Marulan South Limestone Mine
Continued Operations Project

Boral Cement Limited

Annual Environmental Management Review
1 July 2023 to 30 June 2024

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ANNUAL REVIEW INFORMATION

Annual Review Authorisation

Name of Operation	Marulan South Limestone Mine
Name of Operator	Boral Limited
Development Consent No.	SSD 7009
Name of holder of development consents	Boral Cement Limited
Mining Lease	CML16, ML1857
Name of Holder of Mining Lease	Boral Cement Limited
Water Licence	WAL25207, WAL25373, WAL25352, WAL24697, WAL41976
Name of Holder of Water Licence	Boral Cement Limited
RMP	Currently under review
Annual Review start date	01 Jul 2023
Annual Review end date	30 Jun 2024

I, Greg Johnson, certify that this audit report is a true and accurate record of the compliance status of the Marulan South Limestone Mine for the period 1 Jul 2023 to 30 June 2024 and that I am authorised to make this statement on behalf of Boral Cement Limited.

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 of $22,000, or both).

Name of authorised reporting officer	Greg Johnson
Title of authorising reporting officer	Senior Environmental Business Partner NSW/ACT
Signature of authorised reporting officer	
Date	30 September 2024

1. STATEMENT OF COMPLIANCE

This Annual Review (AR) summarises compliance with State Significant Development Approval (SSD) 7009 which was granted by the NSW Department of Planning, Industry and Environment on 19 August 2021. Mining operations commenced under this consent on 1st January 2023. The following Mining Authorisations, Rehabilitation Management Plan and EPL are also applicable to the Marulan South Limestone Mine Continued Operations Project. :

- ML1716 (relinquished 17/7/2023);
- CML16
- ML1857 (granted 14/7/2023)
- Marulan South Limestone Mine Rehabilitation Management Plan (RMP) 2023-2026; and
- Environment Protection Licence 944.

This report has been prepared in accordance with the *Post-approval requirements for State significant mining developments Annual Review Guideline* (2015) (the Guideline). Tables 1.1 to 1.3 detail the compliance status of Marulan South Limestone Mine during the 2023 to 2024 reporting period.

Table 1.1 – Compliance Summary 2023/2024

SSD 7009	Two non-compliances identified in IEA – see Table 1.2 and Chapter 10
ML 1716	Conditions satisfied
ML1857	Conditions satisfied
CML 16	Conditions satisfied
RMP 2023-2026	Conditions satisfied
EPL 944	One non-compliance

Table 1.2 – Non-Compliance

Approval	Condition	Description	Compliance Status	Comment	Where addressed
SSD 7009	A19	Surrender of existing consents or approvals within 12 months of commencing development under the consent	Non-compliant	An alternative time frame will be discussed with DPHI as to the surrender of the consents and existing use rights	Chapter 10
SSD 7009	D17	Access to Information. Water licences, EIS, and CCC minutes to be made available on the website.	Non-compliant	Updates to the website have been made	Chapter 10
EPL 944	L2.2	Load limit of coarse	Non-compliant	Boral is currently in consultation with the	Section 6.3.2

Approval	Condition	Description	Compliance Status	Comment	Where addressed
		particulates exceeded		EPA regarding a temporary increase of the load limit.	

Table 1.3 Compliance Status Key

Risk Level	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 (eg submitting a report to government later than required under approval conditions).

Pre-commencement conditions associated with SSD 7009 were satisfied in the 2022 reporting period allowing commencement of the new approval on 1st January 2023. This Annual Review has therefore been prepared in accordance with Clause D11 of SSD 7009.

2. INTRODUCTION

2.1 Project Description

Boral's Marulan South Limestone Mine has been operational since the 1860s, consisting of a limestone mine and processing plant (Figure 1). It is located directly to the north of Bungonia Gorge and approximately 35km east of Goulburn NSW, with lands covering 650 hectares of a significant limestone and granodiorite deposit (Figure 2). Resources over a total of 616.5 hectares of land are to be extracted under SSD 7009 (Figure 3).

The mine produces a range of limestone products for the cement and steel industry as well as the construction, agricultural and industrial markets across the state. Limestone is an essential ingredient in cement and steel manufacture while a component is further processed on site to produce Calcium Oxide and Hydrated Lime for various applications such as water purification, mining, asphalt production and soil stabilisation. Crushed Limestone is transported by rail direct to the Boral Cement Works at Berrima and Maldon, or to Bluescope Steel at Port Kembla. Limestone supplied to the Peppertree Quarry forms a key part of manufactured sand for concrete and Limestone and fine limestone are also widely used in the agricultural industry for neutralising soils and for animal feed. Lime products are distributed typically by road tanker to destinations throughout NSW or by container to Queensland and Victoria. A component of the mine production including clay shale and aggregates is transported directly by truck where rail facilities are not available. Marulan South Limestone Mine operates 24 hours per day, 7 days per week and employs approximately 95 full time personnel.

Boral received approval for the Marulan South Limestone Mine Continued Operations State Significant Development Application (SSDA) on the 19th August 2021 which came into force on 1st January 2023 with the completion of various pre-conditions including the approval of various management plans for the operation. The approval provides a modern planning consent consistent with current legislative requirements which covers a 30 year mine plan representing 120 Mt of limestone at an extraction rate of 4 Mtpa. Clay shale will also be extracted at a rate of up to 200,000 tpa. The new mine plan seeks to incorporate rehabilitation and final landform initiatives with overburden emplacement.

The continued operations of the mine will provide an uninterrupted supply of construction materials to local and regional industries and state projects with an optimal use of regionally significant resources. The mining project is expected to provide economic benefits to the local community through the purchase of goods, local expenditure, and continued employment of almost 200 people, both directly and indirectly associated with the mining operations.

This Annual Review has been prepared in accordance with Condition D11 of SSD 7009 and covers the operation over the 2023-2024 period. This review has been structured in accordance with the Department of Planning and Environment guidelines for the preparation of Annual Reviews.

2.2 Key Personnel

Details of the management personnel at Marulan South Limestone are provided in Table 2.1 below. Additional specialist advice is provided as required by a range of environmental consultants.

Table 2.1 –Mine Contacts

Role	Name	Contact
Marulan Limestone Statutory Quarry Manager	Jamie Whittaker	Ph: 0401 895 212 Email: jamie.whittaker1@boral.com.au
Mine Technical Manager	Therese Thomas	Ph: (02) 4820 3007 Email: therese.thomas@boral.com.au
Senior Environmental Business Partner	Greg Johnson	Ph: (02) 9033 4916 Email: greg.johnson@boral.com.au
Environmental and Stakeholder Advisor	Crystal Perry	Ph: (02) 4820 3007 Email: Crystal.Perry@boral.com.au

3. APPROVALS

This chapter describes the approval platform for the Marulan South Limestone Mine along with other mining and statutory approvals relevant to the ongoing operation.

3.1 Planning Consent

The Marulan South Limestone Mine operates under SSD 7009 which overrides the previous five development consents issued by Goulburn Mulwarree Council (Appendix B). The current approval was the subject of an Environmental Impact Statement and State Significant Development Application covering all existing and future operations for a 30 year period until 31 August 2051. The approval allows for the extraction of up to 4 million tonnes per annum (tpa) of limestone, extraction of up to 200,000 tpa of clay shale and the processing of the lime products (hydrated lime and quick lime) limestone aggregates and sand.

The mine footprint focuses on an expansion of the pit westwards to mine the Middle Limestone and to mine deeper into the Eastern Limestone. As the Middle Limestone lies approximately 70-150 m west of the Eastern Limestone, the 30-year mine plan avoids mining where practical the interburden between these two limestone units thereby creating a smaller second, north-south oriented west pit with a ridge remaining between. The north pit will also be expanded southwards, encompassing part of the south pit, leaving the remainder of the south pit for overburden emplacement and a visual barrier. The approval allows for accessing approximately 120 Mt of limestone down to a depth of 335m.

3.2 Mining Approvals

3.2.1 Consolidated Mining Lease No. 16

Consolidated Mining Lease No. 16 (CML16) was granted on the 23 April 2004 for the purpose of prospecting and mining for agricultural lime, clay/shale, iron minerals, limestone, marble, and structural clay. CML16 is the consolidation of 66 leases that allows mining operations at Marulan South Limestone Mine with an expiration date of 26 February 2023. An application was made to extend the expiration date ensure continuity of mining authorisations over areas to be covered by grant of the new mining lease (ML 1857) and those remaining or remnant areas of CML 16 no longer required under mining lease (approximately 75 hectares). These remnant areas provided security of tenure over a water supply pipeline, for which Boral is now in the process of securing an easement where it traverses private property. Once the application has been granted CML16 will be relinquished.

3.2.2 Mining Lease 1716

ML1716 was granted on the 4 September 2015 to remove a depth restriction on 12.04 hectares on the Eastern Batters within CML16. The lease was granted for a period of 21 years for mining clay/shale, iron minerals, limestone, marble, and structural clay. ML1716 was cancelled on 14th July 2023 when the new ML1857 was granted for the mining operations as the new lease covers the proposed mining disturbance area including all of the previous ML1716 area.

3.2.3 Mining Lease 1857

ML1857 was granted on 14th July 2023 for a term of 21 years and covers an area of 688.5 hectares. This ML1857 covers the new mining and associated ancillary activity areas as covered by SSD7009 for the Continued Operations Project that were not already covered by CML16.

3.2.4 Rehabilitation Management Plan

A Rehabilitation Management Plan (RMP) was prepared for the mine under the new regulatory framework established by the Mining Amendment (Standard Conditions of Mining Leases – Rehabilitation) Regulation 2021. The RMP came into effect on the 14th July 2023.

3.3 Environmental Protection Licence (EPL) 944

Boral Cement Limited holds EPL 944 for the "Marulan South Limestone Mine and Lime Plant" (Appendix A). The EPL allow for between 100,000 and 250,000 tpa of cement or lime production and between 2 and 5 million tpa of minerals production by mining.

Commencement of development under of the SSD7009 consent triggered a revision and variation of the EPL in order to align new consent conditions placed on the operation with those in the EPL. This update occurred in March 2023. As part of this review an additional dust deposition gauge was added to the licence as well as the requirement for a weather station within the premises. There were no variations to the EPL during the reporting period.

3.4 Other Licences

In addition to SSD7009, mining leases and EPA licence, the following activities and items are licenced:

Table 3.1 - Site Licences

Description	Licence No	Licence Authority	Renewal
Explosive Licence to Import	11-100005-004	Safe Work NSW	Held by Orica
Acknowledgement of Notification of Dangerous Goods on Premises	35/008099	Safe Work NSW	N/A
Revised Apparatus Licence	1203917 1958988 & 1958989 9922223	A.C.M.A.	21/07/2025 23/01/2025 22/02/2025
Radiation Management Licence	5061123	NSW EPA	21/08/2024
Refrigerant Trading Authorisation Certificate	AU 04450	ARC	10/03/2027
Certificate of Plant Item Registration	MC 6-82896/05/0	Safe Work NSW	16/10/2025
Bore Licences (2 x Production Bores) Converted to Certificate W3M9-WS-6FLQ	(WAL24697) 12 ML 10WA116142 10AL116141	NSW Department of Primary Industries Office of Water	Continuing

Description	Licence No	Licence Authority	Renewal
Ground water bore	(WAL41976) 838ML/units 10AL122346 10CA122907 (for road construction /dust suppression)		3 Dec 2028
Water Supply Works – two bores	10CA123795	NRAR	08 Apr 2030
Monitoring Bore Licences	10BL605442 10BL605443 10BL605444 10BL605445 10BL605449 10BL605450	NSW Department of Primary Industries Office of Water	Licence 10AL116141D Perpetuity
Surface Water Licence (1 x Overshot Dam & 2 Pumps)	Water supply works 10WA102352 pump to overshot dam (Shoalhaven River water source) Pumps 10AL102350 - WAL 25352 Stock and domestic (1ML Barbers Ck MGMT Zone) 10AL102351 - WAL25207 unregulated river (76ML Barbers Ck MGMT Zone)	NSW Department of Primary Industries Office of Water	30/06/2024
Surface Water Licence (1 x 38mm Centrifugal Pump)	10WA102377 10AL102376 WAL 25373	NSW Department of Primary Industries Office of Water	25/04/2026
Local Land Services ACT 2013 - Rate Notice	Ref: 110324316	NSW Government Office of Local Land Services	Feb/March 2025

4. OPERATIONS SUMMARY

This chapter summarises the production and processing operations during the 2023-24 reporting period. Historic production levels are also provided for completeness.

4.1 Mining

Table 4.1 provides a summary of production during the reporting period. Production is described as annual tonnages of Limestone, clay/shale and overburden/waste.

Table 4.1 - Mine Production

Material	Limestone (Tonnes)	Clay/shale (Tonnes)	Overburden (tonnes)
2023/2024	2,428,400	40,396	5,400,000

Overburden removal of 4.17 million tonnes occurred during the 2023/2024period. Total production of limestone and clay/shale was well within the approved limit of 4 million and 200 thousand tonnes per annum respectively.

Limestone and (overburden as required) is mined using drilling and blasting methods while clay shale is mined by excavator or front-end loader. Limestone, clay shale and overburden are transported to the primary crusher, stockpile areas and overburden emplacement areas using the load and haul fleet of front end loaders and trucks on site.

Additional mobile crushing and screening plant is hired as required to meet and trial special product specifications and during plant breakdown and maintenance periods. Limestone is selected from particular areas within the mine and blended together with shale when required at the face, within stockpiles and during the crushing and screening process. Limestone quality is monitored using laboratory analysis of drill hole cuttings and online using Geoscan technology.

Limestone extraction has focused on the northern end of North Pit over recent years, requiring the prior removal of previously dumped overburden as well as in-situ shale and granite as the pit has developed. Stripping on the eastern side of North Pit and further development on the northwest side was undertaken during the 2022-2023 reporting period to relocate the haul road to enable resource extraction. In-pit overburden emplacement continued in South Pit and in addition at the northern elevation dumps.

4.2 Mineral Processing-

During the 2023/2024 reporting period the lime manufacturing plant produced the following tonnages of Quicklime, Hydrated Lime and Waste Lime. (Table 4.2).

Table 4.2 – Mineral Production

Material	Quicklime (Tonnes)	Hydrated Lime (Tonnes)	Waste Lime (tonnes)
2023/24	65,681	52,276	2,635

Mineral production varies according to market demand and the current reporting period production levels are in line with recent years. There are no individual limits on mineral

production however these are used in combination with total production and transport of products from the site.

4.3 Traffic and Transportation

The approved transportation limits compared to the actual tonnages is provided in Table 4.3.

Table 4.3 Transportation Compliance

Condition	Details	Transported Tonnage 2023
A9	A maximum of 1 million tonnes of manufactured sand may be transported to Peppertree Quarry in any financial year	318,709
A10	A maximum of 150,000 tonnes of quarry products may be transported from Peppertree Quarry to the shared road sales stockpiling area in any financial year	34,337
A11	A maximum of 720,000 tonnes of limestone, clay/shale and quarry products (combined) may be transported from the site by road in any financial year	375,603

Boral is currently permitted to despatch laden trucks from "the site" under SSD-7009 (including the shared road sales stockpile area that also benefits Peppertree) within the following parameters:

- *On school days, no more than 15 laden trucks per hour between:*
  - *5:30am and 7:30am and*
  - *8:30am and 4:00pm, and*
- *No more than 5 laden trucks per hour:*
  - *On school days between 7:30am and 8:30am, and*
  - *Between 4:00pm on any day preceding a school day and 5:30am the following school day, and*
- *On days that are not school days and do not precede a school day:*
  - *No more than 15 laden trucks per hour between 5:30am and 4:00pm,*
  - *No more than 5 laden trucks per hour between 4:00pm on any day and 5:30am the following day, and*

No more than 75 laden trucks in total on any day

As shown in Table 4.3, total product transported by road complies with limits provided by Conditions A9 to A11. Additional limits are provided on 24-hour intervals by Conditions A12 and A13. Condition A12 provides for a maximum of 133 laden trucks to be dispatched from the site in any 24-hour period while Condition A13 provides for a maximum of six laden trains leaving the site in any 24-hour period. However, Condition B88 restricts road movements to 75 trucks per day until Marulan South Road has been realigned and reconstructed. Details of 24-hour movements are provided in Table 4.4 along with monthly movements to show typical variations over the reporting period.

Table 4.4 – Monthly Truck and Train Movements (Total and Maximum per 24hrs)

	TRUCK		TRAIN	
	Monthly Movements	Maximum movements/24h	Monthly Movements	Maximum movements/24h
Jul-23	764	51	119	5
Aug-23	920	47	67	5

	TRUCK		TRAIN	
	Monthly Movements	Maximum movements/24h	Monthly Movements	Maximum movements/24h
Sep-23	909	63	103	4
Oct-23	916	59	116	5
Nov-23	940	57	78	5
Dec-23	739	58	88	5
Jan-24	783	63	46	4
Feb-24	957	59	86	5
Mar-24	745	53	104	5
Apr-24	788	65	100	5
May-24	990	39	89	5
Jun-24	745	60	104	5

As required by section 7.11 of the EP&A Act, financial contributions are paid to Council to put toward the cost of maintenance of Marulan South Road which is used for haulage of mining and quarry products. The contributions calculated in accordance with the Goulburn Mulwaree Section 94 Development Contributions Plan 2009. As agreed with Council, contributions for haulage of mining and quarry products under the Continued Operation Project will be calculated and paid in accordance with this plan from 1/1/2024. Contributions prior to this were calculated based on the methodology for the previous DA and paid quarterly. Approximately $75,000 was paid to Council for the first year under SSD7009.

4.4 Waste Management

Domestic and light industrial waste continues to be deposited in large dumpsters which are collected weekly by a licensed waste removal contractor.

All runoff from the workshop is channelled through an oil and grease separator. Recovered grease and oil material is collected and stored for removal by a licensed recycling contractor. Similarly, grease drums and oil filters are stored until collected and disposed of for recycling by a licensed contractor.

Reject lime continues to be placed in the designated area of the Middle Gully waste emplacement and investigations continue for reuse of this material to minimise on-site disposal.

4.5 Limestone and Lime Product Stockpiles

Since the removal of the larger stockpiling area, the stockpiling capabilities have been reduced to 50,000t for primary and secondary crushed/screened stone and 35,000t for finished goods stockpiles, giving a total stockpiling capability of 85,000t. The limestone bin capacity for rail dispatch is approximately 11,500 tonnes. Lime product storage capacity is 1,600 tonnes of quicklime and 700 tonnes of hydrated lime.

4.6 Hazardous Material Management

There are multiple hazardous chemical facilities at the mine with two diesel, two LPG, one compressed gas, and one distillate depot which are maintained in accordance with the Work Safe NSW Acknowledgement of Notification of Dangerous Goods on Premises Licence 35/008099. Explosives used for blasting are supplied by the contractor as necessary and not stored on site.

As required, all enclosures to fuel facilities are bunded to meet AS 1940 Storage and Handling of Flammable and Combustible Liquids, 2017 and hazardous materials and chemicals facilities are inspected at least annually by an external accredited inspector.

4.7 Exploration

GeoRes was engaged in 2023 to assist with the Phase 8 (P8) drilling program. The P8 drilling program was undertaken early in 2024 with an aim to provide information which could not be obtained during the prior drilling program, involving a small Reverce Circulation (RC) exploration program. A series of 7 RC drill holes for 902 m were drilled. Four of these drill holes traversed the Eastern Limestone Blocks 5 and 6, two holes were drilled to address Eastern Limestone Block 5 and its boundary with Block 4 to the south and the last hole was drilled into the Middle Limestone in search of groundwater. The geological mapping was considered highly successful in better delineating rock exposures, as reliable interpretations of limestone shapes below ground were achieved.

The two previously planned vertical water monitoring bores remain to be drilled due to permitting constraints during P8. One of the bores is to be located on the south rim of the South Pit (WM08), and the other near the Mine's access road on the west (WM09). These bores requirements form part of the commitments of the Water Management Plan.

4.8 Reserve and Resource Status

The Marulan South limestone resource is significant, with current estimates in the order of 640 million tonnes. SSD7009 has secured 120 million tonnes which will be extracted over a 30 year period.

4.9 Estimated Mine Life

Current studies undertaken as part of the SSD demonstrated that the limestone resource is extensive and can support at least a 30 year mine plan at an extraction rate of 4 Mtpa. The resource will not be exhausted at this time and depending on market conditions at the time, further approvals may be sought to continue extraction.

4.10 Land Preparation

A combined total of 18 hectares was cleared in areas 1, 2, 3 and 5 shown on Plate 1 below during the 2023/2024 financial year.

- Area 5 located on the eastern batters was cleared during November 2023 for expansion of the pit.
- Area 1 includes the area to the south of the contractor (TRN) compound. The area was cleared in February 2024 for emplacements.
- Area 2 is located on the noise bund to the North-East of the TRN compound and extends North to Marulan South Road. Area 2 was cleared in February and May 2024 for the emplacement.
- Area 3 includes the White Clay Area, the main dump road realignment area and the new haul road. This area was cleared in February and May 2024.
- It is envisioned that Area 4 will be cleared during the next reporting period.

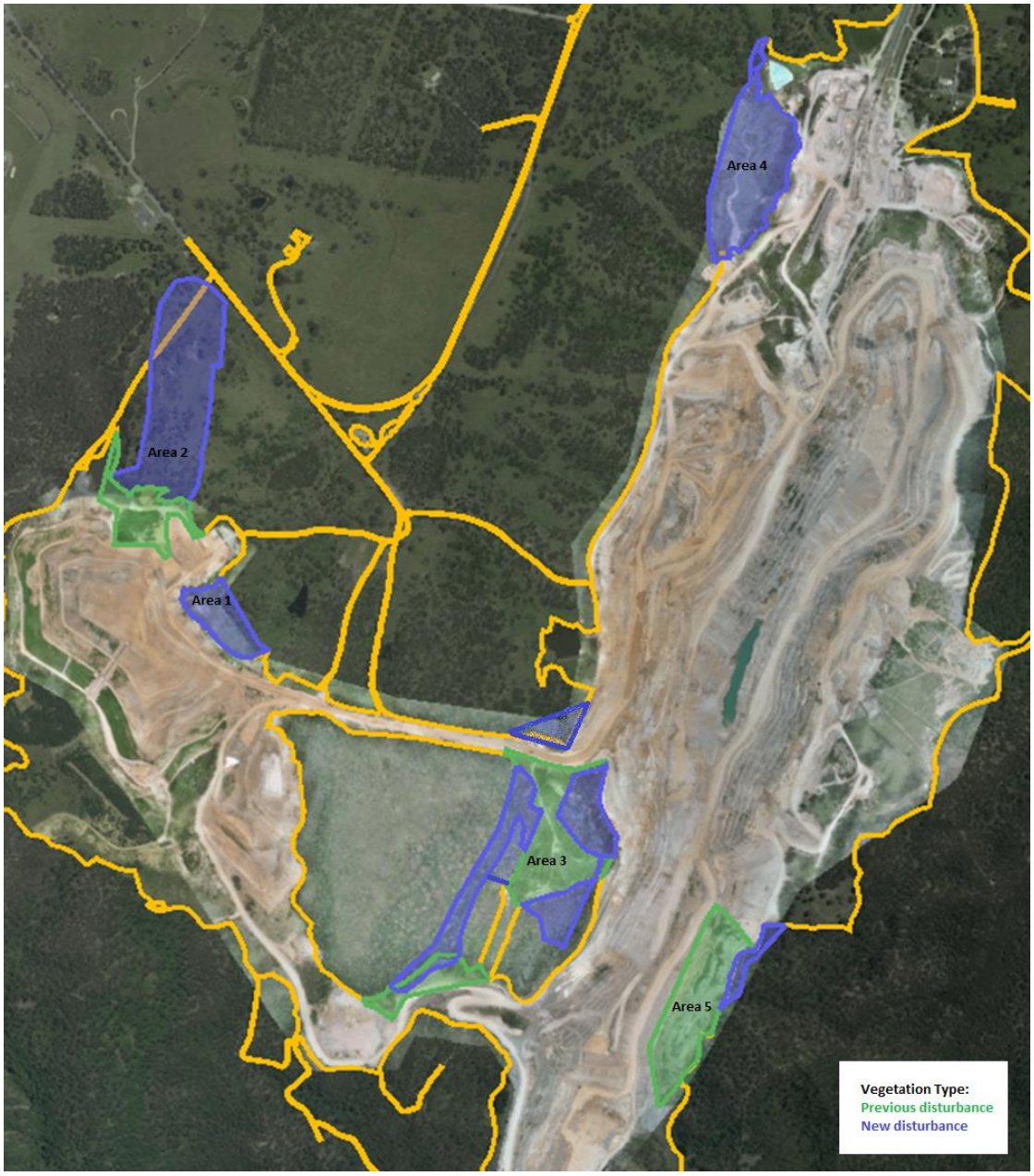


Plate 1- Vegetation Clearance Plan 2023- 2024. Previous disturbance indicates areas which were disturbed historically.

4.11 Construction

Minor construction projects are currently in progress or planned for the coming reporting period. These projects are required to support the ongoing operation and include:

- Establishment of water control structures in association with surface water management plans;
- Ongoing replacement/upgrade of dust control systems; and
- General maintenance of processing facilities.

SSD 7009 provides approval on the construction of a new in-stream water supply dam on Marulan Creek to supplement the water supply and will include associated infrastructure such as an overland pipeline and pump station. The commencement date on this construction project is yet to be determined and will be reported in coming Annual Reviews.

Other future construction projects will include the realignment of Marulan South Road, relocation of the stockpile reclaim area and relocation of the high voltage transmission line. These will be constructed as required in coming reporting periods.

