Salix sp.	Willow					1		
*Senecio madagascariensis	Fireweed							
*Setaria gracilis	Pigeon Grass							
*Silene gallica	Silene				4	2		
*Silybum marianum	Variegated Thistle		1			1		
*Solanum chenopodioides	Whitetip Nightshade	1		1				
*Solanum linnaeanum	Apple of Sodom	1	1	1				
*Solanum nigrum	Blackberry Nightshade					1		
*Sonchus asper	Prickly Sowthistle							
*Sonchus oleraceus	Sowthistle	1	1		4	3		
*Sporobolus spp.	Parramatta Grass							
*Stenotaphrum secundatum	Buffalo Grass				5			
*Tagetes minuta	Stinking Roger							
*Taraxacum officinale	Dandelion				2	1		
*Tolpis barbata							1	
*Trifolium angustifolium	Narrow Leaved Clover				4			
*Trifolium arvense	Haresfoot Clover				1	1	1	1
*Trifolium repens	White Clover							
*Urtica urens	Stinging Nettle							
*Verbascum thapsus	Great Mullein	1	1					1
*Verbascum virgatum	Twiggy Mullein				4			
*Verbena bonariensis	Purpletop	1				1		
*Verbena rigida	Purpletop							
*Veronica anagallis-aquatica	Blue Water Speedwell							
*Veronica persica	Creeping Speedwell							
*Vicia satava	Vetch				1	1		
*Vulpia bromoides	Silver Grass				5	4	1	

Transect no.	Surveyor							
Date								
Flora Detected within Survey sites 2021		Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek	Rehab Old	Rehab New
Native Species		21	56	24	16	28	13	19
Scientific	Common							
Acacia buxifolia	Box-leaf Wattle							
Acacia clandestina	Gold-dust Wattle							
Acacia dealbata	Silver Wattle						1	1
Acacia falciformis	Hickory Wattle							3
Acacia homalophylla	Yarran							
Acacia implexa	Hickory Wattle							
Acacia longissima	Long-leaved Wattle							
Acacia melanoxylon	Blackwood		1			1		
Acacia myrtifolia	Myrtle Wattle							
Acacia obtusata	Bluntleaf Wattle		2					
Acacia uilicifolia	Prickly Moses		1	1				
Acaena ovina	Sheeps Burr							
Actinotus helianthi	Flannel Flower							
Adiantum aethiopicum	Maiden Hair Fern							
Allocasuarina distyla	Scrub She-oak							
Allocasuarina littoralis	Black She-oak	2					2	
Alternanthera denticulata	Lesser Joy-weed							
Amyema miquelii	Box mistletoe	1						
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					
Austrostipa aristiglumis	Speargrass		1			1		
Banksia spinulosa var. spinulosa	Hairpin Banksia							
Baumen articulata	Jointed Twigrush							

Flora Detected within Survey sites 2021		Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek	Rehab Old	Rehab New
Blechnum indicum	Swamp Waterfern							
Bossiaea buxifolia	Matted Bossiaea		1			1		
Bossiaea prostrata								
Bothriochloa macra	Red-leg Grass							
Bothriochloa spp.	Bluegrass							
Brachyloma daphnoides ssp. <i>daphnoides</i>	Daphne Heath		1			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						1	
Calochilus sp	Beard Orchid							
Calytrix tetragona	Fringe Myrtle				1	3	2	1
Carex appressa	Tall Sedge				2	3		
Carex fascicularis	Tassel Sedge							
Carex inversa								
Carex spp.								
Cassinia uncata	Sticky Cassinia			1			1	2
Cassytha glabella f. <i>glabella</i>	Devils Twine				3	3		
Casuarina cunninghamiana ssp. <i>cunninghamiana</i>	River Oak							
Cheilanthes distans	Rock Fern		1					
Cheilanthes sieberi ssp. <i>sieberi</i>	Rock Fern		1	1				
Chloris truncata	Windmill Grass					1		
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		1				1	
Cryptandra amara	Bitter Cryptandra		1					
Cymbonotus lawsonianus	Bears-ear	1						
Cymbopogon refractus	Barbed Wire Grass							
Cynoglossum austral		1	1					
Cyperus gracilis	Slender Flat Sedge						1	
Daviesia acicularis	Bitter Pea		1					
Desmodium brachypodum	Tick-trefoil		1					
Desmodium spp.	Tick-trefoil							
Desmodium varians	Tick-trefoil							
Dianella revoluta var. <i>revoluta</i>	Flax Lily	1	2					1
Dichelachne inaequiglumis	Plumegrass							
Dichelachne micrantha	Plumegrass			1				
Dichelachne spp.	Plumegrass	1	1					
Dichondra repens	Kidney Weed		1		2			1
Digitaria brownii	Cotton Panic Grass							
Digitaria parviflora	Finger Grass							

Flora Detected within Survey sites 2021		Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek	Rehab Old	Rehab New
Hydrocotyle laxiflora	Pennywort	1	1	1				
Hydrocotyle tripartita	Pennywort				1	2		
Hymenanthera dentata	Tree Violet							
Hypericum gramineum	Small St.Johns Wort		1	1	1	3		
Imperata cylindrica var. <i>major</i>	Blady Grass							
Indigofera australis	Australian Indigo							
Isolepis inundata	Club-sedge							
Isotoma axillaris	Rock Isotome			1				
Joycea pallida	Red-anther Wallaby Grass	1	1				1	1
Juncus spp.								
Juncus usitatus								
Lachnagrostis filiformis	Blown Grass							
Lagenophora stipitata	Blue-bottle Daisy		1					
Laxmannia compacta	Slender Wire Lily							
Lepidosperma gunnii								
Lepidosperma laterale			1	1				1
Lepidosperma viscidum					1			
Leptospermum parvifolium		1						1
Leptospermum polygalifolium ssp. <i>polygalifolium</i>								
Leptospermum trinervium								
Leucopogon appressus								
Leucopogon ericoides	Pink Beard-heath		1					
Lindsaea linearis	Screw Fern							
Lissanthe strigosa ssp. <i>strigosa</i>	Peach Heath		1					
Lomandra filiformis ssp. <i>coriacea</i>	Wattle Matt-rush				2	2		
Lomandra filiformis ssp. <i>filiformis</i>	Wattle Matt-rush		2	1				
Lomandra glauca	Pale Matt-rush							
Lomandra longifolia	Spiny Matt-rush	1	3	6				
Lomandra multiflora ssp. <i>multiflora</i>								
Lomandra spp.	Matt Rush				2	2		
Lomatia myricoides	River Lomatia							
Mentha diemenica	Slender Mint							
Microlaena stipoides	Weeping Meadow Grass		1					
Mirbelia platylobioides								
Monotoca elliptica	Tree Broom-heath							
Monotoca scoparia								
Notodanthonia longifolia	Long-leaved Wallaby Grass							
Opercularia hispida	Stinkweed							
Opercularia varia	Stinkweed					1		
Oplismenus aemulus	Basket Grass							
Oplismenus imbecillis	Basket Grass							
Oxalis exilis	Oxalis		1					
Panicum effusum	Hairy Panic							
Panicum simile	Two-colour Panic			1	1	2		
Paspalum distichum	Water Couch							

Flora Detected within Survey sites 2021		Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek	Rehab Old	Rehab New
<i>Patersonia sericea</i>	Silky Purple Flag							
<i>Pelargorium austral</i>		1	1	1				
<i>Persicaria decipiens</i>	Knotweed							
<i>Persicaria hydropiper</i>	Knotweed							
<i>Persicaria praetermissa</i>	Knotweed							
<i>Persicaria strigosa</i>	Knotweed				1	2		
<i>Persicaria lapathifolia</i>	Knotweed							
<i>Persoonia linearis</i>	Narrow-leaved Geebung							
<i>Philotheca</i> spp.	Wax Flower							
<i>Phragmites australis</i>	Common Reed							
<i>Phyllanthus hirtellus</i>	Thyme Spurge					2		
<i>Plantago gaudichaudii</i>	Narrow-leaved Plantain		1					
<i>Platysace ericoides</i>								
<i>Poa affinis</i>								
<i>Poa labillardierei</i> var. <i>labillardierei</i>	Tussock Grass							
<i>Poa sieberiana</i>			3					
<i>Pomaderris</i> spp.								
<i>Pomax umbellata</i>			1	2				1
<i>Poranthera microphylla</i>			1	1		3		
<i>Portulaca oleracea</i>	Pigweed							
<i>Prasophyllum</i> spp.	Leek Orchid							
<i>Prostathera incana</i>	Velvet Mint-bush					1		
<i>Pteridium esculentum</i>	Bracken							
<i>Pterostylis reflexa</i>	Greenhood Orchid							
<i>Pultanea</i> sp.								1
<i>Ranunculus lappaceus</i>	Common Buttercup				1	2		
<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	1		
<i>Schoenus moorei</i>	Bog-rush							
<i>Scutellaria humilis</i>	Dwarf Scullcap					1		
<i>Senecio diaschides</i>	Fireweed							
<i>Senecio hispidulus</i>	Fireweed							
<i>Senecio hispidulus</i> var. <i>hispidulus</i>	Fireweed							
<i>Senecio quadridentatus</i>	Fireweed	1	1	1				
<i>Sigesbeckia orientalis</i>	Indian Weed	1	1					
<i>Solanum americanum</i>	Glossy Nightshade							
<i>Solanum chenopodium</i>								
<i>Solanum cinereum</i>	Narrawa Burr							
<i>Solanum prinophyllum</i>	Forest Nightshade							
<i>Solanum pungentium</i>	Eastern Nightshade							
<i>Stellaria pungens</i>	Prickly Starwort							
<i>Stylidium</i> sp.	Trigger Plant							
<i>Stypandra glauca</i>	Nodding Blue-lily		1	1			1	
<i>Thelymitra</i> sp.	Sun Orchid							
<i>Themeda australis</i>	Kangaroo Grass		1					
<i>Thysanotus juncifolius</i>	Fringe Lily							
<i>Typha domingensis</i>	Cumbungi							

Flora Detected within Survey sites 2021		Impact Ridge	South Ridge	Control Ridge	Control Creek	Impact Creek	Rehab Old	Rehab New
Urtica incisa	Stinging Nettle							
Veronica plebeia	Speedwell		1					
Viola betonicifolia	Native Violet					2		
Vittadinia cuneata var. <i>cuneata</i> f. <i>cuneata</i>	Fuzzweed		1					
Wahlenbergia gracilis	Bluebell		1	1				
Wahlenbergia planiflora	Bluebell							
Wahlenbergia spp.		1	1					
Wahlenbergia stricta ssp. <i>stricta</i>	Bluebell							
Wahlenbergia victoriensis	Bluebell							
Xerochrysum bracteatum	Golden Everlasting			1				

