2023 Annual Review

March 2024

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BOGGABRI COAL

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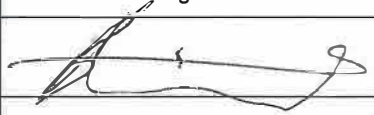
Company	Position
Boggabri Coal Operation Pty Ltd (BCOPL)	Environment Superintendent
Department of Regional NSW – Mining Exploration and Geosciences	Regional Environment Officer
Department of Regional NSW – Resources Regulator	Principal Inspector Environment & Rehabilitation Operations
Department of Planning, Housing and Infrastructure	Senior Planning Officer
Department of Primary Industries – Agriculture	Area Manager North West
Department of Climate Change, Energy, the Environment and Water – Water	Water Regulation Officer
NSW Environment Protection Authority	Regional Operations Officer Armidale
Forestry Corporation of NSW	Forestry Occupancy Supervisor
Community Consultative Committee	Chairperson

Annual Review / Annual Rehabilitation Report Title Block

Field	Item
Name of Operation	Boggabri Coal Mine
Name of Operator	Boggabri Coal Operations Pty Ltd
Development Consent/Project Approval #	09_0182
Name of Holder of Project Approval	• Idemitsu Australia Pty Limited via its subsidiary company, Boggabri Coal Pty Ltd – 80%; • Chugoku Electric Power Australia Resources Pty Ltd – 10%; and • NS Boggabri Pty Limited – 10%.
Mining Lease #	CL 368, ML 1755
Name of Holder of Mining Leases	• Idemitsu Australia Pty Limited via its subsidiary company, Boggabri Coal Pty Ltd – 80%; • Chugoku Electric Power Australia Resources Pty Ltd – 10%; and • NS Boggabri Pty Limited – 10%.
Water Licence #	See **Table 3-1** below for details
Name of Holder of Water Access Licences	• Idemitsu Australia Pty Limited via its subsidiary company, Boggabri Coal Pty Ltd – 80%; • Chugoku Electric Power Australia Resources Pty Ltd – 10%; and • NS Boggabri Pty Limited – 10%.
Annual Rehabilitation Reporting Commencement Date	1 January 2023
Annual Rehabilitation Reporting Completion Date	31 December 2023
Annual Review Commencement Date	1 January 2023
Annual Review Completion Date	31 December 2023
I, Ben Hiatt, certify that this audit report is a true and accurate record of the compliance status of Boggabri Coal Mine for the period 1 January 2023 to 31 December 2023 and that I am authorised to make this statement on behalf of Boggabri Coal Operations Pty Limited.	
Name of Authorised Reporting Officer	Ben Hiatt
Title of Authorised Reporting Officer	General Manager
Signature of Authorised Reporting Officer	
Date	28 March 2023

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1.0 STATEMENT OF COMPLIANCE

In accordance with the requirements of the *Post-approval requirements for State significant mining developments – Annual Review Guideline* (NSW Government, 2015), a statement of compliance has been prepared to document the status of compliance with Boggabri Coal Mine's (BCM's) planning approval State Significant Development approval (SSD) 09_0182 (including Statement of Commitments), mining leases (MLs) and other relevant approvals as at the end of the 2023 reporting period. **Table 1-1** identifies whether or not non-compliances occurred during the reporting period for each statutory approval. Where non-compliances are identified, further details are provided in **Table 1-2**. Non compliances have been colour-coded in that table, in accordance with the descriptions provided in the *Annual Review Guideline* (NSW Government, 2015).

Table 1-1: Statement of Compliance

Approval	Were all conditions of the relevant approval(s) complied with during the reporting period?
Project Approval 09_0182 (incl. Statement of Commitments)	**No**
Coal Lease 368	**No**
Authorisation 355	Yes
Authorisation 339	Yes
Environment Protection Licence (EPL) 12407	**No**
Water Access Licence (WAL) 12691	Yes
WAL 12767	Yes
WAL 15037	Yes
WAL 24103	Yes
WAL 29473	Yes
WAL 29562	Yes
WAL 2571	Yes
WAL 2572	Yes
WAL 2595	Yes
WAL 2596	Yes
WAL 36547	Yes
WAL 37519	Yes
WAL 37067	Yes
WAL 42234	Yes
WAL 44134	Yes

Table 1-2: Non-Compliances During the Reporting Period

Relevant Approval	Ref.	Condition Description	Compliance Status	Comment	Where addressed in the Annual Review
SSD 09_0182	Schedule 3 Condition 27	Ambient Air Quality Monitoring	Non-Compliance Low Risk	The TEOM at Wilberoi East was without power from the 31 December 2022 until the 3 January 2023.	**Section 11.0**
SSD 09_0182	Schedule 3 Condition 38(b)	Surface Water Management Plan (SWMP)	Non-Compliance Low Risk	The implementation of the currently approved SWMP is non-compliant as the clean water drain presented in Appendix A of the SWMP to the north of the disturbance area has been mined through and has not been reinstated.	**Section 11.0**
SSD 09_0183	Schedule 3 Condition 38(c)	Groundwater Management Plan (GWMP)	Non-Compliance Low Risk	The implementation of the currently approved GWMP is non-compliant as groundwater monitoring was not undertaken at all required bores during the reporting period.	**Section 11.0**
SSD 09_0182	Schedule 3 Condition 38(b)	Surface Water Management Plan (SWMP)	Non-Compliance Low Risk	The non-compliance was identified during the 2023 Independent Environmental Audit (IEA). The auditor identified that the clean water drain presented in Appendix A of the SWMP to the north of the disturbance area has been mined through and has not been reinstated. BCOPL are preparing an update to the SWMP that depicts that this drain has been removed, however the updated plan has not been approved constituting a non-compliance against this condition.	**Table 11-2** and **Appendix F**
SSD 09_0183	Schedule 3 Condition 38(c)	Groundwater Management Plan (GWMP)	Non-Compliance Low Risk	The non-compliance was identified during the IEA. The auditor's comments were: A review of water quality monitoring data indicates that there were exceedances of trigger values during the reporting period. The Annual Review documents note that the GMP is required to be reviewed to account for the destroyed monitoring bores. BCOPL intend to submit	**Table 11-2** and **Appendix F**

Relevant Approval	Ref.	Condition Description	Compliance Status	Comment	Where addressed in the Annual Review
				an updated plan for DPHI approval within 3 months of the determination of MOD8 (Apr-24) to be assessed by DPHI.	
SSD 09_0182	Schedule 3 Condition 40	Leard Forest Mining Precinct Regional Biodiversity Strategy	Non-Compliance Low Risk	The non-compliance was identified during the IEA. The Auditor noted that the recommendation provided by Umwelt in the Leard Forest Regional Biodiversity Strategy in 2018 that a comprehensive review of the strategy should be undertaken by 31 December 2021 has not been completed. This is considered a non-compliance against this condition.	**Table 11-2** and **Appendix F**
SSD 09_0182	Schedule 3 Condition 54	Eucalyptus Forestry Plantation Offset Strategy	Non-Compliance Low Risk	BCOPL has not prepared a Eucalyptus Forestry Plantation Offset Strategy to the satisfaction of NSW Forestry Corporation of NSW (Forestry NSW).	**Section 11.0**
SSD 09_0182	Schedule 3 Condition 68	Waste Management	Non-Compliance Low Risk	The non-compliance was identified during the IEA. The auditor noted that the correct waste was not always deposited into the correct bins.	**Section 6.7.2** and **s**
SSD 09_0182	Schedule 5 Condition 5 and Statement of Commitments (SoCs) 3 and 4	Annual Review	Non-Compliance Administrative	The non-compliance was identified during the IEA. The auditor noted that most plans required under this development consent have not been revised over the reporting period and require updating, constituting a non-compliance against this condition.	**Table 11-2** and **Appendix F**
SSD 09_0182	Schedule 5 Condition 10	IEA	Non-Compliance Administrative	The non-compliance was identified during the IEA. The auditor noted that this audit was commissioned on the 11 October 2023, four months after the end of June as required by this condition. BCOPL were not granted an extension from DPHI. It is noted that the previous audit assessed a period of 3 August 2017 to 6 November	**Table 11-2** and **Appendix F**

Relevant Approval	Ref.	Condition Description	Compliance Status	Comment	Where addressed in the Annual Review
				2020, with this audit covering a period of 7 November 2020 to 17 November 2023. This audit was therefore commenced within three years of the previous audit, so there have been no gaps when assessing compliance.	
SSD 09_0182	Schedule 5 Condition 8 and Condition 14	Incident Reporting	Non-Compliance Administrative	The non-compliance was identified during the IEA. An exceedance on 6 March 2023 of criteria at Glenhope HVAS was sent to DPHI on 2 May 2023. The auditor noted that this occurred more than a week from the incident occurring. This has been marked as a non-compliance.	**Table 11-2** and **Appendix F**
Mining Regulation 2016 Schedule 8A Part 2	Standard Condition 11	Rehabilitation	Non-Compliance Administrative	The non-compliance was identified during the IEA. The auditor noted that the rehabilitation objectives for the site was approved by the NSW Resources Regulators on the 13 October 2023. The latest revision of the RMP is dated 10 November 2023, which is within 30 days of the Rehabilitation Objectives approval. The updated RMP however does not incorporate the approved rehabilitation objectives as required by condition (a).	**Table 11-2** and **Appendix F**
Mining Regulation 2016 Schedule 8A Part 2	Standard Condition 15(1)	Rehabilitation	Non-Compliance Administrative	The non-compliance was identified during the IEA. The auditor's comments were: According to Section 4.1.2 of the RMP, the proposed rehabilitation outcomes were submitted to NSW Resources Regulators on 15 March 2023, outside the initial period. The forward program was submitted on 31 March 2023, which was also after the initial period. The Annual Rehabilitation Report was submitted with the Annual Review, which is also greater than 60 days from the completion of the annual reporting period.	**Table 11-2** and **Appendix F**

Relevant Approval	Ref.	Condition Description	Compliance Status	Comment	Where addressed in the Annual Review
Mining Regulation 2016 Schedule 8A Part 2	Standard Condition 15(2)	Rehabilitation	Non-Compliance Administrative	The non-compliance was identified during the IEA. The auditor noted that the forward program was submitted on 31 March 2023, which was more than 60 days from the completion of the reporting period. The Annual Rehabilitation Report reviewed did not have a date of submission, and therefore compliance with this condition cannot be verified.	**Table 11-2** and **Appendix F**
Mining Regulation 2016 Schedule 8A Part 2	Standard Condition 16(2) and Condition 16(3)	Rehabilitation	Non-Compliance Administrative	The non-compliance was identified during the IEA. The auditor noted that the Rehabilitation Management Plan is not available on the website, exceeding the limit of within 14 days of completion as per the requirements of these conditions.	**Table 11-2** and **Appendix F**
EPL-12407	Condition P1.1	Ambient Air Quality Monitoring	Non-Compliance Low Risk	Exceedance of the short term PM_{10} impact assessment criteria at the Glenhope HVAS (High Volume Air Sampler) on the 6 March 2023.	**Table 11-2**
EPL-12407	Condition P1.1	Ambient Air Quality Monitoring	Non-Compliance Low Risk	During the November 2023 collection of the depositional dust gauge D4 at Greenhills, the collection jar was dropped and broken resulting in no sample for November 2023.	**Section 6.2.2.1** and **11.0**
EPL-12407	Condition L3.3	Waste Management	Non-Compliance Low Risk	The non-compliance was identified during the IEA. The auditor noted that BCOPL continued to dispose of waste tyres in pit between 11 January 2023 and the date of submission of the Written Report required under condition R3.5.	**Section 6.7** and **Appendix F**
EPL-12407	Condition O1.1	Operating Conditions	Non-Compliance Low Risk	The non-compliance was identified during the IEA. See Ref. Schedule 3 Condition 68 above.	**Table 11-2** and **Appendix F**

Table 1-3: Compliance Status Key for Table 1-2

Risk Level	Colour code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-complaint	Non-compliance with: • Potential for serious environmental consequences, but is unlikely to occur; or • Potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: • Potential for moderate environmental consequences, but is unlikely to occur; or • Potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

2.0 INTRODUCTION

2.1 Mine Operation Introduction and History

BCM is an open cut coal mine located 15 km north-east of the township of Boggabri in north-western New South Wales (NSW). BCM is managed by Boggabri Coal Operations Pty Ltd (BCOPL) on behalf of Idemitsu Australia Pty Ltd (IA) and its joint venture partners. BCOPL is owned by IA, a subsidiary of Japanese company, Idemitsu Kosan Pty Ltd. BCM is owned by the following joint venture partners:

- IA via its subsidiary company, Boggabri Coal Pty Ltd – 80%;
- Chugoku Electric Power Australia Resources Pty Ltd – 10%; and
- NS Boggabri Pty Limited – 10%.

Environmental assessment first commenced at BCM in 1976 followed by grant of approval for the project in 1989, and the commencement of operations in 2006. Truck and excavator operations produce a crushed and screened export quality thermal coal and pulverised coal injection product, which is transported from the mine via rail to the Port of Newcastle, for export to overseas markets.

In 2009, BCOPL lodged a major project application under the former Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Project Approval (PA) 09_0182, was granted by the NSW Planning Assessment Commission (now Independent Planning Commission) in June 2012, allowing for extraction of up to 8.6 Million tonnes per annum (Mtpa) of run of mine (ROM) coal from BCM until the end of 2033 (the Project).

Under PA 09_0182, a new rail load-out facility and rail spur was constructed. Operation of this infrastructure commenced in December 2014. This has eliminated routine road transport of product coal between the mine infrastructure area (MIA) and the Boggabri Coal Terminal. All product coal is currently transported from site via rail. A new Coal Handling and Preparation Plant (CHPP) was commissioned in mid-2015, enabling beneficiation of ROM coal required for the mine to reach the approved production rates. The grant of PA 09_0182 also facilitates the upgrade of the overburden and coal production fleet and other ancillary infrastructure, as well as the option of a dragline.

Nine modifications to PA 09_0182 have been lodged since granting of the original approval. One of these modifications (Mod 1) was subsequently withdrawn. MOD 8 was most recently approved by the Department of Planning Housing and Infrastructure (DPHI) on the 22 January 2024. MOD 9 was approved by DPHI (formerly the Department of Planning and Environment (DPE)) on the 2 March 2023.

On 20 June 2019, a delegate of Minister declared the PA 09_0182, as modified to be “State Significant Development” under Clause 6 of Schedule 2 of the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*, for the purposes of the EP&A Act. Accordingly, from 20 June 2019, PA 09_0182 is known as SSD 09_0182.

In NSW, mining operations and certain mining purposes were previously required to be carried out in accordance with a Mining Operations Plan (MOP) which had been approved by the Department of Regional NSW – Resources Regulator (Resources Regulator). With the commencement of the Rehabilitation Reforms on 2 July 2022, the MOP has been replaced by a Rehabilitation Management Plan and other supporting documentation. This documentation has been prepared in accordance with the relevant Resources Regulator Form and Way and Guideline documents.

2.2 Mine Contacts

Table 2-1 BCM Mine Contacts

General Manager Operations:	Ben Hiatt
Company:	Boggabri Coal Operations Pty Limited
Address:	386 Leard Forest Rd, Boggabri, NSW, 2382
Phone:	02 6749 6000
Fax:	02 6743 4496
Deputy General Manager/ Environmental Manager:	Stewart Dunlop
Company:	Boggabri Coal Operations Pty Limited
Address:	386 Leard Forest Rd, Boggabri, NSW, 2382
Phone:	02 6749 6000
Fax:	02 6743 4496
Environmental Compliance Superintendent:	Alex Williams
Company:	Boggabri Coal Operations Pty Limited
Address:	386 Leard Forest Rd, Boggabri, NSW, 2382
Phone:	02 6749 6000
Fax:	02 6743 4496

2.3 Purpose and Scope of Report

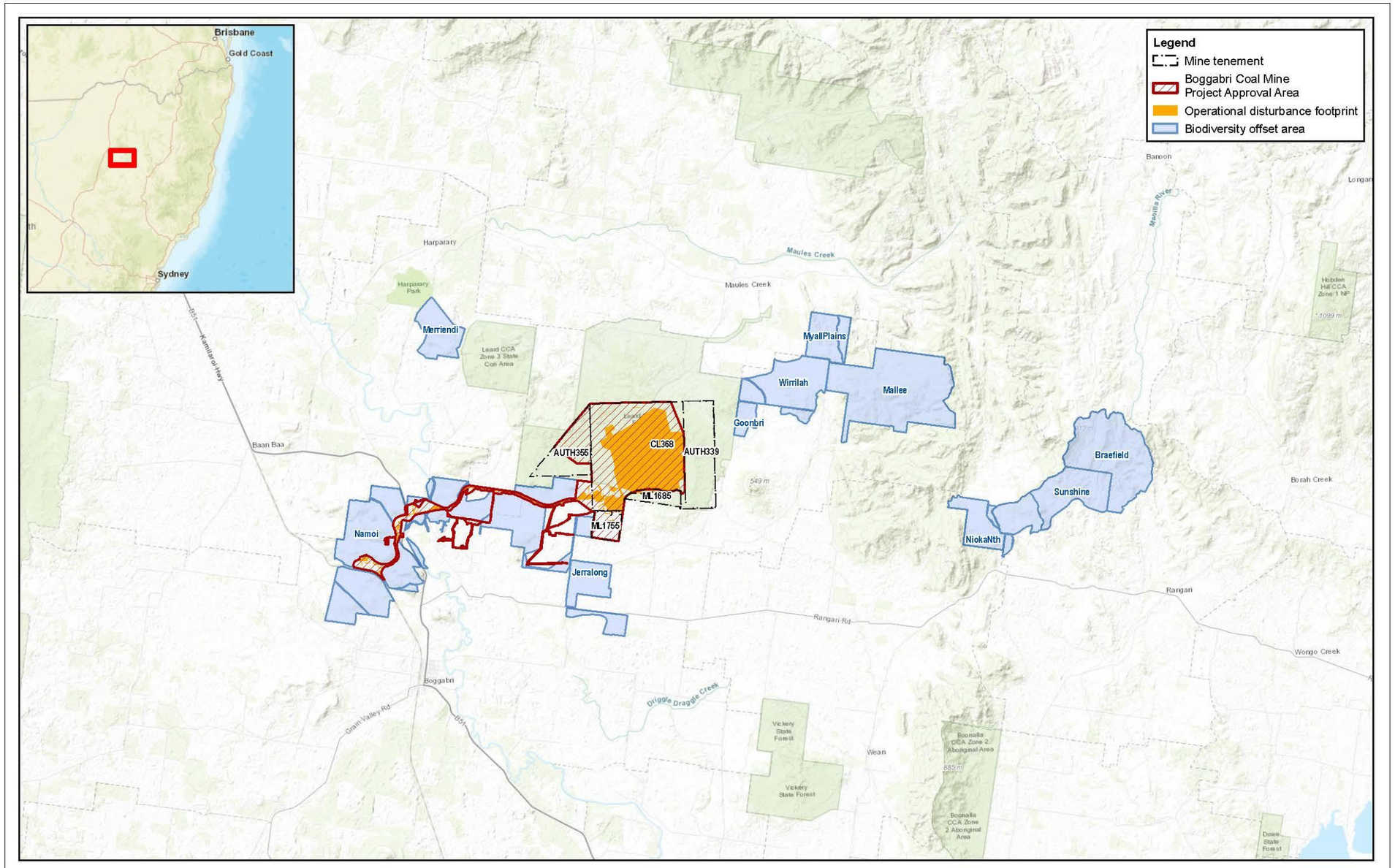
This Annual Review discusses the environmental performance of BCOPL and its contractors, in relation to compliance with the conditions of SSD 09_0182, and other relevant leases, licences and approvals. It provides a summary of operational and environmental management activities undertaken at the BCM during the reporting period (1 January to 31 December 2023) and provides a review against planned works, as described in the Forward Program, and predicted impacts documented in the *Continuation of Boggabri Coal Mine Environmental Assessment* (EA) (Hansen Bailey, 2010) and relevant modification documentation. The Annual Review also covers community relations and addresses mine development and rehabilitation undertaken during the reporting period.

The Annual Review has been prepared in accordance with the following:

- Schedule 5, Condition 4 of SSD 09_0182;
- Post-approval requirements for *State significant mining developments – Annual Review Guideline* (Annual Review Guideline) (NSW Government, 2015);
- Coal Lease 368 (CL 368) and Mining Lease 1755 (ML 1755); and
- Rehabilitation Management Plan (RMP) and Forward Program (dated 31 March 2023).

Key requirements of these approvals are described in **Appendix A**. A map illustrating the mine locality and BCM Project Boundary is provided in **Figure 2.1**, while figures illustrating the relevant monitoring points and land ownership are included within **Appendix B**. Offset properties for BCM are identified on the figures provided in **Appendix C**.

Figure 2.1: Locality Map



3.0 APPROVALS

3.1 Approvals, Licences and Mining Leases

Table 3-1 summarises the key mining leases and approvals currently held by IA and its joint venture partners which are relevant to the operations at BCM.

Table 3-1: Key Approvals, Consents, Mining Leases and Licences

Description	Date Granted/ Commencement Date	Expiry / Duration
Project Approvals		
SSD 09_0182 (as modified)	18-Jul-12	31-Dec-36
EPBC Act Approval 2009/5256 (as varied)	11-Feb-13	31-Dec-53
EPBC Referral 2021/8875 (Regarding SSD 09_0182 (MOD 8))	Under Assessment	
Coal Leases/Mining Leases		
Coal Lease CL 368	15-Nov-90	14-Nov-32
Mining Lease ML1755	30-Jun-17	30-Jun-38
Mining Lease Application 586	Lodged 5 May 2020 - Under Assessment	
Mining Leases/Authorisations		
Authorisation A 355	19-Jul-84	19-07-28
Authorisation A 339	11-Apr-84	11-Apr-25
Environment Protection Licence		
EPL 12407	11-Jan-06	In perpetuity (Anniversary 11 January)
Water Licences		
WAL12691	1-Nov-06	In perpetuity
WAL12767	1-Nov-06	In perpetuity
WAL15037	1-Nov-06	In perpetuity
WAL24103	29-Jun-11	In perpetuity
WAL29473	16-Jan-12	In perpetuity
WAL29562	16-Jan-12	In perpetuity
WAL2571	1-Jul-04	In perpetuity

Description	Date Granted/ Commencement Date	Expiry / Duration
WAL2572	1-Jul-04	In perpetuity
WAL2595	1-Jul-04	In perpetuity
WAL2596	1-Jul-04	In perpetuity
WAL36547	17-Jan-14	In perpetuity
WAL37519	16-Feb-16	In perpetuity
WAL42234	9-Jan-19	In perpetuity
WAL31084	22-Aug-13	In perpetuity
WAL 37067	26-Apr-16	In perpetuity
WAL44134	21-Apr-22	In perpetuity
90FW833717	21-Sep-15	4-Apr-30
90FW834023	21-Sep-15	4-Jun-29
Rehabilitation reforms		
Forward Program	31-Mar-23	31-Dec-25
Radiation Licences		
Licence No. 5083602	14-Jun-17	14-Jun-24
Council Approvals		
CC 04-04-2012 Mod1	22-Oct-12	In perpetuity
CC 02-03-2012	6-Jun-12	In perpetuity
CC 10-01-2012 Mod1	1-Jun-12	In perpetuity
OC 09-10-2013	19-Nov-13	In perpetuity
OC 02-04-2013	9-Apr-13	In perpetuity
OC 01-03-2013	28-Mar-13	In perpetuity
C6 – Approval to Operate a System of Sewage Management	20-Feb-12	13-May-24
Part 5 Determination – Goonbri Road Upgrade	28-Mar-14	In perpetuity
Forestry Corporation of NSW Agreements/Permits		
Forestry Compensation Agreement	15-May-09	14-Nov-32

Description	Date Granted/ Commencement Date	Expiry / Duration
Land Access and Compensation Arrangement	15-May-09	14-Nov-32
Crown Lands Licences		
RI 507102	12-Nov-12	14-Nov-32
RI 533986	5-Jun-14	14-Nov-32

3.2 Rehabilitation Reforms

On 2 July 2021, the NSW Resources Regulator commenced its Rehabilitation Reforms through an amendment to the *Mining Regulation 2016* (Mining Regulation). The amendment has enabled the introduction of new standard conditions for mining leases which include revised compliance and rehabilitation reporting requirements.

In accordance with these reforms, BCOPL submitted rehabilitation objectives to the NSW Resources Regulator for approval on 15 March 2023. On 6 September 2023, the Resources Regulator refused this version of the rehabilitation objectives and provided comments to address. The revised rehabilitation objectives were updated in response to these comments on 6 October 2023. These rehabilitation objectives were approved by the Resources Regulator on 13 October 2023.

The proposed rehabilitation completion criteria have not been submitted to the Resources Regulator to date. Completion criteria are objective target levels or values that can be measured to quantitatively demonstrate the progress and ultimate success of a biophysical process.

BCOPL have developed a 'Rehabilitation Management Plan' (BCOPL, 2024) (2024 RMP). The 2024 RMP includes a Rehabilitation Risk Assessment, Rehabilitation Objectives and Rehabilitation Completion Criteria as well as a Final Landform and Rehabilitation Plan, referred to as the 'Rehabilitation Outcome Documents', required under the Rehabilitation Reforms. In addition to this, BCOPL has prepared an Annual Rehabilitation Report (**Appendix I**) which reports on the progress of mining and rehabilitation activities against the 2023 to 2025 Forward Program (BCOPL, 2023) is preparing to lodge the '2024 Boggabri Coal Forward Program for the period from 2024 through until 2026' (BCOPL, 2024) to the Resources Regulator. The updated Forward Program includes a schedule of mining activities and the spatial progression of rehabilitation activities for the next three years to ensure and demonstrate that rehabilitation is occurring as soon as reasonably practicable following disturbance.

4.0 SUMMARY OF OPERATIONS

4.1 Mining Preparation

Vegetation is cleared in advance of mining activities in accordance with the following documents:

- Clearing and Fauna Management Protocol, which forms Appendix B of the approved Biodiversity Management Plan (BMP); and
- Cultural Heritage Management Plan (CHMP).

The adopted clearing protocol follows a two-stage clearing process to minimise impacts on native biodiversity. Prior to the removal of vegetation, trained ecologists survey the areas proposed for clearing (refer to **Section 6.5.2.3**). Archaeological survey and salvage are also undertaken as part of the clearing process to identify and recover artefacts within the approved disturbance limits (refer to **Section 6.9.1**).

Topsoil is then stripped in accordance with the approved Soil Management Protocol and BMP. Stripped topsoil is preferentially hauled directly to re-profiled rehabilitation areas. Where re-profiled areas are not ready to receive topsoil, the topsoil is hauled to a temporary stockpile location where it is stored for future transport to rehabilitation locations.

During 2023, 54,751 m^3 of subsoil and 36,362 m^3 of topsoil was stockpiled. As at the end of December 2023, a total of 1,815,895 m^3 of topsoil and 646,893 m^3 of subsoil materials were stored in soil stockpiles across BCM.

4.2 Mining Operations

4.2.1 Equipment

Truck and excavator operations continued to be undertaken throughout the reporting period. The mining equipment fleet as of December 2023 is listed in **Table 4-1**.

Table 4-1: Equipment Fleet as at December 2023

Equipment	Number in Fleet
Haul Truck	54
Excavators	9
Front end Loaders	2
Dozers	19
Graders	4
Water Carts	5
Service Trucks	4
Drills	5
Scraper	1
TOTAL	**103**

4.2.2 Activities

Mining activities undertaken at BCM during the reporting period included:

- Drilling and blasting of overburden;
- Overburden removal by large hydraulic excavators, front-end loaders and dozers;
- Haulage of waste to pit emplacement areas;
- Extraction of coal using large hydraulic excavators, front-end loaders, dozers and rear dump trucks;
- Movement of coal directly to a bypass crusher as product coal or stockpiled on ROM pads for further blending and crushing; and
- Coal processing through the CHPP; and
- Loading product coal to trains for transport to the Port of Newcastle for export.

Apart from the items identified within **Section 1.0**, mining activities at BCM were compliant with the requirements of SSD 09_0182, including no clearing of native vegetation within 250 m of Maules Creek Coal Mine (MCCM) lease boundary.

4.2.3 Operational Closures During 2023

Operational closures and lost production were experienced over 27 days in 2023 due to adverse weather conditions.

4.2.4 Pit Progression

Coal is mined from eight coal seams including the Herndale, Onavale, Teston, Thornfield, Braymont, Bollol Creek, Jeralong and basal Merriown seams. Although MOD 8 recently provided approval from the State government to mine down to the Templemore seam.

Pit progression continued in the Main C-Pit with mining and overburden emplacement progressing in a North-Western direction. Pit floor has been reached in the Southern extent of the Eastern E-Pit and is being progressively backfilled in a Northerly direction (refer to **Figure 8.1**).

The Jeralong Pit, Merriown Pit (Pit 1), Bollol Creek Pits, Pit B (5), and Pit A were completed in 2009, 2010, 2013, 2014 and 2017, respectively. These pits have previously been progressively backfilled with waste in accordance with the Conceptual Final Landform design within Appendix 9 of SSD 09_0182 (as modified by MOD 8).

4.2.4.1 Pit C

Pit C is a north progressing continuation of the Bollol Creek Pit and Pit A. Operations commenced in June 2013. Progression is along the Merriown Seam in a northerly direction along 60 m wide east - west orientated mining strips, for the upper seams down to the Jeralong Seam and 60 m wide strips for the Merriown Seam. Pit C will be backfilled from the south to the north in line with pit progression.

4.2.4.2 Pit E

Pit E is a pit adjacent to the north eastern corner of Pit A. The pit floor has been reached in the Southern extent of the Eastern E-Pit and is being progressively backfilled in a Northerly direction.

4.2.4.3 Production Waste

Waste emplacement areas have been progressed by in–pit dumping to completed pits to a maximum Reduced Level (RL) of 400 m in accordance with the Conceptual Final Landform design within Appendix 9 of SSD 09_0182. The main emplacement areas are immediately bounded by the Merriown and Bollol Creek Pits to the east and south east, the Jeralong and Bollol Creek Pits to the north and the surface mine limit to the West and South (refer **Figure 8.1**).

4.3 Production Statistics

From January to December 2023, mine production at BCM was carried out by BCOPL personnel and mine contractors. Mining was undertaken generally in accordance with the 2023 Forward Program and site work standards and procedures, which have been developed to ensure ongoing compliance with the approved management plans.

A summary of production figures for the 2023 calendar year in relation to the previous 2022 calendar year and those forecast for the 2024 calendar year is provided in **Table 4-2** below.

Table 4-2: Production and Waste Rock Summary

Material	Project Approval Limit	Reporting Period (Calendar Year)		
		2022 (actual)	2023 (actual)	2024 (predicted)
Waste Rock/ Overburden (Mbcm)	N/A	46.5	60.3	60.2
ROM Coal (Mt)	8.6	6.8	8.07	8.53
Reject Material (Mt)	N/A	1.4	1.3	1.13
Stripped Topsoil (kbcm)	N/A	118	91	285
Saleable Product (Mt)	8.6 (by rail)	5.7	6.9	7.1

Mining operations during the 2023 calendar year remained below the ROM coal and railed product coal limits specified in SSD 09_0182. Specific conditions from Schedule 2 of SSD 09_0182 are presented in **Table 4-3** with responses on the compliance of each also provided.

Table 4-3: Compliance with SSD Conditions

SSD Condition No. and Description		Compliance Response
6.	The Proponent may undertake mining operations 24 hours a day, 7 days a week.	Compliant.
8.	The Proponent shall not extract more than 3.5 million tonnes of ROM coal from the site in any calendar year (on a pro rata monthly basis) while ever coal is being transported along the private haul road to the coal loader, unless a road safety audit at the intersections of Leard Forest Road and Therribri Road has been completed in consultation with Council and RMS, and any recommended actions implemented to the satisfaction of the Secretary.	Not triggered – transport of product coal by road was ceased following the completion of the Boggabri Rail Spur Line. Product coal from BCM was transported via the rail spur during 2023.

SSD Condition No. and Description	Compliance Response
9. The Proponent shall not extract more than 4.5 million tonnes of ROM coal from the site in any calendar year (on a pro rata monthly basis) or undertake mining operations outside the disturbance area approved under DA36/88 MOD 2, unless the Biodiversity Management Plan required under condition 49 of Schedule 3 has been approved by the Secretary.	Compliant –The BMP has been approved.
10. The Proponent shall not extract more than 8.6 million tonnes of ROM coal from the site in any calendar year.	Compliant – 8.06 Mt of ROM coal was extracted in 2023.
11. The Proponent may process up to 4.2 million tonnes of ROM coal in the CHPP in any calendar year.	Compliant – 3.90 Mt of ROM coal was processed in the CHPP during 2023.
11A. The Proponent shall not process any coal from the Tarrawonga coal mine unless it has demonstrated that adequate water license are held to account for the required water use associated with processing this coal, to the satisfaction of the Secretary.	Not triggered – no coal was processed from the Tarrawonga Coal Mine in 2023.
12. The Proponent may transport up to 10 million tonnes of product coal via the Boggabri Rail Spur Line in any calendar year; comprising: (a) 8.6 million tonnes of product coal from the Boggabri coal mine in any calendar year. (b) 3 million tonnes of product coal from the Tarrawonga coal mine in any calendar year.	Compliant – 6.60 Mt of product coal from the BCM was transported by rail in 2023. No coal from the Tarrawonga Coal Mine was received at BCM for transport during 2023.
13. The Proponent may transport up to 200 tonnes of coal per year from the site by road for marketing and testing purposes. All other coal must be transported from the site via the Boggabri Rail Spur Line, except in exceptional circumstances as agreed with RMS and Council and approved by the Secretary.	Compliant – transport of product coal by road was ceased following the completion of the Boggabri Rail Spur Line. The Rail Spur was operational throughout 2023.

4.3.1 Saline or Potentially Acid Forming Materials

BCOPL monitors and manages the reject materials generated through its operations in accordance with the BCM Reject Potentially Acid Forming (PAF) Testing Procedure (October 2016). From CHPP build to 2020, monitoring of reject materials returned no potentially acid forming reject. In January 2020, routine monitoring identified a reject sample with potentially acid forming qualities. This result was encountered from the sampling of the reject material from a special non-product typical sample (grab sample) of BR11-12 coal. In an operational setting, this coal would typically be co-blended with other non-PAF forming feed coals and limestone to manage water quality and maintain lower product sulphur and reject acid potential. Reject materials from the processing of this coal sequence were appropriately managed and co-disposed deep within the pit void as described in the Rehabilitation Management Plan (RMP) and Forward Program.

To improve monitoring techniques, a reject sampler was installed and commissioned within the CHPP in September 2020. In line with the commissioning of this infrastructure, a static geochemical and physical testing program for fortnightly reject composites was implemented in coordination with RGS Environmental Consultants Pty Limited, to monitor the variability in reject characteristics through 2021 and 2022. Until end 2022, all data indicated that overall, there has been a low risk of oxidation of reject and therefore a low potential for acid forming conditions to be generated from bulk reject materials, if there is "*At least 5 metres*

of non-carbonaceous capping material (must be category 3) (…) dumped over the top of the reject emplacement cell" (RGS 2020)

The 2023 BB8 and BB5 product trends confirmed that product sulphur was not expected to change until mid to late 2024 where it is expected to display a nominal increase. A review of the process is scheduled for Q1 2024 and intend to continue testing the method throughout 2024.

RGS has also recently completed a six-month Kinetic Leach Column test program on representative samples of non-acid forming and potentially acid forming reject materials. The results demonstrate that under freely oxidising conditions, the non-acid forming reject is likely to generate circumneutral pH conditions with low levels of acidity and salinity and low concentrations of soluble metals/metalloids in dynamic contact water.

4.4 Exploration

BCOPL continued an exploration drilling programme throughout 2023, to improve knowledge of coal quality and structure for modelling purposes.

A total of 53 exploration holes were drilled by BCOPL during the reporting period. Details of BCM's borehole drilling during 2023 and relevant figure is provided in **Appendix E**.

4.5 Construction Activities During 2023

A summary of construction activities undertaken during the reporting period and their completion status is provided in **Table 4-4**.

Table 4-4: Summary of Construction Activities during the Reporting Period

Infrastructure	Commencement Date	Completion Date
Lime Dosing Plant	September 2022	January 2023 (predicted)
Pre-Shift Information Facility	February 2023	August 2023

4.6 Next Reporting Period

4.6.1 Mining

During 2024, mining activity will involve the continuation of extraction within Pits C and E. Mining will advance in a northerly direction through Pit C and easterly direction into E Pit. Mining will advance towards the north utilising 100 m wide mining strips. Backfilling of the completed mining void will continue as mining proceeds northward.