5. ACTIONS REQUIRED FROM PREVIOUS AR

This document represents the second Annual Review prepared under Condition D11 of SSD7009 Consent which will be submitted to the Department of Planning, Housing and Infrastructure and Council. The 2022/2023 Annual Review was accepted by the DPHI on the 8th October 2023. Two actions were requested from the AR as follows:

- Review and revise the strategies, plans, and programs required under the consent and submit for Planning Secretary's approval, in accordance with Schedule 2, Condition D7 of the consent.; and
- In accordance with Schedule 2, Condition D17 of the consent, make a copy of the Annual Review available on the company website, including any other documents as required under Condition D17 and also ensure that these documents are up-to-date.

Review of the management plans was undertaken as required and the Annual Review made available on the company website.

6. ENVIRONMENTAL PERFORMANCE

This Chapter provides details of the environmental outcomes that were intended for the reporting period and whether these were achieved. This section identifies the requirements of any specific management plan other than water management and rehabilitation which are dealt with under Chapter 7 and 8 respectively.

6.1 Environmental Management Plans

Under SSD7009, the following management plans have been prepared and approved by DPHI:

- Noise Management Plan.
- Blast Management Pan.
- Air Quality and Greenhouse Gas Management Plan.
- Water Management Plan.
- Aboriginal and Cultural Heritage Management Plan.
- Historic Heritage Management Plan.
- Traffic Management Plan.
- Biodiversity Management Plan.
- Environment Management Strategy.

The performance of the operation against the requirements of these plans, including any specific monitoring data or inspections required, are discussed in the following sections. In addition to these management plans, the operation also operates under a Water Management Plan which is discussed in Chapter 7 and a Rehabilitation Strategy which is discussed in Chapter 8. The above management plans were reviewed in October and November 2023 and no changes were made.

6.2 Meteorological Monitoring

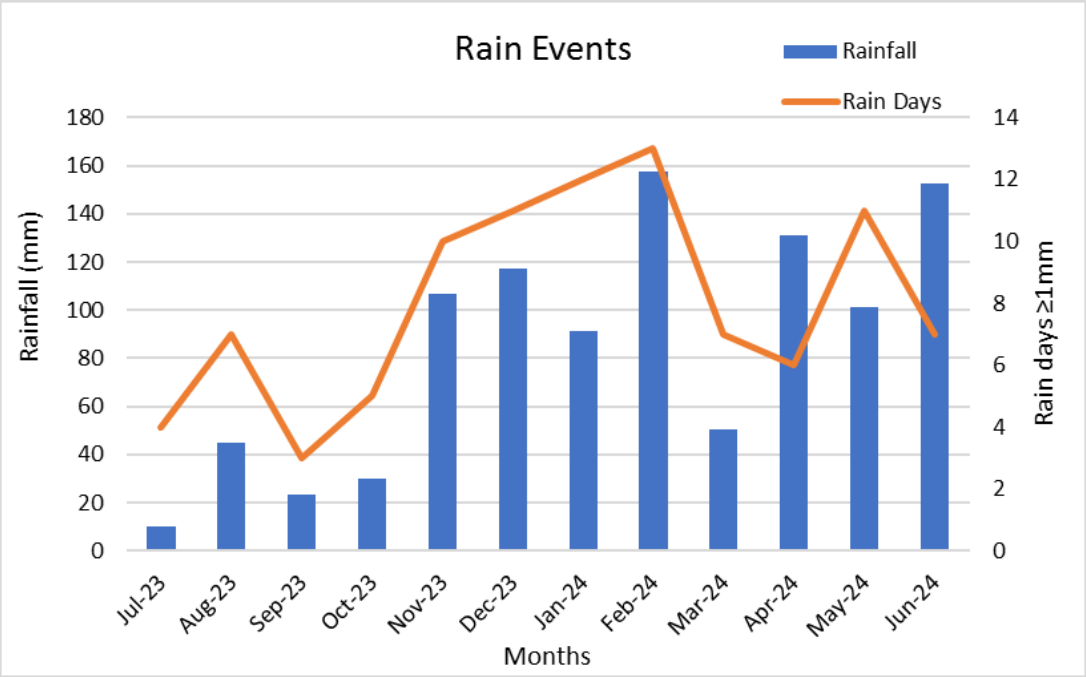
Condition B34 of the development consent and condition M5 of EPL 944 (varied March 2023) requires monitoring of meteorological conditions at the site. A new weather station was installed on 7/12/22 to provide continuous meteorological monitoring data for the operation. Summaries of this data are provided in the following sections.

6.2.1 Rainfall

A total of 1016.6mm of rainfall with 96 rain days was recorded at the site weather station during the reporting period. This was lower than the previous reporting period that recorded 1614mm with 149 rain days, but higher than the annual average with intense storm evemts. Rainfall was highest during February 2024 with 157.4mm and was the lowest in July 2023 with 10mm (Graph 6.1). The number of rain days ranged from 3-13 days per month.

Table 6.1 – Total Monthly Rainfall (mm) (2023/24)

Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	**Tot**
10	45.2	23.4	29.8	106.8	117	91.2	157.4	50.6	131	101.4	152.8	1016.6
Number of Rain Days (≥1mm)												
4	7	3	5	10	11	12	13	7	6	11	7	96



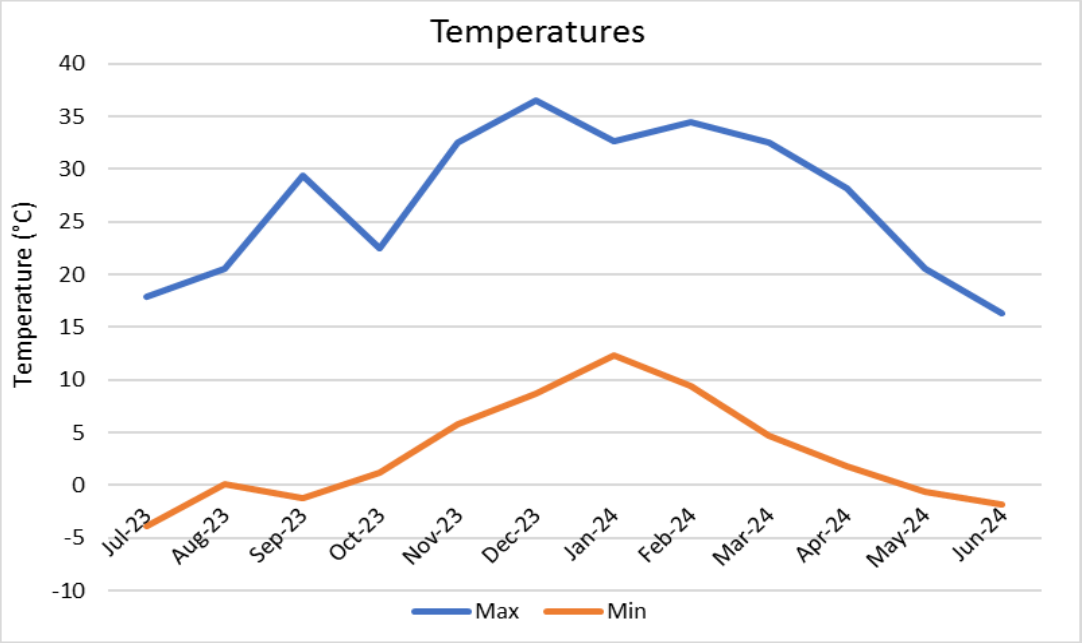
Graph 6.1 – Monthly rainfall and number of rain days

6.2.2 Temperature

Temperatures were hottest in summer months with the highest maximum of 36.5°C in December 2023 and were coldest during the winter months with a lowest minimum of -3.9°C in July 2023 (Graph 6.2). The average maximum and minimum temperatures for the reporting period were 27°C and 3.0°C respectively, which were higher maximums and minimums than recorded in the previous period.

Table 6.2 - Minimum and Maximum Monthly Temperatures (°C) (2023/24)

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Max	17.93	20.57	29.36	22.52	32.53	36.49	32.6	34.52	32.58	28.17	20.59	16.35
Min	-3.93	0.08	-1.2	1.24	5.8	8.64	12.3	9.4	4.757	1.79	-0.61	-1.87



Graph 6.2 – Monthly Minimum and Maximum Temperatures

6.3 Air Quality

An Air Quality and Greenhouse Gas Management Plan (AQMP) was prepared for the site as required by the development consent which was approved by the then DPE in September 2022. The management plan was reviewed in October 2023 and no changes were made. The AQMP documents control measures and management initiatives, with the main objectives being to minimise the dust exposure to all persons working on site as well as to reduce the offsite dust impacts, remain in compliance with stack emission limits and mitigate dust nuisance. The AQMP provides a program detailing the assessment criteria, monitoring locations and procedures, reporting protocol and compliance checking procedures for air quality management at the Mine for the Continued Operations project.

6.3.1 Assessment Criteria

Marulan South Limestone Mine operates an air quality monitoring program as required by EPL Licence 944 and the AQMP. This program includes monitoring of ambient dust levels with deposited dust and particulates, as well as emissions of specific metals and both nitrogen and sulphur oxides from the kiln and hydrator stacks as detailed in Table 6.5. The NSW EPA air quality impact assessment criteria for dust emissions which are applicable to the Continued Operations Project are presented in Table 6.3 below.

Table 6.3 – NSW EPA Air Quality Impact Assessment Criteria (dust)

Pollutant	Averaging Period	Impact	Criterion
TSP	Annual	Total	(a, c) 90 µg/cm^3
PM_{10}	Annual 24 hour	Total Total	(a, c) 25 µg/cm^3 (b) 50 µg/cm^3
$PM_{2.5}$	Annual 24 hour	Total Total	(a, c) 8 µg/cm^3 (b) 25 µg/cm^3

Pollutant	Averaging Period	Impact	Criterion
Deposited Dust	Annual	Incremental Total	2g/m^2/month 4g/m^2/month

Notes:

[a] Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).

[b] Incremental impact (i.e. incremental increase in concentrations due to the development on its own).

[c] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Planning Secretary.

The NSW EPA air quality impact assessment criteria for NO_2 and SO_2 emissions which are applicable to the Continued Operations Project are presented in Table 6.4.

Table 6.4 - NSW EPA Air Quality Impact Assessment Criteria (NO_2 and SO_2)

Pollutant	Averaging Period	Criterion
NO_2	1 hour Annual	246 µg/cm^3 62 µg/cm^3
SO_2	10 minutes 1 hour 24 hour Annual	712 µg/cm^3 570 µg/cm^3 228 µg/cm^3 60 µg/cm^3

6.3.2 Kiln and Hydration Stack Monitoring

In accordance with EPA Licence 944 Condition L2, the actual load of an assessable pollutant discharged from the mine during the reporting period must not exceed the load limit specified for the assessable pollutant in table 6.5 below. Emissions of these pollutants are monitored annually, and the actual load of each pollutant is calculated in accordance with the relevant load calculation protocol provided by the EPA and reported in the EPA Annual Return. The current load limits are detailed in Table 6.5.

It was identified that the assessable pollutant load for Coarse Particulates for the 23/24 period exceeded the limit of 8500kg. On investigation the likely cause was found to be a process change to using finer material which reduced energy usage by 20% per tonne. We are working with the EPA on a temporary increase into the load as we work through energy efficiency opportunities.

Table 6.5 - Assessable Pollutant

Assessable Pollutant - Air (Kg)	Coarse Particulates	Fine Particulates	Lead	Mercury	Nitrogen Oxides	Sulphur Oxides
Load Limit	8,050	5,050	6.00	2.00	91,680	170
Load 22/23	7,395	3,638	0.769	1.462	73,089	30.806
Load 23/24	10,598	3,858	0.361	0.391	69,220	4.95

Kiln stack and hydrator stack monitoring results from the previous and the current reporting periods are presented in Table 6.6. All stack monitoring results were below the 100th percentile for both existing concentration limits and for Group 5 emission standards. The latest Annual Stack Monitoring was undertaken in December 2023.

Table 6.6 - Kiln Stack and Hydrator Stack Results

Pollutant	Kiln Stack (11)		Hydrator Stack (12)
Units: mg/m^3	Nitrogen Oxides	Solid Particles	Solid Particles
Sampling Method:	TM-11	TM-15	TM-15
Existing 100th percentile concentration limit	2,500	250.0	250.0
Group 5 100th percentile concentration limit	2,000	100	100
Result 2022/2023	300	43	<2
Result 2023/2024	300	64	1.5

Notes: Monitored results on a Dry Basis, corrected to 101.325kPa and 0^{0}C

6.3.3 Dust Deposition

Ambient dust levels are monitored at three depositional dust gauges. The dust gauges are referred to as 'Freddy's Hill' (EPL Point 18) located to the northwest of the mine, 'Store Paddock Hill' located to the northeast of the mine (EPL Point 16) and the Sub Station (EPL Point 17), which was monitored from January 2023 as required by the EPL variation. The dust deposition gauges are monitored by mine personnel with samples being delivered to NATA-accredited Boral Laboratories for dust analyses.

Results for dust deposition monitoring for the deposited dust monitoring sites are shown in Table 6.7 and Graph 6.3 below.

Table 6.7 – Deposited Dust (g/m^2/month Insoluble Solids)

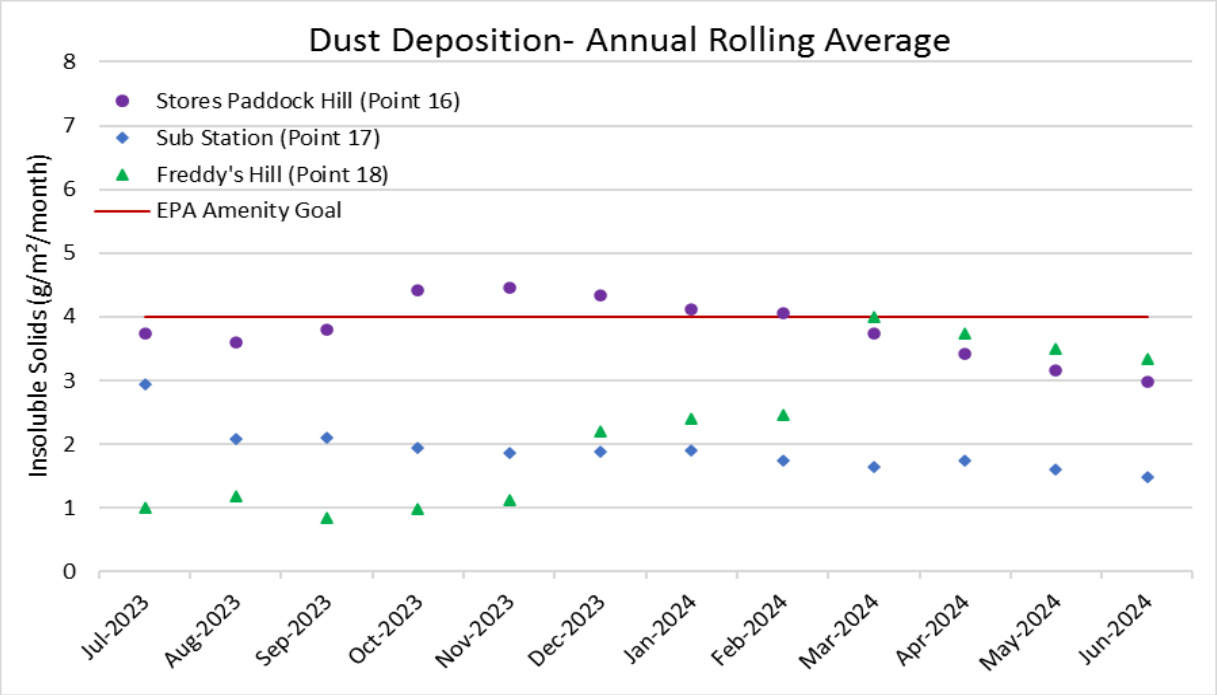
Site	Stores Paddock Hill (Point 16)	Sub Station (Point 17)	Freddy's Hill (Point 18)
Jul-2023	3.74	2.95	1.01
Aug-2023	3.45	1.22	1.36
Sep-2023	4.20	2.13	0.18
Oct-2023	6.31	1.45	1.40
Nov-2023	4.54	1.52	1.69
Dec-2023	3.76	2.04	7.62
Jan-2024	2.80	1.98	3.56
Feb-2024	3.68	0.60	2.83
Mar-2024	1.14	0.85	16.4
Apr-2024	0.49	2.64	1.36
May-2024	0.75	0.22	1.15
Jun-2024	0.99	0.12	1.49
Annual average	**2.99**	**1.48**	**3.34**

The annual average for the Store Paddock Hill Site 16 was 2.99 g/m^2/month (Table 6.7). Graph 6.3 shows that the annual rolling average rose above the EPA Amenity Goal of 4 g/m^2/month from September 2023 until February 2024. This does not constitute a non-compliance with the Development Consent as the gauge is on Boral owned land. Whilst this gauge is located on Boral-owned land the data is useful in determining the relative sources of dust which contribute to the levels experienced at the nearest non-company owned residences further from the mine. The annual average during the 2023/24 reporting period was higher than that recorded in 2022/23, with an average of 2.19 g/m^2/month.

The deposited dust results from the Substation (Point 17) remained consistently below the EPA amenity criteria guidelines, fluctuating from 0.12 g/m^2/month to 2.95 g/m^2/month with an annual average of 1.48 g/m^2/month during the reporting period (Graph 6.3, Table 6.7). This year's annual average was lower than last reporting period with an average of 1.95 g/m^2/month which recorded only the first 6 months of monitoring data for the Substation.

The annual average insoluble solids at Freddy's Hill Site 18 was 3.34 g/m^2/month (Table 6.7) which was higher than the average last year of 2.77 g/m^2/month, but still below the assessment criteria. The maximum was 16.4 g/m^2/month in March 2024. This caused the rolling average to rise slightly above the EPA Amenity Goal with a result of 4.01 g/m^2/month. As with Point 16, this does not constitute a non-compliance with the Development Consent as the gauge is on Boral owned land. The distance to the nearest non-Boral owned residence is approximately 1.2km further to the northwest from this monitoring location.

Freddy's Hill and the Substation monitoring sites are located proximal to residential receivers C1, B3, B4 and B5. The predictions based on the EIS modelling of cumulative impacts for Stage 1 of the Project can be compared to the above results. The results for Freddy's Hill are in line with the EIS predictions, which modelled annual average deposited dust results ranging from 3.0-3.4 g/m^2/month at the receivers in close proximity. The Substation had a lower deposited dust annual average compared to the EIS predictions. The Store Paddock Hill is located to the North-East of the site, and there are no nearby receivers.



Graph 6.3 - Rolling Average Dust Deposition at EPL Points 16, 17 and 18

6.3.4 Particulate Matter

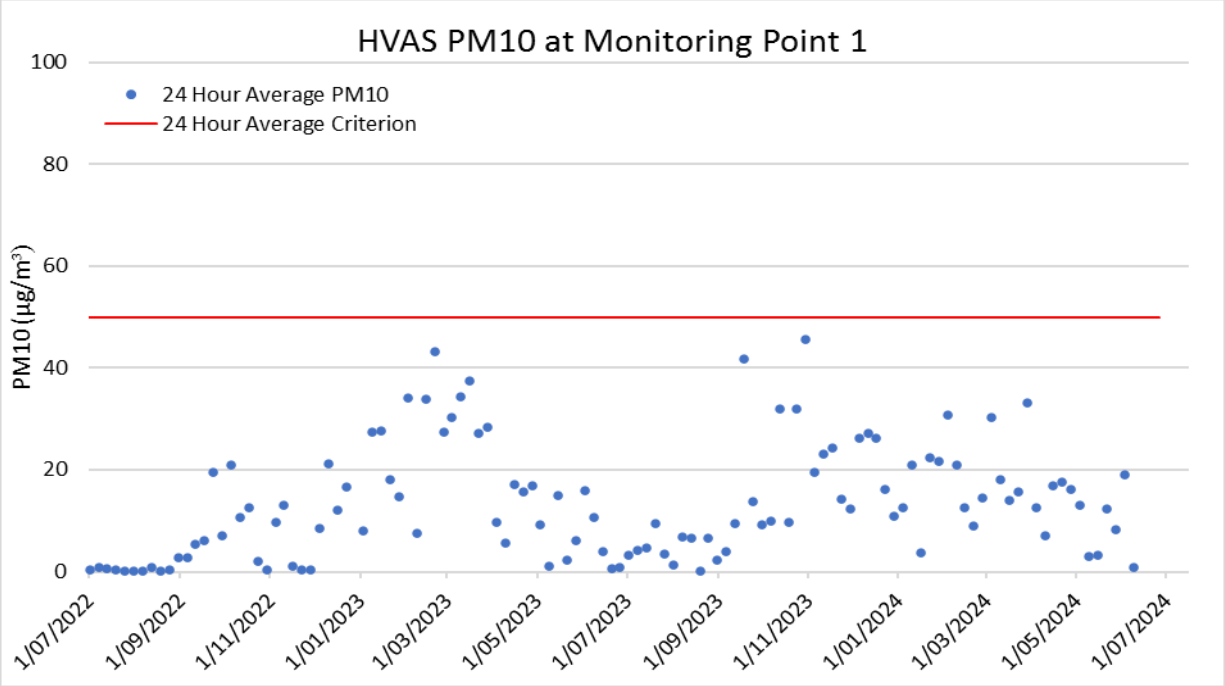
The development consent provides the air quality criteria for the site as per Table 6.8.

Table 6.8- Air Quality Criteria

Pollutant	Averaging period	Criterion
Particulate matter < 10 µm (PM10)	Annual 24 hour	25 µg/m3 50 µg/m3
Particulate matter < 2.5 µm (PM2.5)	Annual 24 hour	8 µg/m3 25 µg/m3
Total suspended particulate (TSP) matter	Annual	90 µg/m3

PM10

The PM_{10} high volume air sampler (HVAS) is referred to and located at the 'Nearest Resident' and identified as Monitoring Point 1 in the EPL. The monitoring results for the reporting period and the previous period are shown in Graph 6.4. The EIS cumulative impacts model predicted a PM_{10} annual average of 27.5 µg/m³ at the Boral owned receiver B4 that is located at the HVAS site which is above the criteria of 25 µg/m³. The actual annual average for the reporting period was much lower than the prediction, recorded at 14.9 µg/m³ and well under the criteria. The minimum and maximum results for the 2023/2024 period were 0.14 µg/m³ and 45.49 µg/m³ respectively. The PM_{10} results are slightly higher than the previous reporting period which had an annual average of 11.8 µg/m³. The trends visible below show that the PM_{10} readings over the last two years have been lower during the cooler months of July, August and September.



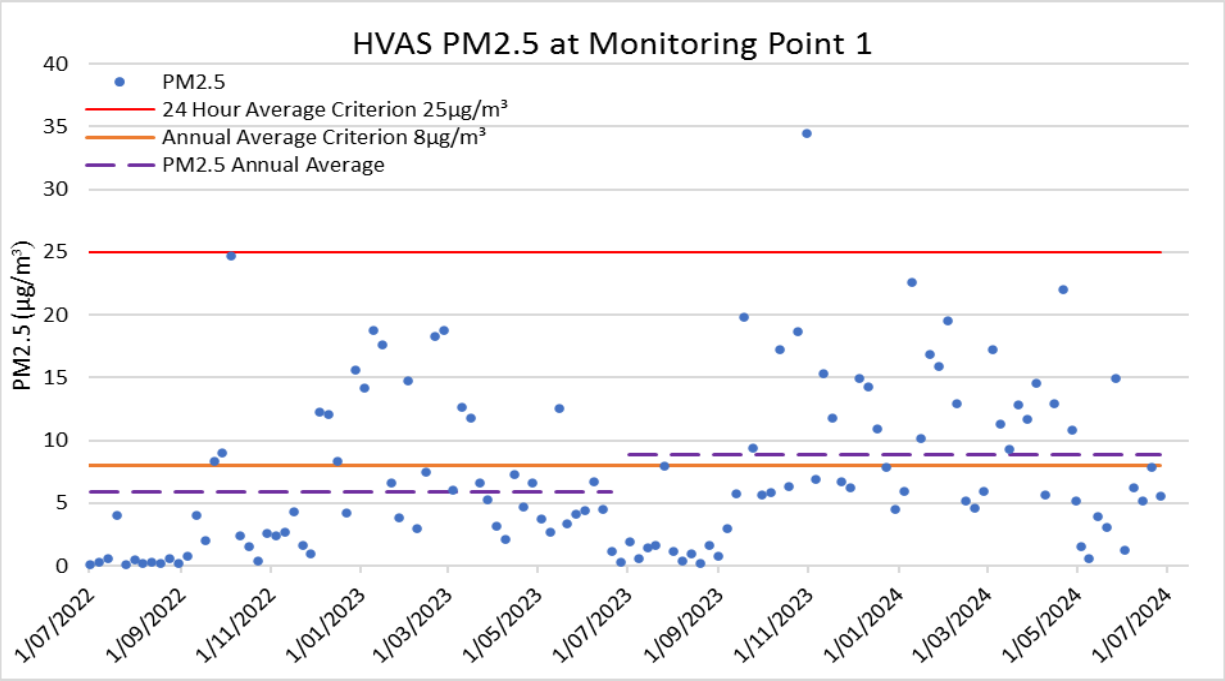
Graph 6.4 - PM_{10} Monitoring Point 1 HVAS

PM2.5

The $PM_{2.5}$ concentrations were monitored by the high volume air sampler (HVAS) in conjunction with Peppertree Quarry from January 2023 as required by SSD7009 for the Continued Operations Project. The monitoring results for the reporting period and the previous period are shown in Graph 6.5. The maximum 24-hour average and annual average PM2.5 concentrations were slightly higher for the reporting period than the one prior. The 24-hour average PM2.5 exceeded the 24 –hour average assessment criteria on one occasion, with a result of

34.43 µg/m³ on the 30/10/2023. Very strong westerly winds of 41 km/h were experienced for the duration of this monitoring event and it is unlikely that the high concentration was caused by the mine since the mine is located to the east of the HVAS.

