



# Slys Quarry, Tullmorgan- Jackbulbin Road, Mororo

**Annual Review**

Mororo Quarry Pty Ltd

3 December 2024

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**Document status**

Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4	0	B. Slater	B. Luffman	<i>Ben</i>	S. Lawer	<i>[Signature]</i>	03/12/24

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# Annual review title block

Feature	Details
Name of operation	Slys Quarry
Name of operator	Mororo Quarry Pty Ltd
Development consent/project approval #	SSD 6624
Name of holder of development consent/project approval	Mororo Quarry Pty Ltd
Mining lease #	NA
Name of holder of mining lease	NA
Water licence #	NA
Name of holder of water licence	NA
MOP/RMP start date	NA
MOP/RMP end date	NA
Annual Review start date	01 July 2023
Annual Review end date	30 June 2024
<p>I, Angus Deane, certify that this annual review is a true and accurate record of the compliance status of Slys Quarry for the period 01 July 2023 to 30 June 2024 and that I am authorised to make this statement on behalf of Mororo Quarry Pty Ltd.</p> <p><i>Note.</i></p> <p><i>a) The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</i></p> <p><i>b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).</i></p>	
Name of authorised reporting officer	Angus Deane
Title of authorised reporting officer	Director
Signature of authorised reporting officer	
Date:	

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# 1. Statement of compliance

The expansion of Slys Quarry was approved by the former Department of Planning and Environment (DPE, now Department of Planning, Housing and Infrastructure (DPHI)) (Project Approval SSD 6624) and has an Environmental Protection Licence (EPL 11649). In regard to the compliance of the operations with the Project Approval (SSD 6624) and EPL, a statement of compliance, as at the end of the reporting period, is provided in Table 1.1.

Table 1.1 Statement of compliance

Were all conditions of the relevant approvals complied with	
SSD 6624	Yes
EPL 11649	Yes

Table 1.2 Compliance status

Risk level	Colour code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence.
Medium	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> <li>– Potential for serious environmental consequences but is unlikely to occur.</li> <li>– Potential for moderate environmental consequences but is likely to occur.</li> </ul>
Low	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> <li>– Potential for moderate environmental consequences but is unlikely to occur.</li> <li>– Potential for low environmental consequences but is likely to occur.</li> </ul>
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions).

## 2. Overview

Mororo Quarry Pty Ltd (Mororo Quarry) operate a sandstone quarry known as Sly's Quarry at Tullymorgan-Jackybulbin Road, Mororo, NSW. Sly's Quarry is located at Lot 2 DP 1055044, approximately 2.6 km west of the Pacific Highway, in the Clarence Valley Local Government Area (LGA). The location of the site is presented in Figure 2.1. The primary purpose of the quarry is to supply quarry materials required for current and proposed Pacific Highway works, and for supply to local councils and contractors.

Mororo Quarry purchased Slys Quarry in mid 2024, however the site has reportedly been used as a quarry since the 1950's. On 5 May 2016, development consent (SSD 6624) was granted for the expansion of the quarry and involved the following:

- Expand main quarry pit (Site A) by 11.1 hectares to 18 hectares.
- Close and rehabilitate other quarry pits (Sites B and C).
- Extraction depth 44 m AHD.
- Increase the extraction rate up to 500,000 tonnes per annum.
- Estimated resource 7,000,000 tonnes.
- Estimated operating period 15-40 years with approval to 31 May 2041.

### 2.1 Quarry contacts

Table 2.1 provides contact details for key personnel who are responsible for the environmental management of Sly's Quarry.

Table 2.1 Sly's Quarry Contacts

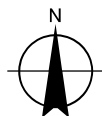
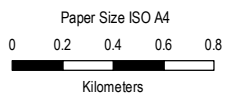
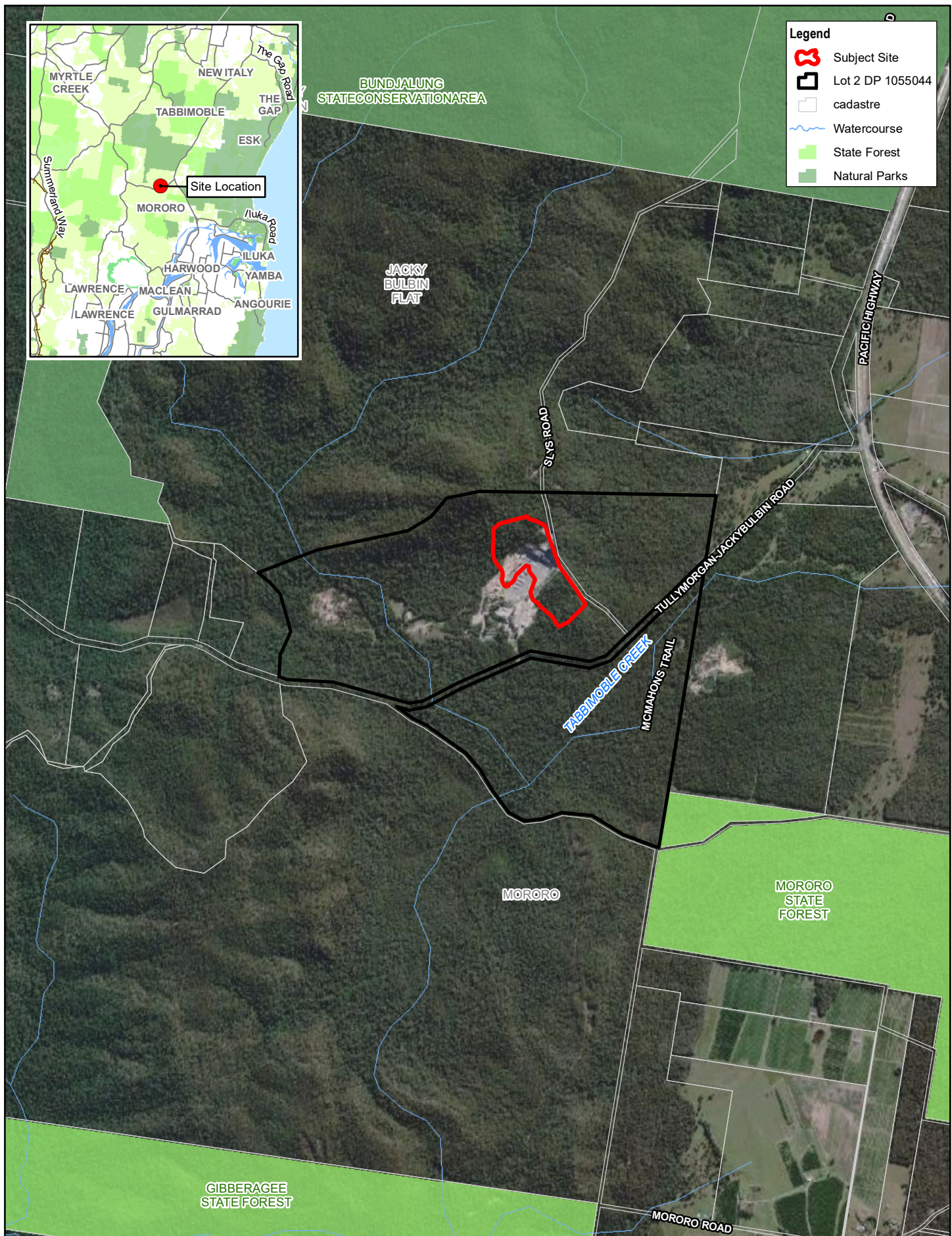
<b>Quarry Manager:</b>	Angus Deane
<b>Company:</b>	Mororo Quarry Pty Ltd
<b>Address:</b>	Tullymorgan-Jackybulbin Road, Mororo
<b>Phone:</b>	0487 519 582
<b>Email:</b>	angus@mororo.com

### 2.2 Purpose and scope of this report

This Annual Review has been prepared to satisfy the Conditions of Development Consent (SSD 6624), in particular Condition 10 of Schedule 5. The Annual Review covers the period from 1 July 2023 until 30 June 2024 (herein referred to as the reporting period).

This Annual Review provides a summary of actual operational and environmental management activities undertaken at Sly's Quarry during the reporting period. The Annual Review also addresses any complaints made during the reporting period.

The Annual Review has been prepared generally in accordance with the *Annual Review Guideline* (2015) where practicable.



Map Projection: Transverse Mercator  
Horizontal Datum: GDA 1994  
Grid: GDA 1994 MGA Zone 56

Sly's Quarry  
Annual Review 2020-21

Project No. 22-17528  
Revision No. 0  
Date 29 Sep 2021

Site location

FIGURE 2-1

## 2.3 Limitations

This report has been prepared by GHD for Mororo Quarry Pty Ltd and may only be used and relied on by Mororo Quarry Pty Ltd for the purpose agreed between GHD and the Mororo Quarry Pty Ltd.

GHD otherwise disclaims responsibility to any person other than Mororo Quarry Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this Report are based on conditions encountered and information reviewed at the date of preparation of the Report. GHD has no responsibility or obligation to update this Report to account for events or changes occurring subsequent to the date that the Report was prepared.

Where this Report is relied on or used without obtaining this further advice from GHD, to the maximum extent permitted by law, GHD disclaims all liability and responsibility to any person in connection with, arising from or in respect of this Report whether such liability arises in contract, tort (including negligence) or under statute.

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GHD has prepared this report on the basis of information provided by Mororo Quarry Pty Ltd and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services, and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.



### 3. Approvals and licences

Table 3.1 summarises the key approvals currently held by Mororo Quarry which are relevant to the operations at Sly's Quarry.

Table 3.1 Key approvals, consents, and licences

Description	Date granted/ commencement date	Expiry/duration
<b>Project Approvals</b>		
Development Consent (SSD 6624)	5 May 2016. Modified 19 October 2017	31 May 2041
<b>Environmental Protection Licences</b>		
EPL 11649	12 June 2002. Licence varied 14 September 2020	In perpetuity (Anniversary 1 Jan) until surrendered

The requirements of the Development Consent via conditions of approval (CoA), relevant to the Annual Review, are shown in Table 3.2.

Table 3.2 Annual Review Requirements

Licence, Approval or Guideline	Section Reference	Requirement	Reference in this report									
Development consent and CoA SSD 6624	Schedule 2 Condition 16	The Applicant must: (a) Provide annual quarry production data to DRG using the standard form for that purpose. (b) Include a copy of this data in the Annual Review (see condition 9 of Schedule 5).	Appendix A									
	Schedule 2 Condition 19	The Applicant must pay to Council an annual financial contribution toward the maintenance of Tullymorgan-Jackybulbin Road. The contribution must be determined in accordance with the Maclean Shire Council S.94 Contribution Plan for Maintenance of Quarry Roads, November 1994, or any subsequent relevant contributions plan adopted by Council. The annual contribution must be paid to Council prior to 31 July each year and reported in the Annual Review required in condition 9 of Schedule 5.	Appendix B									
	Schedule 3 Condition 1	The Applicant must comply with the operating hours set out in Table 1. <i>Table 1: Operating Hours</i> <table border="1"> <thead> <tr> <th>Activity</th> <th>Permissible Hours</th> </tr> </thead> <tbody> <tr> <td>Employee arrival</td> <td> <ul style="list-style-type: none"> <li>From 6:30 am Monday to Saturday inclusive</li> <li>From 7:30 am Sundays or public holidays if engaged in maintenance, site security or other similar activities</li> </ul> </td> </tr> <tr> <td>Quarrying operations including loading and dispatch of laden trucks</td> <td> <ul style="list-style-type: none"> <li>7 am to 6 pm Monday to Friday</li> <li>7 am to 1 pm Saturday</li> <li>7 am to 4 pm Saturday if fulfilling a contract for the supply of quarry products to the Pacific Highway update project (SSD 4963)*</li> <li>At no time on Sundays or public holidays</li> </ul> </td> </tr> <tr> <td>Blasting</td> <td> <ul style="list-style-type: none"> <li>9 am to 3 pm Monday to Friday (except public holidays)</li> </ul> </td> </tr> <tr> <td>Maintenance</td> <td> <ul style="list-style-type: none"> <li>May be conducted at any time, provided that these activities are not audible at any privately-owned residence</li> </ul> </td> </tr> </tbody> </table> <p>*Note: Evidence of contracts that cover those periods during which extended Saturday afternoon operating hours are undertaken must be reported in the Annual Review required by condition 9 of Schedule 5.</p>	Activity	Permissible Hours	Employee arrival	<ul style="list-style-type: none"> <li>From 6:30 am Monday to Saturday inclusive</li> <li>From 7:30 am Sundays or public holidays if engaged in maintenance, site security or other similar activities</li> </ul>	Quarrying operations including loading and dispatch of laden trucks	<ul style="list-style-type: none"> <li>7 am to 6 pm Monday to Friday</li> <li>7 am to 1 pm Saturday</li> <li>7 am to 4 pm Saturday if fulfilling a contract for the supply of quarry products to the Pacific Highway update project (SSD 4963)*</li> <li>At no time on Sundays or public holidays</li> </ul>	Blasting	<ul style="list-style-type: none"> <li>9 am to 3 pm Monday to Friday (except public holidays)</li> </ul>	Maintenance	<ul style="list-style-type: none"> <li>May be conducted at any time, provided that these activities are not audible at any privately-owned residence</li> </ul>
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Maintenance	<ul style="list-style-type: none"> <li>May be conducted at any time, provided that these activities are not audible at any privately-owned residence</li> </ul>											
Schedule 3, Condition 36	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. d) Report on waste management and minimisation in the Annual Review, to the satisfaction of the Secretary.	Section 6.7										



Licence, Approval or Guideline	Section Reference	Requirement	Reference in this report
	Schedule 5 Condition 10	Annual Review 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:	Entire Report
		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.	Section 4
		b) Include a comprehensive review of the monitoring results and complaints records of the development over the previous financial year, which includes a comparison of these results against the: <ul style="list-style-type: none"> <li>– Relevant statutory requirements, limits, or performance measures / criteria.</li> <li>– Requirements of any plan or program required under this consent.</li> <li>– Monitoring results of previous years.</li> <li>– Relevant predictions in the Environmental Impact Statement (EIS).</li> </ul>	Section 5 and 7
		c) Identify any non-compliance over the past financial year, and describe what actions were (or are being) taken to ensure compliance.	Section 8
		d) Identify any trends in the monitoring data over the life of the development.	Section 5
		e) Identify any discrepancies between the predicted and actual impacts of the development and analyse the potential cause of any significant discrepancies.	Section 8
		f) Describe what measures will be implemented over the current financial year to improve the environmental performance of the development.	Section 5

## 4. Operation summary

During the reporting period, the quarry extracted material from Stage 2B only, shown in Figure 4.1.