The progression of mining operations is scheduled to has result in approximately 39.19 ha of new disturbance along the northern extents of the mine plan. The mining operations will advance into the area currently occupied by mine water dam MW5 for which a new dam is scheduled to be constructed during the reporting period.

4.6.2 Exploration

Exploration proposed for 2024 includes the drilling of 56 holes. The exploration programme will continue to improve knowledge of coal quality, structure, geotechnical, geochemical and fugitive emission calculation purposes.

4.6.3 Construction

Construction activities during the 2024 reporting period are proposed to include the relocation of the Fuel farm to the new Pre-Shift Start-up Infrastructure with a volume increase of 200 kL, construction of the replacement dam for MW5 and (subject to the receipt of the necessary approvals) the expansion of the Heavy Vehicle Workshop and stores building and infrastructure.

4.6.4 Production Waste

During 2024, coal reject materials will continue to be co-disposed within the pit void with overburden in a planned manner in accordance with the process described within the 2024 Forward Program. Trucks are loaded with reject materials at the Rejects Bin adjacent to the CHPP and transport the reject materials to the operational pit for co-disposal with overburden materials in the overburden emplacement area. A temporary reject transfer area adjacent to the ROM pad is also used to manage the relocation of coarse reject from the CHPP to the mining void. An Emergency Tailings Facility (ETF) is also available to store fine rejects, in the unlikely event this is required. All reject materials co-disposed with overburden is covered with at least 5 m of inert overburden.

Heavy earthmoving tyres are re-treaded and reused where possible. However where these tyres are no longer able to be safely used within the operations, they will be buried in pit in accordance with site procedures and Environmental Protection Licence (EPL) 12407. BCOPL is working closely with the Environmental Protection Authority (EPA) to investigate the feasible alternative uses of these heavy earthmoving tyres.

5.0 ACTIONS REQUIRED FROM 2022 ANNUAL REVIEW

The 2022 Annual Review was provided to the DPHI on the 31 March 2023. The 2022 Annual Review was approved on the 13 June 2023 and sent to the NSW Environment Protection Authority (EPA), NSW Department of Primary Industries (DPI) – Land and Natural Resources, DCCEEW – Water (formerly DPE-Water), Department of Regional NSW – Resources Regulator (Resources Regulator), Forestry NSW and the Narrabri Shire Council (NSC). No comments were received from DPHI regarding actions to be addressed in 2023 Annual Review. Correspondence received from DPHI in June 2023 confirmed that the 2022 Annual Review satisfied the Annual Review Guideline requirements (see **Appendix D**).

DPHI noted in its correspondence in June 2023 there were number of outstanding actions for BCOPL to complete. The status of these actions is described in **Table 5.1**.

Table 5-1: Annual Review Reporting Requirements

Actions required for the 2023 Annual Review Period	Requested by	Where discussed in the Annual Review
Provide an update on the ongoing non-compliances identified in the amended AR 2022 with Schedule 3, Conditions 38(b) and 38(c), of the approval by the 30 November 2023	DPHI	**Table 6-1** and **Table 11-2**
Provide an update on the ongoing non-compliances identified in the amended AR 2022 with Schedule 3, Condition 54 of the approval by the 30 November 2023	DPHI	**Table 11-2**
DPHI noted that they cannot locate any notifications from BCOPL regarding the non-compliances with Schedule 3, Condition 22 (missing rainfall and solar radiation data and missing 14/11/22 Blast monitoring data). In accordance with Schedule 5, Condition 15 of the approval the applicant must notify the department with 7 days of becoming aware of a non-compliance.	DPHI	**Section 6.4.1**

6.0 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

The Environment Management Strategy (EMS) provides the strategic framework for environmental management at BCM. The EMS:

- Outlines all relevant statutory leases, licences and approvals that apply to BCM;
- Details key plans, procedures, management plans and other documents that will be implemented to ensure compliance with all relevant leases, licences and approvals;
- Describes the key processes that will be implemented to:
  - Communicate with community and government stakeholders;
  - Manage community complaints;
  - Resolve disputes; and
  - Respond to non-compliance incidents and emergencies;
- Outlines BCM's monitoring, reporting and auditing requirements; and
- Outlines relevant roles, responsibilities and accountabilities relevant to environment management for all BCOPL employees and contractors.

A suite of environmental management plans (EMPs) has been developed to guide environmental management at BCM. They have been developed in accordance with the EMS, SSD 09_0182 and other statutory requirements. The revision status of approved key EMPs, as required by SSD 09_0182, is summarised in **Table 6-1**. Following approval of MOD 8 on the 22 January 2024, BCOPL has commenced revisions of many of the required management plans to be provided to DPHI for review and approval by 21 April 2024.

BCOPL maintains a register to capture and track details of when documents have been updated including the requirement for the review and revision of management plans.

Table 6-1: Key EMPs

Management Plan	Version Approved by DPHI*	BCOPL Revision	Awaiting Approval
Forward Program	N/A – Submitted to Resources Regulator	2024 Forward Program lodged 31 March 2024	N/A
Blast Management Plan (BLMP)	November 2018 (Rev 5)	Under Revision	-
Blast Fume Management Protocol	July 2018 (Rev 3)	Under Revision	-
Air Quality and Greenhouse Gas Management Plan (AQGHGMP)	July 2018 (Rev 6)	Under Revision	-
Traffic Management Plan (TMP)	August 2022 (Rev 5)	-	-

Management Plan	Version Approved by DPHI*	BCOPL Revision	Awaiting Approval
Cultural Heritage Management Plan (CHMP)	November 2016 (Rev 7)	Under Revision	Yes
Environment Management Strategy (EMS)	June 2020 (Rev 2)	Under Revision	-
Noise Management Plan (NMP)	April 2019 (Rev 13)	Under Revision	-
Water Management Plan (WMP)	May 2017 (Rev 6)	Submitted in January 2022. Under Revision following: • Non-compliance recorded in 2022 Annual Review; • Approval of MOD 8 by DPHI; and • Enforceable undertaking agreed upon with NRAR.	Yes
Surface Water Management Plan (SWMP)	August 2021 (Rev 7)		
Groundwater Management Plan (GWMP)	April 2020 (Rev 9)		
Site Water Balance (SWB)	October 2018 (Rev 12)		
Social Impact Management Plan (SIMP)	August 2021 (Rev 7)	Under Revision	-
Rehabilitation Strategy	N/A	Under Preparation	
Biodiversity Management Plan (BMP)	October 2018 (Rev 12)	-	-
Biodiversity Offset Strategy	March 2019 (Rev G)	-	-
Pollution Incident Response Management Plan	September 2023 (Rev 13)	-	-

* Based on internal final approval date

6.1 Meteorology

6.1.1 Environmental Management

SSD 09_0182 (Schedule 3, Condition 32) requires a permanent meteorological station to be installed and maintained for the life of the BCM. The station must comply with the requirements of the *Approved Methods for Sampling of Air Pollutants in New South Wales* Guideline (EPA, 2022) and be capable of determining the temperature lapse rate.

As such, a meteorological monitoring station (MET) has been established to continuously measure and record wind speed, wind direction, temperature, solar radiation and rainfall at BCM. The location of the BCM MET is shown on the Environmental Monitoring Location Plan in **Appendix B**.

The MET provides real-time data to BCOPL employees and contractors. Meteorological data is used for assessing compliance, proactive dust and noise management, and for investigative and reporting requirements.

The parameters recorded by the BCM MET and the method are outlined in **Table 6-2**.

Table 6-2: MET Parameters

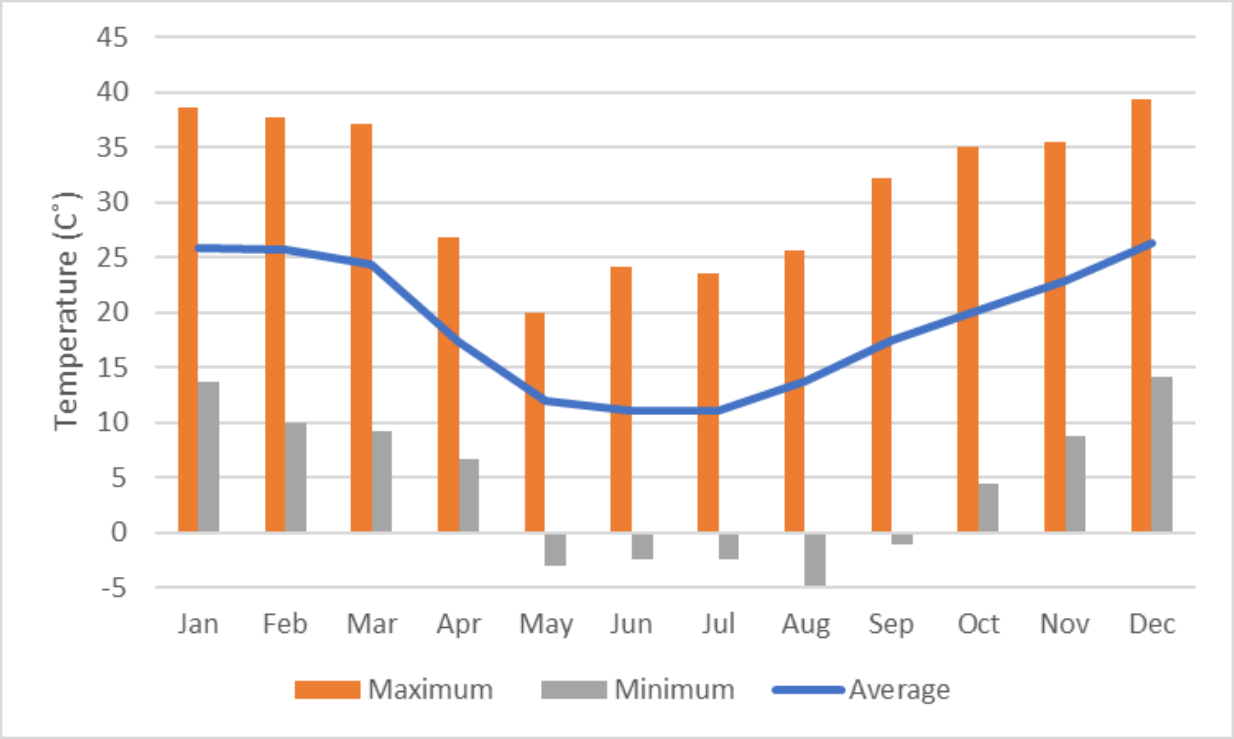
Parameter	Units	Frequency	Averaging Period
Temperature at 2 m	ºC	Continuous	15 minute
Temperature at 10 m	ºC	Continuous	15 minute
Wind direction at 10 m	º	Continuous	15 minute
Sigma theta at 10 m	º	Continuous	15 minute
Rainfall	mm/hr.	Continuous	1 hour
Solar radiation	W/m^2	Continuous	15 minute
Additional requirements: – Siting & Measurement	N/A	N/A	N/A

6.1.2 Environmental Performance

6.1.2.1 Temperature

Maximum, minimum and average temperatures are calculated daily from the 15 minute recordings. **Figure 6.1** shows average monthly temperature records for the reporting period (2 m MET recordings). Compared to the previous reporting period, the average minimum and maximum temperatures are notably higher in summer.

Figure 6.1: 2023 Monthly Temperature Records



6.1.2.2 Rainfall

Rainfall is measured using an RG5 type flow-through monitor, with a 15 minute recording interval. Monthly rainfall totals for the 2023 reporting period are presented in **Figure 6.2**. A comparison of 2022-2023 rainfall is shown in **Figure 6.3**.

Figure 6.2: 2023 Monthly Rainfall

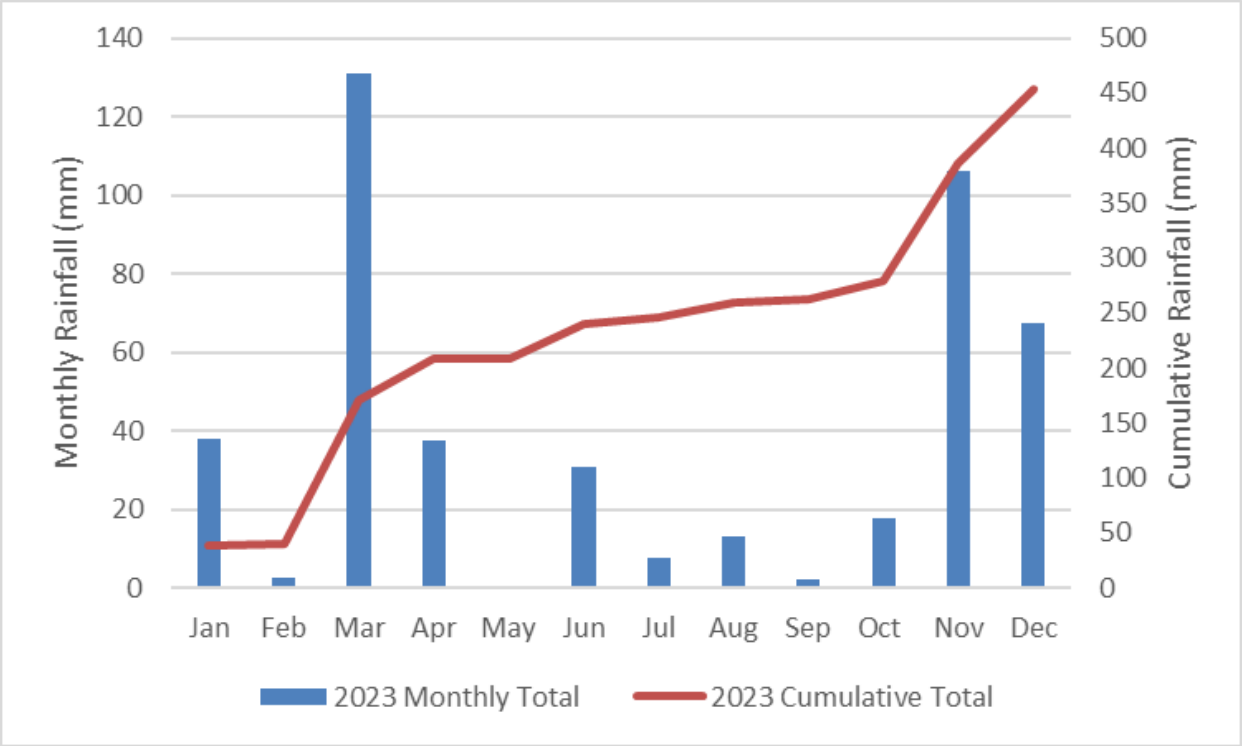
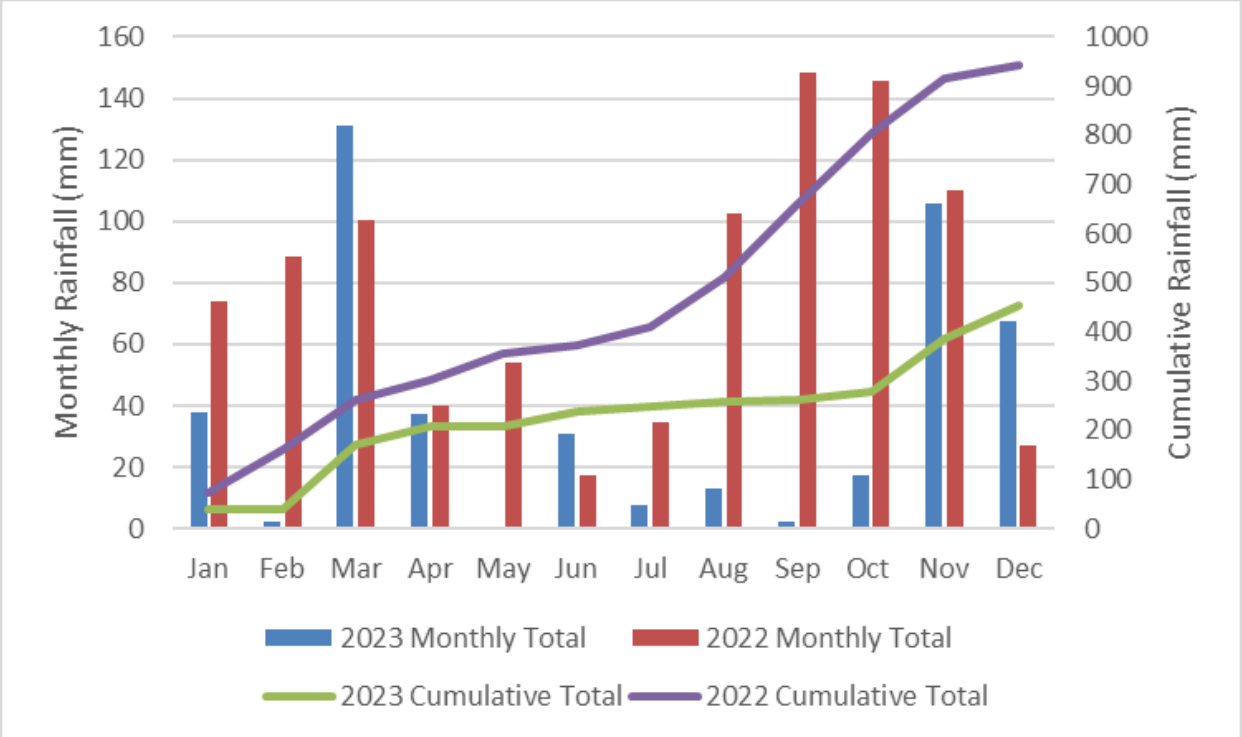


Figure 6.3: Comparison of 2022 and 2023 Rainfall



6.1.2.3 Wind

Wind speed and direction are important parameters for the planning and preparation of blasting activities, investigating noise and dust complaints, and assessing cumulative impacts as a result of other coal mines operating in the region. Wind data for the 2023 reporting period are provided in **Table 6-3**. Wind speed values are displayed as metres per second (m/s).

The prevailing wind conditions during the 2023 reporting period were relatively consistent with the historical data as presented in the 2010 EA (Hansen Bailey, 2010) which indicate BCM predominately receives wind from the south-east in summer and the north and north-west in winter. Autumn and spring months experienced a combination of these wind conditions.

The meteorological data from MET identified that average monthly wind speed generally did not exceed 3 m/s.

Table 6-3 Monthly Wind Speeds and Dominant Wind Directions (60 m AWS)

Month	Average Wind Speed (m/s)	Maximum Wind Speed Recorded (m/s)	Dominant Wind Directions
January 2023	2. 6	19.7	SSE
February 2023	2.3	15.3	SE
March 2023	2.1	17.0	SSE
April 2023	1.9	13.4	SSE
May 2023	1.3	11.3	NNW
June 2023	1.3	12.8	NNW
July 2023	1.3	10.3	NW
August 2023	1.4	11.1	S
September 2023	1.8	14.8	NNW
October 2023	2.5	17.0	SSE
November 2023	2.2	17.3	SSE
December 2023	2.1	16.0	SSE

6.1.3 Improvements and Initiatives

Building on the work completed during the previous reporting periods, BCOPL continued to implement and refine the real-time air quality and noise management system at the BCM. This included ongoing utilisation of real-time meteorological data and weather forecasting software to guide the day-to-day implementation of reactive and proactive noise and air quality management and mitigation measures.

6.2 Air Quality

6.2.1 Environmental Management

Air quality management at BCM is undertaken in accordance with the approved AQGHGMP. Through implementation of the AQGHGMP, BCOPL execute a range of mitigation measures for air quality that have proved to be effective at managing dust impacts, demonstrated by generally maintaining compliance with criteria specified in SSD 09_0182. During the reporting period, mitigation measures included the following:

- Visual assessments of mining and coal transport areas to identify dust sources and modify operations as required;
- Revegetating disturbed areas of the rail corridor;
- Implementation of product coal handling controls to minimise dust generation;
- Maintaining unsealed surfaces and trafficable areas in good condition;
- Installation and maintenance of dust suppression equipment on drill rigs;
- Implementing good practice blast design to minimise dust and plan blasting to suit meteorological conditions; and
- Monitoring meteorological conditions to plan and modify operations as required.

These mitigation measures continued to be employed during 2023.

BCOPL implements an air quality monitoring program to measure concentrations of depositional dust, Particulate Matter less than 10 microns (µm) (PM_{10}) and Particulate Matter less than 2.5 µm ($PM_{2.5}$) in the vicinity of the BCM.

Depositional dust monitoring provides an indication of levels of dust in the atmosphere measured in g/m²/month of insoluble matter using depositional dust gauges. PM_{10} monitoring utilises High Volume Air Sampler (HVAS) and tapered element oscillating microbalance (TEOM) monitoring units, whilst $PM_{2.5}$ is measured only using a TEOM monitoring unit.

The current air quality monitoring program includes 3 depositional dust gauges, two HVAS, four TEOMs, and up to four portable real-time PM_{10} monitors details of which are provided in **Table 6-4**. A figure showing the location of each air quality monitoring site is provided in **Appendix B**.

Table 6-4: Air Quality Monitoring Sites

Site ID	To be used for compliance monitoring?	Type	Units	Frequency
D4-Greenhills	Yes	Deposited dust gauge	g/m2/month	Monthly
D5-Goonbri	Yes	Deposited dust gauge	g/m2/month	Monthly
D6-Onavale	Yes	Deposited dust gauge	g/m2/month	Monthly
Glenhope	Yes	HVAS (PM_{10})	µg/m3	Every 6 days
Merriown	No	HVAS (PM_{10})	µg/m3	Every 6 days

Site ID	To be used for compliance monitoring?	Type	Units	Frequency
Tarrawonga	No	TEOM (PM_{10})	µg/m3	Continuous
Wilberoi East	Yes	TEOM (PM_{10} and $PM_{2.5}$)	µg/m3	Continuous
Velyama	No	TEOM (PM_{10} and $PM_{2.5}$)	µg/m3	Continuous
Goonbri	No	TEOM (PM_{10} and $PM_{2.5}$)	µg/m3	Continuous
BTM Complex Portable Samplers (x4)	No	TEOM (PM_{10} and $PM_{2.5}$)	µg/m3	Continuous

Monitoring data is routinely compared to the air quality assessment criteria provided within SSD 09_0182 and the EPL. Exceedances of the relevant air quality assessment criteria is considered an 'incident' under SSD 09_0182 and the Secretary will be notified as soon as practicable after the proponent becomes aware of the incident. Exceedances of the criteria can be attributed to variations in weather conditions, these 'extraordinary events' can be justified with evidence from meteorological monitoring from the site and surrounding areas. This evidence is logged in the incident register.

6.2.2 Environmental Performance

6.2.2.1 Depositional Dust

BCM's depositional dust monitoring is undertaken on a monthly basis at three monitoring sites: D4, D5 and D6 (refer to **Appendix B**). D5 is located on land owned by BCOPL, while D4 and D6 are located on land owned by Whitehaven Coal Pty Limited. All three sites are used for compliance monitoring.

In accordance with SSD 09_0182 (Schedule 3, Condition 27), the annual average depositional dust must not exceed the limit of 4 g/m^2/month at any residence on privately owned land, or on more than 25 percent of any privately-owned land. Given that there are no criteria specified for non-privately owned land, the results have been assessed against these criteria for consistency, despite land being mine-owned.

Sampling and analysis of depositional dust data is undertaken in accordance with *AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.*

Results

Depositional dust samples were subject to visual analysis by a NATA accredited laboratory to determine sample contamination by naturally occurring impurities. **Table 6-5** presents the corrected results following visual analysis of the three dust monitors.

The results indicate that all depositional dust gauges remained below the criterion for the annual average during 2023.

Table 6-5 Depositional Dust – Annual Average Results

Monitoring Point	Annual average limit (g/m^2/month)	Corrected annual average* (g/m^2/month)
D4	4	1.1
D5	4	1.2
D6	4	1.2

* Annual average applies to 2023 calendar year.

The results for D4 and D5 are above the predicted levels documented in the EA (i.e. 0.5 and 0.6 g/m^2/month) for the closest corresponding year of operations (Year 10). It is important to note that since the 2010 EA was prepared, further approvals for mining operations within the BCM, Tarrawonga Coal Mine (TCM) and MCCM Complex (collectively referred to as the BTM Complex) have been granted which have subsequently resulted in increased background dust deposition levels. D6 is located outside the area assessed in the EA and no predictions were provided.

During the November 2023 collection of the depositional dust gauge D4 at Greenhills, the collection jar was dropped and broken, resulting in a loss of sample and inability to report results.

All dust gauge results for the 2023 reporting period remained well below the relevant assessment criteria specified in SSD 09_0182. Further the depositional dust levels recorded during the 2023 reporting period remain within the range of historical results.

6.2.2.2 PM_{10}

BCM monitors PM_{10} dust compliance through one HVAS unit (Glenhope) and one TEOM (Wilberoi East) (see **Appendix B**). PM_{10} monitoring using a HVAS unit is undertaken for a period of 24 hours every 6 days. PM_{10} monitoring using a TEOM unit records continuous data and provides a 24hr average and an annual average for comparison with the relevant air quality assessment criteria.

Results

Figure 6.5 provides the results for the Glenhope HVAS unit whilst the PM_{10} monitoring results from the Wilberoi East TEOM unit over the reporting period are provided in **Figure 6.6**. In accordance with SSD 09_0182, the short-term concentration limit for PM_{10} over each 24-hour period is 50 $\mu g/m^3$ while the long-term concentration limit for the annual average is 30 $\mu g/m^3$.

In 2023, the Wilberoi East TEOM experienced several power outages over periods longer than 6 hours which resulted in insufficient data being collected for the 24 hour average. Despite this, 92.4% of available data was captured and recorded from Wilberoi East TEOM. Five potential exceedances of the PM_{10} 24-hour air quality assessment criteria were recorded during the reporting period. These exceedances were determined to not be a direct result of the operations at BCM. These results were 75.8 $\mu g/m^3$ recorded at the Glenhope monitoring unit on the 6 March 2023, see **Figure 6.5**, and 58.28, 52.6, 69.0 and 81.9 $\mu g/m^3$ recorded at the Wilberoi East monitoring unit on the 29 January and 10, 17 and 18 December 2023 respectively, see **Figure 6.6**.

BCOPL commissioned EMM to complete an investigation into the exceedance of the PM_{10} 24-hour air quality assessment criteria experienced at the Glenhope monitoring unit on the 6 March 2023. The investigation determined that based on the weather and wind patterns that occurred on the 6 March BCM was not "up-

wind" of the monitor and therefore was not a primary contributing source. This report states that the exceedances were more likely associated with bushfire events occurring in the region.

An investigation into the exceedance of the PM_{10} 24-hour air quality assessment criteria experienced at the Wilberoi East monitoring unit on the 29 January 2023 determined that agricultural works were being completed in the vicinity of the monitoring unit on this day. The investigation concluded that BCM was not the primary contributing source to this exceedance.

BCOPL provided a letter to DPHI on the 18 January 2024 following an internal investigation into the exceedances that occurred at Wilberoi East monitoring unit on the 10, 17 and 18 December 2023. It was identified that these exceedances were more than likely attributed to the bushfires that occurred at Duck Creek – Pilliga Forest. DPHI responded to BCOPL on the 6 February 2024 considering this event as extraordinary event and, as such, no further reporting would be required.

Figure 6.4: Glenhope HVAS PM_{10} Monitoring 2023 Results

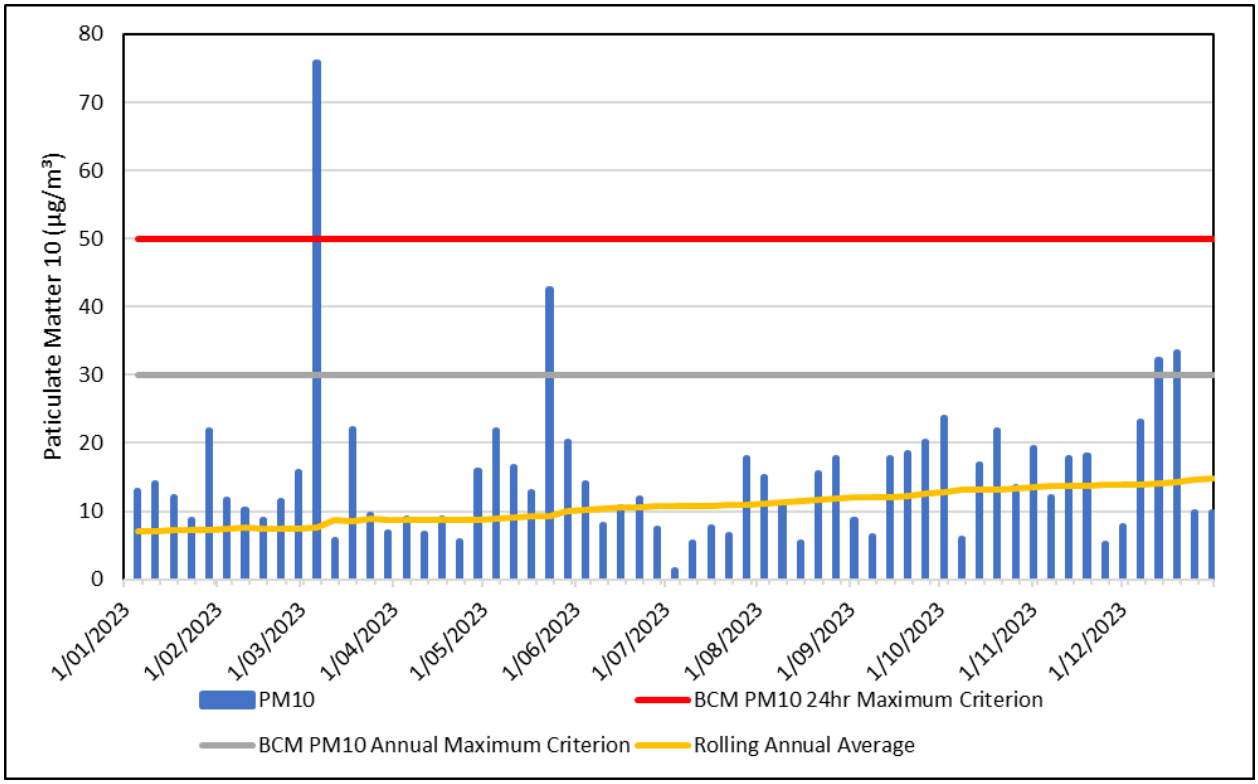
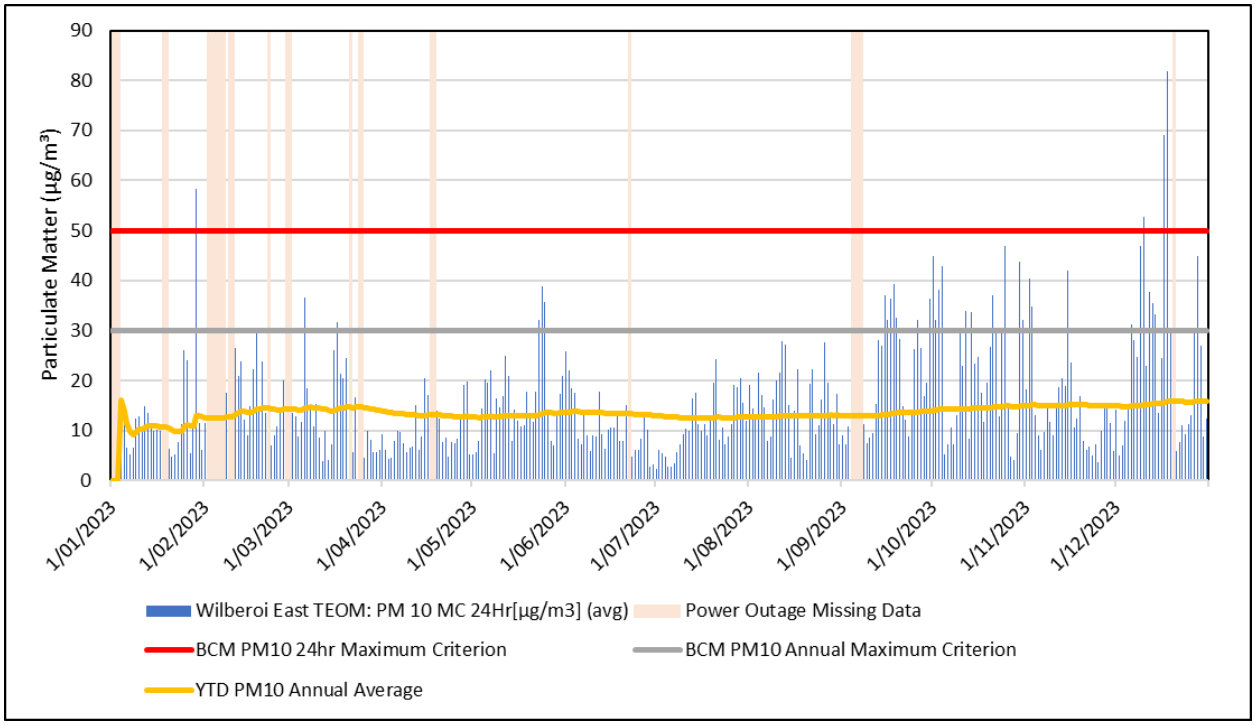


Figure 6.5: Wilberoi East PM_{10} TEOM Monitoring 2023 Results



6.2.2.3 Total Suspended Particulates

The ambient air quality criterion for Total Suspended Particulates (TSP) specified within Table 9 of SSD 09_0182 (annual average 90 µg/m³) is based on a value derived by the National Health and Medical Research Council in 1996. There is an established relationship between TSP concentration and the concentration of PM_{10}. In areas where coal mining is a significant component of the local particulate emission inventory, PM_{10} typically comprises ~40% of the TSP (SPCC, 1986 and others).

As prior studies have confirmed that the long-term average PM_{10} to TSP ratio is close to 0.4:1, that is, 40% of TSP is comprised of PM_{10}, inversely, the relationship between TSP and PM_{10} can be written as: TSP = PM_{10} x 2.5. Due to the nature of the relationship between TSP and PM_{10} levels, the TSP criterion of 90 µg/m³ (annual average) will always be satisfied when the long-term PM_{10} criterion of 30 µg/m³ is satisfied.

In consideration of the historical PM_{10} monitoring undertaken for the BCM (i.e. results have historically been significantly below the PM_{10} annual average criteria), BCOPL consider that compliance with the long-term annual average TSP criteria can be demonstrated via the application of the known relationship between PM_{10} and TSP. The calculation of TSP is based on the available data at the Merriown HVAS monitoring location and Glenhope HVAS monitoring location.

The results indicate the annual average TSP at the Glenhope HVAS (20 µg/m³) is below the TSP air quality criterion in SSD 09_0182 of 90 µg/m³ for the reporting period.

6.2.2.4 Odour

There is no requirement to conduct odour monitoring at BCM. It is considered that there is an exceptionally low risk of odour generation as a result of BCM's operations.

6.2.2.5 Long Term Trend Analysis

It is noted that air quality results are generally higher than what was predicted within the 2010 EA (Hansen Bailey, 2010). This is due to the fact the 2010 EA was assessed prior to surrounding mines being approved (MCCM and TCM). Therefore, BCM's cumulative assessment did not take into consideration the impact these approvals would have on the surrounding air quality. Whilst the 2023 results are generally marginally higher than that predicted for Year 10 of the 2010 EA, it is noted that the monitoring results continue to comply with the required criteria at all neighbouring privately owned residences. In accordance with SSD 09_0182, a long term trend analysis of air quality monitoring results at BCM has been undertaken using data from 2015 to 2023 to identify any trends in the monitoring. The results indicate the following:

- Depositional dust monitoring results have been generally consistent since mining operations commenced. There have been no exceedances of the annual depositional dust criteria between the commencement of mining operations and as at end of 2023;
- PM_{10} concentrations were slightly higher between 2017 and 2019, coinciding with drought conditions and lower than average rainfall during this period. The drought conditions experienced between 2017 and 2019 led to increases in the number of days when the 24-hour average PM_{10} concentration exceeded 50 $\mu g/m^3$ and increased annual average PM_{10} concentrations. The elevated PM_{10} concentrations were observed across many locations in NSW and were not unique to BCM. Concentrations decreased during 2020 and 2022, coinciding with increased rainfall. During 2023 less than half the rainfall fell than what was experienced in 2022 as shown in **Figure 6.3**. Accordingly, there was an increase in the amount of dust produced from all sources. Five exceedances of the PM_{10} 24 hour average criteria were experienced during the reporting period. Following investigations completed by EMM and BCOPL, the January and December exceedances were determined to be caused by agricultural works in the vicinity of the monitoring unit and bushfires occurring in the region, respectively;
- There are seasonal variations with higher PM_{10} concentrations generally occurring in the warmer months;
- Annual average TSP concentrations were clearly higher in 2018 and 2019 than in the preceding five years. Again, this outcome was influenced by the drought conditions and lower than average rainfall. The increases in TSP concentrations were not unique to the area; and
- Two complaints were received form the community regarding dust produced by the BTM Complex. This is further discussed in **Section 9.3**.