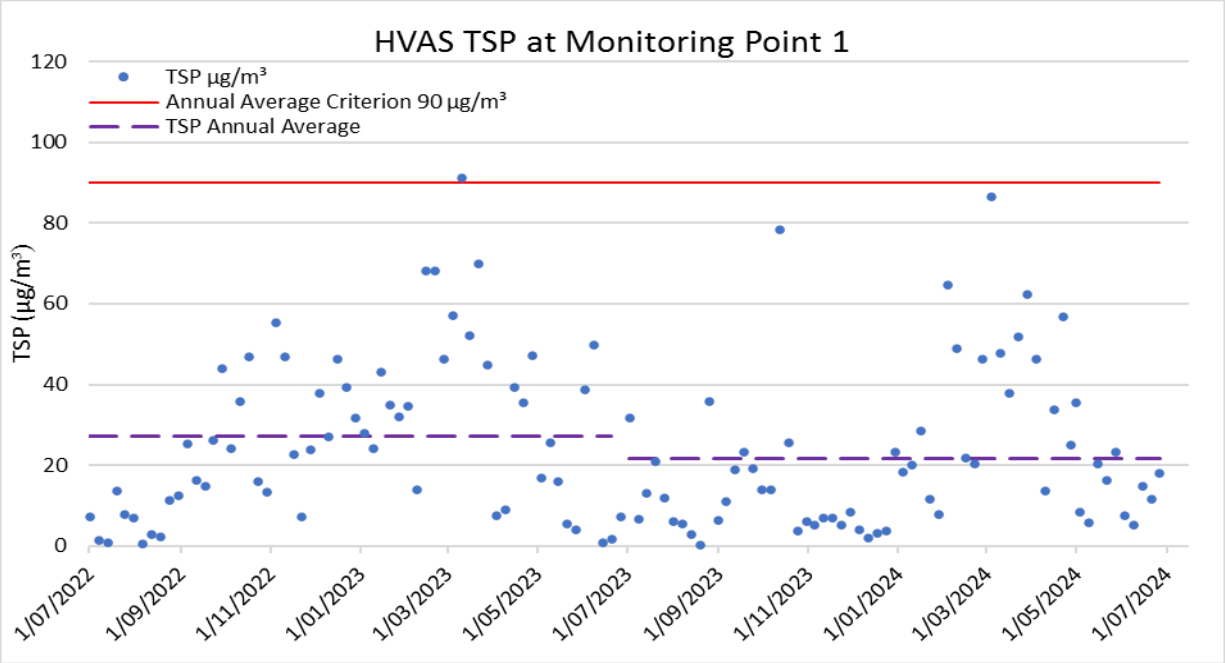
The annual average was 8.8 µg/m³, which is above the annual criterion of 8 µg/m³. Since the HVAS is located in Boral owned land, this is not classed as a non-compliance for the site as the criteria needs to be met at the boundary. These results were higher than the previous reporting period which had an annual average of 5.9 µg/m³. The EIS Stage 1 cumulative impacts model predicted an annual average $PM_{2.5}$ concentration of 6.59 µg/m³ at B4, which is lower than the 2023/2024 annual average. A similar trend is visible as for PM_{10}, where the $PM_{2.5}$ emissions are lower during the cooler months of the year. The maximum result for the last two reporting periods were both recorded during the month of October.



Graph 6.5 - $PM_{2.5}$ Monitoring Point 1 HVAS

TSP

TSP was also monitored by the site's HVAS from January 2023. Results for the reporting period and the previous period are shown below in Graph 6.6. The annual average was 21.06 µg/m³ with minimum and maximum results of 0.12 µg/m³ and 86.49 µg/m³ respectively and is well below the annual criterion of 90 µg/m³. The TSP during the reporting period was lower than the previous years annual average of 27.57 µg/m³. The Stage 1 predicted cumulative annual average in the EIS for TSP at B4 was 60.4 µg/m³ which is higher than the recorded average for the reporting period. During the last two reporting periods, the most discernible trend is that the highest TSP was recorded in the month of March for each period. As observed with the particulate matter, the results were also lowest for TSP during July and August.



Graph 6.6 - TSP Monitoring Point 1 HVAS

6.4 Biodiversity

A Biodiversity Management Plan (BMP) was prepared in accordance with condition B54 of the Continued Operations Project development consent which was approved in April 2022 and reviewed in November 2023. The BMP covers vegetation clearing, management of remnant vegetation, pest and weed management, establishes biodiversity performance indicators and rehabilitation completion criteria as well as ongoing biodiversity monitoring initiatives. The specific objectives of the BMP are to:

- comply with requirements including the development consent;
- meet the obligations and commitments identified in the EIS;
- ensure compliance with relevant environmental legislation;
- outline management actions and controls to protect and enhance biodiversity values;
- ensure appropriate and representative monitoring is conducted for verification that the BMP is effectively implemented and meeting its objectives; and
- ensure appropriate contingencies and resources for mitigating adverse impacts to native vegetation areas.

The BMP has designed the following vegetation clearing protocol which is implemented prior to and during the clearing of vegetation on site:

- ground dwelling fauna will be identified and relocated prior to clearing;
- suitably qualified personnel will be engaged to supervise felling of hollow bearing trees;
- displaced fauna will be caught and relocated to pre-designated areas by qualified wildlife handlers; and
- the NSW Wildlife Information and rescue Service will be requested to handle and care for wildlife encountered during operations.

6.4.1 Clearing of Vegetation

A total of 18 ha was cleared using the above protocol in the reporting period under guidance and supervision of an ecologist. The location of this work is summarised under land preparation (Section 4.10; Plate 1) and is detailed below:

- Area 5 located on the eastern batters was surveyed on the 21st November 2023. During the night survey, one brushtail possum was observed in the undisturbed area on the upper half of the batter. The area of previous disturbance lower on the batter did not have any habitat trees, and was cleared within 21 days. No fauna were encountered during the clearing conducted in Area 5.
- Area 1 includes the area to the south of the TRN compound. A day and night survey was conducted on the 28th February 2024. No habitat features including hollow bearing trees or burrows were found during the survey. The area was cleared within 21 days and no fauna were encountered during this process.
- Area 2 is located on the noise bund to the North-East of the TRN compound and extends North to Marulan South Road. This area was surveyed on the 28th February 2024 and one habitat tree was identified on the South-Eastern boundary of the area. This tree was left untouched and the bulk of the area was cleared within 21 days. An additional strip requiring to be cleared on the western boundary line of Area 2 was re-surveyed on the 21st May 2024. No habitat features were present in this area, and it was cleared on the 22nd and 23rd May.
- A day survey of Area 3, the White Clay Area was conducted on the 28th February 2024, followed by a night survey on the 5th March. One sugar glider was observed in a non-habitat tree during the night survey. The area to the east of the old kiln road was cleared on the 20th and 21st May 2024, with the felling of 6 habitat trees supervised by an ecologist. One lace monitor was observed in a habitat tree and was encouraged to vacate the tree by shaking the trunk prior to felling.
- The day and night survey of the remaining vegetation in the white clay area (west of the old kiln road), main dump road realignment area and the new haul road was undertaken on the 23rd May 2024. The area was cleared on the 24th and 25th May, with 15 habitat trees felled under the supervision of an ecologist. One brush tail possum was residing in a habitat tree in the main dump road realignment area and was unharmed. Two inactive wombat holes were also destroyed in this area.

6.4.2 Biodiversity Offsets

A Biodiversity Development Assessment Report was prepared By Niche to support the EIS for SSDA7009. This identified a number of ecosystems and species that would be impacted by the project and generated the number of credits of each that would be required to offset these impacts. Boral will be offsetting the impacts using two properties, which are established as Stewardship Sites under the BAM to provide in-perpetuity protection and management of biodiversity values. Short, medium and long term measures have been developed as part of the Biodiversity Stewardship Agreements (BSAs) to manage the offset areas. The majority of the required credits have been retired through the Boral owned Stewardship Site Coolumburra' which satisfies all of the ecosystem credit requirements (except for Box Gum Woodland) and the majority of the species credit requirements for the Project. The second payment from the Biodiversity Conservation Trust was received for the site during the reporting period. The site is now under active management and the BSA details specific

management measures and monitoring requirements which have commenced. Annual reporting to BCT commenced during the reporting period.

Boral has negotiated security of credits to satisfy the full State and Commonwealth offset liabilities for Box Gum Woodland via a privately owned existing Biodiversity Stewardship Agreement. The residual species credit requirements will be met by payment into the Biodiversity Conservation Fund.

6.5 Vibration and Air blasting

A Blast Management Plan was prepared in March 2022 under Condition B23 of the Continued Operations Project development consent and revised in November 2023. In accordance with Condition L5 of EPL 944, mining operations are required to employ practices to limit the effects from blasting as follows:

Ground Vibration	-	Peak particle velocity not to exceed 10mm/sec
	-	Peak particle velocity not to exceed 5mm/sec in more than 5% of the total number of blasts over a financial year
Blast Overpressure	-	Blast overpressure noise level not to exceed 120dB(lin) for any blast
	-	Blast overpressure noise level not to exceed 115dB(linear) in more than 5% of the total number of blasts over financial year

The above criteria also aligns with the operational blast emissions criteria (Continued Operations Project Development Consent Condition B11). The following protocols are currently followed in regard to blasting:

- Blasting is conducted between the hours of 9am and 5pm Monday to Friday with no blasting occurring on public holidays. If blasting is delayed, the shot will be left overnight and blasted the next day within the allowable hours.
- Only one blast per day is allowed in accordance with CoC B14.
- Prior to production blasting, Boral will contact affected landowners or occupiers within two kilometres of the pit seeking expressions of interest in being notified of future blasts.
- Marulan South Limestone Mine operations shall be in daily contact with the adjacent Boral Peppertree Quarry operations to reduce the possibility of blasting concurrently.
- As per the BMP, individual blast design records shall be maintained to assist in the design and optimisation of future events, planning and control of blasting emissions and to provide a traceable system of documentation in case of accident or complaint.
- The mine shall maintain a record of the Blast Design and monitoring Airblast Overpressure and Ground Vibration for each blast event in a suitable format guided by the requirements of AS 2187.2-1993.
- Prior to blasting, warning sirens continue to be activated in accordance with safe blasting procedures.

Predictions were made in the EIS based on a review of the last three years of blasting data. Table 6.9 below shows calculated overpressure and vibration levels at the B5 receiver due to blasting from the mine. The B5 receiver is located to the north-west of the operation at “Turkey

Farm", 950m from the closest blast. The predictions below are assuming a Maximum Instantaneous Change (MIC) from the blast of 1,760 (8x220) kg.

Table 6.9 Predicted Overpressure and Vibration Levels for Blasting Stage 1 and 2 at B5

Stage	Measurement	Result
1 (Approximately 5 years; commencing 2019)	Peak Overpressure dB(Lin)	117
	PPV mm/sec	2.34
2 (Approximately 7-8 years following Stage 1)	Peak Overpressure dB(Lin)	113
	PPV mm/sec	1.34

The predicted blast vibration and overpressure levels are below the building damage criteria of 10mm/s and 133 dB(Lin) respectively and was also below the human annoyance and discomfort criteria of 2mm/s and 115 dB(Lin) at all dwellings of sensitive receivers.

Table 6.10 details the Airblast Overpressure and the Ground Vibration level monitoring results for the total 110 blasts undertaken at Marulan South during the reporting period. These blasts were monitored at the Boral owned residence on Marulan South Road to the northwest of the mine and at the Sub Station since January 2023 (located west to northwest of the pit on Marulan South Road). One blast exceeded the overpressure blast emissions criteria outlined in the consent and the EPL of 120dB (Lin Peak) with an overpressure of 120.1dB (Lin Peak) recorded at the Substation on the 30th October 2023. Whilst this was an exceedance of the criteria, it is not considered a non-compliance as the monitoring location is Boral-owned. The exceedance was however investigated by a consultant who confirmed that the result was caused by high westerly winds recorded at 40.1 km/h and was not caused by the blast itself. This conclusion was reported to the DPHI. This was the only exceedance, and all other overpressure readings were below 115dB. There were no exceedances of the overpressure of vibration criteria at Marulan South Road during the period. On average blasting overpressure and vibration results at both Marulan South Road and the Substation were below the predictions. All blasting was undertaken within the approved time between 9:00am to 5:00pm Monday to Friday.

Table 6.10- Blast Monitoring Results

Date	Time	Substation		Marulan South Road	
		Overpressure dB(Lin Peak)	Vibration (mm/s)	Overpressure dB(Lin Peak)	Vibration (mm/s)
03-Jul-23	11.12AM	99.5	0.21	98.1	0.19
06-Jul-23	3.32PM	97.4	0.13	No trigger	No trigger
10-Jul-23	1.15PM	108	0.13	104.9	0.28
12-Jul-23	11.13AM	100.7	0.13	No trigger	No trigger
13-Jul-23	11.26AM	102.2	0.13	No trigger	No trigger
19-Jul-23	2.35PM	104.9	0.25	96.9	0.23
20-Jul-23	1.40PM	105.2	0.19	96.2	0.17
24-Jul-23	2.33PM	90.6	0.13	94.3	0.19
27-Jul-23	11.35AM	103.5	0.24	95.9	0.29
28-Jul-23	11.35AM	103.5	0.24	95.9	0.29
02-Aug-23	11.53AM	102.2	0.27	99.2	0.19
03-Aug-23	12.04PM	104.6	0.16	97.6	0.24
09-Aug-23	12.36PM	97.4	0.13	93.2	0.2

Date	Time	Substation		Marulan South Road	
		Overpressure dB(Lin Peak)	Vibration (mm/s)	Overpressure dB(Lin Peak)	Vibration (mm/s)
10-Aug-23	4.12PM	110.1	0.19	107	0.3
14-Aug-23	3.09PM	101.2	0.22	94.8	0.15
16-Aug-23	12.40PM	88.6	0.13	96.8	0.31
21-Aug-23	3.31PM	98.2	0.16	92.3	0.13
23-Aug-23	12.48PM	103.5	0.3	101.5	0.28
24-Aug-23	12.48PM	103.5	0.3	101.5	0.28
28-Aug-23	1.44PM	94.7	0.27	99.9	0.2
30-Aug-23	12.44PM	103.5	0.24	103.1	0.21
31-Aug-23	12.35PM	102.6	0.45	100.8	0.56
06-Sep-23	3.35PM	100.7	0.14	No trigger	No trigger
11-Sep-23	12.31PM	90.6	0.28	99.2	0.39
13-Sep-23	11.17AM	90.6	0.14	No trigger	No trigger
18-Sep-23	12.10PM	0.06	0.15	No trigger	No trigger
20-Sep-23	12.26PM	0.05	0.14	No trigger	No trigger
25-Sep-23	1.01PM	0.05	0.14	94.7	0.2
26-Sep-23	12.43PM	0.05	0.14	No trigger	No trigger
27-Sep-23	12.43PM	0.05	0.14	No trigger	No trigger
04-Oct-23	3.25PM	0.01	0.06	No trigger	No trigger
05-Oct-23	12.36PM	97.4	0.09	No trigger	No trigger
09-Oct-23	1.54PM	90.6	0.12	92.1	0.16
11-Oct-23	12.53PM	90.6	0.11	No trigger	No trigger
12-Oct-23	12.53PM	90.6	0.11	No trigger	No trigger
16-Oct-23	2.26PM	111.1	0.05	94.2	0.13
18-Oct-23	01.16PM	92.2	0.12	NO TRIGGER	NO TRIGGER
23-Oct-23	2.41PM	98.2	0.14	99.2	0.13
25-Oct-23	10.35AM	113.9	0.16	NO TRIGGER	NO TRIGGER
30-Oct-23	1.31PM	120.1	0.18	107.6	0.17
01-Nov-23	11.54AM	90.6	0.15	NO TRIGGER	NO TRIGGER
02-Nov-23	11.55AM	90.6	0.17	96.2	0.23
06-Nov-23	2:40PM	90.6	0.06	93.5	0.14
08-Nov-23	1:59PM	90.6	0.06	NO TRIGGER	NO TRIGGER
13-Nov-23	2:08pm	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
15-Nov-23	2:06pm	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
16-Nov-23	1:30pm	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
20-Nov-23	4.35PM	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
23-Nov-23	1.02PM	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
27-Nov-23	3.39pm	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
30-Nov-23	1.40PM	101.1	0.2	NO TRIGGER	NO TRIGGER
04-Dec-23	3:03pm	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
06-Dec-23	2:35pm	97.6	0.11	NO TRIGGER	NO TRIGGER
11-Dec-23	1:01pm	105.3	0.15	NO TRIGGER	NO TRIGGER
14-Dec-23	1.02pm	96	0.14	NO TRIGGER	NO TRIGGER
18-Dec-23	12:36pm	91.6	0.1	NO TRIGGER	NO TRIGGER
20-Dec-23	3:38pm	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
21-Dec-23	12.32pm	98.3	0.08	NO TRIGGER	NO TRIGGER
10-Jan-24	3:40pm	94.1	0.11	98.8	0.17
11-Jan-24	12:06pm	101.1	0.14	97.7	0.14
15-Jan-24	12:12pm	97.3	0.18	103.6	0.09
18-Jan-24	3.27pm	88.1	0.18	106.4	0.17
22-Jan-24	1:28pm	NO TRIGGER	NO TRIGGER	92.9	0.1
25-Jan-24	12:43pm	88.1	0.9	90.1	0.15
01-Feb-24	1:00pm	101.6	0.15	NO TRIGGER	NO TRIGGER
07-Feb-24	1:15pm	108.9	0.19	103	0.2
08-Feb-24	11:20am	100.6	0.17	NO TRIGGER	NO TRIGGER

Date	Time	Substation		Marulan South Road	
		Overpressure dB(Lin Peak)	Vibration (mm/s)	Overpressure dB(Lin Peak)	Vibration (mm/s)
09-Feb-24	11:20am	100.6	0.17	NO TRIGGER	NO TRIGGER
12-Feb-24	2:52pm	102.1	0.16	96.3	0.17
15-Feb-24	12:51pm	103.3	0.08	NO TRIGGER	NO TRIGGER
19-Feb-24	10.46am	95.1	0.19	99.9	0.3
21-Feb-24	1.33pm	94.1	0.19	98.1	0.16
26-Feb-24	3.50pm	98.3	0.16	104.9	0.17
29-Feb-24	3.36pm	97.6	0.2	94.8	0.17
04-Mar-24	3.37pm	94.1	0.11	NO TRIGGER	NO TRIGGER
07-Mar-24	12.30pm	102.1	0.12	NO TRIGGER	NO TRIGGER
13-Mar-24	10.41am	102.5	0.15	NO TRIGGER	NO TRIGGER
14-Mar-24	12.30pm	102.1	0.22	95.6	0.17
18-Mar-24	12.36pm	100.1	0.22	95.5	0.22
20-Mar-24	3.35pm	0	0	0	0
25-Mar-24	1.35pm	99.6	0.21	91.4	0.19
28-Mar-24	3.26pm	96	0.19	NO TRIGGER	NO TRIGGER
3-Apr-24	12.56pm	96	0.15	91.6	0.13
8-Apr-24	12.42pm	95.1	0.08	NO TRIGGER	NO TRIGGER
10-Apr-24	3.28pm	103.3	0.13	NO TRIGGER	NO TRIGGER
11-Apr-24	3.28pm	103.3	0.13	NO TRIGGER	NO TRIGGER
15-Apr-24	1.04pm	90	0.09	NO TRIGGER	NO TRIGGER
17-Apr-24	3.35pm	90	0.08	NO TRIGGER	NO TRIGGER
22-Apr-24	1.07pm	88.1	0.09	NO TRIGGER	NO TRIGGER
24-Apr-24	3.35pm	88.1	0.9	102.3	0.14
1-May-24	3.32pm	88.1	0.08	NO TRIGGER	NO TRIGGER
2-May-24	3.30pm	99	0.09	NO TRIGGER	NO TRIGGER
6-May-24	1.13pm	105	0.18	102.7	0.18
8-May-24	2.01pm	96.9	0.2	95.3	0.2
9-May-24	3.30pm	91.6	0.11	NO TRIGGER	NO TRIGGER
13-May-24	3.29pm	96	0.27	94.8	0.14
16-May-24	12.47pm	100.6	0.15	97.8	0.17
20-May-24	1.42pm	103.3	0.09	NO TRIGGER	NO TRIGGER
22-May-24	3.05pm	96.9	0.16	97.9	0.13
23-May-24	3.32pm	102.5	0.13	NO TRIGGER	NO TRIGGER
27-May-24	3.33pm	88.1	0.06	NO TRIGGER	NO TRIGGER
30-May-24	12.42pm	96	0.08	NO TRIGGER	NO TRIGGER
5-Jun-24	1.03pm	88	0.06	NO TRIGGER	NO TRIGGER
6-Jun-24	1.13pm	90	0.23	NO TRIGGER	NO TRIGGER
13-Jun-24	3.33pm	99.6	0.14	98.5	0.13
17-Jun-24	3.31pm	100.1	0.13	101	0.15
19-Jun-24	3.30pm	97.6	0.15	97.3	0.16
24-Jun-24	2.41pm	96	0.11	NO TRIGGER	NO TRIGGER
27-Jun-24	12.41pm	110.7	0.1	NO TRIGGER	NO TRIGGER
28-Jun-24	10.04am	112.2	0.08	NO TRIGGER	NO TRIGGER

6.6 Operational Noise

In March 2022 the Noise Management Plan was approved and was reviewed in November 2023 with no changes made. This Management Plan details the noise criteria defined by Section B1 of the Continued Operations Project development consent, as provided in Table 6.11. The Noise Management Plan established a hierarchical approach to ensure that operations comply with the relevant conditions of the consent:

- Mine operations will be managed to meet the criteria presented in Table 6.11 and EPL noise criteria, through operational practices and the implementation of reasonable and feasible noise controls.
- Where noise levels exceed noise criteria or verified noise complaints are received, ensure all noise controls are in place or determine the need to reduce operations and point of source noise.
- Liaise with the local community regarding scheduled works which are predicted to have increased noise impacts.

Table 6.11– Operational Noise Criteria

Receivers	Project Noise Trigger Level (dBA)		
	Day	Evening	Night
R9	40	36	36
All other residents	40	35	35

Note: Daytime 7:00am-7:00pm; Evening 7:00pm-10:00pm; Night 10:00pm-7:00am

Noise levels for daytime, evening and night resulting from the continuation of mining operations for each stage of the 30 year mine life were predicted in the EIS. Noise levels from two worst-case operating scenarios comply with the noise trigger levels at all stages over all time periods. The predicted noise levels at Receiver 9 (R9) are shown in Table 6.12 below.

Table 6.12 Predicted Noise Levels at R9 ($L_{Aeq, 15min}$ dBA)

Scenario	Stage	Daytime	Evening	Night	Complies
Overburden Removal, Overburden Emplacement, Limestone Removal ('4+2')	1 Start	30	31	31	Yes
	1 End	27	28	28	Yes
	2	32	31	31	Yes
	3	29	30	30	Yes
	4	26	27	27	Yes
Overburden Removal and Emplacement ('6')	1 Start	33	34	34	Yes
	1 End	36	36	36	Yes
	2	34	35	35	Yes
	3	32	33	33	Yes
	4	26	27	27	Yes

Current mitigation measures will continue to be followed to avoid the likelihood of exceedances in the future. This entails a quarterly noise monitoring program based on attended noise monitoring. To supplement quarterly attended noise monitoring, a continuous unattended noise monitoring station has been established between the western overburden emplacement and the nearest potentially affected receiver location identified as R9.

Attended noise monitoring was undertaken quarterly during the reporting period by Muller Acoustic Consulting Pty Ltd. Attended noise monitoring was conducted at five noise monitoring locations for 15-minute periods for three attended events during day, evening, and night periods. Where possible, throughout each measurement the operator quantified the contribution of each significant noise source. Extraneous noise sources such as wind gusts, insects, birds, livestock, dog barking, aircraft and residential noise were audible throughout the attended measurements.

The site noise level contribution was below the operational noise criteria in Table 6.11 during monitoring events in September 2023, December 2023, March 2024 and July 2024 at all receptor locations during all three time periods.

The mine was generally just audible at R8 and R9 throughout day, evening and night measurements. The mine was audible at R6 during day and night measurements only, and during day measurements only at R12. The mine was inaudible during all measurements conducted at location R17. Mine related noise included general processing noise, heavy vehicle movements, machinery operations and reverse alarms audible at R8 and R9. At R6 the mine related noise included site hum and machinery operation, while only heavy vehicle movements were audible at R12.

Noise levels recorded from the mine were in line with the Scenario '4+2' predicted noise levels and below the Scenario '6' predictions outlined in Table 6.11 above. The contributions at all monitoring locations satisfied the consent conditions at their respective assessed receivers.

6.7 Aboriginal Heritage

The Aboriginal Cultural Heritage Management Plan (ACHMP) was approved in March 2022 in accordance with Condition B60 of the Continued Operations Project development consent. The management plan was reviewed in October 2023 and no changes were made. The plan provides guidance on:

- management procedures for historic heritage values within, and adjacent to, the mine during pre-construction and construction phases;
- protocols and procedures for new cultural finds and human remains;
- protocols for undertaking activities in areas that have not been previously assessed;
- administrative requirements, including post-project management of historical finds and recovered material, ongoing compliance, regular review and update of the HHMP to ensure its functionality is maintained through the mine life; and
- includes a strategy for the care, control and storage of heritage relics salvaged from the site.

Five archaeological sites were identified for salvage excavation during the Aboriginal Cultural Heritage Assessment (ACHMP) for SSDA7009 (EMM 2019). These sites are within two localities: adjacent to Marulan Creek (MSL 046; MSL 047; MSL 057 and MSL 045) and on a flat spur at the main Project site MSL 055. The ACHMP only addresses the sites adjacent to Marulan Creek and excludes MSL 055 because that site is now within the Peppertree Quarry MOD 5 footprint and subject to the salvage measures detailed in the PTQ AHMP (Boral & EMM 2021).