Appendix B

Biometric Survey Results

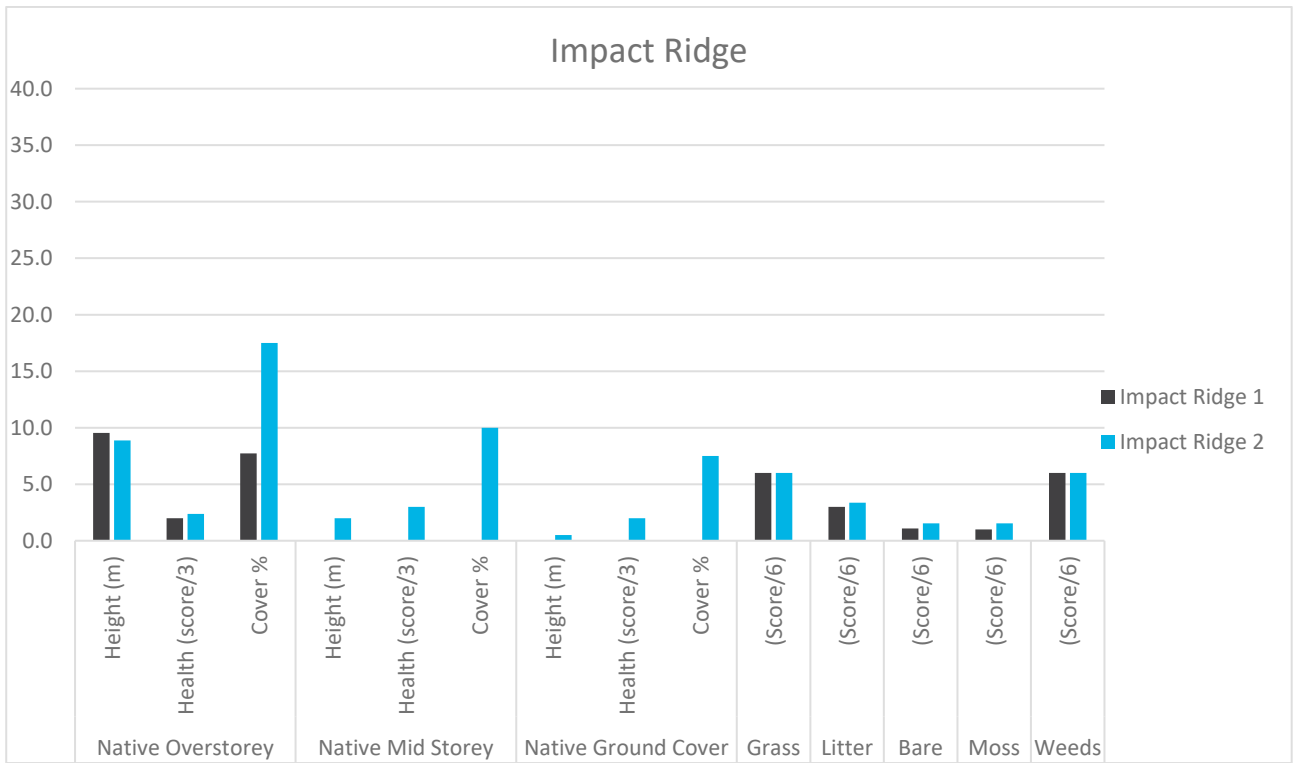


Figure B.1 Impact Ridge Biometric Survey Results

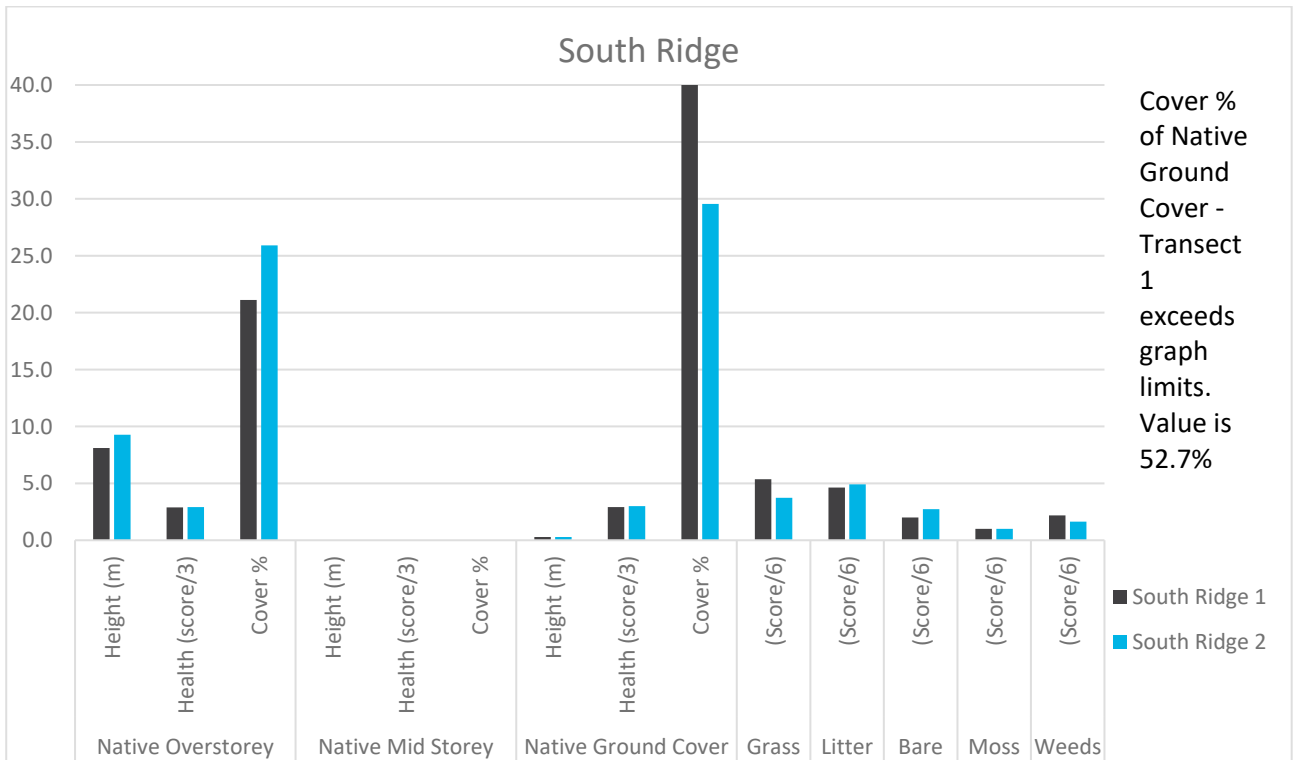


Figure B.2 South Ridge Biometric Monitoring Results

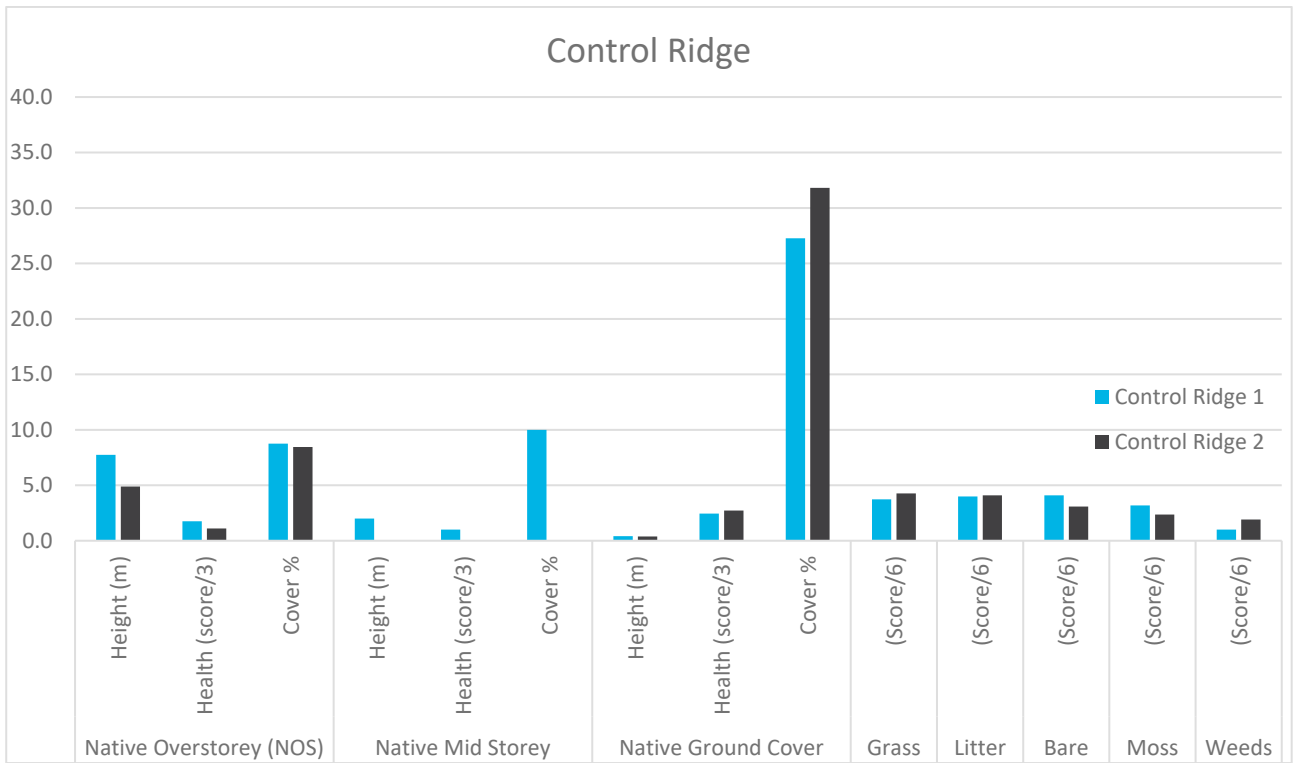


Figure B.3 Control Ridge Biometric Monitoring Results

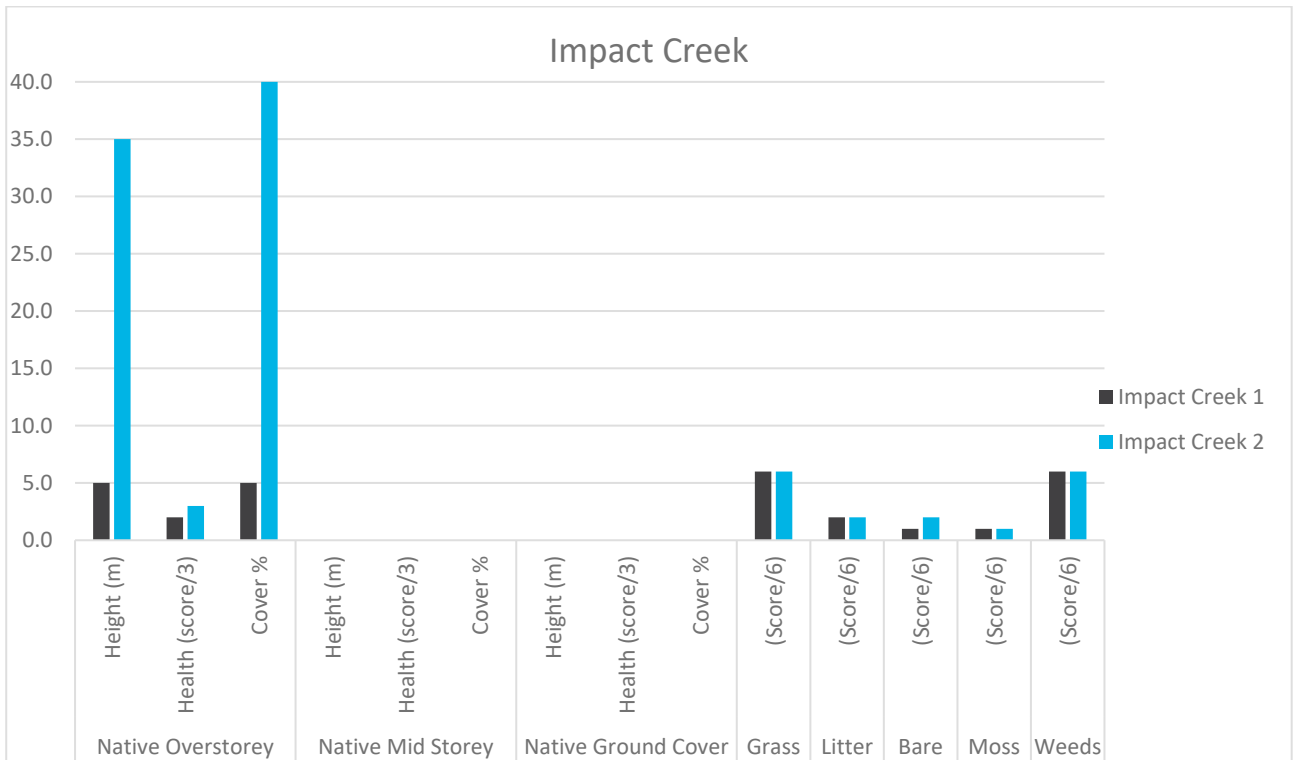


Figure B.4 Impact Creek Biometric Monitoring Results

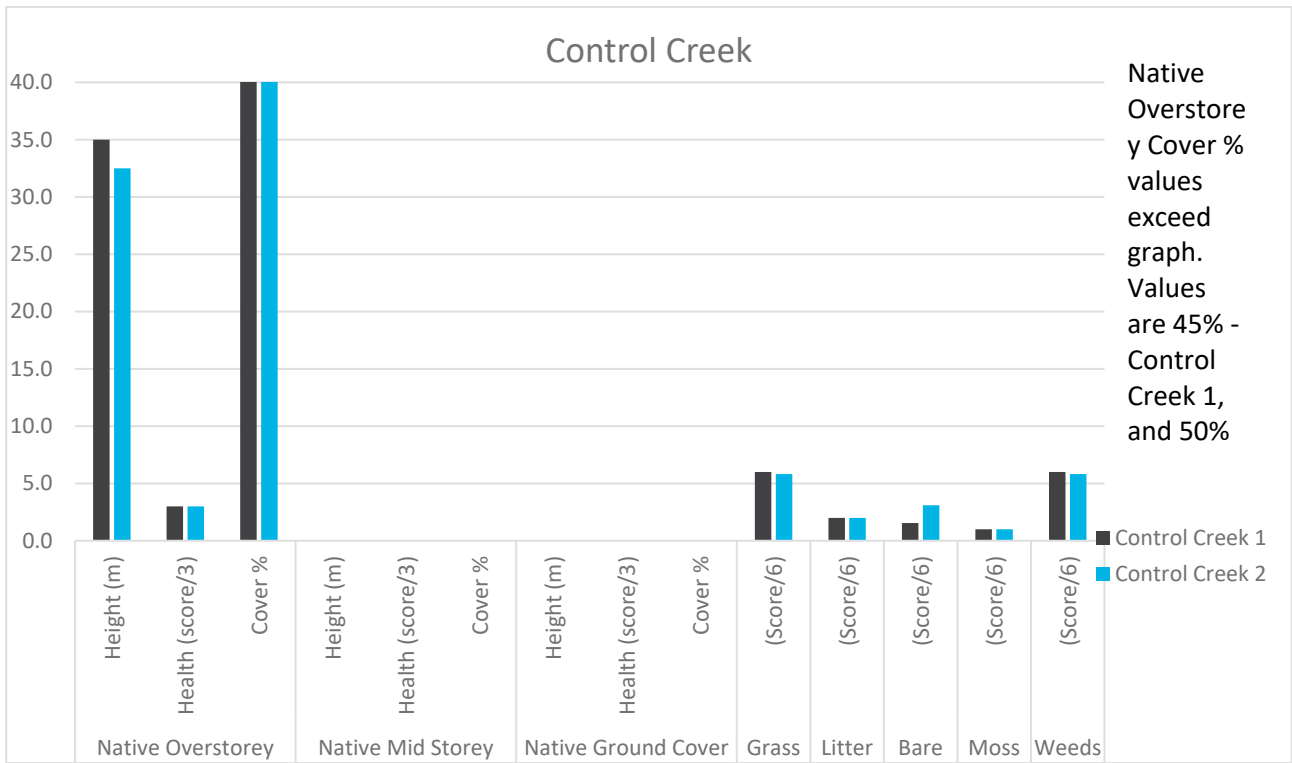


Figure B.5 Control Creek Biometric Monitoring Results

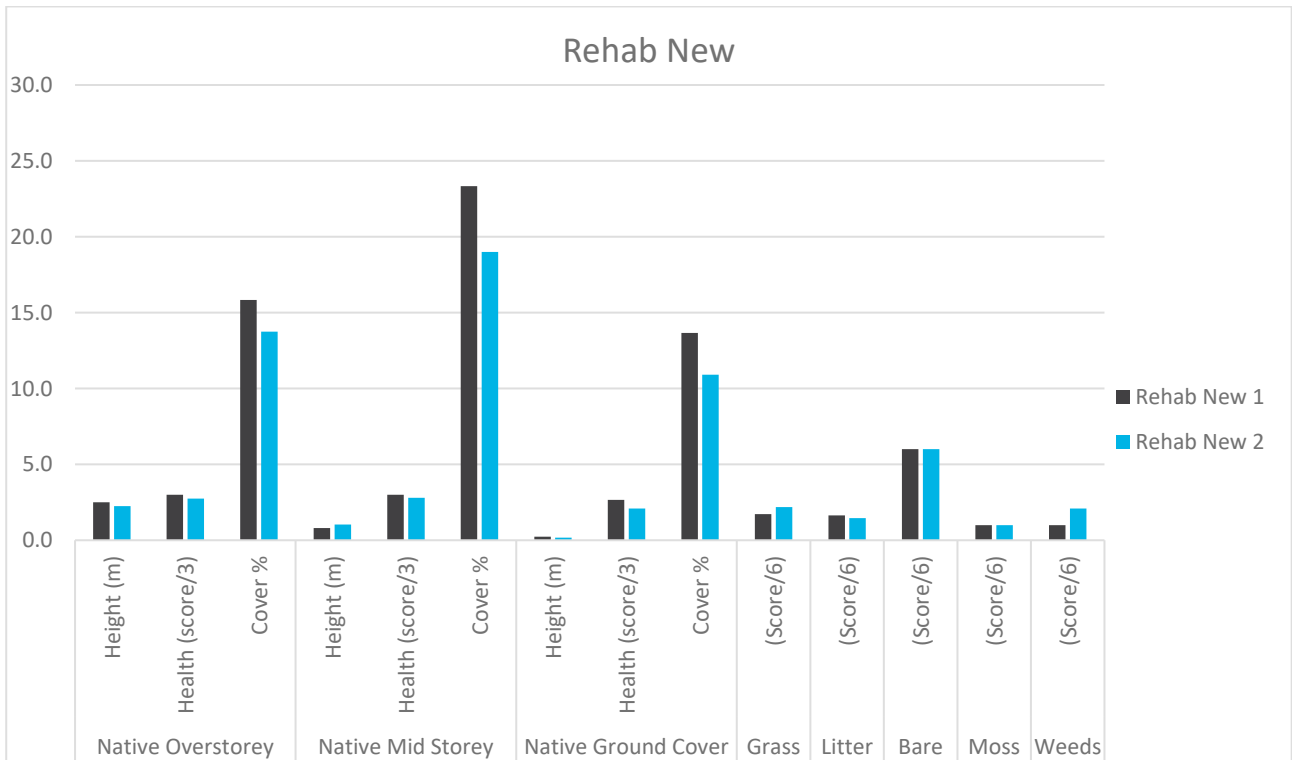


Figure B.6 Rehab New Biometric Monitoring Results

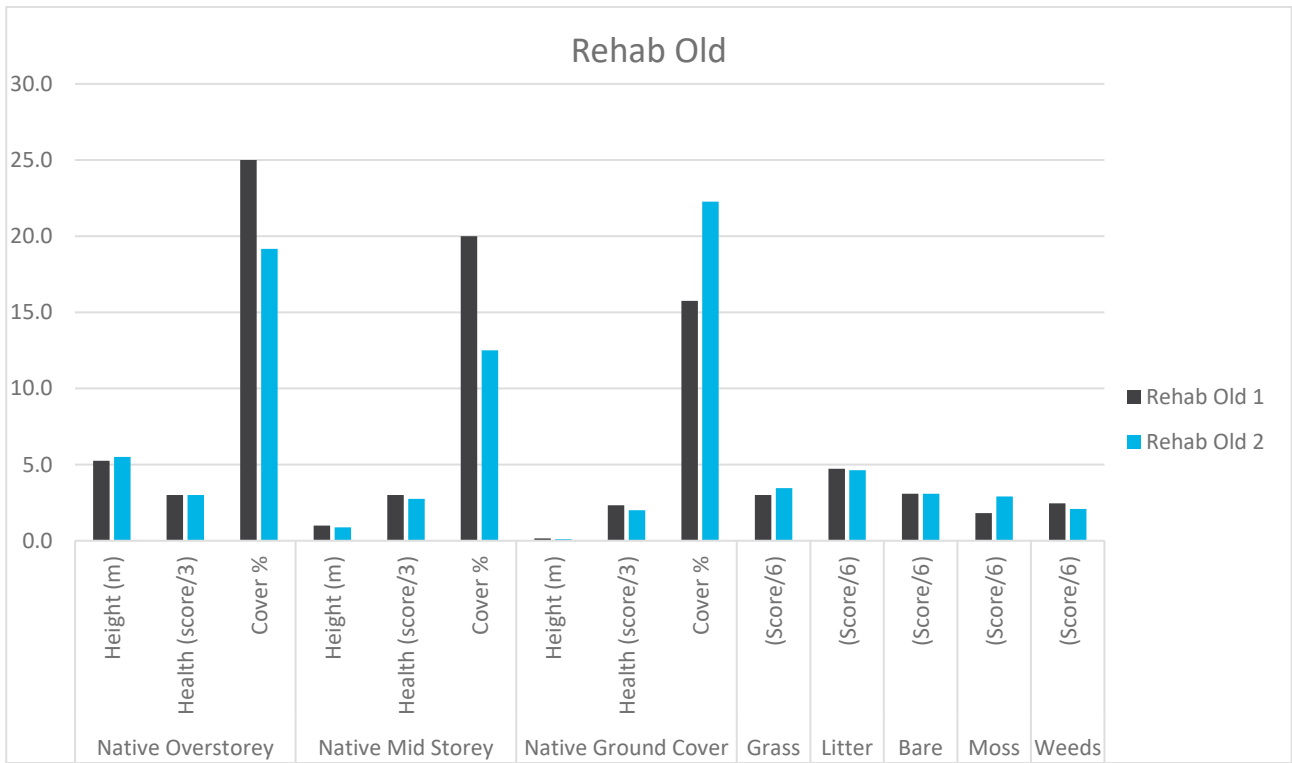


Figure B.7 Rehab Old Biometric Monitoring Results

Appendix C

Declared weeds of Central Tablelands

Table C.1 Priority weeds for the Central Tablelands – 11/01/22

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>
<p>Aaron’s beard prickly pear <i>Opuntia leucotricha</i></p>	<p>Prohibition on certain dealings</p> <p>Must not be imported into the state, sold, bartered, exchanged or offered for sale.</p>
<p>African boxthorn <i>Lycium ferocissimum</i></p>	<p>Prohibition on dealings</p> <p>Must not be imported into the State or sold</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>
<p>African olive <i>Olea europaea</i> subsp. <i>cuspidata</i></p>	<p>Regional Recommended Measure</p> <p>Exclusion zone: whole region except the core infestation area of the Cowra Council area</p> <p>Whole region: The plant should not be bought, sold, grown, carried or released into the environment.</p> <p>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.</p> <p>Core infestation area: Land managers should mitigate spread from their land. Land managers reduce impacts from the plant on priority assets.</p>
<p>Alligator weed <i>Alternanthera philoxeroides</i></p>	<p>Prohibition on dealings</p> <p>Must not be imported into the State or sold</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>

Table C.1 Priority weeds for the Central Tablelands – 11/01/22

Weed	Duty
Anchored water hyacinth <i>Eichhomia 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 dealings</p> <p><i>Must not be imported into the State or sold</i></p>
Bellyache bush <i>Jatropha gossypifolia</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p>
Bitou bush <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</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 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.</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>
Black knapweed <i>Centaurea X moncktonii</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>
Black willow <i>Salix nigra</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p>
Blackberry <i>Rubus fruticosus</i> species aggregate	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p> <p>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</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 lands that are free of blackberry</p>
Blind cactus <i>Opuntia rufida</i>	<p>Prohibition on certain dealings</p> <p><i>Must not be imported into the state, sold, bartered, exchanged or offered for sale.</i></p>

Table C.1 Priority weeds for the Central Tablelands – 11/01/22

Weed	Duty
Boneseed <i>Chrysanthemoides monilifera</i> subsp. <i>monilifera</i>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p> <p>Control Order Boneseed Control Zone: Whole of NSW <i>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.</i></p>
Boxing glove cactus <i>Cylindropuntia fulgida</i> var. <i>mamillata</i>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></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>
Bridal creeper <i>Asparagus asparagoides</i>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p> <p>*this requirement also applies to the Western Cape form of bridal creeper</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>
Bridal veil creeper <i>Asparagus declinatus</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>
Broomrapes <i>Orobanche</i> species	<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>Orobanche</i> are Prohibited Matter in NSW, except the natives <i>Orobanche cernua</i> var. <i>Australiana</i> and <i>Orobanche minor</i></p>

Table C.1 Priority weeds for the Central Tablelands – 11/01/22

Weed	Duty
Bunny ears cactus <i>Opuntia microdasys</i>	Prohibition on certain dealings <i>Must not be imported into the state, sold, bartered, exchanged or offered for sale.</i>
Burr ragweed <i>Ambrosia confertiflora</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>
Cabomba <i>Cabomba caroliniana</i>	Prohibition on dealings <i>Must not be imported into the State or sold</i>
Cane cactus <i>Austrocylindropuntia cylindrica</i>	Prohibition on dealings <i>Must not be imported into the State or sold</i> All species in the <i>Austrocylindropuntia</i> genus have this requirement
Cape broom <i>Genista monspessulana</i>	Prohibition on dealings <i>Must not be imported into the State or sold</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 and natural environments that are free of Cape broom
Cat’s claw creeper <i>Dolichandra unguis-cati</i>	Prohibition on dealings <i>Must not be imported into the State or sold</i>
Chicken dance cactus <i>Opuntia schickendantzii</i>	Prohibition on certain dealings <i>Must not be imported into the state, sold, bartered, exchanged or offered for sale.</i>
Chilean needle grass <i>Nassella neesiana</i>	Prohibition on dealings <i>Must not be imported into the State or sold</i> Regional Recommended Measure <i>Exclusion zone: whole region except for the core infestation area of Bathurst Council, Blayney Council, Lithgow Council, Oberon Council, Cabonne Council and Cowra Council</i> <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 spread from their land. Land managers reduce impacts from the plant on priority assets.</i>

Table C.1 Priority weeds for the Central Tablelands – 11/01/22

Weed	Duty
<p>Chinese violet <i>Asystasia gangetica</i> subsp. <i>micrantha</i></p>	<p>Control Order <i>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.</i></p>
<p>Climbing asparagus <i>Asparagus africanus</i></p>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p>
<p>Climbing asparagus fern <i>Asparagus plumosus</i></p>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p>
<p>Common pear <i>Opuntia stricta</i></p>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p>
<p>Coolatai grass <i>Hyparrhenia hirta</i></p>	<p>Regional Recommended Measure <i>Exclusion zone: whole region except for the core infestation areas of Lithgow Council and Mid-Western Regional Council areas</i> <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>
<p>Eurasian water milfoil <i>Myriophyllum spicatum</i></p>	<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 or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries</i></p>
<p>Eve’s needle cactus <i>Austrocylindropuntia subolata</i></p>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p>
<p>Fireweed <i>Senecio madagascariensis</i></p>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p> <p>Regional Recommended Measure <i>Exclusion zone: Whole region except for the core infestation area of Bylong Valley and Kanimbla Valley (lower Cox River Catchment)</i> <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>

Table C.1 Priority weeds for the Central Tablelands – 11/01/22

Weed	Duty
Flax-leaf broom <i>Genista linifolia</i>	Prohibition on dealings <i>Must not be imported into the State or sold</i>
Foxtail fern <i>Asparagus densiflorus</i>	Prohibition on dealings <i>Must not be imported into the State or sold</i>
Frogbit <i>Limnobium laevigatum</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 of Limnobium are Prohibited Matter
Gamba grass <i>Andropogon gayanus</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>
Giant Parramatta grass <i>Sporobolus fertilis</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>
Giant reed <i>Arundo donax</i>	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>
Gorse <i>Ulex europaeus</i>	Prohibition on dealings <i>Must not be imported into the State or sold</i> 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>

Table C.1 Priority weeds for the Central Tablelands – 11/01/22

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>

Table C.1 Priority weeds for the Central Tablelands – 11/01/22

Weed	Duty
Hudson pear <i>Cylindropuntia pallida</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. 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 Cylindropuntia.</p>
Hydrocotyl <i>Hydrocotyle ranunculoides</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>
Hygrophila <i>Hygropila costata</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>
Hymenachne <i>Hymenachne amplexicaulis</i> and hybrids	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p>
Karoo acacia <i>Vachellia karoo</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>
Kochia <i>Bassia scoparia</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>Excluding the subspecies <i>trichophylla</i></p>
Koster’s curse <i>Clidemia hirta</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>
Lagarosiphon <i>Lagarosiphon major</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>
Lantana <i>Lantana camara</i>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p>

Table C.1 Priority weeds for the Central Tablelands – 11/01/22

Weed	Duty
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>
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

Table C.1 Priority weeds for the Central Tablelands – 11/01/22

Weed	Duty
Ox-eye daisy <i>Leucanthemum vulgare</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 plan 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 ox-eye daisy</p>
Parkinsonia <i>Parkinsonia aculeata</i>	<p>Prohibition on dealings</p> <p><i>Must not be imported into the State or sold</i></p> <p>Control Order</p> <p>Parkinsonia Control Zone: Whole of NSW</p> <p><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></p>
Parthenium weed <i>Parthenium hysterophorus</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>Prohibited Matter</p> <p><i>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</i></p>
Pond apple <i>Annona glabra</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>
Prickly acacia <i>Vachellia nilotica</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>
Prickly pears – <i>Austrocyllindropuntias</i> <i>Austrocyllindropuntia</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>Austrocyllindropuntia</i> genus have this requirement</p>

Table C.1 Priority weeds for the Central Tablelands – 11/01/22

Weed	Duty
Prickly pears – <i>Cylindropuntias</i> <i>Cylindropuntia</i> species	<p>Prohibition on dealings <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 <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. Notify local control authority if found.</i></p> <p>This Regional Recommended Measure does not apply to cultivated plants</p>
Prickly pears – <i>Opuntias</i> <i>Opuntia</i> species	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p> <p>Except for <i>Opuntia ficus-indica</i> (Indian fig)</p>
Privet – broad-leaf <i>Ligustrum lucidum</i>	<p>Regional Recommended Measure Exclusion zone: urban areas of Bathurst Council, Blayney Council, Lithgow Council, Oberon Council, and Orange City Council <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 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.</i></p> <p><i>Outside exclusion zone: Land managers reduce impacts from the plant on priority assets.</i></p>
Privet – European <i>Ligustrum vulgare</i>	<p>Regional Recommended Measure Exclusion zone: urban areas of Bathurst Council, Blayney Council, Lithgow Council, Oberon Council, and Orange City Council <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 Exclusion zone: urban areas of Bathurst Council, Blayney Council, Lithgow Council, Oberon Council, and Orange City Council <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>

Table C.1 Priority weeds for the Central Tablelands – 11/01/22

Weed	Duty
Rope pear <i>Cylindropuntia imbricata</i>	<p>Prohibition on dealings <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 <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 <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 <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. 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>
Salvinia <i>Salvinia molesta</i>	<p>Prohibition on dealings <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 <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 and natural environments that are free of Scotch broom</p>
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>

Table C.1 Priority weeds for the Central Tablelands – 11/01/22

Weed	Duty
Siam weed <i>Chromolaena odorata</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>
Silverleaf nightshade <i>Solanum elaeagnifolium</i>	Prohibition on dealings <i>Must not be imported into the State or sold</i> 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>
Smooth tree pear <i>Opuntia monacantha</i>	Prohibition on dealings <i>Must not be imported into the State or sold</i>
Snakefeather <i>Asparagus scandens</i>	Prohibition on dealings <i>Must not be imported into the State or sold</i>
Spanish heath <i>Erica lusitanica</i>	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>
Spiny burrgrass – longispinus <i>Cenchrus longispinus</i>	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>

Table C.1 Priority weeds for the Central Tablelands – 11/01/22

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>

Table C.1 Priority weeds for the Central Tablelands – 11/01/22

Weed	Duty
Tiger pear <i>Opuntia aurantiaca</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 unimproved grazing lands that are free of tiger pear</p>
Tropical soda apple <i>Solanum viarum</i>	<p>Control Order 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>
Tutsan <i>Hypericum androsaemum</i>	<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 land that is free of tutsan</p>
Velvety tree pear <i>Opuntia tomentosa</i>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p>
Water caltrop <i>Trapa species</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 in the <i>Trapa</i> genus are Prohibited Matter in NSW</p>

Table C.1 Priority weeds for the Central Tablelands – 11/01/22

Weed	Duty
Water hyacinth <i>Eichhomia crassipes</i>	<p>Prohibition on dealings <i>Must not be imported into the State or sold</i></p> <p>Biosecurity Zone 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). <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 <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>
Willows <i>Salix</i> species	<p>Prohibition on dealings <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 <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 <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 Searches

Common Name	Scientific Name	Habitat Requirements	Listing
			New listings since last monitoring period
Endangered Ecological Communities			
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	No scientific name	Dominated by White Box Yellow Box or Blakely's Red Gum where a tree canopy still exists. Must be greater than 0.1 hectares in size where these canopy species dominate.	EPBC Act 2000 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.	EPBC Act 2000 Critically Endangered
Upland Basalt Eucalypt Forest of the Sydney Basin Bioregion	No scientific name	Tall open eucalypt forests found on igneous rock (predominately Tertiary basalt and microsyenite) in, or adjacent to, the Sydney Basin Bioregion. The ecological community occurs in areas of high rainfall, generally ranging from 950 to 1600 mm/year. The ecological community typically occurs at elevations between 650 and 1050 m above sea level although it has been recorded at elevations as low as 350 m at the back of the Illawarra Escarpment in the Upper Nepean Sydney Catchment Authority (SCA) lands where proximity to the coast provides higher rainfall at lower elevations. The ecological community may occur at elevations of 1200 m or more within its range, such as on the Boyd Plateau in the western Blue Mountains.	EPBC Act 2000 Endangered
Flora			
Bynoe's Wattle	Acacia bynoeana	Occurs in heath or dry sclerophyll forest on sandy soils. Seems to prefer open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leafed Apple.	EPBC Act 2000 Vulnerable
Flockton Wattle	Acacia flocktoniae	The Flockton Wattle is found only in the Southern Blue Mountains (at Mt Victoria, Megalong Valley and Yerranderie) and grows in dry sclerophyll forest on sandstone.	BC Act 2016 Vulnerable EPBC Act 2000 Vulnerable

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.	EPBC Act 2000 Vulnerable BC Act 2016 Vulnerable
Silver-leaved Mountain Gum, Silver-leaved 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>).	BC Act 2016 Vulnerable EPBC Act 2000 Vulnerable
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.	EPBC Act 2000 Critically Endangered
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	EPBC Act 2000 Vulnerable
Leionema lachnaeoides	<i>Leionema lachnaeoides</i>	Occurs on exposed sandstone cliff tops and terraces, at 960 – 1000m altitude with aspects from south-east to south-west. Habitat vegetation is montane heath and commonly includes <i>Eucalyptus stricta</i> , <i>Allocasuarina nana</i> , <i>Dillwynia retorta</i> , <i>Epacris microphylla</i> and <i>Caustis flexuosa</i> .	EPBC Act 2000 Endangered
Peppergrass	<i>Lepidium hyssopifolium</i>	Grows in open, bare ground with limited competition from other plants. Recently recorded localities have predominantly been in weed-infested areas of heavy modification, high degradation and high soil disturbance.	EPBC Act 2000 Endangered
Hoary Sunray, Grassland Paper-daisy	<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.	EPBC Act 2000 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	EPBC 2000 - Endangered

Smooth Bush-pea	<i>Pultenaea glabra</i>	Primarily associated with riparian or swamp habitat areas in the mid to upper altitudes of the central Blue Mountains on sandstone derived soils. Grows in swamp margins, hillslopes, gullies and creekbanks and occurs within dry sclerophyll forest and tall damp heath on sandstone. Flowers September to November.	EPBC Act 2000
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.	EPBC Act 2000 Endangered
Austral Toadflax, 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.	EPBC Act 2000 Vulnerable
Swamp Everlasting	<i>Xerochrysum palustre</i>	Swamp Everlasting grows in wetlands including sedge-swamps and shallow freshwater marshes, often on heavy black clay soils.	EPBC 2000 Vulnerable
Fauna			
Fish			
Macquarie Perch	<i>Macquaria australisica</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.	EPBC Act 2000 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.	EPBC Act 2000 Vulnerable
Amphibians			
Giant Burrowing Frog	<i>Heleioporus australiacus</i>	Breeding habitat is generally soaks or pools within first or second order streams. Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based.	EPBC Act 2000 Vulnerable
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.	EPBC Act 2000 Endangered

Littlejohn's Tree Frog, Heath	<i>Litoria littlejohni</i>	This species breeds in the upper reaches of permanent streams and in perched swamps. Non-breeding habitat is heath based forests and woodlands where it shelters under leaf litter and low vegetation, and hunts for invertebrate prey either in shrubs or on the ground. Breeding is triggered by heavy rain and can potentially occur all year, but is usually from late summer to early spring when conditions are favourable. Males call from low vegetation close to slow flowing pools. Eggs are laid in loose gelatinous masses attached to small submerged twigs. Eggs and tadpoles are mostly found in still or slow flowing pools that receive extended exposure to sunlight, but will also use temporary isolated pools.	EPBC Act 2000 Vulnerable
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.	BC Act 2016 Endangered EPBC Act 2000 Vulnerable
Birds			
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 cambagei</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.	EPBC 2000 Critically Endangered, BC Act 2016 – Critically Endangered
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallows primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.	BC Act 2016 - Vulnerable

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.	EPBC 2000 - Endangered
Curlew Sandpiper	<i>Calidris ferruginea</i>	In Australia, Curlew Sandpipers occur around the coasts and are also quite widespread inland, though in smaller numbers. Records occur in all states during the non-breeding period, and also during the breeding season when many non-breeding one year old birds remain in Australia rather than migrating north. In Queensland, scattered records occur in the Gulf of Carpentaria, with widespread records along the coast south of Cairns. There are sparsely scattered records inland. In NSW, they are widespread east of the Great Divide, especially in coastal regions. They are occasionally recorded in the Tablelands and are widespread in the Riverina and south-west NSW, with scattered records elsewhere.	EPBC 2000 – Critically Endangered
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 <i>Eucalyptus pauciflora</i> 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.	BC Act 2016 Vulnerable
Glossy Black-Cockatoo	<i>Calyptorhynchus 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 (<i>Casuarina</i> and <i>Allocasuarina</i> species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites.	BC Act 2016 Vulnerable
Varied Sittella	<i>Daphoenositta chrysoptera</i>	Distribution in NSW is nearly continuous from the coast to the far west. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy.	BC Act 2016 - 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.	EPBC Act 2000 Vulnerable
Painted Honeyeater	<i>Grantiella picta</i>	Inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	EPBC 2000 Vulnerable
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest). Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass.	BC Act 2016 - Vulnerable
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 1000 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.	EPBC 2000 - Vulnerable
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. sideroxyylon</i> and White Box. Commonly used lerp infested trees include <i>E. microcarpa</i> , Grey Box and Blackbutt.	EPBC 2000 – Critically Endangered, BC Act 2016 - Endangered
Barking Owl	<i>Ninox connivens</i>	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. Roosts in shaded portions of tree canopies. Preferentially hunts small arboreal mammals such as Squirrel Gliders and Ringtail Possums, but also takes birds, invertebrates and rodents and rabbits. Requires very large permanent territories in most habitats due to sparse prey densities. Eggs are laid in hollows of large, old trees. Living eucalypts are preferred though dead trees are also used.	BC Act 2016 - Vulnerable