6.2.3 Improvements and Initiatives

BCOPL continued to implement and refine the real-time air quality management system at BCM during the reporting period. The real-time air quality management system provided 193 'Action' alerts, which subsequently resulted in a review of operations in order to appropriately manage emissions from the BCM to remain within the relevant criteria.

6.3 Operational Noise

6.3.1 Environmental Management

Operational noise is managed by BCOPL in accordance with the approved Noise Management Plan (NMP) and EPL 12407. Revision 13 of the NMP was approved by the DPHI in April 2019.

The NMP covers all operational activities with the potential to generate noise at the BCM. It details specific noise management and mitigation measures, outlines monitoring and reporting requirements and provides clear definition of the roles and responsibilities for noise management. Blast management is detailed in **Section 6.4**.

BCOPL proactively implements a range of noise mitigation measures for operational activities at BCM. Mitigation measures for BCM are included in Table 5.2 of the NMP. During the reporting period, these included the following:

- Implementing an annual monitoring plan to ensure the effectiveness of attenuated plant is maintained;
- Enforcing speed limits for product trucks in accordance with the NMP;
- Progressive replacement of components of the existing fleet found to be generating excessive noise;
- Maintaining plant and equipment to manufacturer's standards;
- Placement of spoil in strategic locations to enhance noise screening;
- Scheduling noisy activities between 7 am and 6 pm where possible;
- Selecting alarms, horns and warning devices such as reverse squawkers which produce the lowest possible noise level within safety requirements;
- Monitoring weather conditions on a daily basis;
- Screening or partially enclosing conveyor belt motors at the coal handling area; and
- Ensuring train loading chute and bins are closed.

BCOPL engaged acoustic consultants to undertake attended noise monitoring in 2023 on a monthly basis at locations defined in the NMP to adequately assess the noise impacts related to BCM. Prior to 2016, this was undertaken quarterly.

In addition, Sound Power Level (SPL) monitoring is undertaken annually, in accordance with SSD 09_0182, to assess the performance of mine plant against the SPL utilised within the modelling in the 2010 EA. SPL monitoring for 2023 was conducted on 11 July, 27-28 September, 18-19 October, 16-17 and 23-24 November, and 4-5 and 12-13 December 2023. Results of this monitoring is presented in **Section 6.3.2.2**.

6.3.2 Environmental Performance

6.3.2.1 Attended Noise Monitoring

Monthly attended noise monitoring surveys were carried out during 2023. Each monthly survey was undertaken during the night-time period only. Prior to 2016, three measurements were undertaken at each location during each time period (day, evening and night) on a quarterly basis. Due to the uniformity of noise limits across day, evening and night periods, an alternative monitoring methodology involving one fifteen minute measurement at each location during the night period, on a monthly basis, was agreed with DPHI and the EPA. This alternative method was adopted from January 2016 onwards.

The monthly monitoring was undertaken at the three locations in **Table 6-6** as per the requirements of the NMP and EPL 12407. The results are presented in the following sections.

Table 6-6: Current Attended Noise Monitoring Locations

Noise Monitoring Site ID	Current Monitoring Location
N2	Sylvania, Dripping Rock Road
N3	Picton, Dripping Rock Road
N4	Barbers Lagoon, Boggabri-Manilla Road

The conditions of SSD 09_0182 specify that BCM's operational noise limits apply to all nominated private residences, except for those that are either subject to a noise agreement with BCM, or subject to acquisition or noise mitigation upon request.

BCM's operational noise limits are 35 dB(A) $L_{Aeq\ (15\ minutes)}$ for day, evening and night time periods which are defined as follows:

- Day – 7 am to 6 pm Monday to Saturday and 8am to 6pm on Sunday and public holidays;
- Evening – 6 pm to 10 pm; and
- Night – Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

In addition to the above, the noise levels during the night period must not exceed the sleep disturbance level specified as 45dB(A) $L_{1\ (1\ min)}$, at any residence. Operational noise limits are specified in **Table 6-7**.

Table 6-7: Noise Limits

Location	Operational Noise Impact Criteria			Sleep Disturbance Criteria	Cumulative Noise Criteria (BTM complex)
	Day L_{Aeq} (15 min)	Evening L_{Aeq} (15 min)	Night L_{Aeq} (15 min)	Night $L_{Aeq\ (1\ min)}$	Day, Evening, Night, L_{Aeq} (15 min)
All privately-owned residences*	35 dB(A)	35 dB(A)	35 dB(A)	45 dB(A)	40 dB(A)

*Noise criteria does not apply if BCOPL has an agreement with the owner(s) of the relevant residence to generate higher noise levels

Table 5 in Schedule 3 of SSD 09_0182 also specifies long-term intrusive noise goals at all privately owned existing residences, which concur with the limits specified in **Table 6-7**.

Results

A summary of the attended noise monitoring results is provided in **Table 6-8**. This includes all monthly monitoring conducted in 2023.

Noise levels assessed as part of the monitoring program remained within the relevant operational noise and sleep disturbance criteria. The monitored noise levels also remained below the maximum noise levels predicted in the noise assessment completed for the 2010 EA. Noise measurements ranged from IA to <25 dB(A) except during the attended monitoring completed on the 7 June 2023 reached 28 dB(A) $L_{Aeq\ (15\ minutes)}$ and 40 dB(A) $L_{Aeq\ (1\ minutes)}$. These measurements, BCM are well below the criterion outlined in **Table 6-7**.

Applicable meteorological conditions for “Year 10” of the EA were experienced on only 9 occasions during noise monitoring. As monitored noise was inaudible or below measured levels the data therefore is not comparable to the EA predictions.

Attended noise monitoring also considered the assessment of cumulative noise from the BTM Complex and confirmed the noise levels were within the cumulative noise criteria specified under SSD 09_0182 (refer to **Table 6-7**).

Table 6-8: Summary of Attended Noise Monitoring Results - dB(A) $L_{Aeq\ (15\ minutes)}$ & $L1_{\ (1\ min)}$

	Sylvania (N2)		Picton (N3)		Barbers Lagoon (N4)	
	Criteria dB(A) Leq (15 min)@	Criteria dB(A) L1 (1 min)#	Criteria dB(A) Leq (15 min)@	Criteria dB(A) L1 (1 min)#	Criteria dB(A) Leq (15 min)@	Criteria dB(A) L1 (1 min)#
	35	45	35	45	35	45
18-Jan	^	^	^	^	^	^
1-Feb	<25	<25	^	^	^	^
9-Mar	^	^	^	^	^	^
27-Apr	^	^	^	^	^	^
24-May	^	^	^	^	^	^
7-Jun	<20	<20	28	40	<25	<25
16-Jul	^	^	^	^	^	^
7-Aug	^	^	^	^	^	^
18-Sep	<25	<25	<25	<25	^	^
23-Oct	^	^	^	^	^	^
14-Nov	^	^	^	^	^	^
20-Dec	^	^	^	^	^	^

^ BCM Inaudible
@ Operational noise impact criteria
# Sleep disturbance noise criteria

6.3.2.2 Sound Power Screening

Schedule 3, Condition 10 of SSD 09_0182 requires BCOPL to:

> *‘(a) Conduct an annual testing program of the attenuated plant on site to ensure that the attenuation remains effective;*
>
> *(b) Restore the effectiveness of any attenuation if it is found to be defective; and*
>
> *(c) Report on the results of any testing and/or attenuation work within the Annual Review.’*

The annual sound power screening was undertaken across 13 dates throughout the reporting period and is available on BCM's website. The results of this monitoring was then compared against the SPLs used within the noise modelling for the 2010 EA. The plant assessed for sound power screening consisted of the following:

- Komatsu D475A (TD02 TD04, TD074, TD079, TD081);
- Komatsu D375A (TD090, TD093);
- Caterpillar D11T (TD11);
- Caterpillar 16M (GR060);
- Caterpillar 24M (GR063);
- Caterpillar 992K (WL02, WL03);
- Komatsu WA320 (WL189);
- Komatsu 730E (WC042, WC043, WC044);
- Caterpillar 777D (WC691);
- Caterpillar 740B (ST4090);
- Komatsu HD1500 (DT178, DT180, DT181);
- Komatsu 730E (DT268);
- Hitachi EH3500 (DT310, DT325, DT326, DT327);
- Caterpillar 789C (DT364, DT365, DT366, DT367);
- Liebherr 9400 (EX125, EX129);
- Hitachi EX2600 (EX259); and
- Hitachi EX1900 (EX258).

Overall sound power screening results which exceeded the relevant criterion by 2 dB or less are considered minor and not significant enough to require additional investigation. Results that exceeded the relevant criteria by 3 dB or more were considered significant. Sound power results have been assessed against sound powers used in modelling for the 2010 EA. Any difference in screening results for the same plant between consecutive years of +3 dB or more would trigger a more detailed analysis of results (third octave band results analysis) and potentially follow-up machine inspection and/or additional testing.

Methodology

The measurement and calculation methodology adopted for the 2023 sound power screening was undertaken using the methods described in AS ISO 6393 and AS ISO 6395. Haul Truck dynamic testing has been adjusted to Uphill Loaded and Downhill Unloaded. Water Cart and Service Cart dynamic testing has been adjusted to Uphill and Downhill Loaded (Thearle Engineering, 2024).

Results

All plant tested as a part of the annual sound power level screening for 2023 were compliant with sound power levels used in the 2010 EA (Hansen Bailey, 2010). Individual plant results, atmospheric testing conditions and testing equipment information is available on the BCM's website.

6.3.2.3 Noise Model Validation

In accordance with SSD 09_0182 Schedule 3, Condition 13 (f), BCOPL commissions an independent acoustic consultant annually to complete a validation of the noise model used in the Continuation of Boggabri Coal Mine Acoustic Impact Assessment (2010 AIA) (Bridges Acoustics, 2010). This involved comparing 2023 attended noise monitoring results with modelled noise impacts for the 2010 AIA. Predictions from Year 10[1] of the 2010 AIA were utilised, as that stage best aligns with the current operations (EMM, 2024).

Attended environmental noise monitoring was conducted in accordance with Australian Standard AS1055 *'Acoustics, Description and Measurement of Environmental Noise'*, relevant NSW EPA requirements, and the BCM NMP. Meteorological data was obtained from the BCM's automatic weather station which allowed correlation of atmospheric parameters with measured noise levels.

Meteorological conditions included in the Acoustic Impact Assessment report did not regularly occur during attended monitoring in 2023. Of the 36 measurements conducted in 2023, 9 measurements occurred during meteorological conditions that coincided with modelled meteorological conditions. During these 9 measurements, BCM was either inaudible or lower than noise levels predicted in the 2010 EA.

6.3.2.4 Long Term Trend Analysis

Attended compliance monitoring results indicate a trend toward reduced noise levels from BCM over time with all attended results since September 2018 being either inaudible, or at levels significantly lower than criterion. Full compliance with approved noise limits has been achieved since 2015. Further, since SSD 09_0182 was granted in 2012, there have been a total of 10 complaints requested that received relating to noise, none of which can be directly attributed to BCM's operations.

6.3.3 Improvements and Initiatives

The SPL attenuation trial of Komatsu 930E-4 was completed during the 2022 reporting period. To assess the performance of this attenuation, two measurements on trucks DT721, DT722, DT724, and DT725 were made during the 2022 sound power screening campaign on 24 August and 20 December 2022. Results show that 2022 linear sound power levels are lower than pre-attenuation 2016 levels and 2022 A weighted sound power levels are also lower than pre-attenuated 2016 levels. As with the linear results. The trial is currently ongoing in 2023 as the kits have shown reliability issues.

6.4 Blasting

6.4.1 Environmental Management

Blast operations at BCM are managed in accordance with the approved Blast Management Plan (BLMP), which covers blasting activities associated with mining. The BLMP and Blast Fume Management Protocol (BFMP) was updated and approved in November 2018 (currently under review). Drill and blast design at BCM focuses on the following objectives:

- Control of air blast and ground vibration;
- Minimising fly-rock;
- Optimising fragmentation;
- Reducing coal seam damage; and
- Reducing blast fume.

[1] Predictions were made for Year 5, Year 10, Year 15 and Year 20 of operations.

Blast fume is managed in accordance with BCM's BFMP. The BFMP was prepared to satisfy the conditions of SSD 09_0182 in order to establish management measures for control of fume-related emissions from blasting operations. The BFMP is based on the Australian Explosive Industry and Safety Group's *Code of Good Practice: Prevention and Management of Blast Generated NOx Gases in Surface Blasting, Edition 2*. It describes site specific monitoring and rating/recording for blast fume events as well as incident response procedures.

6.4.2 Environmental Performance

6.4.2.1 Blast Events

SSD 09_0182 permits blasting to occur only between 9:00 am and 5:00 pm Monday to Saturday, at a rate of up to one blast per day and an average of up to four blasts per week (when averaged over the calendar year), unless otherwise exempted.

Results

Blasting events at BCM did not occur more than once a day at any time during the reporting period. All blasting operations were conducted between the approved times of 9:00 am – 5:00 pm Monday to Saturday. No temporary road closures were required due to proximity of blasting.

A total of 106 blast events occurred during the 2023 reporting period, which remains well within the permitted maximum blasts when averaged over the calendar year.

6.4.2.2 Blast Peak Vibration

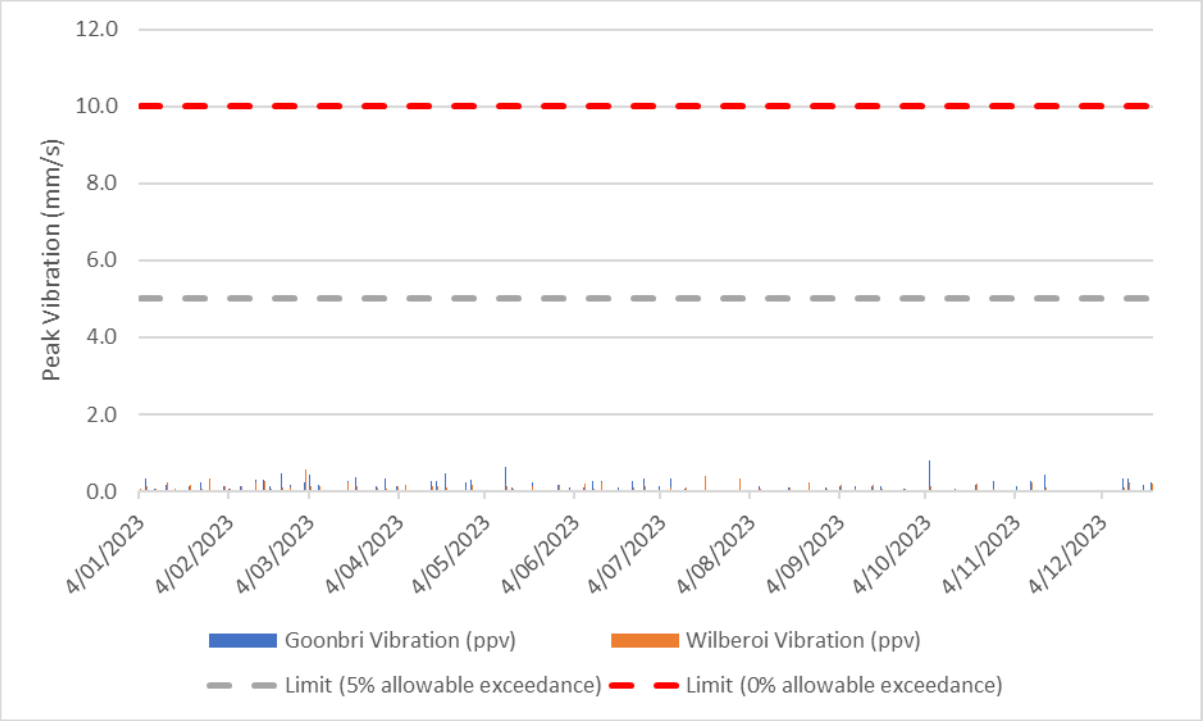
Monitoring of peak vibration was conducted at Goonbri (MP1) and Wilberoi East (MP3) during the entire 2023 reporting period (refer to **Appendix B**).

The applicable criteria within SSD 09_0182, EPL, and CL368 for peak vibration are 10 mm/second at any privately owned residence, and 5 mm/second at any noise sensitive location for up to 5 percent of all blast events occurring within the reporting period.

Results

Blast monitoring results indicate blasts complied with the vibration limits of 5 mm/second (exceedance allowed for 5% of the blasts) and peak vibration of 10 mm/second (refer to **Table 6-7**). One blast event measured at 8 mm/second on the 5 October 2023, exceeding the 5mm/second limit. However this remains well below the 5% allowable limit though not the 10 mm/second limit, as such no non-compliances occurred. Blast vibration monitoring results for the 2023 reporting period were similar to those recorded in the 2022 reporting period. Blast vibration for the past few years has consistently remained well below the relevant limits.

Figure 6.6: Summary of Peak Vibration Monitoring Results 2023



6.4.2.3 Blast Overpressure

Monitoring of blast overpressure was conducted at Goonbri (MP1) and Wilberoi East (MP3) during the entire 2023 reporting period (refer to **Appendix B**).

The applicable criteria for airblast overpressure under SSD 09_0182 are 120 dB(A) at any noise sensitive location (residence on privately owned land), and 115 dB(A) for up to 5 percent of all blast events conducted during the reporting period.

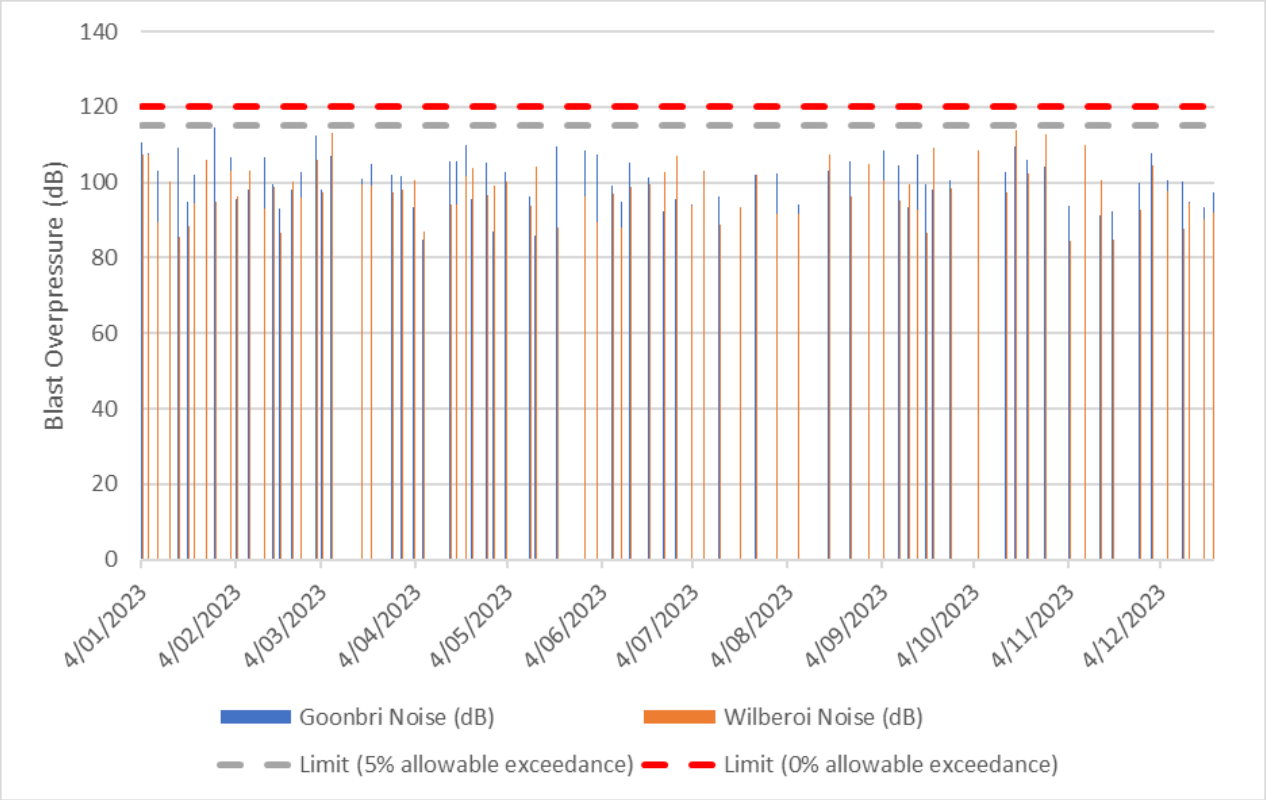
Results

Figure 6.8 illustrates the blast overpressure monitoring results for the 2023 reporting period.

The monitoring results indicate that there were no blasts that exceeded the 115 dB(A) (or 120 dB(A)) criteria at Wilberoi and Goonbri monitoring locations during the reporting period.

BCOPL complied with all its blast overpressure criteria during the 2015, 2016, 2017, 2018, 2020 and 2021 reporting periods. One exceedance of the 120 dB(A) criteria occurred in the 2019 and 2022 reporting periods.

Figure 6.7: Blast Overpressure Results 2023



6.4.2.4 Blast fume

Blast fume at BCM is managed and monitored in accordance with the Blast Fume Management Protocol (2018). Blast fume was monitored by BCOPL for all blast events that occurred during the reporting period.

A fume risk rating system is utilised at BCM to categorise fume events. This is based on the fume rating system detailed in the *Code of Good Practice: Prevention and Management of Blast Generated NOx Gases in Surface Blasting, Edition 2* (AEISG, 2011).

Results

A total of 14 blast fume events were recorded during the reporting period. None of the fume events were categorised as a Level 3C fume event or higher as such no notification was required. All blast fume events recorded remained within the relevant criteria during the 2023 reporting period.

6.4.2.5 Blast Monitoring Results

All blast monitoring results are provided on BCOPL's website for the 2023 reporting period.

6.4.3 Improvements and Initiatives

During 2023, BCOPL continued the trial of an alternative emulsion product known as Fortis Clear Blue with a view to improving fume performance. The trial period was undertaken during a very wet period, which included flooding and intermittently cut access to the BCM contributing to the trial running into 2023. The trials demonstrated an improved fume response in extreme wet conditions which included less-than-ideal loaded hole sleeping conditions.

6.5 Biodiversity

6.5.1 Environmental Management

Biodiversity issues at Boggabri Coal Mine (BCM) are managed in accordance with the approved Biodiversity Management Plan (BMP). The BMP provides a framework for managing biodiversity values within the Project Boundary, Biodiversity Offset Areas (BOAs) and wider locality.

The BMP guides the management of potential risks to biodiversity as a result of the BCM. Specifically, the BMP aims to:

- Provide details of the parties responsible for monitoring, reviewing, and implementing the BMP;
- Ensure compliance with all legislative requirements, statutory approvals/licences and corporate responsibilities of Boggabri Coal Operations Pty Limited (BCOPL);
- Describe the measures (short, medium and long-term) to be implemented to manage remnant vegetation and habitat within the project boundary and BOAs, including detailed performance and completion criteria;
- Describe the practical management strategies (including procedures) to be implemented to manage impacts on flora and fauna, maximising salvage and beneficial use of resources in areas to be impacted for habitat enhancement, rehabilitate creeks, drainage lines and disturbed areas, control weeds and pests; and
- Describe biodiversity monitoring and reporting requirements.

No impacts outside those predicted in the Environmental Assessment (EA) have occurred during the reporting period, indicating the management strategies specified by the BMP and implemented across the site are adequate to address potential impacts.

BCM's biodiversity offset requirements are outlined in the Boggabri Coal Mine Biodiversity Offset Strategy (WSP, 2018) (BOS). The BOS guides the implementation of BOAs. It identifies potential suitable offsets to adequately compensate the Project's impacts on local biodiversity, ensuring the Project complies with legislative and Project Approval (PA) offset requirements.

The BOS was revised in 2018 in accordance with Schedule 3, Condition 43 of the PA to incorporate an additional 1000 ha of offsets. The revised strategy also included additional offset requirements identified in Condition 39, Table 15 of the PA. This BOS was prepared to accurately reflect the final offset areas to be subject to formal in perpetuity conservation in accordance with Schedule 3 Condition 47 of the PA. In 2019, BCM commenced formal negotiations with the NSW Biodiversity Conservation Trust regarding formal in perpetuity conservation agreements for 8,076.8 ha committed as biodiversity offset to meet the PA. This process was ongoing through 2023, with several site visits by representatives of the NSW Biodiversity Conservation Trust for formal commitments and approvals under the new legislative apparatus.

BCOPL has implemented a range of biodiversity monitoring activities since the commencement of operations, in addition to those studies completed for the EA. Biodiversity monitoring has included the following programs or studies undertaken by WSP:

- Vegetation clearing monitoring (undertaken in conjunction with the annual tree clearing program) – completed in 2023;
- Leard State Forest annual biodiversity monitoring (an annual program of comprehensive flora and fauna surveys) – completed in 2023;
- Leard State Forest biodiversity corridor monitoring (a program to monitor biodiversity within a vegetation corridor between BCM and Maules Creek Coal Mine) – completed in 2023;

- BOA monitoring (an annual program to assess the progress of the BOAs in achieving biodiversity targets), including autumn Box Gum Woodland monitoring – completed in 2023;
- Targeted seasonal threatened species surveys for Regent Honeyeater, Swift Parrot and Corben's Long-eared Bat – completed in 2023;
- Mine rehabilitation biodiversity monitoring (an annual program based on flora and fauna surveys to assess the progress of mine rehabilitation areas in achieving rehabilitation targets) – completed in 2023;
- Stygofauna monitoring (an annual program designed to monitor groundwater monitoring bores along the Nagero Creek and Namoi River floodplain for Stygofauna) – completed in 2023; and
- Stream and riparian vegetation health assessment and terrestrial vegetation monitoring within the locality of MOD5 (an annual program monitoring riparian vegetation health in accordance with BCM Surface Water and Groundwater Management Plans) – completed in 2023.

The following sections summarise activities related to biodiversity management, provide updates on key biodiversity studies undertaken during the reporting period, and summarises the performance of BCOPL in meeting requirements of the PA and internal management plans.

6.5.2 Environmental Performance

6.5.2.1 Environmental Management Correspondence

Correspondence with MCCM and TMC has been undertaken on a regular basis to discuss cooperative management and protection of the vegetated corridor and Leard Forest Regional Biodiversity Strategy.

The *Leard Forest Regional Biodiversity Strategy (Stage 2 – Strategy Report)* (RBS) (Umwelt, 2017) was prepared to provide a strategic framework for the management and implementation of the BTM Complex biodiversity offset programs and to provide guidance for co-ordinated management with other land managers within the region. To achieve coordinated and successful biodiversity management within the region, the RBS specifies that the BTM Complex must prepare an 'Annual Summary Report' detailing the overall biodiversity performance and outcomes of biodiversity offsets.

An Annual Summary Report would summarise activities completed across the BTM Complex as they pertained to natural regeneration, seed collection and propagation, active revegetation, pest management, mine rehabilitation, biodiversity management consultation, biodiversity offset monitoring methodologies and biodiversity offset performance and outcomes (vegetation community attributes, key weed attributes, fauna monitoring results, threatened flora and fauna monitoring results).

6.5.2.2 Commonwealth Consent Fauna Surveys

In accordance with the Commonwealth Department of Climate Change, Energy, the Environment and Water Conditions of Approval 13c and 14, BCOPL have commissioned annual surveys across BCM biodiversity offset lands for Nyctophilus corbeni (Corben's Long-eared Bat), Anthochaera phrygia (Regent Honeyeater) and Lathamus discolor (Swift Parrot).Targeted surveys for Regent Honeyeater and Swift Parrot were undertaken during June and August 2023, whilst surveys for Corben's Long-eared Bat were undertaken in late November and December 2023.

Annual targeted threatened species surveys were undertaken for Regent Honeyeater and Swift Parrot with consideration of the Commonwealth Survey Guidelines for Australia's Threatened Birds (Department of Environment Water Heritage and the Arts 2010). Surveys were completed in Leard State Forest, the Leard State Forest biodiversity corridor and across the BOAs, extending from the Western offset (Merriendi BOA), through the Namoi offsets (Namoi BOA, Jerralong BOA), Central offsets (Goonbri BOA, Wirrilah BOA, Myall Plains BOA, Mallee BOA) and Eastern offsets (Nioka North BOA, Sunshine BOA, Braefield BOA). The key

objective of these surveys is to determine if the threatened species are using winter blossom resources. Eucalyptus albens (White Box) is an important source of winter blossom resources in the western slopes region of NSW and it occurs widely across the BOAs and throughout Leard State Forest surrounding BCM.

Foraging resources in Leard State Forest and across the BOAs in late June 2023 were patchily distributed. Localised patches of E. albens were observed heavily in flower within BOAs to the west of the Nandewar Range; particularly including the Myall Plains BOA, Goonbri BOA and Merriendi BOA. Large numbers of Noisy Friarbird were in attendance, as where inflated numbers of resident nectarivorous birds, such as Fuscous Honeyeater, White-plumed Honeyeater and Spiny-cheeked Honeyeater. In addition, regionally nomadic species such as Scarlet Honeyeater, Silvereye and Yellow-faced Honeyeaters were present, which suggests that resources present were significant for the region. Due to the location's nectar resources and the numbers of nectarivorous birds, it was considered that Swift Parrots may have been present within flowering patches, but there was no indication that Swift Parrots were using them during the survey timing.

During the early August 2023 survey period, stands of White Box throughout the Eastern offsets held scant blossom resources and blossom in the Central offsets were scarce apart from relatively small flushes of blossom in Goonbri, Wirrilah and Myall Plains BOAs. In the west, woodlands associated with the Merriendi BOA and the adjoining Leard Conservation lands exhibited a mixture of available resources and blossom that was clearly past its prime. Resources across the Namoi BOA were sparse and no significant response from nectarivorous birds to the few resources available suggested sites holding winter blossom were not significant on a regional basis and unable to attract distant bird populations. Leard State Forest has been identified as a standout provider of blossom locally at this time of year with 16 recorded in the August 2023 survey. The Swift Parrot and Regent Honeyeater were not detected in the BOAs during the monitoring period.

Targeted surveys for Corben's Long-eared Bat were also undertaken within the BOAs, encompassing the Western, Namoi, Central and Eastern offset areas, and the Leard State Forest boundary corridor. Corben's Long-eared Bat was recorded within the Central and Eastern offset areas (Mallee BOA and Nioka North BOA) during the monitoring period, as well as the Leard State Forest boundary corridor.

6.5.2.3 Vegetation Clearing

Vegetation clearing for the reporting period commenced on 13 March 2023 and ended 6 April 2023, inclusive of pre-clearing surveys, and Stage 1 and Stage 2 clearing operations. The program included the removal of vegetation from the forecasted active mining area for the 2023 period. The extent of clearing totalled 15.40 ha of vegetation, encompassing one vegetation community, being White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion (PCT 1383). This vegetation community was consistent with the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands threatened ecological community listed as Critically Endangered under the EPBC Act and BC Act.

6.5.2.4 Vegetation Clearing Ecological Monitoring

As with previous years, the 2023 tree-clearing program was undertaken in conjunction with a team of qualified ecologists to ensure, as far as practicable, the safe removal and relocation of native fauna. Pre-clearing and relocation surveys completed prior to the commencement of the clearing activities recorded 372 habitat, hollow-bearing and/or significant trees within the 2023 tree clearing area. These trees were marked with fluorescent pink paint in preparation for the tow-stage clearing process.

During Stage 1 and Stage 2 clearing operations, 128 animals were successfully relocated, 104 animals were observed from habitat trees and evaded capture, and seven animals were killed or euthanised as a result of clearing operations (**Table 6-10**). The most abundant groups of animals encountered during 2023 clearing operations were reptiles (226 individuals).

To minimise stress to displaced native animals, all individuals were appropriately retained and released into designated fauna relocations sites at the earliest practicable time following capture. It is anticipated that the

number of microchiropteran bats, either relocated or evading capture, is likely to be higher, with numerous microbats observed within existing hollow-bearing trees or being present in broken hollow branches that were safely relocated to the designated fauna relocation sites.

Table 6-9: Animal Groups Encountered During Clearing Operations

Fauna Group	Number of Individuals Recorded			
	Relocated	Observed	Deceased / Euthanised	Total
Reptiles	124	95	7	226
Microchiropteran bats	3	8	0	11
Birds	0	0	0	0
Amphibians	1	0	0	1
Mammals	0	11	0	11
Total	128	114	7	249

The attendance of ecologist's supervising tree clearing greatly enhanced the likelihood of survival for the above listed species.

The rigorous fauna surveys undertaken as part of the BCM tree clearing program are regarded as a key practice in minimising harm to fauna prior to clearing activities and reducing the mine's impact on biodiversity.

The tree clearing program involved the salvage of woody debris, including fallen timber, felled hollow trees, and bush rock for later use in restoration areas in the BOAs and mine rehabilitation areas.

6.5.2.5 Stygofauna Surveys

Like most biodiversity monitoring programs in 2022, stygofauna sampling was affected by significant rainfall received throughout the region, leading to multiple flood events along the Namoi River and associated tributaries. Therefore, the 2022 stygofauna survey was undertaken in March 2023, with nine groundwater bores sampled. Stygofauna (Notobathynellidae (Parabathynellidae)) was detected in bores MW6 and MWP07, which has previously been identified from these locations. An additional stygofauna species is suspected from MWP07 and is still being identified.

The 2023 stygofauna sampling event was completed between 11-12 August 2023 with a total of eight groundwater bores sampled. Stygofauna were detected in three bores, including Victoria Park bore, Belleview bore and Cooboobindi House bore. This increases the number of sites/bores that stygofauna have been collected from and confirms the distribution across the region. Stygofauna specimens are currently undergoing taxonomic review.

6.5.2.6 Annual Leard State Forest Biological Monitoring

A tailored biological monitoring program for BCM was established in 2006, prior to mining. The monitoring program aims to identify and assess potential impacts to biodiversity within Leard State Forest as a result of mining activities. It focuses on native vegetation, fauna habitat, invertebrates, birds and microbats within the forest. Monitoring is undertaken on an annual basis by qualified ecologists.

The monitoring program is based on the 'Beyond BACI' monitoring design, incorporating four replicate survey sites within the Leard State Forest (the potential impact location) and four survey sites in each of two

reference locations (Central Offset Area and the Namoi Offset Area (Rocklea property)). The reference locations contain homogenous vegetation considered to be analogous with that of the Leard State Forest, and its relative absence of impacts associated with BCM.

Survey sites within Leard State Forest were selected where possible to represent each of the two main vegetation types likely to be impacted by mining – Ironbark Woodland and White Box Woodland. These sites were located at varying distances around the area of mining. Likewise, survey sites at the reference locations/ control sites were selected, where possible, within vegetation types like those found in Leard State Forest, or at a minimum, with similar vegetation structures. Surveys at each site would typically include:

- Two 100 m transects for vegetation cover abundance;
- Two 100 m transects for invertebrates each containing 10 pitfall traps;
- Two nights of microbat ultrasonic recordings on non-consecutive nights using ultrasonic recording units set to record from dusk;
- Two 20-minute area searches within an 80 m radius (approximately 2 ha) of fixed monitoring sites on non-consecutive mornings; and
- A reference photograph for each transect.

Results

- Vegetation across the monitoring locations retained a high level of native plant species richness and moderate to low diversity of exotic species. The Central Offset Area replicate sites showed the highest level of native plant species richness, followed by Leard State Forest and the Rocklea property, respectively. The Central Offset Area also had the highest mean exotic species richness, followed by the Rocklea property. Leard State Forest recorded the lowest exotic species diversity;
- Although *Tylophora linearis* has previously been recorded from monitoring site LSF3 and ROC2, no threatened flora species were recorded during the field survey in September 2023. *Tylophora linearis* is listed as Endangered under both the NSW BC Act and Commonwealth EPBC Act. It is commonly recorded throughout Leard State Forest and the broader locality including some locations within the Central Offset Area and Rocklea property;
- Dry woodland habitat associated with Leard State Forest and the two reference locations provide important habitat for a variety of woodland specialist and generalist species of bird. A total of 72 species of diurnal bird were recorded during replicate monitoring surveys with the Fuscous Honeyeater, Rufous Whistler, Grey Fantail, Galah, Yellow Thornbill, Silvereye and Weebill, commonly recorded. Mean diurnal bird species richness and abundance was similar within the potential impact location compared to the control locations during the 2023 monitoring event; and
- Seven threatened species of bird listed as Vulnerable under the NSW BC Act were recorded during duplicate surveys at replicate monitoring sites, including Speckled Warbler, Dusky Woodswallow, Brown Treecreeper (eastern subspecies), Diamond Firetail, Varied Sittella, Little Lorikeet and Turquoise Parrot.