Salvage work was carried out between 19 – 22 June 2023 by EMM Archaeologists accompanied by representatives from Ngunawal Heritage Aboriginal Corporation, Thunderstone Aboriginal Cultural and Land Management Services and Pejar Local Aboriginal Lands Council.

Each of the 38 Aboriginal sites with management requirements within the southern section of the project area were visited and were managed according to the guidelines set out within the

ACHMP. A total of 72 artefacts were collected from 16 Aboriginal sites. One new Aboriginal site (MSL2301) was recorded during the work. MSL2301 is characterised as an open site artefact scatter comprising a total of 14 stone artefacts eroding from the southern bank of a dam. This site is yet to be salvaged.

Salvage of the sites adjacent to Marulan Creek will be undertaken prior to construction of the Marulan Creek Dam and reported in a future Annual Review once undertaken as per the protocol in the ACHMP.

6.8 Combustion Risk and Management

The storage of coal used as a supplementary fuel for the calcination of limestone in the lime kilns is the only activity previously identified on site with the potential for spontaneous combustion. The primary use of natural gas as kiln fuel has reduced the potential risk of spontaneous combustion.

The risk of spontaneous combustion is minimized by CO monitoring, alarming and a triggered, stored CO_2 discharge system sized to extinguish combustion. This system is serviced by Wormald, a division of Tyco Australia Pty Ltd. These services are carried on a planned preventative maintenance schedule held within BCL's MAXIMO maintenance management system.

6.9 Bushfire

Bushfire response and management is an ongoing site program both from a safety and environmental aspect. The Marulan South Operations Bushfire Management Plan seeks to maintain and monitor bushfire prone areas and equipment; minimise the risk of bushfires spreading from the project site; and establish responses and controls to fires.

An annual bushfire risk assessment is undertaken at the commencement of each bushfire season in October. The bushfire management plan addresses associated risks and lays out requirements for very high risk days relating to things such as hot work, vehicles driving on vegetation etc. Boral is aware of the risks of bushfire and has implemented the following safeguards:

- ❒ Fire fighting equipment is on hand during hot work activities at all times;
- ❒ Safe Work Method Statements are required for all activities on site and the risks of bushfire are considered;
- ❒ Fire extinguishers are installed in mobile machinery;
- ❒ Cleared asset protection zones have been created around all buildings and infrastructure;
- ❒ Water storages on site are available for use in firefighting as necessary; and
- ❒ One of the two water carts on site must remain full at all times to be available on site for emergencies.

The Bushfire Management Plan was reviewed in February 2020 following the Morton Bushfires. Specific measures for evacuation were updated to include refuge in the pit as a secondary option to evacuation via Marulan South Road as it was demonstrated that the fire threat could be more widespread than previously mitigated against. Three levels of threat were identified based on RFS categorisation and associated response measures incorporated into the management plan.

During the reporting period, bushfire risk has been low, however improved foliage growth following favourable conditions and with reduced rainfall expected in future months, could increases in bushfire risks in the next period.

6.10 Geotechnical Stability

Open pit and waste emplacement slope stability is an aspect of limestone mining activities with the potential for both safety and environmental impacts particularly as the depth of mining increases. The use of improved blasting techniques, the development of procedures for managing slope stability issues and training instruction for site inspection continue to be implemented.

Geotechnical investigations were undertaken on 12th January 2024 by Pell Sullivan Meynink (PSM) for the preparation of the annual geotechnical report for the Marulan Limestone Mine. The assessment predominantly focused on inspection of pit exposures and proposed progression of the mine, inspection of the Barbers Creek Emplacement following evidence of failure in November 2022, and discussion of the draft Ground Control Management Plan (GCMP) of the Principal Hazard relating to ground and strata failure.

The inspections covered the current exposures to provide an overview of the potential long term performance of the pit walls in limestone and which will need to remain to allow production to continue under the Continued Operations Project. Known areas of instability were also covered in the 2024 assessment. The assessment made a number of recommendations which Boral are currently considering. A number of recommendations have been adopted which are summarised as follows:

- Redirection of water and repairs to cracked sections on the backfill road on the east wall to mitigate water infiltration.
- Increase the frequency of geotechnical reviews to six monthly given the scale of the operation.
- Interim designs be developed for east and west wall development. In light of increased understanding through development of exposures there is opportunity to upside in the design parameters of the eastern sediments and also the norther part of the western sediments.

Ongoing assessment, monitoring and remediation of the Barbers Creek Emplacement will continue in the next reporting period.

6.11 Hydrocarbon Contamination

Hydrocarbons used on site include fuels (diesel and petrol), oils and greases. The 95,000L double lined diesel tank was removed from the diesel storage facility in North Pit and relocated to a temporary refuelling station to the south of Ring Road following refurbishment. The one 40,000L tank and one 20,000 tank that were being utilised in interim were removed during the reporting period. The area is fully bunded where any potential spills can be adequately contained and managed in accordance with emergency response procedures and classified and disposed of in accordance with relevant waste legislation.

The potential for hydrocarbon contamination resulting from leakages and spills continues to be minimised by the implementation of documented hydrocarbon spill procedures and the use of biological oil spill kits located across site operational areas. These spill kits are maintained and serviced by approved contractor services and checked by BCL.

Oils are stored within bulk storage tanks within a roofed storage facility at the mine. A maximum of 10,000L of hydraulic oil, engine oil, and torque fluids respectively are stored within these storage tanks. Small quantities of greases are required for maintenance of plant and equipment. Storage, handling, containment and disposal of workshop hydrocarbons is managed in accordance with AS 1940:2004.

Review of procedures, equipment and training for hydrocarbon management and spill response is an ongoing commitment. Testing of the management system and responses is undertaken generally every 12 months.

6.12 Public safety

A security plan has been fully operational since 2006 and was upgraded with the new access requirements between Peppertree and the mine. This plan is reviewed annually.

Features of the security plan and system include the following:

- A 3 metre tall automated sliding security gate at the exit of the Sand Plant Road.
- A 3 metre tall sliding gate located at the Main office, connected to chain mesh fencing for appropriate scrutiny of all site visitors.
- A pedestrian gate near the visitor's car park for office access to ensure visitor sign in.
- Two swing gates located on the Lime Kiln Road prior to the main weighbridge and associated chain mesh fencing.
- Chain mesh fencing of the mine site perimeter and around the main entry areas to limit points of entry and exit to the control points (gates).
- Signage for both the new and existing mine perimeter fencing.

All visitors report to the "off lease" Site Administration and Training Main Office to sign in prior to gaining entry to Mining Lease CML 16.

Review and upgrade of the Site's Induction system for visitors, contractors and employees is an on-going commitment as part of the Site Safety Management System.

7. WATER MANAGEMENT

An updated site Water Management Plan (WMP) was completed in August 2022 and reviewed in December 2023 with no changes made. The updated WMP covers the Stage 1 and 2 expansions of the mine but will need to be updated again prior to the commencement of Stage 3.

7.1 Erosion and Sediment Management

Current methods of erosion control including the use of clean water diversions to limit run off over disturbed areas, contour banks on the exposed batters of waste emplacements, rock and concrete lined drainage structures, sediment ponds and the re-establishment of vegetation continue to be effective means of reducing erosion on exposed areas. Periodic inspections on drainage are performed to ensure water runs to either the North pit or South pit voids.

Use of a daily water balance model within the surface water assessment concluded that the water management system is extremely robust and is secure for the mining operations. Overflow from storage dams and runoff can be estimated at 580ML per annum, which is expected to evaporate or seep into groundwater. Clean water and "mine supply water" storages are detailed in Table 7.2 - Stored Water Volumes.

The erosion and sediment control system is managed through control plans which have been progressively updated to meet changes as the project develops. The new WMP continues this process in order to meet the obligations and commitments identified in the SSD approval. The existing surface water management system provides measures to divert runoff from the overburden emplacements to sediment basins designed in accordance with current guidelines. Rehabilitated landforms are designed to shed water without causing excessive erosion and downstream pollution. During rehabilitation, topsoil is prioritised for the high-risk erosion areas on the overburden emplacement slopes, and alternative media for vegetation growth is used on lower slopes and flat areas.

Maintenance of dams and drainage lines continued where possible following high rainfall events which occurred during the reporting period.

7.1.1 Sewerage Waste Management

No changes to sewerage waste management have occurred during the reporting period. The Marulan South Limestone Mine continues to operate five sewerage treatment facilities:

- Main envirocycle unit that receives effluent from main offices, laboratory, bathrooms, store and conference room. This aerated water treatment system was refitted with new pumps and upgraded during the reporting period to maintain compliance with Council requirements.
- Two Lime plant envirocycle units servicing the kiln control room, hydration, dispatch and workshop areas.
- Two Septic tanks, one located at the "machine shop"/primary crusher the other adjacent to the "Fettlers' shed".

Another septic system services the former “Club” facility, north of the main office and located “off-lease”.

To ensure no overflow occurs from the “machine shop”/primary crusher septic tank, this unit continues to be inspected and pumped out weekly by an accredited waste disposal contractor. The “Fettler’s shed” and “Club” units are adequately serviced by adsorption trenches.

7.2 Surface Water Management

7.2.1 Pollution Control Strategies

The Marulan South Limestone Mine continues to operate under the Environment Protection Licence (EPL) No. 944 and is required to prevent pollution of waters. The existing water management system involving three major catchments, (northern, southern and western emplacement areas) and associated infrastructure continued to operate during the 2023/2024 reporting period. The performance measures for the pollution control system are as follows:

- Maintain separation between clean, dirty (i.e. sediment laden) and mine water management systems.
- Minimise the use of clean and potable water on the site.
- Maximise water recycling, reuse and sharing opportunities.
- Minimise the use of make-up water from external sources.
- Design, install, operate and maintain water management systems in a proper and efficient manner.
- Minimise risks to the receiving environment and downstream water users.

The surface water management system is an integrated network of pipelines, drains, dams and sediment basins that provide dual purposes of water supply for on-site use and erosion and sediment control functions for runoff generated from disturbed areas. The water management system will be progressively developed over the life of the mine. A site water balance has also been developed to assess the performance of the water management system.

As part of the SSD approval, the eastern emplacement batters will be progressively rehabilitated which will significantly reduce the sediment load leaving the site. This work is nearing completion which will allow all future runoff from the Eastern Emplacement to be fully contained with the South Pit. Over the next three years, overburden will be used to:

- Backfill the South Pit and subsequently extend the emplacement of overburden to the west to create a single Southern Overburden Emplacement (SOE).
- Extend the existing Western Overburden Emplacement to the north.
- Construct a Northern Overburden Emplacement to adjoin the neighbouring Boral Peppertree's waste emplacement.
- except for the section of the SOE that drains directly to the South Pit, overburden and haul road drainage will be directed to a series of new sediment basins that have been appropriately sized.
- runoff collected in the sediment basins would either be pumped to one of the mine water dams for reuse in limestone processing or dust suppression or would drain to the mine pit.

An overview of the current water management plan is provided in Plate 2.

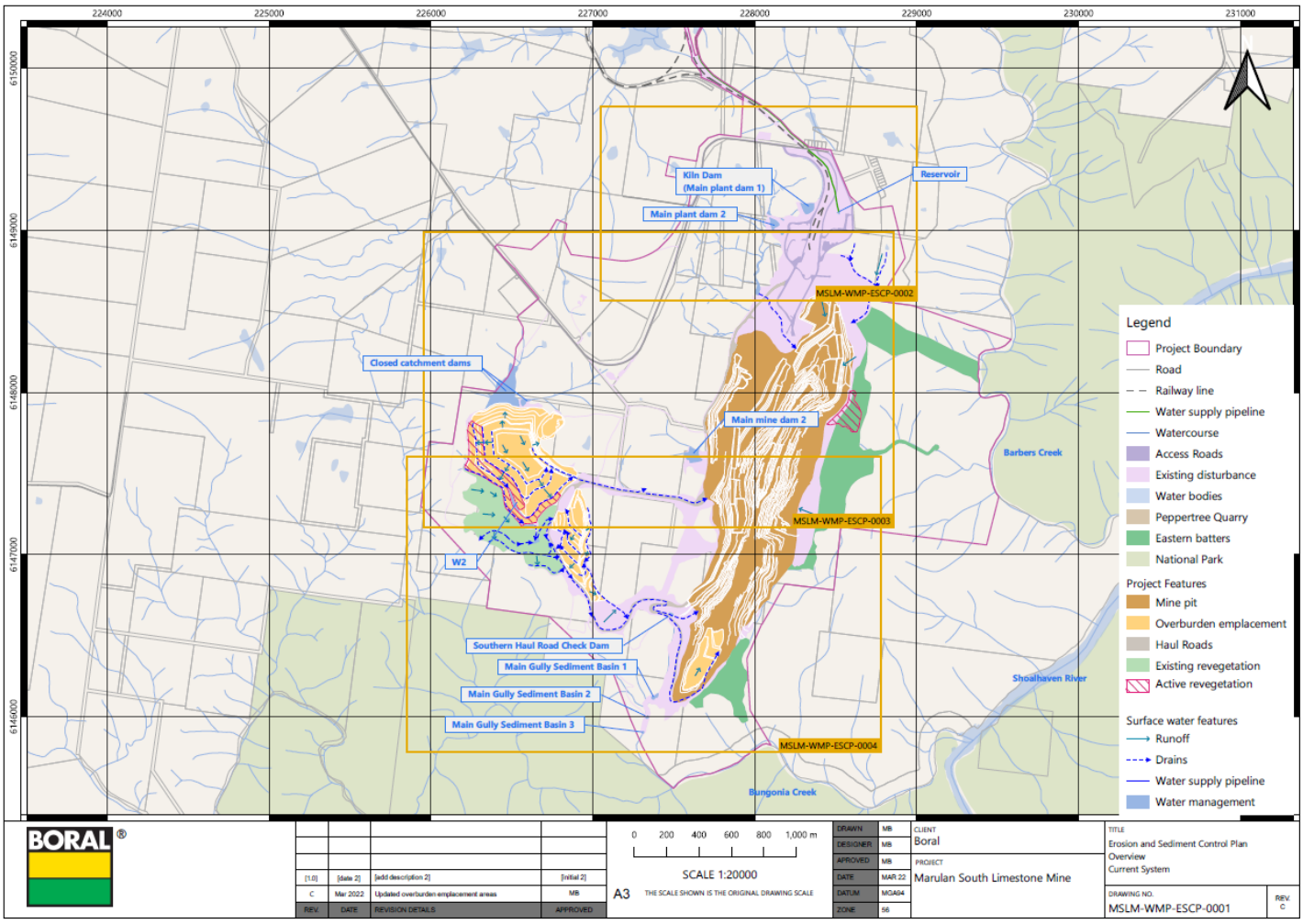


Plate 2 – Existing Surface Water Management System

7.2.2 Pollution Control Storages

A description of the current pollution control dams is provided in Table 7.1 while the estimated volumes stored within the pollution control structures is provided in Table 7.2.

Table 7.1 - Dam Descriptions

Dam name	Description
Clean Water Dam 1	Clean water diversion dam constructed in late 2007 above Main Plant Dam 2. Between Blue Lagoon and Kiln Dam
Clean Water Dam 2	Clean water diversion dam constructed as above but not previously recorded. Between Blue Lagoon and Kiln Dam
Minor Farm Dam 1	"Off-lease" farm dam upstream of Main Mine Dam 1. Near old weather station
Minor Farm Dam 2	Farm dam upstream of Main Mine Dam 1. Next to Black Dam
Minor Farm Dam 3	Potential New Clean Water Dam added as per MOP Plan 4-1. Near Substation
Minor Farm Dam 4	On Lime Dump Rd near Sweeper
Minor Farm Dam 5	Robs Farm House near Gate
Minor Farm Dam 6	Robs Farm House on bend in driveway
Minor Farm Dam 7	Robs Farm House NW larger than MFD8
Minor Farm Dam 8	Robs Farm House N smaller than MFD7
Minor Mine Dam 1	Clean water dam North of Main Gully waste emplacement. East of TRN compound
Minor Mine Dam 2	Clean water dam North-East of Main Gully waste emplacement. On metro road in new Central Dam area

Dam name	Description
Minor Mine Dam 3	Clean water dam, East of North Pit. Black dam
Main Plant Dam 1	"Off-lease" dam north of lime plant. Holds Tallong water and some plant area run-off
Main Plant Dam 2	Main lime plant water re-cycling dam on lease boundary. Blue lagoon
Main Mine Dam 1	Mine Dam 1 has been covered by the advance of the west emplacement.
Main Mine Dam 2	Mine water supply dam to west of shale road on boundary.
North Pit Void	Overflow from enlarged Kiln Dam and runoff from the plant (31 ha) northern catchment of the mine pit (68 ha). Not yet constructed- will be in an area of tyre storage behind secondary
Plant Sediment Dam	Small sediment pond upstream from Main Plant Dam 2
South Pit Void	See Note 4.
Southern Haul Road	Pre-treatment sediment check dam in roadside drainage. East of Maggie Dump
Check Dam	Near Main Gully diversion of southern haul road prior to entry to South Pit. No longer exists
Sediment Dams 1-3	Main Gully control and monitoring dams
Green Lagoon	Drainage line east of Dave Shep Drive
Swimming Pool	Western Batters Pit Void. Currently empty and will be mined and expanded in near future, may not hold water after that time.

7.2.3 Surface Water Monitoring and Reporting

The approved surface water monitoring program is detailed in the Water Management Plan for the Continued Operations project. Surface water monitoring is undertaken quarterly at sites upstream and downstream of the mine. These sites include the Shoalhaven River, Bungonia Creek and Barbers Creek (Figure 5). An additional sample is taken from the lower end of the Blowhole, prior to entry into Bungonia Creek. The Blowhole is a groundwater seep, or spring which is representative of groundwater situated below the elevation of South Pit. The surface water monitoring results are outlined below in this section, and a comprehensive description can be found in the Surface Water Assessment Report attached as Appendix D.

Additionally, an automatic water sampler is located in the lower section of Main Gully which is triggered automatically when the water levels in the sediment control pond rise during a significant storm event. Overflow events occurred during April 2024 and June 2024 following heavy rainfall. Results from both discharge events are presented in Table 7.2.

On the 6th April 2024 a total of 91mm rainfall was recorded at the site weather station which exceeded the 95% 5 day rain event for Marulan (i.e. where rainfall exceeds 52.8 mm in a 5-day period). This resulted in a single day discharge from Main Gully, which was sampled by the auto-sampler.

Heavy rainfall was experienced for three days from the 6th to 8th June 2024 inclusive with a total of 134.2mm rainfall recorded over the period which exceeded the 95% 5 day rain event for Marulan. This led to a 6-day overflow event from the 6th to 11th June.

Table 7.2- Main Gully Overflow Water Quality Monitoring Results April and June 2024

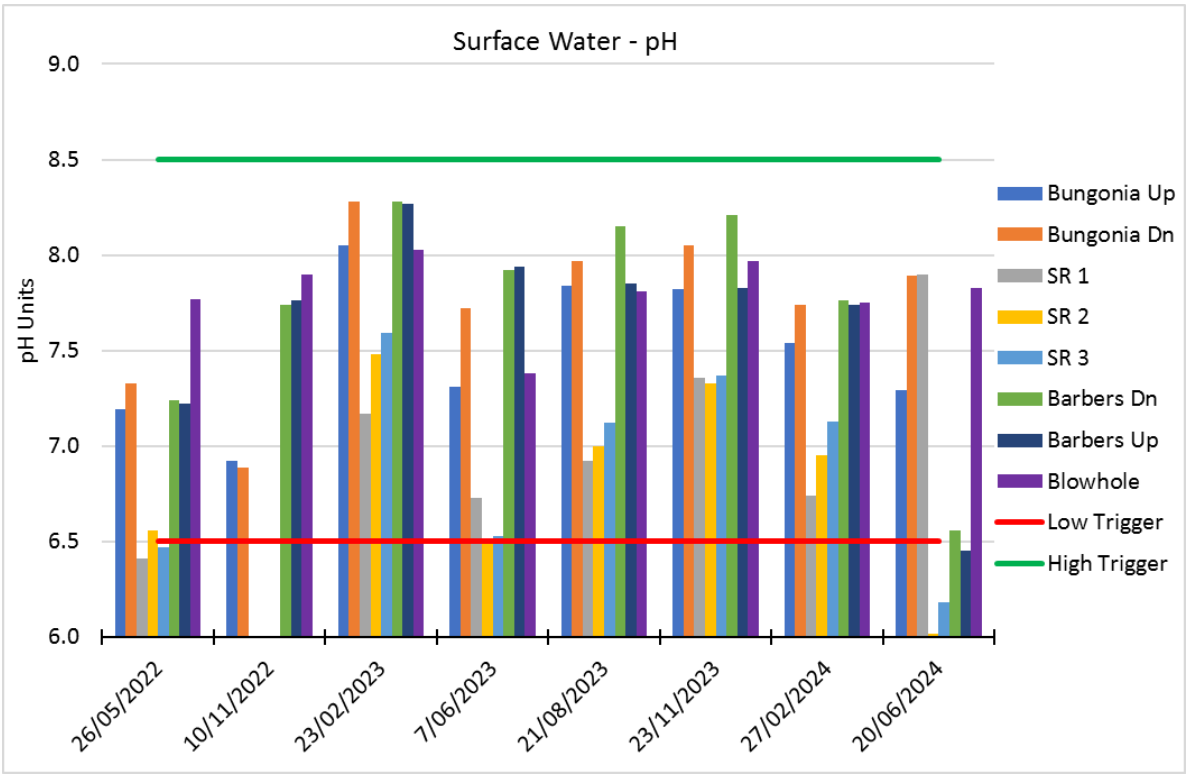
Date	pH Units	EC (µS/cm)	Suspended Solids (mg/L)	Turbidity (NTU)	Oil and Grease
6/04/2024	7.60	464	830	1720	<5
6/06/2024	7.31	437	1370	4650	<5
7/06/2024	7.72	514	306	640	<5
8/06/2024	7.93	631	155	234	<5
9/06/2024	8.02	664	60	88.2	<5
10/06/2024	8.03	676	57	76.6	<5
11/06/2024	8.04	694	56	70.4	5

**Two individual events are separated by bold lines*

The results show that during storm events when discharge occurs, suspended solids can be elevated however pH and conductivity are comparable with Bungonia Creek. Figure 11 of Appendix D shows that suspended solids loading with Bungonia Creek rose slightly during the same period. Although the Main Gully discharge would have an influence on solids loading within Bungonia Creek, Figure 11 of Appendix D, shows that the upstream sample site in Bungonia Creek had a slightly higher suspended solids loading than the downstream site during this high rainfall period. Figure 27 of Appendix D, shows that the Shoalhaven River was also elevated upstream of the confluence with Bungonia Creek indicating that there was widespread movement of sediment within the receiving waters during this period of high rainfall.

An extended ambient surface water quality monitoring program is also in place as envisaged in the EIS. Sampling was increased from biannual to quarterly at the beginning of 2023. This includes measurements taken from sites upstream and downstream of the mine on Bungonia Creek and Barbers Creek, at three sites along the Shoalhaven River (SR) and at the Main Gully Sample Point located downhill of the Spring (Blowhole).

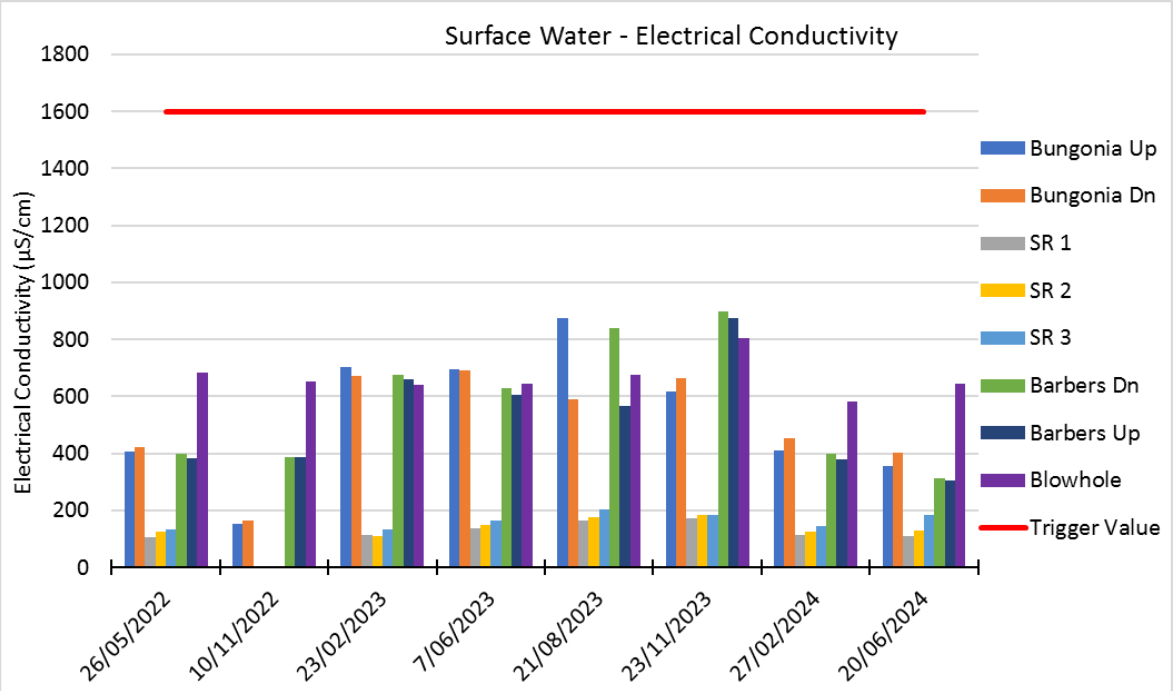
Surface water trigger values have been outlined in the Water Management Plan and are noted in Graphs 7.1 - 7.6 below. The purpose of the trigger values is to provide indicators of whether the mine is having an influence on the receiving water quality. Graphs 7.1 - 7.6 present the water quality parameters over the last two reporting periods.



