Slys Quarry, Tullmorgan-Jackbulbin Road, Mororo

Annual Review

Newman Quarrying Pty Ltd

30 September 2022

The Power of Commitment

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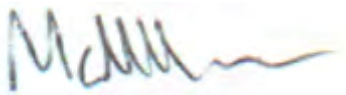
			Name	Signature	Name	Signature	Date
S4	0	L Spears	B Luffman		S Lawer		30/09/22

Annual review title block

Feature	Details
Name of operation	Slys Quarry
Name of operator	Newman Quarrying Pty Ltd
Development consent/project approval #	SSD 6624
Name of holder of development consent/project approval	Newman Quarrying 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 2021
Annual Review end date	30 June 2022
I, Mark Newman, certify that this annual review is a true and accurate record of the compliance status of Slys Quarry for the period 01 July 2021 to 30 June 2022 and that I am authorised to make this statement on behalf of Newman Quarrying Pty Ltd. *Note.* *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.* *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).*	
Name of authorised reporting officer	Mark Newman
Title of authorised reporting officer	Director
Signature of authorised reporting officer	
Date: 30 September 2022	

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1. Statement of compliance

The expansion of Slys Quarry was approved by 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: potential for serious environmental consequences, but is unlikely to occur; or potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: potential for moderate environmental consequences, but is unlikely to occur; or potential for low environmental consequences, but is likely to occur
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

Newman Quarrying Pty Ltd (Newman Quarrying) 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.

Newman Quarrying have been operating since the early 1990's, 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

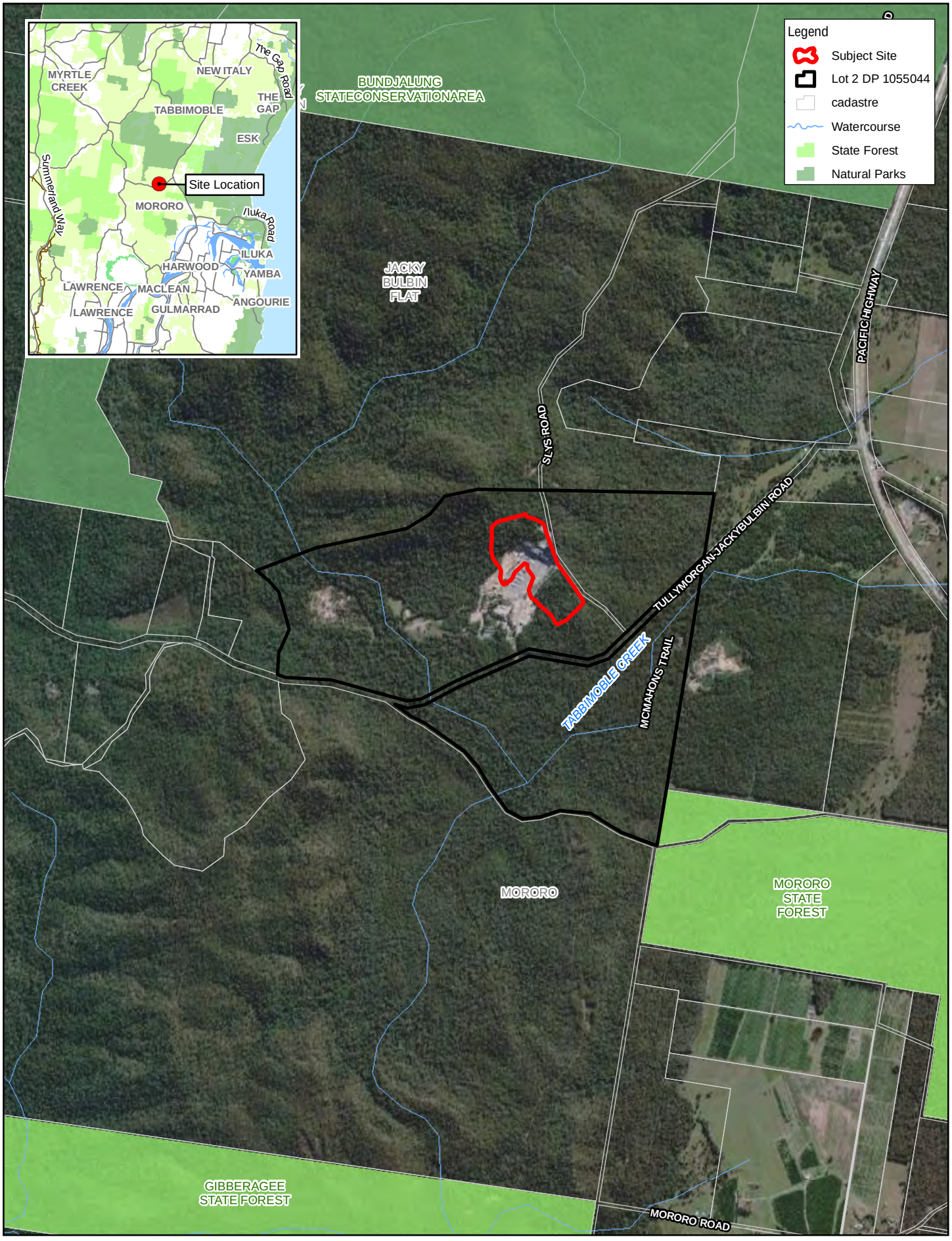
Quarry Owner/Manager:	Mark Newman
Company:	Newman Quarrying Pty Ltd
Address:	Tullymorgan-Jackybulbin Road, Mororo
Phone:	0427 822 667
Email:	newmanquarrying@gmail.com

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 2021 until 30 June 2022 (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.



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0 0.2 0.4 0.6 0.8

Kilometers

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

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GHD

Sly's Quarry
Annual Review 2020-21

Site location

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

FIGURE 2-1

G:\22\17528\GIS\Maps\Deliverables\AnnualReview_2020_21\2217528_AR20-21_001_SiteLocation_0.mxd
Print date: 29 Sep 2021 - 14:35

Data source:Geoscience Australia: 250k Topographic Data Series 3, 2006; LPI: DTDB, DCDC, 2017. LPI: Aerial Imagery, 2019 Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community. Created by: QChung, fmackay

2.3 Limitations

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

GHD otherwise disclaims responsibility to any person other than Newman Quarrying 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.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Newman Quarrying 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 Newman Quarrying 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
Project Approvals		
Development Consent (SSD 6624)	5 May 2016. Modified 19 October 2017	31 May 2041
Environmental Protection Licences		
EPL 11649	12 June 2002. Licence varied 14 September 2020	In perpetuity (Anniversary 1 January) until surrendered

The requirements of the Development Consent, 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; and (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. *Table 1: Operating Hours* **Activity** / **Permissible Hours** Employee arrival: • From 6:30 am Monday to Saturday inclusive • From 7:30 am Sundays or public holidays if engaged in maintenance, site security or other similar activities Quarrying operations including loading and dispatch of laden trucks: • 7 am to 6 pm Monday to Friday • 7 am to 1 pm Saturday • 7 am to 4 pm Saturday if fulfilling a contract for the supply of quarry products to the Pacific Highway update project (SSD 4963)* • At no time on Sundays or public holidays Blasting: • 9 am to 3 pm Monday to Friday (except public holidays) Maintenance: • May be conducted at any time, provided that these activities are not audible at any privately-owned residence *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.	Not applicable – the quarry has not operated on Saturday afternoons during the reporting period
	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; and 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: – relevant statutory requirements, limits or performance measures / criteria; – requirements of any plan or program required under this consent; – monitoring results of previous years; and – relevant predictions in the Environmental Impact Statement (EIS);	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; and	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 has continued to extract material from the north of Stage 1, as shown in Figure 4.1 and has commenced extraction of the southern Stage 2 area. Extraction of Stage 1 has involved a process of blasting, crushing, screening and stockpiling as described in the *Environmental Impact Statement* (GHD, 2015) submitted with the development application. The extraction of Stage 2 has not involved blasting or crushing but has required clearing an area of vegetation.

In the reporting period, 183,442 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 263,091 tonnes. This shows the material extracted and transported during the reporting period was within the approved limit of 500,000 tonnes.