6.5.2.7 Annual Leard State Forest Biodiversity Corridor Monitoring

The Leard State Forest biodiversity corridor refers to a vegetated boundary corridor that occurs in Leard State Forest between BCM and MCCM. This corridor forms a part of the larger East-West Corridor (as detailed in the BMP) representing the vegetation corridor between the Nandewar Range, BCM BOAs, Leard State Forest and the Namoi River.

The purpose of the corridor monitoring is to gain an understanding of biodiversity values within the Leard State Forest corridor and to identify any potential changes to these values as a result of the works being undertaken at BCM.

Biodiversity survey was completed between 18-22 September 2023. Monitoring targeted native vegetation, bird and microbat assemblages with the following general survey methodologies completed at replicate monitoring sites:

- Photographic point monitoring;
- One 20-minute area search within 80 m (approximately 2 ha) of fixed monitoring sites;
- One night of microbat recordings using Anabat Express Bat Detector units;
- Two consecutive nights of passive infra-red/motion sensor camera detection; and
- One BioBanking plot (LC4 and LC6 only).

In addition, targeted seasonal survey methodologies were apportioned to Swift Parrot and Regent Honeyeater in June and August 2023, and Corben's Long-eared Bat in November 2023.

Results

A total of 82 species of plant were recorded from seven replicate monitoring sites associated with the corridor, including 80 native species (98%) and two exotic species (2%). No threatened species of plant were recorded during the 2023 monitoring event. Despite this, Tylophora linearis (listed as Vulnerable under the BC Act and Endangered under the EPBC Act) is known to occur within the biodiversity corridor;

Photographic monitoring and BBAM vegetation plots completed at each of the monitoring sites indicate that the native vegetation structure, function, and condition within the biodiversity corridor are all high. This is supported by most vegetation attributes meeting, being within or exceeding the BBAM benchmark values in spring 2023;

A total of 36 species of bird were recorded from replicate monitoring sites, the composition of which suggest vegetation retains structural complexity capable of providing habitat to woodland and generalist species of bird common the region;

Three threatened species of bird, Speckled Warbler (LC3 and LC7), Varied Sittella (LC5) and Diamond Firetail (LC8) which are listed as Vulnerable under the BC Act, were recorded from the corridor. Replicate monitoring site LC6 recorded the highest number of birds with a mean diurnal bird species richness of 11.5 (as averaged from two 20-minute surveys) during the 2023 monitoring period;

Targeted Swift Parrot and Regent Honeyeater surveys were conducted in the corridor (and wider Leard State Forest and BCM BOAs) over two discrete sampling periods in June and August 2023. Approximately 16 Swift Parrots were recorded at a moderately strong White Box blossoming event in the north-east section of Leard State Forest in August 2023. The Swift Parrot and Regent Honeyeater where not recorded from habitats associated with the corridor during these surveys; and

A total of six harp trap nights was completed from three locations within (or immediately adjacent) the corridor over a two-consecutive night period. A total of seven individuals from six species of microchiropteran bat were trapped, processed and released, including one individual of Corben's Long-eared Bat.

6.5.2.8 Annual Stream and Riparian Vegetation Health & Terrestrial GDE Monitoring within the Locality of MOD5

The BCM is largely contained within the catchment of an unnamed ephemeral drainage line commonly known as 'Nagero Creek'. A small area to the south of the Project is also located within the catchment of Bollol Creek. Nagero Creek and Bollol Creek are both small tributaries of the Namoi River. The Namoi River is the main watershed for the region and is part of the Murray Darling Basin system and managed under two Water Sharing Plans. BCOPL holds existing licences under the *Water Management Act 2000* for the extraction of both surface water and groundwater associated with this watershed.

The purpose of this program is to monitor stream and riparian vegetation health due to the potential for impacts on surface water and groundwater systems. Survey methodologies for the 2023 monitoring program were completed over two sessions being Autumn (22 May 2023, 5-7 July 2023) and Spring (8 November 2023 and 11-14 December 2023) at five replicate monitoring sites, incorporating:

- Quantitative transect/plots (one BioBanking plot)
- Stream characteristics (for example channel size, composition, flow category, clarity etcetera – stream health monitoring locations only).
- Photographic monitoring.

Monitoring of terrestrial vegetation in the locality of MOD5 was also completed in conjunction with the stream and riparian health monitoring program in 2023. The purpose of this monitoring is to assess the impacts of the MOD5 borefield on terrestrial native vegetation health and composition within the locality of MOD5 and its proposed draw down impacts associated with groundwater extraction Survey methodologies for the 2023 monitoring program were completed over two sessions being Autumn (22 May 2023, 5-7 July 2023) and Spring (8 November 2023 and 11-14 December 2023) at the 11 replicate monitoring sites (including the five stream and riparian health monitoring sites), incorporating:

- Quantitative transect/plots (one BioBanking plot).
- Photographic monitoring.

Results

The results from the 2023 monitoring program confirmed that the composition and health of riparian and terrestrial vegetation had remained relatively consistent since the 2018 baseline monitoring program. More specifically, vegetation attributes associated with floristic composition, structure and functionality monitored were consistent with or only showed slight increases/decreases in values compared to the 2018 baseline. The fluctuations in vegetation attribute values observed across the monitoring locations is likely attributable to climatic conditions experienced in the region, which has encompassed the cyclic nature from severe drought to major flood events. Nevertheless, these fluctuations were within the boundaries of the probable mean, as predicted by the standard error. It is considered unlikely that these changes in vegetation attributes are due to impacts associated with the Project.

A substantial proportion of vegetation attributes across all sites failed to meet the BBAM benchmark values for their respective vegetation type, however this is not dissimilar to the results of the 2018 baseline data. This was largely attributed to past land uses (predominantly agriculture), which have cleared canopy and midstorey components and heavily disturbed the soil profile leading to the dominance of exotic species in the groundcover.

Similarly, stream characteristics of Nagero Creek and the Namoi River were relatively consistent with the 2018 baseline monitoring results. Exceptions to these included changes in attributes that are affected by drought conditions, such as water height, flow and where water was present, turbidity.

Overall, the structure and health of Nagero Creek was in moderate condition. The stream is an ephemeral waterway with intermittent flow, which is heavily dependent on high rainfall. In contrast to the volume and quality of water recorded along Nagero Creek in 2020, the autumn and spring 2023 monitoring event recorded no water within the stream. Disturbances on this stream are likely attributed to past agricultural pressures rather than impacts associated with the Project. The creek appears however to be in a stable condition and consistent in health compared to previous years.

Overall, the structure and health of the Namoi River was in moderate condition. The Namoi River is a perennial waterway, which usually contains large volumes of water that flow constantly as witnessed during both the autumn and spring 2023 survey periods. Although the river is a permanent waterway with many habitat features (such as fallen timber, hollow bearing trees, debris etc.) the riverbanks appeared to be partially unstable as substantial undercutting and scourging was recorded at all sites (SM3, SM4 and SM5). Further, considerable weed incursions of Noogoora Burr (Xanthium occidentale*) were also recorded at some monitoring locations, which had not previously been observed. This increase in erosion and proliferation of Nagoora Burr along the Namoi River is likely attributed to low vegetation cover and the flow velocity and transportation of flood waters received during significant high rainfall events in 2021 and 2022.

6.5.2.9 Annual Biodiversity Offset Area Monitoring

Biodiversity offset area monitoring comprises annual surveys of vegetation, diurnal birds, microchiropteran bats, terrestrial mammals and vertebrate pest and biennial surveys of nocturnal mammals and birds. In addition, targeted annual seasonal surveys are undertaken for Regent Honeyeater, Swift Parrot and Corben's Long-eared Bat and autumn Box Gum Woodland monitoring was completed.

The 2023 biodiversity offset monitoring represents the ninth year of biodiversity monitoring completed on the BOAs for the Project. The 10 BOAs contain large patches of remnant vegetation and high-quality habitats adjoining existing vegetated lands and create direct linkages or key stepping-stones for a regional east-west wildlife corridor. Boggabri Coal's ten BOAs are separated in to four management areas, including:

- Eastern Offset Area (Braefield BOA, Sunshine BOA, Nioka North BOA).
- Central Offset Area (Mallee BOA, Myall Plains BOA, Wirrilah BOA, Goonbri BOA).
- Namoi Offset Area (Namoi BOA, Jerralong BOA).
- Western Offset Area (Merriendi BOA).

Habitat Management Zone

Vegetation data collected and general observation made as part of the 2023 monitoring session suggests that the vegetation types within the habitat management zones across the four management areas are in good condition overall and are typical of large relatively undisturbed patches of native vegetation in the locality. Ecosystem health and ecosystem structure were observed as good. The monitoring sites established in the habitat management zones provide good analogue sites for which to compare the progress of habitat restoration zones against. Key findings identified within the habitat management zones in 2023, included:

- Native species richness has remained relatively consistent across all BOAs, showing fluctuations over time in response to varying seasonal conditions such as extended periods of severe drought through to periods of above average rainfall and flooding. In 2023, native plant species richness and cover was comparable to other dry years;
- All but one (i.e. S3) Box Gum Woodland monitoring site monitored in 2023 within habitat management zones meet or are considered likely to meet the EPBC Act listing for the threatened ecological community White Box – Yellow Box – Blakely's Red Gum grassy woodland and derived native grasslands; and

- Box Gum Woodland monitoring sites surveyed in 2023 within habitat management zones largely meet, are within or exceed BBAM benchmarks. The main exceptions to this included the occasional site which did not meet fallen timber, hollow bearing tree and native groundcover (grass or other) percentage or native species richness benchmarks.

Habitat management zones across the BOAs provide habitat for a range of threatened species and the intact and semi-intact habitats remain in good condition. The association of habitat management zones with areas of high-quality extant vegetation with a diversity of woodland structural forms are key to the diversity this zone supports, as illustrated by the presence of 15 threatened species recorded in these zones. Key findings identified in habitat management zones during the 2023 monitoring event included:

- The presence of 15 threatened fauna species recorded across the habitat management zones in 2023, including Black-chinned Honeyeater, Black Falcon, Brown Treecreeper, Diamond Firetail, Dusky Woodswallow, Grey-crowned Babbler, Hooded Robin, Little Eagle, Little Lorikeet, Southern Whiteface, Spotted Harrier, Speckled Warbler, Turquoise Parrot, Varied Sittella and Corben's Long-eared Bat. Additional threatened species of microchiropteran bat may be identified from bat call sequence data that is currently being processed;
- Diurnal bird species richness was typical of relatively undisturbed woodland and open forest habitats in the region;
- Comparatively, mean diurnal bird species richness in 2023 is like previous years for the Eastern and Central Offset Areas, whilst the Namoi and Western Offset Areas exhibit more pronounced fluctuations;
- Mean diurnal bird species richness in habitat management zones achieved between 63 % and 90 % of the Leard State Forest analogue benchmark in 2023;
- Nocturnal surveys associated with habitat management zones recorded 15 species of nocturnal animal, including four birds, one mammal, eight amphibians and two reptiles; and
- Several introduced species were recorded during the 2023 monitoring period, including Fox, Pig, Rabbit, Goat, Cat and Brown Hare.

Restoration Zone

The habitat restoration zone was predominantly comprised of derived native grassland communities. Ecosystem health and ecosystem structure are generally poor. As such, the monitoring sites surveyed in 2023 generally fall below the BBAM vegetation type benchmarks for a range of attributes. Due to the general lack of canopy, midstorey, fallen logs and presence of grazing pressure, native grass cover is generally high and exceeds benchmark conditions. To date, restoration works are limited to revegetation activities within the Merriendi, Namoi, Jerralong, Wirrilah, Mallee, Nioka North and Braefield BOAs. Restoration activities in habitat restoration zones will result in an overall improvement in the attributes over time. Key findings identified within the habitat restoration zones in 2023 included:

- Most Box Gum Woodland monitoring sites monitored in 2023 within habitat restoration zones meet or are considered likely to meet the EPBC Act listing for the threatened ecological community White Box – Yellow Box – Blakely's Red Gum grassy woodland and derived native grasslands. The only exceptions to this were Ni2, Me5a, Me6 and Na16 which did not meet the native understorey species criterion. Despite this however it is possible that these sites would meet the threshold during more favourable seasonal conditions as most, except for Ni2, previously meet the threshold in 2020;

- Box Gum Woodland monitoring sites within habitat restoration zones largely fail to meet BBAM benchmark values especially for attributes relating to the number of hollow bearing trees, length of fallen timber and native overstorey percentage cover. Furthermore, most sites showed no or limited evidence of regeneration of canopy species aside from restoration tube stock planting. This is expected given many of these areas occur as derived native grassland. Most other vegetation attributes meet the BBAM benchmarks;
- Due to the above, management within habitat restoration zones should continue to focus on tube stock planting of canopy species and monitoring the success/failure of these which will lead to the eventual increase in canopy cover and formation of habitat resources such as hollow bearing trees, fallen timber, leaf litter etc to increase connectivity. As these resources take over 50 years to form, it is recommended that in the interim fauna habitat resources such as salvaged fallen timber and nest boxes should be introduced, where possible, to encourage fauna usage. These measures will also aid in increasing other BBAM vegetation attributes which do not currently meet benchmark values;
- Native species richness has remained relatively consistent across all BOAs, showing fluctuations over time in response to varying seasonal conditions such as extended periods of severe drought through to periods of above average mean rainfall and flooding. In 2023, native plant species richness and cover was comparable to other dry years;
- One habitat restoration zone monitoring site exceeded the Cypress Pine density threshold of 650 stems per hectare (i.e. Wi3). Although most BBAM benchmark values for its corresponding vegetation type were met it failed to meet the native overstorey percentage cover and no natural regeneration was recorded suggesting that the germination and establishment of canopy species at this location may be prohibited by the high density of Cypress Pine. It is recommended that Cypress Pine thinning be considered in this area; and
- In 2023 evidence of brief livestock grazing was observed within the Nioka North BOA. BCOPL identified that the livestock had broken through a fence from a neighbouring property. This matter was swiftly rectified.

Generally, habitat restoration zones possessed a low diurnal bird species richness. This can be expected as these areas are typically disturbed areas that have long been dedicated to grazing of cattle. Such areas are structurally simplified, contain few habitat features and are generally devoid of canopy and understorey cover; attributes that may otherwise encourage a diverse woodland fauna. Key findings identified in habitat restoration zones in 2023 included:

- Despite most habitat restoration zones being disturbed, they do provide habitat (particularly foraging habitat) for threatened species, such as Grey-crowned Babbler; particularly along ecotones, where regenerating shrubs provide adequate cover close to open grounds. The Spotted Harrier, Little Eagle and Black Falcon also forage over grasslands, with the Spotted Harrier being a specialist hunter of quail and rodents.
- Comparatively, mean diurnal bird species richness in 2023 is like previous years for the Eastern and Central Offset Areas, whilst the Namoi and Western Offset Areas exhibit more pronounced fluctuations. Habitat restoration zones possessed a low diurnal bird species richness, typically averaging between 25 % to 44 % of the Leard State Forest analogue benchmark in 2023 for bird species richness.
- Monitoring of salvaged woody debris in the Namoi Offset Area identified four species of reptile, including Tree Skink, Eastern Striped Skink, Bynoe's Gecko and Boulenger's Morethia.
- Several introduced species were recorded in habitat restoration zones during the 2023 monitoring period, including Pig, Fox, Goat, Brown Hare, Rabbit, Common Starling and Common Myna.

Corridor Enhancement Zone

The corridor enhancement zone has been significantly disturbed by past land use practices, including clearing, cropping and pasture improvement and heavy grazing. The lack of canopy, midstorey and altered ground layer composition recorded during baseline monitoring supports this assumption. Likewise, the paucity of fauna species demonstrates how disturbed such areas are. The planned supplementary canopy planting and targeted weed and post management activities should serve to increase woody canopy cover and build on adjoining existing wildlife corridors. A considerable improvement in habitat value should be seen in this area over the coming years. Key findings identified within the corridor enhancement zones in 2023 included:

- Native species richness has remained relatively consistent across all BOAs, showing fluctuations over time in response to varying seasonal conditions such as extended periods of severe drought through to periods of above average mean rainfall and flooding. flooding. In 2023, native plant species richness and cover was comparable to other dry years;
- In 2023 evidence of livestock grazing was observed within the corridor enhancement zone located in the Sunshine BOA; and
- In 2023 no evidence of livestock grazing was observed within any corridor enhancement zones.
- Mean diurnal bird species richness was observed in 2023 to be consistent with the 2020 survey results. Corridor enhancement zones possessed a low diurnal bird species richness, typically achieving between 14 % and 20 % of the Leard State Forest analogue benchmark for bird species richness.

6.5.2.10 Pest management activities

Five animal pest control programs were carried out in 2023 across the BOAs, including the Cooboobindi, Bellevue, Merriown and Velyama properties (Namoi Offset Area), the Wirrilah, Myall Plains, Mallee and Goonbri properties (Central Offset Area), and the North Nioka, Sunshine and Braefield properties (Eastern Offset Area). Results for each session are:

- April 2023: 230 Pigs, 7 Foxes, 3 Cats, 1 Hare, 1 Rabbit;
- June 2023: 183 Pigs, 12 Foxes, 4 Cats;
- August 2023: 97 Pigs, 1 Fox, 3 Cats, 9 Hares;
- November 2023: 266 Pigs, 19 Foxes, 99 Goats, 1 Deer, 5 Rabbits; and
- December 2023: 344 Pigs, 19 Foxes, 52 Goats, 17 Rabbits.

6.5.3 Improvements and Initiatives

Biodiversity management initiatives implemented during the reporting period continued to include ongoing biodiversity monitoring and management in accordance with the approved BMP and revegetation activities within BCOPL's BOAs. As mentioned in **Section 6.5**, BCM commenced formal negotiations with the NSW Biodiversity Conservation Trust regarding formal in perpetuity conservation agreements for 8,076.8 ha committed as biodiversity offset to meet SSD 09_0182. This process was ongoing through the 2022 reporting period, with several site visits by representatives of the NSW Biodiversity Conservation Trust for formal commitments and approvals under the new legislative apparatus.

6.6 Hazardous Materials

6.6.1 Environmental Management

The management of hazardous materials at BCM is undertaken in accordance with the following BCOPL documents:

- Waste Management Plan;
- Pollution Incident Response Management Plan; and
- Hazardous Material, Dangerous Goods Risk Assessment.

Contractors operating at the BCM also implement a range of company-specific standards and procedures to ensure alignment with BCOPL requirements and legal obligations for the management of hazardous materials.

Collectively the hazardous materials management documents:

- Set out the minimum requirements for contractors for the use, storage and control of hazardous materials;
- Provide protocols for hazardous material use, storage and clean-up response;
- Provide a mechanism for the assessment of potentially hazardous materials prior to them being delivered to site; and
- Specify design standards for which hazardous materials storage structures must comply.

Control measures implemented on site include but are not limited to the following:

- Locating spill kits in high risk areas around mine infrastructure and construction areas within the Project Boundary;
- Ensuring all BCOPL personnel and contractors are trained in incident and emergency response procedures. Specific training is also be provided to those personnel required to handle hazardous materials;
- All workshop and vehicle wash down water is directed to a sump/separator for containment and subsequent treatment or appropriate disposal;
- Vehicles, plant and equipment leaking fuel, oil coolant or any other hydrocarbons will not be operated where practicable and repaired at the earliest opportunity;
- All hazardous materials facilities on site will be designed, constructed and operated in accordance with all relevant legislation, standards and guidelines, with particular reference to *AS 1940:2004 – The Storage and Handling of Flammable and Combustible Liquids*; and
- Refuelling operations will be undertaken within areas specifically designated for that purpose, where practicable.

6.6.2 Environmental Performance

Hazardous materials used at the BCM that require licensing are listed in **Table 6-12**. Orica Australia Pty Ltd (Orica) holds the appropriate licences and notifications for the storage, handling and use of these substances. The use of hazardous materials during the 2023 reporting period was comparable with the 2022 reporting period.

Table 6-10: Explosives and Hazardous Materials Licence/Notification Holders

Hazardous Materials:	Licence/Notification Holder:
Acetic Acid Solution Ammonium Nitrate Ammonium Nitrate Emulsion Oxidizing Liquids	Orica
Bulk Diesel	Boggabri Coal Operations Pty Ltd

All hydrocarbons including fuels and hydraulic/lubricating oils are stored in double-skinned, above ground tanks. Waste oils are stored in a bulk oil tank, for regular collection by a licensed waste contractor.

One minor hydrocarbon spill was recorded and managed in accordance with BCOPL and contractor-specific hazardous materials management documentation. The spill was considered to present a low environmental risk and was promptly cleaned up. The management measures contained within relevant documentation were considered to be adequate for the prevention and clean-up of the hazardous spill. These measures will continue to be implemented in the event of future incidents.

6.6.2.1 Diesel

Diesel fuel is stored in the maintenance workshop area in nine double-skinned, aboveground tanks plumbed in series as “slave and master,” with a total nominal capacity of 766,000 litres. Bunded areas are inspected on a regular basis to ensure their integrity. These tanks are proposed to be relocated to the newly built PSI Facility with an additional capacity of 200,000 litres to be installed as part of the process.

Ultra-low sulphur diesel (ULSD) constitutes the primary fuel used on site. Diesel fuel consumption quantities for the 2019 to 2023 reporting periods are summarised in **Table 6-13**. Fuel consumption at BCM has notably increased from previous reporting periods. In previous years, BCOPL has endured periods of industrial action and flooding which stopped coal production. The increase has also been a result of the progressive increase to approved maximum production rates and longer haulage of overburden waste.

Diesel fuel consumption quantities for the 2019 to 2023 reporting periods are summarised in **Table 6-11**. Fuel consumption at BCM has notably increased during the reporting period and over time as a result of the progressive increase to approved maximum production rates.

Table 6-11: Diesel Fuel Consumption

Fuel type	Quantity (L)				
	2019 period	2020 Period	2021 Period	2022 Period	2023 Period
Diesel*	65,987,493	69,734,267	60,559,675	64,631,567	76,833,977

*ULSD was used during all reporting periods

6.6.2.2 Ammonium Nitrate/Ammonium Nitrate Emulsions

Ammonium Nitrate (AN) and AN Emulsions are used in the blasting process and are stored in 1.2 tonne bulker bags and 40 tonne mobile trailers within the bunded AN storage compound. The AN storage compound is fitted with lockable access gates and is subject to daily inspections to safeguard against theft and/or spillages.

6.6.2.3 Ammonium Nitrate/Fuel Oil

Ammonium Nitrate/Fuel Oil (ANFO) is a blasting agent used at BCM. Ingredients are stored separately. ANFO is blended using mobile mixing units at blast sites.

6.6.2.4 Detonators

Detonators and other high explosives are used in the blasting process and are stored in purpose built isolated magazines, to the west of the AN storage compound, at the toe of the western overburden emplacement area. The magazines incorporate security fencing, lockable entry points and are bunded.

6.6.2.5 Hydraulic/lubricating oils

Hydraulic/lubricating oils are stored in double-skinned above-ground tanks adjacent to the heavy vehicle workshop area. Waste oils are stored in a bunded bulk oil tank which is regularly removed off-site by a licensed waste contractor.

6.6.2.6 Cleaning agents

Cleaning agents are used in the equipment wash down facility for preparing the fleet of mobile equipment prior to maintenance. The cleaning agents are kept within covered stores in the maintenance workshop area, adjacent to the wash down facility.

Water collected at the bunded wash down facility is treated by an oil-water separator at the wash down bay and recycled.

6.6.2.7 Herbicides

Herbicides are used across the site for noxious weed control and are purchased on an as-needs basis. Therefore they are not stored on-site. Application of herbicides is conducted only by suitably qualified persons and records of application areas are maintained.

6.7 Waste Management

6.7.1 Environmental Management

Condition 68, Schedule 3 of SSD 09_0182 requires the following waste management actions:

- Implement all reasonable and feasible measures to minimise waste generated by the Project;
- Ensure waste generated by the Project is appropriately stored, handled and disposed of; and
- Monitor and report on the effectiveness of waste minimisation and management measures in the Annual Review.

Waste management measures employed on site include:

- General waste from operations (food etc.) is disposed of at an appropriate licensed waste management facility;
- Recyclable wastes are separated on site and collected for recycling at an appropriate facility;
- Contaminated soil is collected and transported to the on-site bioremediation area for treatment and eventual on-site disposal. This is undertaken in accordance with the site's Bioremediation Management Procedure;

- All plant and equipment wash down areas have oil/water separating devices. Water from these areas is collected onsite; sediment, oils and grease are separated. Any sediment collected during wash down activities is placed into the in pit bioremediation area for further treatment;
- Scrap metal materials are separated onsite and collected by a recycling contractor for off-site recycling;
- Sewage from permanent site facilities is collected onsite and treated within an aerated septic sewer system, with treated effluent being applied to a transpiration area. Sewage collected from in-pit crib hut locations is collected by a licenced waste contractor and disposed of off-site at an appropriate treatment facility;
- All waste oils and greases are segregated and stored appropriately until collection by a licensed waste contractor for appropriate offsite recycling/disposal;
- HEAVY earthmoving tyres are re-treaded and reused where possible. Otherwise, they are buried in pit in accordance with site guidelines;
- Waste chemicals (including solvents) are segregated, stored appropriately and transported offsite by a licensed waste contractor for appropriate disposal;
- Concrete wash down areas are located away from surface water drains;
- Clean water surface water/runoff is diverted around mine facilities (where feasible); and
- Printer cartridges, bottles and waste collectors are all donated to PlanetArk.

Table 6-12: Waste Disposal from 2020-2023

Waste Stream	2020 Reporting Period (tonnes)	2021 Reporting Period (tonnes)	2022 Reporting Period (tonnes)	2023 Reporting Period (tonnes)
General waste – bulk waste skips	43.84	60.7	58.58	88.63
General waste – industrial bins	380.7	401.8	453.32	532.73
Oily Rags	4.28	8.99	7.34	3.09
Oily Water - recycled	4.36	7.13	3.90	1.28
Waste Grease – recycled	6.5	5.25	5.35	7.92
Scrap metal -recycled	269	1,684.06	414.07	321.52
Aluminium Wire - recycled	-	9.02	-	-
Copper Wire - recycled	-	5.63	-	-
Empty Drums - recycled	1	0.92	1.43	-

Waste Stream	2020 Reporting Period (tonnes)	2021 Reporting Period (tonnes)	2022 Reporting Period (tonnes)	2023 Reporting Period (tonnes)
Paper and cardboard-recycled	41.27	28.43	55.76	34.88
Timber packaging and pallets -recycled	86.26	129.75	99.40	91.05
Oil filters - recycled	31.77	31.21	35.55	36.10
Hydraulic hoses	23.87	26.47	28.48	28.62
Batteries –recycled	15.93	5.79	10.92	10.06
Nicad Batteries - recycled	-	0.15	-	-
Printer cartridges	0.05	0.06	0.09	0.01
Tyres (heavy oversize vehicle) – each	162	174	426	300
Tyres (light vehicle) - each	363	116	366	471
1,000L plastic containers (IBCs)	48	74	25	18.55
Oil- recycled (litres)	557,700#	518,740#	515,382#	590,000#
Coolant – treatment and recycling (litres)	18,000#	19,700#	21,100#	28,500#
Effluent - offsite recycled (Litres)	867.3#	807.5#	875.7#	1,773.15#
TOTAL	**1,776.13**	**2,405.36**	**1,174.19***	**4,333.71***
Total Recycled	**1,323.39**	**1,907.19**	**626.47***	**2,913.01***

* Total applies only to waste measured in tonnes
# Total in Litres

Bioremediation areas are operated to manage contaminated waste materials at BCM. A Bioremediation Management Procedure guides the implementation of the bioremediation process and includes details on required maintenance actions, sampling and testing of contaminated materials within the area.

6.7.2 Environmental Performance

This reporting period has seen an increase in several non-recyclable and recyclable waste streams compared to the 2022 reporting period. It is likely this increase in waste streams is due to the continued increase in mining as it approaches the maximum extraction levels.

Several extra waste streams have been tracked since 2018 including timber packaging and pallets and printer cartridges. The inclusion of recording 1,000L plastic containers was introduced during the 2020 reporting period. Mining operation waste collection statistics for the 2020, 2021, 2022 and 2023 reporting periods are summarised in **Table 6-13**.

The total and total recycled figures dropped in 2022 due to some amendments to the calculations used in previous years. Previously, these totals included the effluent figure despite it being in litres. The totals from 2022 on will now only be the waste measured in tonnes as stated in the table notes.

BCOPL and its contractors have continued to implement the waste management hierarchy. Wherever possible, waste materials are re-used on site in preference to direct disposal. Recycling of materials is also undertaken where possible to minimise waste. An example of reuse is the integration of an oil water separator at the wash bay, which minimises waste water and returns water to the water management system for re-use.

Site induction packages include waste awareness components and waste practice is included in employee and contractor toolbox sessions. Environmental surveillance was undertaken by BCOPL throughout the reporting period, and observations and non-conformances were communicated as necessary to relevant employees and contractors.

6.7.2.1 Bioremediation Areas

Fifteen bioremediation areas have been utilised at the BCM since 2007. Successful management of these bioremediation areas has allowed for onsite treatment of contaminated material and subsequently reduced the need to transfer contaminated waste material offsite. Bioremediation Areas 1 through 14 have been reported in previous Annual Reviews.

The current Bioremediation Pad, area 15 was commissioned in November 2021 with seven cells. In October 2022, an additional three bioremediation pad cells were constructed adjacent to those originally established.

Bioremediation area management was undertaken in accordance with the BCM Bioremediation Management Procedure, which includes details on the management, watering, aeration, sampling and testing of contaminated waste materials within the area. The materials retained in the bioremediation area were turned and watered as required and sampled during the reporting period.

Compliance sampling was undertaken in Area 15 during the reporting period. Two sampling events in Area 15 were undertaken in the reporting period.

6.8 Spontaneous Combustion

6.8.1 Environmental Management

Spontaneous combustion is controlled by avoiding the disposal of combustible material in waste emplacement areas and emplacing combustible materials in locations where oxygen ingress is minimised (i.e. deep in pit burial, away from rehabilitation areas).

Four key principles apply to the management of spontaneous combustion at BCM:

- Prevention;
- Detection;

- Control; and
- Incident management.

Due to the varied nature of spontaneous combustion, the issue is dealt with on a case-by-case basis. Measures that were implemented during the reporting period include:

- Managing spontaneous combustion in accordance with the Spontaneous Combustion Management Plan;
- Capping all areas of combustible material with inert material where possible, noting some mined areas cannot be capped. In some cases capping is not practical for areas that require re-working in the near or medium future;
- Placing any identified combustible materials deep within in pit emplacement areas;
- Monitoring coal stockpiles for signs of spontaneous combustion and responding as required; and
- Implementing Safe work method statements as required.

The 2010 EA reported that spontaneous combustion presents a low risk of causing environmental impacts at BCM. All risks to rehabilitation from spontaneous combustion are managed in accordance with the strategies outlined in the RMP.

6.8.2 Environmental Performance

BCOPL continued to apply the above principals to minimise the occurrence of spontaneous combustion onsite. One minor spontaneous combustion incident occurred in June during the reporting period with an additional four minor incidents occurring in December. The incidents were reported and managed in accordance with the site Spontaneous Combustion Management Plan.

6.9 Heritage

6.9.1 Environmental Management

The management of cultural heritage at BCM is undertaken in accordance with the CHMP. The current CHMP was revised following the determination of Modification 5 and was approved by DPIE (now known as DPHI) in February 2017. A review of the CHMP was commenced in late 2020 and was submitted for DPHI's review in January 2024. This review has resulted in a document name change, now identifying the Cultural Heritage Management Plan as the Heritage Management Plan due to the incorporation of European Heritage items. This is yet to be approved by DPHI.

An outline of the process and draft document was discussed at the Aboriginal Stakeholder Consultative Forum (ASCF) meetings in 2021, 2022 and 2023. Time has been allowed for review of the draft CHMP by Registered Aboriginal Parties (RAPs) and Community Consultative Committee (CCC) and their feedback incorporated into the management plan. The approved CHMP prescribes:

- The policies and practices for the preservation of sites during construction and operations;
- Other facets of cultural heritage practices and conservation measures including salvage of sites as required and practice of due diligence inspections; and
- Other relevant cultural heritage considerations including consultation with the Aboriginal community.

During the reporting period, BCMs archaeological salvage of BC34 and BC54 continued in conjunction with the staged tree clearing program. As with previous years, all tree clearing was subject to comprehensive archaeological salvages lead by qualified archaeologists and RAPs, as specified in the CHMP.

Field investigations, reporting and salvage works undertaken during 2023 focussed on the proposed 2024 tree clearing area and the deposit known as BC54. This included an area of 39.19 ha on the eastern side of MW5. This area was the salvaged by surface collection and an extensive test pitting program. The test pits confirmed that the density of surface artefacts is a reliable indicator of the density of sub-surface artefacts within the Leard Forest. The eastern tree clearing area was found to have one area of low-density artefacts that did not warrant extensive salvage.

6.9.2 Environmental Performance

6.9.2.1 Archaeological Salvage

The aim of the archaeological salvage work was to:

- Identify and salvage Aboriginal artefacts within the 2024 tree clearing areas to mitigate harm (refer **Figure 6.8**);
- Use the artefacts salvaged and the landscape context of the area to develop a picture of prehistoric land use and Aboriginal occupation of the area;
- Engage and involve the RAPs in all phases of the archaeological and cultural salvage; and
- Comply with the CHMP and thereby comply with legislative requirements.

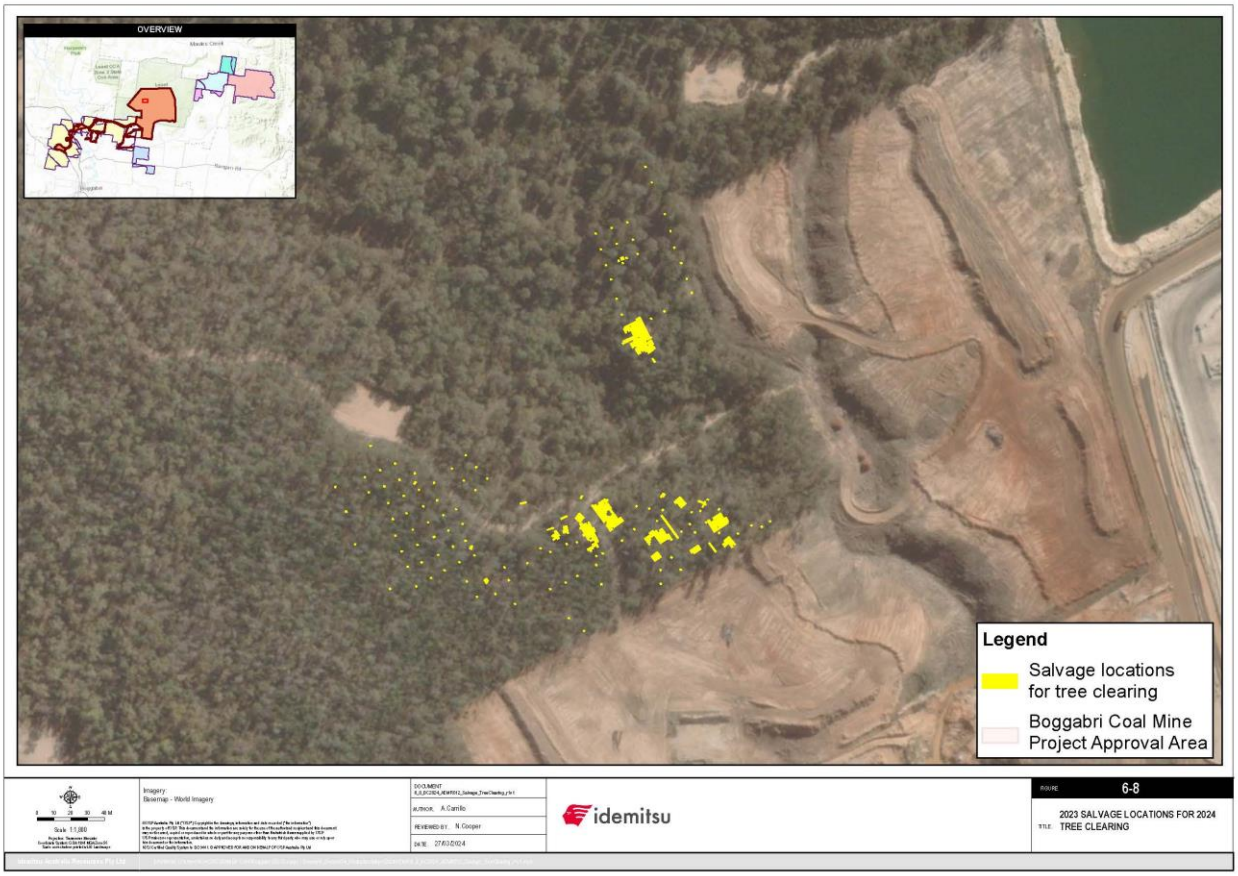
Tree Clearing ahead of Pit Progression

A 39.19 hectares area of land to the north of the pit (east of BC34/54 and MW5) was surveyed ahead of the planned 2024 tree clearing that is required for pit progression. Two surface artefacts were collected during the surface survey.