In the reporting period, 103,081.37 tonnes of material was extracted, as shown in Table 4.1. The table also shows the volume of material sold from Slys Quarry during the reporting period was 95,488 tonnes. This shows the material extracted and transported during the reporting period was within the approved limit of 500,000 tonnes.

**Table 4.1** *Blast and production summary*

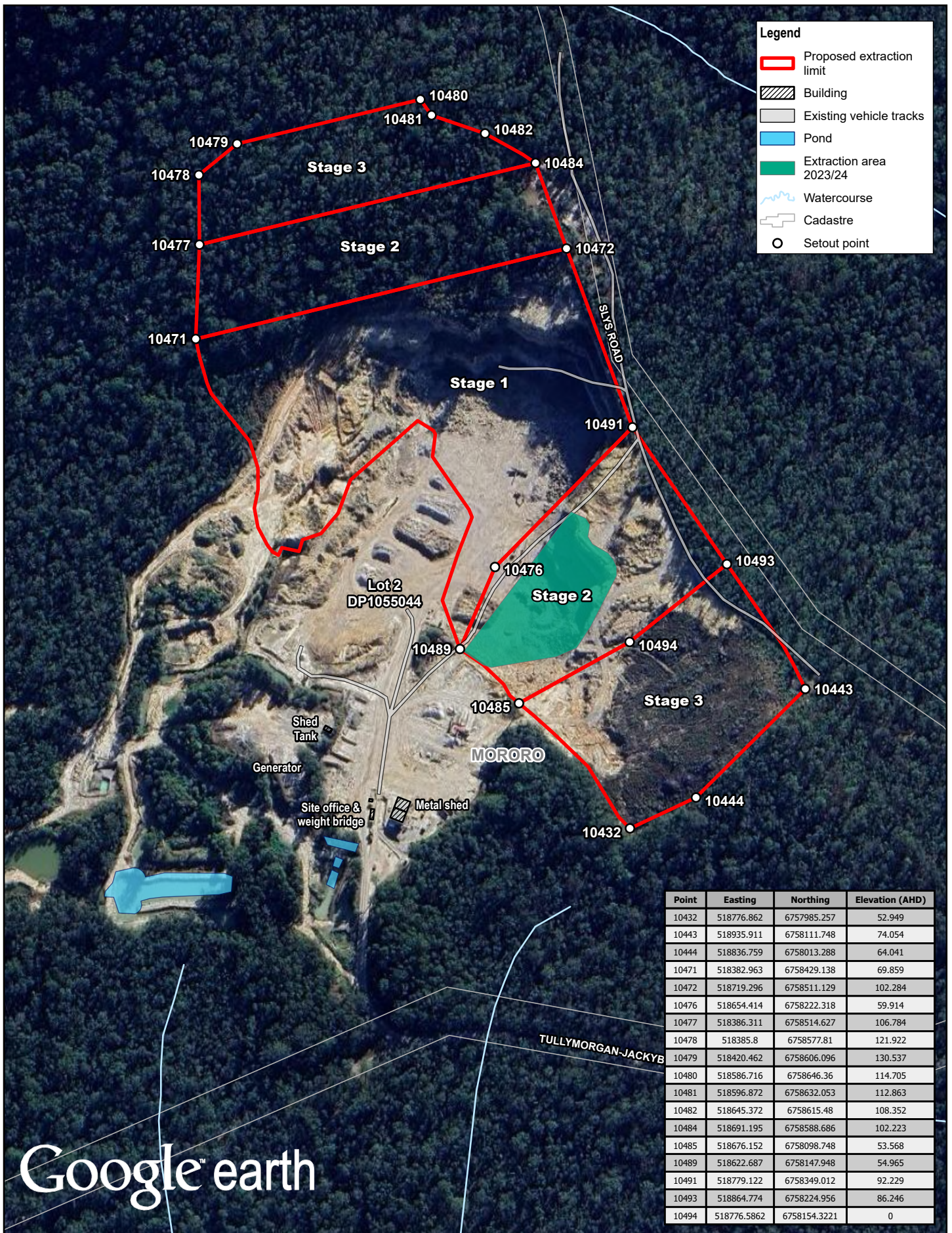
Reporting period	Extracted		Sold/transported (tonnes)
	Volume (m <sup>3</sup> )	Tonnes	
2020/21	29,351*	73,377*	142,121
2021/22	61,828	184,633	263,091
2022/23	105,926	264,814.30	278,912
2023/24	41,233	103,081.37	95,488

\*This was reported incorrectly in the 2020/21 Annual Report

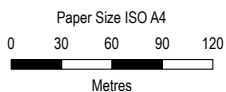
The primary quarry operations undertaken during the reporting period included:

- Reviewing management plans on 14 August 2023.
- The following management plans were updated in the reporting period:
  - The BRMP was updated on 28/03/2024 but has not been approved by DPE to date.
  - The SWMP was updated on 28/09/2023 and approved by DPE on 21 December 2023.
- Nest box monitoring, see Appendix C.
- Area C rehabilitation monitoring.
- Environmental monitoring, see Section 6 and Appendix D.
- Stewardship site monitoring.

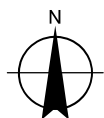




Google™ earth



Map Projection: Transverse Mercator  
Horizontal Datum: GDA 1994  
Grid: GDA 1994 MGA Zone 56



Sly's Quarry  
Annual Review

Project No. 22-17528  
Revision No. 0  
Date 29/09/2022

Extraction and clearing

FIGURE 4-1



## 5. Actions from previous Annual Review

The actions identified during the previous Annual Review for implementation during the current Annual Review reporting period are presented in Table 5.1, along with the current status.

*Table 5.1 Status of actions from previous Annual Review*

Action predicted in previous Annual Review	Action taken by the Operator	Reference
Extraction of Stage 2B to continue, as shown in Figure 4.1.	Material was extracted only from Stage 2B during the reporting period.	Section 4
Extraction of 300,000 tonnes.	Extraction of 103,081.37 tonnes of material during the reporting period.	Section 4
Management plan update and review.	Management plans have been reviewed. Dates of each review are provided in each environmental performance section.	Section 6
Continuing nest box monitoring.	Ongoing. In accordance with the Nest Box Plan of Management, monitoring must be undertaken twice per year for a period of five years. This reporting period comprises Year 4 and Year 5 of the monitoring.	Appendix C
Stewardship site monitoring and implementation as per agreement.	Ongoing.	
Continuing to implement the requirements of the management plans, EPL and CoA.	Yes, see statement of compliance.	Section 1
Area C rehabilitation monitoring.	Ongoing.	

## 6. Environmental performance

### 6.1 Noise

#### 6.1.1 Environmental management

Operational noise is managed by Mororo Quarry in accordance with the approved Noise Management Plan (NMP). The NMP covers all operational activities with the potential to generate noise at Sly's Quarry. It details specific noise management and mitigation measures, outlines monitoring and reporting requirements and provides clear definition of the roles and responsibilities for noise management. The objectives of the NMP are:

- Ensure full compliance with the relevant legislative requirements and CoA.
- No exceedance of the operational noise limits.
- No justified complaints from adjacent residents in relation to noise generation.
- No out of hours work.

The NMP was reviewed by Newman Quarrying on 14/08/2023.

Mororo Quarry proactively implements a range of noise mitigation measures for operational activities at Sly's Quarry. During the reporting period these included, but were not limited to the following:

- Ensuring machines were operated at low speed and were switched off when not being used.
- Progressive replacement of components of the existing fleet found to be generating excessive noise.
- Maintaining plant and equipment to manufacturer's standards.
- Scheduling noisy activities between 7:00 am and 6:00 pm where possible.
- Closing all engine covers while equipment is operating.
- Avoiding dropping materials from height and avoiding metal to metal contact on material.

#### 6.1.2 Environmental performance

As reported in the 2018/19 Annual Review, Mororo Quarry ceased noise monitoring following approval from DPE. Although no noise monitoring was carried out during the reporting period, there was less extraction than what was originally proposed and no complaints, so it is expected the noise impacts were less than predicted which indicated the operations complied with the noise criteria.

#### 6.1.3 Improvements and initiatives

Mitigation measures and monitoring identified in the CoA, EPL and NMP will continue to be implemented.

### 6.2 Blasting

#### 6.2.1 Environmental management

Blasting operations at Sly's Quarry are managed in accordance with the Blast Management Plan (BMP), which covers blasting activities associated with the quarry and appropriate mitigation measures. The objectives of blast management at Sly's Quarry are:

- Ensure full compliance with the relevant legislative requirements and CoA.
- No exceedance of the blasting criteria.
- No justified complaints from adjacent residents in relation to blasting and vibrations.

In order to meet these objectives Mororo Quarry proactively implements a range of mitigation measures for blasting activities at Sly's Quarry. During the reporting period these included:

- Only undertaking blasting operations between 09:00 and 15:00 Monday to Friday.
- Providing all sensitive receivers at least 24 hours' notice when blasting operations were undertaken.

Mororo Quarry completed blast monitoring in accordance with the CoA and BMP.

## 6.2.2 Environmental performance

Blast monitoring was undertaken for all blasts at Sly's Quarry during the reporting period. Monitoring was undertaken from Receiver 3, as outlined in the EPL. Receiver 3 is located approximately 1.5 km south of the quarry boundary.

The BMP was reviewed by Newman Quarrying on 14/08/2023. Project specific blast criteria are outlined in EPL 11649 and CoA SSD 6624. A summary of the blast criteria is provided in Table 6.1.

**Table 6.1** Sly's Quarry blast 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.

A total of 4 blasts were undertaken during the reporting period and all were below the trigger threshold. A summary of the blast monitoring is provided in Table 6.2.

**Table 6.2** Summary of blast monitoring

Date	Time	Vibration (mm/s)	Pressure (dBL)	Complies
<b>Blast criteria</b>		<b>5</b>	<b>115</b>	
<b>Trigger value</b>		<b>0.8</b>	<b>106</b>	
10/08/2023	2:49 pm	0.015	101.2	Yes
4/09/2023	1:12 pm	0.1	106.6	Yes
5/03/2024	2:30 pm	0.25	113	Yes
14/06/2024	2:06 pm	Not triggered	Not triggered	Yes

Based on the predicted results in the EIS, presented in Figure 6.1, the actual results are consistent. This is similar to the previous year when all results were less than the criteria.



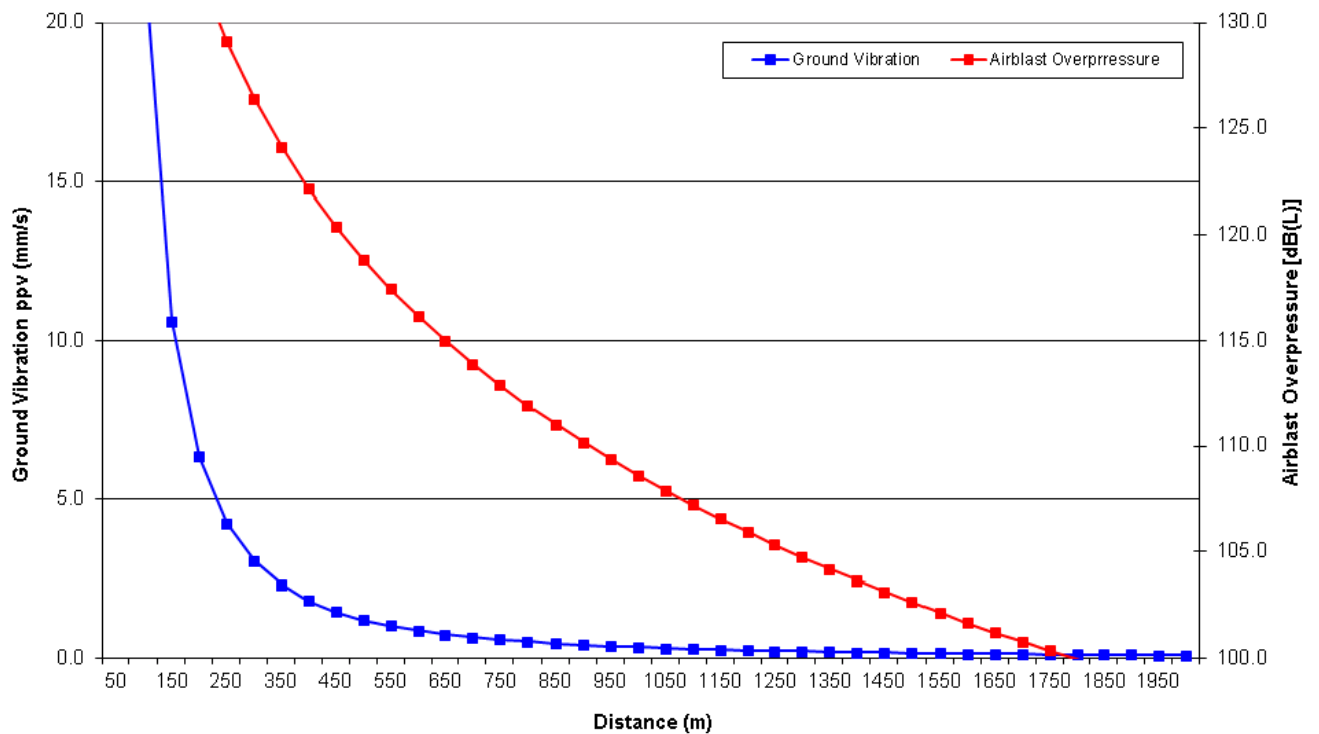


Figure 6.1 EIS estimated ground vibration and airblast overpressure levels from blasting

### 6.2.3 Improvements and initiatives

Given that no exceedances of the blast criteria were recorded in the reporting period, no improvements are considered necessary. Monitoring and mitigation measures identified in the CoA, EPL and BMP will continue to be implemented.