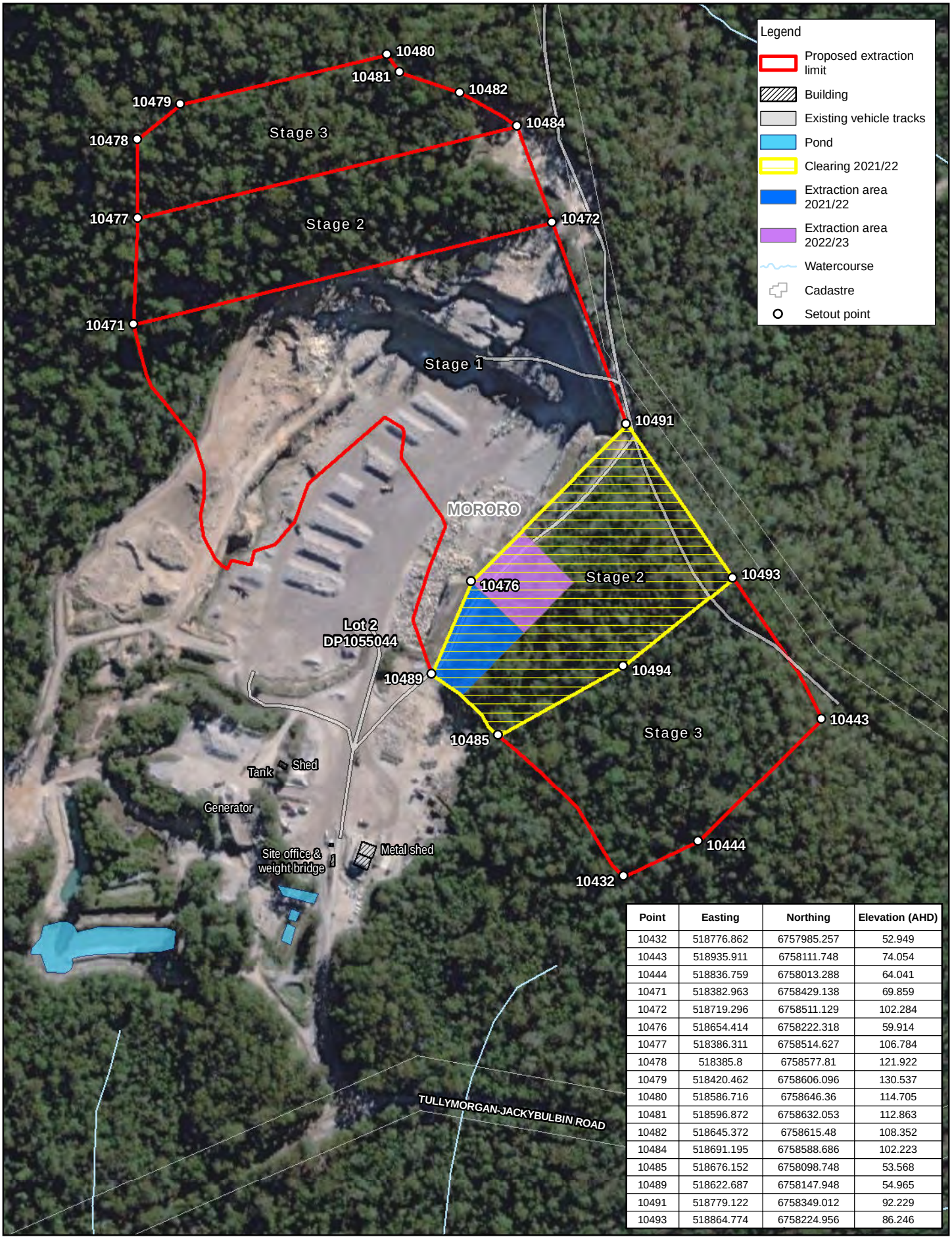
Table 4.1 Blast and production summary

Reporting period	Extracted		Sold/transported (tonnes)
	Volume (m^3)	Tonnes	
2020/21	29,351*	73,377*	142,121
2021/22	61,828	184,633	263,091
2022/23 (forecast)	120,000	300,000	300,000

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

Other activities during the reporting period include:

– Monitoring rehabilitation of Area C
– Ongoing environmental monitoring
– Management plan updates
– Biobank monitoring as per agreement
– Nest box installation and monitoring
– Sediment pond cleaning



Point	Easting	Northing	Elevation (AHD)
10432	518776.862	6757985.257	52.949
10443	518935.911	6758111.748	74.054
10444	518836.759	6758013.288	64.041
10471	518382.963	6758429.138	69.859
10472	518719.296	6758511.129	102.284
10476	518654.414	6758222.318	59.914
10477	518386.311	6758514.627	106.784
10478	518385.8	6758577.81	121.922
10479	518420.462	6758606.096	130.537
10480	518586.716	6758646.36	114.705
10481	518596.872	6758632.053	112.863
10482	518645.372	6758615.48	108.352
10484	518691.195	6758588.686	102.223
10485	518676.152	6758098.748	53.568
10489	518622.687	6758147.948	54.965
10491	518779.122	6758349.012	92.229
10493	518864.774	6758224.956	86.246

Paper Size ISO A4

0 25 50 75 100

Metres

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

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Sly's Quarry
Annual Review

Extraction and clearing

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

FIGURE 4-1

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Data source: LPI: DTDB, DCDC, 2017. LPI: Aerial Imagery, 2019, Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community. Created by: TMorton, tmorton, fmackay

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 required from previous Annual Review	Requested by	Action taken by the Operator	Reference
Monitoring and mitigation measures identified in the CoA, EPL and management plans will continue to be implemented.	A commitment from the previous Annual Review	The monitoring and mitigation measures identified in the CoA, EPL and management plans have continued to be implemented.	Section 6

6. Environmental performance

6.1 Noise

6.1.1 Environmental management

Operational noise is managed by Newman Quarrying 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 revised and submitted to DPE during the reporting period to update the monitoring requirements. The revised NMP was approved on 14/09/2022.

Newman Quarrying 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, Newman Quarrying 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

Blast 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 Newman Quarrying 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.

Newman Quarrying 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.

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 9 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
Blast criteria		**5**	**115**	
Trigger value		**0.8**	**106**	
15/07/2021	2.40pm	0.1	114.5	Yes
10/08/2021	2.40pm	0.33	112.5	Yes
8/09/2021	11.18am	0.17	103.4	Yes
2/11/2021	1.54pm	0.08	114	Yes
24/01/2022	1.08pm	0.16	107.4	Yes
14/02/2022	1.44pm	0.08	106.4	Yes
21/03/2022	12.16pm	0.12	Not triggered	Yes
27/04/2022	1.26pm	0.18	Not triggered	Yes
17/06/2022	2.20pm	0.22	106.9	Yes

Based on the predicted results in the EIS, presented in Figure 6.1, the actual results are less. This is similar to previous year's results when most did not trigger and the others were less than the criteria.

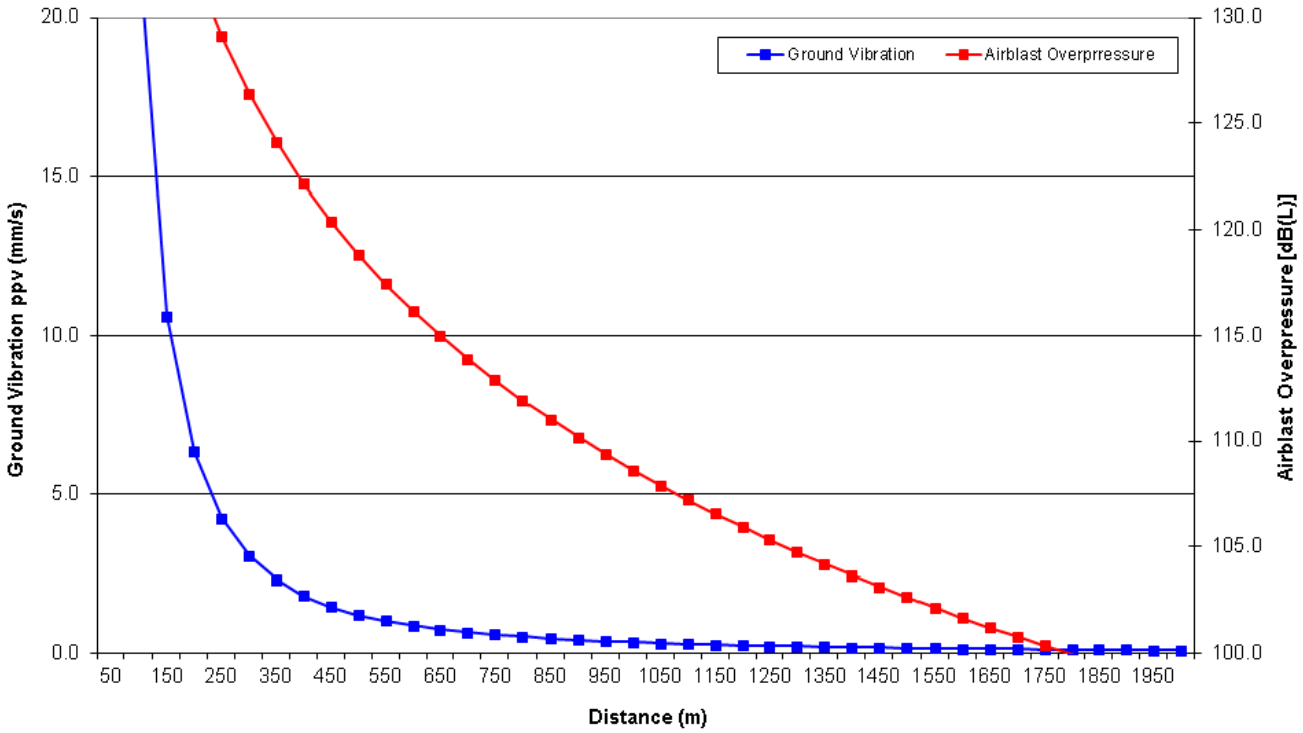


Figure 6.1 EIS estimated ground vibration and airblast overpressure levels from blasting

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 revised and submitted to DPE during the reporting period to update the monitoring requirements. The revised AQMP was approved on 19/09/2022.