Graph 7.1 – Ambient Surface Water Quality – pH

Graph 7.1 shows the pH values of the eight sample sites over the past three reporting periods. For the past 18 months, Bungonia Creek, Barbers Creek and the Shoalhaven River were all well within the upper and lower trigger values, with averages of 7.61 pH, 7.68 pH and 6.93 pH units respectively. Levels at the Bungonia downstream site are generally around 0.2 pH higher

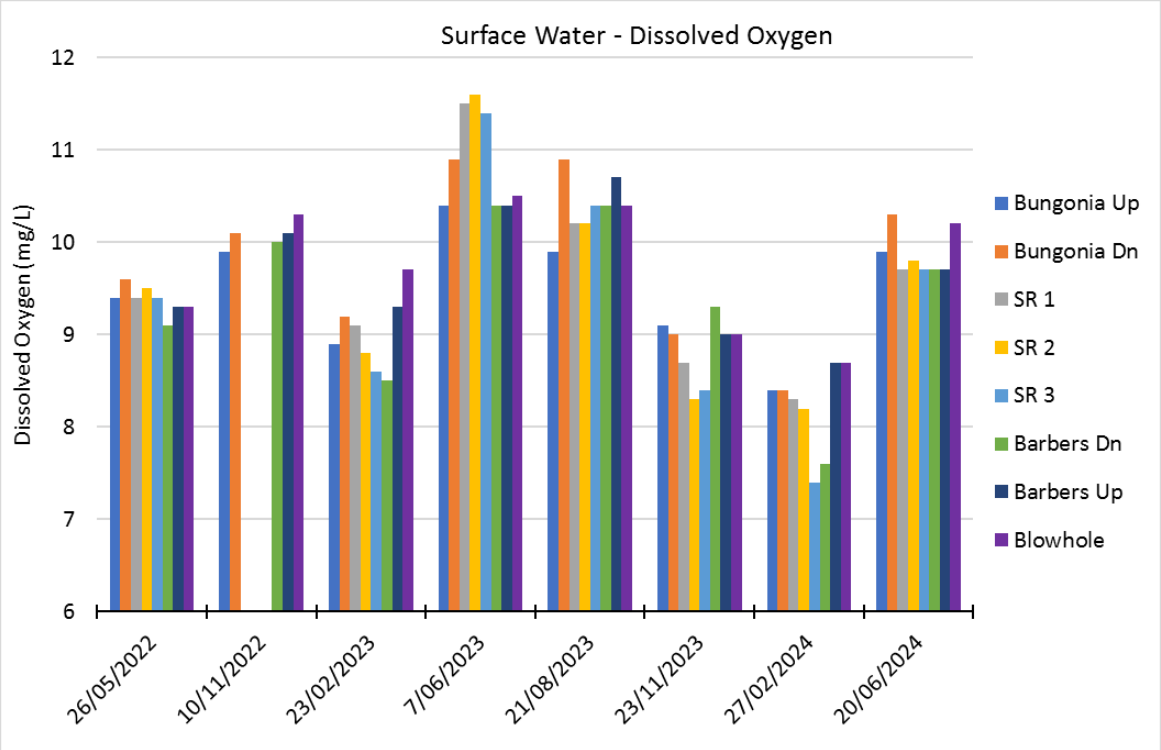
than the upstream sample site, and both sites on Barbers creek are usually relatively equal. The pH levels in the Shoalhaven River showed a high level of variability during June 2024, with a result of 7.9 pH units at the SR1 upstream site, 6.02 pH at SR2 and 6.18 pH at SR3 downstream. The Blowhole three-year average is 7.80 pH. The pH is governed by geological influences, particularly the large limestone deposit. Given the limestone's marine origin, salt level is also largely controlled by geological influences.



Graph 7.2 – Ambient Surface Water Quality – Electrical Conductivity

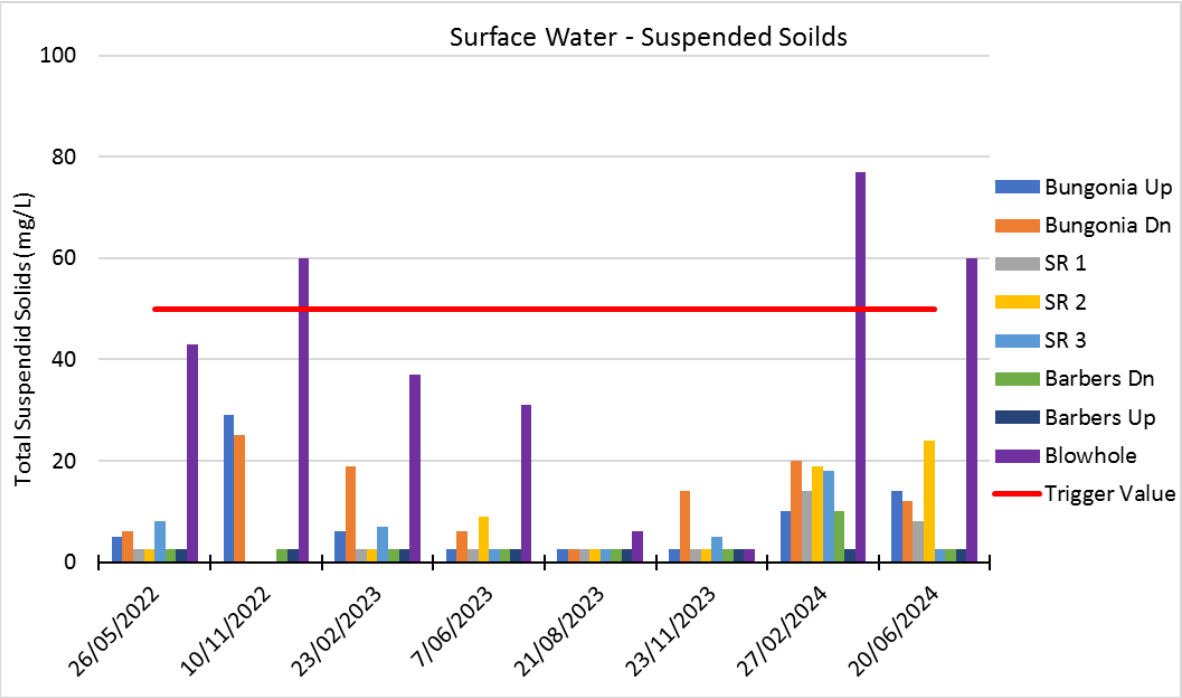
The electrical conductivity is significantly lower in the Shoalhaven River than all other sampling sites with a three-year average of 146 µS/cm (Graph 7.2). Bungonia and Barbers Creek three-year averages of 517 µS/cm and 544 µS/cm respectively lie significantly lower than the trigger value of 1600 µS/cm, and show levels representative of the surrounding limestone aquifer. The three-year average conductivity values have dropped since the previous reporting period in Barbers Creek and Bungonia Creek. This may be due to the high rainfall experienced in recent years. The average electrical conductivity at the Blowhole recorded over a three-year period is 666 µS/cm, which shows a 10 µS/cm increase since the last period. Although the majority of levels of electrical conductivity have dropped during the reporting period, the water quality remains in a healthy and stable state.

The variation in pH and conductivity, which is a measure of salt, is considered natural and caused by surrounding marine based geological strata. The physical and chemical properties of Shoalhaven River will naturally vary as it passes through different geological strata and land uses. The variations would occur in mineral content, nutrients, pH and dissolved solids.



Graph 7.3 – Ambient Surface Water Quality – Dissolved Oxygen

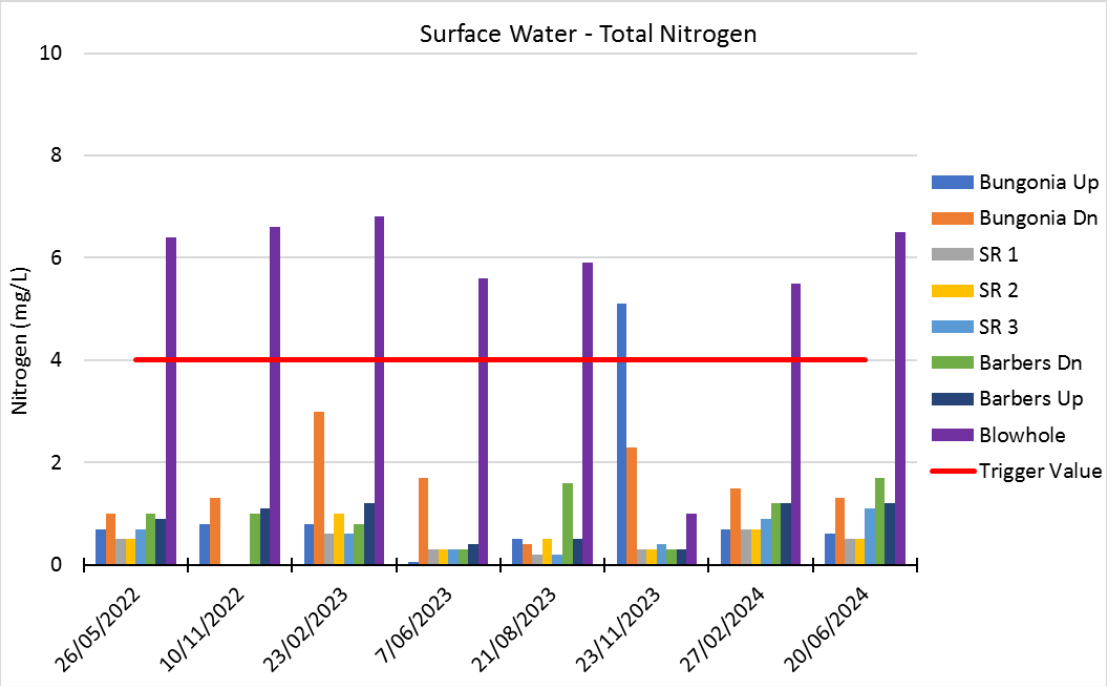
The dissolved oxygen levels range from 7.4 mg/L to 11.6 mg/L with an average of 9.56 mg/L over a three-year period across all ambient surface water monitoring sites (Graph 7.3). Results show that the waterways have sufficient dissolved oxygen levels to support a healthy aquatic environment including fish populations.



Graph 7.4 – Ambient Surface Water Quality – Total Suspended Particles

Suspended solid concentrations exceeded the trigger level at the Blowhole twice more during the reporting period (Graph 7.4). These elevated levels are likely due to the prolonged rainfall

flushing out the sediment contained in the karst system over time. The levels were often under detection limits of 5 mg/L (recorded as half of the limit value: 2.5 mg/L), however levels increased to averages of 13mg/L and 9 mg/L during February and June 2024 across all sites.



Graph 7.5 – Ambient Surface Water Quality – Total Nitrogen

Total Nitrogen levels were the highest at the Blowhole with a three-year average of 5.5 mg/L (Graph 7.5). Concentrations at Bungonia and Barbers Creeks usually remained below the trigger level of 4 mg/L with respective averages of 1.36 mg/L and 0.92 mg/L. A sample at Bungonia Creek upstream exceeded the trigger level on one occasion in November 2023, with a value of 5.1 mg/L. Nitrogen levels in the Shoalhaven River recorded an average of 0.66 mg/L and did not exceed 2.0 mg/L.

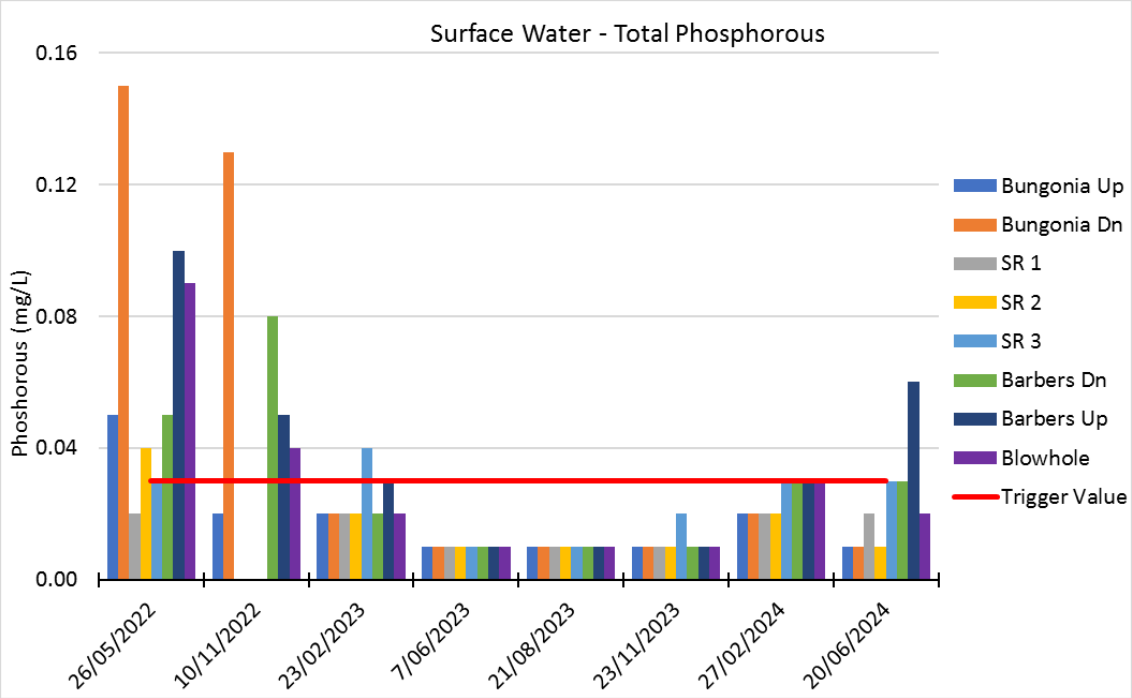
Total Nitrogen is the combined value of both Nitrite (NH2-) and Nitrate (NO3-) in the natural environment, Nitrite readily oxidises to Nitrate. Laboratory results are presented as Nitrate+Nitrite-N which is their respective Nitrogen contents. The conversion for both are as follows:

- 1mg/L nitrate-N = 4.43mg/L nitrate
- 1mg/L nitrite-N = 3.29mg/L nitrite

The nominated trigger value of 4mg/L of Nitrogen is conservative. ANZECC 2000 guidelines state that Nitrate concentrations less than 400mg/L in livestock drinking water should not be harmful to animal health. The Australian Drinking Water Guidelines (2011) stipulate 50mg/L of Nitrate as an appropriate long term health criteria in drinking water.

Nitrogen and Phosphorous occur naturally but are also caused by agricultural fertilisers. Although Nitrogen levels at the Blowhole are uncharacteristically high, it does not pose a hazard to either humans or animals. However, the cause of the elevated Nitrogen is unknown. For natural systems to yield Nitrogen at the measured levels would indicate the presence of high

levels of organic matter. As the volume of the Blowhole discharge is relatively small, there is only a minor increase in Nitrogen levels downstream.



Graph 7.6 – Ambient Surface Water Quality – Total Phosphorous

As shown in Graph 7.6, Phosphorous was above the trigger levels at a variable number of sites in 2022. It is thought that the elevated concentrations during this time are a result of runoff from saturated soils in agricultural areas within the catchment following over a year of above-average rainfall and storm events. For the past two years the phosphorus levels have generally remained below the trigger. There have only been two exceedances, at SR3 in February 2023 with a concentration of 0.04 mg/L and at Barbers Creek up in June 2024 with a concentration of 0.06 mg/L. The concentration of nutrients will continue to be monitored and investigations into the cause of the elevated nitrogen will be reported in the next Annual Review. It should also be noted that the actual concentrations are very low and would not cause adverse algal growth within the receiving waters.

The WMP has also included a requirement to conduct quarterly stream and riparian vegetation health inspections of surface water monitoring sites. The inspections commenced in the 2023 reporting period and have involved photographing the channel and creek banks, description of the condition and noting any changes observed since the last inspection. The most recent inspection was conducted in June 2024 which concluded that there were no visual changes to the geomorphology or surrounding vegetation to the creeks and river which could be attributed to the mine. The assessment confirmed that based on the observations, there have been no impacts to groundwater dependent ecosystems, the alluvial aquifers or the natural springs within the gorge. The complete Surface Water Assessment Report has been attached as Appendix D.

7.2.4 Aquatic Biodiversity Monitoring

In accordance with the Biodiversity Management Plan, Autumn baseline aquatic biodiversity monitoring was undertaken by Niche in June 2024. A total of 16 monitoring sites were included in the study across 5 stream networks, including three sites in Main Gully to assess the macroinvertebrate assemblages at Groundwater Dependant Ecosystem (GDE) survey sites which had not been previously monitored. Two of the control sites (Barbers Creek Upstream 1 and Bungonia Creek Upstream 1) were not monitored due to inaccessibility caused by high water levels in the creeks.

The sampling method used followed the NSW AUSRIVAS protocols for edge habitats. Samples were captured by sweeping a dip net through the benthic microhabitats at the site, and collected from a sorting tray using a pick method for 40 minutes. Invertebrate specimens were preserved in 70% ethanol and identified at the lab. A visual assessment of the aquatic habitat and physio-chemical field measurements were also taken in the field. Data analysis including the Observed to Expected ratio (OE50), Stream Invertebrate Grade Number Average Level (SIGNAL2), ETP Index and taxa richness were the key model outputs and stream health indices used to interpret stream health conditions under an Autumn model. Fish surveys were not undertaken but are scheduled for the Spring survey using eDNA sampling techniques.

Results showed that the upstream control sites were comparable to the downstream sites. A total of 41 different taxa were identified during the surveys across all sites, with between 2 and 17 taxa at each site. Samples were typically dominated by an abundance of Leptophlebiidae (Ephemeroptera), Baetidae (Ephemeroptera), Conoesucidae (Trichoptera) and Corixidae (Hemiptera) which made up 62% of the total number of macroinvertebrates collected.

While spatial variability was detected in the results, there were no significant differences among the control or treatment site groups. It could be concluded that the macroinvertebrate assemblages and stream health indicators show that the taxa composition and biological health of the five streams are similar at the control and treatment sites along the streams. An additional round of monitoring is scheduled for Spring 2024.

7.2.5 Future Improvements

Surface water management procedures will be amended and updated as mining operations move forward in the upcoming reporting period. In particular, the specific surface water management controls to be implemented as part of the future Marulan Creek Dam and Marulan South Road alignment operations are to be aligned with the SSDA approval. I

7.3 Groundwater Management

The quality and quantity of ground water may be impacted by sediments, dissolved salts, sewage effluent, hydrocarbons and chemicals generated or associated with surface water run-off from limestone mining and lime processing operations at the Marulan South Limestone Mine.

7.3.1 Monitoring and Reporting

There are three groundwater sources located on site, including a shallow unconsolidated aquifer within the weathered zone where groundwater exists between pores and deeper consolidated bedrock aquifer located between rock fractures.

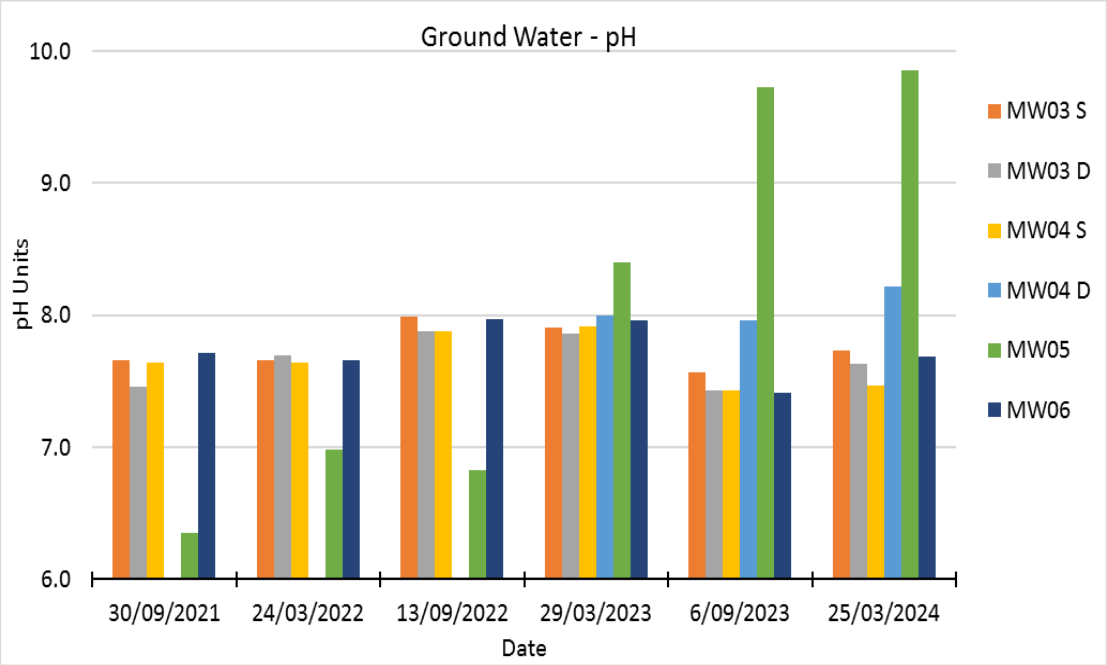
A total of eight monitoring bores were installed in 2014 within and adjacent to the pit area to determine the baseline groundwater levels and quality for the SSD project groundwater assessment. Monitoring bores MW01 and MW02 were located in the north pit and south pit respectively and were removed as bench development progressed in 2017 and 2018. The six remaining bores are monitored for water quality twice-yearly. Screened formations of the bores include limestone, sandstone, weathered regolith and volcanics such as dacite, tuffs and andesite.

Monitoring Point 13 on EPL 944 requires monitoring of groundwater for oil and grease and suspended solids on a quarterly basis. Monitoring Point 13 is the groundwater bore MW05. Table 7.3 shows the results of monitoring as required by the EPL for the past two reporting periods whilst pH and conductivity are presented in Graphs 7.7 and 7.8 below.

Table 7.3 – EPL Monitoring Point 13

Date	Oil and Grease (mg/L)	TSP (mg/L)
13/09/2022	<5	18
21/12/2022	<5	48
29/03/2023	<5	26
21/06/2023	<5	13
06/09/2023	<5	23
04/12/2023	<5	26
25/03/2024	<5	40
19/06/2024	<5	37

All the results for the reporting period are below the detection limits for Oil and Grease. TSS ranges from 13 to 48 mg/L at the licenced monitoring point.



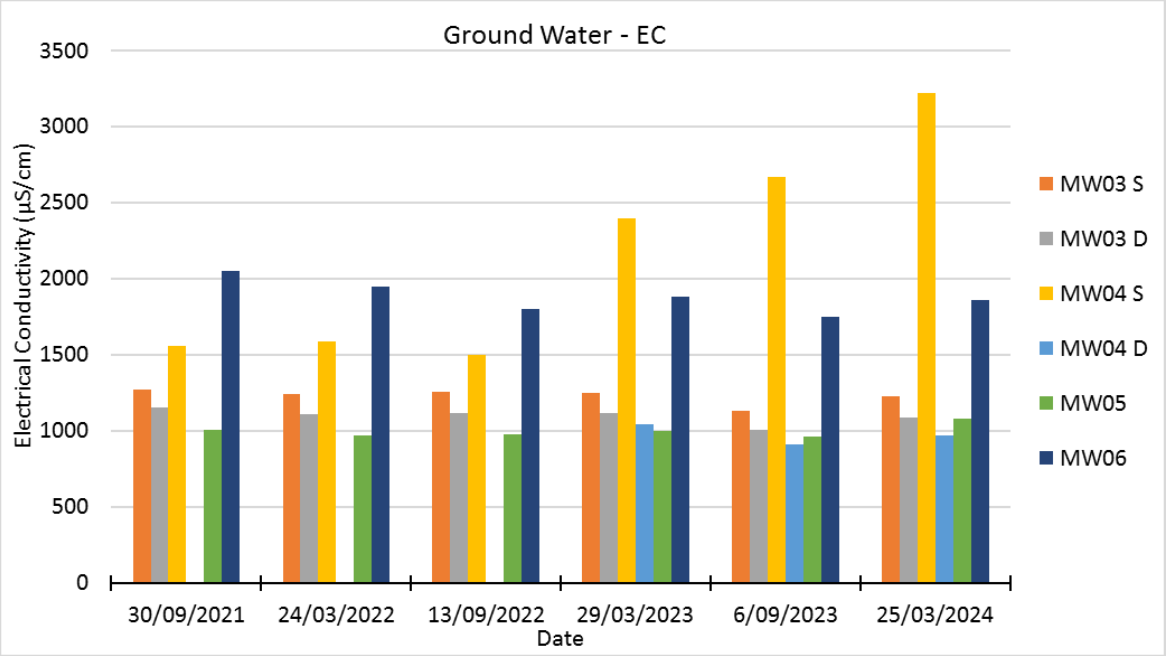
Graph 7.7 – Monitoring Bore Ground Water - pH

All of the bores excluding MW05 are generally neutral to slightly alkaline, within a 1 pH unit range (Graph 7.7). In the past, differences in pH levels have resulted from variability in host rock geology, although no such trends have been observed in the past two reporting periods.