Powerful Owl	<i>Ninox strenua</i>	In NSW, widely distributed throughout the eastern forests from the coast inland to tablelands. Inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. Requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation. The main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider. They nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old.	BC Act 2016 - Vulnerable
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.	EPBC Act 2000 Critically Endangered
Scarlet Robin	<i>Petroica boodang</i>	The Scarlet Robin breeds in drier eucalypt forests and temperate woodlands, often on ridges and slopes, within an open understorey of shrubs and grasses and sometimes in open areas. Abundant logs and coarse woody debris are important structural components of its habitat. In autumn and winter it migrates to more open habitats such as grassy open woodland or paddocks with scattered trees. It forages from low perches, feeding on invertebrates taken from the ground, tree trunks, logs and other coarse woody debris. The robin builds an open cup nest of plant fibres and cobwebs, sited in the fork of tree (often a dead branch in a live tree, or in a dead tree or shrub) which is usually more than 2 m above the ground.	BC Act 2016 - Vulnerable
Superb Parrot	<i>Polytelis swainsonii</i>	The Superb Parrot occurs only in south-eastern Australia. The Superb Parrot is found in NSW and northern Victoria, where it occurs on the inland slopes of the Great Divide and on adjacent plains, especially along the major river-systems; vagrants have also been recorded in southern Queensland. In NSW, it mostly occurs west of the Great Divide, where it mainly inhabits the Riverina, the South-west Slope and Southern Tableland Regions: west to Mathoura, Boorooban, Goolgowi, and east to Canberra, Yass and Cowra. Its range extends north to around Narrabri and Wee Waa in the North-west Plain Region, from a line joining Coonabarabran and Narrabri, and extending at least as far west as Tottenham and Quambone, with occasional records even further west.	EPBC 2000 - Vulnerable

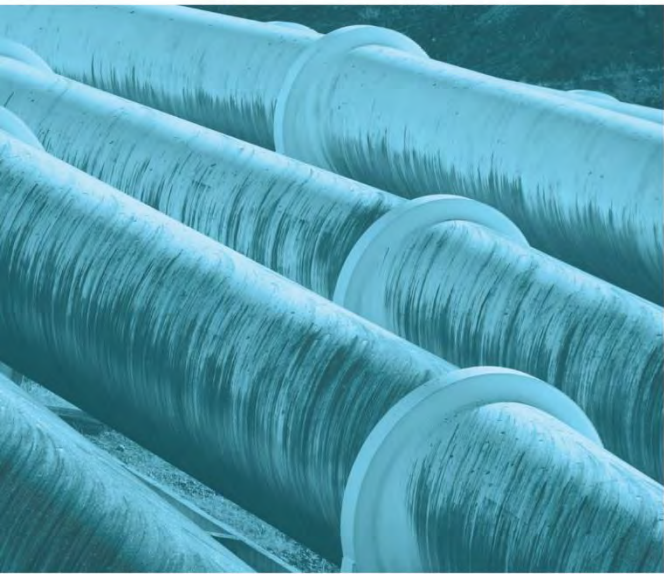
Australian Painted Snipe	<i>Rostratula australis</i>	In NSW, this species has been recorded at the Paroo wetlands, Lake Cowell, Macquarie Marshes and Hexham Swamp. Most common in the Murray-Darling Basin. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, 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.	EPBC Act 2000 Endangered
Mammals			
Large-eared Pied Bat, Large 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.	EPBC Act 2000 Vulnerable
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	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.	BC Act 2016 Vulnerable EPBC Act 2000 Endangered
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania. Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy. Hibernates in winter. Females are pregnant in late spring to early summer.	BC Act 2016 Vulnerable

Little Bentwing-bat	<i>Miniopterus australis</i>	<ul style="list-style-type: none"> Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats 	TSC 1995 Vulnerable
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	Caves are the primary roosting habitat for the large bent-winged bat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. The species forms discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. Maternity caves have very specific temperature and humidity regimes. At other times of the year, populations disperse within about 300 km range of maternity caves. Breeding or roosting colonies can number from 100 to 150,000 individuals. The species hunts in forested areas, catching moths and other flying insects above the tree tops.	BC Act 2016 - Vulnerable
Eastern Coastal Freetail-bat	<i>Micronomus norfolkensis</i>	Highly mobile species requiring either hollows, decorticating bark or cave structures for shelter. All forage over wide areas on insects.	BC Act 2016 Vulnerable
Southern Myotis	<i>Myotis macropus</i>	Highly mobile species requiring either hollows, decorticating bark or cave structures for shelter. All forage over wide areas on insects.	BC Act 2016 Vulnerable
Platypus	<i>Ornithorhynchus anatinus</i>	Platypuses commonly live in the rivers, streams and lakes of eastern Australia. Out of the water, platypuses spend most of their time in burrows which have been dug into the river bank, with their entrances usually above water level. The animals use a number of short resting burrows (three to five metres long) as protection from predators and temperature extremes. Burrows used for nesting tend to be more elaborate, with many side branches.	NSW Protected Fisheries Management Act – Threatened
Greater Glider	<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.	EPBC 2000 – Vulnerable
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.	EPBC Act 2000 Vulnerable
Koala	<i>Phascolarctos cinereus</i>	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	EPBC Act 2000 Vulnerable

		size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size.	BC Act 2016 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 other. 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.	EPBC Act 2000 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.	BC Act 2016 Vulnerable EPBC Act 2000 Vulnerable
Yellow-bellied Sheath-tail-bat	<i>Saccolaimus flaviventris</i>	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. Breeding has been recorded from December to mid-March, when a single young is born. Seasonal movements are unknown; there is speculation about a migration to southern Australia in late summer and autumn.	BC Act 2016 Vulnerable
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	Highly mobile species requiring either hollows, decorticating bark or cave structures for shelter. All forage over wide areas on insects.	BC Act 2016 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.	EPBC Act 2000 Vulnerable

Broad-headed Snake	Hoplocephalus bungaroides	<p>The Broad-headed snake is a nocturnal species which shelters in rock crevices and under flat sandstone rocks on exposed cliff edges during autumn, winter and spring. Moves from the sandstone rocks to shelters in crevices or hollows in large trees within 500m of escarpments in summer. Feeds mostly on geckos and small skinks; will also eat frogs and small mammals occasionally.</p>	<p>EPBC Act 2000 Vulnerable</p>
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Appendix K Aquatic Ecology Monitoring

Excellence in your environment



Aquatic Monitoring Report

Spring 2021

Prepared for Austen Quarry Pty Ltd | 27 July 2022



Document control

Project number	Client	Project manager	LGA
6940	Hy-Tech	Matthew Russell	Lithgow

Version	Author	Review	Status	Date
D1	Luke Stone	Matthew Russell	Draft	04/03/2022
D2	Matthew Russell	Luke Stone	Draft	7/3/2022
R1	Matthew Russell	Darryl Thiedeke	Final	27/7/2022

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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 2021 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 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 physical-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.

Edge and riffle habitat was sampled at six sites for aquatic macroinvertebrates during November 2021 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 moderate antecedent flows. Sampling was conducted according to AUSRIVAS protocol and was consistent with previous monitoring. 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.

Key findings of this report were:

- Electrical conductivity returned to within ANZG DTVs at all sites.
- pH, turbidity and dissolved oxygen were within ANZG DTVs at all sites, with the exception of the Quarry Control sites which recorded dissolved oxygen values below the DTV's, although only a minor reduction.
- Pool edge macroinvertebrate assemblages were generally similar to reference condition (Band A) in comparison with the AUSRIVAS reference model data. The exceptions were at Site 2 (Quarry Processing) and Site 8 (Quarry Control), recording Band B scores reflecting significantly impaired conditions.
- Riffles habitats were comparable to AUSRIVAS modelled reference condition (Band A) with the exception of Site 2 (Quarry Processing) which recorded a Band B score indicating significantly impaired conditions.
- Despite a minor reduction for OE50Taxa (Band B) in pool edge habitat in Site 2 for pool edge habitat 2021, the statistical analysis did not support any significant differences between treatment and control sites for OE50taxa or other indicators.
- Despite a Band B OE50Taxa (Band B) in riffle habitat at Site 2 in 2021, the statistical analysis of location groupings did not support any significant differences between treatment and control sites for OE50taxa or other indicators.
- Significant differences observed for pool univariate data were largely related to differences between years and not between locations. The multivariate results did show a significant

interaction for *Year X Location*, but no differences were observed in 2021 between years or locations.

- A significant *Year X Location* interaction was observed for both O0SIGNAL and OE50 SIGNAL in riffle habitats, however pairwise comparison showed that while there maybe difference temporally, there were no differences between treatment and control groups in 2021.

Water quality was improved in 2021 in comparison to 2020, with lower electrical conductivity and only minor and limited exceedances in other physiochemical measurements for all locations. The conclusions are similar to previous years that, in general, temporal variability across a broader spatial scale continues to be the major driver of changes in the macroinvertebrate assemblages.

The 2021 biological monitoring results represent a continued overall improvement in pool habitat and stream health, most likely related to higher and more frequent river flows. While one site in the Quarry Treatment location again recorded a lower Band score than the other sites, further analysis of OE50 score did not find any statistical difference between treatment and control locations in 2021.

Macroinvertebrate assemblages and stream health indicators results show that the composition and ecological health of the river within the vicinity of the Quarry remains similar to and for some attributes potentially better, than other areas of the river not influenced by Quarry operations.

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Glossary and abbreviations

Anthropogenic	Caused or produced by humans.
ANZECC	Australian and New Zealand Environment and Conservation Council
ANZG	Australian and New Zealand Guidelines (ANZG) for Fresh and Marine Water Quality.
Aquatic macroinvertebrates	Animals that have no backbone, are visible with the naked eye and spend all or part of their life in water.
AUSRIVAS	Australian Rivers Assessment System
CMA	Catchment Management Area
Drainage	Natural or artificial means for the interception and removal of surface or subsurface water.
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 2020 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 physio-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 Niche Aquatic Ecologists over two days (03/11/2021 and 04/11/2021). 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

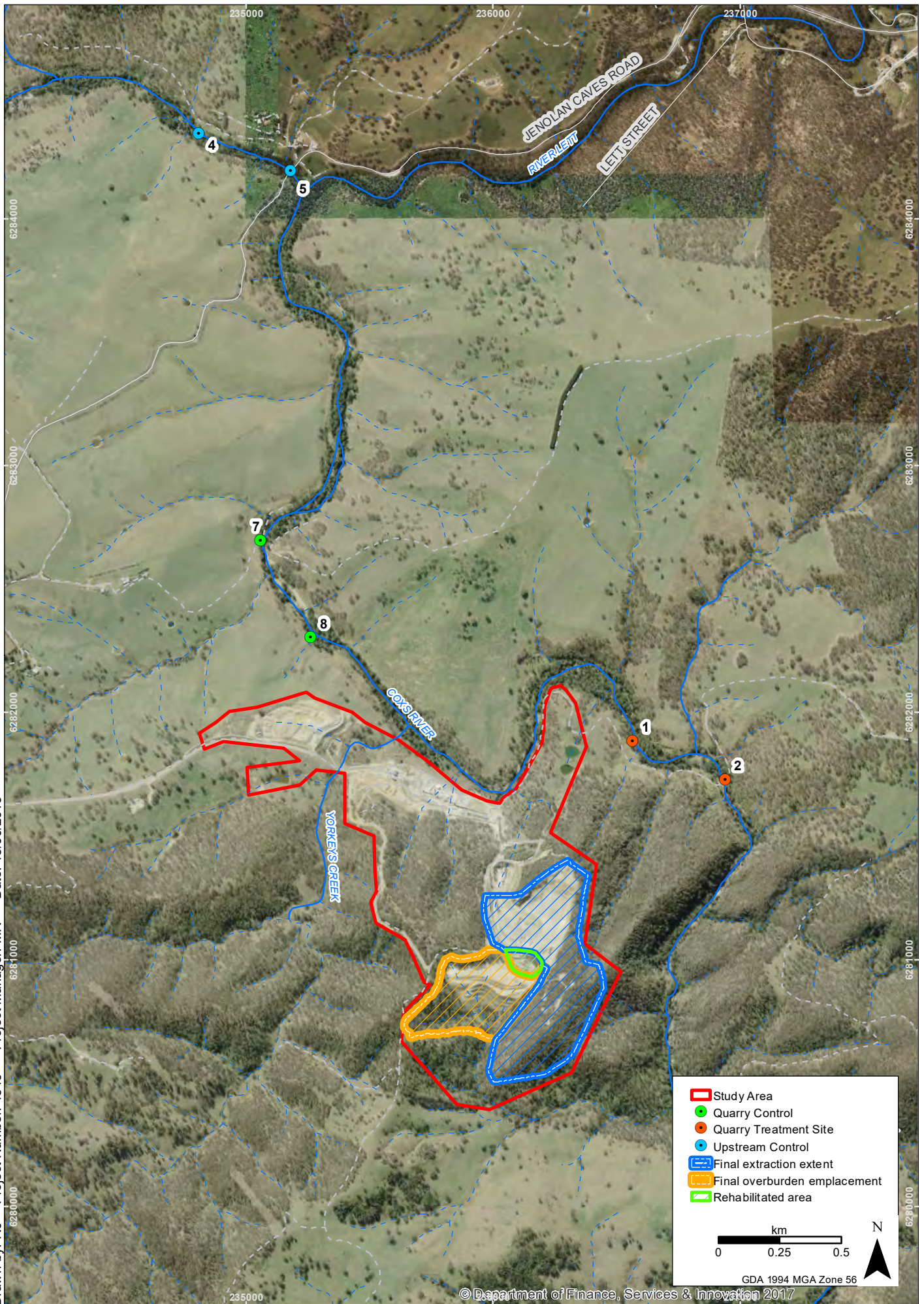
A total of six sites were sampled during the current survey (Figure 1, Table 1). These sites are consistent with those sampled in previous monitoring and allows for comparison of data collected over time.

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

Drawn by: RJ Project Number: 4546 Project Manager: MR Date: 13/06/2019



Spring 2021 Aquatic Monitoring Program - Austen Quarry

Location of monitoring sites

2.3 Water quality sampling

Surface water quality was measured *in situ* using a Yeokal 611 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 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), SIGNAL (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 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 (8 levels: 2011, 2014, 2015, 2016, 2017, 2019, 2020 and 2021)

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).

2.6.1 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.

2.6.2 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.

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 1 - Plate 6).

3.1 Hydrology

River flow in 2021 was comparatively higher in comparison to mean yearly flows since 2007 (Figure 2, Table 4), recording the highest total annual discharge volume since 2007, beyond which the continuous dataset is incomplete. While not experiencing the greater peak flow events recorded in 2011 and 2012, 2021 can be seen to be characterised by more frequent elevated flow events (Figure 2) and higher average daily discharge volumes (Table 4). These factors contributed to overall greater levels of discharge over the year.

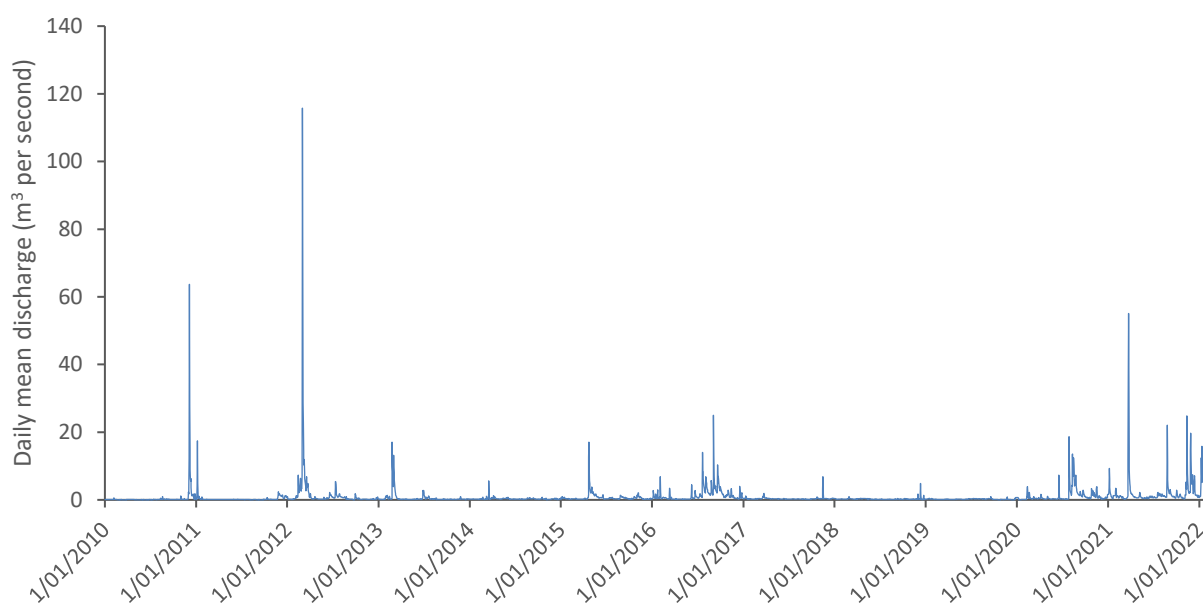


Figure 2: Daily mean stream flow at Coxs River downstream Lake Lyell – Gauge 212011

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

A total discharge of 68,467.50 Megalitres was recorded in 2021, the highest recorded between 2010 and 2021 and more than double the mean of 26,563.29 Megalitres throughout this period (Table 4). These totals are recorded in the context of elevated flows in 2020, which followed three years of extended drought (2017 – 2019).

Table 4: Mean yearly flow at Coxs River downstream Lake Lyell – Gauge 212011

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

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

Year	Total annual discharge volume (ML)	Average daily mean discharge (m ³ per second)
2018	8,016.12	0.25
2019	6,686.60	0.21
2020	37,625.69	1.19
2021	68,467.50	2.17

Stream flows in 2021 were highest in March (autumn) and November (spring), with higher flows also recorded in August and December (Figure 3). A total discharge of 68,467.50 Megalitres was recorded in 2021, the highest recorded between 2010 and 2021 and more than double the mean of 26,563.29 Megalitres throughout this period (Table 4). These totals are recorded in the context of previously elevated flows in 2020, which followed three years of extended drought (2017 – 2019).

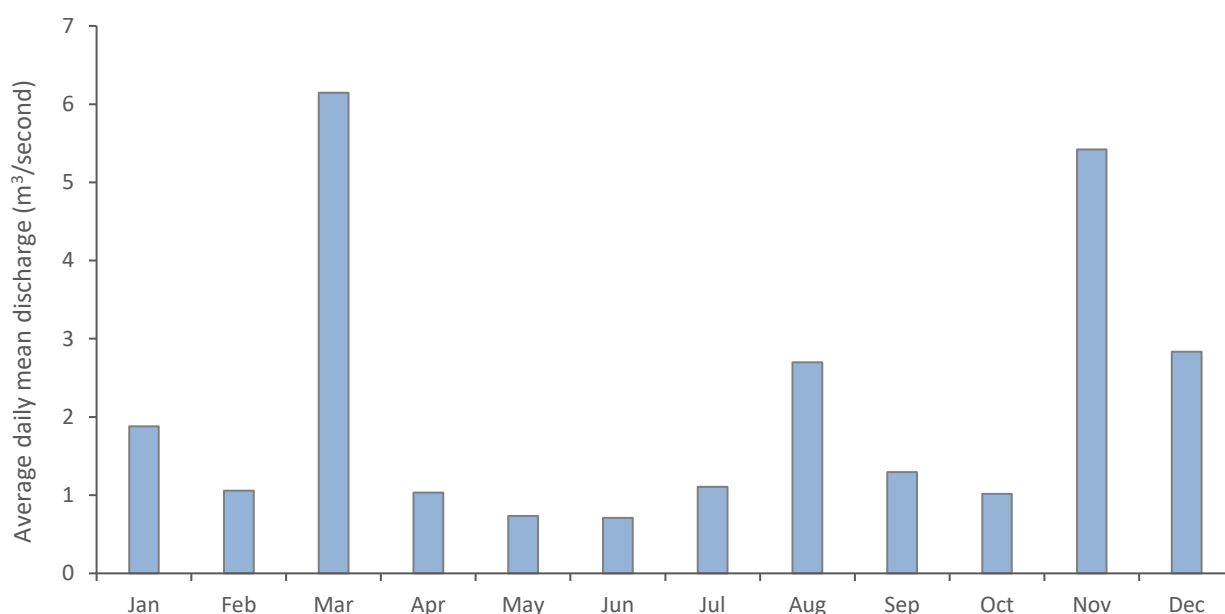


Figure 3: Average daily mean stream flow at Coxs River downstream Lake Lyell – Gauge 212011 in 2021

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

3.2 Water quality

Water quality results of temperature, electrical conductivity, and turbidity were generally consistent across all sites (Table 5). All electrical conductivity results were within the ANZG Default Trigger Values (DTVs), with all locations recording electrical conductivity values substantially lower than the elevated levels recorded in autumn 2021. Alkalinity was slightly higher in upstream control sites, as was the case in autumn 2021.

Table 5 Water quality results for spring 2021

Location	Quarry Processing		Upstream Control		Quarry Control		DTV's
	1	2	4	5	7	8	
Temperature °C	16.97	16.92	17.06	17.09	16.78	16.8	-
Electrical conductivity (µS/cm)	92	92	102	100	90	92	30-350
Turbidity (NTU)	3.6	3.8	3.3	22.3	3.4	3.2	2-25
Dissolved oxygen (% sat)	92.3	91.7	93.6	93.8	87.8	84.5	90-110
Dissolved Oxygen (mg/L)	8.93	8.82	9.04	9.05	8.54	8.23	-

Location	Quarry Processing		Upstream Control		Quarry Control		DTV's
Site	1	2	4	5	7	8	
pH	7.06	7.02	7.00	7.09	7.59	8.24	6.5-8
Alkalinity (mg CaCO ₃ /L)	60	60	80	80	60	80	-

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 38 different taxa were collected from the pool sampling, with the number of taxa collected at each site ranging between 17-25. Pool edges were dominated numerically by Leptophlebiidae (mayflies), Caenidae (mayflies) and Corbiculidae (Bivalves), which collectively made up 54% 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 similar to reference conditions, recording OE50 scores with Band A. Two sites recorded OE50 scores within Band B, indicating significantly impaired conditions when compared to the modelled reference site data, these were Quarry Treatment Site 2 (0.71) and Quarry Control Site 8 (0.67). For SIGNAL2, sites ranged between 4.00-5.32. All sites except Upstream Control Site 4 recorded scores between 4–5, indicating macroinvertebrate assemblages that are dominated by taxa that are able to withstand to moderate levels of pollution. Whereas Site 4 recorded a relatively higher SIGNAL2 score, reflecting a dominance of macroinvertebrate taxa tolerant of mild pollution, indicating superior water quality conditions at this site. In terms of the number of taxa recorded at each site, Upstream Control Site 5 recorded the lowest (15) and Quarry Control Site 7 the highest (25). The numbers of taxa recorded at the Quarry Treatment Sites (24 and 19) are comparable to those recorded at the control sites.

Table 6 AUSRIVAS results for edge habitat (2021)

Season	Spring 2021					
Status	Quarry Treatment		Upstream Control		Quarry Control	
Site	1	2	4	5	7	8
OE50	1.03	0.71	0.85	0.9	1.04	0.67
Band	A	B	A	A	A	B
No of taxa	24	19	19	17	25	17
OOSIGNAL (SIGNAL2)	4.42	4.79	5.32	4.00	4.60	4.18
OE50SIGNAL	1	1.04	1.05	0.94	0.98	0.99

Statistical analysis

Statistical analysis outputs are presented in Appendix 2. The statistical analysis of the number of taxa detected significant difference for the term *Year*. Pairwise comparisons show that there was only significant difference between 2021 and 2014 which contributed to this result (Figure 4), with the total number of taxa recorded in 2021 being significantly lower than number of taxa in 2014.

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

Significant differences for OE50SIGNAL were detected for the term *Year*. Pairwise comparisons indicated that these differences were between 2021 with 2020, 2019 and 2014 (Figure 5). The results show that 2021 was statistically lower than 2019 however was greater than the previous year 2020 as well as 2014 (Figure 4).

Significant differences were also detected in OE50 Taxa for the *Year* term. However pairwise comparisons indicated that this result did not include any significant differences between 2021 and previous years. That is, significant differences were confined to comparisons between previous years (Appendix 2, Figure 6).