Newman Quarrying 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 revised and submitted to DPE during the reporting period to update the monitoring requirements. To date the revised SWMP has not been approved.

In order to meet these objectives, Newman Quarrying 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 level monitoring

Newman Quarrying completed water quality monitoring in accordance with the EPL.

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 C. 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 results less than 50 mg/L and between a pH of 6.87 and 8.14.

Table 6.4 Summary of basin monitoring results

Date	Rain		Discharging	TSS (mg/L)	pH	Oil	Treated?	Discharged
	24hrs	5 Days						
Criteria				**50**	**6.5-8.5**	**Nil**		
06/08/21	17.7	17.7	No	41	7.54	Nil	No	Yes
07/09/21	0	4	No	20	8.14	Nil	No	Yes
13/10/21	70	90	No	11	6.87	Nil	No	Yes
10/01/22	5	51	No	30	7.35	Nil	No	Yes
15/05/22	11	39	No	17	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 from the water quality sampling since operations commenced. A total of 5 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 C. 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

	TSS (mg/L)		pH		Oil (visible)	
Site	**WQ1**	**WQ2**	**WQ1**	**WQ2**	**WQ1**	**WQ2**
Median	4	5	6.29	6.33	None	None
Maximum	7	22	6.4	6.06	None	None
Minimum	2	5	6.08	6.4	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 C. This shows the results vary a little between sites. Generally pH is highest at GW1 and about 1 pH unit lower at GW 2 and GW3. The conductivity reduces from GW1 to GW3. It is not clear what would cause this difference but the conductivity for all sites would be considered freshwater and within the natural variability of the area.

Table 6.6 Groundwater monitoring results

	Rain		GW1		GW2		GW3	
Date	**24 hrs**	**5 days**	**pH**	**Cond**	**pH**	**Cond**	**pH**	**Cond**
7/09/21	0	4	6.31	457	5.36	234	5.07	176

6.4.3 Improvements and initiatives

Newman Quarrying 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 revised and submitted to DPE during the reporting period to add details regarding the establishment of the Biodiversity Stewardship site. To date the revised BRMP has not been approved.

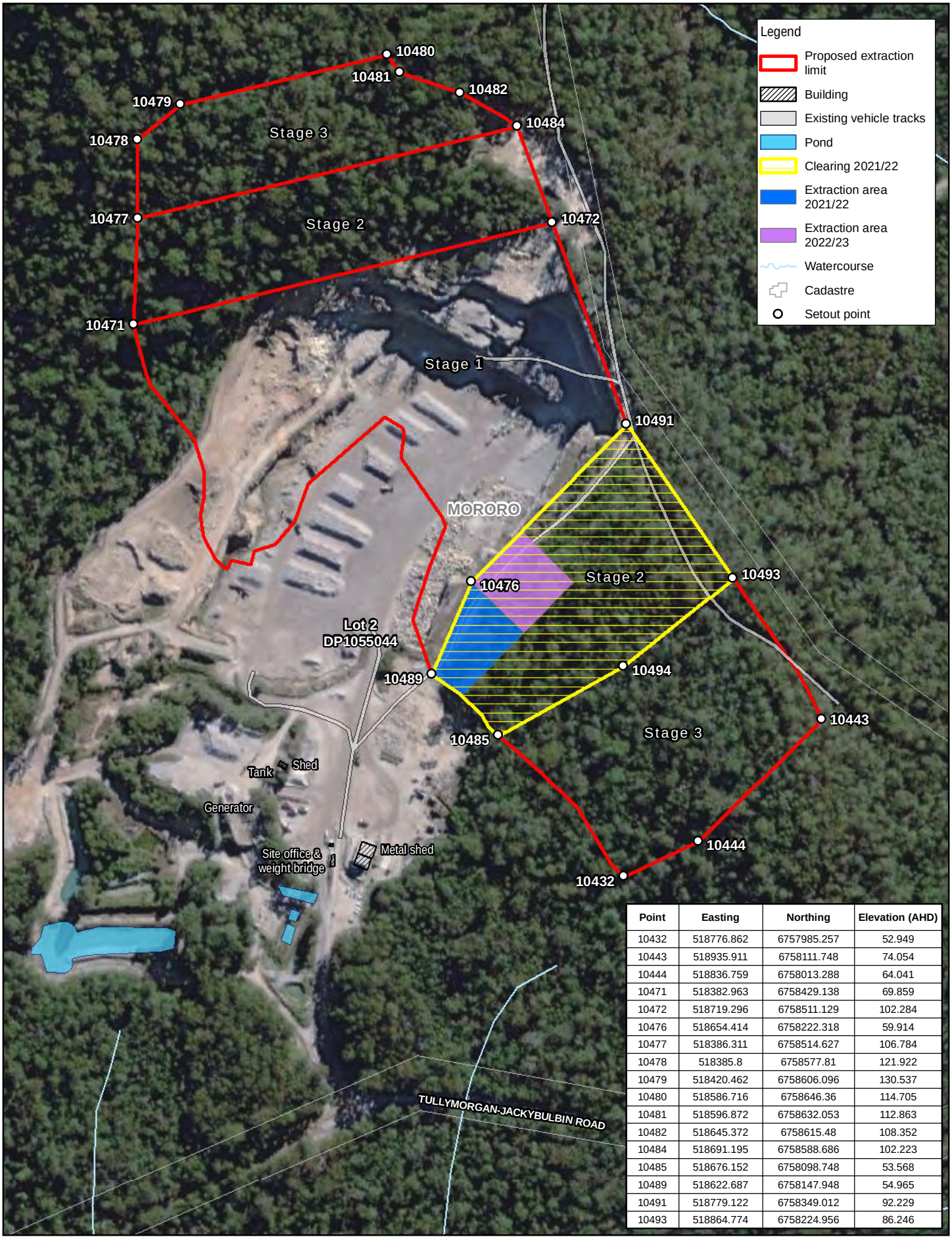
In order to meet these objectives, Newman Quarrying implements a range of mitigation measures and monitoring requirements as outlined in the BRMP, which include:

– 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 D
– Cleared the southern area of Stage 2 in accordance with BRMP requirements
– Maintained the Stewardship site in accordance with the Agreement

6.5.2 Environmental performance

Although the southern area of Stage 2 has been cleared, this is less than a quarter of the area proposed to be cleared, so the actual impacts are considered to be less than those predicted at the moment.

Detailed monitoring of the revegetation of Area C has not been completed previously but from opportunistic observations and Figure 6.3, the natural revegetation appears to have progressed with plants growing and additional species observed. Some areas are slow to revegetate and may require assistance if natural revegetation continues to fail in the next few years.



Point	Easting	Northing	Elevation (AHD)
10432	518776.862	6757985.257	52.949
10443	518935.911	6758111.748	74.054
10444	518836.759	6758013.288	64.041
10471	518382.963	6758429.138	69.859
10472	518719.296	6758511.129	102.284
10476	518654.414	6758222.318	59.914
10477	518386.311	6758514.627	106.784
10478	518385.8	6758577.81	121.922
10479	518420.462	6758606.096	130.537
10480	518586.716	6758646.36	114.705
10481	518596.872	6758632.053	112.863
10482	518645.372	6758615.48	108.352
10484	518691.195	6758588.686	102.223
10485	518676.152	6758098.748	53.568
10489	518622.687	6758147.948	54.965
10491	518779.122	6758349.012	92.229
10493	518864.774	6758224.956	86.246

Paper Size ISO A4

0 25 50 75 100

Metres

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

N

GHD

Sly's Quarry
Annual Review

Extraction and clearing

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

FIGURE 4-1

G:\22\17528\GIS\Maps\Deliverables\AnnualReview_2022\2217528_AR22_002_ExtractionPlan_0.mxd
Print date: 29 Sep 2022 - 10:40

Data source: LPI: DTDB, DCDC, 2017. LPI: Aerial Imagery, 2019, Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community. Created by: TMorton, tmorton, fmackay

Figure 6.3 Aerial photograph of Area C rehabilitation between 5/10/2013 (top), 25/10/2018 (middle) and September 2022 (bottom)

Newman Quarrying have been progressing the removal of the 317 Common Planigale credits from Condition 27, Schedule 3, and are currently in the process of engaging an expert to assess if the site contains Common Planigale habitat.