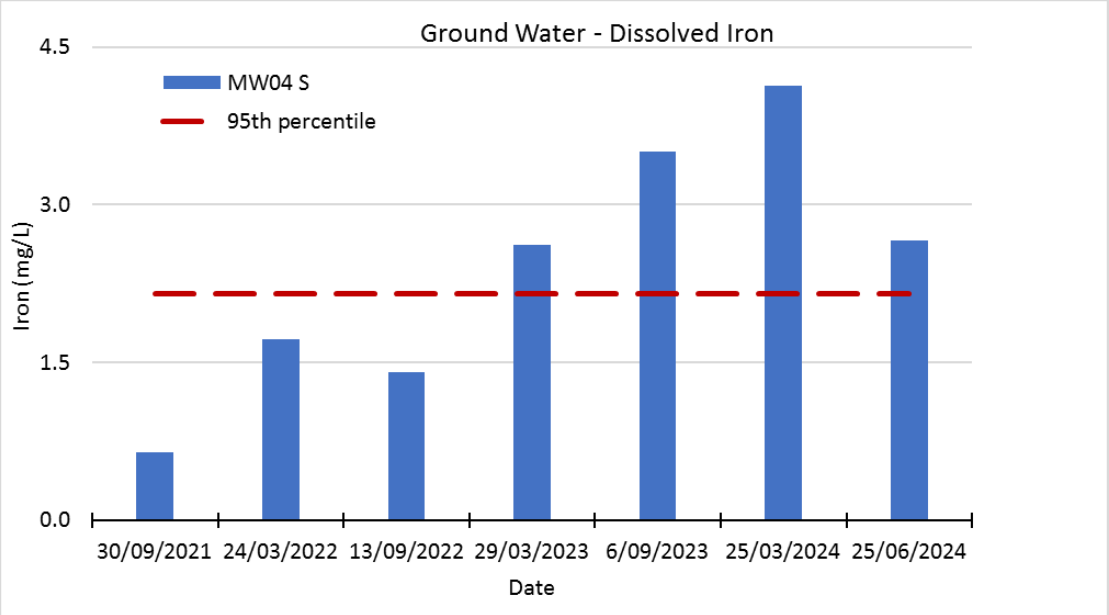
The pH of MW05 has been quite variable over the last two periods. During 2021 and 2022 the pH dropped from a long term average of 9.5 to an average of 6.6 pH. Since March 2023 it has increased again to levels above 8.0 pH units, with a maximum of 9.85 in March 2024.

There is a positive correlation between pH and alkalinity, so as total alkalinity (CaCO3) falls the natural buffering capacity of the water decreases as does its ability to neutralise acid, and pH decreases. The drop in pH was attributed to a decrease in water level which had reduced the aquifer's exposure to the baked limestone in the proximity of the bore, which in turn reduced its inherent carbonate concentration. The last three monitoring rounds show in increase in pH reflective of increased alkalinity.

Graph 7.8 shows variability among monitoring bore conductivity levels over the past three reporting periods. Host geology significantly influences conductivity of the bores, with limestone bores such MW05 with the lowest salinity ranging from 961 to 1080 µS/cm, and bores hosted in volcanics with conductivity levels as high as 2050 µS/cm at MW06 and 3220 µS/cm at MW04S which has been increasing over the past 18 months. This fresh to slightly brackish water is defined as 'marginal' for drinking water use, but suitable for stock water and aquatic ecosystems. During the reporting period, the 95th percentile trigger values for EC and dissolved iron (1738 µS/cm and 2.15mg/L respectively) for MW04S were exceeded for a third consecutive monitoring round in March 2024 triggering the TARP. Another round of monitoring undertaken in June as required by the TARP indicated that concentrations had not decreased and an investigation into the cause of the higher concentrations is currently being undertaken by a hydrogeologist. The findings will be reported in next year's Annual Review. The iron levels for MW04S are shown in Graph 7.9 below.



Graph 7.8 – Monitoring Bore Ground Water - Electrical Conductivity



Graph 7.9- MW04S Dissolved Iron

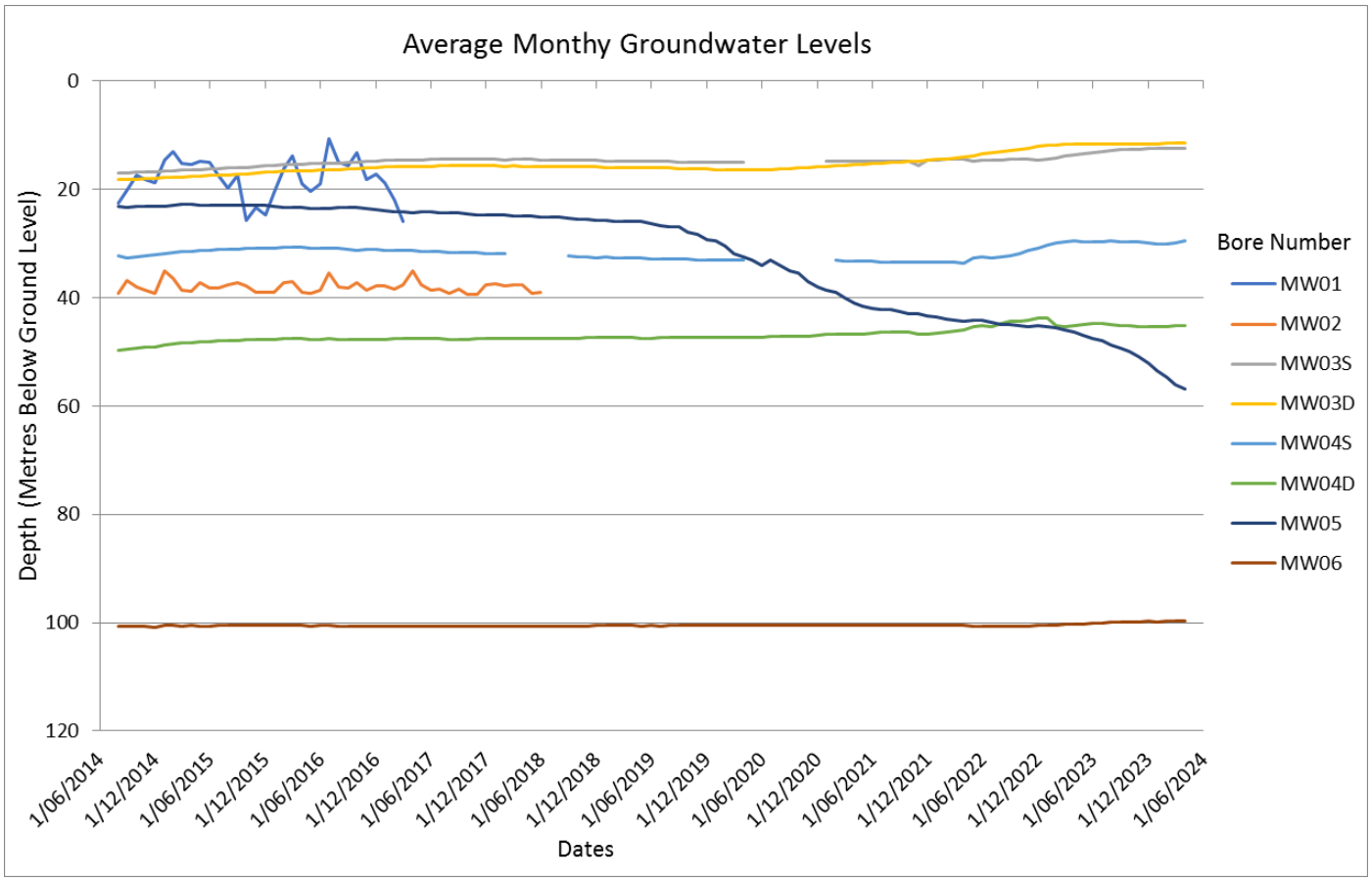
7.3.2 Groundwater Levels

Groundwater levels are recorded daily from monitoring bores using pressure transduced piezometers. The piezometers are downloaded quarterly in correspondence with water quality sampling and the recordings are cross checked with manual water level measurements.

Historical water levels of bores in the pit contrast strongly with those located outside pit. Bores located in the pit such as MW01 and MW02 (both of which are now discontinued) had rapid responses to rainfall and runoff that seeps directly through the limestone. As an alternative, the remainder of the bores outside of the pit do not show variation associated with rain events because such fluctuation is buffered by the regolith situated above the

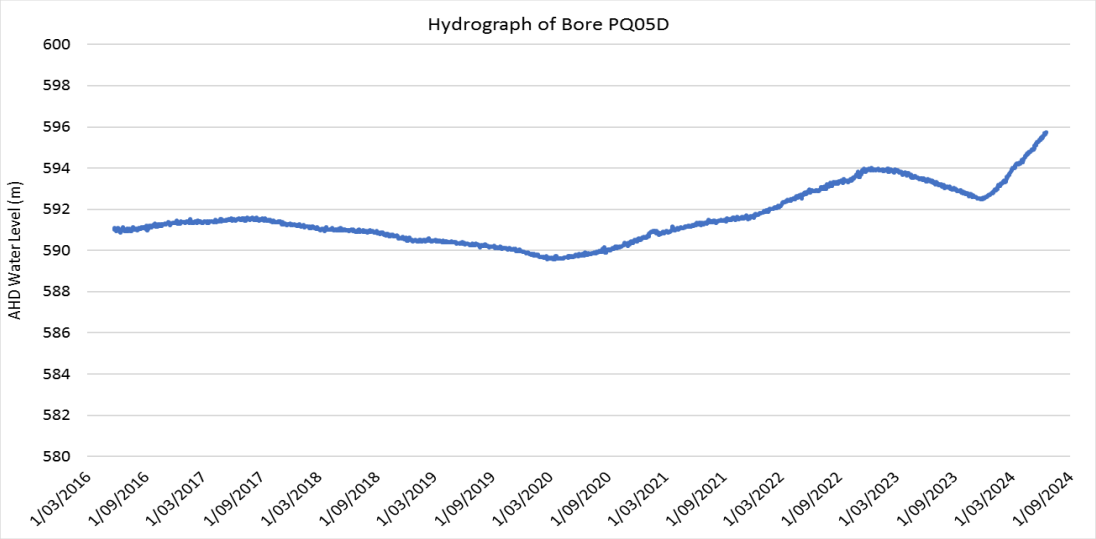
groundwater level. The standing water level in these bores has either been fairly static or increased slightly since 2014.

The standing water level in monitoring bore MW05 presents a gradual decline from March 2017 until May 2019, plateaued for 18 months from 2021-2022 and has accelerated again until present. It is becoming clear that MW05 has been impacted by the mine extraction. The decrease in standing water level observed at MW05 was expected based on groundwater modelling predictions of pit development. It is believed that the rapid decline was a result of the removal of the cross-cutting dolerite dyke in the North Pit which appeared to be 'damming' groundwater up-dip. Since the water level of this bore is artificially high (perched) it is also not reflective of the impact the quarry is having on regional groundwater levels. MW03 and MW04 are more accurate representations of the surrounding granite groundwater systems which have not as yet been impacted by the limestone removal within the mine. Graph 7.10 below shows that bore levels as monitored since 2014.



Graph 7.10 – Average Monthly Groundwater Levels from Monitoring Bores

The WMP requires a comparison of groundwater levels with those recorded at the adjacent Peppertree Quarry. Graph 11 shows the hydrograph for bore PQ05D which is located to the west of the hardrock quarry, north of the Mine. There is an increasing trend in standing water level evident similar to those of MW03S and MW04S resulting from prolonged wet periods. The hydrograph results for PQ05D demonstrates that this bore has some level of connectivity to surface recharge and is therefore a good indicator of regional groundwater movements.



Graph 7.11 – Peppertree Quarry PQ05D Hydrograph

The groundwater impact assessment conducted for the SSDA by AGE Consulting in 2019 does not predict any private bores will be impacted by drawdown greater than 1 metre during the 30 year SSD7009 consent period for the mine. The groundwater monitoring to date supports this conclusion.

7.3.3 Groundwater Review

Assessment of groundwater monitoring data is undertaken six monthly after each round of water quality sampling. The assessment includes graphing the data to determine if trends are developing. Particular attention is given to MW5 bore which is a licensed monitoring point. The assessment is undertaken in conjunction with the surface water monitoring and the River System Health assessment as described in the Groundwater Management Plan. A photographic record is kept for comparison and visual observations are compared to historical baselines observations and climatic conditions. Any ecological and environmental anomalies observed through ongoing ecological and environmental monitoring will be compared with the annual groundwater level data. Any significant variation or the appearance of adverse trends will trigger further investigation.

Routine groundwater monitoring at the mine seeks to identify any mine related impacts on the local aquifer systems. No specific groundwater monitoring is undertaken within the Bungonia Creek and Barbers Creek gorge due to the impracticality of installing groundwater monitoring infrastructure. The current quarterly monitoring program of groundwater levels coupled with six monthly water quality monitoring is sufficient to determine any potential trends in groundwater system changes as a result of the mine excavation. The groundwater monitoring program is also used to will identify any changes in stream and vegetation health which is an indicator of any impacts on Groundwater Dependent Ecosystems (GDEs) and general terrestrial and aquatic ecology.

Monitoring of the spring (also known as the Blowhole) is also covered in the Surface Water Management Plan. Spring flow is regarded as groundwater which becomes surface water in this case, and hence there is an overlap between surface water and groundwater monitoring. A photographic record of the Blowhole as well as quarterly water quality testing is documented. No changes to flow or water quality were recorded at the Blowhole in the

reporting period, as discussed in the Surface Water Monitoring Report attached as Appendix D.

No alluvial aquifers are mapped along Barbers Creek, Bungonia Creek and the Main Gully south west of the mine. The Shoalhaven River alluvial aquifers are situated outside the predicted zone of drawdown and not deemed necessary for groundwater monitoring.

7.3.4 Future Improvements

The potential impact of the SSD7009 approved 30-year mining plan on groundwater was assessed by a numerical groundwater flow model which was prepared in accordance with the Aquifer Interference Policy. The assessment identified two risk areas. The first is the potential impacts on the quality and volume of groundwater flowing between the western mining area and the eastern Bungonia gorge system. The second is the potential risk to the water level at private bores located on the plateau to the west of the mine.

A model predicted that there will be only a minimal change in groundwater resources outside the limestone bodies following the mining project. The dolerite dyke running through the current north section of the northern pit is the only barrier identified to potentially prevent drainage in the future. The assessment also found that assuming no changes to the pit fractures, there will be a slight increase in recharge into the limestone from a larger overall mine pit area and increased flow into Bungonia Creek.

There are no specific groundwater mitigation measures required however Table, Condition B43 of SSD7009 provides performance indicators applicable to groundwater. In order to verify the impact predictions made in the EIS and to confirm adherence to the performance indicators, the existing groundwater monitoring program will be enhanced. This includes monitoring of the newly installed production bore WB07 and the installation of two additional monitoring bores MW8 and MW9 in the coming reporting period. These bores were required to be installed within 12 months the commencement of development under SSD7009 (or other timeframe as agreed by the Planning Secretary). Boral was granted an extension until 30.6.24. monitoring of these bores will be reported in next year's annual review.

7.3.5 Verification

A Trigger Action Response Plan has been developed which forms the basis for ongoing assessment of potential groundwater impacts. The following key actions and responses will be undertaken if a trigger threshold is exceeded.

- The re-confirmed exceedances will prompt an investigation, conducted by suitably qualified personnel, to determine the reasons for the exceedance, which could include but not be due to the influence of climatic conditions, agriculture abstraction or mining activities.
- In the case exceedances are attributed to mining activities, changes in groundwater conditions, such as a decrease in water level or increase in salinity, will be compared to performance measures to evaluate the significance of any impacts on the groundwater system.
- Furthermore, the response and action to trigger exceedances in the TARP should determine if the trigger event resulted in an incident.

The results of the trigger investigations will be reported in each Annual Review. If it is clear each year that the groundwater baseline is changing in response to factors not related to mining such as climate or other land uses then the trigger thresholds will be recalculated. If this occurs the Ground Water Management Plan will be updated.

7.4 Water Access Licences and Water Take

Water take for the reporting period is detailed in Table 7.4 below.

Table 7.4 - Water Take

WAL	Works Approval	Water Source	Entitlement (ML)	Water Use (ML) 2023/2024
WAL25207	10WA102352	Shoalhaven River Water Source	76	76
WAL25373	10WA102377	Shoalhaven River Water Source	10	10
WAL25352	10WA102352	Shoalhaven River Water Source	1	1 (Stock and Domestic, used for domestic purposes only)
WAL24697	10WA115141 And 10WA116142	Goulburn Fractured Rock Groundwater Source	12	0
WAL41976	10CA122907 (statement of approval)	Goulburn Fractured Rock Groundwater Source	838	4.7

The volume of incidental groundwater intercepted in the mining areas will be estimated using the site water balance model each calendar year. The site water balance method compares rainfall and runoff inputs to the pits with pumping outputs and storage changes to estimate incidental groundwater take from the mining areas. This data will be published in subsequent annual reviews.

8. REHABILITATION STRATEGY

A Rehabilitation Strategy was prepared for the site as required by the consent for the Continued Operations Project which was approved by DPE on 16th September 2022. This chapter summarises the environmental performance compared to the requirements of the Rehabilitation Strategy.

8.1 Rehabilitation Risk Assessment

The Rehabilitation Strategy was prepared in March 2022 and reviewed in November 2023 with no changes made. This strategy included:

- Rehabilitation Objectives;
- Rehabilitation Completion Criteria;
- Conceptual Final Landform; and
- Rehabilitation Risk Assessment.

The Rehabilitation Strategy identified the key constraints to achieving rehabilitation success. These are:

Soil pH conditions: The overall limited availability of topsoil material suitable for use in rehabilitation is exacerbated by elevated pH levels exhibited in the overburden materials used as growth medium layers to date. This has impeded the successful development of a growth medium layer that can support rehabilitation.

Steep slopes: Although overburden emplacements have been designed to mimic adjacent natural steep slopes, landform steepness has contributed to rehabilitation establishment issues in some emplacements, leading to potential derivative impacts of erosion and downstream water quality impacts.

Climate: Highly variable and irregular climatic conditions hinder rehabilitation development. Such conditions include hot summers, cold winters and periodic droughts. It is important to plan towards rehabilitation in the traditional windows of Spring and Autumn but allow flexibility in long term rehabilitation planning to allow for drought periods and capitalising on La Nina (wetter) periods.

Water supply: Rehabilitation success has been impacted upon by water shortages following good initial germination. Irrigation trials have been set up previously, with limited success. The most effective irrigation has been natural rainfall.

Environment: Local environmental factors resulting from mine location have impeded rehabilitation establishment. Such factors include browsing by herbivorous pests such as goats and rabbits, native macropod species, as well as weed competition.

Measures to reduce these risks have been incorporated into the design of the rehabilitation program which are discussed further in the following sections.

8.2 Rehabilitation Objectives

The current rehabilitation strategy encompasses the following landform objectives across all rehabilitation domains:

- Rehabilitated land will be geotechnically stable and will not present a greater safety hazard than surrounding land to land-users, public, livestock and native fauna accessing or transiting the post-mining area;
- Land capability will, at a minimum, be returned to a class similar to that existing prior to Project commencement (Class V, VII or VIII);
- Except for mine void, mined land will be visually compatible with the surrounding natural landscape.
- Rehabilitated landforms will be designed to shed water without causing excessive erosion or increasing downstream pollution.
- Rehabilitated landforms will not negatively impact visual amenity for nearby residents and users of conservation reserves.

8.3 Site Domains

Mining domains were previously referred to as "primary" domains which are operation based such as infrastructure areas and overburden emplacements and final land use domains were previously known as "secondary" domains indicating post-mining land use objectives. The domains are shown in Figure 6 and Figure 7, and outlined in Tables 8.1 and 8.2 below. These will be revised and updated during the finalisation of the new RMP.

Table 8.1 – Mining Domains

No.	Domain	Site Name	Vegetation Community	Area (Ha)
A1	Infrastructure Area	Building, access and railway infrastructure	PCT1334	1.07
A1	Infrastructure Area	Mine infrastructure	PCT1334	18.07
A4	Overburden Emplacement Area	Eastern Batters Bryces Gully	PCT778	10.85
A4	Overburden Emplacement Area	Eastern Batters Barbers Creek	PCT778	19.46
A4	Overburden Emplacement Area	Eastern Batters Bungonia Creek	PCT778	6.81
A4	Overburden Emplacement Area	NOE Peppertree	PCT1334	0.08
A4	Overburden Emplacement Area	NOE	PCT1334	37.34
A4	Overburden Emplacement Area	SOE	PCT1334	28.60
A4	Overburden Emplacement Area	WOE	PCT1334	146.97
A4	Overburden Emplacement Area	SOE Middle Gully	PCT1334	33.20
G3	Water Management Area	Central Dam		3.80
G3	Water Management Area	Closed catchment Dam		0.53
G3	Water Management Area	Eastern gully Dam		1.26
G3	Water Management Area	Kiln Dam		1.21
I1	Infrastructure Area	Mine Infrastructure	PCT1334	17.37

No.	Domain	Site Name	Vegetation Community	Area (Ha)
I1	Infrastructure Area	Retained haulroads and access		17.08
I1	Infrastructure Area	Building, access and railway infrastructure		1.20
I1	Infrastructure Area	Rail Line	PCT1334	4.67
J5	Active Mining Area (Open Cut Void)	Open Cut Mine		155.37
J5	Active Mining Area (Open Cut Void)	Open Cut Mine-Backfill		16.78
Total				521.70

Table 8.2 – Final Land Use Domains

No.	Domain	Mining Domain	Area (Ha)
A1	Native Ecosystem	Infrastructure Area	19.14
A4	Native Ecosystem	Overburden Emplacement Area	283.30
G3	Water Management Areas	Water Management Areas	6.80
I1	Infrastructure	Infrastructure Area	40.32
J5	Final Void	Active Mining Area (Open Cut Void)	172.15
	Total Area		521.70

8.4 Rehabilitation of Disturbed Land

8.4.1 Seed Sources and Application

Seed spray trials conducted at the south-western end of the Western Overburden Emplacement during 2020 showed best results with Flexterra FGM with ryegrass and couch cover seed mix. This therefore has been selected from the trials and will be used to rehabilitate the remainder of the Western Overburden Emplacement area. To date, the seeding has taken well as a dense mat of clover is visible. It is envisioned that further areas to be seed sprayed will include a thicker layer of topsoil to improve germination success.

Topsoil spreading was undertaken as a substitute to hydromulching this reporting period to take advantage of available topsoil and in response to recommendations made by the hydro mulching contractor regarding the suitability of forecasted weather conditions in the Spring.

Further hydroseeding is planned for Spring 2024 and Autumn 2025 within the Western Overburden Emplacement area.

8.4.2 Rehabilitation Activities

The site achieved a total of 11.63 hectares of land prepared for rehabilitation during the reporting period which exceeded the 2023 forecast of 4.798 hectares. Rehabilitation activities undertaken during the reporting period are detailed in the following sections.

Western Overburden Emplacement

During the reporting period, overburden continued to be emplaced in the WOE and the final batter height was reached. Topsoil rich in seed was relocated from recently cleared areas on site. This topsoil was spread across 2.5 hectares on the uppermost bench and 6.6 hectares of the previously rehabilitated lower benches. To take advantage of the topsoil made available through clearing activities on site, spreading was selected in preference to hydro mulching. This was also recommended by the hydro mulching contractor regarding the suitability of forecasted weather conditions in the Spring. Final landform establishment was achieved on some area of the WOE during the period.

Plate 3 Western Overburden Emplacement Rehabilitation

Bryce's Gully

The site specific Bryce's Gully Rehabilitation Strategy was implemented in 2019. The general objectives for rehabilitation of the gully are to construct a geotechnically stable landform which does not present a greater safety hazard than the surrounding land; create land to be visually compatible with the surrounding natural landscape and to not negatively impact the visual amenity of the gully. The rehabilitation progression is monitored annually using EFA (See Section 8.4).

A Geotechnical report on Bryce's Gully was completed during 2023 which deemed the slope unstable at this time (See Section 6.11). It was advised that personnel should avoid entering this area as it may not be safe. Rehabilitation works planned for the upcoming reporting period have been put on hold until actions can be put forth to ensure slope stability.

Plate 4 Bryces Gully bench 2 (EFA site 4)

8.4.3 Feral Animal Control

There has been much habitat disturbance on the project site associated with feral animals including rabbits, brown hares, foxes, goats and more recently deer. During the reporting period feral animal control was undertaken via aerial culling by National Parks and Wildlife (NPWS) across the months of September, December and March, removing a total of 17 goats and 1 fox from the site.

8.4.4 Weed Management

The Weed Management Implementation Plan was recently revised in December 2023. Three WoNS/state priority weeds, including 3 regional priority weeds, Blackberry, Serrated Tussock and Pampas Grass were recorded on site in the reporting period. The objective for the WoNS/state priority weeds is asset protection- to prevent the spread of weeds to key sites/assets of high economic, environmental and social value, or to reduce their impact on these sites if spread has already occurred.

Weed monitoring and control during the reporting period focused on the control of pampas grass, serrated tussock, cotoneaster and hawthorn. Spraying was undertaken via foot and drone along the Eastern Batters, the rehabilitation areas and the South Pit border using Glyphosate, Taskforce and Woody spray during August, October, November and March.

8.5 Rehabilitation Monitoring

8.5.1 Rehabilitation Monitoring - Ecosystem Function Analysis

An Ecosystem Function Analysis (EFA) developed by Tongway and Hindley (2004) is being utilised to assess the rehabilitation progression at the mine. The EFA monitors transects to measure the landscape function, vegetation dynamics, habitat complexity and disturbance. These measures are converted into indices for comparisons of rehabilitation over time and to undisturbed reference sites. The methodology used does not replace the traditional methods of monitoring vegetation and fauna but adds a functional interpretation to link vegetation structure and organisation more closely with soil function and the development of habitat for native fauna.

The site is surrounded by National Park and State Conservation Area bushland to the South and East, and farmlands to the North and West. The end result of the rehabilitation process is a return of the site to natural woodland where possible, or as sustainable grazing pasture where appropriate.

Monitoring surveys are scheduled to occur on a biannual basis, with monitoring undertaken in January and November 2023 and the next round of monitoring scheduled for October 2024. Generally, surveys will occur in Autumn and Spring to record seasonal differences in floristic structure and composition in the reference areas, to identify seasonally occurring plant species, and to note the effects of seasonal conditions on plant germination on exposed rehabilitation sites.

A total of five transects, including one reference site were surveyed, as described in Table 8.3 below.