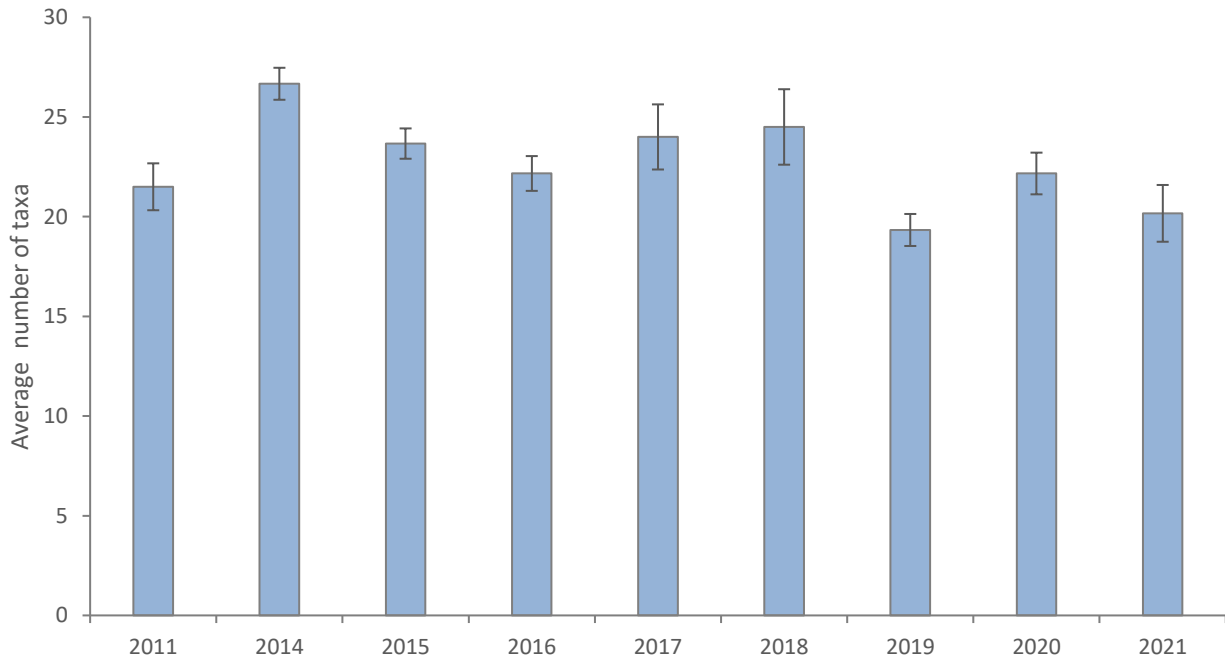


Figure 4: Comparison of Total Taxa (\bar{x} , \pm SE) between Years for edge habitat

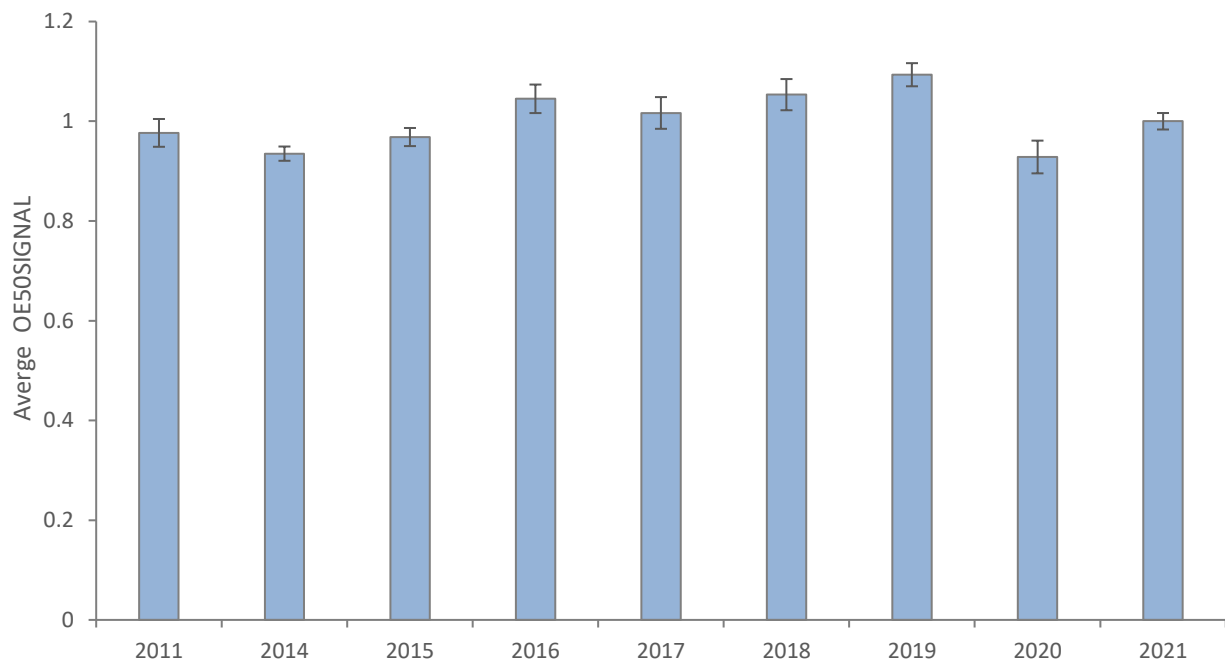


Figure 5: Comparison of OE50SIGNAL (\bar{x} , \pm SE) between Years for edge habitat



Figure 6: Comparison of OE50 taxa (\bar{x} , \pm SE) between Years for edge habitat

Assemblage Structure

Significant differences were detected for the interaction of *Year x Location* for assemblage structure. Pairwise comparisons however did not detect any significant differences for, or within, comparisons from Year 2021. Indicating that there were no significant differences between control and impact sites in 2021, or between data from these sites in 2021 and previous years. The significant differences identified for the *Year x Location* interaction were due to differences for, or within, years prior to 2021 (Appendix 2) and there are no obvious groupings based on location in the PCoA (7).

The PCO analysis of 2021 data found that that the first two axes explain 64.4% of the variation (7). This variation was being most influenced by a negative correlation of Gomphidae and to a lesser extent, negative correlation of Dytiscidae, with PCO1. The negative correlation of Parastacidae, Philortheithridae and to a lesser extent Tanypodinae with both PCO1 and PCO2 was also of notable influence.

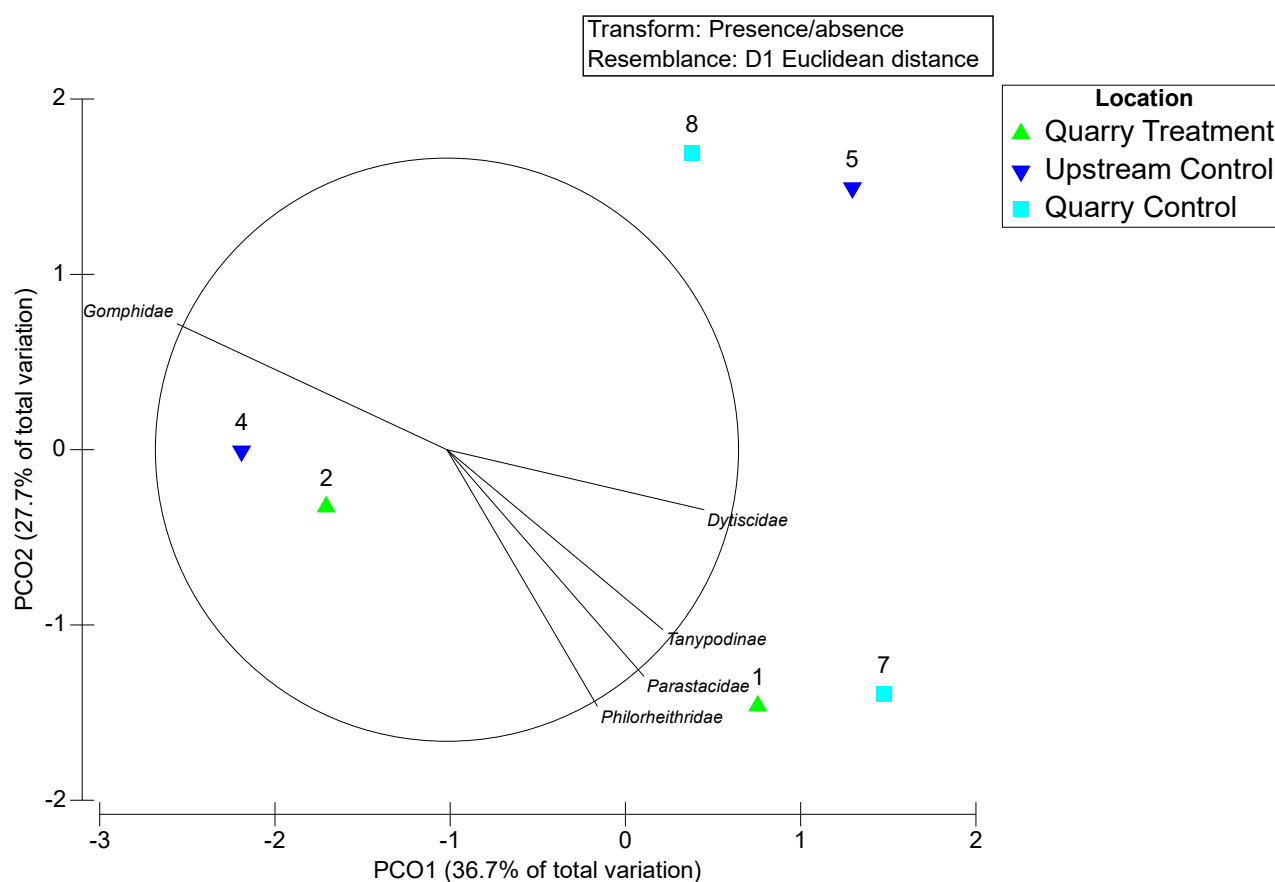


Figure 7: PCoA plot with vector overlays of taxa based on Spearman’s Correlation ($r^2 > 0.7$) for the edge habitat assemblages within Location within 2021

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, 31 different taxa were collected with the number of taxa collected ranging from 15-24 at each site. Riffle habitat was dominated numerically by Orthocladinae (non-biting midges), Gripopterygidae (Stoneflies) and Hydropsychidae (caddisflies), which together made up 55% of the total number of macroinvertebrates collected from this habitat.

In comparison to the AUSRIVAS model reference site data for the for riffle habitats, with the exception of Site 2, all sites recorded OE50 scores with Band A. These results indicate the macroinvertebrate

assemblages at these sites are equivalent to those of the modelled reference sites. Site 2 recorded an OE50 score (0.80) within Band B, indicating that the macroinvertebrate assemblage at this site was impoverished when compared to that of the modelled reference sites and significant levels of impairment. Interestingly, the more upstream Quarry Processing site, Site 1, also recorded the highest OE50 score of 1.06. In terms of SIGNAL2, all sites were within the 5-6 range, indicating they were dominated by species that are able to withstand moderate levels of pollution (Table 7). The lowest SIGNAL2 score (5.21) was recorded at Upstream Control Site 5 and highest at Quarry Control Site 7 (5.88), with the Quarry Processing sites within that range.

Table 7: AUSRIVAS results for riffle habitat (2021)

Season	Spring 2021					
Status	Quarry Processing		Upstream Control		Quarry Control	
Site	1	2	4	5	7	8
OE50	1.06	0.80	1.02	1.02	0.97	0.89
Band	A	B	A	A	A	A
No. of taxa	16	18	24	19	16	15
OOSIGNAL (SIGNAL2)	5.81	5.61	5.38	5.21	5.88	5.47
OE50SIGNAL	0.99	0.99	1	0.97	1	0.98

Statistical analysis

The statistical analysis found no significant differences were detected for Number of Taxa (Appendix 3).

Significant differences were detected for OOSIGNAL for the interaction of *Year x Location*. Pairwise comparisons indicated that a significant difference between 2021 and 2014 within the Upstream Control Location contributed to this result and there were other significant differences detected (Appendix 3, Figure 8) between 2021 and other years, but not between the Treatment and Control groups.

Significant differences were detected for OE50 SIGNAL for the interaction of *Year x Location*. Pairwise comparisons indicated a significant difference between 2021 with 2018, 2015 and 2011 within the Quarry Treatment Location contributed to this result (Appendix 3, Figure 9) indicative of temporal variability at these sites. There were no significant differences between Treatment and Control locations in 2021 (Appendix 3).

Significant differences were detected for OE50 taxa for the *Location* term. Pairwise comparisons indicated that these differences were between the Upstream Control and Quarry Control Locations. There were no differences detected between Treatment or Control groups (Appendix 3, Figure 10).

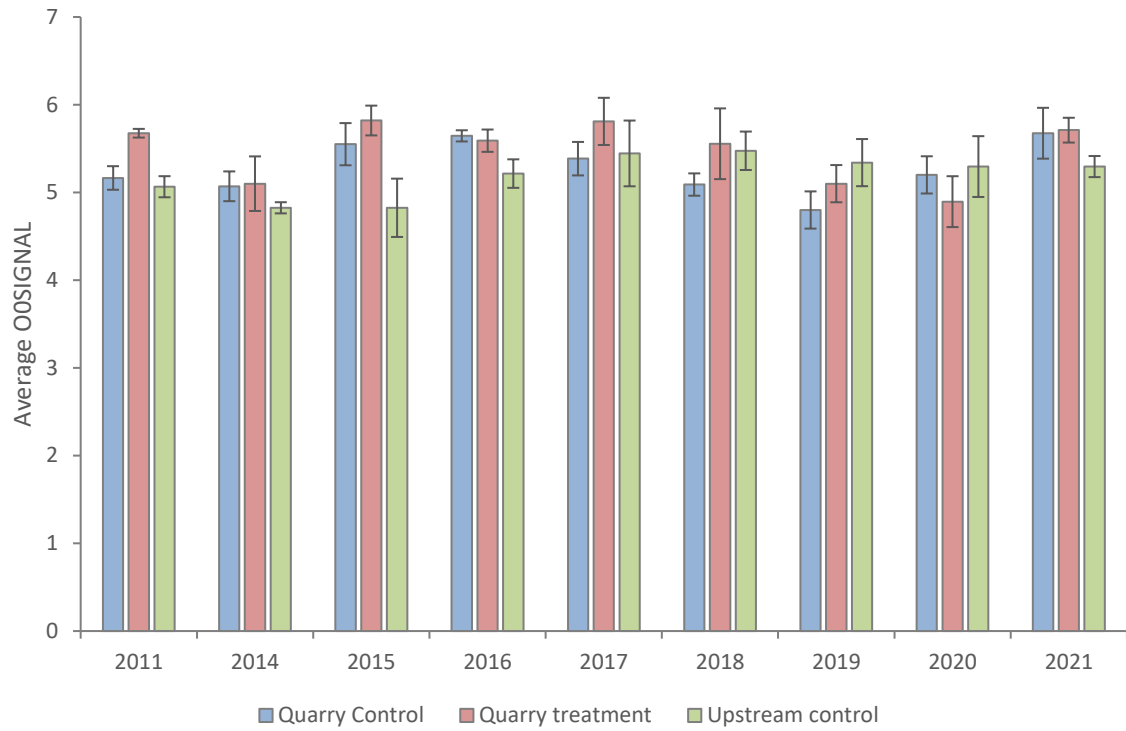


Figure 8: Comparison of OOSIGNAL (\bar{x} , \pm SE) between Years and Location for riffle habitat

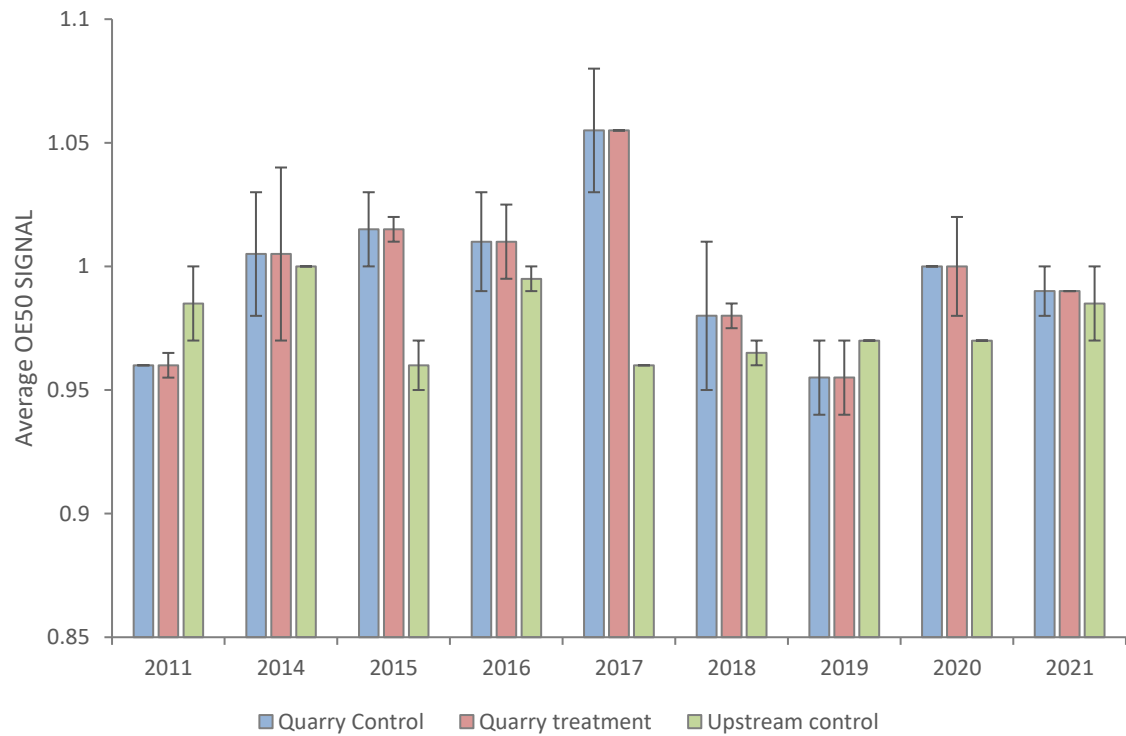


Figure 9: Comparison of OE50SIGNAL (\bar{x} , \pm SE) between Years and Location for riffle habitat

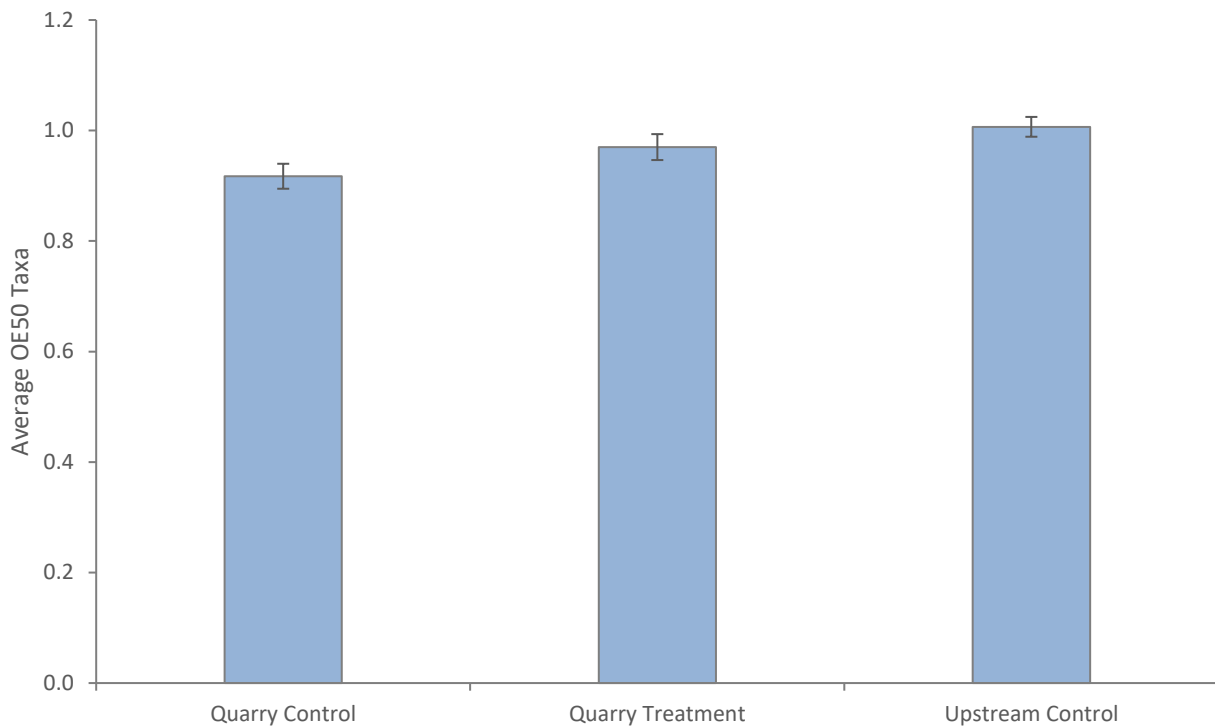


Figure 10: Comparison of OE50Taxa (\bar{x} , \pm SE) between Locations for riffle habitat

Assemblage structure

Multivariate analysis of the riffle habitat assemblages detected significant differences for both *Year* and *Location*. Pairwise comparisons indicated that for *Year* these differences were between 2021 and all earlier years, except for 2020. For *Location*, the Quarry Treatment was found to be significantly different to the Upstream Control, while both the Upstream Control and Quarry Control were also significantly different.

The PCO analysis of all data found that that the first two axes explain 34.7% of the variation (Figure 11). This variation was being most influenced by a positive correlation of Dixidae with PCO1, combination of positive correlation with PCO1 and negative correlation with PCO2 of Lepterceridae, and combination of negative correlation with PCO1 and positive correlation with PCO2 of Oniscigastridae.

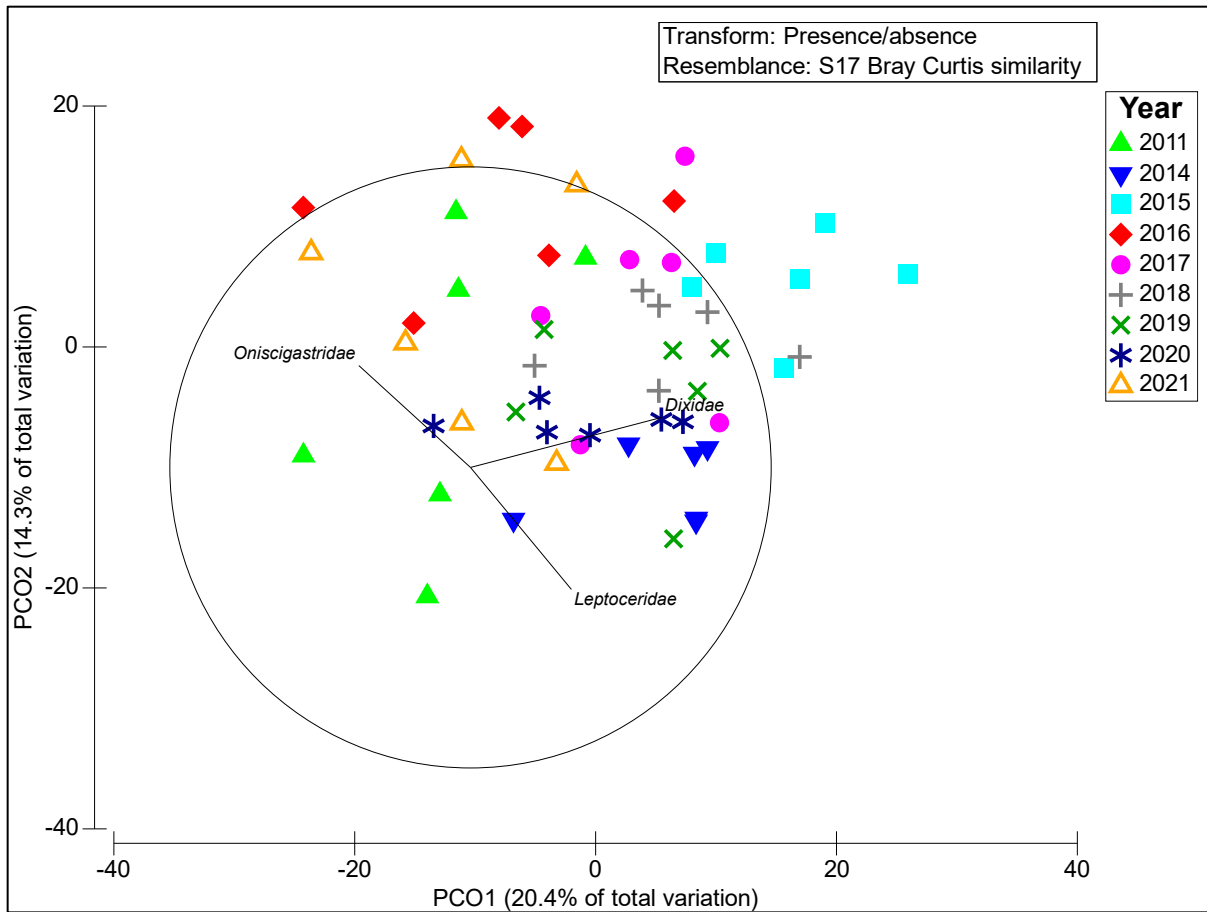


Figure 11: PCoA plot with vector overlays of taxa based on Spearman's Correlation ($r^2 > 0.50$) of riffle habitat assemblages for Years

4. Discussion

4.1 Key findings

Sampling was conducted at two Quarry Processing sites, two Quarry Control sites and two Upstream Control sites in a wet period, with moderate flows. The key findings from the monitoring results are:

- Electrical conductivity returned to within ANZG DTVs at all sites.
- pH, turbidity and dissolved oxygen were within ANZG DTVs at all sites, with the exception of the Quarry Control sites which recorded dissolved oxygen values below the DTV's, although only a minor reduction.
- Pool edge macroinvertebrate assemblages were generally similar to reference condition (Band A) in comparison with the AUSRIVAS reference model data. The exceptions were at Site 2 (Quarry Processing) and Site 8 (Quarry Control), recording Band B scores reflecting significantly impaired conditions.
- Riffles habitats were comparable to AUSRIVAS modelled reference condition (Band A) with the exception of Site 2 (Quarry Processing) which recorded a Band B score indicating significantly impaired conditions.
- Despite a minor reduction for OE50Taxa (Band B) in pool edge habitat in Site 2 for pool edge habitat 2021, the statistical analysis did not support any significant differences between treatment and control sites for OE50taxa or other indicators.
- Despite a Band B OE50Taxa (Band B) in riffle habitat at Site 2 in 2021, the statistical analysis of location groupings did not support any significant differences between treatment and control sites for OE50taxa or other indicators.
- Significant differences observed for pool univariate data were largely related to differences between years and not between locations. The multivariate results did show a significant interaction for *Year X Location*, but no differences were observed in 2021 between years or locations.
- A significant *Year X Location* interaction was observed for both O0SIGNAL and OE50 SIGNAL in riffle habitats, however pairwise comparison showed that while there maybe difference temporally, there were no differences between treatment and control groups in 2021.