Based on the landform, and to survey for a potential large site like BC54 may be present, eleven areas of potential were identified. 131 test pits were excavated within these areas (PAD 1 to 5 and PAD 18 to 23), the majority of which contained no artefacts.

The total of 57 artefacts salvaged from the 131 test pits excavated across the PAD's. PAD 19 was the most productive where the expansion of three pits yielded 31 artefacts. The test pits clearly demonstrated that the area of highest potential was at PAD 19, however the PAD did not have the potential for a second large site with the scale and complexity of BC 54/BC34.

Figure 6.8: 2023 Salvage Locations for 2024 Tree Clearing



Open area excavation – BC54/34

Archaeological salvage work in 2022 continued to focus on the previously recorded sites of BC34 and BC54 to the west of MW5. A revised methodology was implemented in 2023 following consultation with RAPs and DPHI. The change in methodology allowed for the use of a 1.8 ton excavator and a mechanical sieve. Wet sieving was introduced, allowing for an increased volume of spoil to be processed. The open area excavations focused on two main areas – the west side of the deeply incised drainage line and the eastern side of the same drainage line.

6.9.3 Results to Date

- In 2023 excavations were expanded by 481 m² over two field seasons, Jan- Feb 23 (68 m²) and Nov-Dec 2023 (413 m²). The increase in output reflects the increased efficiency of the mechanization of excavation;
- With the previous 363.5 m² (2021-2022) and 281 m² excavated in 2023 a total of 644.5 m² has been excavated at BC54;
- A total of 12,001 artefacts were excavated in 2023;
- A revised methodology using a small excavator, a mechanical sieve and wet sieving were introduced increasing throughput;

- As there is no opportunity to conserve any part of BC54 and BC34 in-situ, further open area excavation was undertaken to maximise the data retrieved;
- A total of 131 test pits and expansions were excavated in tree clearing area 2024 demonstrating that artefact densities remain low further away from BC54 /BC34; and
- Mid way between the Jan- Feb and the Nov – Dec field work, a report was prepared to document the results to date and prepare a preliminary analysis. The results informed the changes to excavation methodology which was supported by RAPs and submitted to Dept of Planning and Environment.

The BC 54 and BC 34 area have been excised from the 2022 tree clearing area and decisions regarding 2023 and 2024 tree clearing remain to be resolved in consultation with RAPs.

Figure 6.9: Wet Sieving being undertaken in 2023 at BC 54

6.9.3.1 Discussion

Approximately 12,000 artefacts have been salvaged during 2023 with approximately 15,000 thousand salvaged in 2022 and 5,000 salvaged during 2021 from test pits and the initial open area excavations. A substantial number of samples from sites BC54 and BC32 have been retrieved and form a significant representative sample on which to base the archaeological analysis of site use, raw material selection and sources and the significance of the site relative to others in the Nandewar Range.

Archaeological sites of this size and density are rare in the Leard Forest. Significant resources are being invested into maximising the salvage of the site prior to tree clearance.

6.9.3.2 Aboriginal Community Consultation

To facilitate ongoing Aboriginal stakeholder consultation, BCOPL hold Aboriginal Stakeholder Consultative Forum (ASCF) meetings, which are open to all RAPs who have registered during the BCOPL Project and any other member of the Aboriginal community who wish to attend. The ASCF provide an inclusive platform for information exchange between BCOPL and Aboriginal stakeholders and allows for continued dialogue on cultural heritage issues and their management at BCM.

Meetings were held in February, July and October in 2023. Issues discussed in this forum include:

- Project update (including environmental monitoring rainfall and water storage);
- Exploration update;
- Status of management plans such as the revision of the Cultural Heritage Management Plan;
- The keeping place; and
- Archaeological salvage update.

The ASCF is a proactive and positive step in managing Aboriginal Stakeholder relations at BCM.

6.9.3.3 Historic Cultural Heritage

No historic cultural heritage works were required in 2023.

6.9.4 Improvements and Initiatives

Towards the end of 2023, BCOPL recognised the need for an improvement measure, with the establishment of a RAP employment policy to outline indigenous stakeholder engagement onsite. The RAP engagement policy outlines matters such as commercial engagement, conditions of work and consultation engagement requirements. This RAP employment policy will be implemented in 2024.

BCOPL will continue to implement Aboriginal Cultural and Historic Heritage management and mitigation measures in accordance with the approved CHMP.

6.10 Greenhouse Gases

6.10.1 Environmental Management

In accordance with the *National Greenhouse and Energy Reporting Act 2007*, and the *National Environment Protection (National Pollutant Inventory (NPI)) Measure,* IA submits mandatory National Greenhouse and Energy Reporting (NGERs) and NPI reporting on an annual basis, which includes emissions reporting on behalf of BCM.

The AQGHGMP details air quality and greenhouse gas management and mitigation measures and outlines BCM's monitoring and reporting requirements for Greenhouse Gas (GHG) emissions.

6.10.2 Environmental Performance

Key GHG and energy statistics for BCOPL as reported in the 2022-2023 NGERs submission to the Clean Energy Regulator are summarised in **Table 6-15** alongside statistics from the 2020-2021 and 2021-2022 periods. As the reporting period for NGERs ends in June, data for the current financial year is not yet available.

For reporting purposes, emissions are categorised as either direct (Scope 1) or indirect (Scope 2) emissions. Scope 1 emissions are from sources that are owned or controlled by BCOPL. Scope 2 emissions are a consequence of the activities of BCOPL but occur at external sources; e.g. emissions resulting from the purchase of electricity. Emissions are calculated as tonnes of carbon dioxide equivalent (t CO2-e).

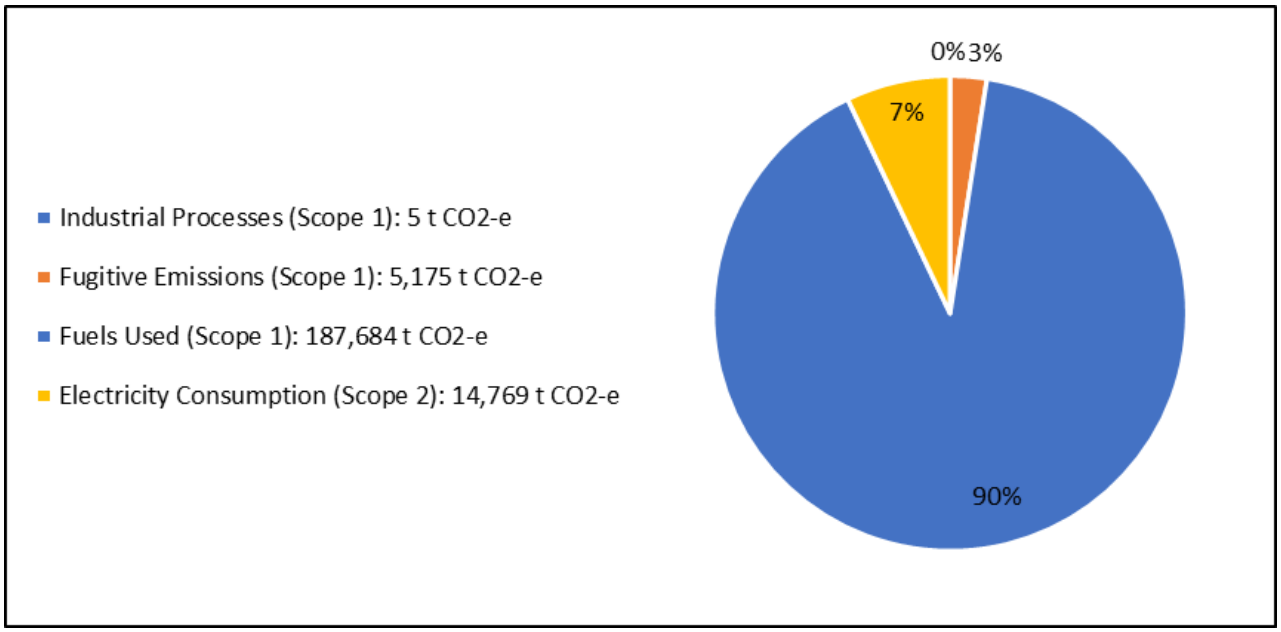
Three gasses constitute the emissions of BCOPL, being primarily carbon dioxide, in addition to methane and nitrous oxide.

Table 6-13: BCOPL GHG and Energy Statistics

GHG/ Energy	2020-2021	2021-2022	2022-2023
Scope 1 (t CO2-e)	184,492	177,437	192,864
Scope 2 (t CO2-e)	18,004	16,941	14,769
Total scope 1 and scope 2 (t CO2-e)	**202,496**	**194,378**	**207,633**
Energy Consumed (total) (Gigajoules (GJ))	2,719,576	2,604,679	2,832,711
Energy Consumed (net) (GJ)	2,719,576	2,604,679	2,838,711
Energy Produced (GJ)	183,237,714	168,996,402	153,752,823

Sources of Scope 1 and Scope 2 emissions for 2022-2023 are illustrated in Figure 6.10. The main contributor to Scope 1 emissions was the combustion of diesel. Scope 2 emissions are attributed to the purchase of 21,443,787 kWh of electricity from the state grid.

Figure 6.10: Sources of BCM Scope 1 and Scope 2 Emissions



Electricity usage during 2022-2023 was similar to 2021-2022 periods due to the ongoing operation of the CHPP. Emissions from diesel combustion increased marginally the 2021-2022 NGERS reporting period. This can be attributed to the increase ROM production at BCM for 2023 compared to 2022.

6.10.2.1 Comparison to Predictions

The difference in emission predictions to actual can be explained by several changes from the assumptions made in the 2010 EA (Hansen Bailey, 2010). These changes include a larger equipment fleet, a higher rate of electricity usage and a change in the way in which fugitive emissions are calculated. The increase in electricity consumption compared to the 2010 predictions is the use of electricity by the CHPP. This is considered negligible as the total Scope 1 and 2 emissions are less than half what was predicted in the 2010 EA.

Table 6-14: Comparison of 2010 EA Emissions Predictions and 2022-23 NGER Report

GHG (t CO_2-e)	2022-2023 NGER Report	2010 EA Emissions Predictions
Scope 1 - Industrial Processes	5	no comparable data estimated
Scope 1 - Fugitive Emissions	5,175	329,763
Scope 1 - Fuels Usage	187,684	136,920
Scope 1 - Total	192,864	466,683
Scope 2 - Electricity Consumption	14,769	3,233
Total Scope 1 and Scope 2	**207,633**	**469,916**

6.10.3 Improvements and Initiatives

BCOPL continued to target a decrease in fuel burn during 2023 through improved operating conditions and practices, and efficient engine configuration. This initiative involved reviewing existing operating practices and engine configurations as well as, assessing the viability of alternate products through engaging specialist consultants. It is considered that all decreases in fuel burn achieved will improve fuel consumption and therefore GHG efficiencies. The improvement of efficiency is evident given an increase in the amount of ROM coal produced at 42.9 tonnes/t CO_2-e in 2023 compared to 39.6 tonnes/t CO_2-e within 2022.

During 2021, IA conducted an investigation in relation to the potential GHG initiatives which could potentially be implemented across its Queensland and NSW operations, including the BCM. Following on from this work, detailed site specific reviews of existing GHG measures and potential measures available to further reduce direct GHG measures are under consideration for implementation at BCM during 2023, the outcomes of which are reported in **Section 6.10.3.1** and **Section 6.10.3.3**.

6.10.3.1 Solar Farm

BCOPL has commenced a project to develop a small solar farm (4.95 MW solar farm and battery) in close proximity to the BCM. The solar farm aims to provide enough energy for all mining operations at BCM to be self-sufficient and run entirely from renewable energy during daytime operations.

BCOPL is seeking a development approval for the solar project and subject to the receipt of the necessary approvals, construction is scheduled to be complete in 2025. The project is to be constructed on land adjacent to the mine on property already owned by BCOPL. A Development Application and associated Statement of Environmental Effects was lodged with NSC in late 2023 and is currently under assessment.

6.10.3.2 Revegetation Works

Extensive revegetation works are being completed in the biodiversity offset areas (pursuant to it the biodiversity offset strategy) and mine rehabilitation areas together with a significant native vegetation corridor which will create a future carbon sink.

6.10.3.3 Modification 8 Workshop

During the application process for MOD 8, BCOPL held a workshop in July 2022 to consider potential additional measures to further minimise the GHG emissions from BCM. A number of these are currently being assessed for their feasibility and practicality including:

- Rail-Conveyor system between the mining area and the CHPP is expected to reduce the use of haul trucks and associated diesel use as mining operations are advancing further to the north;
- Hydrogen Injection Technology which is an emerging technological advancement for internal combustion engines that promises to increase fuel efficiency of heavy mobile equipment; and
- Carbon Farming Feasibility Study using BCOPL owned land to generate carbon sinks through vegetation to offset site emissions.

6.10.3.4 Equipment and Fuel Providers

In 2023, BCOPL conducted meetings with the BCM site equipment's Original Equipment Manufacturers (OEMs) (Komatsu, Hitachi, Cummins etc) and Ampol to understand their roadmap for carbon reduction and assess potential for biodiesel and Renewable Fuel. The OEMs' noted that there are completing research and development projects regarding lower emission equipment. However whilst these technologies are being investigated, they are not of the size and scale which are commercially available to supply vehicles at the scale required e.g. BEV Haul Truck.

Ampol confirmed for BCOPL that alternative fuels are not currently reasonably practicable given the limited availability and elevated price when compared with conventional diesel.

BCOPL will be following up with the OEMs and Ampol (fuel providers) to continue discussions over the availability of new methods, equipment and fuels that can assist in reducing emissions at BCM.

BCOPL will continue to explore possible reasonable and feasible mitigation and management measures to minimise GHG emissions associated with their coal operations.

6.11 Public Safety

6.11.1 Environmental Management

The management of public safety at the BCM involves four key elements as follows:

- Traffic – to ensure a safe environment for public access to and egress from the site and movement within the site;
- Bushfire – to ensure that the public both onsite and offsite are not exposed to increased risk of bushfire as a result of the Project;
- Lighting – to ensure the provision of adequate lighting to minimise adverse risk to the public both onsite and offsite; and
- Security – to restrict public access to areas of BCM where non-inducted and non-trained members of the public may be exposed to adverse risks posed from mining and related activities.

6.11.2 Environmental Performance

6.11.2.1 Traffic

Additional detail on traffic management is detailed in **Section 6.12**.

6.11.2.2 Bushfire

During the reporting period, management of bushfire risk at BCM was achieved through monitoring and maintenance of bushfire hazards including:

- Monitoring and maintaining equipment and areas where bushfire hazards are present to prevent and minimise the potential outbreak of bushfire;
- Regular monitoring of fuel loads adjacent to mining areas and within the mining lease area portion of Leard State Forest;
- Maintaining adequate water supplies;
- Maintaining access tracks and fire breaks around the mining lease;
- Prohibition of burning any materials on-site;
- Maintaining appropriate firefighting equipment in consultation with the NSW Rural Fire Service and maintaining a fire control and emergency system in accordance with the *Work Health and Safety (Mines and Petroleum Sites) Act 2013*; and
- Assessing contractor safety plans to adequately address fire control and response.

BCOPL has historically worked closely with the NSW Rural Fire Service and Forestry Corporation of NSW, and will continue to do so, to ensure that bushfire risks on-site are actively identified and managed.

During 2018, BCOPL installed water fill points across biodiversity offset land to also aid in bushfire fighting circumstances.

No bushfires or fire related incidents were recorded at BCM during the reporting period. Current management controls are considered to be appropriate.

6.11.2.3 Lighting

BCOPL and its subcontractors ensure the careful positioning of on-site light sources to actively minimise associated impacts on surrounding receivers, while maintaining adequate illumination levels for operational activities to be carried out safely. This is particularly the case for the lighting sets at the waste emplacement areas. Lighting is provided and maintained in accordance with *AS/NZS 1158.0:2005 Lighting for roads and public spaces* and *AS 1680.1-1990 Interior lighting – General principles for recommendations*.

The control strategies implemented during the reporting period are considered appropriate and will be continued.

6.11.2.4 Security

BCOPL implements a Site Access and Security Procedure which defines the conditions under which employees, contractors and visitors can access BCM. It outlines policies and strategies for limiting unauthorised access by members of the public with no commercial cause to be on the site, with a view to limiting the risk of personal harm, theft or damage of assets or personal property.

During the reporting period security measures implemented by BCOPL included, but were not limited to:

- Implementing a security check point where workers, contractors and visitors had to be approved by

management to access the site and undergo a temperature check (due to COVID-19 restrictions);

- Maintaining site fencing, gates, and signage at perimeters and road;
- Providing CCTV surveillance at various areas of the site;
- Implementing an on-site tracking system to monitor personnel and vehicles;
- Performing security patrols including out-of-hours patrols by trained security personnel;
- Implementing a site wide policy for vehicle access; and
- Maintaining community engagement through the CCC.

6.12 Traffic

6.12.1 Environmental Management

Traffic generated by construction and operation activities at BCM is managed in accordance with the approved Traffic Management Plan (TMP). The TMP focuses on the broader issues of traffic management at BCM and prescribes the overall requirements of the contractors associated with the BCM. It details management strategies that address environmental and safety risks associated with traffic generated from construction and operation activities to mitigate potential impacts and to satisfy the requirements of SSD 09_0182 and other statutory obligations. The TMP also considers traffic associated with the TCM and MCCM.

The TMP describes forecast operational traffic volumes, site access arrangements, safety improvements, monitoring requirements and control measures to ensure the safe movement of pedestrians and vehicles, and to ensure roads are maintained in a 'fit for purpose' state.

Traffic counts were undertaken at six monthly intervals during the construction phase (2012 – 2015) and at 12 monthly intervals post- construction (mid-2015 onwards); to ensure actual traffic volumes are consistent with the TMP. Where there are significant variations in the traffic volumes on a given road because of BCM's operation, amendments to the TMP shall be considered. Internal and external audits of the implementation of the TMP are undertaken periodically.

6.12.2 Environmental Performance

6.12.2.1 Traffic Monitoring

Traffic incidents, monitoring of road conditions and road kill observations are recorded in weekly inspections and incident reports, where relevant. There were seven BCM personnel traffic-related incidents recorded on roads in the vicinity of the BCM during the 2023 reporting period. These included four wildlife collision events, one severe windscreen smash and two vehicle accidents by personnel on their way to BCM.

6.12.2.2 Inspections and Audits

A traffic count audit was completed during the reporting period over a 2 week period between 11 and 24 October 2023 to investigate traffic flows on the key routes and to quantify the number of vehicles entering the BCM via each access routes.

The traffic monitoring recorded an Annual Average Daily Traffic Volume (AADT) of 623 vehicles per day (vpd) travelling to BCM via the former BCM haul road and 129 vpd traveling to BCM via the Leard Forest Road. This equates to approximately 82.8% via the former BCM haul road and 17.2% via the Leard Forest Road.

An analysis of the traffic counts indicates that 7% of vehicles travelling to the BCM (via the mine access road) were heavy vehicles (Class 4 to 12 vehicles). It is important to note that whilst Class 3 vehicles are also

typically grouped as heavy vehicles, it was observed during the traffic counts that a significant proportion of Class 3 vehicles are small vehicles with wheel base of more than 3.1m, which includes small busses, utes and 4 x 4 vehicles that are often driven by workers involved in construction and mining projects. Accordingly, these vehicles have been reported as light vehicles.

Over the 2-week traffic count period, the survey indicated an AADT of 752 vehicles (heavy and light vehicles). This figure is much lower than the predicted estimated daily traffic volume outlined in the Traffic Management Plan (2022). The TMP estimated a total of 1,174 vehicle trips per day comprising 1,138 vehicle trips per day generated by staff and 36 heavy vehicle movements per day.

6.13 Socio-economic

6.13.1 Socio-economic Management

Socio-economic impacts at the BCM are managed via implementation of the Social Impact Management Plan (SIMP). The approved SIMP contains a commitment to undertake a major review of the document every three years. The SIMP was drafted in November 2013 and approved by the Director-General on 21 April 2014. The SIMP was revised and issued to the then DPHI in June 2016. A further revision was conducted on the SIMP during 2019 and 2020 with the revised draft SIMP being distributed to stakeholders (including the then DPE) for consultation in December 2020. Comments received during the consultation process were then addressed and the revised SIMP was approved by the then DPHI in August 2021. BCOPL are currently reviewing the SIMP regarding the local community and regulatory requirements. This is proposed to be provided to DPHI for review and approval in 2024.

The approved SIMP summarises the findings of the Social Impact Assessment completed as part of the 2010 EA. It outlines BCOPL's commitments to the mitigation and management of social impacts throughout the life of the Project. This includes implementing adaptive management in response to impacts on:

- Housing affordability;
- Local employment;
- Local businesses;
- Social and community infrastructure;
- Community cohesion;
- Farming communities;
- Indigenous communities; and
- Traffic.

The SIMP also outlines strategies for the management of cumulative social impacts from BCM and other mines in the region.

6.13.2 Environmental Performance

Section 7.1 of the approved SIMP outlines a range of measures to be used to monitor the social impact of the BCM. BCOPL's performance against each of the monitoring mechanisms outlined in the SIMP has been assessed as part of the annual review process. The findings of that review are presented in **Table 6-15**.

Table 6-15: Social Impact Monitoring Summary

Monitoring Mechanism	Type	Frequency	Purpose	Status (2023 Reporting Period)
Employment records	Quantitative	Quarterly	Monitor employment diversity (gender, Indigenous status), local residency, journey to work.	Details of the profile of the BCM workforce are provided in **Section 9.4**.
Procurement records	Quantitative	Six monthly	Monitor project spend on goods and services with local and regional business, including sub-contractors.	Approximately $54,207,090 was spent on goods and services procured from the local or regional areas around BCM.
Housing data	Quantitative	Quarterly	Monitor changes in house prices and rentals, vacancy rates, motels and temporary accommodation.	A summary of housing data monitoring is provided in **Section 6.13.2.1**.
Land use data	Quantitative	Annual	Monitor availability of zoned and serviced residential land and supply of new housing.	Refer to **Section 6.13.2.2** for a summary of key land availability and housing supply data for the Narrabri and Gunnedah LGAs.
Social statistics	Quantitative	Six monthly	Monitor changes in service provider statistics (hospital admission rates, GP attendance, school enrolments, emergency response, reported crime).	Refer to **Section 6.13** for a summary of key social statistics.
Attendance Records	Quantitative	Annual	Monitor workforce and community participation in education and training programs, induction programs, local sports events, local business forums and business events.	Details of workforce participation are provided in **Section 9.0**.

Monitoring Mechanism	Type	Frequency	Purpose	Status (2023 Reporting Period)
Workforce Survey	Qualitative	Annual	Record workforce perceptions about general wellbeing, family functioning, and community issues	In November 2023, the workforce was invited to participate in Idemitsu Australia's annual workforce survey. From the feedback captured in this survey elements of the BCO business that are going well and where improvement is required have been identified. The site leadership team is working through a program to provide the workforce with feedback from the survey, combined with proposed action plans to introduce constructive change through a continuous improvement process. This program will commence early in 2024.
Community Survey	Qualitative	Annual	Record community perceptions about company reputation, workforce integration into the community, access to local services, and specific project impacts.	Community is regularly engaged through the CCC meetings. Meetings discuss various topics on how the company is interacting with the community and any specific impacts that are viewed by the local community.
Local business survey	Qualitative	Annual	Record perceptions about access to the supply chain, tender opportunities, and business engagement and support programs.	BCOPL is a member of the Narrabri and District Chamber of Commerce, which meets regularly to discuss business trends and opportunities within Narrabri and its surrounds. BCOPL has not attended meetings over the last 4 years although the District Chamber of Commerce allows BCOPL to provide information to local businesses on upcoming events. BCOPL is a member of the Boggabri Business Chamber. Meetings were attended throughout the reporting period to provide the local business with updates on upcoming events and engage in

Monitoring Mechanism	Type	Frequency	Purpose	Status (2023 Reporting Period)
				local business issues. BCOPL's involvement in Boggabri's business community provides a mechanism for the company to gauge business perceptions about the BCM within the local community. BCOPL held a vendor information session with the Boggabri Business Chamber to discuss opportunities for local businesses.
Indigenous engagement	Qualitative	Annual	Monitor labour demographics in local area	BCOPL facilitates an ASCF. The ASCF provides a forum for raising general issues by stakeholders or BCOPL. The forum met three times during the reporting period and discussed matters including Keeping Place for Aboriginal salvage items, results of environmental monitoring on site, consultation for upcoming modifications and consultation for the review of the CHMP and SIMP. As of 2021, upon employment BCOPL employees can choose to indicate whether they identify as an Aboriginal or Torres Strait Islander person. During the reporting period 5 percent of employees identified as a First Nations person.
Community complaints	Qualitative	Annual	Record workforce perceptions about general wellbeing, family functioning, and community issues	Details of all community complaints received during the reporting period and responses made by BCOPL are presented in **Section 9.3**.

6.13.2.1 Housing

During 2021, BCOPL commissioned an SQM Research report on the Narrabri, Gunnedah and Boggabri area completed in December 2021. An additional housing survey was conducted in November. No housing surveys were completed in 2023.

Housing vacancy data indicated there have been substantial changes in residential vacancy rates over the past 11 years. Between 2009 and 2022, residential vacancy rates in Narrabri fluctuated significantly from less than 1% (two vacancies) in 2009, to a peak of around 5% (55 properties) in December 2015 and a vacancy rate of less than 1% (ten vacancies) in 2022 (SQM 2022).

Between 2009 and 2020, vacancy rates in Boggabri peaked in September 2013 at around 14% (25 vacancies) before dropping to a ten-year low of around 2% (4 vacancies) in September 2014. Between 2014 and 2019, vacancy rates in Boggabri fluctuated with another low of 2% in May 2018 before increasing to 4.6% in April 2019, and then decreasing to a current rate in 2022 of 2.6% (five vacancies) (SQM 2022).

Between 2009 and 2022, vacancy rates in Gunnedah peaked in both May 2013 and August 2015 at around 6% (more than 75 vacancies and more than 80 vacancies respectively). Over the 12-year period, vacancy rates dropped to a low of around 1% in September 2014 before increasing through to the August 2015 high. The residential vacancy rate in Gunnedah during 2022 increased slightly from 2021 to 1% (14 vacancies) (SQM 2022) from 0.7% (12 vacancies) (SQM 2021).

6.13.2.2 Land Availability and New Housing Supply

DPHI housing projections from 2016 to 2041 for the areas of interest are summarised below (DPE, 2022b). DPHI housing projections indicate that the number of households in Gunnedah LGA and New England North West Region are expected to increase between 2016 and 2041, whilst the number of households is anticipated to decline (0.36%) in Narrabri LGA during the period of 2016 to 2041. This is consistent with the NSW population decline projections for Narrabri LGA. DPHI projections suggest a forecast reduction in demand for housing in Narrabri into the future.

Dwelling Approvals

The Gunnedah Shire Council (GSC) *Community Strategic Plan* indicates that improved housing affordability and diversity is needed. GSC has identified that residential and commercial development increased significantly from 2009 to 2014 and remained constant till 2020(Profile ID, 2020). There was a slight decrease in housing approvals in 2022 compared to 2021 though still significantly greater than 2020. This indicates a substantial level of growth that is predicted to be sustained throughout the coming decade. In the Gunnedah LGA, 61 residential buildings were approved to be built in 2021-2022 (ABS 2022).

Building Approvals

Building approvals data provides an indication of population growth and the expansion of urban areas. Residential building approvals data from the Australian Bureau of Statistics shows:

- For the period 2020-2021:
  - Approvals for four new houses in Narrabri LGA, with a total value of approximately $1.3 M.
  - Approvals for 64 new houses, and one other residential building in Gunnedah LGA, with a total value of approximately $24.5 M (ABS, 2021).

- For the period 2021-2022:
  - Approvals for 10 new houses in Narrabri LGA, with a total value of approximately $3.3 M.
  - Approvals for 61 new houses, and one other residential building in Gunnedah LGA, with a total value of approximately $22.2 M (ABS, 2022).

Future Development

Future land development in the Narrabri and Gunnedah LGAs will be centred around housing development, and several key precinct plans. All future land development options were to be considered at the end of 2021. No further update is available on the NSC website.

In 2020, the NSC finalised its Local Strategic Planning Statement – Future 2040 (NSC LSPS) (NSC, 2020) report which provides a road map to manage the forecast growth within the region whilst ensuring that NSC can continue to deliver the required services and facilities for its local community. The NSC LSPS is supported by the NSC's 2017-2027 Community Strategic Plan and the Narrabri Local Environmental Plan (LEP) to sustainably deliver the forecast growth over the next 20 years. In relation to housing, the NSC has committed to implementing a precinct plan for the Narrabri CBD (Master Plan). The Master Plan aims to identify the constraints and opportunities to improve the functionality and appeal of the Narrabri business precinct, which will also include improvements to the existing industrial and logistics precinct to be able to support the development of the Northern NSW Inland Port. NSC has a series of additional planning studies underway that will lead to appropriate zonings and the finalisation of the Master Plan for the 'Inland Port.' These studies have continued throughout 2022 and are anticipated to be released in the near future. The Northern NSW Inland Port will facilitate future manufacturing, production and industrial and logistics operations (The Courier, 2020). It was noted during consultation with NSC that it had purchased several land parcels to develop and rezone for the purposes of supporting the 'Inland Rail' project.

NSC has committed to developing a Housing Strategy in accordance with Planning Priority 7 of the NSC LSPS (*Provide new space to grow and deliver greater housing diversity to suit changing needs*). The Housing Strategy which remains under development will address matters such as "*capacity for residential development in the CBD, building heights and densities, changing demand for housing due to an ageing population*."

The GSC *Local Strategic Planning Statement - Future 2040* (Gunnedah Shire Council, 2020b) report presents the planning priorities for the Gunnedah LGA over the next 20 years. The *Local Strategic Planning Statement - Future 2040* report indicates that the GSC will undertake regular monitoring of housing development, land demand and supply to remain informed of housing demands.

6.13.2.3 Social Statistics

Health

BCOPL contacted local healthcare service providers via telephone during early 2020 to evaluate the effects that BCM may have had on healthcare services in recent years. The feedback received indicated that the demand on local services has remained stable in recent years and that local providers are sufficiently staffed to cope with the number of patients visits they typically receive. Further consultation during early 2021 with health care providers over an upcoming modification at BCM support this feedback. Findings indicated that current demand upon health services is manageable (DPE, 2019).

Schools

As part of the social impact monitoring required under the SIMP, BCOPL completed a review of school enrolment records for all public schools in Gunnedah, Narrabri, Maules Creek and Boggabri between 2011 and 2022. 2023 enrolment data is released Mid-to-late 2024 which will be reported in the 2024 Annual Review.

Enrolment records indicate there have been gradual increases and decreases in student numbers amongst schools, with no significant trends observed between different years. Gunnedah High School has experienced a decline in enrolment numbers since 2011, though recent enrolments at Narrabri high school have slightly increased. The declining enrolment at Gunnedah High School may be attributed to a growing trend of boarding school education or a shift to accessible private education options such as St Xaiver's Christian School and Saint Mary's College whose enrolments increased to 396 and 445 in 2022. A summary of annual enrolments for local schools between 2011 and 2022 is provided in **Table 6-16**.

Table 6-16: Local School Enrolments 2011 - 2022

School	Annual Enrolments											
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Boggabri												
Boggabri Public School	98	101	105	123	117	117	113	88	83	69	77	86
Sacred Heart Boggabri	37	32	33	34	23	24	37	43	39	43	38	40
Narrabri												
Narrabri Public School	≈ 400	≈ 395	≈ 400	≈ 410	≈ 410	406	403	399	394	353	329	298
Narrabri West Public School	≈ 230	≈ 240	≈ 280	≈ 280	≈ 300	370	348	327	330	325	313	301
Narrabri High School	568	589	588	614	587	540	508	488	489	504	521	511
St Xavier's Narrabri	240	224	113	171	195	178	188	189	187	212	235	237
Fairfax Public School	8	8	13	10	10	12	14	11	11	8	6	3

School	Annual Enrolments											
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Gunnedah												
Carinya Christian School – Gunnedah	37	43	6	17	42	69	89	99	155	186	220	211
Saint Mary's College Gunnedah	-	-	379	408	401	379	357	364	379	370	421	445
St Xavier's Gunnedah	-	-	350	350	358	350	371	381	365	382	374	396
G S Kidd Memorial School	45	49	32	33	40	40	40	36	36	33	33	35
Gunnedah Public School	≈ 135	≈ 130	≈ 120	≈ 122	≈ 122	≈ 122	156	155	156	164	154	172
Gunnedah South Public School	≈ 480	≈ 520	≈ 570	599	616	620	634	629	636	614	607	571
Gunnedah High School	≈ 550	≈ 550	≈ 500	≈ 450	≈ 430	430	391	414	426	432	399	357

7.0 WATER MANAGEMENT

Water management at BCM is undertaken in accordance with the approved water management plans, prepared in accordance with SSD 09_0182. The Water Management Plan (WMP) acts as the overarching document governing water management at BCM. Approved subordinate plans supporting water management include:

- Surface Water Management Plan (SWMP);
- Groundwater Management Plan (GWMP);
- Site Water Balance (SWB) report; and
- BTM Complex Water Management Strategy (WMS).

The water management system operates across four key elements as defined below:

- **Clean water** is defined as runoff from catchments that are not disturbed by mining operations;
- **Dirty water** is defined as runoff from disturbed areas within the mine site and includes runoff from spoil dumps, haul roads and parts of the mine infrastructure area. This water contains high levels of suspended solids;
- **Contaminated water** is defined as runoff generated from coal stockpiles, the CHPP, parts of the MIA and the mining void, as well as groundwater inflows to the mining void. This water contains high levels of suspended solids and is mildly saline; and
- **Erosion and sediment control** is defined as the suite of management and physical measures available to minimise the generation of soil erosion and to prevent soil and sediment entering the receiving water systems (i.e. 'Nagero Creek' and the Namoi River).

7.1 Surface Water

Surface water is managed in accordance with BCM's SWMP and associated water management plans which conform to the approvals, licences and other regulatory requirements of BCM. The key objectives of the surface water management system are to:

- Segregate clean runoff, dirty runoff, and contaminated water generated from rainfall events and mining operations;
- Minimise the volume of contaminated mine water (surface runoff draining to the pit and groundwater seepage) generated by BCM;
- Preferentially reuse contaminated water for dust suppression and coal washing;
- Provide sufficient on-site storage to avoid releases of contaminated water that could affect the quality of downstream watercourses;
- Treat all dirty runoff from un-rehabilitated overburden areas to settle coarse suspended solids; and
- Where practicable, divert 'clean' runoff to downstream creeks.

In accordance with SSD 09_0182, BCM maintains a SWB for effective management of water resources. The SWB details water use, water demand and water management at BCM, as well as the sources and security of water supply, including contingency for future reporting periods. The SWB is regularly revised in order to reflect modifications to the mine plan.

7.1.1 Erosion and Sediment Control

Erosion and sediment control at BCM is guided by the WMP and the SWMP and is consistent with the "Blue Book" - *Managing Urban Stormwater, Soils and Construction, Volume 1* (Landcom, 2004) and *Managing Urban Stormwater, Volume 2E: Mines and Quarries* (DECC, 2008).

Erosion and sediment control measures employed at BCM include:

- Minimising ground disturbance where possible;
- Amelioration of dispersive soil to minimise the risk of rill, gully and tunnel erosion and to allow the infiltration of surface water;
- Contour scarification of compacted surfaces to encourage infiltration and surface roughness;
- Placing removed soils in areas where they are less likely to be affected by rainfall;
- Stockpiling in a stable manner by ensuring that topsoil is not dispersed and the height of stockpiles is restricted to 3 m;
- Long term (greater than six months) stockpiles are stabilised by appropriate seeding or mulched vegetation where possible;
- Disturbed areas are rehabilitated as soon as possible following disturbance, including regrading where required;
- Where feasible, understorey and ground cover vegetation are retained in and around drainage lines;
- Preventing vehicles from entering topsoiled rehabilitation areas to prevent damage to vegetation and soil structure;
- Erosion and sediment control measures are installed before commencement of any works;
- All erosion control measures are maintained until all earthworks and mining activities are completed and site rehabilitation is complete; and
- All erosion and sediment control measures employed are appropriately designed, sized, located and installed. Erosion and sediment control measures include the use of:
  - Sediment fencing;
  - Channel bed and bank protection;
  - Earth bunds and diversion drains;
  - Geotextile sediment fencing; and
  - Sediment retention basins.