6.5.3 Improvements and initiatives

Newman Quarrying will continue to implement the BRMP and Stewardship Agreement requirements to minimise impacts on biodiversity.

6.6 Heritage

6.6.1 Environmental management

Management of both historical and Aboriginal cultural heritage at Sly's 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, Newman Quarrying 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.

6.6.3 Improvements and initiatives

The HMP and CoA will continue to be implemented at Sly's 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.

6.7.2 Environmental performance

The following mitigation measures were implemented by Newman Quarrying 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 2021/22 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	15 m^3	Landfill
Cardboard	9 m^3	Recycled
Oil	5,600 L	Recycled
Hydrocarbon bin	0.3t	Landfill

6.7.3 Improvements and initiatives

Newman Quarrying 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 revised and submitted to DPE during the reporting period to update some of the requirements. The TMP was approved on 22/08/2022.

In order to meet these objectives Newman Quarrying implemented the following mitigation measures during the reporting period:

– Implementation of a code of conduct
– No more than 150 laden trucks dispatched from the quarry on any day

6.8.2 Environmental performance

Newman Quarrying present a truck movement summary on their website, which is summarised in Table 6.8. A total of 10,629 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	17	0	26	8	73	4	0	122	0	9	0	52
2	29	47	34	0	45	84	0	120	0	0	16	52
3	0	47	13	0	122	24	0	2	0	0	18	55
4	0	22	0	0	89	18	0	18	0	0	15	4
5	33	22	0	64	66	0	0	0	0	38	9	0
6	49	25	20	24	0	16	0	0	0	44	15	90
7	34	0	15	45	0	20	0	45	14	40	0	122
8	91	0	43	46	31	29	0	28	17	21	0	94
9	39	21	28	0	59	30	0	72	31	0	21	109
10	3	23	18	0	120	28	10	74	7	0	19	73
11	0	24	0	77	31	0	16	110	5	64	31	0
12	33	37	0	1	12	0	100	0	0	32	38	0
13	17	18	29	4	2	124	105	0	0	32	13	0
14	45	0	20	12	0	110	80	50	10	18	0	43
15	96	0	26	28	92	115	3	26	9	0	0	52
16	85	19	39	0	120	107	0	43	15	0	16	65
17	0	27	10	0	88	12	6	103	16	0	20	71
18	0	29	0	35	81	0	110	89	40	0	15	8
19	76	26	0	31	51	0	112	65	0	23	16	0
20	142	20	46	70	2	109	6	0	0	30	21	114
21	73	0	59	19	0	145	0	99	24	34	0	112
22	44	0	59	10	24	76	0	69	0	38	0	88
23	75	23	48	0	45	0	0	53	0	0	3	101
24	0	22	10	0	61	0	30	0	0	0	17	106
25	0	22	0	18	56	0	40	9	0	0	25	7
26	46	40	0	54	80	0	0	4	0	21	15	0
27	56	30	29	89	0	0	117	0	0	41	6	77
28	56	0	21	77	0	0	60	0	0	19	0	86
29	48	0	30	18	106	0	0		0	19	0	102
30		28	2	0	0	0	0		0	0	15	121
31		21		0		0	80		0		32	

The traffic impacts were generally consistent with those predicted, however truck numbers have increased by over 4,000 compared to the previous reporting period.

6.8.3 Improvements and initiatives

Newman Quarrying will continue to implement the traffic mitigation measures and conditions outlined in the TMP, CoA and EPL. It is also proposed to request confirmation that the 150 trucks per day can continue in accordance with Condition 8A.

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 Newman Quarrying 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.

Newman Quarrying 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.

8. Independent audit

An independent environmental audit (IEA) was completed in April 2021, so an IEA was not required during the audit period. Table 8.1 provides an update on the actions proposed in response to the recommendations from the 2021 IEA.

Table 8.1 IEA actions status update

Recommendation	Response	Status
The Land Application Area for the onsite sewage management system be regularly mown and kept in a well-maintained manner to allow future assessment	Council recently inspected the on-site wastewater system and didn't raise any concerns. Regardless, the Land Application Area has since been sprayed and will continue to be mown monthly.	Complete/ongoing
The potholes and cracked bitumen seal on the access road is repaired and maintained in good order to service heavy vehicular movements from the subject development.	Newman Quarrying have filled the potholes with road base as an interim measure. Newman Quarrying have been trying to organise a contractor to bitumen the area for the past few months. However, due to the small nature of the job and the lack of contractor availability, a contractor has not been available to date but one is scheduled to undertake the work next month.	Complete
Additional measures are required to protect the above-ground pipe/funnel for the underground used oil storage tank from inadvertent damage from vehicles or other machinery. Install some form of protection such as bollards or some robust form of fencing to prevent vehicles/machinery inadvertently damaging the pipe used for pouring waste oil into the tank.	Newman Quarrying will install steel bollards in July 2021.	Complete - steel bollards have been installed
The dedicated basin installed to capture washdown of vehicles requires initial and thereafter regular removal of sand and sediment. A regular program for removal of built-up sand/sediment should also be implemented.	Newman Quarrying has been removing sediment on a six monthly basis but will increase the frequency to quarterly.	Complete/ongoing
It is noted that a concrete hardstand / vehicle inspection ramp has been constructed outside near the main shed for inspection / maintenance of vehicles. This should not be used for a formal washdown facility and care is to be taken to ensure no spills of fuels / oils from the vehicles being serviced.	Newman Quarrying confirm the hardstand is only used to service machinery and not wash downs.	NA

Recommendation	Response	Status
Update the Soil and Water Management Plan (SWMP) prepared by GHD (2017) to include: – The new storage / sediment basin that has been constructed since 2017 and any other modifications to drainage lines or sediment and erosion control measures; – Revised frequency of monitoring of baseline water quality of drainage lines at locations WQ1 and WQ2. Noted that the frequency of this monitoring was reduced to “at least once every quarter” as per letter from DPE dated 04/02/2021; – Revised frequency of monitoring of groundwater monitoring bores (GW1, GW2 and GW3). The frequency of this monitoring was reduced from quarterly to “annually, where adequate water is available for sampling” as per letter from DPE dated 04/02/2021. It has been noted by GHD that DPE has agreed that monitoring of groundwater can be reduced to annually and via dipping, rather than loggers (email B. Luffman, GHD 21/04/21).	The SWMP will be updated with the recommendations and submitted to DPE for approval, within three months of the audit.	The SWMP has been submitted to DPE for approval
Install a new weather station as proposed to address past issues of battery failure or memory failure.	Newman Quarrying will install a new weather station in July 2021. To clarify, rainfall has and will continue to be recorded manually daily, so the issues with the weather station have not affected the rainfall records.	Complete
Implement a regular program for removal of built-up sand/sediment in the small basin associated with the vehicle washdown area.	Newman Quarrying has been removing sediment on a six monthly basis but will increase the frequency to quarterly.	Complete/ongoing
Ensure that the proposed new above ground 1,200 litre fuel tank to be installed and commissioned near the white generator is bunded.	Newman Quarrying confirm the fuel tank will be installed with a bund, as per the relevant standards.	Complete

9. Incidents and non-compliance

9.1 Incidents

No incidents occurred during the reporting period.

9.2 Non compliance

No non-compliance 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 from Stage 2B, as shown in Figure 4.1.
- Extraction of 300,000 tonnes.
- Independent Environmental Audit.
- Reviewing management plans.
- Continuing nest box monitoring.
- Requesting confirmation 150 trucks can continue to operate, as per Condition 8A.
- Modify the consent to update the biobank credit requirements.
- Continuing to implement the requirements of the management plans, EPL and CoA.
- Continuing rehabilitation.
- Implementing Stewardship management as per the agreement.

11. Conclusion

This Annual Review has been completed for Sly's Quarry, on behalf of Newman's Quarrying, in accordance with the CoAs (SSD 6624), to assess environmental compliance at the site from 1 July 2021 to 30 June 2022.

The primary quarry operations undertaken during the reporting period included:

– Clearing the remaining area of Stage 2 south.
– Extraction from Stage 1.and Stage 2 south
– Total extraction of 184,633 tonnes
– Nest box installation and monitoring
– Area C rehabilitation has been ongoing

Activities proposed for the next reporting period include:

– Extraction from Stage 2B, as shown in Figure 4.1.
– Extraction of 300,000 tonnes.
– Independent Environmental Audit.
– Reviewing management plans
– Continuing nest box monitoring.
– Requesting confirmation 150 trucks can continue to operate, as per Condition 8A
– Modify the consent to update the biobank credit requirements.
– Continuing to implement the requirements of the management plans, EPL and CoA.
– Continuing rehabilitation
– Implementing Stewardship management as per the agreement.