Table 8.3- Transect Description

Transect	Landscape Position	Comments
Reference 1 (R1)	South-West of the WOE	Has not been disturbed by mining activities
T1	Located at the northern end of the WOE, Domain 4.1w in the 2018-2023 MOP	Monoculture of *acacia* species with juvenile *Eucalypts*. Rehabilitated in 2005 and 2008. Discontinued due to expansion of the west overburden emplacement.
T2	South of the active area within the WOE, Domain 7.1w in the 2018-2023 MOP	Flat ground with groundcover of weed species and older monoculture of *Acacia*. Rehabilitated in 2005.
T3	Far south of the WOE Domain 7.1w in the 2018-2023 MOP	Rehabilitation occurred in 2017. Many *Acacia* with juvenile *Eucalyptus* and *Allocasuarina*. Many weeds present.
T4	Second bench of Bryces Dump Domain 7.3e in the 2018-2023 MOP	Stable slope, high vegetation cover is mostly weeds, moss and dying serrated tussock. Rehabilitated in 2019/2020
T5	WOE - first bench, Domain 4.1w in the 2018-2023 MOP	Transect established April 2021. Rehabilitation trial conducted January 2019. High grass, broadleaf weed density with increased *Acacias* on lower half.

A summary of the November 2023 EFA results are presented below, while the complete report is provided as Appendix C.

Field surveys involved the collection of patch/interpatch and soil surface condition data for each transect. This data is used to calculate the landscape organisation, soil stability, infiltration and nutrient cycling indices. The landscape organisation and soil surface assessments are most useful when compared over time, during subsequent monitoring surveys.

Table 8.4 contains the Landscape Function Analysis (LFA) and Soil Surface Assessment (SSA) results. Minimal changes to soil characteristics were measured in November 2023. Soil structure takes many years to develop and it takes many years for a soil type to change its composition. The proportion of bare ground is now negligible at all sites apart from Site 3 due to increased native ground cover, annual weed growth and increase leaf litter.

Site 2 and 4 had the highest stability index with an extensive, localised layer of litter, high rain splash protection and a high presence of vegetative and biological cover. Moss was identified for the first time on Site 3, and it is expected that it will have a positive contribution to the soils biological crust cover rating in years to come. Since infiltration scores were similar to, or higher than the reference site, no further infiltration improvements are necessary. Only small improvements in nutrient cycling indices were recorded in November 2023, since only little changes were recorded for the overall soil assessment. A slight improvement of nutrient cycling is still required for Site 3, which would involve increased vegetation, litter and biological cover. Brush-matting can be recommended to achieve this.

Table 8.4- Landscape Function Analysis and Soil Surface Assessment Results

Index	T2	T3	T4	T5	Reference
Landscape Organisation	100	77	98	98	94
Stability	72	58	73	63	74
Infiltration	70	60	55	60	55
Nutrient Cycling	58	48	72	60	57

Vegetation Composition is measured by species richness at three strata levels and by cover percentages (Table 8.6). The canopy is split into middle (1-3m tall) and upper canopy (>3m). Stem count is used as a measure of vegetation density.

Species Richness is fairly consistent across the sites, except for lower shrub richness in the rehabilitated areas compared to the reference site. Species Richness of Revegetated Areas still often remains below the Species Richness of the Reference Transect. It is natural for species richness to be low in newly colonised and regenerating areas, with complexity increasing with time. The groundcover richness ranges from 16 to 30 species per transect, although a significant proportion of groundcover species are weeds (see Table 8.5).

Percent covers varied considerably among all five transects. There is a large percent of bare ground in transect T3 which can have negative impacts on soil stability and nutrient cycling, although this percent dropped from 50% to 39% in the past 6 months. T4 has a high groundcover percentage, although is lacking a middle and upper storey level. Seeding and tube stock planting has occurred in this area and will seek to address this issue over time.

The rehabilitated sites T2 and T5 in particular, have a considerably high density of mature acacia species, which is not representative of the reference site. Care must be taken when conducting rehabilitation that species mixes reflect the surrounding native vegetation.

Table 8.5- Vegetation Composition Results

Species Richness	T2	T3	T4	T5	Reference
Groundcover	25	16	30	29	23
Shrub	1	1	2	1	4
Canopy	4	7	1	2	7
Average Cover (%)					
Groundcover	51.5	18.15	50.25	50.45	12.25
Shrub Cover	34.8	19	5.25	8.4	2.25
Leaf Litter	48.5	43.15	47.25	34.9	84.25
Bare Ground	1	38.65	3	11.35	3.5
Canopy Cover	43.5	0	0	21	24.5
Total Stem Density Count					
1-3m	1	9	0	16	1
3m+	10	0	0	3	2

The Habitat Complexity is scored from 0 to 3 on the following five features to survey the extent of available niches for vertebrate fauna (Table 8.6). The index shows that all rehabilitated transects have lower habitat complexity levels than the reference transect. The canopy cover at Transect T2 has reduced to a score 2 due to several fallen Acacias. All sites were moist following heavy rainfall the day prior.

Table 8.6- Habitat Complexity Scores

Transect	Tree Canopy %	Shrub Canopy %	Ground Herb %	Litter %	Water Availability	Habitat Complexity Index
2	2	2	1	3	1	9
3	0	2	1	2	1	6
4	0	1	2	2	1	6
5	1	1	2	2	1	7
Reference	2	1	1	3	2	9

The EFA monitoring program is primarily designed to track rehabilitation progression and success through time. These results can be used as a baseline for the future.

8.5.2 Rapid Visual Assessment

As a requirement of the BMP (Section 7.3), the Rapid Visual Assessment (RVA) was added to the rehabilitation monitoring schedule during the reporting period. The BMP incorporates the relevant management measures presented in the EIS, Response to Submission and Condition B54 of SSD7009.

Each RVA site is traversed on foot and assessed for the following:

- ❒ evidence of regeneration;
- ❒ presence of mine rubbish;
- ❒ evidence of grazing;
- ❒ presence of exotic weeds

- ❒ presence of feral animal species
- ❒ presence of domestic litter / rubbish;
- ❒ fire disturbance;
- ❒ presence of salvaged habitat and nest boxes;
- ❒ evidence of nearby maintenance activities; and
- ❒ surface stability and erosion.

Outcomes of the RVA will also be reported against performance indicators and completion criteria provided in Table 6.1 of the Biodiversity Management Plan. A total of 8 RVA sites were determined and examined in November 2023 as per Table 8.7 and 8.8 below.

Table 8.7 - RVA site locations

Site ID	Description	Southings	Eastings
RVA1	Near Bryces Dump	S34°46'21.48"	E150°2'7.85"
RVA2	Near Maggie Dump	S34°47'15.31"	E150°1'7.52"
RVA3	EFA Site T5	S34°46'42.41"	E150°0'36.77"
RVA4	EFA Site T2	S34°46'49.86"	E150°0'40.27"
RVA5	EFA Site T3	S34°46'53.03"	E150°0'36.50"
RVA6	EFA Reference Site	S34°46'52.97"	E150°0'36.75"
RVA7	Lime Dump Road Nth	S34°46'52.53"	E150°0'35.05"
RVA8	Lime Dump Road Sth	S34°46'30.11"	E150°1'16.38"

Table 8.8 - RVA November 2023 Summary of Observations

Transect ID	Disturbance freq/intensity	Evidence natural regeneration	Presence/absence feral animals	Mine Rubbish	Grazing/Animal Pads	Weed Cover	Wind erosion	Water Erosion	Maintenance Activities	Fire freq /intensity/height	Salvaged Habitats
Units	3/3	Y/N	Y/N	Y/N	Y/N	%	3	3	Y/N	3/3/3	Y/N
RVA1	2/1 feral animals	yes- sprouting euc and olearia	Y- goat track	Y- cables, electrical wires	No grazing, yes kangaroo scat	10	0	0	No	0/0/0	No
RVA2	2/2	Y	n	No	only native	25	0	0	No	0/0/0	No
RVA3	0/0	Y - acacias	Y deer scat	No	Y deer, roo, wombat scat	30	0	0	No	0/0/0	No
RVA4	0/0	yes acacia+euc	Y deer/rabbit scat, deer antler, deer scratches	No	Y deer, rabbit, roo, wombat	15	0	0	No	0/0/0	No
RVA5	0/0	No	Y deer and rabbit scat	No	Y deer, rabbit, roo, wombat	30	0	0	No	0/0/0	yes logs
RVA6	0/0	Y	No	No	No	2	0	0	No	0/0/0	No
RVA7	0/0	Y	No	Y- wire	No	50	0	0	No	0/0/0	No
RVA8	0/0	Y	y rabbit scat	No	No	60	0	0	No	0/0/0	No

Key:
1= mild
2=moderate
3=extensive

Outcomes of the RVA are reported against performance indicators and completion criteria provided in Table 6.1 of the Biodiversity Management Plan. Recommendations specific to this round of the RVA are provided in Table 8.9 below.

Table 8.9 – Recommendations

Site ID	Recommendations for remedial action
RVA1	Removal of mine rubbish
RVA2	Treatment of the serrated tussock
RVA3	Feral animal control plan including deer
RVA4	Feral animal control plan including deer
RVA5	Native seed sowing or planting of tubestock, in particular on the lower half of this embankment.
RVA6	No actions required
RVA7	Treatment of the serrated tussock Removal of mine rubbish
RVA8	Treatment of the serrated tussock

These are the results of the first RVA undertaken under the Marulan South Limestone Mine Biodiversity Management Plan. Monitoring sites have now been established and will be monitored on a 12 monthly basis. Some initial recommendations have been made which will form part of the overall management of rehabilitation work at the mine. The complete RVA report can be found in Appendix C of the Ecosystem Function Analysis Report which is attached as Appendix C of this Annual Review.

8.5.3 Progressive Rehabilitation Strategy

The Marulan South Limestone Mine has a progressive rehabilitation strategy which considers the continued 30 year SSDA mine operation. The rehabilitation strategy has been updated to satisfy the consent conditions. Stage 1 rehabilitation activities area proposed over a five year period commencing 2023 and include the following activities:

- Establish existing rehabilitation or 'ecosystem and land use establishment' over 16.5 ha of the lower slopes of the WOE and the 2.4 ha of the active Barbers Creek overburden emplacement.
- Commence growth medium development or active rehabilitation over 10.2 ha of the western and northern lower slopes of the completed NOE.
- Commence active rehabilitation over 20.8 ha of the western and northern lower slopes of the extended WOE. In addition, any final batters constructed for the associated central dam and similarly for the Eastern Gully dam would be revegetated for slope stabilisation.
- Commence active rehabilitation of 1.7 ha of the south-eastern 'outer' slopes of overburden backfilled into the in-pit part of the SOE.

The dumping of overburden will focus on the south pit and WOEB "Noise Wall", where final shaping can be achieved. The rehabilitation of the emplacements is scheduled so that revegetation can commence following each lift stage of the emplacement. This ensures rehabilitation occurs as quickly as practicable.

The following actions may need to be taken as per recommendations from the LFA/EFA rehabilitation monitoring program:

- ❒ Controlling weeds within rehabilitation areas;
- ❒ Management and control of feral animals as required;
- ❒ Management and control of erosion;
- ❒ Revisiting rehabilitation methodologies in areas that may have failed;
- ❒ Infilling tube stock to improve species richness or in areas with failed plantings.
- ❒ General maintenance including irrigation and fertilising; and
- ❒ Repairing fences, access tracks and other land management activities.

8.6 Further Development of the Final Rehabilitation Plan

The Rehabilitation Management Plan was submitted to the Resources Regulator on the 29th December 2023. A final land use statement is outlined in the plan which provides the rehabilitation objectives as per SSD 7009 CoC B76.

The rehabilitation objectives involve rehabilitation of all out-of-pit overburden emplacements and infrastructure sites to a native vegetation community. The final void will be reduced by partial in-pit placement of overburden in the south pit with additional visual screening of the extraction area. Areas proposed for native ecosystem re-establishment will be restored to self-sustaining native woodland ecosystems. The revegetation will aim to establish local plant community types, with a focus on species commensurate with *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland* and *Derived Native Grassland CEEC*.

The completion criteria specified in the SSD EIS and approved Rehabilitation Strategy commitments include a minimum of 70% vegetation cover, 50% if rocks, logs or other features of cover are present and no areas of weed infestation. Table 8.7 below summarises the rehabilitations objectives from the Rehabilitation Management Plan.

Table 8.7 Rehabilitation objectives.

Feature	Objective
All areas of the site affected by the development	❒ Safe, stable and non-polluting ❒ Fit for the intended post-mining land use/s ❒ Establish the final landform and post-mining land use/s as soon as practicable after cessation of mining operations ❒ Minimise post-mining environmental impacts
Areas proposed for native ecosystem re-establishment	❒ Establish/restore self-sustaining native woodland ecosystems ❒ Establish local plant community types, with a particular focus on species commensurate with White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC ❒ Establish: - riparian habitat within any retained water features; - habitat, feed and foraging resources for threatened fauna species (including the Koala); and

Feature	Objective
	- vegetation connectivity and wildlife corridors, as far as is reasonable and feasible
Final Landform	❒ Stable and sustainable for the intended post-mining land use/s ❒ Integrated with surrounding natural landforms and other mine rehabilitated landforms, to the greatest extent practicable ❒ Incorporate micro-relief and drainage features that mimic natural topography and mitigate erosion, to the greatest extent practicable ❒ Maximise surface water drainage to the natural environment i.e. free draining (excluding final void catchment) ❒ Minimise visual impacts, where practicable
Final void	❒ Designed as long term groundwater sink to prevent the release of saline water into the surrounding environment, unless further mine planning and final landform design processes identify a more suitable outcome for the final void (see condition B79) ❒ Maximise potential for beneficial reuse, where practicable ❒ Minimise to the greatest extent practicable: - the size and depth; - the drainage catchment; - any high wall instability risk; and - the risk of flood interaction
Surface infrastructure of the development (excluding Marulan Creek Dam)	❒ To be decommissioned, removed and rehabilitated, unless the Resources Regulator agrees otherwise
Water quality	❒ Water retained on the site is fit for the intended post-mining land use/s ❒ Water discharged from the site is suitable for receiving waters and fit for aquatic ecology and riparian vegetation
Community	❒ Ensure public safety ❒ Minimise adverse socio-economic effects associated with mine closure

9. COMMUNITY RELATIONS

The Marulan South Limestone Mine has been owned and operated previously by BCSC and now Boral Cement Limited since 1987 and continues to provide direct employment currently for approximately 95 local people who travel from the towns of Goulburn (35kms), Marulan (12kms), Berrima (60kms) and surrounding areas.

Services provided by Boral Cement include a contracted bus service for employees travelling from Goulburn. In addition, a helicopter landing station is maintained in support of emergency responses, which may occur on site or in the adjoining Bungonia National Park and State Conservation Area.

During the reporting period, meetings have continued for the Marulan South Operations CCC. Meetings are held on a three-monthly basis and committee members are emailed an update including the monitoring data from the previous quarter. Minutes from the meetings are provided on the Boral Marulan South Operations website.

9.1 Environmental Complaints and Enquiries

No complaints were received from the public during the reporting period.

9.2 Community Liaison

Boral conducted a specific community liaison program as part of the SSD approval process in addition to its normal ongoing community engagement activities. The additional liaison provided information on community attitudes and concerns which assisted in the development of the ongoing mine operation strategic planning and environmental mitigation strategies.

The current engagement activities include:

- Regular community newsletters;
- Active participation in local events;
- Arranging site inspections and one on one consultation;
- Active engagement with key government and non-government organisations; and
- Maintenance of an environmental and community complaints register and actively managing and resolving community issues as they arise.

9.3 Community Involvement

Boral is engaged in local community events and has been involved in some of the most significant events since 2011. Boral is a proud major sponsor of the Tallong Apple Day Festival held annually in May (postponed to September 2024 due to wet weather), the Goulburn Mulwaree Council community bike ride, a sponsor of the Tallong public school numeracy award, Careers Expo, IQA site visit and slope stability course and the Mayoral Charity golf day.

10. INDEPENDENT AUDIT

In accordance with Condition D13, an Independent Environmental Audit (IEA) was required to be undertaken within one year of the SSD approval. The first IEA was conducted in March 2024 by EPS for the period from the 1 January 2023 to 31 December 2023.

Two low-risk non-compliances were recorded from the IEA which are outlined below in Table 10.1. The overall environmental performance based on the observed condition of the site is considered satisfactory.

Table 10.1- Non-Compliances

Number	Details	Audit Findings
A19	Within 12 months of the date of commencement of development under this consent, or other timeframe agreed by the Planning Secretary, the Applicant must surrender the existing development consents dated 21 February 1972, 16 October 1974, 13 February 1995 and 22 May 1997, April 2008, 20 June 2006 and 1 March 2012 as detailed in Section 3.3.4 of the EIS, and any existing or continuing use rights for the site, in accordance with the EP&A Regulation.	**Non- Compliant (Low Risk)** Boral seek alternative timeframe from the Planning Secretary to surrender consents and existing or continuing use rights.
D17	Before the commencement of development under this consent until the completion of all rehabilitation required under this consent, the Applicant must make the following information and documents (as they are obtained, approved or as otherwise stipulated within the conditions of this consent) publicly available on its website.	**Non- Compliant (Low Risk)** 1. Water licences made available on website or link to relevant website where water licences can be accessed. 2. EIS (see definition of EIS under heading "Definitions" in the conditions of consent) to be on website or link to relevant website where EIS can be accessed. 3. All minutes of CCC meetings made available on website or link to the Peppertree Quarry website for combined minutes.

A total of 8 opportunities to promote improvement in terms of regulatory compliance and environmental performance were included in the audit report for consideration and action. Table 10.2 outlines Boral's response to the recommendations which was submitted to the DPHI on the 30th April 2024.

Table 10.2- Improvement Opportunities and Action

No.	Condition	Recommendation	Response	Due Date	Outcome
BML01/24	D11- Audit period to align with the Annual Review period.	Boral request the Planning Secretary's approval for the next IEA, scheduled for 2026, for the audit period to align with the Annual Review period which are configured with financial year reporting periods of July – June.	Letter to be issued to DPHI requesting the alignment of the 2026 audit with the Annual reporting period.	30/6/2024	Resolution pending
BML02/24	A19- Surrender of existing consents or approvals.	Boral seek alternative timeframe from the Planning Secretary to surrender consents and existing or continuing use rights.	An alternative time frame will be discussed with DPHI as to the surrender of the consents and existing use rights.	30/6/2024	Resolution pending
BML03/24	B82- Error references in the Rehabilitation Management Plan.	Correct "Error" references throughout the management plan.	The Management plans are to be reviewed in line with the findings of the IEA. The changes as identified will be corrected and the plan reissued to DPHI for approval.	30/7/2024	completed
BML04/24	B83- Monitoring of Product transport.	Include in Annual Review maximum truck movements per day (currently only train movements per day shown (Table 4.4 of Annual Review 2022-2023).	Maximum truck movements per day will be included in the 2023-2024 Annual review.	30/9/2024	Amended in this AR.
BML05/24	B90- Traffic Management Plan missing appendices.	Appendices A, B, C, D to be included in the TMP on Boral's website. If currently not applicable, then note this on the appendix page until appendix is available.	The Traffic management plan will be reissued to the website with appendices attached.	30/6/2024	Completed
BML06/24	D1- Environmental Management Strategy missing appendices.	Include appendices not already on the website and for appendices on the website include a note under each appendix "see website for appendix".	Appendices on the website will be reviewed and notes applied as required by the audit.	30/6/2024	Completed
BML07/24	D8- Revision of Strategies, Plans and Programs	All strategies, plans and programs should update the document control table to include review of document, the trigger for the review, dates of review and whether Planning	The document control table will be reviewed in the plans and updated.	30/7/2024	Completed

	updates and approval.	Secretary approval has been received or is not required. Date of Planning Secretary approval should also be included.	It may not be possible to add the date of The Panning Secretary's approval as this then amends the document from the version submitted to the DPHI. However, the letter of approval will be placed on the website corresponding with the relevant plan.		
BML08/24	D17- Access to missing specified information on the website.	1. Water licences made available on website or link to relevant website where water licences can be accessed. 2. EIS (see definition of EIS under heading "Definitions" in the conditions of consent) to be on website or link to relevant website where EIS can be accessed. 3. All minutes of CCC meetings made available on website or link to the Peppertree Quarry website for combined minutes.	Updates to the website to be made in line with the Improvement Opportunity	30/6/2024	Completed

The next independent audit, as per Condition D13, will be undertaken in 2026.

11. INCIDENTS AND NON-COMPLIANCES

No reportable incidents occurred during the reporting period. One reportable incident occurred during the previous period but prior to the commencement of operations under SSD7009 and did not represent a non-compliance with any conditions of SSD7009.

The incident comprised a landslip on the eastern batters into an unnamed drainage line approximately 700 meters above Barbers Creek, although the slip material remained within the site boundary. The site initiated its Pollution Incident Response Management Plan and applicable stakeholders were notified.

Clean up notice was received from the EPA on the 16/12/22 requesting that Boral *engage a suitably qualified expert with the capacity to undertake an assessment of the landslip and its risk to the environment.* The Resources Regulator also issued a Directive to investigate the cause of the slip and to determine the most appropriate long term remediation options.

The site closed out the notice in December 2023 with acceptance by the regulators of the proposed long term remediation plans. In accordance with Direction 1d, a geotechnical assessment was undertaken to nominate a Factor of Safety / Probability of Failure which is used as the criteria to assess remedial options to achieve a long term stable landform. The site has commenced initial recommendations by geotechnical experts by removing the hillside and therefore reducing the weight from the back of the slip area. Works will continue in the coming reporting period and will be reported in the next Annual Review.

12. ACTIVITIES PROPOSED FOR NEXT PERIOD

Activities for the coming reporting period primarily centre around the implementation of the various management plans associated with the SSD post-approval process.

12.1 Current Approved Management Plans and Strategies

The SSDA development consent requires a number of plans and strategies which were prepared during 2022. The following plans which were approved include:

- Noise Management Plan.
- Blast Management Plan.
- Air Quality and Greenhouse Gas Management Plan.
- Water Management Plan (including Site Water Balance, Erosion and Sediment Control Plan, Surface Water Management Plan, Marulan Creek Dam Management Plan, and Groundwater Management Plan).
- Biodiversity Management Plan.
- Aboriginal Cultural Heritage Management Plan.
- Historic Heritage Management Plan.
- Bushfire Management Plan
- Rehabilitation Strategy.
- Rehabilitation Management Plan.
- Traffic Management Plan.
- Environmental Management Strategy.

These plans have been prepared in accordance with relevant guidelines and in consultation with DPE and relevant government agencies. The plans provide details on statutory requirements, relevant limits or performance criteria and performance indicators, as well as a description of the measures to be implemented to comply with these requirements. The plans also detail monitoring programs to assess the environmental performance of the development and the effectiveness of the management measures. Protocols for managing and reporting any incidents, non-compliance or exceedances of impact assessment criteria are also included.

All of the above management plans were reviewed from October to December 2023 and no changes were made. In the upcoming reporting period, the management plans will be reviewed and updated in accordance to the recommendations from the Independent Audit.

During the 2024-25 reporting period, the various management strategies and plans will continue to be implemented.

12.2 SSD7009 Post Approval Requirements

Actions remaining to be undertaken include:

- Relinquishment of CML16.
- Active protection of nominated Aboriginal site scheduled for avoidance in proximity to development footprint.
- Preclearance surveys to be undertaken prior to clearing any vegetation within the approved disturbance area.
- Update site water balance.

12.3 Rehabilitation Activities Planned for 2024-25

The rehabilitation activities planned for next three years (2024-2027) will include:

- Use of soil ameliorants to prepare soil for seeding;
- Cross-ripping followed by hydro-mulching and seeding of a total of 4ha in the WOE on the second highest bench (2.5ha) and the southern portion of the third bench (1.5ha);
-
- A total of approximately 1,000 tubestock will be planted over the last years hydro-mulched area of the WOE (total 5.1ha) on the southern portion of the lowest bench (2.5ha) and west of the third bench (2.6ha)
- The planting out the new rehabilitation enclosures on the lower sections of Bryce's Gully and ongoing fertilisation and watering via the irrigation system as required;
- Monitoring and maintenance Bryce's Gully including weed control measures when required;
- Ongoing monitoring and remediation of the Barbers Creek Emplacement as required;
- Backfilling the south pit void to levels above the rim of current topography; and
- The WOBE will be expanded towards the current location of Marulan South Road with an outer "Noise Wall" being constructed first, followed by dumping inside the shell.

Active rehabilitation in the South Pit and WOBE will be undertaken as soon as lower benches are completed, including:

- The spreading of topsoil which has been stockpiled on site from recent disturbance areas;
- Hydro-mulching with Flexterra FGM with ryegrass, couch and clover seed as well as a native seed mix; and
- Planting of tubestock to target specific species required for the Plant Community Type.

12.4 Mining Operations

Mining operations will continue in accordance with SSD7009 which is likely to involve:

- pre-stripping of topsoil in approved mine expansion and emplacement areas;
- overburden removal and emplacement;

- drill and blast activities;
- extraction of limestone and clay shale;
- Clay shale will continue to be mined by excavator or front-end loader;
- hauling of overburden and extracted resource;
- crushing, screening and stockpiling operations;
- product dispatch predominantly by rail but also by road;
- maintenance and rehabilitation activities; and
- environmental and rehabilitation monitoring.

Further exploration will be undertaken to further develop the geological model and assist with future mine planning.