4.2 Discussion of 2021 findings

In 2020 the water quality within the reaches of Coxs River surveyed as part of this program exceeded DTVs, for electrical conductivity, this was observed to return to within DTVs in spring 2021. Other water quality variables were generally within DTVs and similar values were observed across all locations. This indicates that there were no 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.

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). Data collected in 2021 showed mixed results with pool edge habitat and riffle habitat near the LDPs scoring in Band A (similar to reference) and Band B (fewer macroinvertebrate families that expected). The results recorded for pool habitats were comparable to those recorded at both sets of control sites, which indicates that this is not localised to the area influenced by the Quarry and is observed elsewhere in the catchment.

For the second consecutive time, riffle Site 2 at the Quarry Processing Site scored in Band B, while all other sites scored in Band A. This may reflect a localised deterioration in habitat conditions and is not necessarily indicative of ecological impact. It is noted that this site recorded SIGNAL2 scores above that of three of the

four control sites and the third highest number of taxa of all riffle sites. In addition to this, the AUSRIVAS results from edge habitat at this site were comparable to that of the control sites. When comparing the results of 2021 to 2020 at Site 2, an improvement was achieved in all stream health indices, with only the OE50 score and Band score remaining consistent, potentially this site may be experiencing a greater lag in recovery following the reduction occurring in 2020. The weight of evidence in this report indicates that this reduced Band score at riffle Site 2 is unlikely to be associated with quarry discharge. However, this finding will need to be considered in light of other stream health indicators and long-term results, in particular to be re-examined in future iterations of the program to determine whether this is part of an ongoing trend. 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 teasing out any localised habitat changes or differences from water quality influences on stream health at this location.

Overall SIGNAL2 scores were improved when compared to the previous iteration of the monitoring program. The scores for all riffle sites and pool edge Site 4 (upstream control) indicate mild levels of pollution. All other pool sites recorded scores indicative of moderate levels of pollution. These scores were comparable across the site types, indicating that these findings were representative of stream processes and fluctuations occurring throughout this section of the catchment.

Statistical differences observed do not indicate impacts from the Quarry as:

- Most differences identified for pool edge habitats in 2021 are primarily between years indicating temporal variability.
- Multivariate analysis of pool edges showed a significant *Year X Location* interaction, but did not show differences between Treatment and Control groups in 2021.
- Although interactions were observed for *Year x Location* for OOSIGNAL and OE50SIGNAL, further analysis did not show differences between Treatment and Control groups in 2021.
- Difference observed for *Location* for riffle OE50 Taxa indicated overall difference between locations. However further analysis showed that this due to differences between control groups only.
- Multivariate analysis of riffles showed significant difference for the terms *Location* and for *Year*. Difference observed for years is most likely related to temporal variability and not indicative of downstream impact. Further analysis showed that overall the Treatment site was statistically different to the Upstream Control but not to the Quarry Control. This indicates that overall years there are spatial differences however is not indicative impact in 2021 as it was still comparable to the Quarry Control site.

4.3 Spatial and temporal trends

Despite exceeding water quality guidelines in 2020, electrical conductivity levels returned to within guideline levels in 2021. These levels have fluctuated over the life of the program (Niche 2020) and in the past electrical conductivity readings regularly exceeded DTVs at all sites including upstream control locations. The lower readings in spring 2021 may be a result of the prevailing wet conditions and elevated flows diluting the levels of dissolved material present within the water. Other water quality variables were within generally within guidelines in spring 2021, including at the Quarry Treatment sites with water quality conditions continuing to improve when compared to 2019.

Previous monitoring in 2019 found that there was an overall reduction of stream health in pool habitat with all sites scoring in Band B. This was thought to be due to catchment conditions and processes related to low flows and fine sedimentation (Niche 2020). River systems can recover quickly from short-term sedimentation events, however continuous sedimentation can have longer term effects on

macroinvertebrate communities (Wood and Armitage 1997). Niche (2020) considered it likely that increases in flow, and higher flow events in the future will rework and redistribute fine sediment and improve stream health in these habitats. In 2020, all locations had one site that was in Band A, close to reference condition. In 2021, there was continued a general trend across the monitoring sites of improved Band and SIGNAL2 scores. This continued improvement is likely related to increased flows (Figure 2 and Table 4); Since 2019 there has been a continuous rise in both the total annual discharge volume and average daily mean discharge, reflecting increasingly wet conditions and higher more powerful flows.

Site 2 in the Quarry Treatment location again recorded a lower Band score than the other sites, however further analysis of OE50 score did not find any statistical difference between Treatment and Control locations in 2021 for pool or riffle habitat.

Statistical analysis of stream health indices identified temporal and spatial variability, however no difference between Treatment and Control locations in 2021 that could be considered an ecological impact. These spatial and temporal trends are likely influenced by local catchment conditions and the streams response to rainfall and flow. Overall, there was statistical difference between riffle habitat assemblages for Treatment and Upstream Control locations, however there was no difference for the Treatment and Quarry Control. As such, this is likely the result of natural variation and not indicative of any impact to the waterways.

This monitoring indicates that other pressures within the catchment of the Coxs River and upstream of the Quarry, such as grazing, erosion and regulation of flow, are likely the most significant drivers of aquatic habitat quality at the sites monitored for this program. Any observed changes are likely unrelated to any discharges from the Quarry.

5. Conclusion

Water quality was improved in 2021 in comparison to 2020, with lower electrical conductivity and only minor and limited exceedances in other physiochemical measurements for all locations. The conclusions are similar to previous years that, in general, temporal variability across a broader spatial scale continues to be the major driver of changes in the macroinvertebrate assemblages.

The 2021 biological monitoring results represent a continued overall improvement in pool habitat and stream health, most likely related to higher and more frequent river flows. While one site in the Quarry Treatment location again recorded a lower Band score than the other sites, further analysis of OE50 score did not find any statistical difference between Treatment and control Locations in 2021.

Macroinvertebrate assemblages and stream health indicators results show that the composition and ecological health of the river within the vicinity of the Quarry remains similar to and potentially better, than other areas of the river not influenced by Quarry operations. As such, any observed changes are likely unrelated to any discharges from the Quarry.

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Appendix 1. Macroinvertebrate data

Macroinvertebrates recorded at survey sites: spring 2021

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
Atyidae	1	0	1	0	2	0	0	0	1	0	4	0
Baetidae	7	18	8	8	3	16	4	9	13	11	5	11
Caenidae	37	1	27	1	23	2	93	3	21	1	16	1
Calamoceratidae	0	0	0	0	0	0	1	0	1	0	0	0
Ceinae	0	0	0	0	0	0	0	0	0	0	2	0
Ceratopogonidae	3	0	0	0	4	7	0	1	3	0	0	0
Chironominae	4	5	0	1	6	24	20	26	2	8	2	8
Conoesucidae	0	0	0	1	0	1	0	3	0	2	0	2
Corbiculidae	5	0	0	0	0	1	53	0	4	0	3	0
Corixidae	5	0	2	0	26	0	1	0	5	0	6	0
Corydalidae	0	2	0	0	1	3	0	0	0	4	0	4
Dixidae	0	0	0	0	1	1	0	0	0	0	0	0
Dytiscidae	5	0	4	0	0	0	6	0	5	0	4	0
Ecnomidae	5	0	9	0	6	2	14	2	3	0	4	0
Elmidae	4	15	6	61	1	5	0	7	5	15	0	15
Empididae	0	0	0	1	0	0	0	0	0	0	0	0
Gerridae	0	0	2	0	0	0	0	0	0	0	0	0
Glossosomatidae	0	0	0	1	0	0	0	0	0	1	0	1
Gomphidae	0	0	1	0	2	1	0	1	0	0	1	0
Gripopterygidae	20	32	3	48	3	17	3	44	13	49	5	49
Gyrinidae (adult)	0	0	0	0	0	0	0	0	1	0	0	0
Hydrobiosidae	0	7	1	10	1	11	0	9	0	14	0	14
Hydrophilidae	0	0	0	0	0	0	1	0	0	0	0	0
Hydropsychidae	2	30	1	97	2	39	0	22	0	25	0	25

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
Hydroptilidae	0	0	0	0	0	2	0	1	0	0	0	0
Leptoceridae	8	0	1	0	14	1	13	0	6	0	7	0
Leptophlebiidae	3	5	54	2	5	20	45	14	59	3	23	3
Lumbriculidae	2	1	2	3	3	14	8	3	1	11	2	11
Mites	0	1	0	0	0	0	0	0	1	0	0	0
Notonectidae	1	0	0	0	0	0	1	0	1	0	7	0
Odontoceridae	0	0	0	0	0	0	0	0	1	0	0	0
Onascigastridae	1	0	0	0	0	0	0	0	6	0	7	0
Orthocladinae	5	48	1	31	4	82	0	89	2	21	0	21
Paratascidae	1	0	0	0	0	1	0	0	2	0	0	0
Philopotamidae	0	0	0	0	0	0	0	1	0	0	0	0
Phlorheithridae	4	0	1	0	0	0	0	0	14	0	0	0
Physidae	6	0	1	0	0	0	11	0	1	0	0	0
Psephenidae	0	0	0	2	0	3	0	0	0	1	0	1
Pyalidae	0	0	0	1	0	0	0	0	0	0	0	0
Scirtidae	0	3	0	0	0	0	0	0	0	0	0	0
Sialidae	0	0	0	0	0	0	3	0	0	0	8	0
Simuliidae	0	2	4	0	0	0	0	1	0	3	0	3
Synlestidae	2	0	0	0	0	0	0	0	0	0	0	0
Tanipodinae	2	0	0	0	0	0	1	0	1	0	0	0
Telephlebiidae	0	1	0	1	2	1	0	0	0	0	0	0
Tipulidae	0	4	0	1	0	4	0	3	0	1	0	1
Tricladida	2	0	0	1	0	1	0	1	0	0	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	8	248.15	31.0190	4.3506	0.0019	9948
Lo	2	18.82	9.4074	1.3195	0.2834	9962
YexLo	16	190.19	11.8870	1.6672	0.1133	9931
Res	27	192.50	7.1296			
Total	53	649.65				

Pairwise comparisons for Year (2021)

Groups	t	P(perm)	Unique perms	P(MC)
2011, 2021	0.7303	0.4796	3033	0.4940
2014, 2021	3.4074	0.0183	5727	0.0140
2015, 2021	2.0114	0.1008	2679	0.0946
2016, 2021	1.1442	0.2882	2428	0.3003
2017, 2021	1.9508	0.1003	8626	0.0985
2018, 2021	1.7450	0.1348	7263	0.1313
2019, 2021	0.4834	0.6575	8042	0.6439
2020, 2021	1.2122	0.2655	2193	0.2779

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	8	1.31	0.1632	1.7140	0.1353	9942
Lo	2	0.48	0.2404	2.5244	0.0985	9949
YexLo	16	2.05	0.1282	1.3462	0.2360	9937
Res	27	2.57	0.0952			
Total	53	6.41				

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	8	0.15	0.0186	6.0642	0.0003	9948
Lo	2	0.01	0.0042	1.3735	0.2677	9947
YexLo	16	0.09	0.0056	1.8223	0.0800	9933
Res	27	0.08	0.0031			
Total	53	0.33				

Pairwise comparisons for Year (2021)

Groups	t	P(perm)	Unique perms	P(MC)
2011, 2021	0.7826	0.4587	8856	0.4633
2014, 2021	3.0547	0.0273	6234	0.0233
2015, 2021	1.2781	0.2507	8809	0.2427
2016, 2021	1.2946	0.2414	6345	0.2394
2017, 2021	0.6804	0.5106	8528	0.5220
2018, 2021	1.2729	0.2585	9091	0.2479
2019, 2021	2.7589	0.0342	8513	0.0329
2020, 2021	2.9057	0.0274	8720	0.0283

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	8	0.53	0.0657	3.3010	0.0106	9947
Lo	2	0.00	0.0000	0.0003	0.9997	9951
YexLo	16	0.13	0.0080	0.4024	0.9682	9917
Res	27	0.54	0.0199			
Total	53	1.19				

Pairwise comparisons for Year (2021)

Groups	t	P(perm)	Unique perms	P(MC)
2011, 2021	0.1245	0.8958	9250	0.9063
2014, 2021	1.8400	0.1376	8737	0.1144
2015, 2021	2.3261	0.0698	9252	0.0591
2016, 2021	1.0333	0.3422	9206	0.3449
2017, 2021	2.1715	0.0837	9313	0.0743
2018, 2021	1.3089	0.2351	9137	0.2369
2019, 2021	1.1002	0.3095	4549	0.3174
2020, 2021	0.4003	0.6948	9222	0.7052

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	8	16297.0	2037.20	4.3163	RED	9862
Lo	2	1737.8	868.92	1.8411	RED	9940
YexLo	16	10678.0	667.35	1.4140	0.0083	9822
Res	27	12743.0	471.97			
Total	53	41456.0				

Pairwise comparisons for Year x Location (2021)

Level	Comparison	t	P(perm)	Unique perms	P(MC)
Quarry Treatment	2011, 2021	1.584	0.3452	3	0.1770
Quarry Treatment	2014, 2021	1.461	0.3342	3	0.2249
Quarry Treatment	2015, 2021	1.804	0.3343	3	0.1249
Quarry Treatment	2016, 2021	1.792	0.3298	3	0.1408
Quarry Treatment	2017, 2021	1.216	0.3363	3	0.3144
Quarry Treatment	2018, 2021	1.151	0.3310	3	0.3504
Quarry Treatment	2019, 2021	1.640	0.3347	3	0.1701
Quarry Treatment	2020, 2021	0.939	0.6653	3	0.4823
Upstream Control	2011, 2021	1.172	0.3379	3	0.3385
Upstream Control	2014, 2021	1.337	0.3304	3	0.2654
Upstream Control	2015, 2021	1.261	0.3286	3	0.2958
Upstream Control	2016, 2021	1.348	0.3430	3	0.2854
Upstream Control	2017, 2021	0.925	1.0000	3	0.4931
Upstream Control	2018, 2021	0.970	0.6684	3	0.4702
Upstream Control	2019, 2021	1.097	0.6609	3	0.3880
Upstream Control	2020, 2021	0.831	0.6636	3	0.5641
Quarry Control	2011, 2021	1.200	0.3388	3	0.3205
Quarry Control	2014, 2021	2.276	0.3359	3	0.0771
Quarry Control	2015, 2021	1.701	0.3302	3	0.1404
Quarry Control	2016, 2021	1.440	0.3337	3	0.2237
Quarry Control	2017, 2021	1.088	0.6630	3	0.3932
Quarry Control	2018, 2021	1.245	0.3371	3	0.2979
Quarry Control	2019, 2021	1.079	0.6724	3	0.4048
Quarry Control	2020, 2021	0.815	1.0000	3	0.5780
2021	Quarry Treatment, Upstream Control	0.658	1.0000	3	0.6978
2021	Quarry Treatment, Quarry Control	0.998	0.6622	3	0.4446
2021	Upstream Control, Quarry Control	0.511	1.0000	3	0.7992

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	8	1.31	0.1632	1.7140	0.1348	9946
Lo	2	0.48	0.2404	2.5244	0.1016	9951
YexLo	16	2.05	0.1282	1.3462	0.2421	9933
Res	27	2.57	0.0952			
Total	53	6.41				

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	8	2.05	0.2566	4.8999	RED	9934
Lo	2	0.71	0.3545	6.7692	RED	9956
YexLo	16	2.23	0.1392	2.6573	0.0114	9922
Res	27	1.41	0.0524			
Total	53	6.40				

Pairwise comparisons for and within Year x Location (2021)

Level	Groups	t	P(perm)	Unique perms	P(MC)
Quarry Treatment	2011, 2021	0.3304	1.0000	3	0.7602
Quarry Treatment	2014, 2021	2.5242	0.3316	3	0.1286
Quarry Treatment	2015, 2021	0.7042	0.6644	3	0.5556
Quarry Treatment	2016, 2021	0.8920	0.6652	3	0.4582
Quarry Treatment	2017, 2021	0.4658	0.6679	3	0.6955
Quarry Treatment	2018, 2021	0.5132	1.0000	3	0.6528
Quarry Treatment	2019, 2021	3.3837	0.3207	3	0.0738
Quarry Treatment	2020, 2021	3.5732	0.3256	3	0.0664
Upstream Control	2011, 2021	1.9133	0.3281	3	0.1922
Upstream Control	2014, 2021	4.8868	0.3373	3	0.0402
Upstream Control	2015, 2021	1.8808	0.3371	3	0.2056
Upstream Control	2016, 2021	0.5594	0.6709	3	0.6393
Upstream Control	2017, 2021	0.5390	1.0000	3	0.6446
Upstream Control	2018, 2021	1.0182	0.6749	3	0.4166
Upstream Control	2019, 2021	0.2162	1.0000	3	0.8465
Upstream Control	2020, 2021	0.0000	1.0000	3	1.0000
Quarry Control	2011, 2021	2.2572	0.3356	3	0.1531
Quarry Control	2014, 2021	2.5469	0.3378	3	0.1264
Quarry Control	2016, 2021	0.1429	1.0000	3	0.8999
Quarry Control	2017, 2021	1.1815	0.6675	3	0.3631
Quarry Control	2018, 2021	2.6129	0.3280	3	0.1226
Quarry Control	2019, 2021	3.4446	0.3312	3	0.0744
Quarry Control	2020, 2021	1.8699	0.3371	3	0.2063
Quarry Control	2011, 2021	2.2572	0.3356	3	0.1531
Quarry Control	2014, 2021	2.5469	0.3378	3	0.1264
Quarry Control	2016, 2021	0.1429	1.0000	3	0.8999
2021	Quarry Treatment, Upstream Control	3.1620	0.3302	3	0.0810

Level	Groups	t	P(perm)	Unique perms	P(MC)
2021	Quarry Treatment, Quarry Control	0.1535	1.0000	3	0.8916
2021	Upstream Control, Quarry Control	1.7123	0.3298	3	0.2295

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	8	0.01	0.0010	2.2639	RED	9927
Lo	2	0.01	0.0033	7.5043	RED	9956
YexLo	16	0.02	0.0011	2.5620	0.0154	9934
Res	27	0.01	0.0004			
Total	53	0.04				

Pairwise comparisons Year x Location (2021)

Level	Groups	t	P(perm)	Unique perms	P(MC)
Quarry Treatment	2011, 2021	5.0000	0.3410	2	0.0379
Quarry Treatment	2014, 2021	0.1429	1.0000	2	0.8988
Quarry Treatment	2015, 2021	11.0000	0.3392	2	0.0074
Quarry Treatment	2016, 2021	0.3333	1.0000	2	0.7751
Quarry Treatment	2017, 2021	Denominator is 0			
Quarry Treatment	2018, 2021	5.0000	0.3437	2	0.0389
Quarry Treatment	2019, 2021	1.0000	1.0000	1	0.4157
Quarry Treatment	2020, 2021	0.0000	1.0000	2	1.0000
Upstream Control	2011, 2021	0.0000	1.0000	1	1.0000
Upstream Control	2014, 2021	1.0000	1.0000	1	0.4346
Upstream Control	2015, 2021	1.3868	0.6653	2	0.2914
Upstream Control	2016, 2021	0.6325	1.0000	2	0.5877
Upstream Control	2017, 2021	1.6667	0.3301	2	0.2399
Upstream Control	2018, 2021	1.2649	0.6614	2	0.3361
Upstream Control	2019, 2021	1.0000	1.0000	1	0.4252
Upstream Control	2020, 2021	1.0000	1.0000	1	0.4162
Quarry Control	2011, 2021	3.0000	0.3304	2	0.0975
Quarry Control	2014, 2021	0.5571	1.0000	2	0.6321
Quarry Control	2015, 2021	1.3868	0.6661	2	0.2978
Quarry Control	2016, 2021	0.8944	0.6718	3	0.4612
Quarry Control	2017, 2021	2.4140	0.3330	3	0.1345
Quarry Control	2018, 2021	0.3162	1.0000	3	0.7813
Quarry Control	2019, 2021	1.9415	0.3308	3	0.1983
Quarry Control	2020, 2021	1.0000	1.0000	1	0.4337
2021	Quarry Treatment, Upstream Control	0.3333	1.0000	2	0.7710
2021	Quarry Treatment, Quarry Control	0.0000	1.0000	2	1.0000
2021	Upstream Control, Quarry Control	0.2774	1.0000	2	0.8148

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	8	0.11	0.0142	1.5616	0.1860	9943
Lo	2	0.07	0.0364	3.9917	0.0302	9957
YexLo	16	0.06	0.0040	0.4341	0.9583	9926
Res	27	0.25	0.0091			
Total	53	0.50				

Pairwise comparisons for Location

Groups	t	P(perm)	Unique perms	P(MC)
Quarry Treatment, Upstream Control	1.2143	0.2388	9724	0.2389
Quarry Treatment, Quarry Control	1.4738	0.1575	9810	0.1647
Upstream Control, Quarry Control	3.0774	0.0052	9687	0.0081

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	8	13530.0	1691.30	4.6232	0.0001	9871
Lo	2	1744.9	872.43	2.3849	0.0048	9927
YexLo	16	7562.9	472.68	1.2921	0.0632	9825
Res	27	9877.1	365.82			
Total	53	32715.0				

Pairwise comparisons between Years (2021)

Groups	t	P(perm)	Unique perms	P(MC)
2011, 2021	1.731	0.0450	9421	0.0610
2014, 2021	2.955	0.0029	9414	0.0025
2015, 2021	3.015	0.0026	9399	0.0032
2016, 2021	2.193	0.0083	9430	0.0122
2017, 2021	2.138	0.0080	9422	0.0154
2018, 2021	2.085	0.0137	9376	0.0142
2019, 2021	2.016	0.0087	9443	0.0188

Groups	t	P(perm)	Unique perms	P(MC)
2020, 2021	1.541	0.0717	9417	0.0960

Pairwise Comparisons between Location

Comparison	t	P(perm)	Unique perms	P(MC)
Quarry Treatment, Upstream Control	1.755	0.0124	9970	0.0174
Quarry Treatment, Quarry Control	1.422	0.0765	9959	0.0855
Upstream Control, Quarry Control	1.492	0.0478	9952	0.0584

Appendix 4 – Photographs



A



B

Plate 1: Site 1 (Quarry Processing Area). A) Upstream B) Downstream.



A



B

Plate 2: Site 2 (Quarry Processing Area). A) Upstream B) Downstream.



A



B

Plate 3: Site 4 (Upstream Control). A) Upstream B) Downstream.



A



B

Plate 4: Site 5 (Upstream Control). A) Upstream B) Downstream.



A



B

Plate 5: Site 7 (Quarry Control). A) Upstream B) Downstream.