An assessment of the environmental monitoring completed at Sly's Quarry was undertaken, with compliance against CoA 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 2017. *Air Quality Management Plan*. May 2017.

GHD 2017. *Biodiversity and Rehabilitation Management Plan*. May 2017.

GHD 2017. *Blast Management Plan*. May 2017.

GHD 2017. *Environmental Management Strategy*. May 2017.

GHD 2017. *Heritage Management Plan*. May 2017.

GHD 2017. *Noise Management Plan*. May 2017.

GHD 2017. *Soil and Water Management Plan*. May 2017.

GHD 2017. *Traffic Management Plan*. May 2017.

GHD 2017. *Waste Management Plan*. May 2017.

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

Appendices

Appendix A

Production data

Extractive Materials Return
2019-2020

NSW GOVERNMENT | Regional NSW

Form S1 – Period Ending 30 June 2020

Sales During 2019-2020

Production information may be published in aggregated form for statistical reporting. However, production data for individual operations is kept strictly confidential. 2021 - 2022

Product	Description	Quantity Tonnes
Virgin Materials		
Crushed Coarse Aggregates		
Over 75mm		
Over 30mm to 75mm		22,425.93
5mm to 30mm		2,171.29
Under 5mm		2,521.68
Natural Sand		
Manufactured Sand		
Prepared Road Base & Sub Base		7366.12
Other Unprocessed Materials	General Fill	96,459.28
		103,574.36
Recycled Materials		
Crushed Coarse Aggregates		
Over 75mm		
Over 30mm to 75mm		
5mm to 30mm		
Under 5mm		
Natural Sand		
Manufactured Sand		
Prepared Road Base & Sub Base		
Other Unprocessed Materials		
River Gravel		
Over 30mm		
5mm to 30mm		
Under 5mm		
Construction Sand	Excluding Industrial Fill Sand	17,897
Industrial Sand		
Foundry, Moulding		
Glass		
Other (Specify)		
Dimension Stone	Building, Ornamental, Monumental	
Quarried in Blocks	Sorted rock	10,627.67
Quarried in Slabs	Flat rock grey	46.76
Decorative Aggregate	Including Terrazzo	
Loam	Soil for Topdressing, Garden soil, Horticultural purposes)	
TOTAL SITE PRODUCTION		263,090 mT
Gross Value ($) of all Sales		$2,893,990.99
Type of Material	Sandstone.	
Number of Full-Time Equivalent (FTE) Employees	**Employees** 9	**Contractors** 1

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

Regional NSW | 2

Extractive Materials Return
2019-2020

NSW GOVERNMENT | Regional NSW

Form S1 – Period Ending 30 June 2020

Quote RIMS ID in all correspondence 2021 - 2022

Quarry Id: Rims ID: 400563

Operators Name: Newman Quarrying Pty
Address: PO Box 292
Yamba 2464

Email: newmanquarrying@gmail.com

Quarry Name: Sly's Quarry
Quarry Address: Jacksons rd, Maroo

Inquiries please telephone:
(02) 4063 6713
Completed or Nil Returns
Email –
mineral.royalty@planning.nsw.gov.au
Postal Address (see below)

Please amend name, postal address and location of mine or quarry if incorrect or incomplete.

The return should be completed and forwarded to **Senior Advisory Officer, RESOURCE ECONOMICS, RESOURCE PLANNING & PROJECTS, DEPARTMENT OF REGIONAL NSW, PO BOX 344 HUNTER REGION MAIL CENTRE NSW 2310 on or before 31 October 2020.** 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, Resource Planning & Projects

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

Typical Geology Sandstone

Nearest Town to Quarry Maclean

Local Council Name Clarence Valley Council

Deposited Plan and Lot Number/s of Quarry Lot 2 DP1053044

Email Address of Operator newmanquarrying@gmail.com

Name of Owner or Licensee Mark Newman

Postal Address of Licensee PO Box 292, Yamba 2464

Licence/Lease Number/s (if any)

From Mining, Exploration & Geoscience (NSW Mineral Resources) N/A

From Crown Lands or other NSW Department SS96624

If any output was obtained from land NOT held under licence from the above Departments, state the Name/s and Address/es of the Owners of the land N/A

To the best of my knowledge, information entered in this return is correct and no blank spaces left where figures should have been inserted.

- **SIGNATURE of PROPRIETOR or MANAGER** _____ **DATE** 25-7-22
- **CONTACT PERSON for this return** MARK NEWMAN
- **NAME** (Block letters) MARK NEWMAN **Telephone** 0427822667

Regional NSW | 1

Appendix B

Council contributions

NEWMAN QUARRYING PTY.LTD

ACN 067 605 323 / ABN 32 067 605 323
PO BOX 292, Yamba 2464
PH 0427822667
newmanquarrying@gmail.com

19.7.22

To Whom it may concern,

Please see attached our cheque to pay our annual s94 contribution. This amount has been calculated using the formula in your s94 plan the following way.

L = 2km of council road from our gate to Pacific Hwy
T = 263,090.09 sold /5t per axle (as s94 plan states) = 52,618.02 esa's used 21/22
M = $4,347.65 as per s94 plan maclean quarry rd maintenance minor rd
Q = 45000 anticipated esa's used 22/23

Formula (l x m) / t x Q

2 x $4347.65 = $8,695.30 / 52618.02 x 45,000 = $7,436.40

Please feel free to contact me if you need any further information.

Regards

Mark Newman
Director

clarence
VALLEY COUNCIL

ABN: 85864095684
Locked Bag 23
Grafton NSW 2460

Tax Invoice

Official Receipt

27/07/2022 **Receipt No:** 878235

To: Newman Quarrying Pty Ltd
PO Box 292
YAMBA NSW 2464

Applic	Reference	Amount
GL Receipt		
GL S94QuryRdsJacky		$7,436.40
1 - Newman Quarry - Annual S94 Contribution		
Qty 1, CredCardSurcharge		$40.56
1		
GL19997480		$4.06
Transaction Total:		**$7,481.02**
Includes GST of:		**$4.06**

Amounts Tendered

Cash	$0.00
Cheque	$0.00
Db/Cr Card	$7,481.02
Money Order	$0.00
Agency	$0.00
Total	$7,481.02
Rounding	$0.00
Change	$0.00
Nett	**$7,481.02**

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 27/07/2022 11:08:54AM

Appendix C

Water quality results

DATE 2021-2022	WHO	WEATHER	RAIN PAST 24 HRS	RAIN PAST 5 DAYS	POINT	DISCHARGING?	TSS/TURB	PH	conduct	OIL	TREATED?	DISCHARGED?		
1.7.21	mark n	rainy	11	31	wq1	n/a	3	6.34	n/a	no	n/a	n/a	surface water >10mm	running
1.7.21	mark n	rainy	11	31	wq2	n/a	5	6.38	n/a	no	n/a	n/a	surface water >10mm	running
6.8.21	mark n	cloudy	17.7	17.7	wq1	n/a	4	6.08	n/a	no	n/a	n/a	surface water >10mm	running
6.8.21	mark n	cloudy	17.7	17.7	wq2	n/a	5	6.06	n/a	no	n/a	n/a	surface water >10mm	running
6.8.21	mark n	cloudy	17.7	17.7	epl point 1	no	41	7.54	n/a	no	no	yes		
7.9.21	mark n	fine	0	4	gw1	n/a	n/a	6.31	457	no	n/a	n/a		
7.9.21	mark n	fine	0	4	gw2	n/a	n/a	5.36	234	no	n/a	n/a		
7.9.21	mark n	fine	0	4	gw3	n/a	n/a	5.07	176	no	n/a	n/a		
7.9.21	mark n	fine	0	4	epl point 1	no	20	8.14	n/a	no	no	yes		
13.10.21	mark n	rain	70	90	wq1	n/a	2	6.29	n/a	no	n/a	n/a	surface water >10mm	running
13.10.21	mark n	rain	70	90	wq2	n/a	6	6.1	n/a	no	n/a	n/a	surface water >10mm	running
13.10.21	mark n	rain	70	90	epl point 1	no	11	6.87	n/a	no	no	yes		
10.1.22	mark n	cloudy	5	51	epl point 1	no	30	7.35	n/a	no	no	yes		
4.2.22	mark n	rain	44	88	wq1	n/a	5	6.22	n/a	no	n/a	n/a	surface water >10mm	running
4.2.22	mark n	rain	44	88	wq2	n/a	5	6.33	n/a	no	n/a	n/a	surface water >10mm	running
12.5.22	mark n	rain	11	39	epl point 1	no	17	7.6	n/a	no	no	yes		
12.5.22	mark n	rain	11	39	wq1	n/a	7	6.4	n/a	no	n/a	n/a	surface water >10mm	running
12.5.22	mark n	rain	11	39	wq2	n/a	22	6.4	n/a	no	n/a	n/a	surface water >10mm	running

Appendix D

Nest Box Monitoring report

Ref: 3532122:SlysQuarryNestBoxMonitoringEpisode6

6th October 2021

Newmans Quarrying
PO Box 292
Yamba NSW 2464
Attention: Mark Newman

Re: Nest Box Monitoring – Episode 6 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 5th 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. The specific requirements of these nest boxes was summarised as follows:

- Five small nest boxes with entrances smaller than 50 mm;
- Four medium nest boxes with entrances of 50-150 mm; and
- Two larger nest boxes with entrances exceeding 150 mm.