## 6.3 Air quality

### 6.3.1 Environmental management

Air quality at Sly's Quarry is managed in accordance with the Air Quality Management Plan (AQMP), CoA and EPL. The objectives of the AQMP are:

- Minimise and manage potential air quality/dust impacts from the development in accordance with relevant legislative requirements and CoA.
- Control dust and exhaust emissions of plant and equipment from quarrying activities.
- Achieve particulate matter and dust concentrations that meet the approved air quality criteria.
- No visible offsite dust emissions as a result of site operations.
- No justifiable complaints related to air quality attributable to site operations.

The AQMP was reviewed by Newman Quarrying on 14/08/2023.

Mororo Quarry proactively implements a range of air quality mitigation measures for operational activities at Sly's Quarry. During the reporting period these included, but were not limited to the following:

- Covering loads.
- Watering haulage routes to reduce dust.
- Using water sprays on crushers.

## 6.3.2 Environmental performance

Dust monitoring ceased in August 2018 following approval from DPE given there was no exceedances during previous years. Air quality monitoring will recommence, in accordance with the AQMP, if the site receives a dust complaint or makes an operational change that is likely to increase dust emissions from the site. As there were no complaints and the operations extracted less than originally proposed or was assessed in the EIS, it is expected the impacts were less than predicted.

## 6.3.3 Improvements and initiatives

Monitoring and mitigation measures identified in the CoA, EPL and AQMP will continue to be implemented.

## 6.4 Soil and water quality

### 6.4.1 Environmental management

Soil and water quality at Sly's Quarry are managed in accordance with the Soil and Water Management Plan (SWMP), which outlines appropriate mitigation measures for soil, surface water and groundwater management.

The objectives of soil and water management at Sly's Quarry are:

- Ensure full compliance with the relevant legislative requirements and CoA.
- Meet EPL water discharge parameters for all controlled discharges.
- Ensure training on soil and water management is provided to all relevant personnel through site inductions.

The SWMP was updated on 28/09/2023 and approved by DPE on 21/12/2023. The SWMP was reviewed by Newman Quarrying on 14/08/2023.

In order to meet these objectives, Mororo Quarry implements a range of mitigation measures and monitoring requirements as outlined in the SWMP, which include:

- Daily weather monitoring.
- Daily rainfall monitoring.
- Weekly monitoring of erosion and sediment controls, and following rain.
- Baseline monitoring following rain.
- Basin monitoring prior to discharging.
- Basin capacity monitoring following rain.
- Spill kit checks monthly and following use.
- Groundwater monitoring.

### 6.4.2 Environmental performance

#### Basin monitoring

Monitoring was undertaken for total suspended solids (TSS), pH and oil and grease at the outlet of the main basin (MP1) prior to discharging. This location is the EPL monitoring point. The criteria outlined in the SWMP and EPL is presented in Table 6.3.

Table 6.3 Basin monitoring criteria

Pollutant	Concentration/Limit
Oil and grease	Nil visible
pH	6.5-8.5
Total suspended solids (TSS)	50 mg/L

Results of the basin monitoring are summarised in Table 6.4. Full water quality records are provided in Appendix D. This shows the water quality complied with the EPL criteria prior to discharging, as predicted in the EIS. The results are reasonably consistent with previous years, with the TSS results less than 50 mg/L and between a pH of 7.4 and 8.

**Table 6.4** Summary of basin monitoring results

Date	Rain		Discharging	TSS (mg/L)	pH	Oil	Treated?	Discharged
	24hrs	5 Days						
<b>Criteria</b>				<b>50</b>	<b>6.5-8.5</b>	<b>Nil</b>		
4/07/23	14	15	No	16	8	Nil	No	Yes
13/11/2023	0	21	No	18	7.5	Nil	No	Yes
2/01/2024	0	130	No	9	7.6	Nil	No	Yes
22/01/2024	38	38	No	37	7.4	Nil	No	Yes
7/04/2024	2	36	No	8	7.6	Nil	No	Yes

### Surface water

Surface water samples were collected at WQ1 and WQ2 following greater than 10 mm of rain in a 24 hour period until the end of 2020, when DPE agreed to reducing the monitoring frequency to once per quarter based on no impact on water quality being detected from the water quality sampling since operations commenced. A total of 2 sampling events occurred during the reporting period. A summary of the results are presented in Table 6.5 with full water quality records provided in Appendix D. This shows the water quality at the two monitoring locations were relatively consistent. The water quality is also relatively good, which is as predicted in the EIS.

**Table 6.5** Baseline surface water monitoring results summary

Site	TSS (mg/L)		pH		Oil (visible)	
	WQ1	WQ2	WQ1	WQ2	WQ1	WQ2
Median	3.85	3.25	6.55	6.25	None	None
Maximum	4.7	4.5	6.8	6.4	None	None
Minimum	3	2	6.3	6.1	None	None

### Groundwater

As approved by DPE in letters dated 02/12/2020 and 04/02/2021 groundwater monitoring is now undertaken annually at the three groundwater wells.

A summary of the results are presented in Table 6.6, with full water quality records provided in Appendix D. GW3 was dry and unable to be sampled. The pH results vary between GW1 and GW2. pH is highest at GW1 and lower at GW2. It is not clear what would cause this difference but the pH at both locations is considered to be within the natural variability of the area. Conductivity is relatively consistent between the two locations. The groundwater quality results are consistent with previous years and the predictions of the EIS.

**Table 6.6** Groundwater monitoring results

Date	Rain		GW1		GW2		GW3	
	24 hrs	5 days	pH	Cond	pH	Cond	pH	Cond
5/10/2023	0	0	6.2	250	5	230	Dry	Dry

## 6.4.3 Improvements and initiatives

Mororo Quarry will continue to implement the appropriate mitigation measures and monitoring required by the EPL and SWMP.

## 6.5 Biodiversity and rehabilitation

### 6.5.1 Environmental management

Biodiversity and rehabilitation at Sly's Quarry is managed in accordance with the Biodiversity and Rehabilitation Management Plan (BRMP) and CoA. The targets outlined in the BRMP include:

- Ensure full compliance with the relevant legislative requirements and CoA.
- No fauna fatalities.
- No unapproved disturbance of vegetation.
- No new occurrences of weeds or pathogens on-site.

The BRMP was updated on 28/09/2023 and 28/03/2024 but these revisions have not been approved to date.

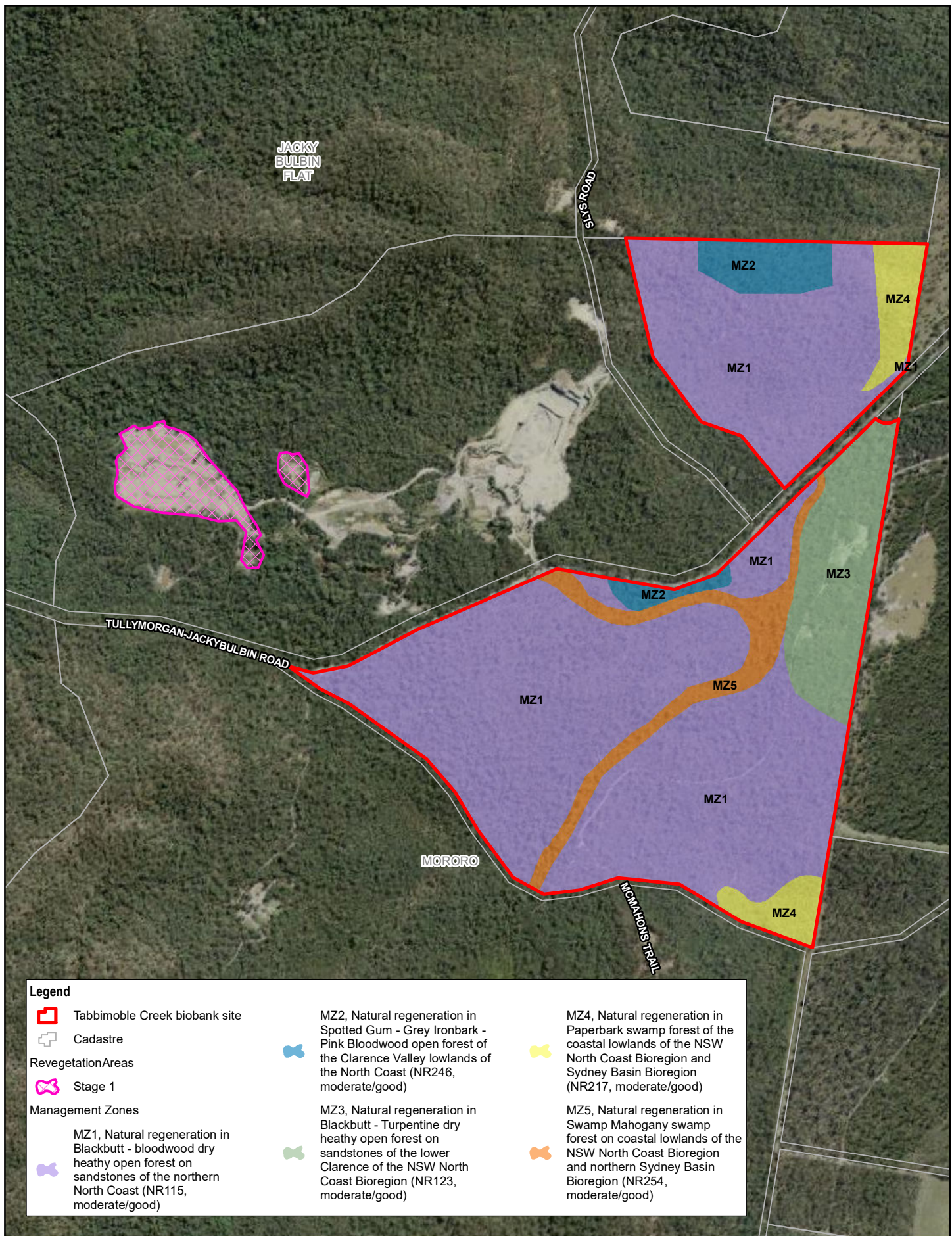
In order to meet these objectives, Mororo Quarry implements a range of mitigation measures and monitoring requirements as outlined in the BRMP, which include:

- Restricting vehicle movements to daylight hours.
- Implementing speed limits at the site.
- Revegetating Area C in accordance with the Rehabilitation Plan.
- Clearly marked the limits of clearing.
- Nest box monitoring in accordance with the Nest Box Management Plan, see Appendix C.
- Maintained the Stewardship site in accordance with the Agreement.

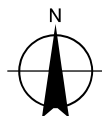
### 6.5.2 Environmental performance

Revegetation at Area C is ongoing.

Figure 6.2 and Figure 6.3 below show that the natural revegetation appears to have progressed with plants growing and additional species observed. The western portion has been slow to revegetate and may require assistance if natural revegetation continues to fail in the next few years.



Map Projection: Transverse Mercator  
Horizontal Datum: GDA 1994  
Grid: GDA 1994 MGA Zone 56



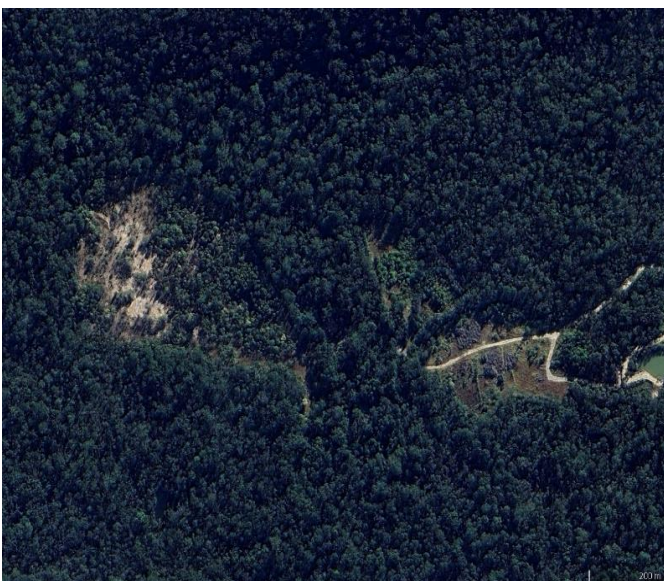
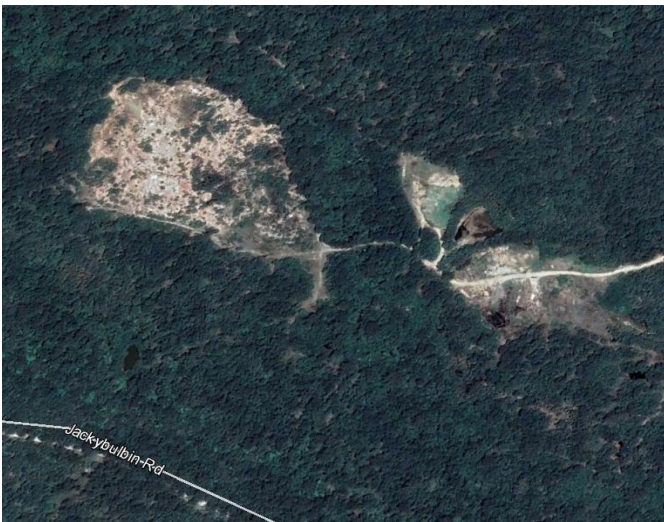
Sly's Quarry  
Annual Review 2020-21

Project No. 22-17528  
Revision No. 0  
Date 29 Sep 2021

**Biobank and revegetation areas**

**FIGURE 6-2**





**Figure 6.3** Aerial photograph of Area C rehabilitation between 5/10/2013 (top), 25/10/2018 (middle) and July 2023 (bottom)



In the previous reporting period, Mororo Quarry were progressing the removal of the 317 Common Planigale credits from Condition 27, Schedule 3, and were in the process of engaging an expert to assess if the site contains Common Planigale habitat.

Despite years of trying, we have been unsuccessful in finding a suitable expert to assess the suitability of Slys Quarry for the Common Planigale. We have since become aware of some BCD funded research into Planigale monitoring techniques using artificial shelter sites being trialled in the Tweed area. It has apparently been successful and may be a good option at Slys Quarry due to the site conditions, which makes traditional survey techniques difficult.