A



B

Plate 6: 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 L Surface Water Results for Report Period

Date	Sample ID	pH	Conductivity (µS/cm)	O2 demand	Turbidity (NTU)	Total Suspended Solids (mg/L)	TDS (mg/L)	Oil & Grease (mg/L)	Volume Discharged (kL)
8/07/2021	Dam 4	7.8			1.6	0		0	0
9/07/2021	Dam 4	8			1.8	0		0	1000
9/07/2021	Downstream AQW3	7.8			1.8	0		0	
26/07/2021	Downstream AQW3	6.6	345	0	7.6	8	197	0	
26/07/2021	Upstream AQW1	7.3	343	0	5.7	6	214	0	
28/07/2021	Dam 4	7.6			0.95	0		0	0
29/07/2021	Dam 4	7.6			2.1	0		0	1000
29/07/2021	Downstream AQW3	7.8			4.1	0		0	
10/08/2021	Dam 4	6.8			5.5	0		0	0
11/08/2021	Dam 4	8.5			2.9	0		0	1000
11/08/2021	Downstream AQW3	8.1			3.2	0		0	
25/08/2021	Dam 4	8			3.4	0		0	0
25/08/2021	Downstream AQW3	7.4	333	0	21	37	194	0	
25/08/2021	Upstream AQW1	7.1	342	0	15	20	194	0	
26/08/2021	Dam 4	8.3			55	34		0	1000
26/08/2021	Downstream AQW3	8			5.9	12		0	
27/08/2021	Dam 4	7.8			33	30		0	1000
27/08/2021	Downstream AQW3	7.5			7.8	11		0	
2/09/2021	Dam 4	7.7	642		7.4	0		0	
3/09/2021	Dam 4	8.3			5.6	0		0	1000
3/09/2021	Downstream AQW3	8			5.3	0		0	
16/09/2021	Dam 4	8	653		1.6	0		0	
17/09/2021	Dam 4	7.9			2.2	0		0	1000
17/09/2021	Downstream AQW3	7.7			2.7	0		0	
27/09/2021	Dam 4	7.7			1.6	0		0	
27/09/2021	Downstream AQW3	7.6	326	0	0.2	6	180	0	
27/09/2021	Upstream AQW1	7.7	349	0	2.3	5	195	0	
28/09/2021	Dam 4	7.6			2	0		0	1000
28/09/2021	Downstream AQW3	5.8			7	0		0	
14/10/2021	Dam 4	7.3	588		2.9	0		0	0

Date	Sample ID	pH	Conductivity (µS/cm)	O2 demand	Turbidity (NTU)	Total Suspended Solids (mg/L)	TDS (mg/L)	Oil & Grease (mg/L)	Volume Discharged (kL)
15/10/2021	Dam 4	8.3	521		3.1		5	0	1000
15/10/2021	Downstream AQW3	7.9	263		3.6		6	0	
21/10/2021	Dam 4	6.8	666		6.9		0	0	0
22/10/2021	Dam 4	8.3	666		2.7		0	0	1000
22/10/2021	Downstream AQW3	7.7	320		2.3		0	0	
26/10/2021	Downstream AQW3	7.8	297	0	2.3		0	182	0
26/10/2021	Upstream AQW1	7.8	322	0	2.4		0	196	0
8/11/2021	Dam 1	7.8	643		5.8		0	0	1500
8/11/2021	Dam 4	7.7	402		80		24	0	1000
8/11/2021	Downstream AQW3	7.2	325		13		0	0	
8/11/2021	Upstream AQW1	7.5	339		12		8	0	
9/11/2021	Dam 1	7.3	386		46		8	0	1500
9/11/2021	Dam 4	7.8	620		3.4		0	0	1000
9/11/2021	Downstream AQW3	7.7	326		13		7	0	
9/11/2021	Upstream AQW1	7	332		10		8	0	
10/11/2021	Dam 4	7.8	654		4.7		0	0	1000
10/11/2021	Downstream AQW3	6.9	353		8.6		8	0	
10/11/2021	Upstream AQW1	6.7	359		10		0	0	
11/11/2021	Dam 4	7.5	640		6.6		0	0	1000
11/11/2021	Downstream AQW3	7.4	299		31		17	0	
12/11/2021	Dam 1	8.3	171		827		439	0	1500
12/11/2021	Dam 2	8.2	169		553		177	0	1000
12/11/2021	Downstream AQW3	7.2	245		31		74	0	
12/11/2021	Upstream AQW1	7	273		32		64	0	
24/11/2021	Downstream AQW3	7.7	290	0	4		0	182	0
24/11/2021	Upstream AQW1	7.2	330	0	4		0	183	0
26/11/2021	Downstream AQW3	7.5	258		75		108	0	
27/11/2021	Dam 1	8.5	207		950		438	0	1500
27/11/2021	Dam 4	7.4	455		40		14	0	1000
27/11/2021	Downstream AQW3	7.5	296		28		16	0	

Date	Sample ID	pH	Conductivity (µS/cm)	O2 demand	Turbidity (NTU)	Total Suspended Solids (mg/L)	TDS (mg/L)	Oil & Grease (mg/L)	Volume Discharged (kL)
27/11/2021	Upstream AQW1	7.7	119		28	10		0	
28/11/2021	Dam 1	8.3	213		400	254		0	1500
28/11/2021	Dam 4	8.1	421		46	16		0	1000
28/11/2021	Downstream AQW3	7.9	286		16	9		0	
28/11/2021	Upstream AQW1	8.3	279		19	11		0	
29/11/2021	Dam 1	8.3	224		410	165		0	1500
29/11/2021	Dam 4	7.9	442		39	16		0	1000
29/11/2021	Downstream AQW3	7.8	282		14	9		0	
29/11/2021	Upstream AQW1	7.8	284		14	8		0	
30/11/2021	Dam 1	8.4				30		0	1500
30/11/2021	Dam 4	6.9	519		40	8		0	
30/11/2021	Downstream AQW3	6.9	300		10	5		0	
30/11/2021	Upstream AQW1	7.8				68		0	
1/12/2021	Dam 1	7.2	313		147	91		0	1500
1/12/2021	Downstream AQW3	7.5	231		8.8	0		0	
1/12/2021	Upstream AQW1	7.6	231		8.8	6		0	
6/12/2021	Dam 4	7.9	408		23	18		0	0
7/12/2021	Dam 4	8.5	388		18	0		0	1000
7/12/2021	Downstream AQW3	7.7	222		8.8	0		0	
8/12/2021	Dam 4	8.6	407		17.6	0		0	1000
8/12/2021	Downstream AQW3	7.6	226		6	0		0	
9/12/2021	Dam 4	8	347		20	0		0	1000
9/12/2021	Downstream AQW3	7.3	387		40	35		0	
10/12/2021	Dam 4	7.4	241		27	6		0	1000
10/12/2021	Downstream AQW3	7.4	284		20	27		0	
14/12/2021	Dam 4	8.2	460		15	16		0	0
15/12/2021	Dam 4	8.3	482		1.9	0		0	1000
15/12/2021	Downstream AQW3	7.9	351		2.6	0		0	
16/12/2021	Dam 4	8.6	379		10	0		0	1000
16/12/2021	Downstream AQW3	7.6	193		4.3	0		0	

Date	Sample ID	pH	Conductivity (µS/cm)	O2 demand	Turbidity (NTU)	Total Suspended Solids (mg/L)	TDS (mg/L)	Oil & Grease (mg/L)	Volume Discharged (kL)
22/12/2021	Downstream AQW3	6.9	274		0	2.6	8	176	0
22/12/2021	Upstream AQW1	6.3	130		0	4.3	6	105	0
7/01/2022	Dam 1	7.2	307			600	350		0
7/01/2022	Dam 4	8.3	420			6	0		1000
7/01/2022	Downstream AQW3	7.7	252			33	31		0
7/01/2022	Upstream AQW1	7.7	254			29	35		0
10/01/2022	Dam 1	7.3	221			360	99		0
10/01/2022	Dam 3	7.2	374			22	6		2000
10/01/2022	Downstream AQW3	7.3	132			5.7	5		0
10/01/2022	Upstream AQW1	7.2	244			7.7	0		0
11/01/2022	Dam 1	7.2	172			250	54		0
11/01/2022	Dam 3	7.4	276			8	6		2000
11/01/2022	Downstream AQW3	7.5	200			6.7	9		0
11/01/2022	Upstream AQW1	7.4	267			6	10		0
20/01/2022	Downstream AQW3	7.2	216	0		11	9	150	0
20/01/2022	Upstream AQW1	7.2	244	0		13	5	174	0
27/01/2022	Dam 4	8.2	325			6.4	0		0
28/01/2022	Dam 4	7.5	318			11	9		0
28/01/2022	Downstream AQW3	7.3	199			9.8	10		0
29/01/2022	Dam 4	7.9	327			10	9		0
29/01/2022	Downstream AQW3	7.5	197			9.1	25		0
21/02/2022	Downstream AQW3	7.4	185	8		14	19	142	0
21/02/2022	Upstream AQW1	7.5	189	0		6.7	8	138	0
6/03/2022	Dam 1	5.8	182			900	546		0
6/03/2022	Downstream AQW3	7.2	186			33	50		0
6/03/2022	Upstream AQW1	7.3	164			44	37		0
7/03/2022	Dam 1	7.2	152			1000	544		0
7/03/2022	Dam 2	7	297			380	132		0
7/03/2022	Downstream AQW3	6.7	165			34	57		0
7/03/2022	Upstream AQW1	7.2	166			34	40		0

Date	Sample ID	pH	Conductivity (µS/cm)	O2 demand	Turbidity (NTU)	Total Suspended Solids (mg/L)	TDS (mg/L)	Oil & Grease (mg/L)	Volume Discharged (kL)
8/03/2022	Dam 1	7.8	246		850	586		0	1000
8/03/2022	Dam 2	7.9	291		340	159		0	1000
8/03/2022	Downstream AQW3	7.6	187		28	60		0	
8/03/2022	Upstream AQW1	7.7	187		34	62		0	
9/03/2022	Dam 1	7.2	104		100	30		0	500
9/03/2022	Dam 4	7.5	334		120	39		0	1000
9/03/2022	Downstream AQW3	7.3	153		40	35		0	
9/03/2022	Upstream AQW1	7.4	155		35	34		0	
10/03/2022	Dam 1	6.7	547		260	137		0	1000
10/03/2022	Dam 4	7.1	334		65	20		8	1000
10/03/2022	Downstream AQW3	7.2	179		17	23		7	
10/03/2022	Upstream AQW1	6.8	186		24	21		0	
11/03/2022	Dam 1	7.2	216		330	139		0	2000
11/03/2022	Dam 4	7.4	368		90	20		0	1000
11/03/2022	Downstream AQW3	7.7	185		21	18		0	
11/03/2022	Upstream AQW1	7.4	188		20	18		0	
12/03/2022	Dam 1	7.2	147		131	84		0	2000
12/03/2022	Downstream AQW3	7.1	152		21	14		0	
12/03/2022	Upstream AQW1	6.9	153		25	14		0	
22/03/2022	Downstream AQW3	7.7	247	0	9.1	5	194	0	
22/03/2022	Upstream AQW1	7.7	251	0	9.8	5	118	0	
29/03/2022	Dam 4	7.7	529		7.8	10		0	0
30/03/2022	Dam 4	7.6	507		11	16		0	1000
30/03/2022	Downstream AQW3	7.2	171		11	18		0	
21/04/2022	Dam 4	7.4	612		16	14		0	0
21/04/2022	Downstream AQW3	6.4	163	0	14	6	126	0	
21/04/2022	Upstream AQW1	5.3	162	0	7	0	174	0	
2/05/2022	Dam 4	7.6	598		8.2	5		0	0
3/05/2022	Dam 3	6.7	110		6.4	6		0	
3/05/2022	Dam 4	7.6	603		14	12		0	1000

Date	Sample ID	pH	Conductivity (µS/cm)	O2 demand	Turbidity (NTU)	Total Suspended Solids (mg/L)	TDS (mg/L)	Oil & Grease (mg/L)	Volume Discharged (kL)
3/05/2022	Downstream AQW3	7.3	172		5	0		0	
4/05/2022	Dam 3	7.5	127		5.4	0		0	1000
4/05/2022	Dam 4	7.9	556		10	7		0	1000
4/05/2022	Downstream AQW3	7.6	182		4.3	0		0	
16/05/2022	Dam 4	7.3	605		11	0		0	0
17/05/2022	Dam 4	7.8	561		16	5		0	1000
17/05/2022	Downstream AQW3	6.5	167		9.5	10		0	
18/05/2022	Dam 4	8.1	464		26	12		0	1000
18/05/2022	Downstream AQW3	7.3	165		6.3	0		0	
23/05/2022	Downstream AQW3	7.5	199	0	6.1	0	130	0	
23/05/2022	Upstream AQW1	7.5	219	0	6	0	142	0	
31/05/2022	Dam 4	8.3	545		7.5	0		0	
23/06/2022	Dam 3	7.2	794		5.7	0		0	
23/06/2022	Dam 4	7.2	601		7.1	0		0	
23/06/2022	Downstream AQW3	6.8	203	0	4.2	0	152	0	
23/06/2022	Upstream AQW1	7.3	208	0	3.9	0	144	0	
24/06/2022	Dam 3	7.7	681		12	12		0	1000
24/06/2022	Dam 4	8.3	674		8.6	8		0	1000
24/06/2022	Downstream AQW3	7.5	236		4	0		0	

Appendix M 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

16 February 2022

Hy-tec Industries Pty Ltd
Austen Quarry
391 Jenolan Caves Road
Hartley NSW 2790
Craig.Mcdonald@adbri.com.au

Attention: Mr Craig McDonald

Dear Craig,

**RE: FEBRUARY 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 3 February 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 afternoon of 3 February 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 3 February 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 3 February 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 Ground Doctor on the evening of 3 February 2022. The samples were left in an overnight drop-off point and were logged as being received by Envirolab on the morning of 4 February 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

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 February 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 generally within the range of previous results. Reported concentrations of iron and nitrite were the highest recorded, but were only marginally higher than previously reported concentrations.

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 February 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 February 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 (July 2021 to February 2022) were as follows.

7.1 MB01S

The water level in MB01S rose approximately 0.4m between the July 2021 monitoring event and the February 2022 monitoring event. Most of the observed rise occurred between November 2021 and February 2022. Several brief spikes in water level are apparent and correspond to rainfall events.

7.2 MB01D

The water level within MB01D fell approximately 0.8m in the period July 2021 to October 2021. Water levels rose approximately 0.9m between October 2021 and February 2022 finishing the monitoring interval slightly higher than the July 2021 monitoring round. Similar to MB01S, water level was observed to spike several times over the monitoring interval in response to rainfall events.

7.3 MB02

The water level within MB02 rose approximately 1.6m over the monitoring interval. Most of the observed increase occurred in the period December 2021 to February 2022. Similar to water levels within other monitoring bores, brief spikes were evident in MB02 corresponding to 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 July 2021 to February 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 July 2021 to February 2022.

Table 3: Summary of Pit Inflow Estimates July 2021 to February 2022

Monitoring Event	Change in Water Level	Description of Pit Conditions	Estimate of Groundwater Inflow
18-19 August 2021	No change in water level. 0.4mm Evaporation Loss	Pit floor approximately 6900m ² . Pit floor covered by water.	1.0ML/yr
17-18 December 2021	No change in water level. 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

The average estimate of groundwater inflow across the monitoring period was 3.0ML/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 February 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



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: February 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 February 2022

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	Units	
Sample Location		DGV 2018 (Fresh)	2011	PIT	PIT	PIT	PIT	PIT	PIT	PIT	PIT	PIT		
Major Cations (mg/L)	Calcium	-	-	71	49	64	62	92	58	54	54	48	mg/L	
	Magnesium	-	-	45	26	44	51	60	43	43	43	35	mg/L	
	Sodium	-	-	26	25	20	24	35	28	23	24	19	mg/L	
	Potassium	-	-	4	3	4.7	4.6	6.2	4	4.5	5	5	mg/L	
Major Anions (mg/L)	Sulphate	-	-	183	98	220	210	230	170	150	160	150	mg/L	
	Chloride	-	-	9	10	13	18	25	9	9	8	7	mg/L	
	Hydroxide as CaCO3	-	-	<1	<1	<5	<5	<5	<5	<5	<5	<5	mg/L	
	Carbonate as CaCO3	-	-	<1	<1	<5	<5	<5	<5	<5	<5	<5	mg/L	
	Bicarbonate as CaCO3	-	-	181	201	170	170	300	180	190	180	170	mg/L	
Heavy Metals (Dissolved) (mg/L)	Aluminium	0.055	-	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	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	mg/L	
	Barium	-	2	0.032	0.029	0.071	0.029	0.046	0.039	0.048	0.040	0.047	mg/L	
	Beryllium	-	0.06	<0.001	<0.001	<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	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	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	mg/L	
	Cobalt	-	-	0.003	<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	mg/L	
	Iron	-	-	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.100	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	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	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	mg/L	
	Molybdenum	-	0.05	0.004	<0.001	0.011	0.009	0.015	0.005	0.004	0.004	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	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	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	mg/L	
	Strontium	-	-	0.298	0.231	0.330	0.260	0.440	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	mg/L
	Vanadium	-	-	<0.01	<0.01	<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	mg/L		
Silicon (mg/L)	Silicon	-	-	15.2	19.4	5.1	3.8	8.6	3.6	3.2	2.7	3.2	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	mg/L	
	Nitrite	None	-	0.010	<0.01	0.012	<0.005	<0.005	0.008	0.007	0.009	0.016	mg/L	
	Ammonia	0.9	-	0.4	0.05	<0.005	<0.005	0.087	<0.005	<0.005	<0.005	<0.005	mg/L	
Hydrocarbons (ug/L)	TRH	-	-	<EQL	<EQL	<EQL	<EQL	<EQL	<EQL	<EQL	<EQL	<EQL	ug/L	
	Benzene	950	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/L	
	Toluene	-	800	<2	<2	<1	<1	<1	<1	<1	<1	<1	ug/L	
	Ethylbenzene	-	300	<2	<2	<1	<1	<1	<1	<1	<1	<1	ug/L	
	Xylene	200	600	<2	<2	<3	<3	<3	<3	<3	<3	<3	ug/L	
	Naphthalene	16	-	<5	<5	<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	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
Envirolab Reference	288040
Date Sample Received	04/02/2022
Date Instructions Received	04/02/2022
Date Results Expected to be Reported	11/02/2022

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:



Sample ID	VTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHsin Water	HM in water - dissolved	Metals in Water - Dissolved	Nitrate as N in water	Nitrite as N in water	Ammonia as N in water	Total Dissolved Solids(grav)	Calcium - Dissolved	Potassium - Dissolved	Sodium - Dissolved	Magnesium - Dissolved	Hydroxide Alkalinity (OH-) as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Sulphate, SO4	Chloride, Cl	Ionic Balance	
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 288040

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</u>
Number of Samples	1 Water
Date samples received	04/02/2022
Date completed instructions received	04/02/2022

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 11/02/2022

Date of Issue 09/02/2022

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Results Approved By

Hannah Nguyen, Metals Supervisor

Jenny He, Chemist

Josh Williams, LC Supervisor

Kyle Gavrily, Chemist

Loren Bardwell, Development Chemist

Priya Samarawickrama, Senior Chemist

Steven Luong, Organics Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

Client Reference: Hytec Austen Quarry Groundwater Monitoring

vTRH(C6-C10)/BTEXN in Water		
Our Reference		288040-1
Your Reference	UNITS	Pit
Date Sampled		3/02/2022
Type of sample		Water
Date extracted	-	04/02/2022
Date analysed	-	04/02/2022
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	%	95
Surrogate toluene-d8	%	96
Surrogate 4-BFB	%	103

svTRH (C10-C40) in Water		
Our Reference		288040-1
Your Reference	UNITS	Pit
Date Sampled		3/02/2022
Type of sample		Water
Date extracted	-	08/02/2022
Date analysed	-	08/02/2022
TRH C ₁₀ - C ₁₄	µg/L	<50
TRH C ₁₅ - C ₂₈	µg/L	<100
TRH C ₂₉ - C ₃₆	µg/L	<100
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
Surrogate o-Terphenyl	%	83

Client Reference: Hytec Austen Quarry Groundwater Monitoring

PAHs in Water		
Our Reference		288040-1
Your Reference	UNITS	Pit
Date Sampled		3/02/2022
Type of sample		Water
Date extracted	-	08/02/2022
Date analysed	-	09/02/2022
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	%	107

Client Reference: Hytec Austen Quarry Groundwater Monitoring

HM in water - dissolved		
Our Reference		288040-1
Your Reference	UNITS	Pit
Date Sampled		3/02/2022
Type of sample		Water
Date prepared	-	07/02/2022
Date analysed	-	07/02/2022
Aluminium-Dissolved	µg/L	20
Arsenic-Dissolved	µg/L	<1
Boron-Dissolved	µg/L	<20
Barium-Dissolved	µg/L	47
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	100
Lead-Dissolved	µg/L	<1
Manganese-Dissolved	µg/L	7
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	230
Titanium-Dissolved	µg/L	<1
Vanadium-Dissolved	µg/L	<1
Zinc-Dissolved	µg/L	8

Client Reference: Hytec Austen Quarry Groundwater Monitoring

Metals in Water - Dissolved		
Our Reference		288040-1
Your Reference	UNITS	Pit
Date Sampled		3/02/2022
Type of sample		Water
Date digested	-	07/02/2022
Date analysed	-	07/02/2022
Silicon*- Dissolved	mg/L	3.2

Miscellaneous Inorganics		
Our Reference		288040-1
Your Reference	UNITS	Pit
Date Sampled		3/02/2022
Type of sample		Water
Date prepared	-	04/02/2022
Date analysed	-	04/02/2022
Nitrate as N in water	mg/L	3.1
Nitrite as N in water	mg/L	0.016
Ammonia as N in water	mg/L	<0.005
Total Dissolved Solids (grav)	mg/L	450

Ion Balance		
Our Reference		288040-1
Your Reference	UNITS	Pit
Date Sampled		3/02/2022
Type of sample		Water
Date prepared	-	04/02/2022
Date analysed	-	04/02/2022
Calcium - Dissolved	mg/L	48
Potassium - Dissolved	mg/L	5
Sodium - Dissolved	mg/L	19
Magnesium - Dissolved	mg/L	35
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	170
Carbonate Alkalinity as CaCO ₃	mg/L	<5
Total Alkalinity as CaCO ₃	mg/L	170
Sulphate, SO ₄	mg/L	150
Chloride, Cl	mg/L	7
Ionic Balance	%	-4.0

Client Reference: Hytec Austen Quarry Groundwater Monitoring

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

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			04/02/2022	[NT]	[NT]	[NT]	[NT]	04/02/2022	[NT]
Date analysed	-			04/02/2022	[NT]	[NT]	[NT]	[NT]	04/02/2022	[NT]
TRH C ₆ - C ₉	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH C ₆ - C ₁₀	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	108	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	113	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	95	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate toluene-d8	%		Org-023	95	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate 4-BFB	%		Org-023	102	[NT]	[NT]	[NT]	[NT]	100	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			08/02/2022	[NT]	[NT]	[NT]	[NT]	08/02/2022	[NT]
Date analysed	-			08/02/2022	[NT]	[NT]	[NT]	[NT]	08/02/2022	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	96	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	96	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	94	[NT]
Surrogate o-Terphenyl	%		Org-020	84	[NT]	[NT]	[NT]	[NT]	104	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			08/02/2022	[NT]	[NT]	[NT]	[NT]	08/02/2022	[NT]
Date analysed	-			09/02/2022	[NT]	[NT]	[NT]	[NT]	09/02/2022	[NT]
Naphthalene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	84	[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]	85	[NT]
Fluorene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Phenanthrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	75	[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]	106	[NT]
Pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	127	[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]	78	[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]	102	[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	103	[NT]	[NT]	[NT]	[NT]	131	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring

QUALITY CONTROL: HM in water - dissolved				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W6	[NT]
Date prepared	-			07/02/2022	[NT]	[NT]	[NT]	[NT]	07/02/2022	[NT]
Date analysed	-			07/02/2022	[NT]	[NT]	[NT]	[NT]	07/02/2022	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	96	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	[NT]	[NT]	[NT]	[NT]	85	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	86	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	[NT]	[NT]	[NT]	[NT]	97	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[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]	111	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Silver-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	113	[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]	94	[NT]
Vanadium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring

QUALITY CONTROL: Metals in Water - Dissolved				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			07/02/2022	[NT]	[NT]	[NT]	[NT]	07/02/2022	[NT]
Date analysed	-			07/02/2022	[NT]	[NT]	[NT]	[NT]	07/02/2022	[NT]
Silicon*- Dissolved	mg/L	0.2	Metals-020	<0.2	[NT]	[NT]	[NT]	[NT]	105	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			04/02/2022	[NT]	[NT]	[NT]	[NT]	04/02/2022	[NT]
Date analysed	-			04/02/2022	[NT]	[NT]	[NT]	[NT]	04/02/2022	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	101	[NT]
Nitrite as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	101	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	[NT]	[NT]	106	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	[NT]	[NT]	[NT]	[NT]	101	[NT]

Client Reference: Hytec Austen Quarry Groundwater Monitoring

QUALITY CONTROL: Ion Balance				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			04/02/2022	[NT]	[NT]	[NT]	[NT]	04/02/2022	[NT]
Date analysed	-			04/02/2022	[NT]	[NT]	[NT]	[NT]	04/02/2022	[NT]
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	96	[NT]
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	94	[NT]
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	96	[NT]
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	[NT]	[NT]	[NT]	[NT]	96	[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]	96	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	102	[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.