A fifth medium sized nest box was installed due to anomalies between the individual and total tallies in Table 4-2 of the Slys Quarry Nest Box Management Plan (GHD 2017).

In accordance with the Nest Box Plan of Management, monitoring must be undertaken twice per year for a period of five years.

The following is a summary of past nest box monitoring events:

- Year 1 with episode 1 performed in October 2018. This survey found three of the 12 (25%) nest boxes showed signs of occupation. Two of the medium sized nest boxes (numbers 6 and 8) had glider leaf nests in them whilst the large nest box designed for small owls had been recently used by a possum, presumably a Common Brushtail Possum (*Trichosurus vulpecula*). The second round of monitoring in April 2019 (episode 2) found six of the 12 (50%) nest boxes showed signs of occupation. This included a Gould's Long-eared Bat (*Nyctophilus gouldi*) using Nest Box 1 (two chamber bat box) along with an active marsupial glider nests in Nest Box 4 (Parrot design), Nest Box 6 (parrot design) and Nest Box 8 (rear entry glider). Older signs of occupation were recorded in Nest Box 3 (small possum) with a disused glider nest and Nest Box 10 (small owl) with a possum nest.

At the end of Year 1, no feral species (i.e. European Honey Bee or Common Myna) were recorded using the nest boxes and only some minimal maintenance was required to remove ants using a medium sized parrot box (Nest Box 9) and some repositioning of Nest Box 11 so that it remained in a firm position in the recipient tree.

- Year 2 where the first round of monitoring was performed shortly after the Myall Creek Bushfire which burnt through the site on the 20-21 November 2019. Sampling on the 28th December 2019 (episode 3) found eight of the 12 (67%) nest boxes had been destroyed by the fire. Of the remaining four nest boxes, two were found to contain wildlife with two Sugar Gliders (*Petaurus breviceps*) using Nest Box 4 and a Common Brushtail Possum (*Trichosurus vulpecula*) using Nest Box 11. A follow up survey in September 2020 (episode 4) found both of the nest boxes had been unused for some time. From a maintenance perspective, no feral species (i.e. European Honey Bee or Common Myna) were recorded using the four nest boxes that remain undamaged from the fire and there was a recommendation to replace those boxes lost in the fire during the next round of monitoring.

- Year 3 with episode 5 performed on the 2nd May 2021 where three of the twelve (25%) nest boxes showed recent signs of use by native wildlife. Nest Box 1 was occupied by two Gould's Long-eared Bats (*Nyctophilus gouldi*) whilst a Sugar Glider (*Petaurus breviceps*) was found in Nest box 10. Some leaves consistent with Brushtail Possum was observed in Nest box 2 and is likely to be a Common Brushtail Possum (*Trichosurus vulpecula*). Two of the inhabited nest boxes were replacement boxes installed after the 2019 wildfire.

The second round of sampling for Year 3 is episode 6 and forms the current round of monitoring presented below.

2.0 - Episode Six Monitoring Details

The site was accessed on the 26th September 2021 for the purposes of inspecting the 12 nest boxes installed as part of stage 1 works. In addition to this, an additional 20 nest boxes were installed in the southern nest box zone, more or less east of the quarry maintenance shed.

A ladder with a fall arrest (belay and harness) system was used to access each nest box so that species could be positively identified and that any maintenance activities could be performed at that time.

3.0 - Monitoring Results

Only one of the twelve nest boxes showed recent signs of use by native wildlife. Nest box 8 was a replacement nest box following the fires and contained some leaves that weren't present during the last round of monitoring. A number of the remaining nest boxes showed aged signs of use which has been captured during previous monitoring events.

From a maintenance perspective, termites have started to consume Nest Box 4, a parrot design box that has been previously used by Sugar Glider (Plate 1-1). This box remains in a functional state but may require some maintenance intervention in the near future.

Plate 1-1. Nest box 4 with termite activity.

Twenty additional nest boxes were installed in the southern nest box zone. Generally, two boxes were installed on each tree, the only exceptions were the two very large boxes where they were installed as one nest box per tree (Table A-2).

4-0 - Discussion and Conclusion

This round of monitoring found only one nest box showed any form of recent activity. It is presently unclear why this is the case given fauna had used nest boxes leading up to and for a period of time after the wildfire. More recently, a number of larger trees have died as a result of the fire or had showed some signs of initial recovery with epicormic growth but have since died. This may have resulted in changes to available foraging resources including the extent of flowering resources, invertebrates that live within the foliage or underneath bark or some incision trees used by gliders may have died. The additional incremental clearing to the south as part of quarry expansion activity is not expected to have had any effect.

The installation of an additional 20 nest boxes has ensured there is adequate resources for any hollow dependent fauna displaced as part of the clearing works (Plate 1-2). Monitoring in or around April 2022 will be able to evaluate the update of fauna in these newly installed boxes.

Plate 1-2. Retained habitat trees subject to staged clearing as part of quarry expansion works.

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

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Lewis, B. D (2020). Nest Box Monitoring – Episode 3 (January 2020). Stage 1 Slys Quarry Tullymorgan. Report prepared for Newman Quarrying by Lewis Ecological Surveys.

Appendix 1

Table A1. Nest box register for the northern zone at Year 3 encompassing monitoring episodes 1-6.

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)			
						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
6/02/2018	2	Medium	Barn Owl	518703 6758648	Pink Bloodwood	Few leaves – possible possum	Nil	Functional	Nil	Nil	Nil	Functional	Nil
6/02/2018	3	Small	Microbat (2 chamber)	518659 6758655	Needlebark Stringybark	Nil	Nil	Functional	Nil	Nil	Nil	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
6/02/2018	5	Small	Microbat (2 chamber)	518707 6758662	Needlebark Stringybark	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil
6/02/2018	6	Medium	Parrot/nightjar	518707 6758662	Needlebark Stringybark	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil
6/02/2018	7	Small	Microbat (2 chamber)	518565 6758642	Rough-barked Apple	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil
6/02/2018	8	Medium	Rear Entry Glider	518565 6758642	Rough-barked Apple	Nil	Nil	Functional	Nil	Older leaves	Nil	Functional	Nil
6/02/2018	9	Large	Glider (large rear entry)	518660 6758644	Rough-barked Apple	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil
6/02/2018	10	Medium	Parrot Box	518660 6758644	Rough-barked Apple	Sugar Glider	Nil	Functional	Nil	Nil	Nil	Functional	Nil
6/02/2018	11	Large	Possum (large)	518588 6758616	Pink Bloodwood	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil
6/02/2018	12	Medium	Possum (small)	518588 6758616	Pink Bloodwood	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil

Table A-2. Nest boxes installed in the southern zone as part of staged clearing works.

Installation Date	Nest Box Number	Nest Box Size	Nest Box Type	Easting Northing	Tree Species	Year 1 - Monitoring Episode 1 (April 2022)			
						Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements
26/09/2021	1	Small	Microbat (2 chamber)	518680 6758075	Angophora				
26/09/2021	2	Medium	Lorikeet/Parrot	518680 6758075	Angophora				
26/09/2021	3	Large	Owl	518675 6758071	Coastal Blackbutt				
26/09/2021	4	Medium	Glider	518675 6758071	Coastal Blackbutt				
26/09/2021	5	Large	Cockatoo/Owl	518687 6758069	Swamp Box				
26/09/2021	6	Medium	Possum	518692 6758053	Angophora				
26/09/2021	7	Medium	Glider	518692 6758053	Angophora				
26/09/2021	8	Small	Microbat (2 chamber)	518682 6758037	Coastal Blackbutt				
26/09/2021	9	Medium	Possum	518682 6758037	Coastal Blackbutt				
26/09/2021	10	Small	Microbat (2 chamber)	518694 6758038	Angophora				
26/09/2021	11	Medium	Possum	518694 6758038	Angophora				
26/09/2021	12	Large	Cockatoo/owl	518707 6758021	Angophora				
26/09/2021	13	Medium	Glider	518716 6758024	Angophora				
26/09/2021	14	Large	Owl	518716 6758024	Angophora				
26/09/2021	15	Medium	Lorikeet/Parrot	518725 6758025	Coastal Blackbutt				
26/09/2021	16	Medium	Glider	518725 6758025	Coastal Blackbutt				
26/09/2021	17	Small	Microbat (2 chamber)	518721 6758010	Needlebark Stringybark				
26/09/2021	18	Medium	Lorikeet/Parrot	518721 6758010	Needlebark Stringybark				
26/09/2021	19	Small	Microbat (2 chamber)	518713 6757984	Turpentine				
26/09/2021	20	Medium	Glider	518713 6757984	Turpentine				

Ref: 3702223: NewmansQuarrying/NestBoxMonitoringEpisode7

20th August 2022

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

Re: Nest Box Monitoring – Episode 7 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 5th 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.