BCD have advised that because the use of artificial shelter sites is not a technique included in the Biodiversity Assessment Methodology (BAM), it would not be suitable for the development site. However, the Biodiversity Conservation Trust (BCT) are responsible for deciding if it could be used in the Stewardship site.

We contacted the BCT on 18 July 2023 and received a response dated 31 July 2023 advising that it would be the Credit Supply Taskforce (CST) that would make the decision about the suitability of using the artificial shelter sites technique. We contacted the CST on 31 July 2023 and received a response dated 31 October 2023 to suggest:

*Generally, we try to align survey methods on impact sites with survey methods on offset sites. Accordingly, it is likely that the CST would also not endorse the artificial shelter sites survey approach for Common Planigale, however, we are open to further discussion. If you would like to discuss this further, we would organise an officer with the appropriate expertise to meet with you.*

We held a meeting with CST on 11 March 2024 which indicated, if the Common Planigale is detected on the site using an artificial shelter site, the CST is open to accepting a variation application to add species credits for this species. Since then, Slys Quarry has been sold to Mororo Quarry, who are deciding on the next steps.

### 6.5.3 Improvements and initiatives

Mororo Quarry will continue to implement the BRMP and Stewardship Agreement requirements to minimise impacts on biodiversity. They will also progress the retirement of the Common Planigale species credits.

## 6.6 Heritage

### 6.6.1 Environmental management

Management of both historical and Aboriginal cultural heritage at Slys Quarry is in accordance with the Heritage Management Plan (HMP) and CoA. The targets outlined in the HMP are to:

- Ensure full compliance with the relevant legislative requirements and CoA.
- No damage to heritage items.
- All site staff and contractors trained on unexpected finds protocol.

### 6.6.2 Environmental performance

During the reporting period, Mororo Quarry has followed the protocols outlined in the HMP. As predicted in the EIS, no unexpected finds of historical or Aboriginal heritage items have been recorded during the reporting period.

The HMP was reviewed by Newman Quarrying on 14/08/2023.

### 6.6.3 Improvements and initiatives

The HMP and CoA will continue to be implemented at Slys Quarry over the next reporting period.

## 6.7 Waste

### 6.7.1 Environmental management

Waste at Sly's Quarry is managed in accordance with the Waste Management Plan (WMP), CoA and EPL. The objectives of the WMP are to:

- Ensure full compliance with the relevant legislative requirements and CoA.
- Waste generation minimised through the hierarchy of waste management priorities.
- Separable waste bins provided.

The WMP encouraged using the waste management hierarchy of avoid, reuse/recycle, and then dispose to mitigate the impacts of waste from a number of sources, including excavated material, green waste, general construction waste, contaminated soil, liquid waste, wastewater, biological waste, and domestic waste.

The WMP was reviewed by Newman Quarrying on 14/08/2023.

### 6.7.2 Environmental performance

The following mitigation measures were implemented by Mororo Quarry during the reporting period to manage waste on-site:

- Re-using excess materials.
- Recycling metal, waste oil and old batteries.
- Appropriate storage of chemicals and fuels in bunded areas with 110% capacity.
- Diverting clean water from the site.
- Routine weekly inspection to ensure the site is clean and tidy.

A summary of the type and quantity of wastes generated by the quarry during the 2023/24 reporting period are presented in Table 6.7. The volumes of waste were not predicted in the EIS; however, the type of wastes and disposal option is generally as predicted.

Table 6.7 Waste records

Waste	Amount*	Management option
General rubbish	4.5 m <sup>3</sup>	Landfill
Cardboard	-	Recycled and landfill
Oil	100 L	Recycled
Hydrocarbon bin	-	Landfill

\* Waste generated by Mororo Quarry, records of waste volumes prior to this, within the reporting period, are unknown.

### 6.7.3 Improvements and initiatives

Mororo Quarry will continue to implement the waste mitigation measures and conditions outlined in the WMP, CoA and EPL.

## 6.8 Traffic

### 6.8.1 Environmental management

Traffic at Sly's Quarry is managed in accordance with the Traffic Management Plan (TMP), CoA and EPL. The objectives of the TMP are:

- Ensure full compliance with the relevant legislative requirements and CoA.
- No justified complaints related to site traffic.

- No road damage from quarry vehicle movements beyond normal wear and tear.

The TMP was reviewed by Newman Quarrying on 14/08/2023.

In order to meet these objectives Mororo Quarry implemented the following mitigation measures during the reporting period:

- Implementation of the driver's code of conduct.
- No more than 150 laden trucks dispatched from the quarry on any day.

## 6.8.2 Environmental performance

Mororo Quarry present a truck movement summary on their website, which is summarised in Table 6.8.

A total of 3,537 trucks transported material from the quarry in the reporting period. Truck movements were compliant with the CoA and TMP.

**Table 6.8** *Truck movement summary*

Day	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	0	27	16	0	9	0	0	0	0	0	11	0
2	0	43	0	0	11	0	0	0	0	0	9	0
3	49	32	0	4	12	0	0	0	0	0	12	10
4	32	33	9	5	0	21	0	0	0	0	0	6
5	16	0	46	0	0	23	0	0	0	0	0	10
6	44	0	52	0	0	33	0	0	0	0	15	21
7	29	28	35	0	6	31	0	0	0	0	1	18
8	0	29	23	0	17	21	0	0	0	0	2	0
9	0	34	0	2	29	0	24	0	0	0	14	0
10	27	31	0	5	12	0	41	0	0	0	29	0
11	20	16	43	3	0	28	37	0	0	0	0	39
12	27	0	53	20	0	45	24	0	0	0	0	46
13	36	0	43	0	22	39	0	0	0	0	16	37
14	16	32	51	0	33	23	0	0	0	0	9	36
15	0	29	31	0	34	12	0	0	0	0	15	0
16	0	13	0	0	36	0	0	0	0	0	2	0
17	42	27	0	0	21	0	0	0	0	0	0	22
18	28	20	21	0	0	29	0	0	0	0	0	47
19	36	0	18	0	0	37	0	0	0	0	0	52
20	46	0	0	0	22	35	0	0	0	0	5	59
21	30	15	0	0	31	19	0	0	0	0	5	42
22	0	4	0	0	28	0	0	0	0	0	31	0
23	0	24	0	2	31	0	2	0	0	0	17	0
24	11	30	0	2	8	0	1	0	0	0	14	33
25	22	20	17	0	0	0	0	0	0	0	0	7
26	10	0	11	0	0	0	0	0	0	0	0	13
27	16	0	47	0	11	0	0	0	0	0	13	27
28	11	11	16	0	29	0	0	0	0	0	16	28
29	15	15	0	0	34	0	0	0	0	1	24	0

Day	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
30	0	31	0	13	27	0	0	-	0	1	3	0
31	-	11	-	4	-	0	0	-	0		21	-

The traffic impacts were a lot less than those predicted and with the previous reporting period. Truck numbers have reduced by 7,246 compared to the previous reporting period.

### 6.8.3 Improvements and initiatives

Mororo Quarry will continue to implement the traffic mitigation measures and conditions outlined in the TMP, CoA and EPL.

## 7. Community

In accordance with the CoA, an Environmental Management Strategy (EMS) was prepared, which included details of a complaints handling process for the quarry. In accordance with the EMS, a complaints telephone line was established, with the number advertised on the Sly's Quarry entrance and on the Mororo Quarry website. The EMS requires all complaints to include:

- The date and time of the complaint.
- The method by which the complaint was made.
- Any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect.
- The nature of the complaint.
- The action taken in relation to the complaint, including any follow-up contact with the complainant.
- If no action was taken, the reason why no action was taken.

Mororo Quarry records all complaints regarding quarry operations, in accordance with the EMS. The complaints are publicly available on their website.

During the reporting period, no complaints were received.

The EMS was reviewed by Newman Quarrying on 14/08/2023.

## **8. Independent audit**

An independent environmental audit (IEA) is required every three years, in accordance with CoA 11, Schedule 5. An IEA was completed in June 2023, so an IEA was not required during the reporting period. Actions identified in the 2023 IEA were provided in the 2022/23 Annual Review and all actions were closed out in the previous reporting period.



## **9. Incidents and non-compliance**

### **9.1 Incidents**

No incidents occurred during the reporting period.

### **9.2 Non-compliance.**

No non-compliances were recorded during the reporting period.

### **9.3 Regulatory agency actions**

There has been no regulatory agency action during the reporting period.

## **10. Activities to be completed in the next reporting period**

In the next 12 months, activities at the quarry are anticipated to include:

- Extraction of Stage 2B to continue with an estimated extraction volume of 300,000 tonnes.
- Management plan update and review.
- Nest box monitoring.
- Area C rehabilitation monitoring.
- Stewardship site monitoring and implementation as per agreement.
- General operations to meet EPL and CoA.

# 11. Conclusion

This Annual Review has been completed for Sly's Quarry, on behalf of Mororo Quarry, in accordance with Conditions 10, Schedule 5 of SSD 6624, to assess environmental compliance at the site from 1 July 2023 to 30 June 2024.

The primary quarry operations undertaken during the reporting period included:

- Management plan reviews.
- Updating the SWMP and the BRMP.
- Nest box monitoring.
- Area C rehabilitation monitoring.
- Environmental monitoring.
- Stewardship site monitoring.
- Extraction from Stage 2B only.
- Total extraction of 103,081.37 tonnes.

Activities proposed for the next reporting period include:

- Extraction of Stage 2B to continue with an estimated extraction volume of 300,000 tonnes.
- Management plan update and review.
- Nest box monitoring.
- Area C rehabilitation monitoring.
- Stewardship monitoring and implementation as per agreement.
- General operation to meet EPL and CoA.

An assessment of the environmental monitoring completed at Sly's Quarry was undertaken, with compliance against CoA of SSD 6624, EPL 11649 and the relevant management plans also assessed. Generally, environmental management at Sly's Quarry, during the reporting period, was as predicted, consistent with previous reporting periods and compliant.

No complaints were received during the reporting period.

Environmental management will continue to comply with the CoA of SSD 6624, EPL 11649 and the relevant management plans.

## 12. References

GHD 2015. *Environmental Impact Statement*. May 2015.

GHD 2022. *Air Quality Management Plan*. November 2022.

GHD 2024. *Biodiversity and Rehabilitation Management Plan*. March 2024.

GHD 2022. *Blast Management Plan*. November 2022.

GHD 2022. *Environmental Management Strategy*. November 2022.

GHD 2023. *Heritage Management Plan*. November 2022.

GHD 2022. *Noise Management Plan*. November 2022.

GHD 2023. *Soil and Water Management Plan*. September 2023.

GHD 2022. *Traffic Management Plan*. November 2022.

GHD 2022 *Waste Management Plan*. November 2022.

NSW Government 2015, *Post-approval requirements for State Significant mining developments – Annual Review Guideline*.

# Appendices

# **Appendix A**

**Production data**



# Extractive Materials Return 2021-2022



Regional  
NSW

Form S1 – Period Ending 30 June 2022

Quote RIMS ID in all correspondence

2024

Quarry Id: Rims ID: <u>400563</u>	Inquiries please telephone: (02) 4063 6713 Completed or Nil Returns Email – mineral.royalty@regional.nsw.gov.au Postal Address (see below)
Operators Name: <u>MORORO QUARRY T/A NEWBANKS QUARRY</u> Address: <u>4 Ironbark Dr, Townsend NSW</u>	
Email: <u>admin@mororo.au</u>	Please amend name, postal address and location of mine or quarry if incorrect or incomplete.
Quarry Name: <u>Sly's Quarry</u> Quarry Address: <u>Jackybalbin Road Mororo, 2469</u>	

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, Performance

Please complete all the following information to assist in identifying the location of the Quarry

Typical Geology Sandstone

Nearest Town to Quarry Maclean NSW

Local Council Name Clarence Valley Council

Deposited Plan and Lot Number/s of Quarry Lot 2, DP 1055044

Email Address of Operator admin@mororo.au

Name of Owner or Licensee Mororo Group

Postal Address of Licensee 4 Ironbark Dr, Townsend NSW

Licence/Lease Number/s (if any)  
From Mining, Exploration & Geoscience (NSW Mineral Resources) N/A  
From Crown Lands or other NSW Department 99D 6624

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 [Signature] DATE 9/9/24
- CONTACT PERSON for this return Angus Deane
- NAME (Block letters) ANGUS DEANE Telephone 0487 519 582

# 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
<b>Virgin Materials</b>		
<b>Crushed Coarse Aggregates</b>		
Over 75mm	<u>Over 75mm</u>	<u>85,302.89</u>
Over 30mm to 75mm	<u>30 to 75mm</u>	<u>1,378.4</u>
5mm to 30mm	<u>5 - 30mm</u>	<u>1,822.96</u>
Under 5mm	<u>-</u>	
Natural Sand	<u>-</u>	
Manufactured Sand	<u>Manufactured sand</u>	<u>1,146.8</u>
Prepared Road Base & Sub Base	<u>various road bases</u>	<u>5,839.02</u>
Other Unprocessed Materials		
<b>Recycled Materials</b>		
<b>Crushed Coarse Aggregates</b>		
Over 75mm	<u>-</u>	
Over 30mm to 75mm	<u>-</u>	
5mm to 30mm	<u>-</u>	
Under 5mm	<u>-</u>	
Natural Sand	<u>-</u>	
Manufactured Sand	<u>-</u>	
Prepared Road Base & Sub Base	<u>-</u>	
Other Unprocessed Materials	<u>-</u>	
<b>River Gravel</b>		
Over 30mm	<u>-</u>	
5mm to 30mm	<u>-</u>	
Under 5mm	<u>-</u>	
<b>Construction Sand</b> Excluding Industrial		
<b>Industrial Sand</b>		
Foundry, Moulding	<u>-</u>	
Glass	<u>-</u>	
Other (Specify)	<u>-</u>	
<b>Dimension Stone</b> Building, Ornamental, Monumental		
Quarried in Blocks	<u>-</u>	
Quarried in Slabs	<u>-</u>	
<b>Decorative Aggregate</b> Including Terrazzo		
<b>Loam</b> Soil for Topdressing, Garden soil, Horticultural purposes)		
<b>TOTAL SITE PRODUCTION</b>		<u>95,488.07</u>
<b>Gross Value (\$) of all Sales</b>		<u>\$201,450.43</u>
<b>Type of Material</b>		<u>Sandstone</u>
<b>Number of Full-Time Equivalent (FTE) Employees</b>		<u>6</u>
<b>Employees</b>		<u>6</u>
<b>Contractors</b>		<u>1</u>

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



# **Appendix B**

**Council contributions**



clarence  
VALLEY COUNCIL

ABN: 85864095684

Locked Bag 23  
Grafton NSW 2460

**Tax Invoice**

**Official Receipt**

14/08/2024

Receipt No:

919964

To: Mororo Quarry Pty Ltd T/AS Newman  
Quarrying  
4 Ironbark Drive  
TOWNSEND NSW 2463

Applic	Reference	Amount
--------	-----------	--------

GL Receipt

GL S94QuryRdsJacky		\$4,684.93
--------------------	--	------------

1 - Newman Quarry - Annual S94 Contributions

Qty 1, CredCardSurcharge		\$25.55
--------------------------	--	---------

1

GL19997480		\$2.56
------------	--	--------

<b>Transaction Total:</b>		<b>\$4,713.04</b>
---------------------------	--	-------------------

<b>Includes GST of:</b>		<b>\$2.56</b>
-------------------------	--	---------------

**Amounts Tendered**

Cash	\$0.00
------	--------

Cheque	\$0.00
--------	--------

Db/Cr Card	\$4,713.04
------------	------------

Money Order	\$0.00
-------------	--------

Agency	\$0.00
--------	--------

<b>Total</b>	<b>\$4,713.04</b>
--------------	-------------------

Rounding	\$0.00
----------	--------

Change	\$0.00
--------	--------

<b>Nett</b>	<b>\$4,713.04</b>
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You are a valued customer of Clarence Valley Council. We thank you for your payment.