7.1.2 Surface Water Quality Monitoring

To track surface water quality within and around the site and to determine environmental compliance and performance, BCOPL undertakes 'ambient,' 'event' and 'frequency' based water quality monitoring in accordance with the SWMP and EPL12407.

Ambient monitoring measures the surface water quality of the receiving environment surrounding BCM (i.e. outside the site water management system). Ambient monitoring is triggered by an event such as a 'wet weather discharge' rather than as part of a set sampling regime.

Mine site event-based monitoring is undertaken within the site water management system and includes monitoring of sediment dams and mine water dams (MWD) in response to controlled discharges (i.e. release

from a sediment dam), uncontrolled discharges (i.e. spillage from a dam during wet weather) or emergency discharges (i.e. an emergency discharge due to wet weather).

Frequency based monitoring is undertaken within the site water management system on a quarterly basis to assess the condition of site water quality and inform ongoing management.

Details of BCM's surface water quality monitoring program including monitoring locations, trigger events and sampling methods, are outlined in **Table 7-1**.

Table 7-1: Surface Water Quality Monitoring Regime

EPL ID	Location	Location description	*Trigger event/ Type of monitoring	Frequency	Sampling method
Ambient and Event Based Monitoring					
1	SD6	Nagero Dam	Wet weather discharge Controlled discharge water quality	As soon as practicable at the commencement of a wet weather discharge	Grab sample with conductivity and pH in situ
3	SD3	Southwest corner of spoil dump	Wet weather discharge Controlled discharge water quality	As soon as practicable at the commencement of a wet weather discharge	Grab sample with conductivity and pH in situ
4	SD4	Sediment dam at rail load out area, west of mine site	Wet weather discharge Controlled discharge water quality	As soon as practicable at the commencement of a wet weather discharge	Grab sample with conductivity and pH in situ
5	SW1 'Nagero Creek'	Downstream of mining	Discharge water quality (from EPL points 1,3 & 4)	As soon as practicable during or following a rainfall event sufficient to generate flow in 'Nagero Creek' OR As soon as practicable during a discharge event from EPL discharge points 1, 3 & 4	Grab sample with conductivity and pH in situ

EPL ID	Location	Location description	*Trigger event/ Type of monitoring	Frequency	Sampling method
6	SW2 'Nagero Creek'	Upstream of mining	Discharge water quality (from EPL points 1,3 & 4)	As soon as practicable during or following a rainfall event sufficient to generate flow in 'Nagero Creek' OR As soon as practicable during a discharge event from EPL discharge points 1, 3 & 4	Grab sample with conductivity and pH in situ
Frequency Based Monitoring					
36	SD6^	Nagero Dam	Surface water quality	Quarterly	In situ
37	SD10 & SD12	Near CHPP	Surface water quality	Quarterly	In situ
38	SD3^	Southwest corner of spoil dump	Surface water quality	Quarterly	In situ
41	MW3	South of MIA	Surface water quality	Quarterly	In situ

Notes:
* Wet weather discharge: An overtopping event from a dam as a result of excessive rainfall (i.e. typically via the emergency spillway)
* Controlled discharge water quality: a controlled discharge event from a dam (i.e. drawdown of a dam after adequate sediment settlement has occurred)
^ EPL Point – Licensed discharge point

Surface water quality testing parameters from the SWMP are specified in **Table 7-2**.

Table 7-2: Surface Water Quality Testing Parameters

Monitoring Type	Determinants
Ambient and event based	Conductivity, nitrate, nitrogen (total), oil and grease, pH, phosphorus (total), reactive phosphorus, total suspended solids, dissolved metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc, iron)
Frequency based (quarterly)	Conductivity, pH, Temp

BCOPL uses a handheld multi-parameter water quality probe (pH, EC, temperature) for field checks. All water quality samples requiring lab analysis are sent to a NATA-accredited laboratory for processing.

7.1.2.1 Water Storage and Usage Monitoring

Water storage levels of all active sediment dams and mine water dams are monitored and recorded on a weekly basis. This allows for effective management of stored supplies in terms of consumption, potential discharges and infrastructure planning.

BCOPL submitted an updated SWMP (Rev 8) to DPHI (formerly DPIE) for approval in July 2019; however, no approval has yet been received. It is noted that the implementation of the currently approved SWMP is non-compliant as the clean water drain presented in the SWMP to the north of the disturbance area has been mined through and has not been reinstated.

This current clean water drainage system is presented in the SWMP (Rev8) submitted to DPHI which removes this clean water drain. GHD were commissioned by BCOPL to complete a report to justify not reinstating this drain and provided evidence that BCM is not harvesting clean water outside of harvestable rights allowances (GHD, 2017). As the current SWMP (Rev8) is yet to be approved by DPHI the implementation of the approved SWMP is considered non-compliant.

BCOPL continue to liaise with DPHI throughout the reporting period regarding the approval of the revised water management system, as part of the subsequent updated SWMP (Rev 9) which was submitted to DPHI for consultation in March 2024.

7.1.3 Environmental Performance

7.1.3.1 Surface Water Quality Criteria

Interim Trigger Levels

The SWMP specifies interim trigger levels for ambient monitoring, i.e. water quality of Nagero Creek when a discharge event occurs at BCM. Sufficient baseline data for the formation of statistically sound trigger levels is not available for Nagero Creek and the ANZECC (2000) default guidelines are considered to be unsuitable, as the ambient water quality has historically exceeded some of the criteria. The SWMP therefore assigns interim trigger levels based on the ANZECC *guideline values for the protection of Environmental Values* (2010) and the 80th percentile value of the limited ambient monitoring results historically collected from SW2.

7.1.3.2 Results of Event Based Monitoring

The approved SWMP requires BCOPL to undertake surface water quality monitoring in Nagero Creek upstream (SW2) and downstream (SW1) of the BCM as soon as possible at the commencement of discharge.

No discharge events occurred during the reporting period as such no event based sampling was undertaken. This is a reduced occurrence of discharge when compared to the 2022 reporting period and is due to the significant decrease in rainfall in 2023 when compared with 2022, see **Section 6.1.2.2** for further details.

7.1.3.3 Results of Frequency Based Monitoring

Frequency based monitoring was undertaken on the following dates:

- Quarter 22 March 2023;
- Quarter 2 June 2023;
- Quarter 5 – 7 September 2023; and
- Quarter 5 – 6 December 2023.

The in-situ results for quarterly monitoring are provided in **Table 7-3**, with the laboratory results indicated in brackets.

Table 7-3: Summary of Frequency Based Monitoring Results

	MW3	SD3	SD4	SD6	SD10	SD12	SD23	MW5
pH								
Q1	8.16	8.01	-	7.45	7.92	7.96	7.79	8.26
Q2	8.6	8.34	-	7.91	8.11	8.3	8.3	8.21
	(8.16)	(8.36)	(-)	(7.97)	(8.42)	(8.51)	(8.52)	(8.44)
Q3	8.3	8.96	-	7.87	8.61	8.81	8.32	8.28
Q4	8.56	8.2	-	8.23	8.72	8.22	8.17	8.58
	(8.79)	(8.37)	(-)	(8.51)	(8.86)	(8.34)	(8.38)	(8.82)
Average of In Situ Results	**8.41**	**8.38**	**-**	**7.87**	**8.34**	**8.32**	**8.15**	**8.33**
Conductivity (µS/cm)								
Q1	697	1431	-	598	1,273	1,402	887	1,398
Q2	697	566	-	494	1,211	1,727	1,702	1,758
	(702)	(596)	(-)	(549)	(1,450)	(1,720)	(1,690)	(1,720)
Q3	751	637	-	632	1,661	2,268	1,863	1,956
Q4	838	669	-	682	1,414	1,531	1,816	1,823
	(843)	(661)	(-)	(684)	(1,430)	(1,630)	(1,750)	(1,830)
Average of In Situ Results	**745.75**	**825.75**	**-**	**601.5**	**1,389.75**	**1,732**	**1,567**	**1,733.75**

() Brackets are lab based results
- no results recorded

Results show pH measured in situ (site samples) ranged from 7.45 to 8.96, with an average of 8.25 across all mine water and sediment dams included in quarterly monitoring. This is a slightly lower average than recorded in the 2022 reporting period where the average overall pH was 8.36. The in situ pH results were generally similar to the lab analysis results.

Conductivity measured in situ ranged from 494 µS/cm to 2,268 µS/cm with an average of 1,227.93 µS/cm across all surface water monitoring locations during the reporting period. This is a slightly higher average than recorded during 2022 reporting period where the average overall conductivity was 922.49 µS/cm. The in situ conductivity results were generally similar to the lab analysis results with a few minor exceptions including 239 µS/cm difference in Q2 at SD10 and 99 µS/cm difference in Q4 at SD12.

7.1.3.4 Demand, Take and Usage

In accordance with its surface water licences and SSD 09_0182, BCOPL accesses surface water from the Namoi River from time to time. BCOPL also holds water entitlements for groundwater extraction from the Namoi River alluvium. Furthermore, BCOPL can trade additional water to make up shortfalls. Where necessary, BCM uses existing water entitlements to supplement demand. The water taken from the existing licenses as at the end of the water year (1 July 2022 to 30 June 2023) is detailed in **Table 7-4**.

Table 7-4: Water Take

Water Access Licence No.	Water Source and Water Sharing Plan (WSP)	Allocation (ML)	Carryover from Previous Water Year	Temporary Transfers (ML)	Passive Take / Inflows (ML)	Active Pumping (ML)	TOTAL (ML)*
15037 12767 24103 12691 36547 37519	Upper Namoi Zone 4 Namoi Valley (Keepit Dam to Gin's Leap), Upper and Lower Namoi Groundwater Sources WSP	1,028	2,056	833	37	1	38
29473 29562	Gunnedah Oxley Basin Murray Darling Basin Groundwater Source, NSW Murray Darling Basin Porous Rock Groundwater Sources WSP	842	210.5	0	284	12.5	296.5
44134	Bluevale Water Source, Namoi and Peel Unregulated Rivers Water Sources 2012	0	0	846	308.4	0	308.4
2571 2572 2595 2596	Lower Namoi Regulated River, Upper Namoi and Lower Namoi Regulated River WSP	640.92	427.9	350	0	0	0
37067	Upper Namoi Regulated River, Upper Namoi and Lower Namoi Regulated River WSP	128	64	128	0	0	0
42234	Upper Namoi Zone 11 Maules Creek	20	40	0	1	0	1

Water Access Licence No.	Water Source and Water Sharing Plan (WSP)	Allocation (ML)	Carryover from Previous Water Year	Temporary Transfers (ML)	Passive Take / Inflows (ML)	Active Pumping (ML)	TOTAL (ML)*
	Groundwater source. Purchased 9/1/2019						

Water Demand

Core water demands during the 'water year' reporting period (1 July 2022 to 30 June 2023) were for coal processing in the CHPP and dust suppression. Quantities of water were also required for vehicle washdown and potable water uses. **Table 7-5** outlines future estimated water volumes for key water demands as described in the SWB.

Water demand predictions were initially provided in the 2010 EA; however, these have been updated a number of times since to account for changes to water demand and usage in light of approved changes to the operations.

Table 7-5: Predicted Water Demand

	Dust suppression (haul roads)	CHPP	MIA and Potable water
Period	Jan 2017 to 2033	Jan 2017 to 2033	Jan 2017 to 2033
Demand	1,460 Megalitres (ML)/yr	1,460 ML/yr	365 ML/yr

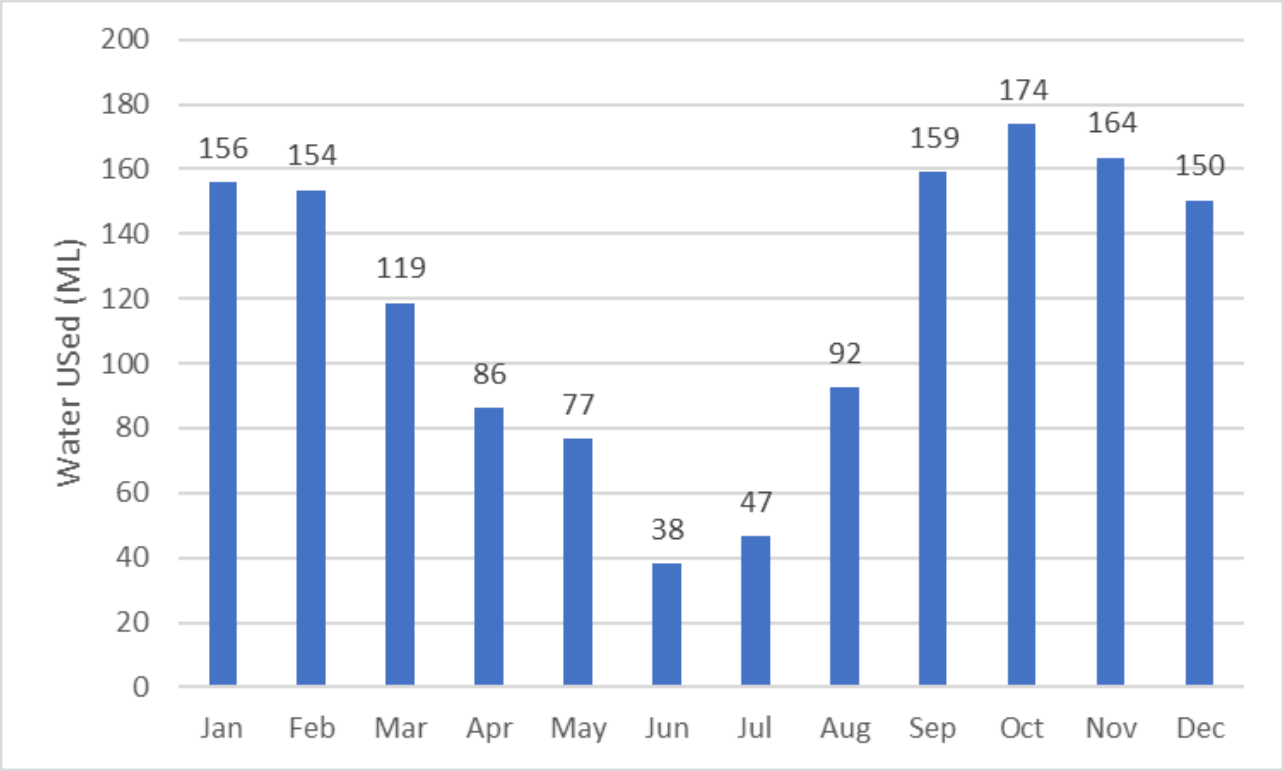
Water Usage

Dust suppression accounts for the majority of water usage at BCM and involves application by water cart to unsealed roads, trafficable areas, windrows, stockpiles and batters.

During the reporting period, 1,416.8 ML of water was used for dust suppression. This represents an increase in water use from the previous reporting period, when 814.0 ML of water was used. The increase in water used is most likely due to the reduced rainfall experienced when compared to 2022, see **Section 6.1**.

In addition, a total of 241.3 ML of water was used in the CHPP during the reporting period. This includes water used in the coal bypass, processing plant and train load out. The total water usage for dust suppression and the CHPP is below the predicted demand as detailed in **Table 7-5**.

Figure 7.1: 2023 Monthly Dust Suppression Water Usage (ML)



Water Storage

Details of BCM's water storage dams including their design capacity and storage at the beginning (as at 3 January 2023) and end of the reporting period (as at 29 December 2023), are outlined in **Table 7-6**.

Table 7-6: Water Storage Summary

Storage	Location/ description	Stored water	Catchment area (ha)	Required minimum capacity (ML)	Design capacity (ML)	Water stored start of period (ML)	Water stored end of period (ML)
Dirty Water							
SD3	West of spoil dump	Dirty Water: runoff from partially rehabilitated spoil dump	194.2	92.1	102.3	47.8	36.1

Storage	Location/ description	Stored water	Catchment area (ha)	Required minimum capacity (ML)	Design capacity (ML)	Water stored start of period (ML)	Water stored end of period (ML)
SD6	Downstream of Mine Infrastructure Area (MIA) (referred to as Nagero Dam)	Dirty Water: Runoff from grassed areas near MIA, and overflows from SD10 and SD8	64.3	14.6	55.9	10.7	5.9
SD7	Eastern spoil dump	Dirty Water: runoff from spoil dump and clean runoff from undisturbed catchment	207.8	57.5	95.1	72.4	64.5
SD8	In MIA	Dirty Water: runoff from MIA	10.9	5.6	13.4	3.6	2.3
					Dirty water total	**134. 4**	**108.8**
Contaminated Water							
SD10	CHPP	Contaminated Water: runoff from product coal stockpile	31.8	92.1	102.3	62. 7	59.22
SD11	At rail loop	Contaminated Water: runoff from rail loop	3.9	10	16.4	2.1	3.3
SD12	CHPP	Contaminated Water: runoff from ROM coal stockpile	45.7	136.6	206.6	131.1	48.6
SD23	Near topsoil stockpile	Dirty Water: runoff from topsoil stockpile	56.5	8.7	17	16.7	14.8
SD28	Train loads out facility (**TLO**)	Contaminated Water: Runoff from TLO	0.7	2.6	3.5	3.5	3.4
MW3	South of MIA	Contaminated Water: surplus pumped from SD2 and clean runoff from small, grassed catchment	10.7	22.5	153.5	102.8	44.0

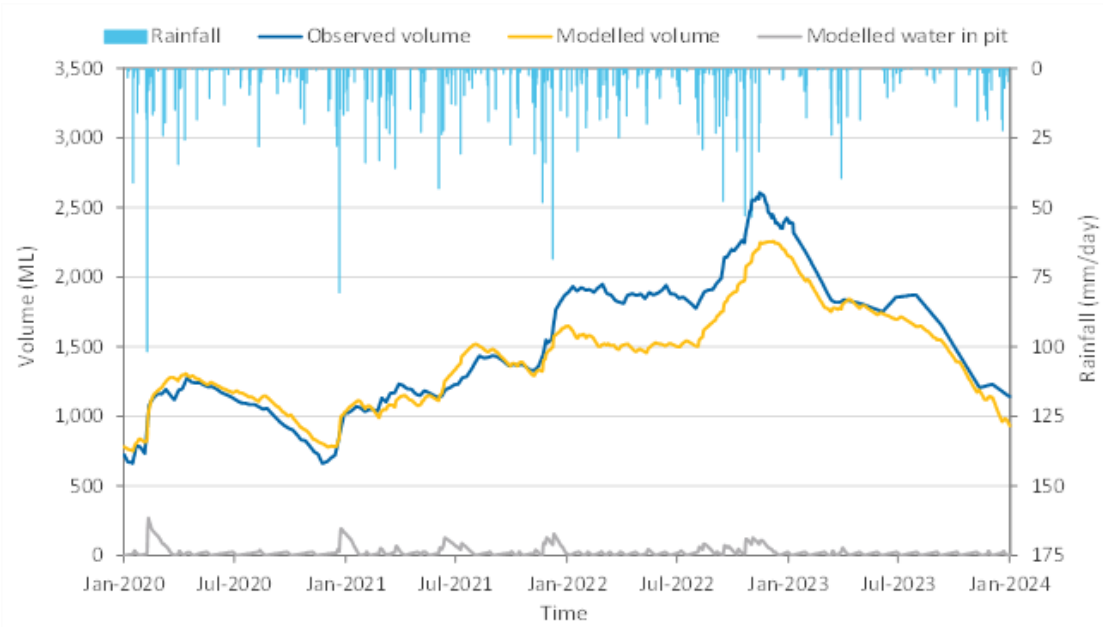
Storage	Location/ description	Stored water	Catchment area (ha)	Required minimum capacity (ML)	Design capacity (ML)	Water stored start of period (ML)	Water stored end of period (ML)
MW5	In pit	Contaminated Water Storage Dam	208.1	40	2,200	1,876.8	855.7
MW9[a]	In pit	Contaminated Water: surplus mine water from pit	-	-	31.2	75.1	-
MW10[b]	In pit	Contaminated Water: surplus mine water from pit	-	-	7.1	-	4.22
					Contaminated water total	**2270.7**	**1033.1**

a MW9 Decommissioned 25 November 2023
b MW10 commissioned 12 November 2023

7.1.3.5 Water Balance Modelling

The site water balance model was reviewed and recalibrated for 2023, see Appendix H (EMM 2023) by comparing the observed and modelled site water Inventory (**Figure 7.2**). The calibrated site water balance model was considered to provide a reasonable fit to the observed site water inventory and is therefore expected to continue to provide reasonable estimates of future water demands, inventories, and discharges.

Figure 7.2: Modelled vs Observed Site Water Inventory



Long Term Trend Analysis

In accordance with SSD 09_0182, a long term trend analysis of surface water monitoring results at BCM has been undertaken using data from 2019 to 2023 to identify any trends in the monitoring. The results indicate the following:

- The pH of surface monitoring results stayed relatively stable between 2019 and 2023 with values ranging between 7.07 and 9.24 (**Figure 7.3**). In 2023 and increasing trends was exhibited, likely due to the decrease in rainfall when compared to 2022 (**Section 6.1**).
- Historical trends show fluctuations in EC between 2019 and 2022. Since mid-2022, EC exhibited an increasing trend for all monitoring sites (**Section 6.1**). This is likely due to lower than average rainfall conditions (**Section 6.1**).

Figure 7.3: Long Term Surface Water Monitoring Results for pH

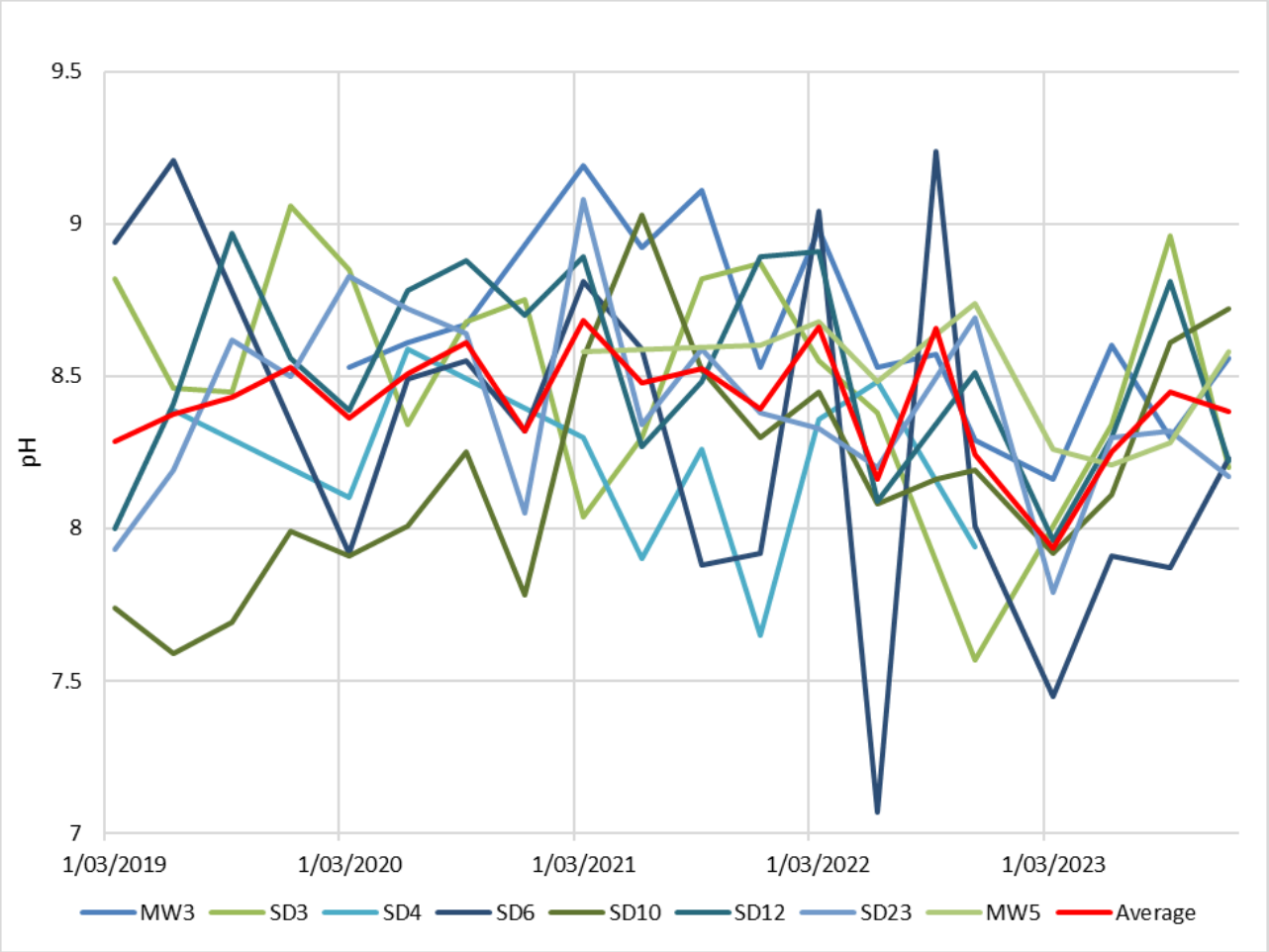
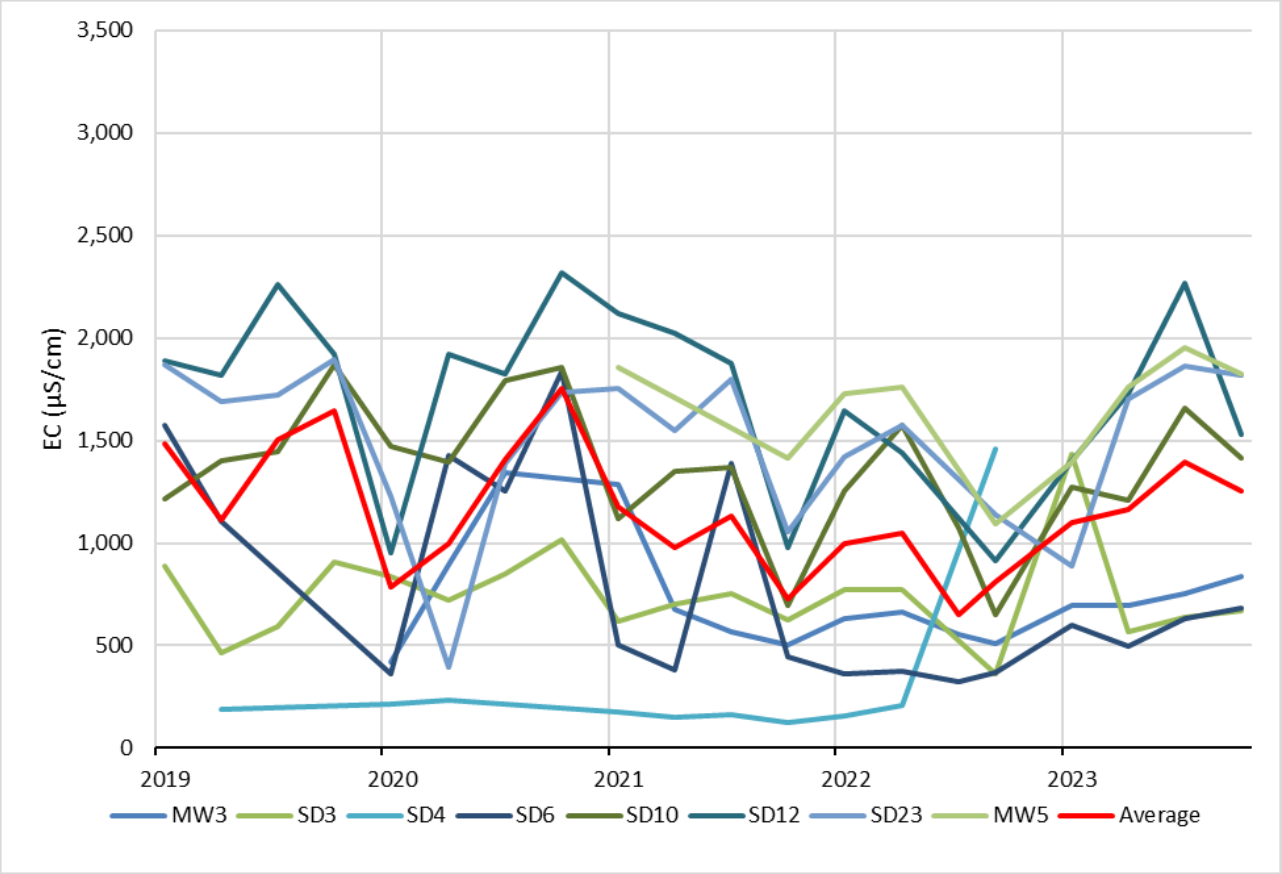


Figure 7.4: Long Term Surface Water Monitoring Results for EC



7.1.4 Improvements and Initiatives

Control strategies implemented under relevant management plans and strategies are considered to be adequate to manage and mitigate impacts to surface water downstream of the BCM. These will continue to be implemented throughout future reporting periods and updated where deemed necessary. Impacts to the downstream environment during the current reporting period are considered negligible.

In response to an Enforceable Undertaking (EU 230608) issued by NRAR on 8 June 2023, BCOPL has upgraded the monitoring system to include additional water metering and telemetry functionality on key water storages and water transfers across the BCM. This will allow the measurement of water transferred out of the pit and into the MWDs and to obtain a better understanding of the water used across the BCM.

7.2 Groundwater

7.2.1 Environmental Management

Groundwater is managed in accordance with BCM's approved water management plans, specifically the GWMP. A general overview of water management at BCM is provided in **Section 7.1**.

The GWMP provides a framework defining how BCOPL will assess, manage, and mitigate impacts to the groundwater system. This particularly focuses on impacts to the shallow alluvial aquifer attributable to mining

activities such as dewatering the open pit void. The GWMP specifies impact assessment criteria and trigger levels to identify groundwater level and quality changes, and outlines BCOPL's monitoring and reporting requirements for groundwater management.

BCOPL holds licences for extraction from several groundwater bores. The amount of water extracted from groundwater sources and corresponding entitlements are identified in **Table 7-4**.

7.2.1.1 Groundwater Monitoring Program

BCOPL's groundwater monitoring program focuses on potential impacts to environmental assets and groundwater users in the area surrounding BCM, and aims to:

- Identify changes to the natural groundwater system attributable to mining operations; and
- Demonstrate compliance with the SSD 09_0182.

Groundwater monitoring during 2023 at BCM consisted of monitoring of groundwater levels and sampling of groundwater quality. Groundwater monitoring was undertaken in accordance with the requirements of EPL 12407 and the GWMP. Groundwater levels were monitored manually on a quarterly basis (March, June, September, and December 2023), as listed in **Table 7-7**.

Table 7-7: Groundwater Quality Testing Parameters

Monitoring type	Determinants
Six-monthly laboratory analysis (June and December)	Sulphate as SO_4^{2-} , chloride, calcium, magnesium, sodium, potassium, dissolved arsenic, dissolved cadmium, dissolved chromium, dissolved copper, dissolved lead, dissolved manganese, dissolved nickel, dissolved zinc, dissolved iron, ammonia as N, nitrite as N, nitrate as N, nitrite + nitrate as N, total nitrogen as N, total phosphorus as P, reactive phosphorus as P, hydroxide alkalinity, carbonate alkalinity, bicarbonate alkalinity and total alkalinity.
Quarterly field parameters (March, June, September, and December)	Electrical Conductivity (EC), pH, temperature, groundwater level

Groundwater quality field parameters (EC, pH and temperature) were measured quarterly, while sampling for major ions, dissolved metals and nutrients was undertaken in June and December 2023.

Groundwater sampling was undertaken using a groundwater pump and a minimum of three well volumes were purged or until the field parameters stabilised prior to sample collection. Samples were filtered onsite for the dissolved metal suite.

During the reporting period the active groundwater monitoring network comprised five monitoring bores screened across different geological units. Details of these bores are listed in **Table 7-8**.

Table 7-8: Groundwater Monitoring Bores

EPL ID	Bore	Licence	Depth (mBGL [A])	Screen interval (mbtoc [B])	Geological Unit	Screened geology	Notes for reporting period
7	GW3115	90BL253832	-	0-42	Colluvial Aquifer	Boggabri Volcanics (weathered)	Water level and quality data collected

EPL ID	Bore	Licence	Depth (mBGL [A])	Screen interval (mbtoc [B])	Geological Unit	Screened geology	Notes for reporting period
							as per groundwater management plan.
12	IBC2110	90BL253841	100	91-97	Colluvial Aquifer	Boggabri Volcanics	Water level and quality data collected as per groundwater management plan.
13	IBC2111	90BL253840	45	36-42	Colluvial Aquifer	Boggabri Volcanics (weathered)	Water level and quality data collected as per groundwater management plan.
-	BC2181 (MW4)	90BL255765	114	105-111	Maules Creek Formation Aquifer	Merriown Coal Seam	Water level and quality unavailable for November 2022 due to inaccessibility.
-	MW6	90BL254255	-	18-22	Nagero Creek Alluvium	Alluvium	Water level and quality data collected as per groundwater management plan.

[A] Metres below ground level
[B] Metres below top of casing

7.2.2 Environmental Performance

7.2.2.1 Groundwater Level Results

The minimum recorded water levels in 2023 have been compared with the trigger levels defined in the GWMP are provided in **Table 7-9**. This table also includes updated trigger values that include the most recent monitoring data. This allows for long-term changes to the groundwater levels to be accounted for, whilst still allowing for sudden changes in groundwater levels to be identified and investigated.

The GMP requires that 5th percentile groundwater level trigger values be recalculated each year to include the additional data. The recalculated trigger values are generally within 400 mm of the triggers included in the GWMP triggers (**Table 7-9**). Recalculated triggers for the 2022 reporting period generally stayed the same (with only minor decreases of less than 100mm) or increased. This is likely due to continue above average rainfall in the 2022 reporting period. During the 2023 reporting period, groundwater levels were observed to

slightly decrease uniformly. This is likely due to the lower than average rainfall that occurred during the reporting period.

During the monitoring period, all monitoring bores screened remained within trigger values defined in the GWMP.

Table 7-9: Minimum Measured Groundwater Levels

Monitoring bore	Trigger value (5th percentile) (mAHD)		Minimum water level 2023 reporting period
	GWMP [A]	Recalculated	
GW3115	256.98	256.9	256.98
IBC2110	257.11	257.5	264.81
IBC2111	256.62	257.0	264.4
MW6	258.48	258.4	263.68

[A] Approved trigger levels from the approved Groundwater Management Plan

The groundwater level monitoring results obtained during the reporting period have been added to the long-term hydrographs presented annually for BCM, as shown in **Figure 7.5**. **Figure 7.5** also includes monitoring data from the discontinued bores.

Figure 7.5: Long Term Groundwater Levels for all Bores

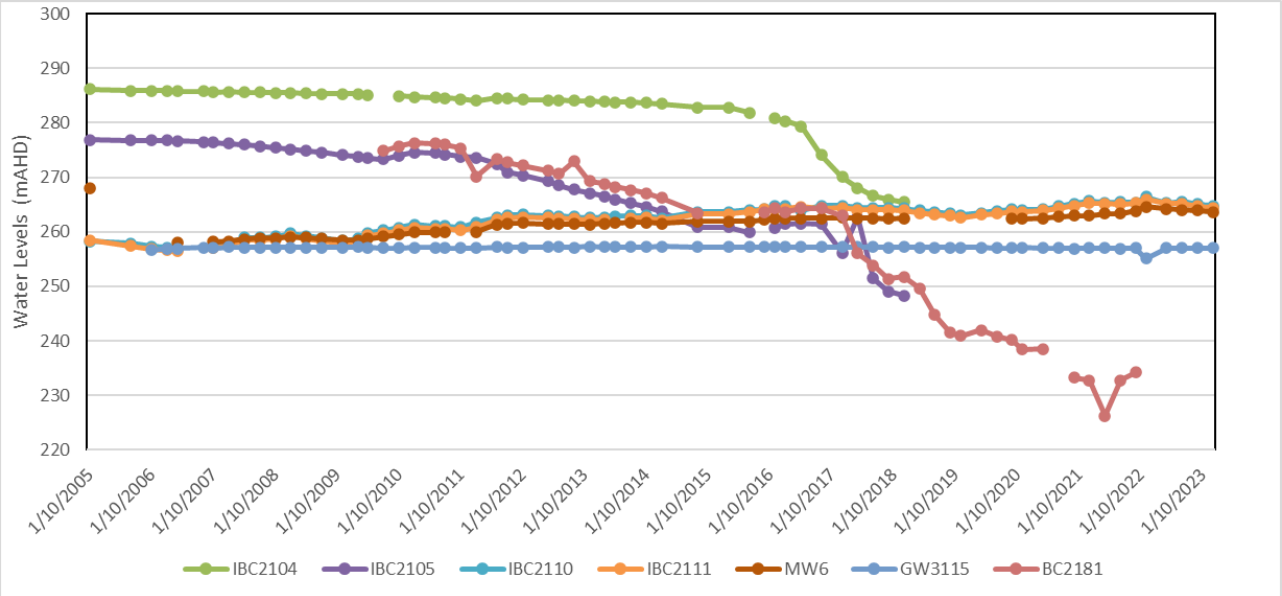


Figure 7.5 clearly shows that the monitoring bores within the Boggabri Volcanics (IBC2110, IBC2111 and GW3115) and alluvium (MW6) have continued to remain relatively stable, whilst a clear downward trend continued for the monitoring bore within the Merriown Seam (BC2181), as mining progressed and depressurised the seam. This bore has since been removed due to the progression of mining.