The following is a summary of past nest box monitoring events:

- Year 1 with episode 1 performed in October 2018. This survey found three of the 12 (25%) nest boxes showed signs of occupation. Two of the medium sized nest boxes (numbers 6 and 8) had glider leaf nests in them whilst the large nest box designed for small owls had been recently used by a possum, presumably a Common Brushtail Possum (*Trichosurus vulpecula*). The second round of monitoring in April 2019 (episode 2) found six of the 12 (50%) nest boxes showed signs of occupation. This included a Gould's Long-eared Bat (*Nyctophilus gouldi*) using Nest Box 1 (two chamber bat box) along with an active marsupial glider nests in Nest Box 4 (Parrot design), Nest Box 6 (parrot design) and Nest Box 8 (rear entry glider). Older signs of occupation were recorded in Nest Box 3 (small possum) with a disused glider nest and Nest Box 10 (small owl) with a possum nest.

At the end of Year 1, no feral species (i.e. European Honey Bee or Common Myna) were recorded using the nest boxes and only some minimal maintenance was required to remove ants using a medium sized parrot box (Nest Box 9) and some repositioning of Nest Box 11 so that it remained in a firm position in the recipient tree.

- Year 2 where the first round of monitoring was performed shortly after the Myall Creek Bushfire which burnt through the site on the 20-21 November 2019. Sampling on the 28th December 2019 (episode 3) found eight of the 12 (67%) nest boxes had been destroyed by the fire. Of the remaining four nest boxes, two were found to contain wildlife with two Sugar Gliders (*Petaurus breviceps*) using Nest Box 4 and a Common Brushtail Possum (*Trichosurus vulpecula*) using Nest Box 11. A follow up survey in September 2020 (episode 4) found both of the nest boxes had been unused for some time. From a maintenance perspective, no feral species (i.e. European Honey Bee or Common Myna) were recorded using the four nest boxes that remain undamaged from the fire and there was a recommendation to replace those boxes lost in the fire during the next round of monitoring.

  Year 3 with episode 5 performed on the 2nd May 2021 where three of the twelve (25%) nest boxes showed recent signs of use by native wildlife. Nest Box 1 was occupied by two Gould's Long-eared Bats (*Nyctophilus gouldi*) whilst a Sugar Glider (*Petaurus breviceps*) was found in Nest box 10. Some leaves consistent with Brushtail Possum was observed in Nest box 2 and is likely to be a Common Brushtail Possum (*Trichosurus vulpecula*). Two of the inhabited nest boxes were replacement boxes installed after the 2019 wildfire. During the second round of sampling in September 2021, just one of the twelve nest boxes showed recent signs of use by native wildlife. Nest box 8 was a replacement nest box following the fires and contained some leaves that weren't present during the last round of monitoring. A number of the remaining nest boxes showed aged signs of use which has been captured during previous monitoring events.

  The current round of monitoring represents:

  - The first episode for Year 4 for the 12 nest boxes installed back in February 2018 and
  - First 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 12 and 13th August 2022 for the purposes of inspecting all 84 installed nest boxes. Nest boxes from Stage 1 were originally scheduled for inspection in Autumn 2022 but this was delayed whilst the nest boxes from Stage 2 (installed in spring/summer 2021) had sufficient establishment time and for the clearing operations to have been finalized in Stage 2 works area.

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

Eleven (13%) of the 84 nest boxes showed signs of use by native wildlife. This included observations of Sugar Glider in two nest boxes where at least two individuals and Gould's Long-eared Bat at two boxes where single individuals were recorded (Plate 3-1). Indirect signs in the form of nesting materials were observed at the remaining eight boxes and included glider nests, ringtail nests and a shallow cupped area of leaves indicative of brushtail possum use.

No feral or pest species in the form of introduced birds or bee hives were recorded. Termites and Golden Spiny Ant were recorded in or near a number of the nest boxes.

Maintenance activities were limited to some rewiring works, nest box repositioning and some lid adjustments. Termites are still active in Nest Box 4, a parrot design box that has been previously used by Sugar Glider in the past. This box remains in a functional state but is not likely to for much longer. A number of the newly installed nest boxes have been constructed in such a way there is large gaps present in the floor and walls of the nest box or with the drying of the timber they have split (Plate 3-2).

Plate 3-1. Twin chambered bat box utilized by Gould's Long-eared Bat.

Plate 3-2. Recently installed nest box with ringtail possum use. Note the large splits in the rear timber wall.

4-0 - Discussion and Conclusion

Eighty-four (84) or 56% of the proposed 150 nest boxes have now 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 required the inspection of substantially more nest boxes than previous monitoring episodes (e.g. Lewis 2018; Lewis 2019; Lewis 2020; Lewis 2021). With this, there were more observations of fauna and the fact that animals were detected in the recently installed nest boxes suggests that it has assisted in providing refuge, roost and den opportunities during and immediately after the staged clearing. It has therefore been a successful mitigation technique.

Nest box inspections recorded two types of possum, one type of glider and bat using the boxes but not birds, scansorial mammals (i.e. antechinus) or arboreal reptiles (i.e. Lace Monitor). This is not an uncommon finding and is consistent with past nest box monitoring on large linear projects such as the Pacific Motorway Upgrade (e.g. Lewis 2011; Lewis 2017). Although the study site and surrounding landscape contains numerous tree hollows, fauna populations are likely to be recovering from the wildfire event in November 2019 which burnt all of the site and surrounding landscape. This fire also destroyed numerous hollow bearing trees including a large number of prominent overstorey eucalypts, some of which remain now as stags (i.e. dead trees).

Nest box maintenance requirements were relatively straight forward with some rewiring and repositioning works whilst some screws had to be added to one of the parrot boxes. Most importantly, all of the 84 boxes remained in place and considered functional. It is a little premature to suggest the functionality is compromised in those nest boxes with large gaps (Plate 4-1). A ringtail possum nest was recorded in one of these boxes during this round of monitoring. If these boxes become disproportionally unused during future monitoring episodes some consideration should be given to cladding the gaps.

Plate 4-1. Example of nest box with gaps on the walls and floor allowing 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

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Lewis, B. D (2020). Nest Box Monitoring – Episode 3 (January 2020). Stage 1 Slys Quarry Tullymorgan. Report prepared for Newman Quarrying by Lewis Ecological Surveys.

Lewis, B. D (2021). Nest Box Monitoring – Episode 6 (September 2021). Stage 1 Slys Quarry Tullymorgan. Report prepared for Newman Quarrying by Lewis Ecological Surveys.

Appendix 1

Table A1. Nest box register for Stage 1 northern zone) in Year 1-4 encompassing monitoring episodes 1-7.