Please Note: The print quality of this receipt will diminish over time.

A surcharge of 0.6% applies to payments by Credit Card

Printed 14/08/2024 11:15:21AM



# **Appendix C**

**Nest box monitoring reports**

Ref: 3832223: NewmansQuarrying/NestBoxMonitoringEpisode8

5<sup>th</sup> June 2023

Newman's Quarrying  
PO Box 292  
Yamba NSW 2464  
**Attention:** Mark Newman

**Re: Nest Box Monitoring – Episode 8 of Stage 1 - Lot 2 DP 1055044 Tullymorgan-Jackybulbin Road**

### **1.0 - Introduction**

The proposal to expand quarrying operations at Lot 2 DP 1055044 Tullymorgan-Jackybulbin Road was approved by the Minister for Planning on the 5<sup>th</sup> May 2016 (SSD 6624). The preparation of a Nest Box Management Plan was identified as an additional requirement from the EIS (GHD 2015) and Biodiversity and Rehabilitation Management Plan (GHD 2017). This Plan identified nest boxes be installed in a number of stages, the first stage specified that prior to the clearing of vegetation, 12 nest boxes would be installed to provide habitat for any displaced hollow dependant fauna. These were installed in February 2018 followed by additional stages of nest box installation over three separate time periods in October, November and December of 2021 to accommodate the remainder of clearing operations associated with the approved expansion.

In accordance with the Nest Box Plan of Management, monitoring must be undertaken twice per year for a period of five years. In essence, this equates to 10 monitoring episodes for each nest box installed.

The current round of monitoring represents:

- The second episode for Year 4 for the 12 nest boxes installed back in February 2018 and
- Second episode for Year 1 for the 72 nest boxes installed in spring/summer of 2021.

### **2.0 - Episode Six Monitoring Details**

The site was accessed on the 3-4<sup>th</sup> June 2023 for the purposes of inspecting all 84 installed nest boxes. A ladder with a fall arrest (belay and harness) system was used to access each nest box so that wildlife could be positively identified and any 'quick fix' maintenance activities could be performed at that time.

### **3.0 - Monitoring Results**

Twenty-five (30%) of the 84 nest boxes showed signs of use by native wildlife. This included a number of direct wildlife observations including:

- Yellow-footed Antechinus (*Antechinus flavipes*) using a scansorial type box installed as part of Stage 2 works (Plate 3-1);
- Sugar Gliders (*Petaurus breviceps*) using some of the scansorial and small glider type boxes (Plate 3-2);
- Lesser Long-eared Bats (*Nyctophilus geoffroyi*) using some of the multi-chambered bat boxes including one observation of six individuals and the presence of many scats on the ground indicating some sustained use (Plate 3-3).

Indirect signs in the form of nesting materials were observed at the remaining 20 boxes and included glider nests, shallow cupped areas of leaves indicative of brushtail possum use, antechinus nests and scats plus bird nests (Plate 3-4).

No feral or pest species in the form of introduced birds (i.e. Common Myna) or bee hives were recorded. Termites and Golden-tailed Spiny Ant were recorded in or near a number of the nest boxes but are considered natural or indicative of the surrounding ecosystem processes.

Maintenance activities were limited to some rewiring works, nest box repositioning and some lid adjustments. Termites remain active in Nest Box 4 from Stage 1 install in February 2018, a parrot design box that has been previously used by Sugar Glider. This box is probably at the point where it is no longer functional and that a new one should be installed as part of the next round of monitoring. A number of the newly installed nest boxes have been constructed in such a way that leaves large gaps present in the floor and walls of the nest box, or with the drying of the timber, they have split. Some maintenance intervention is required on 10 of these boxes with the most practical solution installing a new piece of timber over the gap (i.e. cladding).



**Plate 3-1.** Yellow-footed Antechinus from Stage 2 nest box installation area.



**Plate 3-2.** Recently installed nest box with Sugar Gliders.





**Plate 3-3.** Bat scats or guano beneath the multi chambered bat box inhabited by Lesser Long-eared Bats.



**Plate 3-4.** Nest box used by Australian Owlet Nightjar.



#### **4-0 - Discussion and Conclusion**

This round of monitoring captured 84 or 56% of the proposed 150 nest boxes that have been installed and considered operational as part of the nest box plan of management (GHD 2017). This represents the 12 nest boxes from stage 1 and 72 (96%) of the 75 nest boxes from stage 2 (Table 4-2 in GHD 2017). It is unclear when the remaining 67 nest boxes will be installed as the clearing and expansion is staged.

This round of monitoring reported 30% use of the installed nest boxes or almost one in every three nest boxes showing signs of use. This occupancy rate is substantially higher than previous monitoring events (e.g. Lewis 2022) and shows an upwards trajectory as fauna respond to recent clearing operations and post fire recovery from late 2019. The observations include a broad range of fauna from birds, marsupial mammals like Antechinus, gliders and possums indicating it has overall been a successful mitigation technique.

There has been no uptake of the nest boxes by pest species. There are a number of potential pest species known from the area including invasive birds like the Common Myna and Common Starling which has been recorded from the nearby villages of Woombah and Chatsworth Island. Probably the main threat is from the European Honey Bee, Black Rat, Common Starling and the Common Myna with none of these being recorded on site to date.

Most of the nest box maintenance requirements were straight forward with some rewiring and repositioning works. Most importantly, all of the 84 boxes remain in place and considered functional although the parrot box from the original stage 1 installation works is close to failing due to termite damage. It was previously discussed about the construction of some nest boxes used in Stage 2 and their functionality due to splits and large openings allowing light and weather to penetrate the nest box. Material to clad 10 of these nest boxes should form part of the next round of monitoring.



**Plate 4-1.** Example of nest box identified for “cladding” to reduce the gaps that allow sunlight, wind and rain egress.

Should you require any additional information please contact me at your convenience.

Kind Regards,



Ben Lewis  
Lewis Ecological Surveys



## **References**

GHD (2015). *Environmental Impact Statement*. Prepared for Proposed Quarry Expansion at Lot 2 DP 1055044, Tullymorgan-Jackybulbin Road, Mororo

GHD (2017). Slys Quarry Nest Box Plan of Management. Report prepared for Newman Quarrying Pty Ltd.

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Appendix 1

Table A1. Nest box register for Stage 1 northern zone in Year 1-5 encompassing monitoring episodes 1-8.

Installation Date	Nest Box Number	Nest Box Size	Nest Box Type	Easting Northing	Tree Species	Year 1 - Monitoring Episode 1 (October 2018)				Year 1 - Monitoring Episode 2 (April 2019)				Year 2 - Monitoring Episode 3 (December 2019)				Year 2 - Monitoring Episode 4 (September 2020)			
						Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements
6/02/2018	1	Small	Microbat (2 chamber)	518703 6758648	Pink Bloodwood	Nil	Nil	Good	Nil	Gould's Long-eared Bat	Nil	Good	Nil	Nil	Nil	Functional	Survived Fire	Nil	Nil	Functional	Nil
6/02/2018	2	Medium	Barn Owl	518703 6758648	Pink Bloodwood	Nil	Nil	Good	Nil	Ants	Nil	Good	Nil	na	na	Destroyed by fire	Replace with new box	na	na	New Cyplas Nest Box	Update register to "Barn Owl" Installed
6/02/2018	3	Small	Microbat (2 chamber)	518659 6758655	Needlebark Stringybark	Nil	Nil	Good	Nil	Glider nest - old	Nil	Good	Nil	na	na	Destroyed by fire	Replace with new box	na	na	New Cyplas Nest Box	Update register to "Microbat Box" Installed
6/02/2018	4	Medium	Parrot	518659 6758655	Needlebark Stringybark	Nil	Nil	Good	Nil	Glider nest (active)	Nil	Good	Nil	Sugar Glider x 2	Nil	Functional	Survived Fire	Old glider nest	Nil	Functional	Cleaned some ant nest and spider web material from entrance
6/02/2018	5	Small	Microbat (2 chamber)	518707 6758662	Needlebark Stringybark	Nil	Nil	Good	Nil	Nil	Nil	Good	Nil	na	na	Destroyed by fire	Replace with new box	na	na	New Cyplas Nest Box	Update register to new show new tree location and "Microbat Box" installed
6/02/2018	6	Medium	Parrot/nightjar	518707 6758662	Needlebark Stringybark	Glider nest - Sugar or Squirrel Glider	Nil	Good	Nil	Glider nest (active) - Sugar or Squirrel Glider	Nil	Good	Nil	na	na	Destroyed by fire	Replace with new box	na	na	New Cyplas Nest Box	Update register to new show new tree location and "Parrot/Nightjar Box" installed
6/02/2018	7	Small	Microbat (2 chamber)	518565 6758642	Rough-barked Apple	Nil	Nil	Good	Nil	Nil	Nil	Good	Nil	na	na	Destroyed by fire	Replace with new box	na	na	New Cyplas Nest Box	Update register to "Rear Entry Glider Box" installed
6/02/2018	8	Medium	Rear Entry Glider	518565 6758642	Rough-barked Apple	Glider nest - Sugar or Squirrel Glider	Nil	Good	Nil	Glider nest (active) - Sugar or Squirrel Glider	Nil	Good	Nil	na	na	Destroyed by fire	Replace with new box	na	na	New Cyplas Nest Box	Update register to "Possum Box" installed
6/02/2018	9	Large	Glider (large rear entry)	518660 6758644	Rough-barked Apple	Nil	Ants - native spp	Good	Clean entrance - completed on the day	Nil	Ants - native spp	Good	Clean entrance again - completed on the day	na	na	Destroyed by fire	Replace with new box	na	na	New Cyplas Nest Box	Update register to new show new tree location and "Large Rear Entry Glider Box" installed
6/02/2018	10	Medium	Parrot Box	518660 6758644	Rough-barked Apple	Possum nest - Probably Common Brushtail Possum	Nil	Good	Nil	Possum nest (old) - Probably Common Brushtail Possum	Nil	Good	Nil	na	na	Destroyed by fire	Replace with new box	na	na	New Cyplas Nest Box	Update register to new show new tree location and "Parrot Box" installed
6/02/2018	11	Large	Possum (large)	518588 6758616	Pink Bloodwood	Nil	Nil	Good	Readjusted in tree to firmly position - completed on the day	Nil	Nil	Good	Readjusted in tree to firmly position - completed on the day	Nil	Nil	Functional	Survived Fire	Nil	Nil	Functional	Survived Fire
6/02/2018	12	Medium	Possum (small)	518588 6758616	Pink Bloodwood	Nil	Nil	Good	Nil	Nil	Nil	Good	Nil	Common Brushtail Possum x 1	Nil	Functional	Survived Fire	Old signs of brushtail possum	Nil	Functional	Survived Fire

Installation Date	Nest Box Number	Nest Box Size	Nest Box Type	Easting Northing	Tree Species	Year 3 - Monitoring Episode 5 (May 2021)				Year 3 - Monitoring Episode 6 (September 2021)				Year 4 - Monitoring Episode 7 (August 2022)				Year 4 - Monitoring Episode 8 (June 2023)			
						Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements
6/02/2018	1	Small	Microbat (2 chamber)	518703 6758648	Pink Bloodwood	Gould's Long-eared Bat x 2	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Nil	No	No	Functional	Nil	
6/02/2018	2	Medium	Barn Owl	518703 6758648	Pink Bloodwood	Few leaves – possible possum	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Nil	No	No	Functional	Nil	
6/02/2018	3	Small	Microbat (2 chamber)	518659 6758655	Needlebark Stringybark	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Nil	Lesser Long-eared Bat x 3	No	Functional	Nil	
6/02/2018	4	Medium	Parrot	518659 6758655	Needlebark Stringybark	Old glider nest	Nil	Functional	Nil	Nil	Termites	Functional	Treat for termites during next round of monitoring	Termites	Deteriorating	Monitor until becomes dysfunctional	Old glider nest	No	Questionable	Requires replacement	
6/02/2018	5	Small	Microbat (2 chamber)	518707 6758662	Needlebark Stringybark	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Gould's Long-eared Bat	Nil	Functional	Nil	No	No	Functional	Nil
6/02/2018	6	Medium	Parrot/nightjar	518707 6758662	Needlebark Stringybark	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Nil	No	No	Functional	Nil	
6/02/2018	7	Small	Microbat (2 chamber)	518565 6758642	Rough-barked Apple	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Nil	No	No	Functional	Nil	
6/02/2018	8	Medium	Rear Entry Glider	518565 6758642	Rough-barked Apple	Nil	Nil	Functional	Nil	Older leaves	Nil	Functional	Nil	Nil	Functional	Nil	No	No	Functional	Nil	
6/02/2018	9	Large	Glider (large rear entry)	518660 6758644	Rough-barked Apple	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Nil	No	No	Functional	Nil	
6/02/2018	10	Medium	Parrot Box	518660 6758644	Rough-barked Apple	Sugar Glider	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Nil	No	No	Functional	Nil	
6/02/2018	11	Large	Possum (large)	518588 6758616	Pink Bloodwood	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Adjustment	No	No	Functional	Adjustment	
6/02/2018	12	Medium	Possum (small)	518588 6758616	Pink Bloodwood	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Adjustment	No	No	Functional	Adjustment	