Figures

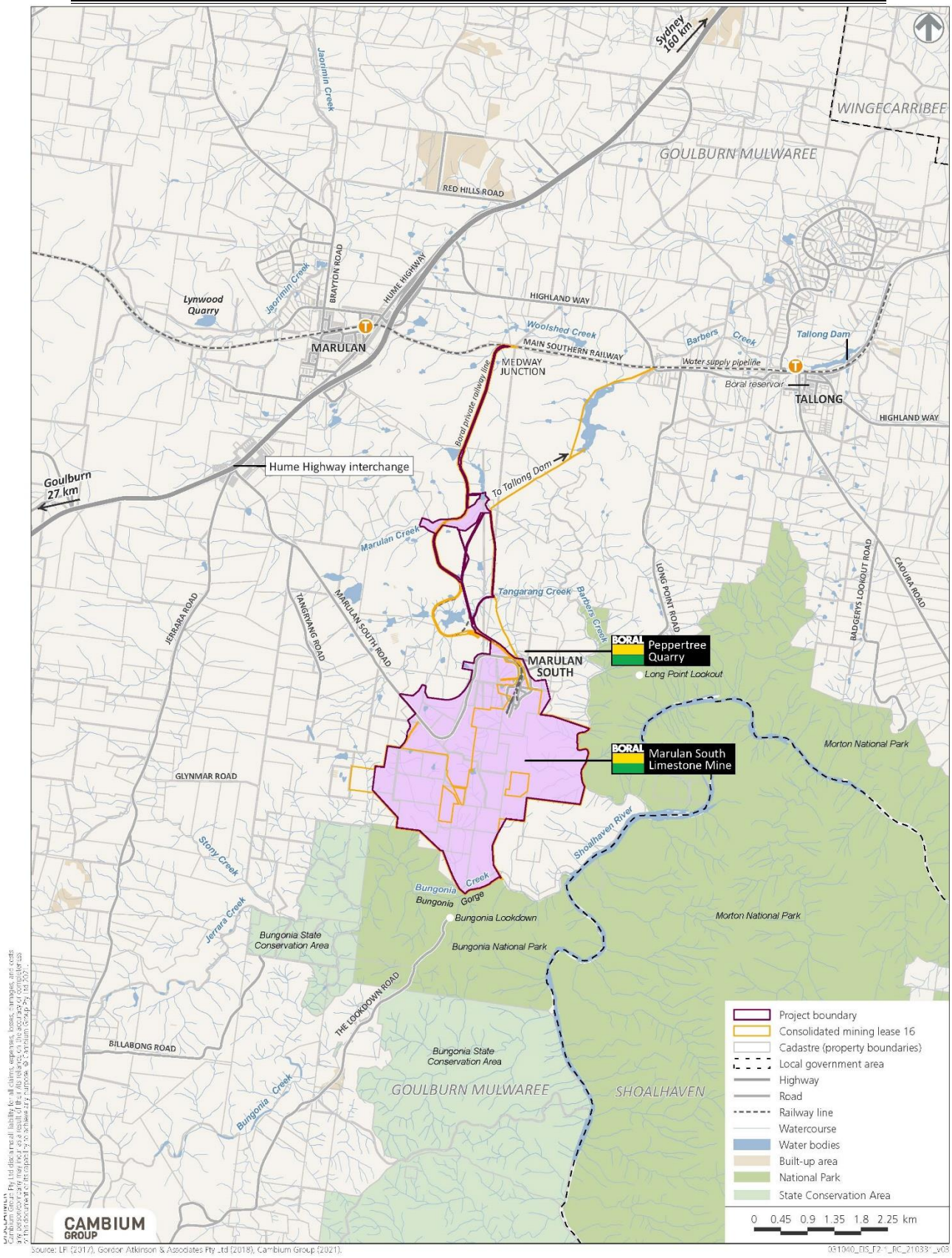


Figure 1 – Regional Location

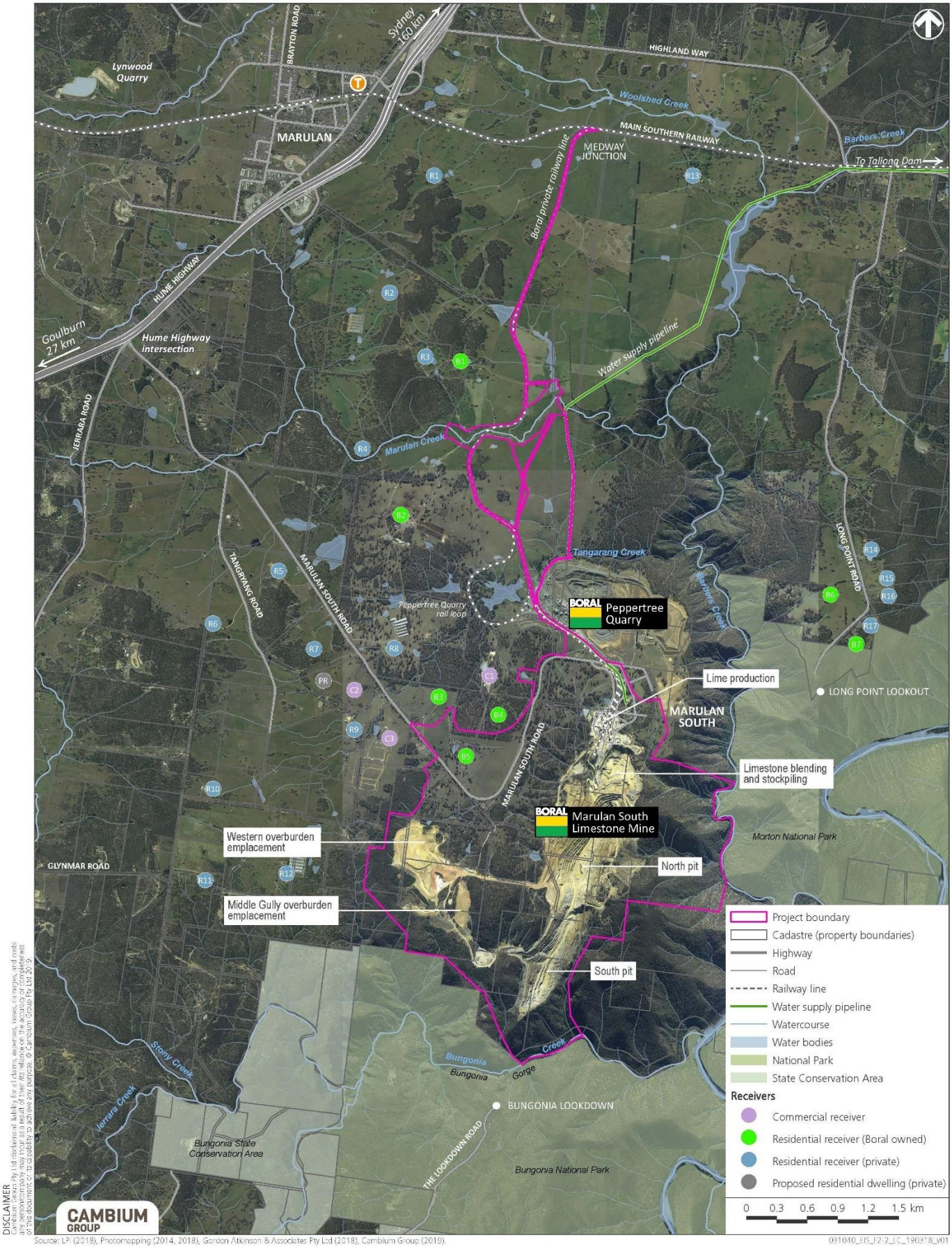


Figure 2 – Local Context

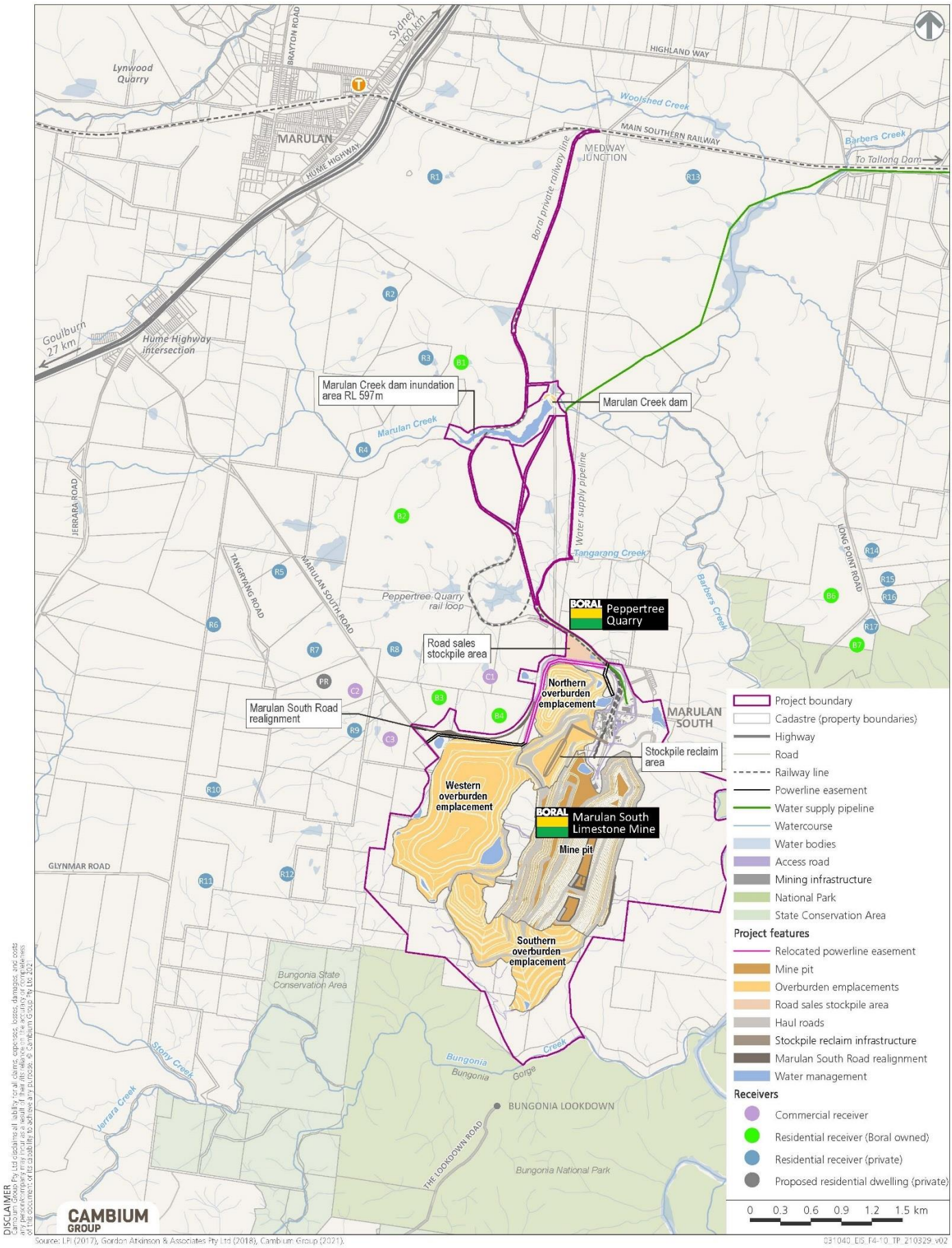


Figure 3 – Approved Project

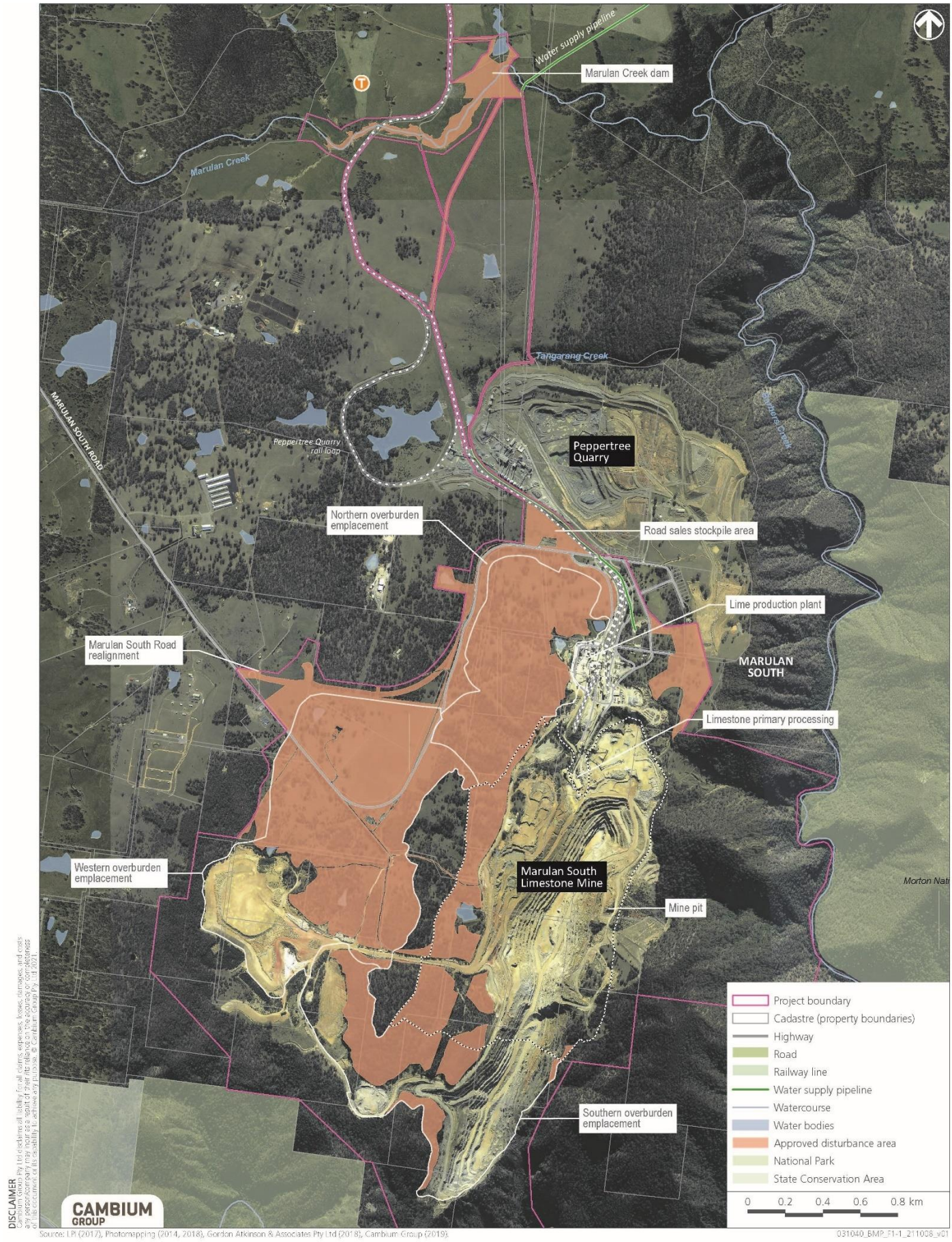


Figure 4 – Approved Disturbance Area

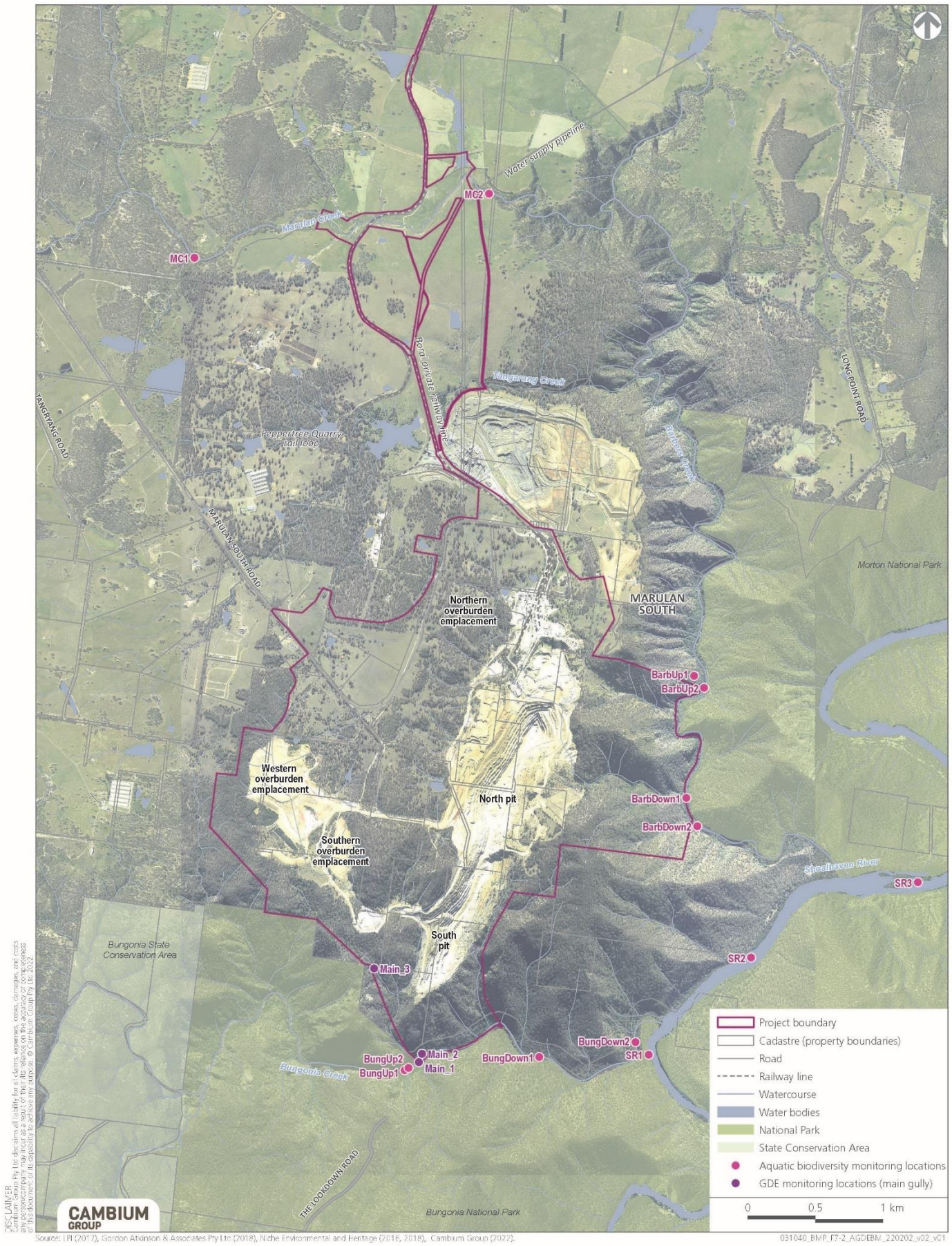


Figure 5 – Monitoring Sites

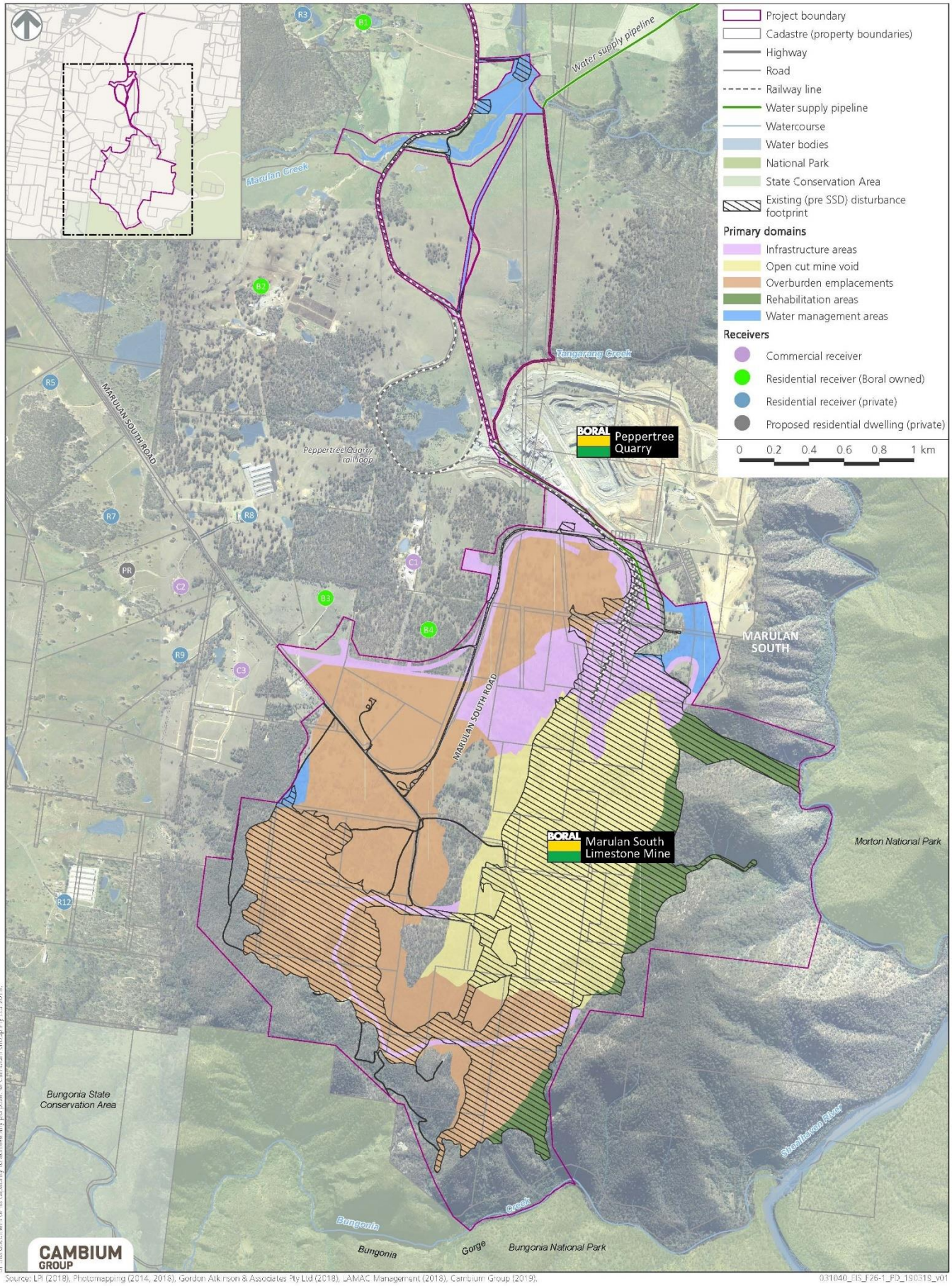


Figure 6 – Mining Domains

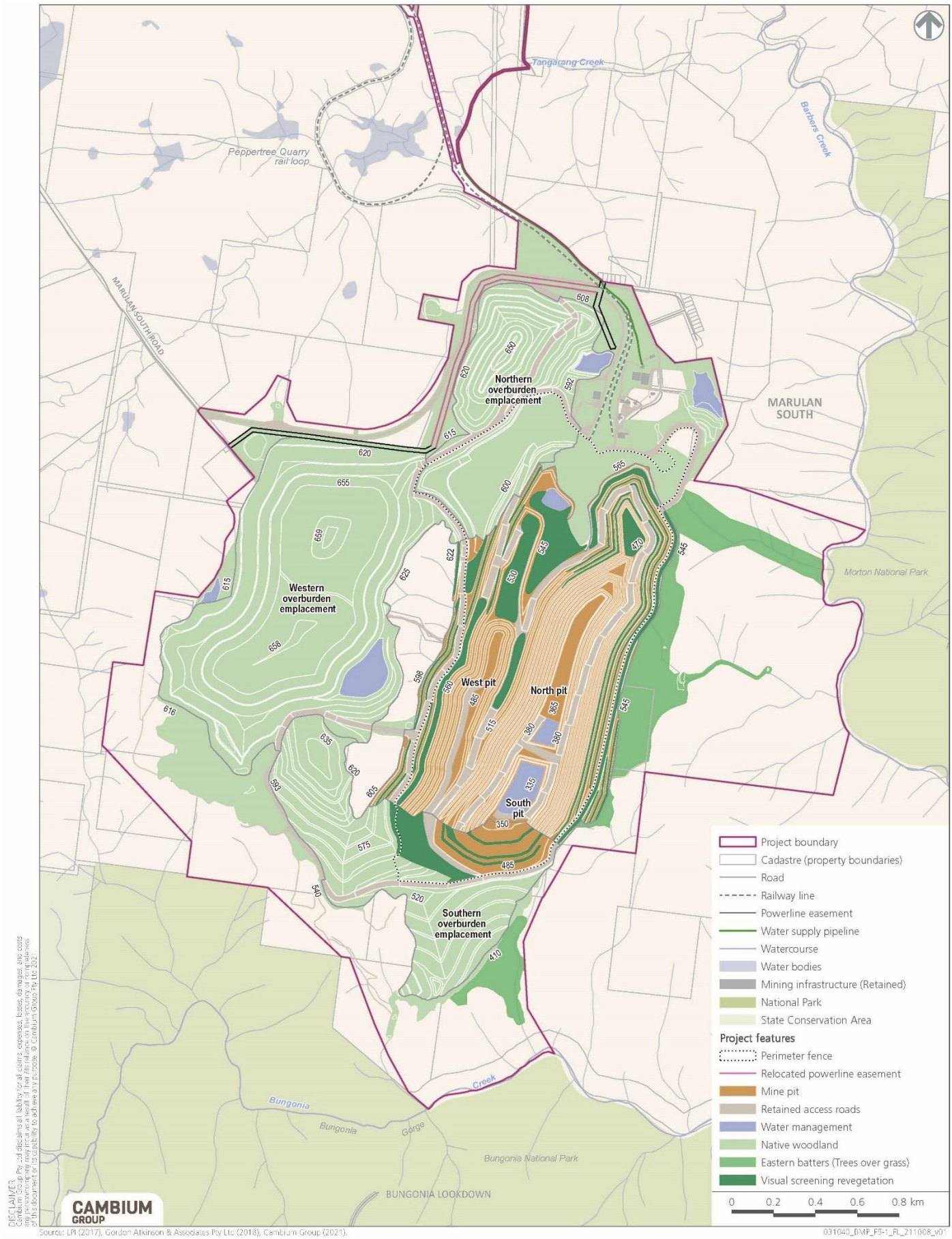


Figure 7 – Final Rehabilitation Plan

APPENDIX A - EPA Licence

APPENDIX B – Development Consent

APPENDIX C - Ecosystem Function Analysis

APPENDIX D – Surface Water Monitoring and River Health