7.2.2.2 Comparison of predicted and annual water levels

Australasian Groundwater & Environmental Consultants (AGE) (2010) developed and calibrated a groundwater model to predict possible void inflows and drawdown caused by the coal extraction activities. AGE have since revised the groundwater model to include cumulative impacts from adjacent operations within the BTM Complex.

Modelled water levels were predicted to decrease over the life of the mine (AGE, 2010). Drawdown has been observed in Maules Creek Formation, which is consistent with the predicted decrease in water levels at BC2181.

The BTM Complex Groundwater Model was validated and updated in 2018. Immediately following acceptance of this model by DPIE, the BTM commenced consultation with members of DPIE's Resource Assessments team and their Water Division along with NRAR. Validation, update and consultation of this groundwater model has been ongoing throughout 2018, 2019, 2020 & 2021 with submission of the resulting model report to DPHI in January 2022. The document was finalised in May 2022. The BTM Complex are currently in discussions regarding the next update to this model.

7.2.2.3 Groundwater Quality Trigger Values

For certain parameters, the groundwater quality data collected to date has been reviewed and used to develop revised site trigger values for groundwater quality, which are documented in the latest version of the GWMP (May 2017).

Criteria to develop the trigger values have followed the percentiles approach instead of the standard deviation, as recommended for skew ed data, which applies to the BCM. The following assessment criteria are defined in the GWMP:

- One data point greater than the High Trigger Value (HTV), defined as the 99.87th percentile.
- Two consecutive data points greater than the Medium Trigger Value (MTV), defined as the 97.73rd percentile.
- Five successive data points greater than the Low Trigger Value (LTV), defined as the 84.13th percentile.

Following this method, the trigger values derived in the GMP for the currently active monitoring bores are presented in **Table 7-10**.

7.2.2.4 Compensatory groundwater

In accordance with Schedule 3 Condition 34 of SSD 09_0182, BCOPL is required to provide a compensatory water supply to any landowner of privately-owned land whose water supply is adversely and directly impacted because of the project.

No adverse or direct impacts to water supply was reported in 2023, therefore no compensatory water supplies were provided.

Table 7-10: Groundwater Quality Trigger Values

Parameter	Trigger values	Exceedance criteria	Alluvium		Boggabri Volcanics	
			MW6	IBC2110	IBC2111	GW3115
pH	Median		7.1	7.9	6.9	7.6

Parameter	Trigger values	Exceedance criteria	Alluvium		Boggabri Volcanics	
			MW6	IBC2110	IBC2111	GW3115
	HTV (99.87th %ile)	1 data point	7.6	8.3	8.1	8.3
	MTV (97.73rd %ile)	2 consecutive data points	7.6	8.2	7.7	8.1
	LTV (84.13th %ile)	5 consecutive data points	7.4	8	7.2	7.8
	LTV (15.87th %ile)	5 consecutive data points	6.9	7.7	6.7	7.4
	MTV (2.27th %ile)	2 consecutive data points	6.8	7.6	6.5	7.2
	HTV (0.13th %ile)	1 data point	6.8	7.4	6.5	7.2
EC (µS/cm)	Median		2,095	2,045	2,350	3,430
	LTV (84.13th %ile)	5 consecutive data points	2,310	2,138	2,490	3,526
	MTV (97.73rd %ile)	2 consecutive data points	2,356	2,434	2,538	3,773
	HTV (99.87th %ile)	1 data point	2,369	2,666	2,559	3,846
Sulphate (mg/L)	Median		52	60	62	179
	LTV (84.13th %ile)	5 consecutive data points	70	85	85	202
	MTV (97.73rd %ile)	2 consecutive data points	74	125	102	211
	HTV (99.87th %ile)	1 data point	77	134	108	212
Chloride (mg/L)	Median		296	285	348	641
	LTV (84.13th %ile)	5 consecutive data points	296	396	409	695
	MTV (97.73rd %ile)	2 consecutive data points	479	465	471	743
	HTV (99.87th %ile)	1 data point	511	508	491	767
Sodium (mg/L)	Median		377	431	348	695
	LTV (84.13th %ile)	5 consecutive data points	403	463	365	766
	MTV (97.73rd %ile)	2 consecutive	414	490	379	802

Parameter	Trigger values	Exceedance criteria	Alluvium		Boggabri Volcanics	
			MW6	IBC2110	IBC2111	GW3115
		data points				

7.2.2.5 Groundwater Quality Results – Field Parameters

Time series plots of pH and electrical conductivity (EC) are presented in **Table 7-5** and **Table 7-6** respectively. Water quality field parameters for EC and pH have also been compared to the trigger values, with results presented in **Table 7-11**.

pH

Exceedances of the pH trigger values during the 2023 reporting include:

- GW3115:
  - Three exceedances of the lower bound HTV (March, June and September).
  - There were three consecutive data points that fell below the lower MTV between March 2023 and September 2023 warranting an exceedance (2 or more consecutive data points above the MTV).
  - There were six consecutive data points that fell below the lower LTV between September 2022 and December 2023 warranting an exceedance (>4 consecutive data points above the LTV).
- IBC2110:
  - Two exceedances of the lower bound HTV (March and September).
  - There were five consecutive data points that fell below the lower MTV between November 2022 and December 2023 warranting an exceedance (2 or more consecutive data points above the MTV).
  - There were six consecutive data points that fell below the lower LTV between September 2022 and December 2023 warranting an exceedance (>4 consecutive data points above the LTV).
- IBC2111:
  - Two exceedances of the lower bound HTV (March and September);
  - There were two consecutive data points that fell below the lower MTV during November 2022 and March 2023 warranting an exceedance (2 or more consecutive data points above the MTV); and
  - There were six consecutive data points that fell below the lower LTV between September 2022 and December 2023 warranting an exceedance (>4 consecutive data points above the LTV).
- MW6:
  - Three exceedances of the lower bound HTV (March, June and September 2023);
  - There were three consecutive data points that fell below the lower MTV during March 2023 and September 2023 warranting an exceedance (2 or more consecutive data points above the MTV); and
  - There were five consecutive data points that fell below the lower LTV between June 2022 and June 2023 warranting an exceedance (>4 consecutive data points above the LTV).

The exceedance of the lower bound HTV for pH at MW6, GW3115, IBC2110 and IBC2111 for the majority fall within the historical range for pH at the monitoring sites. Exceedance of the lower bound HTV for pH at IBC2111

in September and GW3115 in March are the lowest values recorded at each site in recent years and it is possible that the values 6.27 and 6.35 respectively are outliers given the sudden drop from previous values.

Exceedances of pH trigger values may be attributed to variation in flow conditions at the monitoring sites and may not be representative of typical water quality. Trends in pH will continue to be monitored at these sites to determine whether further investigation is required.

Electrical Conductivity

Exceedances of the EC trigger values during the 2023 reporting include:

- IBC2111:
  - There were three consecutive data points that were above the MTV between March 2023 and September 2023 warranting an exceedance (2 or more consecutive data points above the MTV).
- MW6:
  - Three exceedances of the HTV (June, September and December 2023);
  - There were six consecutive data points that were above the MTV between September 2022 and December 2023 warranting an exceedance (2 or more consecutive data points above the MTV); and
  - There were eight consecutive data points that were above the LTV between March 2022 and December 2023 warranting an exceedance (>4 consecutive data points above the MTV).

There were six consecutive data points that that were above the LTV between March 2022 and June 2023 warranting an exceedance (>5 consecutive data points above the LTV).

EC exceedances may be attributed to increases in salinity, increases in the concentration of inorganic materials and/or increases in water temperature. TDS values for the site exceeded the ionic absorption content trigger for the same eight months as EC values. Exceedance of EC trigger values at IBC2111 and MW6 are associated with an increasing trend in EC at these monitoring locations. Further investigation of the relative concentrations of specific dissolved solids may be needed to make a more informed assessment of water quality at these monitoring locations if increasing trends continue.

Figure 7.6: Groundwater Trends in pH

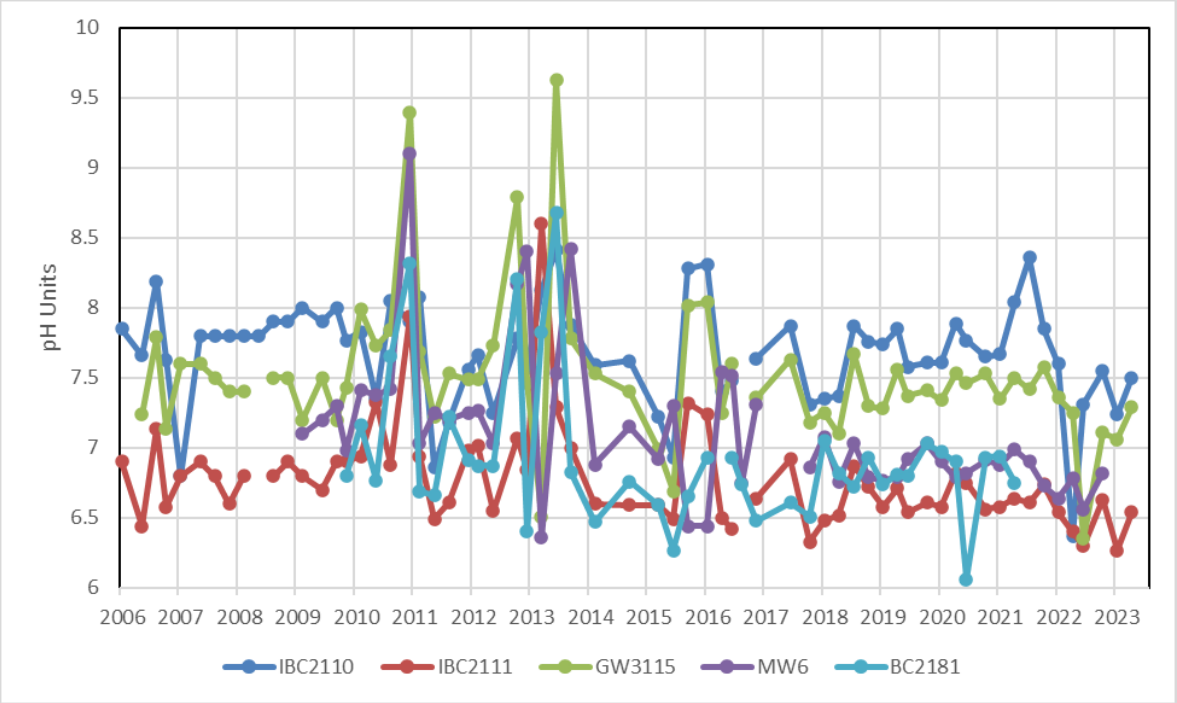


Figure 7.7: Groundwater Trends in Electrical Conductivity

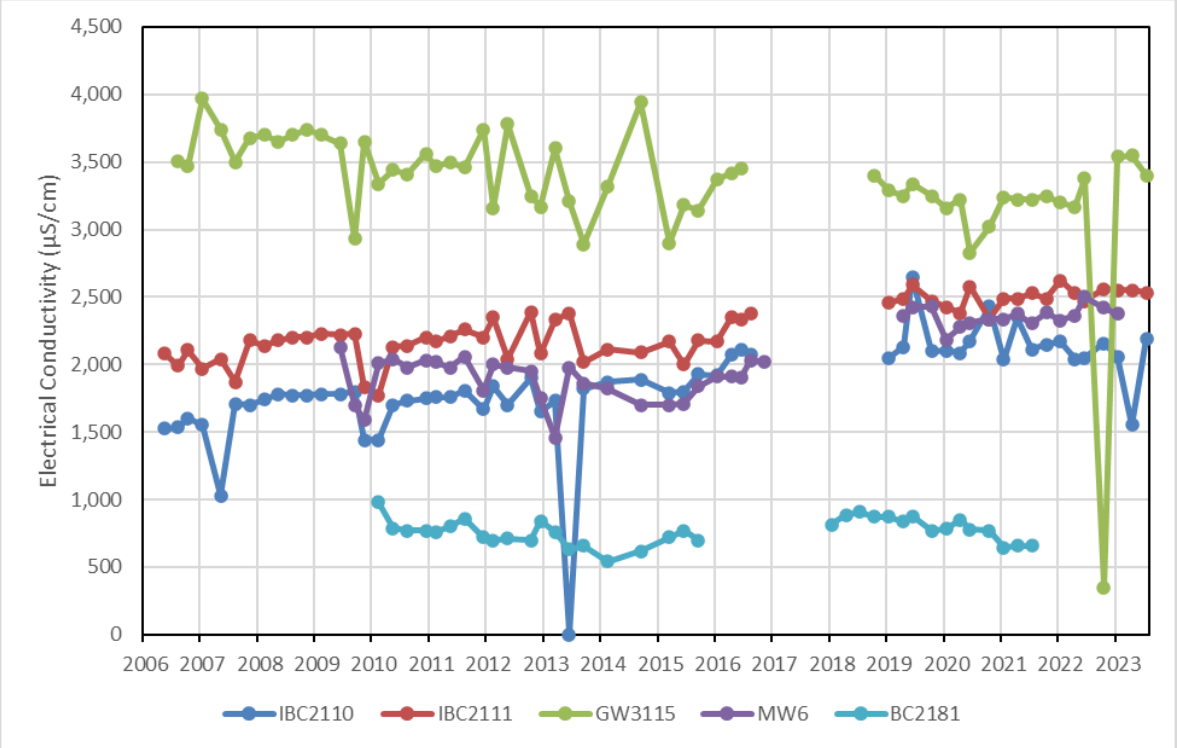


Table 7-11: Results Summary for In Situ Water Quality Measurements

Bore and date sample	Standing Water Level	pH	Electrical Conductivity
	(m AHD)	(pH units)	(µS/cm)
GW3115 (Boggabri Volcanics)			
22/03/2023	256.98	6.35 * ** ***	3,500 c
2/06/2023	256.98	7.11 * ** ***	3,540 a
7/09/2023	257.05	7.06 * ** ***	3,550 a
6/12/2023	272.71	7.29 *	3,400
IBC2110 (Boggabri Volcanics)			
23/03/2023	265.55	7.31 * ** ***	2,058 a
5/06/2023	265.55	7.55 * **	1,552
4/09/2023	265.1	7.24 * ** ***	2,193
4/12/2023	264.81	7.5 * **	2,070 a
IBC2111 (Boggabri Volcanics)			
22/03/2023	265.19	6.3 * ** ***	2,550 ** a
5/06/2023	265.15	6.63 *	2,550 ** a
4/09/2023	264.66	6.27 * *** b	2,532 ** a
5/12/2023	264.4	6.54 *	2,529 a
MW6 (Alluvium)			
22/03/2023	264.2	6.64* ** ***	2,361 ** *** a
6/06/2023	263.99	6.78* ** ***	2,500 * ** ***
5/09/2023	263.92	6.56* ** ***	2,419* ** ***
4/12/2023	263.68	6.82 *	2,374* ** ***

Notes:
[a] exceedance of the LTV (but less than 5 consecutive readings that would constitute a breach of the trigger)
[b] exceedance of the MTV (but less than the 2 consecutive readings required for a breach of trigger)
[c] Outlying data not included in analysis
*** exceedance of the HTV (as defined in **Table 7-10**)
** two consecutive exceedances of the MTV (as defined in **Table 7-10**)
* five consecutive exceedances of the LTV (as defined in **Table 7-10**).

Groundwater - Major Ions

Major ion compositions were analysed as part of the analytical suite. Results for major ions are presented in **Table 7-12**.

All major ions at sites sampled were compliant with the trigger values except for exceedances of sulfates and chloride. The HTV for sulfate was exceeded in June for GW3115 though due to the significant increase outside of the trend for sulphate this was considered an outlier. There have been 5 values higher than the LTV criteria for chloride observed at MW6 causing this to be an exceedance. The LTV for chloride has been consecutively exceeded since 2018 at IBC2111. Due to the increasing trend of chloride at both GW3115 and MW6 BCOPL are reviewing whether the trigger values in the Groundwater Management Plan remain representative of the chloride levels present in the environment at the BTM Complex.

Statistically significant increasing trends in chloride and sulfate have been identified in bores installed in the alluvium (MW6) and the Boggabri Volcanics (IBC2111) (contained within **Section 7.2.2.5**). The exceedance of trigger values for chloride and sulfate commenced in 2016. The trend in sulfate and chloride is associated with the increasing trend in EC in monitoring bores installed in the Boggabri Volcanics. Continued monitoring of major ions is recommended.

Table 7-12: Results Summary for Analysis of Major Ions

Bore and Date Sample	Bicarbonate as CaCO3	Sulfate as SO4	Chloride	Calcium	Magnesium	Sodium	Potassium
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
GW3115 (Boggabri Volcanics)							
2/06/2023	656	296***	609	67	17	628	4
6/12/2023	685	189	683	73	18	677	
IBC2110 (Boggabri Volcanics)							
5/06/2023	399	104 [a]	374	15	6	410	3
5/12/2023	425	70	373	16	5	437	
IBC2111 (Boggabri Volcanics)							
5/06/2023	576	105	430*	128	40	320	5
5/12/2023	607	87	444*	146	45	352	
MW6 (Alluvium)							
5/09/2023	587	67	379*	72	31	366	6
4/12/2023	630	61	411*	82	33	404 [a]	

Note:
[a] exceedance of the LTV (but less than 5 consecutive readings that would constitute a breach of the trigger)
[b] exceedance of the MTV (but less than 2 consecutive readings that would constitute a breach of the trigger)
*** exceedance of the HTV (as defined in **Table 7-10**)

** two consecutive exceedances of the MTV (as defined in **Table 7-10**)
* five consecutive exceedances of the LTV (as defined in **Table 7-10**)

Groundwater - Metals

Analytical results indicated that dissolved metal concentrations for Cadmium, Chromium, Copper, and Iron were generally below laboratory limit of reporting (LOR) (**Table 7-13**). Concentrations of Manganese, Nickel, and Zinc above the LOR were recorded (**Table 7-13**), however remain at levels generally consistent with historically observed values.

A summary of the metal concentrations recorded during the reporting period is presented in **Table 7-13**.

Table 7-13: Results Summary for Analysis of Metals

Bore and date sample	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Nickel	Zinc	Iron
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
GW3115 (Boggabri Volcanics)									
7/09/2023	<0.001	<0.0001	<0.001	<0.001	<0.001	0.072	<0.001	0.028	1.92
6/12/2023	<0.001	<0.0001	<0.001	<0.001	<0.001	0.095	<0.001	0.012	3.21
IBC2110 (Boggabri Volcanics)									
5/06/2023	<0.001	<0.0001	<0.001	<0.001	<0.001	0.057	0.002	<0.005	<0.05
5/12/2023	<0.001	<0.0001	<0.001	<0.001	<0.001	0.057	0.002	0.376	<0.05
IBC2111 (Boggabri Volcanics)									
4/09/2023	<0.001	<0.0001	<0.001	0.004	0.001	0.002	<0.001	0.082	<0.05
5/12/2023	<0.001	<0.0001	<0.001	0.004	<0.001	0.004	0.002	0.092	<0.05
MW6 (Alluvium)									
5/09/2023	<0.001	<0.0001	<0.001	0.004	<0.001	0.005	0.001	0.044	<0.05
4/12/2023	<0.001	<0.0001	<0.001	0.003	<0.001	0.003	<0.001	0.052	<0.05

Groundwater - Nutrients

Nutrient concentrations during 2023 were generally similar to historical concentrations, with spikes in nitrate (and total nitrogen) concentrations at MW6 and IBC2111 in 2023 compared to previous years. The increase in Nitrogen at MW6 is consistent with what was experienced in 2022.

Table 7-14: Results Summary for Analysis of Nutrients

Bore and date sample	Ammonia (mg/L)	Nitrite (mg/L)	Nitrate (mg/L)	Nitrite + Nitrate (mg/L)	Total Kjedahl Nitrogen (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Reactive Phosphorus (mg/L)
GW3115 (Boggabri Volcanics)								
7/09/2023	0.12	<0.01	<0.01	<0.01	0.2	0.2	<0.01	0.01
6/12/2023	0.21	<0.01	<0.01	<0.01	0.3	0.3	0.03	<0.01
IBC2110 (Boggabri Volcanics)								
5/06/2023	0.29	<0.01	<0.01	<0.01	0.4	0.4	0.12	0.08
5/12/2023	0.18	<0.01	<0.01	<0.01	0.2	0.2	0.11	0.11
IBC2111 (Boggabri Volcanics)								
5/06/2023	<0.01	0.01	3.95	3.96	0.5	4.5	0.02	0.03
5/12/2023	0.04	<0.01	3.88	3.88	0.4	4.3	0.05	0.03
MW6 (Alluvium)								
6/06/2023	<0.01	<0.01	2.48	2.48	0.4	2.9	0.03	0.03
4/12/2023	0.01	<0.01	2.49	2.49	0.3	2.8	0.03	0.03

Groundwater Quality Summary

Groundwater quality was generally within trigger values except for several exceedances for pH and EC at Boggabri Volcanics, Merriown Seam and Alluvium sites, and several exceedances for sulfate and chloride.

7.2.2.6 Mine Void Groundwater Inflow

Inflow Volumes

The estimated groundwater make for the reporting period is about 321 ML. This value was estimated using the BCMs water balance model. There is limited no data available to validate this modelling estimate. Further, total groundwater make into the pit is difficult to estimate based on pump data due to the presence of rainfall and runoff in dewatering volumes.

Estimated groundwater takes (including pit inflows) are less than the total licenced water take for the Gunnedah – Oxley Basin groundwater source (WAL29562 and WAL29473) of 842 ML/year.

7.2.3 Improvements and Initiatives

Estimates of the groundwater volumes intercepted by the pit have previously been undertaken based on pump records for pit dewatering. As mining progresses, an increasing proportion of this water will be a result of seepages from the backfilled pit. Accurate separation of this seepage water from the groundwater take is required to:

- Better account for the volume of groundwater intercepted by the pit; and
- Improve the accuracy of water management across the site, including water balance modelling and water inventory forecasting.

A backfill seepage model has been developed and included in the site water balance model (refer to the Site Water Balance Review, 2022) in order to better estimate these inflows. The model will continue to be reviewed and periodically re-calibrated as part of the periodic review of the site water balance model.

BCOPL is planning for the installation of additional groundwater monitoring bores within and surrounding the BCM. The additional bores are proposed to supplement the existing monitoring network allowing for a greater understanding of the impacts of mining on the coal seam aquifers, alluvials, Boggabri Volcanics and confirm if private receivers in the vicinity of the project have been able to detect any changes. These bores are proposed to be installed during 2024.

8.0 REHABILITATION

The principal objective for rehabilitation at BCM is to return the site to a condition where its landforms, soils, hydrology, flora and fauna are self-sustaining and compatible with the surrounding landscape. Progressive rehabilitation is an ongoing activity at BCM and is carried out in accordance with regulatory requirements, previously the MOP, now the RMP.

The RMP guides rehabilitation for all operational activities and associated infrastructure, and indirectly and partly fulfils the rehabilitation requirements specified in SSD 09_0182. It focuses on rehabilitation of the active pit and waste emplacement areas within CL368. However, closure components also consider lands and infrastructure occupied by the private haul road, rail spur, powerline easements and the BCT.

Schedule 3, Condition 71 of SSD 09_0182 (as modified by MOD 9 in March 2023) replaces the former requirement for a RMP with the requirement for a Rehabilitation Strategy. The Rehabilitation Strategy is currently under preparation and will be submitted for consultation with the relevant Regulatory Authorities for review and comment prior to the submission to the DPHI. The purpose of the Rehabilitation Strategy is to build on the Rehabilitation Objectives within SSD 09_0182 and to address the rehabilitation of land within the Project Boundary (i.e. beyond the areas currently covered by CL 368).

Rehabilitation objectives for the BCM are:

- Mine site (as a whole), including the final void - Safe, stable and non-polluting;
- Mine site (as a whole), including the final void - Minimise the size and depth of the final void as far as is reasonable and feasible and ensure the void contains no retained surface water (i.e. no pit lake);
- Mine site (as a whole), including the final void - Land degradation is minimised and vegetation removal is minimised
- Surface Infrastructure – Decommission and remove, unless the Executive Director, Mineral Resources in Resources Regulator agrees otherwise, and rehabilitate to a level equal or better to the original landscape;
- Waterways – Water is managed to ensure that clean and dirty water systems are separated.
- Waterways – No polluting waterways;
- Other land – Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of local native plant species, a landform consistent with the surrounding environment and stable free draining landform able to support proposed vegetation;
- Other land – Ecological biodiversity is promoted;
- Community / General – Safety risks are eliminated as far as is practical;
- Community / General – Minimise the adverse socio-economic effects associated with mine closure; and
- Community / General – Ensure that cultural heritage is not impacted and is appropriately managed.

This section of the Annual Review discusses the rehabilitation which has been undertaken or is proposed within the BCM Project Boundary as required in accordance with the conditions of SSD 09_0182. **Appendix I** provides a copy of the Annual Rehabilitation Report which has been prepared to satisfy the requirements under the *Mining Act 1992* and reports on the rehabilitation undertaken and proposed within CL 368 and ML 1755 only.

8.1 Rehabilitation Methodology

The adopted rehabilitation methodology is described in detail in the RMP. Key components of the methodology include:

- Landform design;
- Contamination Management during Commissioning;
- Acid rock drainage;
- Reject and fines disposal;
- Groundwater barrier;
- Soil stripping and handling;
- Soil stockpiling;
- Topsoil volume;
- Surface preparation;
- Soil respreading;
- Amelioration of growing media;
- Erosion control;
- Timing of revegetation works;
- Revegetation;
- Habitat creation;
- Seed collection and viability testing; and
- Revegetation species.

8.2 Rehabilitation Progress

8.2.1 Summary of Land Rehabilitation

During the reporting period, no new rehabilitation was completed. This aligns with the plans detailed within the 2023 Forward Program.

Significant rainfall during 2021 and 2022 resulted in damage to some areas of the rehabilitation area. During 2023, BCOPL conducted extensive repair works continued and are on-going. Extensive redesign works are scheduled to begin in early 2024 to develop a landform which seeks to mitigate the potential for erosion of the landform during large rainfall events.

A detailed breakdown of rehabilitation/disturbance footprints for the previous, current, and future reporting period is also provided in **Table 8-1**.

Table 8-1: Rehabilitation Status

Mine Area Type	2021 Reporting Period (Actual) (ha)	2022 Reporting Period (Actual) (ha)	2023 Reporting Period (Actual) (ha)	2024 Reporting Period (Predicted) (ha)
A. Total mine footprint	2,567.5	1,664.7	1,682.7	1,722.9
B. Total actual disturbance	1,443.83	1,384.2	1,361.8	1,364.9
C. Land being prepared for rehabilitation	N/A	N/A	40.3	77.4
D. Land under active rehabilitation	292.1	280.6*	280.6*	280.6*
E. Completed Rehabilitation	None	None	None	None

Note:
* Reconciliation of rehabilitation areas was undertaken as part of the rehabilitation reforms work. This inconsistency with rehabilitation between 2022 and previous years may be a result of the inclusion of rehabilitation outside of the mining lease (along the rail spur).

8.2.2 2023 Plantings

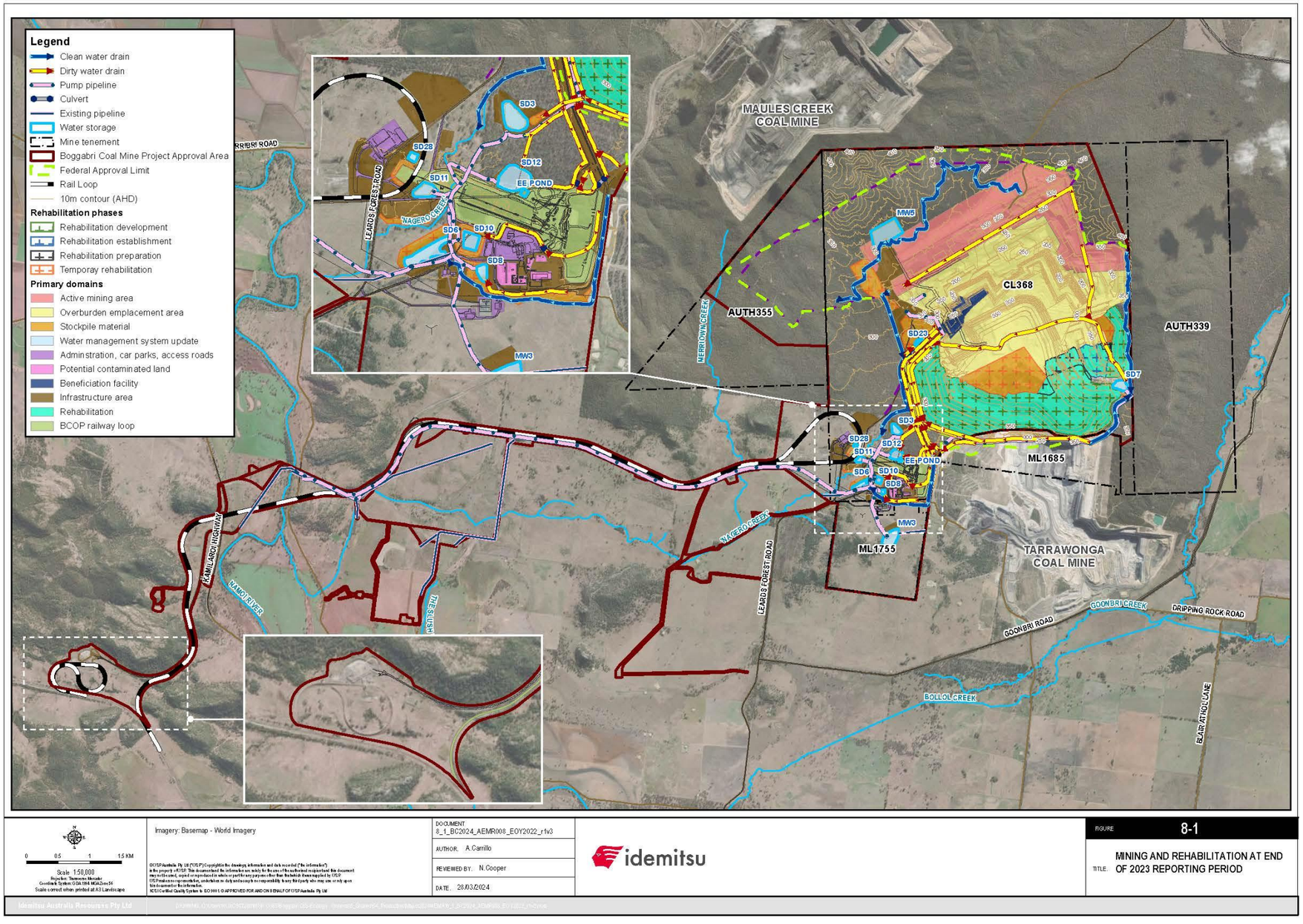
No plantings occurred during the 2023 reporting period in the rehabilitation area.

8.2.3 Rehabilitation Status

BCOPL has adopted ten primary rehabilitation domains (refer to **Figure 8.1**). These domains define areas based on operational or functional purpose and geophysical similarities. The RMP outlines the regulatory requirements, rehabilitation objectives, indicators and completion criteria for each rehabilitation phase of all rehabilitation domains.

The calculated rehabilitation status based on the requirements of the *Annual Review Guideline* (2015) for 2020, 2021, 2022 and predicted values for 2023 in accordance with the Forward Program and RMP are summarised in **Table 8-1**.

Figure 8.1: Extent of Mining and Rehabilitation at the end of the 2023 Reporting Period



8.2.4 Comparison with Forward Program Forecasts

Rehabilitation for the end of 2023 aligns with that proposed by the 2023 Forward Program which was lodged on 31 March 2023 to address the requirements of the Rehabilitation Reforms under the *Mining Act 1992*. The Forward Program did not propose any additional rehabilitation for the 2023 calendar year. BCOPL did progress with rehabilitation maintenance and monitoring measures as described within the following sections.

8.3 Removal of Buildings

During the 2023 reporting period, there has been no removal of buildings.

8.4 Rehabilitation Biodiversity Monitoring

Biodiversity monitoring of rehabilitation areas is completed annually to assess the biodiversity status of rehabilitated areas to further guide rehabilitation methodologies, procedures and maintenance activities, in order to achieve site rehabilitation objectives. The monitoring reports on aspects of ecosystem establishment and ecosystem development.

Rehabilitation monitoring for the reporting period commenced 8 October 2023 at seven (of 10) replicate monitoring sites located within the 3, 5, 6, 7, 12, 13 and 15-year-old mine rehabilitation age-classes. Grassy woodland native ecosystem (secondary domain) within the mine rehabilitation area is known from two replicate monitoring sites: being RH2017 and RH2020. Sampling was undertaken at these locations during 2023 as well as a further five sites associated with shrubby woodland/ forest native ecosystem (RH2008D, RH2010, RH2011, RH2016 and RH2018A). The 2023 monitoring program involved the following sampling methodologies:

- One single modified BioBanking Assessment Methodology (BBAM) plot, species inventories only;
- Photo point monitoring (to track changes in plant growth and ecology of the rehabilitated areas);
- Salinity monitoring within the BioBanking vegetation 20 x 20m quadrat (observational);
- Canopy species recruitment and presence of reproductive structures monitoring (observational); and
- One 20-minute bird and general fauna area search within 80 m (approximately 2 ha) of fixed monitoring sites on separate mornings.

8.4.1 Photographic Monitoring

Photographs of the monitoring sites for 2008D, 2010, 2011, 2016, 2017, 2018A, and 2020 rehabilitation areas are provided in **Figure 8.2**, **Figure 8.3**, **Figure 8.4**, **Figure 8.5**, **Figure 8.6**, **Figure 8.7** and **Figure 8.8** respectively.

Figure 8.2: 2008D Rehabilitation (15 years old)

Figure 8.3: 2010 Rehabilitation (13 years old)

Figure 8.4: 2011 Rehabilitation (12 years old)

Figure 8.5: 2016 Rehabilitation (7 years old)

Figure 8.6: 2017 Rehabilitation (6 years old)

Figure 8.7: 2018A Rehabilitation (5 years old)

Figure 8.8: 2020 Rehabilitation (3 years old)

8.4.2 Summary of Findings

Monitoring results indicate that native species diversity and structure of the vegetation are progressing over time. Acquired data indicate that biodiversity values (vegetation, birds and invertebrates) are trending well against analogue sites associated with the Leard State Forest remnant.

8.4.2.1 Vegetation

A total of 113 species of plant were recorded from the seven replicate mine rehabilitation monitoring sites surveyed during the 2023 monitoring event, of which 94 were native (83%) and 19 species were exotic (17%). No plant species recorded in the mine rehabilitation area during the 2023 monitoring event were listed as threatened species under the BC Act and/ or EPBC Act. Flora surveys and data analysis of mine rehabilitation areas identified the following:

- Mean native species richness from the seven sites surveyed in 2023 was recorded highest from within the 2010 and 2011 mine rehabilitation areas and lowest within the 2008 rehabilitation sites.
- Most mine rehabilitation sites met or exceeded the native species richness, native overstorey projected foliage cover and mid storey cover BBAM benchmarks. Native groundcover percentage was generally high with all monitoring sites meeting or exceeding the BBAM benchmarks for native ground cover (grass, shrubs and other).
- Exotic species richness has tended to initially increase over the first few years after rehabilitation areas are established and then slowly decrease as canopy cover increases. Mean exotic species richness is also appearing to fluctuate and be influenced by seasonal climatic conditions.