**Table A2.** Nest box register for Stage 2 (southern zone) in Year 1 encompassing monitoring episode 2.

Installation Date	Nest Box Number	Nest Box Size	Nest Box Type	Easting Northing	Tree Species	Year 1 - Monitoring Episode 1 (August 2022)				Year 1 - Monitoring Episode 2 (June 2023)			
						Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements
<b>Adjacent Entrance</b>													
Summer 2021	13	Small	Microbat (2 chamber)	518680 6758075	Angophora	Nil	Nil	Functional	Nil	No	No	Functional	Nil
Summer 2021	14	Medium	Parrot Box	518680 6758075	Angophora	Nil	Nil	Functional	Readjust on tree as lid tight	No	No	Functional	Nil
Summer 2021	15	Large	Owl	518675 6758071	Coastal Blackbutt	Nil	Nil	Functional	Nil	Leaves/possum use	No	Functional	Nil
Summer 2021	16	Medium	Glider	518675 6758071	Coastal Blackbutt	Nil	Nil	Functional	Review the functionality of gaps	Leaves/possum use	No	Functional	Nil
Summer 2021	17	Large	Cockatoo/Owl	518687 6758069	Swamp Box	Nil	Nil	Functional	Review the functionality of gaps	Leaves/possum use	No	Functional	Nil
<b>South of Stage 2</b>													
Spring 2021	18	Medium	Possum	518692 6758053	Angophora	Nil	Nil	Functional	Review the functionality of gaps	Leaves from possum use	No	Functional	Nil
Spring 2021	19	Medium	Glider	518692 6758053	Angophora	Golden-tailed Spiny Ant	Nil	Functional	Nil	No	No	Functional	Nil
Spring 2021	20	Small	Microbat (2 chamber)	518682 6758037	Coastal Blackbutt	Nil	Nil	Functional	Nil	No	No	Functional	Nil
Spring 2021	21	Medium	Possum	518682 6758037	Coastal Blackbutt	Nil	Nil	Functional	Review the functionality of gaps	Golden-tailed Spiny Ants	No	Functional	Nil
Spring 2021	22	Small	Microbat (2 chamber)	518694 6758038	Angophora	Nil	Nil	Functional	Nil	No	No	Functional	Nil
Spring 2021	23	Medium	Possum	518694 6758038	Angophora	Nil	Nil	Functional	Review the functionality of gaps	Golden-tailed Spiny Ants	No	Functional	Nil
Spring 2021	24	Large	Cockatoo/owl	518707 6758021	Angophora	Nil	Nil	Functional but lid starting to delaminate	Monitor	Leaves/possum use	No	Functional	Nil
Spring 2021	25	Medium	Glider	518716 6758024	Angophora	Nil	Nil	Functional	Review the functionality of gaps	No	No	Functional	Nil
Spring 2021	26	Large	Owl	518716 6758024	Angophora	Nil	Nil	Functional	Review the functionality of gaps	No	No	Questionable	Probably requires cladding during next round of monitoring
Spring 2021	27	Medium	Lorikeet/Parrot	518725 6758025	Coastal Blackbutt	Nil	Nil	Functional	Review the functionality of gaps	Golden-tailed Spiny Ants	No	Functional	Nil
Spring 2021	28	Medium	Glider	518725 6758025	Coastal Blackbutt	Nil	Nil	Functional	Lid adjustment	No	No	Functional	Nil
Spring 2021	29	Small	Microbat (2 chamber)	518721 6758010	Needlebark Stringybark	Nil	Nil	Functional	Nil	No	No	Functional	Nil
Spring 2021	30	Medium	Lorikeet/Parrot	518721 6758010	Needlebark Stringybark	Golden-tailed Spiny Ant	Nil	Functional	Nil	No	No	Functional	Nil
Spring 2021	31	Small	Microbat (2 chamber)	518713 6757984	Turpentine	Nil	Nil	Functional	Nil	No	No	Functional	Nil
Spring 2021	32	Medium	Glider	518713 6757984	Turpentine	Golden-tailed Spiny Ant	Nil	Functional	Nil	No	No	Functional	Nil
Spring 2021	33	Large	Owl/Cockatoo			Nil	Nil	Nil	Functional	No	No	Functional	Nil
Spring 2021	34	Medium	Parrot			Nil	Nil	Nil	Functional	Yellow-footed Antechinus	No	Functional	Nil
Spring 2021	35	Small	Small Glider			Nil	Nil	Nil	Functional	Golden-tailed Spiny Ants	No	Functional	Nil
Spring 2021	36	Large	Owl/Cockatoo			Nil	Nil	Nil	Functional	No	No	Functional	Nil
Spring 2021	37	Small	Small Glider			Sugar Glider x 2	Nil	Nil	Functional	Old leaves	No	Functional	Nil
Spring 2021	38	Medium	Parrot			Nil	Nil	Nil	Review the functionality of gaps	Golden-tailed Spiny Ants	No	Functional	Nil
Spring 2021	39	Small	Small Glider			Individual leaves	Nil	Nil	Functional	Golden-tailed Spiny Ants	No	Functional	Nil
Spring 2021	40	Medium	Parrot			Nil	Nil	Nil	Review the functionality of gaps	Golden-tailed Spiny Ants	No	Functional	Nil
Spring 2021	41	Small	Microbat (2 chamber)			Nil	Nil	Nil	Functional	No	No	Functional	Nil
Spring 2021	42	Small	Small Glider			Golden-tailed Spiny Ant	Nil	Nil	Functional with re-wire and lid adjustment	No	No	Functional	Nil



Installation Date	Nest Box Number	Nest Box Size	Nest Box Type	Easting Northing	Tree Species	Year 1 - Monitoring Episode 1 (August 2022)				Year 1 - Monitoring Episode 2 (June 2023)			
						Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements
Spring 2021	43	Small	Microbat (2 chamber)			Nil	Nil	Nil	Functional	No	No	Functional	Nil
Spring 2021	44	Medium	Possum			Golden-tailed Spiny Ant	Nil	Nil	Functional	No	No	Functional	Nil
Spring 2021	45	Small	Microbat (2 chamber)			Nil	Nil	Nil	Functional	No	No	Functional	Nil
										No	No	Functional	Nil
Spring 2021	46	Small	Small Glider			Golden-tailed Spiny Ant	Nil	Nil	Functional	Golden-tailed Spiny Ants	No	Functional	Nil
Spring 2021	47	Small	Scansorial			Nil	Nil	Nil	Functional	Golden-tailed Spiny Ants	No	Functional	Nil
Spring 2021	48	Medium	Parrot			Nil	Nil	Nil	Functional	Golden-tailed Spiny Ants	No	Functional	Nil
Spring 2021	49	Small	Scansorial			Golden-tailed Spiny Ant	Nil	Nil	Review the functionality of gaps	Glider nest - recent	No	Functional	Nil
Spring 2021	50	Medium	Possum			Common Ringtail Possum	Nil	Nil	Review the functionality of gaps	Older possum drey/nest but with some old eggs at bottom	No	Functional	Nil
Spring 2021	51	Large	Owl/Cockatoo			Nil	Nil	Nil	Functional	No	No	Questionable	Reclad during next round of monitoring
Spring 2021	52	Small	Microbat (2 chamber)			Nil	Nil	Nil	Functional	No	No	Functional	Nil
Spring 2021	53	Medium	Parrot			Nil	Nil	Nil	Functional	No	No	Functional	Nil
Spring 2021	54	Small	Microbat (2 chamber)			Nil	Nil	Nil	Functional	No	No	Functional	Nil
Spring 2021	55	Medium	Parrot			Nil	Nil	Nil	Functional	No	No	Functional	Nil
Spring 2021	56	Medium	Parrot			Golden-tailed Spiny Ant	Nil	Nil	Functional	No	No	Functional	Nil
Spring 2021	57	Small	Scansorial			Nil	Nil	Nil	Functional	Sugar Glider	No	Functional	Nil
<b>East of stage 2</b>													
Summer 2021	58	Medium	Possum		Grey Ironbark	Nil	Nil	Functional	Nil	No	No	Functional	Nil
Summer 2021	59	Small	Microbat (2 chamber)		Grey Ironbark	Nil	Nil	Functional	Nil	No	No	Functional	Nil
Summer 2021	60	Large	Owl		Small-fruited Grey Gum	Nil	Nil	Functional	Nil	No	No	Questionable	Reclad during next round of monitoring
Summer 2021	61	Medium	Possum		Small-fruited Grey Gum	Nil	Nil	Functional	Nil	No	No	Functional	Nil
Summer 2021	62	Small	Scansorial		Small-fruited Grey Gum	Nil	Nil	Functional	Nil	Antechinus leaf nest	No	Functional	Nil
Summer 2021	63	Medium	Possum		Small-fruited Grey Gum	Nil	Nil	Functional	Re-wire	Antechinus scats	No	Functional	Nil
Summer 2021	64	Small	Microbat (2 chamber)		Small-fruited Grey Gum	Nil	Nil	Functional	Nil	No	No	Functional	Nil
Summer 2021	65	Medium	Glider		Small-fruited Grey Gum	Sugar Glider x 2	Nil	Functional	Nil	Glider nest	No	Functional	Nil
Summer 2021	66	Medium	Possum		Spotted Gum	Nil	Nil	Functional	Nil	No	No	Questionable	Reclad during next round of monitoring
Summer 2021	67	Small	Microbat (2 chamber)		Spotted Gum	Gould's Long-eared Bat x 1	Nil	Functional	Nil	No	No	Functional	Nil
Summer 2021	68	Medium	Possum		Spotted Gum	Nil	Nil	Functional	Review the functionality of gaps	No	No	Functional	Nil
Summer 2021	69	Medium	Glider		Spotted Gum	Nil	Nil	Functional	Nil	Golden-tailed Spiny Ants	No	Functional	Nil
Summer 2021	70	Small	Microbat (2 chamber)		Spotted Gum	Nil	Nil	Functional	Nil	Lesser Long-eared Bat x 6 plus a lot of Guano on ground	No	Functional	Nil
Summer 2021	71	Small	Glider		Spotted Gum	Glider nest	Nil	Functional	Nil	Glider nest	No	Functional	Nil
Summer 2021	72	Medium	Parrot		Small-fruited Grey Gum	Glider nest	Nil	Functional	Nil	Leaves from possum	No	Functional	Nil
Summer 2021	73	Small	Microbat (2 chamber)		Small-fruited Grey Gum	Nil	Nil	Functional	Nil	No	No	Functional	Nil
Summer 2021	74	Small	Glider		Spotted Gum	Nil	Nil	Functional	Nil	No	No	Functional	Nil

Installation Date	Nest Box Number	Nest Box Size	Nest Box Type	Easting Northing	Tree Species	Year 1 - Monitoring Episode 1 (August 2022)				Year 1 - Monitoring Episode 2 (June 2023)			
						Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements
Summer 2021	75	Medium	Parrot		Spotted Gum	Nil	Nil	Functional	Nil	Golden-tailed Spiny Ants	No	Functional	Nil
Summer 2021	76	Small	Glider		Spotted Gum	Glider nest	Nil	Functional	Nil	Glider nest	No	Functional	Nil
Summer 2021	77	Small	Microbat (2 chamber)		Spotted Gum	Nil	Nil	Functional	Nil	No	No	Functional	Nil
Summer 2021	78	Large	Wood duck / Small Owl		Spotted Gum	Nil	Nil	Functional	Review the functionality of gaps	No	No	Questionable	Reclad during next round of monitoring
Summer 2021	79	Medium	Possum		Grey Ironbark	Nil	Nil	Functional	Review the functionality of gaps	No	No	Functional	Reclad during next round of monitoring
Summer 2021	80	Small	Glider		Grey Ironbark	Nil	Nil	Functional	Nil	Glider nest	No	Functional	Nil
Summer 2021	81	Medium	Possum		Small-fruited Grey Gum	Brush-tail Possum – Bark and Leaves	Nil	Functional	Nil	Leaves from possum	No	Functional	Nil
Summer 2021	82	Small	Microbat (2 chamber)		Small-fruited Grey Gum	Nil	Nil	Functional	Nil	No	No	Functional	Nil
Summer 2021	83	Medium	Possum		Small-fruited Grey Gum	Nil	Nil	Functional	Nil	Old leaves from possum	No	Functional	Nil
Summer 2021	84	Medium	Parrot		Small-fruited Grey Gum	Glider Nest	Nil	Functional	Re-wire as lid very tight	Antechinus scats	No	Functional	Nil

13<sup>th</sup> March 2024

Newman's Quarrying  
PO Box 292  
Yamba NSW 2464  
**Attention:** Mark Newman

**Re: Nest Box Monitoring – Episode 9 of Stage 1 - Lot 2 DP 1055044 Tullymorgan-Jackybulbin Road****1.0 - Introduction**

The proposal to expand quarrying operations at Lot 2 DP 1055044 Tullymorgan-Jackybulbin Road was approved by the Minister for Planning on the 5<sup>th</sup> May 2016 (SSD 6624). The preparation of a Nest Box Management Plan was identified as an additional requirement from the EIS (GHD 2015) and Biodiversity and Rehabilitation Management Plan (GHD 2017). This Plan identified nest boxes be installed in a number of stages, the first stage specified that prior to the clearing of vegetation, 12 nest boxes would be installed to provide habitat for any displaced hollow dependant fauna. These were installed in February 2018 followed by additional stages of nest box installation over three separate time periods in October, November and December of 2021 to accommodate the remainder of clearing operations associated with the approved expansion.