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)			
						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	Nil	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	Nil	Functional	Nil
6/02/2018	3	Small	Microbat (2 chamber)	518659 6758655	Needlebark Stringybark	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Nil	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	Termites	Deteriorating	Monitor until becomes dysfunctional
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
6/02/2018	6	Medium	Parrot/nightjar	518707 6758662	Needlebark Stringybark	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil
6/02/2018	7	Small	Microbat (2 chamber)	518565 6758642	Rough-barked Apple	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Nil	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	Nil	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	Nil	Functional	Nil
6/02/2018	10	Medium	Parrot Box	518660 6758644	Rough-barked Apple	Sugar Glider	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil
6/02/2018	11	Large	Possum (large)	518588 6758616	Pink Bloodwood	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Adjustment
6/02/2018	12	Medium	Possum (small)	518588 6758616	Pink Bloodwood	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Nil	Nil	Nil	Functional	Adjustment

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

Installation Date	Nest Box Number	Nest Box Size	Nest Box Type	Easting Northing	Tree Species	Year 1 - Monitoring Episode 1 (August 2022)			
						Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements
Adjacent Entrance									
Summer 2021	13	Small	Microbat (2 chamber)	518680 6758075	Angophora	Nil	Nil	Functional	Nil
Summer 2021	14	Medium	Parrot Box	518680 6758075	Angophora	Nil	Nil	Functional	Readjust on tree as lid tight
Summer 2021	15	Large	Owl	518675 6758071	Coastal Blackbutt	Nil	Nil	Functional	Nil
Summer 2021	16	Medium	Glider	518675 6758071	Coastal Blackbutt	Nil	Nil	Functional	Review the functionality of gaps
Summer 2021	17	Large	Cockatoo/Owl	518687 6758069	Swamp Box	Nil	Nil	Functional	Review the functionality of gaps
South of Stage 2									
Spring 2021	18	Medium	Possum	518692 6758053	Angophora	Nil	Nil	Functional	Review the functionality of gaps
Spring 2021	19	Medium	Glider	518692 6758053	Angophora	Golden-tailed Spiny Ant	Nil	Functional	Nil
Spring 2021	20	Small	Microbat (2 chamber)	518682 6758037	Coastal Blackbutt	Nil	Nil	Functional	Nil
Spring 2021	21	Medium	Possum	518682 6758037	Coastal Blackbutt	Nil	Nil	Functional	Review the functionality of gaps
Spring 2021	22	Small	Microbat (2 chamber)	518694 6758038	Angophora	Nil	Nil	Functional	Nil
Spring 2021	23	Medium	Possum	518694 6758038	Angophora	Nil	Nil	Functional	Review the functionality of gaps
Spring 2021	24	Large	Cockatoo/owl	518707 6758021	Angophora	Nil	Nil	Functional but lid starting to delaminate	Monitor
Spring 2021	25	Medium	Glider	518716 6758024	Angophora	Nil	Nil	Functional	Review the functionality of gaps
Spring 2021	26	Large	Owl	518716 6758024	Angophora	Nil	Nil	Functional	Review the functionality of gaps
Spring 2021	27	Medium	Lorikeet/Parrot	518725 6758025	Coastal Blackbutt	Nil	Nil	Functional	Review the functionality of gaps
Spring 2021	28	Medium	Glider	518725 6758025	Coastal Blackbutt	Nil	Nil	Functional	Lid adjustment
Spring 2021	29	Small	Microbat (2 chamber)	518721 6758010	Needlebark Stringybark	Nil	Nil	Functional	Nil
Spring 2021	30	Medium	Lorikeet/Parrot	518721 6758010	Needlebark Stringybark	Golden-tailed Spiny Ant	Nil	Functional	Nil
Spring 2021	31	Small	Microbat (2 chamber)	518713 6757984	Turpentine	Nil	Nil	Functional	Nil
Spring 2021	32	Medium	Glider	518713 6757984	Turpentine	Golden-tailed Spiny Ant	Nil	Functional	Nil
Spring 2021	33	Large	Owl/Cockatoo			Nil	Nil	Nil	Functional
Spring 2021	34	Medium	Parrot			Nil	Nil	Nil	Functional
Spring 2021	35	Small	Small Glider			Nil	Nil	Nil	Functional
Spring 2021	36	Large	Owl/Cockatoo			Nil	Nil	Nil	Functional
Spring 2021	37	Small	Small Glider			Sugar Glider x 2	Nil	Nil	Functional
Spring 2021	38	Medium	Parrot			Nil	Nil	Nil	Review the functionality of gaps
Spring 2021	39	Small	Small Glider			Individual leaves	Nil	Nil	Functional
Spring 2021	40	Medium	Parrot			Nil	Nil	Nil	Review the functionality of gaps
Spring 2021	41	Small	Microbat (2 chamber)			Nil	Nil	Nil	Functional
Spring 2021	42	Small	Small Glider			Golden-tailed Spiny Ant	Nil	Nil	Functional with re-wire and lid adjustment
Spring 2021	43	Small	Microbat (2 chamber)			Nil	Nil	Nil	Functional
Spring 2021	44	Medium	Possum			Golden-tailed Spiny Ant	Nil	Nil	Functional
Spring 2021	45	Small	Microbat (2 chamber)			Nil	Nil	Nil	Functional

Installation Date	Nest Box Number	Nest Box Size	Nest Box Type	Easting Northing	Tree Species	Year 1 - Monitoring Episode 1 (August 2022)			
						Fauna Use	Feral Animal Activity	Nest Box Condition	Maintenance Requirements
Spring 2021	46	Small	Small Glider			Golden-tailed Spiny Ant	Nil	Nil	Functional
Spring 2021	47	Small	Scansorial			Nil	Nil	Nil	Functional
Spring 2021	48	Medium	Parrot			Nil	Nil	Nil	Functional
Spring 2021	49	Small	Scansorial			Golden-tailed Spiny Ant	Nil	Nil	Review the functionality of gaps
Spring 2021	50	Medium	Possum			Common Ringtail Possum	Nil	Nil	Review the functionality of gaps
Spring 2021	51	Large	Owl/Cockatoo			Nil	Nil	Nil	Functional
Spring 2021	52	Small	Microbat (2 chamber)			Nil	Nil	Nil	Functional
Spring 2021	53	Medium	Parrot			Nil	Nil	Nil	Functional
Spring 2021	54	Small	Microbat (2 chamber)			Nil	Nil	Nil	Functional
Spring 2021	55	Medium	Parrot			Nil	Nil	Nil	Functional
Spring 2021	56	Medium	Parrot			Golden-tailed Spiny Ant	Nil	Nil	Functional
Spring 2021	57	Small	Scansorial			Nil	Nil	Nil	Functional
East of stage 2									
Summer 2021	58	Medium	Possum		Grey Ironbark	Nil	Nil	Functional	Nil
Summer 2021	59	Small	Microbat (2 chamber)		Grey Ironbark	Nil	Nil	Functional	Nil
Summer 2021	60	Large	Owl		Small-fruited Grey Gum	Nil	Nil	Functional	Nil
Summer 2021	61	Medium	Possum		Small-fruited Grey Gum	Nil	Nil	Functional	Nil
Summer 2021	62	Small	Scansorial		Small-fruited Grey Gum	Nil	Nil	Functional	Nil
Summer 2021	63	Medium	Possum		Small-fruited Grey Gum	Nil	Nil	Functional	Re-wire
Summer 2021	64	Small	Microbat (2 chamber)		Small-fruited Grey Gum	Nil	Nil	Functional	Nil
Summer 2021	65	Medium	Glider		Small-fruited Grey Gum	Sugar Glider x 2	Nil	Functional	Nil
Summer 2021	66	Medium	Possum		Spotted Gum	Nil	Nil	Functional	Nil
Summer 2021	67	Small	Microbat (2 chamber)		Spotted Gum	Gould's Long-eared Bat x 1	Nil	Functional	Nil
Summer 2021	68	Medium	Possum		Spotted Gum	Nil	Nil	Functional	Review the functionality of gaps
Summer 2021	69	Medium	Glider		Spotted Gum	Nil	Nil	Functional	Nil
Summer 2021	70	Small	Microbat (2 chamber)		Spotted Gum	Nil	Nil	Functional	Nil
Summer 2021	71	Small	Glider		Spotted Gum	Glider nest	Nil	Functional	Nil
Summer 2021	72	Medium	Parrot		Small-fruited Grey Gum	Glider nest	Nil	Functional	Nil
Summer 2021	73	Small	Microbat (2 chamber)		Small-fruited Grey Gum	Nil	Nil	Functional	Nil
Summer 2021	74	Small	Glider		Spotted Gum	Nil	Nil	Functional	Nil
Summer 2021	75	Medium	Parrot		Spotted Gum	Nil	Nil	Functional	Nil
Summer 2021	76	Small	Glider		Spotted Gum	Glider nest	Nil	Functional	Nil
Summer 2021	77	Small	Microbat (2 chamber)		Spotted Gum	Nil	Nil	Functional	Nil
Summer 2021	78	Large	Wood duck / Small Owl		Spotted Gum	Nil	Nil	Functional	Review the functionality of gaps
Summer 2021	79	Medium	Possum		Grey Ironbark	Nil	Nil	Functional	Review the functionality of gaps
Summer 2021	80	Small	Glider		Grey Ironbark	Nil	Nil	Functional	Nil
Summer 2021	81	Medium	Possum		Small-fruited Grey Gum	Brushtail Possum – Bark and Leaves	Nil	Functional	Nil
Summer 2021	82	Small	Microbat (2 chamber)		Small-fruited Grey Gum	Nil	Nil	Functional	Nil
Summer 2021	83	Medium	Possum		Small-fruited Grey Gum	Nil	Nil	Functional	Nil
Summer 2021	84	Medium	Parrot		Small-fruited Grey Gum	Glider Nest	Nil	Functional	Re-wire as lid very tight

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