Measurement Uncertainty estimates are available for most tests upon request.

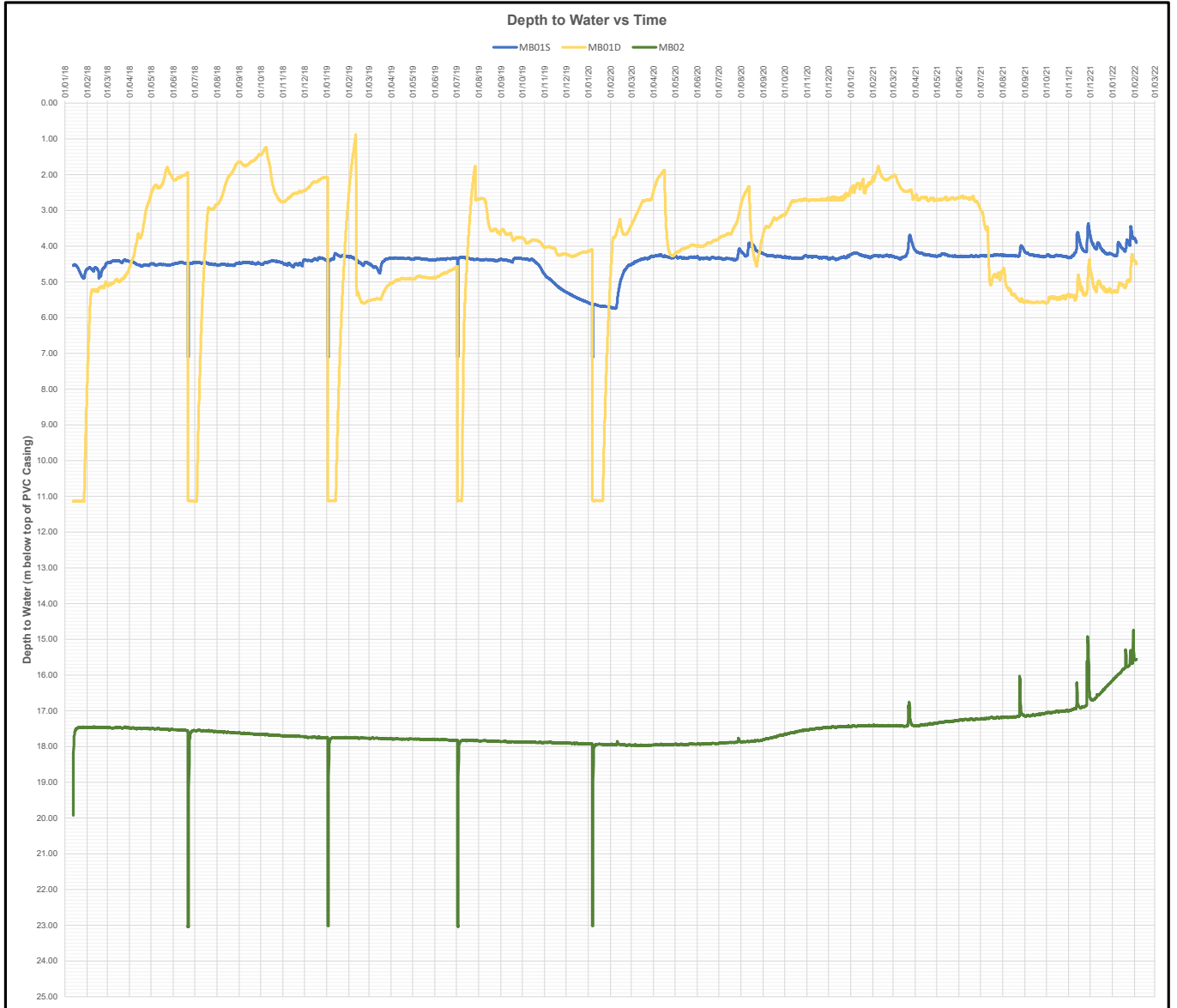
Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical 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

Attachment D

Groundwater Level Chart



Appendix N

Tree Planting Report

Hy-Tec Austen Quarry Tree Planting Day 2021

Report of works completed in August

Scope

Skillset Land Works were engaged by Hy-Tec Austen Quarry at Hartley to complete general maintenance on previous revegetation zones and install 140 *Eucalyptus* on the quarry site. All plants were grown at Lithgow District Community Nursery. An inspection of previous plantings during maintenance activities revealed that the majority of plants are still alive and growing well.

Method



Arrived on site and stripped the guards from mature and past planted areas. We also finished off the day removing the rest of these guarding's here



All materials were taken down to area for planting and Site was prepped – with help by ripper

Results

Total of 140 were planted out. We took photos with the The Hy-Tec team and then finished off the day stripping the first regen site of guards and stakes from the mature Plants



Planting out of the 140 trees



341 Havannah Street
Bathurst NSW 2795
PO Box 646
Bathurst NSW 2795



1300 853 525



info@skillset.com.au



ABN 21 002 407 589

Appendix O

Correspondence Regarding Non- Compliances



Hy-Tec Industries Pty Limited
Attention: Mr Darryl Thiedeke
63-79 PARRAMATTA ROAD
Silverwater NSW 2128

11/10/2021

Dear Mr Thiedeke

**Austen Quarry Extension Project (SSD-6084)
Annual Review 2020/21**

Reference is made to the Annual Review for the Austen Quarry Extension for the period 1 July 2020 to 30 June 2021, submitted to the Department of Planning, Industry and Environment on 29 September 2021 as required under Schedule 5 Condition 4 of SSD 6084, as modified (Consent).

The Department has reviewed the Annual Review and considers it to generally satisfy the requirement of the consent in relation to the Annual Review. Please note that approval of this Annual Review is not endorsement of the compliance status of the project.

Lastly, in accordance with Schedule 5 Condition 10 of the consent, it is requested that the Annual Review is uploaded to the company website within one month from the date of this letter.

Should you need to discuss the above, please contact Jennifer Rowe on (02) 42471851.

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



an ADBRI company

hy-tec.com.au

Hy-Tec Industries Pty Ltd
ABN 90 070 100 702
PO Box 6770
Silverwater NSW 1811
+61 2 9647 2866

17 January 2022

Ms. Jennifer Rowe

Senior Compliance Officer

Department of Planning, Industry and Environment

Level 2/84 Crown Street

WOLLONGONG NSW 2500

Dear Ms. Rowe,

Re: Austen Quarry (SSD 6084) – Water Discharge Quality – RFI-34114058

The following presents a summary and response to the Department of Planning, Industry and Environment's (DPIE's) Request for Information (RFI-34114058) regarding the incident notification submitted on 20 December 2021. We have applied the same numbering as in RFI-34114058 for ease of reference.

a) *identify the project and application number;*

Austen Quarry Stage 2 Extension Project (SSD-6084)

b) *identify any actual or potential non-compliance with conditions of consent, including relevant management plans;*

Exceedance of pH concentration limits identified in:

- Condition 16 of Schedule 3 of SSD 6084 as it relates to water discharge criteria provided in Environmental Protection Licence (EPL) 12323 and Section 120 of the *Protection of the Environment Operations Act 1997* (PoEO Act).
- Condition 20 of Schedule 3 of SSD 6084 as it relates to the implementation of the Austen Quarry Water Management Plan and specifically water quality limits for any water discharged from the Quarry Site that are presented in Table 35.
- Condition L2.4 of EPL 12323 that specifies water quality limits for any discharge at EPL Point 10.

c) *a summary of the incident;*

i) *provide details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident;*

Following prolonged rainfall and in order to ensure sufficient freeboard within water management structures at the Quarry, controlled discharge events were

undertaken at EPL Point 10 (identified as Sediment Dam 2 in the Austen Quarry Water Management Plan) between 7th to 10th and then 14th to 16th December 2021 in anticipation of high levels of predicted rainfall.

A summary of water quality monitoring results recorded for this period are presented in the below table. Site-based records of rainfall are also provided for context. The complete record of results is attached to this letter. EPL Point 10 is the discharge point, EPL Point 3 is downstream of the discharge location and AQW2 is a separate upstream monitoring point not specified in EPL 12323. Monitoring locations are presented in the attached figure (Figure 4 from the Water Management Plan).

Pre-discharge water quality monitoring for EPL 10 on 6th December recorded a pH of 7.9.

Pre-discharge water quality monitoring for EPL 10 on 14th December recorded a pH of 8.2.

Based on the monitoring results showing exceedance of pH levels by 0.1 pH units on two occasions, it was deemed a non-compliance had occurred and the protocol defined in Section 11.1 of the Austen Quarry Water Management Plan was enacted.

Date		06/12	07/12	08/12	09/12	10/12	14/12	15/12	16/12
pH	EPL 3	NM	7.7	7.6	7.3	7.4	NM	8.4	7.6
	EPL 10	7.9	8.5	8.6	8.0	7.4	8.2	7.9	8.6
	AQW2	NM	7.6	7.6	7.6	7.9	NM	8.3	7.7
Rainfall (mm)		1.31	3.51	14.72	25.43	0.50	0	0	0
NM: Not Monitored as no discharge from site BOLD: Exceedance pH Source: ALS Laboratories Report 24007130-12-1 and 24007130-12-02 Rainfall Source: Hy-Tec Met Station									

ii) *identify how the incident was detected;*

Water quality monitoring results were received from ALS Environmental Pty Ltd (ALS) on Friday 17th and Monday 20th December 2021. A review was carried out on the 20th of December and both incidents were detected during this review.

iii) *identify when the Proponent became aware of the incident;*

As above.

iv) *identify any exceedance of the limits and/or performance criteria with the consent;*

Exceedance of pH concentration limits identified in Condition L2.4 of Environmental Protection Licence (EPL) 12323, Schedule 3, condition 16 of SSD 6084 and Table 35 in the approved Austen Quarry Water Management Plan.

v) *identify whether there was actual and/or potential material harm to the environment;*

Water quality monitoring for the downstream river (EPL Point 3 -located downstream of EPL 10 discharge point) recorded pH levels of 7.6 on both 8th

December and 16th December. On both occasions the river pH did not appear to be influenced by the exceedances detected in the water discharged from EPL 10. Therefore, it is considered that no material harm was threatened or occurred to the environment. Regular monthly water sampling from the Coxs River over the last 10 years has recorded results from pH of 6.2 through to pH of 9.1 and therefore these results are considered to be within the range of natural variation of the river itself.

- vi) *details of the type, volume and concentration of any pollutants discharged;*

It is estimated that a total of approximately 2ML of water with a pH level of 8.6 may have been discharged.

- vii) *describe what immediate steps were taken in relation to the incident;*

Following the review on Monday the 20th of December of the results that were received that day and the previous Friday, and in accordance with the protocol defined in Section 11.1.2 of the Austen Quarry Water Management Plan, the Quarry Production Manager was notified, and the events were reported to the EPA and DPIE on 20th December 2021.

Given the delayed reporting and the nature of the incident the Pollution Incident Response Management Plan for the site was not triggered.

- viii) *identify action(s) that were taken in relation to the incident, including notifications to relevant agencies;*

As above, the protocol defined in Section 11.1 of the Austen Quarry Water Management Plan was enacted once the Quarry Production Manager was made aware of the incident.

- d) *outcomes of an incident investigation, including identification of the cause of the incident;*

The root cause of the incident has not been identified, however the 0.1 increase in pH units could be considered short term temporal variation as a result of rainfall pH, noting that the water quality of rainfall may be expected to show significant variation. In addition, we are aware that pH changes with temperature may have caused a short-term change, though this cannot be confirmed. Furthermore, as the monitoring results for the receiving system immediately following the discharge events were not reflective of the discharge point monitoring results, it is considered that the discharge monitoring results obtained on the 8th and 16th December 2021 are not reflective of the total discharge period.

- e) *details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence;*

To avoid any further non-compliances of this nature in the future, prior to any controlled discharge events, on-site water quality testing will be undertaken by appropriately trained site personnel using a calibrated pH testing unit. An order was placed in December for an appropriate pH testing unit and depending on availability, is expected to be on site around the 3rd week of January 2022. The Quarry Manager will only authorise a controlled discharge event upon confirmation that pH levels are within the criteria nominated in Condition L2.4 of EPL 12323 and the Austen Quarry Water Management Plan.

- f) *details of any communication with other stakeholders regarding the incident; and*

EPA and DPIE were notified on the day of the discovery of the pH limit exceedance

g) *identify a project contact for further communication regarding the incident.*

Darryl Thiedeke – National Planning & Development Manager

Darryl.Thiedeke@adbri.com.au

I trust the above provides a satisfactory level of detail to describe the incident and Hy-Tec's response to the matter. Should you have any further questions, please contact myself at the email address above.

Yours sincerely

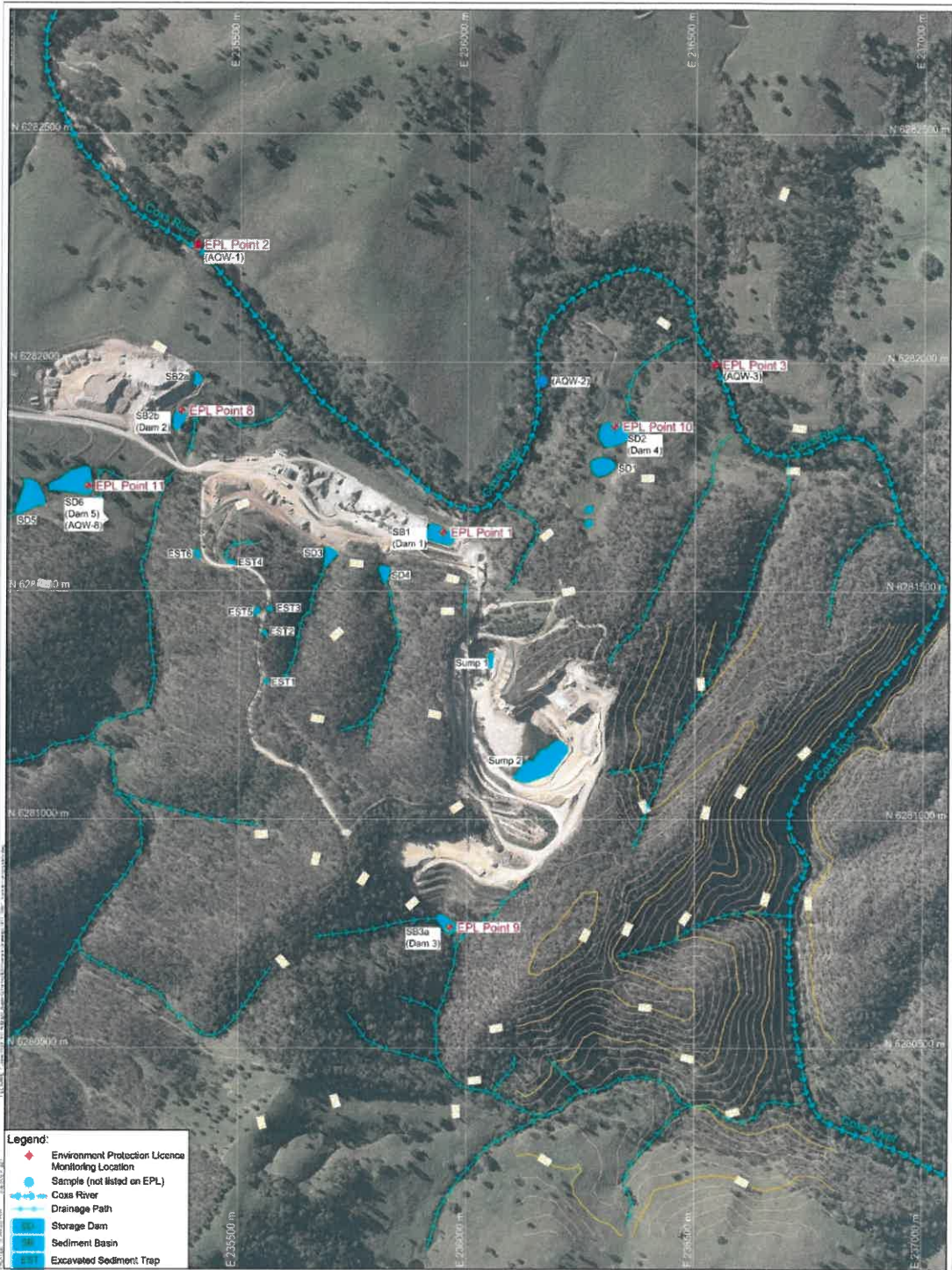
A handwritten signature in black ink, appearing to read 'D Thiedeke', written in a cursive style.

Darryl Thiedeke

National Planning & Development
Manager

Encls: ALS Laboratories Report 24007130-12-1 and 24007130-12-02

Austen Quarry Water Management Plan - Figure 4 Discharge and Water Monitoring
Location Plan



REV	BY	DATE	DESCRIPTION
1	GROUNDWORK	15/11/2018	ISSUED FOR CONSTRUCTION

Auslen Quarry
Stage 2 Extension
Hy-Tec Industries Pty Ltd

Figure 4 - Discharge and Water Monitoring Location Plan

GROUNDWORK P L 1517.088 www.terrain.com.au	 1:7,500	PROJECT NUMBER: 1517.088 SHEET NUMBER: 1
---	-------------	---



**ALS WATER
ANALYSIS AND TESTING REPORT**

REPORT TO: Craig McDonald

REPORT ON: AUS10 Hartley Quarry
Water Results
Discharge Samples
Dec-21

REPORT NO: 24007130-12-1

SAMPLED BY: Client

REPORTED BY: T.MacPhee

Adriana Hernandez
Environmental Project/Quality Officer– Lithgow NSW



Accreditation # 15784
Site # 11436

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Amendment History



Amend No	Date	Description of Amendment	Editor	Approved By

ALS WATER ANALYSIS AND TESTING REPORT



AUS10 QUARRY

	Units	24007130-12-1		
REPORT NO:		ES2144660		
ALS Sydney Report No		ES2144413		
Date of Sample		6-Dec-21	7-Dec-21	7-Dec-21
Site Name		EPL 10	EPL 3	EPL10 AQW 2
Sampled by		Client	Client	Client
General Comments/ Observations		Pre Discharge Slightly cloudy	Slightly cloudy	Slightly cloudy
pH	pH Units	7.9	7.7	8.5 7.6
Total Suspended Solids	mg/L	18	<5	<5
Electrical Conductivity	µS/cm	408	222	388 213
Turbidity	NTU	23	8.8	18 7.2
Total Oil and Grease	mg/L	<5	<5	<5



AUS10 QUARRY

	Units	24007130-12-1					
REPORT NO:		ES2144901			ES2145172		
ALS Sydney Report No							
Date of Sample		8-Dec-21	8-Dec-21	8-Dec-21	9-Dec-21	9-Dec-21	9-Dec-21
Site Name		EPL 3	EPL10	AQW 2	EPL3	EPL10	AWQ 2
Sampled by		Client	Client	Client	Client	Client	Client
General Comments/ Observations		Clear	Clear	Clear	Slightly cloudy	Clear	Slightly cloudy
pH	pH Units	7.6	8.6	7.6	7.3	8.0	7.6
Total Suspended Solids	mg/L	<5	<5	<5	35	<5	29
Electrical Conductivity	µS/cm	226	407	220	387	347	155
Turbidity	NTU	6	17.6	6.4	40	20	39
Total Oil and Grease	mg/L	<5	<5	<5	<5	<5	<5

**ALS WATER
ANALYSIS AND TESTING REPORT**



AUS10 QUARRY

	Units			
REPORT NO:		24007130-12-1		
ALS Sydney Report No		ES2145579		
Date of Sample		10-Dec-21	10-Dec-21	10-Dec-21
Site Name		EPL3	EPL10	AWQ 2
Sampled by		Client	Client	Client
General Comments/ Observations		Clear	Clear	Clear
pH	pH Units	7.4	7.4	7.9
Total Suspended Solids	mg/L	27	6	29
Electrical Conductivity	µS/cm	284	241	427
Turbidity	NTU	20	27	20
Total Oil and Grease	mg/L	<5	<5	<5

METHODS OF WATER ANALYSIS



NATA accreditation covers the following test

TEST	METHOD	Measure of Uncertainty
Turbidity (NTU)	APHA 2130 B	± 5.0%
Electrical Conductivity uS/cm	APHA 2510 B	2.0%
pH value	APHA 4500 H	0.10 pH Units
Total Suspended Solids (mg/l)	APHA 2540 D	± 5.0%

In accordance with "Methods for sampling and analysis of ambient air.
Method 10.1: Determination of particulate matter- Deposited matter-Gravimetric method"
Standards Australia, 2003

The remaining analysis performed at ALS Environmental, 277-289 Woodpark Rd, Smithfield, NSW 2164.

In accordance with "Standard Methods for the Examination of Water & Wastewater"
APHA, AWWA, WEF and Water & Wastewater
Examination Manual (V. Dean Adams)

REPORT NO: 24007130-12-1
ALS Sydney Report No ES2144413 ES2145172
ES2144660 ES2145579
ES2144901



**ALS WATER
ANALYSIS AND TESTING REPORT**

REPORT TO: Craig McDonald

REPORT ON: AUS10 Hartley Quarry
Water Results
Discharge Samples
13th -17th December 2021

REPORT NO: 24007130-12-02

SAMPLED BY: Client

REPORTED BY: T.MacPhee

Adriana Hernandez
Environmental Project/Quality Officer– Lithgow NSW



Accreditation # 15784
Site # 11436

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AUS10 QUARRY

	Units	24007130-12-02		
REPORT NO:		ES2146460		
ALS Sydney Report No		ES2145808	15-Dec-21	
Date of Sample		14-Dec-21		
Site Name		EPL10	AQW 2	EPL 3
Sampled by		Client	Client	Client
General Comments/ Observations		Clear	Clear	Clear
pH	pH Units	8.2	8.4	7.9
Total Suspended Solids	mg/L	16	6	<5
Electrical Conductivity	µS/cm	460	288	351
Turbidity	NTU	15	2.2	2.6
Total Oil and Grease	mg/L	<5	<5	<5



ANALYSIS AND TESTING REPORT

AUS10 QUARRY

	Units			
REPORT NO:		24007130-12-02		
ALS Sydney Report No		ES2146305		
Date of Sample		16-Dec-21		
Site Name		EPL3	EPL 10	AQW 2
Sampled by		Client	Client	Client
General Comments/ Observations		Clear	Clear	Clear
pH	pH Units	7.6	8.6	7.7
Total Suspended Solids	mg/L	<5	<5	5
Electrical Conductivity	µS/cm	193	379	187
Turbidity	NTU	4.3	10	5.3
Total Oil and Grease	mg/L	<5	<5	<5

METHODS OF WATER ANALYSIS



NATA accreditation covers the following test

TEST	METHOD	Measure of Uncertainty
Turbidity (NTU)	APHA 2130 B	± 5.0%
Electrical Conductivity uS/cm	APHA 2510 B	2.0%
pH value	APHA 4500 H	0.10 pH Units
Total Suspended Solids (mg/l)	APHA 2540 D	± 5.0%

In accordance with "Methods for sampling and analysis of ambient air.
Method 10.1: Determination of particulate matter- Deposited matter-Gravimetric method"
Standards Australia, 2003

The remaining analysis performed at ALS Environmental, 277-289 Woodpark Rd, Smithfield, NSW 2164.

In accordance with "Standard Methods for the Examination of Water & Wastewater"
APHA, AWWA, WEF and Water & Wastewater
Examination Manual (V. Dean Adams)

REPORT NO: 24007130-12-02
ALS Sydney Report No ES2145808
ES2146460
ES2146305



DOC22/46303

The Proper Officer
AUS-10 RHYOLITE PTY LIMITED
Attention: Mr Darryl Thiedeke
National Planning & Development Manager

Via e-mail: Darryl.Thiedeke@adbri.com.au

31 January 2022

Dear Mr Thiedeke,

Aus-10 Rhyolite Pty Limited – EPL 12323
Aus-10 Quarry – Discharge to waters

I refer to Environment Protection Licence (EPL) 12323, held by AUS-10 Rhyolite Pty Limited (the Licensee) for the AUS-10 Quarry located on Jenolan Caves Road, Hartley (the Premises). I also refer to correspondence between yourself and the NSW Environment Protection Authority (EPA) in January 2022 regarding the current discharge to waters and associated monitoring points as per Condition L2.5 of the Licence.

Thank you for your notification of the recent discharges from Points 1 and 8 to 10 of the Licence, including the provision of sampling results. The EPA understands that the Premises has experienced significant wet weather from November 2021 through to January 2022. The EPA acknowledges that this wet weather may continue in the coming months due to La Nina weather patterns.

Alternatives to discharging to waters:

The EPA advises that a discharge to waters should be avoided in the first instance. The EPA considers that there may be alternative measures available to you to avoid the need for a discharge and therefore improve environmental outcomes at the Premises. In that regard, the EPA recommends that you consider:

1. Installing clean water diversions where feasible to limit the volume of dirty water generated
2. Maintaining capacity through:
 - a. Pumping water between basins to balance capacity during wet weather
 - b. Irrigating excess water during dry periods to increase capacity
 - c. Using excess water for dust suppression
 - d. Installing additional basins to increase wet weather capacity
3. Implementing enhanced control techniques to meet identified water quality objectives; and

4. Implementing pre-rain and post-rain procedures to manage excess water

The EPA would like to discuss the above with you in greater detail. In that regard, we will be in touch shortly to organise a meeting.