In accordance with the Nest Box Plan of Management, monitoring must be undertaken twice per year for a period of five years. In essence, this equates to 10 monitoring episodes for each nest box installed.

The current round of monitoring represents:

- The first episode for Year 5 for the 12 nest boxes installed back in February 2018 and
- First episode for Year 2 for the 72 nest boxes installed in spring/summer of 2021.

**2.0 - Episode Six Monitoring Details**

The site was accessed on the 3-4<sup>th</sup> January 2024 for the purposes of inspecting all 84 installed nest boxes. A ladder with a fall arrest (belay and harness) system was used to access each nest box so that wildlife could be positively identified and any 'quick fix' maintenance activities could be performed at that time.

### **3.0 - Monitoring Results**

Twenty (24%) of the 84 nest boxes showed signs of use by native wildlife. The only direct wildlife observation during this round of monitoring were some Sugar Gliders (*Petaurus breviceps*) using a rear entry glider nest box. Indirect signs in the form of nesting materials were observed at the remaining 19 boxes and included glider nests, shallow cupped areas of leaves indicative of brushtail possum use, antechinus nests and scats plus signs of past use by birds.

No feral or pest species in the form of introduced birds (i.e. Common Myna) or European bee hives were recorded. Termites and Golden-tailed Spiny Ant were recorded in or near a number of the nest boxes but are considered natural or indicative of the surrounding ecosystem processes.

Maintenance activities were limited to some rewiring works, nest box repositioning and some lid adjustments. Termites have now consumed Nest Box 4 from Stage 1 install in February 2018, a parrot design box that has been previously used by Sugar Glider. A new box needs to be installed.

A number of the newly installed nest boxes have been constructed in such a way that leaves large gaps present in the floor and walls of the nest box, or with the drying of the timber, they have split (Plate 3-1). Some maintenance intervention is required on 12 of these boxes with the most practical solution installing a new piece of timber over the gap (i.e. cladding).



**Plate 3-1.** Nest box with excessive splits allowing light, rain and wind into the box.

#### **4-0 - Discussion and Conclusion**

This round of monitoring looked at 84 or 56% of the proposed 150 nest boxes that have been installed and considered operational as part of the nest box plan of management (GHD 2017). It is unclear when the remaining 67 nest boxes will be installed as the clearing and expansion is staged. There is only one more round of monitoring for the 12 nest boxes installed as part of the Stage 1 works whilst Stage 2 installation still has a number of years remaining.

This round of monitoring reported 24% use of the installed nest boxes or approximately one in every four nest boxes showing signs of use. This differs from the previous monitoring performed in winter of 2023 when almost one in every three nest boxes showed signs of use. This may simply represent seasonal variation as fauna like micro bats were not recorded during this round of monitoring.

To date, there has been no uptake of the nest boxes by pest species, birds such as Common Myna and Common Starling which has been recorded from the nearby villages of Woombah and Chatsworth Island. Probably the main threat is from the European Honey Bee and Black Rat with both expected to occur in the area.

Most of the nest box maintenance requirements were straight forward with some rewiring to allow for tree growth and some repositioning works. On this occasion, one of the 84 nest boxes had fallen from the tree as a result of being consumed by termites. This requires a replacement box to be installed at the same location. The gaps found in a number of the recently installed boxes for Stage 2 have large splits and openings allowing light and weather to penetrate the nest box. Material to clad 12 of these nest boxes should form part of the next round of monitoring.

#### **5.0 Key Recommendations**

1. Install a new parrot box in Stage 1 area to replace the one that has been consumed by termites.
2. Install cladding material (timber and screw or glue) to close up obvious gaps in 12 of the identified nest boxes.

Should you require any additional information please contact me at your convenience.

Kind Regards,



Ben Lewis  
Lewis Ecological Surveys



## **References**

GHD (2015). *Environmental Impact Statement*. Prepared for Proposed Quarry Expansion at Lot 2 DP 1055044, Tullymorgan-Jackybulbin Road, Mororo

GHD (2017). Sly's Quarry Nest Box Plan of Management. Report prepared for Newman Quarrying Pty Ltd.

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Appendix 1

Table A1. Nest box register for Stage 1 northern zone in Year 1-5 encompassing monitoring episodes 1-9.

Installation Date	Nest Box Number	Nest Box Size	Nest Box Type	Easting Northing	Tree Species	Year 1 - Monitoring Episode 1 (October 2018)				Year 1 - Monitoring Episode 2 (April 2019)				Year 2 - Monitoring Episode 3 (December 2019)				Year 2 - Monitoring Episode 4 (September 2020)			
						Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements
6/02/2018	1	Small	Microbat (2 chamber)	518703 6758648	Pink Bloodwood	Nil	Nil	Good	Nil	Gould's Long-eared Bat	Nil	Good	Nil	Nil	Nil	Functional	Survived Fire	Nil	Nil	Functional	Nil
6/02/2018	2	Medium	Barn Owl	518703 6758648	Pink Bloodwood	Nil	Nil	Good	Nil	Ants	Nil	Good	Nil	na	na	Destroyed by fire	Replace with new box	na	na	New Cyplas Nest Box	Update register to "Barn Owl" Installed
6/02/2018	3	Small	Microbat (2 chamber)	518659 6758655	Needlebark Stringybark	Nil	Nil	Good	Nil	Glider nest - old	Nil	Good	Nil	na	na	Destroyed by fire	Replace with new box	na	na	New Cyplas Nest Box	Update register to "Microbat Box" Installed
6/02/2018	4	Medium	Parrot	518659 6758655	Needlebark Stringybark	Nil	Nil	Good	Nil	Glider nest (active)	Nil	Good	Nil	Sugar Glider x 2	Nil	Functional	Survived Fire	Old glider nest	Nil	Functional	Cleaned some ant nest and spider web material from entrance
6/02/2018	5	Small	Microbat (2 chamber)	518707 6758662	Needlebark Stringybark	Nil	Nil	Good	Nil	Nil	Nil	Good	Nil	na	na	Destroyed by fire	Replace with new box	na	na	New Cyplas Nest Box	Update register to new show new tree location and "Microbat Box" installed
6/02/2018	6	Medium	Parrot/nightjar	518707 6758662	Needlebark Stringybark	Glider nest - Sugar or Squirrel Glider	Nil	Good	Nil	Glider nest (active) - Sugar or Squirrel Glider	Nil	Good	Nil	na	na	Destroyed by fire	Replace with new box	na	na	New Cyplas Nest Box	Update register to new show new tree location and "Parrot/Nightjar Box" installed
6/02/2018	7	Small	Microbat (2 chamber)	518565 6758642	Rough-barked Apple	Nil	Nil	Good	Nil	Nil	Nil	Good	Nil	na	na	Destroyed by fire	Replace with new box	na	na	New Cyplas Nest Box	Update register to "Rear Entry Glider Box" installed
6/02/2018	8	Medium	Rear Entry Glider	518565 6758642	Rough-barked Apple	Glider nest - Sugar or Squirrel Glider	Nil	Good	Nil	Glider nest (active) - Sugar or Squirrel Glider	Nil	Good	Nil	na	na	Destroyed by fire	Replace with new box	na	na	New Cyplas Nest Box	Update register to "Possum Box" installed
6/02/2018	9	Large	Glider (large rear entry)	518660 6758644	Rough-barked Apple	Nil	Ants - native spp	Good	Clean entrance - completed on the day	Nil	Ants - native spp	Good	Clean entrance again - completed on the day	na	na	Destroyed by fire	Replace with new box	na	na	New Cyplas Nest Box	Update register to new show new tree location and "Large Rear Entry Glider Box" installed
6/02/2018	10	Medium	Parrot Box	518660 6758644	Rough-barked Apple	Possum nest - Probably Common Brushtail Possum	Nil	Good	Nil	Possum nest (old) - Probably Common Brushtail Possum	Nil	Good	Nil	na	na	Destroyed by fire	Replace with new box	na	na	New Cyplas Nest Box	Update register to new show new tree location and "Parrot Box" installed
6/02/2018	11	Large	Possum (large)	518588 6758616	Pink Bloodwood	Nil	Nil	Good	Readjusted in tree to firmly position - completed on the day	Nil	Nil	Good	Readjusted in tree to firmly position - completed on the day	Nil	Nil	Functional	Survived Fire	Nil	Nil	Functional	Survived Fire
6/02/2018	12	Medium	Possum (small)	518588 6758616	Pink Bloodwood	Nil	Nil	Good	Nil	Nil	Nil	Good	Nil	Common Brushtail Possum x 1	Nil	Functional	Survived Fire	Old signs of brushtail possum	Nil	Functional	Survived Fire

Installation Date	Nest Box Number	Nest Box Size	Nest Box Type	Easting Northing	Tree Species	Year 3 - Monitoring Episode 5 (May 2021)				Year 3 - Monitoring Episode 6 (September 2021)				Year 4 - Monitoring Episode 7 (August 2022)				Year 4 - Monitoring Episode 8 (June 2023)			
						Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements
6/02/2018	1	Small	Microbat (2 chamber)	518703 6758648	Pink Bloodwood	Gould's Long-eared Bat x 2	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Nil	No	No	Functional	Nil	
6/02/2018	2	Medium	Barn Owl	518703 6758648	Pink Bloodwood	Few leaves – possible possum	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Nil	No	No	Functional	Nil	
6/02/2018	3	Small	Microbat (2 chamber)	518659 6758655	Needlebark Stringybark	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Nil	Lesser Long-eared Bat x 3	No	Functional	Nil	
6/02/2018	4	Medium	Parrot	518659 6758655	Needlebark Stringybark	Old glider nest	Nil	Functional	Nil	Nil	Termites	Functional	Treat for termites during next round of monitoring	Nil	Deteriorating	Monitor until becomes dysfunctional	Old glider nest	No	Questionable	Requires replacement	
6/02/2018	5	Small	Microbat (2 chamber)	518707 6758662	Needlebark Stringybark	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Gould's Long-eared Bat	Nil	Functional	Nil	No	No	Functional	Nil
6/02/2018	6	Medium	Parrot/nightjar	518707 6758662	Needlebark Stringybark	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Nil	No	No	Functional	Nil	
6/02/2018	7	Small	Microbat (2 chamber)	518565 6758642	Rough-barked Apple	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Nil	No	No	Functional	Nil	
6/02/2018	8	Medium	Rear Entry Glider	518565 6758642	Rough-barked Apple	Nil	Nil	Functional	Nil	Older leaves	Nil	Functional	Nil	Nil	Functional	Nil	No	No	Functional	Nil	
6/02/2018	9	Large	Glider (large rear entry)	518660 6758644	Rough-barked Apple	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Nil	No	No	Functional	Nil	
6/02/2018	10	Medium	Parrot Box	518660 6758644	Rough-barked Apple	Sugar Glider	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Nil	No	No	Functional	Nil	
6/02/2018	11	Large	Possum (large)	518588 6758616	Pink Bloodwood	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Adjustment	No	No	Functional	Adjustment	
6/02/2018	12	Medium	Possum (small)	518588 6758616	Pink Bloodwood	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Functional	Adjustment	No	No	Functional	Adjustment	
Installation Date	Nest Box Number	Nest Box Size	Nest Box Type	Easting Northing	Tree Species	Year 5 - Monitoring Episode 9 (January 2024)															
6/02/2018	1	Small	Microbat (2 chamber)	518703 6758648	Pink Bloodwood	Nil	Nil	Functional	Nil												
6/02/2018	2	Medium	Barn Owl	518703 6758648	Pink Bloodwood	Nil	Nil	Functional	Nil												
6/02/2018	3	Small	Microbat (2 chamber)	518659 6758655	Needlebark Stringybark	Nil	Nil	Functional	Nil												
6/02/2018	4	Medium	Parrot	518659 6758655	Needlebark Stringybark	Nil	Nil	Eaten by termites	Replace with new box												
6/02/2018	5	Small	Microbat (2 chamber)	518707 6758662	Needlebark Stringybark	Nil	Nil	Functional	Nil												
6/02/2018	6	Medium	Parrot/nightjar	518707 6758662	Needlebark Stringybark	Nil	Nil	Functional	Nil												
6/02/2018	7	Small	Microbat (2 chamber)	518565 6758642	Rough-barked Apple	Nil	Nil	Functional	Nil												
6/02/2018	8	Medium	Rear Entry Glider	518565 6758642	Rough-barked Apple	Glider nest - Individuals	Nil	Functional	Nil												
6/02/2018	9	Large	Glider (large rear entry)	518660 6758644	Rough-barked Apple	Nil	Nil	Functional	Nil												
6/02/2018	10	Medium	Parrot Box	518660 6758644	Rough-barked Apple	Nil	Nil	Functional	Nil												
6/02/2018	11	Large	Possum (large)	518588 6758616	Pink Bloodwood	Nil	Nil	Functional	Nil												
6/02/2018	12	Medium	Possum (small)	518588 6758616	Pink Bloodwood	Nil	Nil	Functional	Nil												

**Table A2.** Nest box register for Stage 2 (southern zone) in Year 1 and 2 encompassing monitoring episode 1-3.

Installation Date	Nest Box Number	Nest Box Size	Nest Box Type	Easting Northing	Tree Species	Year 1 - Monitoring Episode 1 (August 2022)				Year 1 - Monitoring Episode 2 (June 2023)				Year 2 - Monitoring Episode 1 (January 2024)			
						Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements
Summer 2021	13	Small	Microbat (2 chamber)	518680 6758075	Angophora	Nil	Nil	Functional	Nil	No	No	Functional	Nil	Nil	No	Functional	Nil
Summer 2021	14	Medium	Parrot Box	518680 6758075	Angophora	Nil	Nil	Functional	Readjust on tree as lid tight	No	No	Functional	Nil	Nil	No	Functional	Nil
Summer 2021	15	Large	Owl	518675 6758071	Coastal Blackbutt	Nil	Nil	Functional	Nil	Leaves/possum use	No	Functional	Nil	possum leaves	No	Functional	Nil
Summer 2021	16	Medium	Glider	518675 6758071	Coastal Blackbutt	Nil	Nil	Functional	Review the functionality of gaps	Leaves/possum use	No	Functional	Nil	Golden Spiny Ants	No	Functional	Nil
Summer 2021	17	Large	Cockatoo/Owl	518687 6758069	Swamp Box	Nil	Nil	Functional	Review the functionality of gaps	Leaves/possum use	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	18	Medium	Possum	518692 6758053	Angophora	Nil	Nil	Functional	Review the functionality of gaps	Leaves from possum use	No	Functional	Nil	Nil	No	Functional	Apply cladding
Spring 2021	19	Medium	Glider	518692 6758053	Angophora	Golden-tailed Spiny Ant	Nil	Functional	Nil	No	No	Functional	Nil	Glider nest	No	Functional	Nil
Spring 2021	20	Small	Microbat (2 chamber)	518682 6758037	Coastal Blackbutt	Nil	Nil	Functional	Nil	No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	21	Medium	Possum	518682 6758037	Coastal Blackbutt	Nil	Nil	Functional	Review the functionality of gaps	Golden-tailed Spiny Ants	No	Functional	Nil	Nil	No	Functional	Apply cladding
Spring 2021	22	Small	Microbat (2 chamber)	518694 6758038	Angophora	Nil	Nil	Functional	Nil	No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	23	Medium	Possum	518694 6758038	Angophora	Nil	Nil	Functional	Review the functionality of gaps	Golden-tailed Spiny Ants	No	Functional	Nil	Nil	No	Functional	Apply cladding
Spring 2021	24	Large	Cockatoo/owl	518707 6758021	Angophora	Nil	Nil	Functional but lid starting to delaminate	Monitor	Leaves/possum use	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	25	Medium	Glider	518716 6758024	Angophora	Nil	Nil	Functional	Review the functionality of gaps	No	No	Functional	Nil	Glider nest	No	Functional	Apply cladding
Spring 2021	26	Large	Owl	518716 6758024	Angophora	Nil	Nil	Functional	Review the functionality of gaps	No	No	Questionable	Probably requires cladding during next round of monitoring	Nil	No	Functional	Apply cladding
Spring 2021	27	Medium	Lorikeet/Parrot	518725 6758025	Coastal Blackbutt	Nil	Nil	Functional	Review the functionality of gaps	Golden-tailed Spiny Ants	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	28	Medium	Glider	518725 6758025	Coastal Blackbutt	Nil	Nil	Functional	Lid adjustment	No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	29	Small	Microbat (2 chamber)	518721 6758010	Needlebark Stringybark	Nil	Nil	Functional	Nil	No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	30	Medium	Lorikeet/Parrot	518721 6758010	Needlebark Stringybark	Golden-tailed Spiny Ant	Nil	Functional	Nil	No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	31	Small	Microbat (2 chamber)	518713 6757984	Turpentine	Nil	Nil	Functional	Nil	No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	32	Medium	Glider	518713 6757984	Turpentine	Golden-tailed Spiny Ant	Nil	Functional	Nil	No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	33	Large	Owl/Cockatoo			Nil	Nil	Functional	Nil	No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	34	Medium	Parrot			Nil	Nil	Functional	Nil	Yellow-footed Antechinus	No	Functional	Nil	Old Antechinus nest scats	No	Functional	Nil
Spring 2021	35	Small	Small Glider			Nil	Nil	Functional	Nil	Golden-tailed Spiny Ants	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	36	Large	Owl/Cockatoo			Nil	Nil	Functional	Nil	No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	37	Small	Small Glider			Sugar Glider x 2	Nil	Functional	Nil	Old leaves	No	Functional	Nil	Glider nest	No	Functional	Nil
Spring 2021	38	Medium	Parrot			Nil	Nil	Functional	Review the functionality of gaps	Golden-tailed Spiny Ants	No	Functional	Nil	Ringtail	No	Functional	Nil



Installation Date	Nest Box Number	Nest Box Size	Nest Box Type	Easting Northing	Tree Species	Year 1 - Monitoring Episode 1 (August 2022)				Year 1 - Monitoring Episode 2 (June 2023)				Year 2 - Monitoring Episode 1 (January 2024)			
						Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements
Spring 2021	39	Small	Small Glider			Individual leaves	Nil	Nil	Functional	Golden-tailed Spiny Ants	No	Functional	Nil	Glider nest	No	Functional	Nil
Spring 2021	40	Medium	Parrot			Nil	Nil	Nil	Review the functionality of gaps	Golden-tailed Spiny Ants	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	41	Small	Microbat (2 chamber)			Nil	Nil	Nil	Functional	No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	42	Small	Small Glider			Golden-tailed Spiny Ant	Nil	Nil	Functional with re-wire and lid adjustment	No	No	Functional	Nil	Glider nest	No	Functional	Nil
Spring 2021	43	Small	Microbat (2 chamber)			Nil	Nil	Nil	Functional	No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	44	Medium	Possum			Golden-tailed Spiny Ant	Nil	Nil	Functional	No	No	Functional	Nil	Old leaves	No	Functional	Nil
Spring 2021	45	Small	Microbat (2 chamber)			Nil	Nil	Nil	Functional	No	No	Functional	Nil	Nil	No	Functional	Nil
										No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	46	Small	Small Glider			Golden-tailed Spiny Ant	Nil	Nil	Functional	Golden-tailed Spiny Ants	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	47	Small	Scansorial			Nil	Nil	Nil	Functional	Golden-tailed Spiny Ants	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	48	Medium	Parrot			Nil	Nil	Nil	Functional	Golden-tailed Spiny Ants	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	49	Small	Scansorial			Golden-tailed Spiny Ant	Nil	Nil	Review the functionality of gaps	Glider nest - recent	No	Functional	Nil	Nil	No	Functional	Monitor for future cladding requirements
Spring 2021	50	Medium	Possum			Common Ringtail Possum	Nil	Nil	Review the functionality of gaps	Older possum drey/nest but with some old eggs at bottom	No	Functional	Nil	Nil	No	Functional	Monitor for future cladding requirements
Spring 2021	51	Large	Owl/Cockatoo			Nil	Nil	Nil	Functional	No	No	Questionable	Reclad during next round of monitoring	Old leaves possum	No	Functional	Apply cladding
Spring 2021	52	Small	Microbat (2 chamber)			Nil	Nil	Nil	Functional	No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	53	Medium	Parrot			Nil	Nil	Nil	Functional	No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	54	Small	Microbat (2 chamber)			Nil	Nil	Nil	Functional	No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	55	Medium	Parrot			Nil	Nil	Nil	Functional	No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	56	Medium	Parrot			Golden-tailed Spiny Ant	Nil	Nil	Functional	No	No	Functional	Nil	Nil	No	Functional	Nil
Spring 2021	57	Small	Scansorial			Nil	Nil	Nil	Functional	Sugar Glider	No	Functional	Nil	Nil	No	Functional	Nil
<b>East of stage 2</b>																	Nil
Summer 2021	58	Medium	Possum		Grey Ironbark	Nil	Nil	Functional	Nil	No	No	Functional	Nil	Nil	No	Functional	Nil
Summer 2021	59	Small	Microbat (2 chamber)		Grey Ironbark	Nil	Nil	Functional	Nil	No	No	Functional	Nil	Feathertail nest	No	Functional	Nil
Summer 2021	60	Large	Owl		Small-fruited Grey Gum	Nil	Nil	Functional	Nil	No	No	Questionable	Reclad during next round of monitoring	Possum old leaves	No	Functional	Apply cladding
Summer 2021	61	Medium	Possum		Small-fruited Grey Gum	Nil	Nil	Functional	Nil	No	No	Functional	Nil	Nil	No	Functional	Nil
Summer 2021	62	Small	Scansorial		Small-fruited Grey Gum	Nil	Nil	Functional	Nil	Antechinus leaf nest	No	Functional	Nil	Nil	No	Functional	Nil
Summer 2021	63	Medium	Possum		Small-fruited Grey Gum	Nil	Nil	Functional	Re-wire	Antechinus scats	No	Functional	Nil	Glider nest	No	Functional	Nil
Summer 2021	64	Small	Microbat (2 chamber)		Small-fruited Grey Gum	Nil	Nil	Functional	Nil	No	No	Functional	Nil	Nil	No	Functional	Nil
Summer 2021	65	Medium	Glider		Small-fruited Grey Gum	Sugar Glider x 2	Nil	Functional	Nil	Glider nest	No	Functional	Nil	Nil	No	Functional	Nil
Summer 2021	66	Medium	Possum		Spotted Gum	Nil	Nil	Functional	Nil	No	No	Questionable	Reclad during next round of monitoring	Nil	No	Functional	Apply cladding
Summer 2021	67	Small	Microbat (2 chamber)		Spotted Gum	Gould's Long-eared Bat x 1	Nil	Functional	Nil	No	No	Functional	Nil	Nil	No	Functional	Nil



Installation Date	Nest Box Number	Nest Box Size	Nest Box Type	Easting Northing	Tree Species	Year 1 - Monitoring Episode 1 (August 2022)				Year 1 - Monitoring Episode 2 (June 2023)				Year 2 - Monitoring Episode 1 (January 2024)			
						Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements	Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements
Summer 2021	68	Medium	Possum		Spotted Gum	Nil	Nil	Functional	Review the functionality of gaps	No	No	Functional	Nil	Nil	No	Functional	Nil
Summer 2021	69	Medium	Glider		Spotted Gum	Nil	Nil	Functional	Nil	Golden-tailed Spiny Ants	No	Functional	Nil	Glider nest	No	Functional	Nil
Summer 2021	70	Small	Microbat (2 chamber)		Spotted Gum	Nil	Nil	Functional	Nil	Lesser Long-eared Bat x 6 plus a lot of Guano on ground	No	Functional	Nil	Nil	No	Functional	Nil
Summer 2021	71	Small	Glider		Spotted Gum	Glider nest	Nil	Functional	Nil	Glider nest	No	Functional	Nil	Nil	No	Functional	Nil
Summer 2021	72	Medium	Parrot		Small-fruited Grey Gum	Glider nest	Nil	Functional	Nil	Leaves from possum	No	Functional	Nil	Nil	No	Functional	Nil
Summer 2021	73	Small	Microbat (2 chamber)		Small-fruited Grey Gum	Nil	Nil	Functional	Nil	No	No	Functional	Nil	Nil	No	Functional	Nil
Summer 2021	74	Small	Glider		Spotted Gum	Nil	Nil	Functional	Nil	No	No	Functional	Nil	Glider nest	No	Functional	Nil
Summer 2021	75	Medium	Parrot		Spotted Gum	Nil	Nil	Functional	Nil	Golden-tailed Spiny Ants	No	Functional	Nil	Glider nest	No	Functional	Nil
Summer 2021	76	Small	Glider		Spotted Gum	Glider nest	Nil	Functional	Nil	Glider nest	No	Functional	Nil	Nil	No	Functional	Nil
Summer 2021	77	Small	Microbat (2 chamber)		Spotted Gum	Nil	Nil	Functional	Nil	No	No	Functional	Nil	Nil	No	Functional	Nil
Summer 2021	78	Large	Wood duck / Small Owl		Spotted Gum	Nil	Nil	Functional	Review the functionality of gaps	No	No	Questionable	Reclad during next round of monitoring	Nil	No	Functional	Apply cladding
Summer 2021	79	Medium	Possum		Grey Ironbark	Nil	Nil	Functional	Review the functionality of gaps	No	No	Functional	Reclad during next round of monitoring	Glider nest	No	Functional	Apply cladding
Summer 2021	80	Small	Glider		Grey Ironbark	Nil	Nil	Functional	Nil	Glider nest	No	Functional	Nil	Glider nest	No	Functional	Nil
Summer 2021	81	Medium	Possum		Small-fruited Grey Gum	Brush-tail Possum - Bark and Leaves	Nil	Functional	Nil	Leaves from possum	No	Functional	Nil	Nil	No	Functional	Nil
Summer 2021	82	Small	Microbat (2 chamber)		Small-fruited Grey Gum	Nil	Nil	Functional	Nil	No	No	Functional	Nil	Nil	No	Functional	Nil
Summer 2021	83	Medium	Possum		Small-fruited Grey Gum	Nil	Nil	Functional	Nil	Old leaves from possum	No	Functional	Nil	Glider nest	No	Functional	Nil
Summer 2021	84	Medium	Parrot		Small-fruited Grey Gum	Glider Nest	Nil	Functional	Re-wire as lid very tight	Antechinus scats	No	Functional	Nil	Old antechinus nest scats	No	Functional	Nil

# **Appendix D**

**Water quality results**

DATE 2023-2024	WHO	WEATHER	RAIN PAST 24 HRS	RAIN PAST 5 DAYS	POINT	DISCHARGE	TSS/TURB	PH	conduct	OIL	TREATED?	DISCHARGED?	DEPTH
4.7.23	mark n	raining	14	15	epl pt 1	no	16	8	n/a	no	no	yes	
4.7.23	mark n	raining	14	15	wq1	n/a	3	6.3	n/a	no	n/a	n/a	surface water>10mm
4.7.23	mark n	raining	14	15	wq2	n/a	2	6.1	n/a	no	n/a	n/a	surface water>10mm
5.10.23	mark n	cloudy	0	0	gw1	n/a	n/a	6.2	250	no	n/a	n/a	4.2m
5.10.23	mark n	cloudy	0	0	gw2	n/a	n/a	5	230	no	n/a	n/a	1.9m
5.10.23	mark n	cloudy	0	0	gw3	n/a	n/a	dry	dry	dry	n/a	n/a	dry
13.11.23	mark n	fine	0	21	epa 1	no	18	7.5	n/a	no	no	yes	
2.1.24	mark n	fine	0	130	epa 1	no	9	7.6	n/a	no	no	yes	
22.1.24	mark n	cloudy	38	38	epa 1	no	37	7.4	n/a	no	no	yes	
22.1.24	mark n	cloudy	38	38	wq1	n/a	4.7	6.8	n/a	no	n/a	n/a	surface water>10mm
22.1.24	mark n	cloudy	38	38	wq2	n/a	4.5	6.4	n/a	no	n/a	n/a	surface water>10mm
7.4.24	mark n	cloudy	2	36	epa 1	no	8	7.6	n/a	no	no	yes	



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