Complaint – Cox's River

As discussed with you, the EPA received a complaint regarding dirty water in the Cox's River which may have come from your Premises. To assist with the EPA's investigation into this matter, please provide details of operations at the Premises from 20 December 2021 to 30 December 2022 with any additional weather data that you can provide. The EPA would appreciate this information by **14 February 2022**.

Access to monitoring locations

The EPA notes that in your recent Annual Return you have identified problems with safely accessing licensed monitoring points. The EPA is happy to consider varying these locations to another representative location. To progress these changes, the EPA advises that you need to submit a licence variation application via the EPA's online eConnect portal.

Thank you for discussing this matter with the EPA. If you have any questions regarding this matter, please contact Mrs Samantha Hayes on (02) 6333 3806 or via e-mail at info@epa.nsw.gov.au.

Yours sincerely,



Carlie Armstrong
Unit Head - Regulatory Operations Regional



Mr Darryl Thiedeke
National Planning and Development Manager
AUS-10 RHYOLITE PTY LIMITED
63-79 PARRAMATTA ROAD
Silverwater NSW 2128

28/02/2022

Dear Mr Thiedeke

**Austen Quarry Extension - (SSD-6084)
Water Discharge Incident**

I refer to your incident report (SSD-6084-PA-13) submitted to the Department of Planning and Environment (the Department) on 20 December 2021, and your Request for Information response (RFI – 34114058) submitted on 17 January 2022, in relation to the exceedance of pH limits as identified in Schedule 3 Condition's 16 and 20 of SSD-6084 and EPL L2.4 of EPL 12323 for Austen Quarry Extension.

The Department has reviewed your response and notes the reasons for the non-compliance and actions that have been implemented to prevent future non-compliances. The Department has assessed the non-compliances in accordance with the Departments Compliance Policy and in this instance has decided to record the non-compliances. However, the recording of the breaches does not preclude the Department from taking alternative action in the future, should it become apparent that an alternative response is more appropriate.

Please ensure you record the non-compliances, including a status on all actions and measures implemented to prevent future non-compliances, in the next Annual Review.

Should you wish to discuss the matter further, please contact Michael Wood on 0459890661 or compliance@planning.nsw.gov.au

Yours sincerely
APPROVERSIGNATUREANDDETAILSWILLBEINSERTEDHERE

As nominee of the Planning Secretary



DOC22/222727-2

The Proper Officer
AUS-10 RHYOLITE PTY LIMITED
Attention: Mr Darryl Thiedeke
National Planning & Development Manager

Via e-mail: Darryl.Thiedeke@adbri.com.au

25 March 2022

Dear Mr Thiedeke,

Aus-10 Rhyolite Pty Limited – EPL 12323

Aus-10 Quarry – Control discharge

I refer to correspondence between yourself and the NSW Environment Protection Authority (EPA) in March 2022 regarding the discharge to waters and associated monitoring at Aus-10 Quarry (the Premises) as per Environment Protection Licence 12323 (the licence). The EPA acknowledges receipt of the discharge reports provided on 21 March 2022 in accordance with the licence.

The EPA acknowledges that these discharges comply with the exemption for the concentration limit for Total Suspended Solids specified under Licence Condition L2.6.

The EPA understands that the Premises has experienced significant wet weather from January 2022 through to March 2022 and this wet weather may continue in the coming months due to La Nina weather patterns.

As discussed during a meeting between yourself and the EPA on 10 February 2022, the ultimate goal for stormwater management is to avoid a discharge in the first instance. The EPA reminds you to consider where there may be alternative measures to avoid the need for a discharge and therefore improve environmental outcomes at the Premises. The EPA encourages you to continue implementing pre-rain and post-rain procedures to manage excess water.

If you have any specific questions regarding this matter, please contact Mrs Samantha Hayes on (02) 6333 3806 or via EPA.Southopsregional@epa.nsw.gov.au . For general enquiries to the EPA please e-mail info@epa.nsw.gov.au .

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Carlie Armstrong', is written over a light blue circular stamp.

Carlie Armstrong
Unit Head - Regulatory Operations

From: [Michael Greenwood](#)
To: [Samantha Hayes](#)
Cc: [Darryl Thiedeke](#); [Carlie Armstrong](#); [Craig McDonald](#)
Subject: RE: Austen Quarry Discharge
Date: Friday, 14 January 2022 1:56:54 PM
Attachments: [image001.png](#)
[Weather Station data 20.12.21_30.12.21.csv](#)

Good Afternoon Samantha,

As Craig is currently on annual leave at the moment I have gathered the information as requested.

I have attached the weather station data from the 20th through to the 30th December 2021 and our operating times for this period are as follows;

- Monday 20th, Tuesday 21st, Wednesday 22nd, Thursday 23rd Normal operations 5am – 10 pm
- Friday 24th No production. 5am - 1pm
- Saturday 25th, Sunday 26th, Monday 27th, Tuesday 28th Closed
- Wednesday 29th Thursday 30th Minimal staff maintenance only

Craig returns to work on the 31st Jan, So I'd like to address the possible access issues and variations as mentioned then.

Please let me know if I can be of any further assistance
Thankyou

Michael Greenwood
Quarry Production Supervisor
P: 0418678323
M: 0418678323

adbri.com.au



From: Samantha Hayes <samantha.hayes@epa.nsw.gov.au>
Sent: Thursday, 13 January 2022 4:59 PM
To: Craig McDonald <Craig.McDonald@adbri.com.au>
Cc: Michael Greenwood <Michael.Greenwood@adbri.com.au>; Darryl Thiedeke <Darryl.Thiedeke@adbri.com.au>; Carlie Armstrong <Carlie.Armstrong@epa.nsw.gov.au>
Subject: RE: Austen Quarry Discharge

Hi Craig

Thank you for your return call today.

As per our phone conversation

1. Yes The below email is a duplicate, you had sent the original on 7 January 2022.
2. Complaint made for Cox's River : As discussed could you please provide detail of your operation for the days of 20 December 2021 to 30 December 2021 (Aust-10 quarry operations during this period) with any additional weather data that you can provide.
3. Annual return review outlining the problems of access to monitoring points. As discussed that you may like to submit an Application to variation the licence.
 - You may apply for a variation to you lice through [eConnect](#) for the location of you EPL monitoring point as you stated that at times these point have been difficult to access when the river is high, also you may wish to look at alternative storage on site to minimise the amount of discharge required.Please remember if you are to apply for the variation for this please add as much detail i.e. Longitude and latitude of the proposed new monitoring points including a map.

Also when emailing the EPA could you please use the following

EPA.Southopsreginal@epa.nsw.gov.au (replacing the central.west@epa.nsw.gov.au) you may also wish to Cc me in this correspondence.

Kind Regards

Samantha Hayes
Operations Officer
Regulatory Operations
NSW Environment Protection Authority
D 02 6333 3806 | M 0428 737 840

NSW EPA logo



www.epa.nsw.gov.au @NSW_EPA

The EPA acknowledges the traditional custodians of the land and waters where we work. As part of the world's oldest surviving culture, we pay our respect to Aboriginal elders past, present and emerging.

Report pollution and environmental incidents 131 555 or +61 2 9995 5555

From: Craig McDonald <Craig.McDonald@adbri.com.au>

Sent: Thursday, 13 January 2022 12:41 PM

To: Samantha Hayes <samantha.hayes@epa.nsw.gov.au>; EPA RSD Central West Mailbox <central.west@epa.nsw.gov.au>

Cc: Michael Greenwood <Michael.Greenwood@adbri.com.au>; Darryl Thiedeke <Darryl.Thiedeke@adbri.com.au>

Subject: Austen Quarry Discharge

Hi Samantha

Austen Quarry has measured 45mm on rain over the last 48hrs so we have commenced today a discharge from EPL 1 and EPL 10 due to further storm activity predicted over the next 72 hours (please note this discharge has been controlled i.e. pumped not spilling due to capacity of storage basins)

It is expected that we will only discharge for a 24hour period with a estimated amount to be 3 megalitres of water (2megs from EPL 1 and 1meg from EPL10)

Samples have been taken and results will be forwarded once they come in

Kind regards

Craig McDonald

Quarry Manager

P: 02 6355 0268

M: 0405 123 700

adbri.com.au



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Any views expressed in this email are those of the individual sender except where the sender expressly and with authority states them to be the views of the Environment Protection Authority.

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

From: [Darryl Thiedeke](#)
To: [Samantha Hayes](#)
Cc: [Craig McDonald](#); [Michael Greenwood](#); EPA.Southopsregional@epa.nsw.gov.au
Subject: Austen Quarry - dirty water in Cox's River complaint response
Attachments: [image001.png](#)
[RE Austen Quarry Discharge.msg](#)
[01.02.2022 - Response letter - AUS-10 Quarry - EPL 12323.pdf](#)

Afternoon Samantha.

In regards to DOC22/46303 and the Compliant made to the EPA regarding "dirty water in the Cox's River" which may have come from your (our) premises, we advise the following.

As per Michael Greenwood's email of the 14th of January, the site operating times for the period of 20th December through to 30th December were as per the following;

- Monday 20th, Tuesday 21st, Wednesday 22nd, Thursday 23rd Normal operations 5am – 10 pm
- Friday 24th No production. 5am - 1pm
- Saturday 25th, Sunday 26th, Monday 27th, Tuesday 28th Closed
- Wednesday 29th Thursday 30th Minimal staff maintenance only

Rainfall recorded by the quarry's weather station for the period - (weather station data within attached email);

Date	Rainfall - MM	Date	Rainfall - MM
20.12.2021	.03	26.12.2021	22.41
21.12.2021	.01	27.12.2021	.01
22.12.2021	0.0	28.12.2021	.1
23.12.2021	33.9	29.12.2021	0
24.12.2021	3.17	30.12.2021	0
25.12.2021	11.34	Total	70.97

As advised by Craig McDonald (Quarry Manager), the site was checked prior to close of operations on the 24th of December and it was noted that the site's dams still had significant capacity for water capture. The site was closed from the afternoon of the 24th of December until the Wednesday the 29th of December.

Though due to an issue with the front gate, Craig McDonald attended site on Monday the 27th. While on site, Craig checked the capacity of a number of the dams including SB1 (EPL1) and was comfortable that the dams still had sufficient capacity and there was no signs of discharge having taken place from any of the viewed dams or any breach of dam walls having occurred.

Following your phone call with Craig in January, Craig also spoke with the property owner and asked if they had any dam failures and was advised that no failures had occurred.

We unfortunately cannot provide any further guidance on where the "dirty water in the Cox's river" may have come from.

Trusting that this satisfies the query.

Regards

[Darryl Thiedeke](#)

National Planning & Development Manager

P: 02 9751 7130

M: 0409 652 022

hy-tec.com.au

Schedule 3 – Condition 1 - Austen Quarry – SSD 6084 - Report - 29.10.2021

Issue: Load ticketed outside of scheduled hours

While checking previous delivery dockets during the week of 18th of October 2021 it was discovered that a load of material was issued a delivery docket from the Austen Quarry at 22.06pm on Friday the 15.10.2021.

Investigation of Cause:

As per the following docket, Tipper JMC680 arrived at the Austen Quarry upper weighbridge at 21.28pm on the 15.10.2021 and was dispatched at 22.06pm (being outside the consented time of 22.00pm).

The screenshot shows a delivery docket interface with the following information:

AUS-10 RHYOLITE PTY LTD ABN 79 002 325 144		Delivery HA380378 Arrived Date 15/10/2021 21:28 Despatch Date 15/10/2021 22:06
Depot	2801 AUSTEN QUARRY	
Job Number	1031732776	Sap Reference 0040016478-000020
Customer	22516 HYTEC -ALEXANDRIA 154 - 164 EUSTON ROAD	Customer Cartage TruckDog
	ALEXANDRIA	
Purchase Order	2201043182	
Vehicle	JMC680 Truck and Dog	
Driver	Giosofatto Busa	
Carrier	112485 MDB LOGISTICS PTY LTD	Gross 56.00 t
Product	HLCAB24M 20_14MM CONCRETE BLEND AGG	Tare 17.80 t
Stockpile		Net 38.20 t
Lot Number		
Instructions	*PLEASE CHECK DOCKET AND BIN BEFORE TIPPING*	

The following information describes the weighbridge system at the Austen Quarry.

The quarry has a double weighbridge system (2 weighbridges – an upper and a lower weighbridge). The weighbridge system has been programmed to lock out at 21.30pm. After lockout, any vehicles accessing the upper weighbridge will not be granted the required access to the system to be able to proceed to the quarry stockpile area.

The tipper has arrived at 21.28 at the quarry upper weighbridge, and as this was before the automatic system lockout, the tipper has been permitted into the site to load before the automatic quarry upper weighbridge lockout at 21.30pm.

Under normal circumstances it would be expected that a vehicle entering the Quarry would be loaded with material and leaving the Quarry within 15 to 25 minutes. The lock out time of 21:30pm is intended to allow time for this to occur and remain within the approved operating hours. Personnel and drivers are also mindful of the approved operating hours, however, rely on the weighbridge to either accept or reject the load.

In investigating why this tipper was onsite for almost 40 minutes from arrival at the quarry's upper weighbridge to the despatch time, it was found that the tipper was delayed due to loading issues of having too much material being initially loaded (therefore being overweight). In the instance of an overweight vehicle, the weighbridge system will not generate a docket for the load. This has

required the tipper operator to tip off material at the load out area. However, upon returning to the weighbridge, the weighbridge has indicated that the tipper's rear axle was overloaded. To correct this, the tipper operator was required to tip off further material at the load out area, re-weigh on the weighbridge, before having additional material loaded back into the tipper to meet the required weight for delivery. These actions have caused the delay in the tipper proceeding to the quarry's lower weighbridge for confirmation of the load. As a result of these delays, the tipper operator accessed the quarry's lower weighbridge at 22.06pm, which has then generated the load docket.

Until this occurrence, "being a tipper accessing the bottom weighbridge after 22.00pm", Quarry management believed that the bottom weighbridge would not issue a docket after 22.00pm and that the loading process would be aborted.

In terms of an impact to the local community, this minor exceedance of approved operating hours is considered unlikely to have been noticeable from approved operating hours. Jenolan Caves Road is an approved 24hr B-Double route. No complaints were received at this time.

Outcomes:

Following the discovery of this flaw in the operating system, the designer of the weighbridge system has been instructed to provide a patch to the current system that prevents this type of occurrence (in before 21.30pm and out after 22.00pm) from happening again.

The patch was provided and installed in the software by the designer and the system was tested on the night of Monday the 25th of October 2021 at 22.03pm. The system at time of testing confirmed that no docket would be issued after the approved transport hour of 22.00pm and therefore any loading process would be aborted.



Post Approval

Proponent Details

Personal Details

Title	Mr
First Name	Darryl
Last name	Thiedeke
Email	Darryl.Thiedeke@adbri.com.au
Phone	02 9751 7177
Role/Position	National Planning and Development Manager
Address	63-79 PARRAMATTA ROAD Silverwater 2128 AUS

Company Details

Applying as a company/business?

Yes

Company Name	AUS - 10 RHYOLITE PTY LIMITED
ABN	79002325144
Branch Name	

Primary Contact

Title	Mr
First Name	Darryl
Last Name	Thiedeke
Email	darryl.thiedeke@adbri.com.au
Phone	0297517130
Role/Position	National Planning and Development Manager

Post Approval Details

Project:

Austen Quarry Extension - SSD-6084-PA-12

Name of Document

Schedule 3 - Condition 1 - 25.10.2021

Related matter

Incident or non-compliance Report

Type of Document Lodgement

New Document

Description of the document and reason for submission / Overview of changes made to existing documents

It was discovered during last week that a load of material was ticketed at the Austen Quarry at 22.06pm on Friday the 15.10.2021. This matter is currently being investigated and a update will be provided by Friday 29th of October

Applicable Conditions

Schedule	Condition
3	1

Consultation through the Major Projects portal

Consultation required as part of the preparation of the document?

No

Attachment of Post Approval application

File Name	Category
Schedule 3 - Condition 1 - 25.10.2021.pdf	Post Approval Document



AUS - 10 RHYOLITE PTY LIMITED
Attention: Mr Darryl Thiedeke
63-79 PARRAMATTA ROAD
Silverwater NSW 2128

01/11/2021

Dear Mr Thiedeke

**Austen Quarry Extension (SSD-6084)
Incident/Non-Compliance Notification**

I refer to your incident report (Report), submitted to the Department of Planning, Industry and Environment (the Department) on 25 October 2021, in accordance with Schedule 5 Condition 6 for the Austen Quarry Extension Project Consent SSD-6084 (Consent).

The Report identified a non-compliance with Schedule 3 Condition 1 of the Consent, in which on the 15 October 2021 a vehicle was dispatched at 22:06pm from the Project, outside of the approved operational hours, being 22:00pm.

The Department has reviewed the incident notification and considers it to generally satisfy the incident reporting requirements of Schedule 5 Condition 6 of the Consent. Please note that approval of the Report is not an endorsement of the compliance status of the project.

Please be advised the reported non-compliance with Schedule 3 Condition 1 of the Consent, will be investigated further by the Department and you will receive further correspondence in relation to this matter.

If you wish to discuss the matter further, please contact Jennifer Rowe on 0242471851.

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



DOC21/971535

The Proper Officer
AUS-10 RHYOLITE PTY LIMITED
Attention: Mr Darryl Thiedeke
National Planning & Development Manager

Via e-mail: Darryl.Thiedeke@adbri.com.au

8 November 2021

Dear Mr Thiedeke,

Aus-10 Rhyolite Pty Limited – EPL 12323
Aus-10 Quarry – Notification of non-compliance - Out of hours work

I refer to Environment Protection Licence (EPL) 12323, held by AUS-10 Rhyolite Pty Limited (the Licensee) for the AUS-10 Quarry located on Jenolan Caves Road, Hartley (the Premises). I also refer to your e-mail provided to the NSW Environment Protection Authority (EPA) on 29 October 2021, notifying of a load of material being ticketed outside of the hours of operation identified under condition L6.2 of the Licence.

The EPA understands that the out of hours incident occurred at 22:06 on the 15.10.2021 due to technical difficulties at the weigh bridge. The EPA acknowledges the explanation provided in your e-mail. The EPA reminds you that 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.

The EPA has no further comments to make and requires no additional information or explanation with respect to your notification report.

Thank you for discussing this matter with the EPA. If you have any questions regarding this matter, please contact Mrs Samantha Hayes on (02) 6333 3806 or via e-mail at info@epa.nsw.gov.au.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Carlie Armstrong'.

Carlie Armstrong
Unit Head - Regulatory Operations

From: Darryl Thiedeke
Sent: Monday, 30 May 2022 10:04 AM
To: info@epa.nsw.gov.au
Cc: Samantha Hayes; Craig McDonald
Subject: Dust Results May 2022 - EPL 12323

Morning Samantha. FYI, we will not have ash or combustibile matter results for the last month's dust sampling for Austen Quarry EPL points 4 and 6, though according to the below email, we will still have the overall Insoluble matter result.

Regards

Darryl Thiedeke
National Planning & Development Manager
P:02 9751 7130

M:0409 652 022
hy-tec.com.au

From: Trudie MacPhee <trudie.macphee@ALSGlobal.com>
Sent: Friday, 27 May 2022 1:31 PM
To: Craig McDonald <Craig.McDonald@adbri.com.au>
Cc: Michael Greenwood <Michael.Greenwood@adbri.com.au>; Adriana Hernandez <adriana.hernandez@ALSGlobal.com>
Subject: Dust Results May 2022

Hi ,

I'm writing to inform you that your dust results will not be completed as our oven has exploded the crucibles for two of your samples EPL4 and EPL6 they will have Insolubale

matter but not ash or combustible matter as this was when the we lost the crucibles 850 degrees .We think the ovens regulator has gone and we have put this oven out of commission. I do apologise for any inconvenience this may cause you. Below is the picture that we took of the aftermath. If you have any questions please give me a call .



Thank you,

Trudie MacPhee

Environmental Reporting Officer, Lithgow

O: +61 236507400

M: +61 0467032577

trudie.macphee@alsglobal.com

Unit 3& 4 Donald street

Lithgow, NSW, 2790

alsglobal.com

Department of Planning and Environment

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

02/06/2022

Dear Mr Thiedeke

**Austen Quarry Extension (SSD 6084)
Incident Notification Dust Sampling Results April 2022**

I refer to the Incident 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 the lab incident resulting in a loss of dust samples for April 2022.

The Department notes that:

- the incident occurred due to the faulty oven exploding the crucibles for the two samples, EPL4 and EPL6; and
- whilst the ash and combustible matter was lost, the overall insoluble matter is still available.

The incident has been recorded by the Department. However, the recording of the incident does not preclude the Department from taking alternative action, should it become apparent that an alternative response is more appropriate.

Lastly, please ensure you record the incident, 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.

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



Katrina O'Reilly
Team Leader - Compliance
Compliance
As nominee of the Planning Secretary



Post Approval

Proponent Details

Personal Details

Title	Mr
First Name	Darryl
Last name	Thiedeke
Email	Darryl.Thiedeke@adbri.com.au
Phone	02 9751 7177
Role/Position	National Planning and Development Manager
Address	63-79 PARRAMATTA ROAD Silverwater 2128 AUS

Company Details

Applying as a company/business?

Yes

Company Name	AUS - 10 RHYOLITE PTY LIMITED
ABN	79002325144
Branch Name	

Primary Contact

Title	Mr
First Name	Darryl
Last Name	Thiedeke
Email	darryl.thiedeke@adbri.com.au
Phone	0297517130
Role/Position	National Planning and Development Manager

Post Approval Details

Project:

Austen Quarry Extension - SSD-6084-PA-13

Name of Document

20.12.2021 - Notification to EPA re pH limit

Related matter

Compliance Report, Annual Review, Audit Report

Type of Document Lodgement

New Document

Description of the document and reason for submission / Overview of changes made to existing documents

Notification of exceedance of pH limit to the EPA from water discharges following a review today of sampling reports received last Friday and today.

Applicable Conditions

Schedule	Condition
3	16

Consultation through the Major Projects portal

Consultation required as part of the preparation of the document?

No

Attachment of Post Approval application

File Name	Category
20.12.2021 - EPA Notification - pH exceedance.pdf	Post Approval Document

20.12.2021 - Notification of exceedance of pH limit to EPA

From an abundance of caution, we advise that we are notifying 2 non-compliances in relation to condition L2.4 of EPL 12323.

In today's review of the latest water sampling results received on Friday and today for the discharge events of 7th to 10th December (45mm of rain recorded between the 6th December and 10th December) and 14th to 16th December from the Austen Quarry site, we have found 2 results where the pH has been recorded as higher than the licence limit of condition L2.4, this being a pH limit of 8.5.

The pre-discharge result for EPL 10 on the 6th of December recorded a pH of 7.9. Subsequent readings for the period were as per the following. 7th of December (Discharge) was 8.5, 8th of December (Discharge) was **8.6 (Out of limits)**, 9th of December (Discharge) was 8.0 and the 10th of December (Discharge) was 7.4.

The reading for the river (EPL 3) recorded a figure of 7.6 for the 8th of December.

Further the results for the 14th December to the 16th December show the following results. 14th December pre-charge sample was 8.2, 15th December (discharge) was 8.3 and 16th December (Discharge) was **8.6 (Out of limits)**. The ALS sampling emails for the 2 periods are attached. The reading for the river (EPL 3) recorded a figure of 7.6 for the 16th of December.

On both occasions the river pH does not appear to have been influenced by the out of limit pH recorded for the water being discharged from EPL 10.

To avoid this non-compliance in the future, it is advised that prior to any elective discharge taking place, the site will also be conducting pH testing by the use of a calibrated pH testing unit and if the on-site pH test result is within the limits, only then will a discharge be authorised by the Quarry Manger.

Please advise if you require any further information.

Appendix P

Extractive Minerals

Return

Extractive Materials Return

2021-2022



Regional
NSW

Form S1 – Period Ending 30 June 2022

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 23.09.2022

- CONTACT PERSON for this return Darryl Thiedeke
- NAME (Block letters) DARRYL THIEDEKE Telephone 02 96472866

Extractive Materials Return

2021-2022



Regional
NSW

Form S1 – Period Ending 30 June 2022

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		12,522
Over 30mm to 75mm		18,459
5mm to 30mm		638,917
Under 5mm		0
Natural Sand		0
Manufactured Sand		232,560
Prepared Road Base & Sub Base		118,143
Other Unprocessed Materials		
Recycled Materials		
Crushed Coarse Aggregates		
Over 75mm		
Over 30mm to 75mm		
5mm to 30mm	Recycled roadbase	3,319
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		1,023,920
Gross Value (\$) of all Sales		\$27.139M
Type of Material	Concrete aggregates, Roadbase and Fill materials	
Number of Full-Time Equivalent (FTE) Employees	Employees - 17	Contractors - 8

Please Note: A return for clay-based products can be obtained by contacting the inquiry number.



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