- Mean exotic species richness was comparable across all mine rehabilitation age-classes during the 2023 monitoring period, occurring above the Leard State Forest analogue benchmark. All rehabilitation monitoring sites failed to meet the RMP performance criteria for exotic species richness. BCM will continue to manage the exotic species present in rehabilitation areas to control exotic species richness.
- Structural characteristics which take time to develop within natural ecosystems (such as fallen timber and hollow bearing trees) are mostly absent across the rehabilitation area except, for salvaged timber and stags which have been distributed/erected in localised areas.
- No salinity was identified in any of the rehabilitation monitoring sites surveyed in 2023.
- Planted canopy species showed evidence of reproductive structures. Despite this, no natural recruitment of canopy species from the soil seed bank at these locations was observed.
- Groundcover and midstorey species recorded across all rehabilitation areas were observed recruiting from the soil seed bank and/or were producing reproductive structures. This suggests the groundcover and midstorey stratum is progressing towards becoming self-sustainable. Whilst vegetative cover of the groundcover stratum has been historically low, native vegetation ground cover percentage cover was generally high across all rehabilitation age-classes during the 2023 monitoring period.
- There are isolated individuals of African Boxthorn, Prickly Pear and Galenia, which will be monitored and managed to prevent uncontrolled spread.

8.4.2.2 Fauna

- A total of 52 diurnal species of bird were recorded from the seven replicate mine rehabilitation monitoring sites surveyed during the 2023 monitoring event. This comprised several woodland and generalist species common to the region.
- Four threatened species were recorded from the mine rehabilitation area, including Brown Treecreeper (eastern subspecies), Painted Honeyeater, Speckled Warbler and Turquoise Parrot. These species are listed as Vulnerable under the BC Act, whilst the Brown Treecreeper (eastern subspecies) and Painted Honeyeater are also listed as Vulnerable under the Commonwealth EPBC Act.
- Data generally indicates that the more structurally diverse and older mine rehabilitation areas retain a higher mean diurnal bird diversity. Notwithstanding this, RH2016 recorded the highest mean bird species richness during the monitoring period. This is not entirely unexpected, as this monitoring location is progressing well against vegetation benchmarks and is positioned immediately adjacent to and connected with good quality extant habitats of the larger Leard State Forest remnant.
- To meet the RMP performance criteria, shrubby woodland/forest native ecosystems must meet 80 % of the Leard State Forest analogue benchmark (i.e. a species richness of 11.0). Within shrubby woodland/forest native ecosystems, three of five sites (RH2008D, RH2010 RH2016) returned a mean bird species richness above the RMP performance criteria. RH2008D and RH2016 also exceeded the Leard State Forest analogue benchmark. The remaining two sites (RH2011 and RH2018A) achieved <80 % of the analogue benchmark.
- To meet the RMP performance criteria, grassy woodland native ecosystems must meet 80 % of the Leard State Forest analogue benchmark (i.e. a species richness of 11.7). Within grassy woodland native ecosystems, mean diurnal bird species richness was recorded above the Leard State Forest benchmark for RH2017, whilst RH2020 achieved <80% of the analogue benchmark and therefore did not meet the RMP performance criteria. BCM will continue to manage RH2020 to progress towards meeting the RMP performance criteria.
- Four native species were recorded via infra-red/motion sensor cameras, including Short-beaked Echidna, Red-necked Wallaby, Common Wallaroo and Eastern Grey Kangaroo. One pest species, Fox, was also recorded from RH2008D and RH2017 monitoring sites.

8.4.2.3 Weed Management

May 2023

Weed management was undertaken in May 2023 for woody and herbaceous weeds within mine rehabilitation areas, targeting several exotic species, including, but not limited to, *Lycium ferocissimum* (Boxthorn), *Xanthium occidentale* (Noogoora Burr) and *Opuntia stricta* (Prickly Pear). Sixteen individual Boxthorn plants were treated using a cut and paint method, eight individual Prickly Pears were treated by chemical injection. Additional individual plants were identified within rehabilitation areas and management of these is ongoing.

October 2023

Further weed control works were conducted within mine rehabilitation areas in October 2023 to reduce the density of *L. ferocissimum, Opuntia sp., N. glauca* and *G. pubescens* across all worked areas. A large Boxthorn remained untreated, due to an active Superb Fairywren nest.

8.5 Rehabilitation Improvements and Initiatives

During the 2023 reporting period BCOPL has continued with approved rehabilitation activities as usual. No trials or research projects were undertaken during the reporting period.

Repair works of the erosional structures, which formed during the heavy rainfall experienced during 2020 to 2022, was completed during 2023. BCOPL will continue to monitor these areas into the future to assess the ongoing stability and complete maintenance and repair works if identified to be required.

8.6 Rehabilitation in 2024

Rehabilitation activities proposed for the next reporting period will focus on the progressive decommissioning of mining areas and overburden emplacement areas, followed by the establishment of suitable landforms and growth mediums. All rehabilitation will be undertaken in accordance with the RMP, the Rehabilitation Strategy and the Forward Program.

9.0 COMMUNITY

BCOPL's involvement with the local community is guided by:

- Studies undertaken as part of the EA (and associated Modification Reports) for the Project;
- BCM's SIMP;
- Consultation with key stakeholders, including the CCC; and
- BCOPL's internal environmental management plans and corporate guidance.

In accordance with SSD 09_0182 (Schedule 3, Condition 77(b)), BCOPL has prepared a SIMP, in consultation with relevant stakeholders. BCOPL undertook revisions to the SIMP which were approved by the DPHI in August 2021. The SIMP was revised during the reporting period and was distributed to stakeholders for review and comment in December 2023. The SIMP will be finalised during the next reporting period.

9.1 Community Programs and Investment

BCOPL is committed to supporting the local community in which they operate. Over the 2023 reporting period and in concurrence with previous reporting periods, BCOPL and its contractors were involved in a number of community initiatives and events. BCOPL contributed $197,850.40 to local projects and sponsorships in the 2023 reporting period, as summarised in **Table 9-1**.

Contributions for the reporting period are about 42% more than the previous year's contributions ($82,406.49) This is due to the reducing impacts of Covid-19 on community events which were scheduled to occur although did not proceed during the previous reporting period of 2021 and a small part of 2022. During 2023, further community events were able to proceed as restrictions reduced.

BCOPL regularly hosts site visits from the community, industry professionals, the media and other interested parties. The impacts and restrictions that the Covid-19 pandemic brought prevented mine tours from being completed in 2021. During 2022 these mine tours were able to resume, with numerous mine tours taking place during 2023.

Table 9-1: BCOPL Community Funding 2023

Community Group / Project	BCO Contribution
Autism North West	$2,000.00
Black "n" Blue Youth Centre	$4,000.00
Boggabri Anglican Church - Carols	$4,000.00
Boggabri Business Chamber	$2,000.00
Boggabri Drovers Camp fire	$20,000.00
Boggabri Golf Club - Sponsorship Golf Day (Workpalce Challenge)	$5,000.00
Boggabri Public School - Awards	$500.00
Boggabri Rugby League	$10,000.00
Boggabri Womens Shed	$5,000.00

Community Group / Project	BCO Contribution
Coolah Veterans Touch Football	$1,660.00
Gunnedah District AFL	$2,500.00
Gunnedah High School - 2023 Academic Awards	$500.00
Gunnedah Ministers Fraternal - Carols in The Park	$2,000.00
Gunnedah Motor Cycle Club	$2,500.00
Gunnedah Physical Culture	$2,000.00
Gunnedah Shire Band Incorporated	$2,500.00
Gunnedah Show	$20,000.00
Gunnedah South Public School - 2023 Xmas Raffle	$2,500.00
Kane Drayton Appeal	$10,945
Kingston Pony Club - Kitchen	$1,000.00
Manilla Show	$4,545.45
Maules Creek Campdraft	$5,000.00
Narrabri & District Chamber of Commerce	$3,000.00
Narrabri Carp Muster	$5,000.00
Narrabri Polocross Junior Challenge	$2,160.00
NSW Schools - Chromebooks	$28,040.35
Ooranga Family Day	$4,500.00
Ooranga Family Mobile Resource Unit	$4,500.00
PRAMS - Golf Charity Day	$2,000.00
Sacred Hearts Boggabri - Awards	$1,000.00
Tamworth Triathlon Club	$2,500.00
Wean Picnic Races	$5,000.00
Westpac Helicopter Partnership	$30,000.00
Total	**$197,850.40**

9.2 Community Consultative Committee

In accordance with SSD 09_0182 (Schedule 5, Condition 7), a CCC based on the *Community Consultative Committees Guideline for State Significant Projects 2019* (DPE, 2019) has continued through the reporting period.

The purpose of the CCC is to provide a forum for open discussion between representatives of BCOPL, the community, the local council and other stakeholders on issues directly relating to BCM's operations and community relations.

Quarterly CCC meetings were held during the reporting period on the following dates:

- 23 February 2023;
- 25 May 2023;
- 29 August 2023; and
- 26 October 2023.

Key topics discussed included:

- Overview of recent activities and reports from BCM;
- 2023 Archaeological Salvage Program;
- Modification 8 to BCM and proposed amendment;
- Exploration update;
- Biodiversity offset areas;
- Biodiversity Corridor Plan submission;
- Housing VPA – General Housing;
- Recent correspondence with regulatory agencies;
- Tyre management and waste;
- Environmental Monitoring conditions;
- Tree clearing;
- Community Sponsorship 2023; and
- Community complaints.

Copies of the minutes from CCC meetings are publicly available on the BCM website:

https://idemitsu.com.au/operations/boggabri-coal/approvals-plans-and-reports/community-consultative-committee/

9.3 Complaints

9.3.1 Management of Complaints

Community complaints are managed in accordance with the BCOPL Complaint Management Procedure. This procedure outlines a standard process for reporting and responding to community complaints for all BCOPL employees and contractors at BCM.

The procedure includes reporting:

- The nature of the complaint;
- The method of the complaint, for example, telephone;
- The monitoring results, including any relevant conditions at the time of the complaint;
- Site investigation outcomes;
- Site activity and activity changes; and
- Any necessary actions assigned.

BCOPL maintains a 24 Hour Community Response Line to provide the community or interested stakeholders with an accessible and reliable communications point for complaints. In turn, the response line allows for rapid response to community complaints. The phone number for this Community Response Line is: **1800BOGGABRI (1800 264 422 74).**

The Community Response Line is advertised in the local media every three months and is available on the BCM website. It is also available from site personnel and community representatives on the CCC.

Where possible, complainants are contacted within 24 hours of BCOPL's Environment Superintendent being advised of a complaint. Where requested to notify the complainant of any remedial or required actions undertaken, a follow-up on the complaint is made by BCOPL's Environment Superintendent or other authorised representative.

Every effort is made to ensure that concerns are addressed to facilitate a mutually acceptable outcome for both the complainant and mining entity concerned. All complaints received are tabled at CCC meetings. BCOPL maintains records of completed internal complaint forms for a period of no less than five years.

9.3.2 Registered Environmental Complaints

Two community complaints were received by BCOPL during the 2023 reporting period. This is the same as 2022.

A summary of complaints received during the reporting period and BCOPL's responses is provided in **Table 9-2**. Complaints were handled in accordance with BCM's Complaints Management Protocol as previously described. Where the EPA was either notified of the complaint, or directly received the original complaint, results of the investigation and follow-up actions conducted by BCOPL and its contractors were provided to the EPA for review.

Complaints received during the reporting period were tabled at the CCC meetings for discussion. Monthly summaries of complaints are made publicly available on BCOPL's website at:

https://www.idemitsu.com.au/operations/boggabri-coal/approvals-plans-reports/

Table 9-2: Complaint Summary

Date of Complaint	Complaint Reference	Issue	BCOPL Response
22 March 2023	Community Member	Dust	Following a community complaint regarding dust generation from the BTM Complex. EPA contacted BCOPL and requested that they continued to ensure dust mitigation controls are being applied and dust Tarps are being followed. No further actions were required.
25 May 2023	Community Member	Dust	Complaint made to EPA on the 25 May 2023 regarding dust generation from the BTM Complex. EPA provided BCOPL with a 'Notice to Provide Information and/or Records' on 13 June 2023. BCOPL provided the requested information on the 3 July 2023.

9.4 Workforce Profile

As of 31 December 2023, the total workforce on BCM was 747 employees. A breakdown of the workforce and their residential locality are detailed in **Sections 9.4.1** and **9.4.2**.

9.4.1 BCOPL Employees

Wherever possible, local personnel are employed by BCOPL and its contractors. The BCOPL team at BCM consists of 509 staff, the majority (~70%) of whom are based locally within the Narrabri, Gunnedah and Tamworth LGA's. All BCOPL employees are employed full time. A breakdown of the location is found in **Table 9-3**.

Table 9-3: Residential Locality of BCOPL Employees

Locality	BCOPL Employee Residency
Boggabri	52
Gunnedah	195
Curlewis	12
Narrabri	43
Manilla	32
Tamworth	59
Other NSW	113
QLD	10

Locality	BCOPL Employee Residency
Other Australia	0
Total	**509**

9.4.2 Mining Contractors

Expansion project related construction activities concluded in late 2015, at which point the BCM moved to an operational phase. From late 2015, BCM continued to be contractor operated. In 2017, BCOPL took over the operation of BCM with assistance of mining contractor staff. The 2023 reporting period represents the BCM's eighth year of operations since the commencement of mining operations under SSD 09_0182.

During the reporting period, the major mining contractors on site included Orica Australia Pty Ltd (Orica), Ausdrill Limited (Ausdrill), BPA and One Key.

The largest share of the total contractor workforce at BCM during the 2023 reporting period is attributed to the mine contractor One Key. At the end of December 2023, the One Key workforce consisted of 128 personnel, predominantly contract staff, of which around 55% resided locally. The Orica workforce was 44 personnel, Ausdrill was 43 and BPA workforce had 23 personnel employed at the BCM.

Ninety seven percent (91%) of the BCM contractors resided in NSW and 64% resided within the localities of Boggabri, Gunnedah, Curlewis, Narrabri, Manilla and Tamworth (see **Table 9-4**).

Table 9-4: Residential Locality of Contractor Employees

Locality	One Key Resources Pty Ltd	Orica	Ausdrill	BPA
Boggabri	7	5	3	2
Narrabri	8	5	3	2
Gunnedah	55	15	4	9
Curlewis	3	-	0	1
Manilla	13	1	4	-
Tamworth	30	6	1	3
QLD	-	5	13	-
Other NSW	12	7	14	6
Other Australia	0	0	1	-
Total	**128**	**44**	**43**	**23**

10.0 AUDITS

10.1 Independent Environmental Audit (2023)

10.1.1 Scope of Audit

In accordance with Schedule 5, Conditions 10 and 11 of SSD 09_0182, BCOPL engaged independent certified auditors to undertake an independent environmental compliance audit (IEA) of BCM during October 2023.

GHD Pty Ltd (GHD) was approved by the DPHI to assess BCOPL's compliance with the conditions of SSD 09_0182 and other relevant leases, licences and approvals. It also included assessing the environmental performance of the Project in meeting the requirements of SSD 09_0182 through the implementation of a range of environmental management measures outlined in the various environmental management plans developed for the Project. This covered the period from the 7 November 2020 to 17 November 2023.

10.1.2 Audit Outcomes

Overall, 26 non-compliances were identified by GHD including 15 against the conditions of SSD 09_0182, 6 against the conditions of EPL 12407 and 5 against the standard of the Mining Regulation 2016 Schedule 8A Part 2. GHD stated that the site appeared to be well managed and that there were no non-compliances noted of medium or high risk. BCOPL has developed an action plan in response to the recommendations made as part of the IEAs as shown within **Appendix F.**

The final report noted by the auditor that it was evident that the site was generally being managed with a commitment to minimise the impact on the environment and surrounding residents.

Overall, the audit found that the management plans, strategies, and programs that have been prepared for BCM were adequate and prepared in accordance with the relevant compliance requirements. The audit found that on-site staff displayed a good understanding of the key biodiversity issues and were focused on implementing measures that would minimise impacts and achieve good biodiversity/environmental outcomes.

10.1.3 DPHI Review

The IEA was lodged with the DPHI on 20 December 2023. The DPHI found the audit to generally satisfy the requirements of SSD 09_0182 and the DPHI's Independent Audit Guidelines (2015).

The DPHI also requested that a status update on the recommended actions be included in future Annual Reviews until each action is completed.

10.1.4 Status of Audit Recommendations

BCOPL have proposed completion dates for the actions in response to the non-compliances highlighted in the 2023 IEA (Refer to the Response Action Plan in **Appendix F**). The audit action plan is continuing to be closed out and the next IEA is due in 2026.

11.0 INCIDENTS AND NON-COMPLIANCES

All incidents and non-compliances are detailed in **Table 1-2** of the Statement of Compliance. **Table 11-2** outlines the non-compliances which occurred during the 2023 reporting period and BCOPL's response. Actions that have resulted from the IEAs can be found in the Response Action Plan in **Appendix F**.

One Penalty Notice was received by BCOPL during the 2023 reporting period. This has been outlined with BCOPL's response in **Table 11-1**.

Table 11-1: Notices and Warnings Received during the Reporting Period

Agency	Date	Correspondence Details	BCOPL response
NRAR	**15-Jun-23**	NRAR signed an Enforceable Undertaking for contravention of Sections 60A(2), 60I and 60I(2) of the Water Management Act 2000 (WM Act). Between 1 July 2019 and 20 April 2022, it is alleged that BCOPL took surface water from the Bluevale Water Source, being an unregulated river water source to which the Water Sharing Plan for the Namoi and Peel Unregulated Rivers Water Sources 2012 applies, in the course of mining operations at the Boggabri Coal Mine, and without obtaining a requisite water access licence. Water was taken by capturing or impounding clean surface water from upstream third and fourth order streams in dams and water storages at the BCM.	BCOPL has committed to the undertakings listed in the Enforceable Undertaking for the purposes of section 336E of the WM Act and NRAR (see Appendix D).

Table 11-2: Non-Compliances and Exceedances during 2023

Time Period	Condition Description	Relevant approval	Comment
Ongoing	Sound Power Levels	SSD 09_0182 & AQGHGMP	Sound power screening during 2023 recorded 15 items of plant which exceeded its required Sound power Level by 3dB or more. BCO has undertaken extensive consultation with DPHI in relation to this non-compliance. The condition requiring this monitoring to occur is subject of Project Approval Modification Application by BCOPL.
Ongoing	Implementation of SWMP	SWMP	The implementation of the currently approved SWMP is non-compliant as the clean water drain presented in Appendix A of the SWMP to the north of the disturbance area has been mined through and has not been reinstated. DPHI are aware of the non-reinstatement of the clean water drain. SWMP currently under revision.
Ongoing	Implementation of GWMP	GWMP	The implementation of the currently approved GWMP is non-compliant as groundwater monitoring was not undertaken at all required bores during the reporting period. GWMP currently under revision.
Jan-23	Ambient Air Quality Monitoring	SSD 09_0182 Schedule 3 Condition 27	The TEOM at Wilberoi East was without power from the 31 December 2022 until the 3 January 2023.
Apr-24	Surface Water Management Plan (SWMP)	SSD 09_0182 Schedule 3 Condition 38(b)	During the 2020 IEA (SLR 2020) the auditor identified the clean water drain presented in Appendix A of the SWMP to the north of the disturbance area has been mined through and has not been reinstated. BCOPL are preparing an update to the SWMP that depicts that this drain has been removed, however the updated plan has not been approved constituting a non-compliance against this condition.
Apr-24	Groundwater Management Plan (GWMP)	SSD 09_0182 Schedule 3 Condition 38(c)	A review of water quality monitoring data indicates that there were exceedances of trigger values during the reporting period. The Annual Review documents note that the GMP is required to be reviewed to account for the destroyed monitoring bores.
Ongoing	Leard Forest Mining Precinct Regional	SSD 09_0182 Schedule 3 Condition 40	Umwelt prepared a preliminary review of the Leard Forest Regional Biodiversity Strategy in 2018. The scope of the review was reduced to solely focussing on the implementation of the strategy in the revised biodiversity management plans to provide a list of recommendations to the BTM Complex for future revisions of the Leard

Time Period	Condition Description	Relevant approval	Comment
	Biodiversity Strategy		Forest Regional Biodiversity Strategy. The preliminary review included a recommendation (recommendation 4.6) that a comprehensive review of the strategy should be undertaken by 31 December 2021. A letter of response was provided by BCD on 26 July 2019 providing comments on the preliminary review that supported this recommendation. The Comprehensive Review of the strategy has not been undertaken and therefore the recommendations of the preliminary review have not been implemented. This was considered a non-compliance against this condition.
Ongoing	Development of the Eucalyptus Forestry Plantation Offset Strategy	SSD 09_0182 Condition 54	BCOPL submitted a Forestry Planation Offset Strategy in July 2013 to NSW Forestry Corporation. Feedback has been received which suggests NSW Forestry Corporation does not see benefit in the proposed strategy. BCOPL will continue to liaise with NSW Forestry Corporation to finalise this strategy
Apr-24	Environmental Management Plan Revision	SSD 09_0182 Schedule 5 Condition 5 and SoCs 3 and 4	The auditor noted that most plans required under this development consent have not been revised over the reporting period and require updating, constituting a non-compliance against this condition.
Nil	IEA	SSD 09_0182 Schedule 5 Condition 10	The auditor noted that this audit was commissioned on the 11 October 2023, four months after the end of June as required by this condition. BCOPL were not granted an extension from DPHI.
Apr-24	Rehabilitation	Mining Regulation 2016 Schedule 8A Part 2 Standard Condition 11	The auditor noted that the rehabilitation objectives for the site was approved by the NSW Resources Regulators on the 13 October 2023. The latest revision of the RMP is dated 10 November 2023, which is within 30 days of the Rehabilitation Objectives approval. The updated RMP however does not incorporate the approved rehabilitation objectives as required by condition (a).
Mar-24	Rehabilitation	Mining Regulation 2016 Schedule 8A Part 2 Standard Condition 15(1) and 15(2)	The auditor noted that the forward program was submitted on 31 March 2023, which was more than 60 days from the completion of the reporting period. The Annual Rehabilitation Report reviewed did not have a date of submission, and therefore compliance with this condition cannot be verified.

Time Period	Condition Description	Relevant approval	Comment
Mar-24	Rehabilitation	Mining Regulation 2016 Schedule 8A Part 2 Standard Condition 16(2) and Condition 16(3)	The auditor noted that the Rehabilitation Management Plan is not available on the website, exceeding the limit of within 14 days of completion as per the requirements of these conditions.
Nov-23	Ambient Air Quality Monitoring	EPL-12407 Condition P1.1	During the November 2023 collection of the depositional dust gauge D4 at Greenhills, the collection jar was dropped and broken resulting in no sample for November 2023.
Ongoing	Waste Management	EPL-12407 Condition L3.3	The auditor noted that BCOPL continued to dispose of waste tyres in pit between 11 January 2023 and the date of submission of the Written Report required under condition R3.5.

12.0 ACTIVITIES PROPOSED FOR NEXT ANNUAL REVIEW PERIOD

Activities that are proposed for the next Annual Review reporting period are detailed in **Table 12-1**.

Table 12-1: Activities Proposed for Next Reporting Period

Activity	Target Completion Date
Finalisation of Project Approval Modification 8	2024
Commence construction of houses in Boggabri	2024
Commence relocation of MW5	2024
Review and update management plans where required by SSD 09_0182	April 2024
Clearing of vegetation in advance of mining	February - April 2024
Continued implementation of a noise attenuation program for items of plant exceeding modelled sound power levels. This will continue as an iterative process and be ongoing throughout the next reporting period	Ongoing
Undertake exploration activities ahead of mining	Ongoing
Fauna habitat resources such as salvaged fallen timber and nest boxes will be introduced in rehabilitation areas	Ongoing
Fauna habitat resources such as salvaged fallen timber and nest boxes will be introduced in rehabilitation areas	Ongoing
Tubestock planting of canopy species in BOAs and rehabilitation areas	Ongoing

13.0 REFERENCES

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- WSP (2018), Boggabri Coal Mine Biodiversity Offset Strategy

- Australian Bureau of Statistics (2022) *Building Approvals*, Australia, October 2022 (abs.gov.au)
- Department of Environment Water Heritage and the Arts (2010) *Survey Guidelines for Australia's Threatened Birds*
- Department of Planning, Industry and Environment (Letter sent 16/12/2022) Subject: *Additional Reporting Requirements for Coal Mine Annual Reviews*
- Thearle Engineering (2024) Sound Power Compliance Boggabri Coal Mobile Fleet 2023 Revision A.
- EMM Consulting (2024) Environmental Noise Monitoring Annual Report 2023.
- EMM Consulting (2024) Boggabri Coal Operations Pty Ltd Site Water Balance Report.

14.0 ABBREVIATIONS

Abbreviations	Terms
µg/m^3	Micrograms per metre cubed
µS/cm	Microsiemens per centimetre
Ausdrill	Ausdrill Limited
AHCS	Aboriginal Heritage Conservation Strategy
AIA	Acoustic Impact Assessment
AN	Ammonium Nitrate
ANFO	Ammonium Nitrate/ Fuel Oil
AQGHGMP	Air Quality and Greenhouse Gas Management Plan
ASCF	Aboriginal Stakeholder Consultative Forum
BBAM	BioBanking Assessment Methodology 2014
BC Act	Biodiversity Conservation Act 2016 NSW
BCM	Boggabri Coal Mine
BCOPL	Boggabri Coal Operations Pty Limited
BFMP	Blast Fume Management Protocol
BLMP	Blast Management Plan
BMP	Biodiversity Management Plan
BOA	Biodiversity Offset Area
BOS	Biodiversity Offset Strategy
BTM Complex	Boggabri, Tarrawonga, Maules Creek Mining Complex
CCC	Community Consultative Committee
CHMP	Cultural Heritage Management Plan
CHPP	Coal Handling and Preparation Plant
CL	Coal Lease
dB(A) $L_{eq\ (15\ minutes)}$	Decibels A-Weighted with an Equivalent Continuous Sound Pressure Level over 15 minutes
DPE	Department of Planning and Environment - now DPHI

Abbreviations	Terms
DPHI	Department of Planning, Housing and Infrastructure
DPI	Department of Primary Industries
EA	Continuation of Boggabri Coal Mine Environmental Assessment (Hansen Bailey, 2010)
EC	Electrical Conductivity
EMPs	Environmental Management Plans
EMS	Environmental Management Strategy
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EPA	Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cth)
EPL	Environment Protection Licence
Forestry NSW	NSW Forestry Corporation of NSW
g/m²/month	Grams per metre squared per month
GHG	Greenhouse Gas
GJ	Gigajoules
GSC	Gunnedah Shire Council
GWMP	Groundwater Management Plan
ha	Hectares
HTV	High Trigger Value
HVAS	High Volume Air Sampler
IA	Idemitsu Australia Pty Ltd
IEA	Independent Environment Audit
kbcm	Kilo Bank Cubic Metres
$L_{Aeq\ (15\ minutes)}$	Equivalent Continuous Sound Pressure Level over 15 minutes
LGA	Local Government Area
LTV	Low Trigger Value
m/s	Metres per second
mAHD	Metres Australian Height Datum

Abbreviations	Terms
Mbcm	Million bank cubic metres
mBGL	Metres Below Ground Level
mbtoc	Metres below top of casing
MCCM	Maules Creek Coal Mine
mg/L	Milligrams per litre
MIA	Mine Infrastructure Area
ML	Mining Lease
MOP	Mining Operations Plan
Mt	Million tonnes
Mtpa	Million Tonnes Per Annum
MTV	Medium Trigger Value
NGERs	National Greenhouse and Energy Reporting
NMP	Noise Management Plan
NPI	National Pollutant Inventory
NSC	Narrabri Shire Council
Orica	Orica Australia Pty Ltd
PA	Project Approval
PAF	Potential Acid Forming
PM_{10}	Particulate matter < 10 µm
$PM_{2.5}$	Particulate matter < 2.5 µm
RAPs	Registered Aboriginal Parties
RBS	Leard Forest Regional Biodiversity Strategy
RMP	Rehabilitation Management Plan
ROM	Run of Mine
SIMP	Social Impact Management Plan
SPL	Sound Power Level
SSD	State Significant Development approval (formerly Project Approval) 09_0182

Abbreviations	Terms
SWB	Site Water Balance
SWMP	Surface Water Management Plan
t CO_2-e	Tonnes of Carbon Dioxide Equivalent
tonnes/t CO2-e	Tonnes per Tonne of Carbon Dioxide Equivalent
TCM	Tarrawonga Coal Mine
TEOM	Tapered Element Oscillating Microbalance
TLO	Train Load-out Facility
TMP	Traffic Management Plan
TSP	Total Suspended Particulates
ULSD	Ultra-Low Sulphur Diesel
WAL	Water Access Licence
WMP	Water Management Plan

Appendix A
Annual Review Requirements

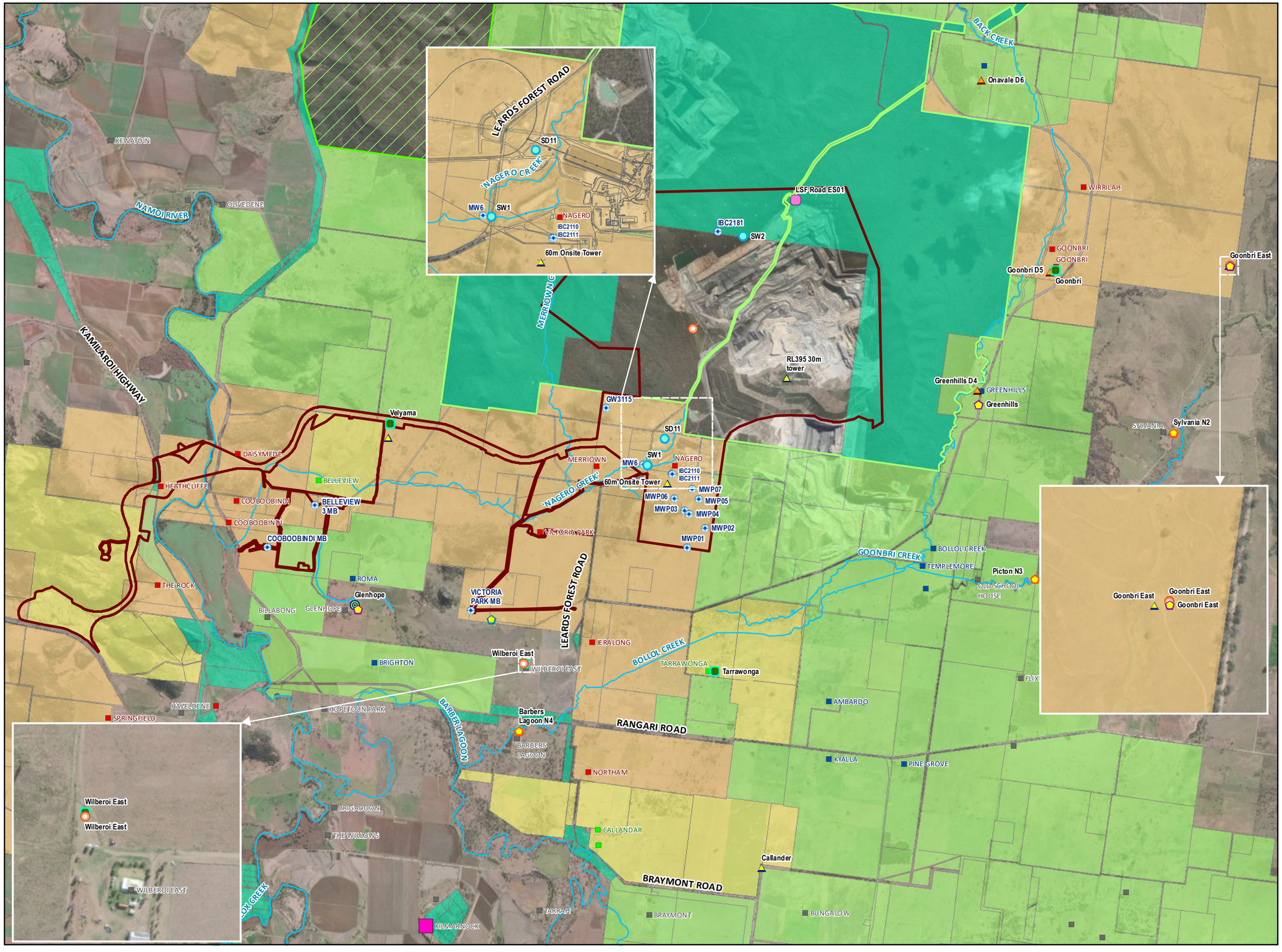
Table A-1: Annual Review Requirements

Licence, Approval or Guideline	Section Reference	Requirement	Reference in this report
CL 368	Condition 4	(a) The lease holder must lodge Environmental Management Reports (EMRs) with the Director-General annually or at dates otherwise directed by the Director-General. (b) The EMR must: i. Report against compliance with the MOP; ii. Report on progress in respect of rehabilitation completion criteria; iii. Report on the extent of compliance with regulatory requirements; and iv. Have regard to any relevant guidelines adopted by the Director-General	Whole document
ML 1755	Condition 3(f)	(f) The lease holder must prepare a Rehabilitation Report to the satisfaction of the Minister. The report must: i. provide a detailed review of the progress of rehabilitation against the performance measures and criteria established in the approved MOP; ii. be submitted annually on the grant anniversary date (or at such other times as agreed by the Minister); and iii. be prepared in accordance with any relevant annual reporting guidelines published on the Department's website at: www.resources.nsw.gov.au/environment. Note: The Rehabilitation Report replaces the Annual Environmental Management Report.	**Section 7.0**
Project Approval 09_0182	Schedule 5, Condition 4	Annual Review By the end of March each year, the Proponent shall review the environmental performance of the project for the previous calendar year to the satisfaction of the Secretary. This review must: (a) Describe the development (including any rehabilitation) that was carried out in the past calendar year, and the development that is proposed to be carried out over the current calendar year;	**Section 7.0**

Licence, Approval or Guideline	Section Reference	Requirement	Reference in this report
		(b) Include a comprehensive review of the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the: • Relevant statutory requirements, limits or performance measures/criteria; • Monitoring results of previous years; and • Relevant predictions in the EA	**Section 4.0 Section 9.3**
		(c) Identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;	**Section 4.0, Section 7.0**
		(d) Identify any trends in the monitoring data over the life of the project;	**Section 4.0**
		(e) Identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and	**Section 4.0**
		(f) Describe what measures will be implemented over the next year to improve the environmental performance of the project.	**Section 5.0**
	Schedule 3, Condition 10	The Proponent shall: (a) Conduct an annual testing program of the attenuated plant on site to ensure that the attenuation remains effective; (b) Restore the effectiveness of any attenuation if it is found to be defective; and (c) Report on the results of any testing and/or attenuation work within the Annual Review.	**Section 6.3**
	Schedule 3, Condition 12	The proponent shall: (i) Use its best endeavours to achieve the long term intrusive noise goals for the project in Table 5, where this is reasonable and feasible, and report on the progress towards achieving these goals in the Annual Review;	**Section 4.3.2**
	Schedule 3, Condition 68	The Proponent shall: (a) Implement all reasonable and feasible measures to minimise the waste (including coal reject) generated by the project; (b) Ensure that the waste generated by the project is appropriately stored, handled and disposed of; (c) Monitor and report on the effectiveness of the waste minimisation and management measures in the Annual Review.	**Section 6.7**

Licence, Approval or Guideline	Section Reference	Requirement	Reference in this report
	Schedule 3, Condition 77	The proponent shall prepare and implement a Social Impact Management Plan (which will) (h) Include a monitoring program, incorporating key performance indicators and a review and reporting protocol, including reporting in the Annual Review.	**Section 11.0**
Boggabri Coal Project EA	Section 8	BCOPL will prepare an Annual Review (which summarises monitoring results and reviews performance) and distribute it to the relevant regulatory authorities and the Boggabri CCC.	**Whole document**

Appendix B
Environmental Monitoring Location Maps



Legend

- Blast monitor
- Dust gauge
- E-sampler
- High volume air sampler (PM10)
- Meteorological station
- Noise monitor (attended)
- Noise monitor (unattended)
- Real time noise monitoring
- Surface water monitoring site
- TEOM location
- Groundwater monitoring bores
- Boggabri Coal residence
- Whitehaven Coal residence
- Mine jointly owned residence
- Privately owned
- Crown
- Waterway
- Boggabri Coal Mine Project Approval Area
- State Conservation Area
- State Forest

Property Ownership

- BCOP
- Joint
- WH
- Crown

N W E S

0 0.5 1 1.5 2 KM

Scale 1:75,000

Projection: Transverse Mercator
Coordinate System: GDA 1994 MGA Zone 56
Scale correct when printed at A3 Landscape

Imagery:
Basemap - World Imagery

DOCUMENT	A_1_BC2024_AEMR002_MON_r1v3
AUTHOR.	A.Carrillo
REVIEWED BY.	N.Cooper
DATE.	19/03/2024

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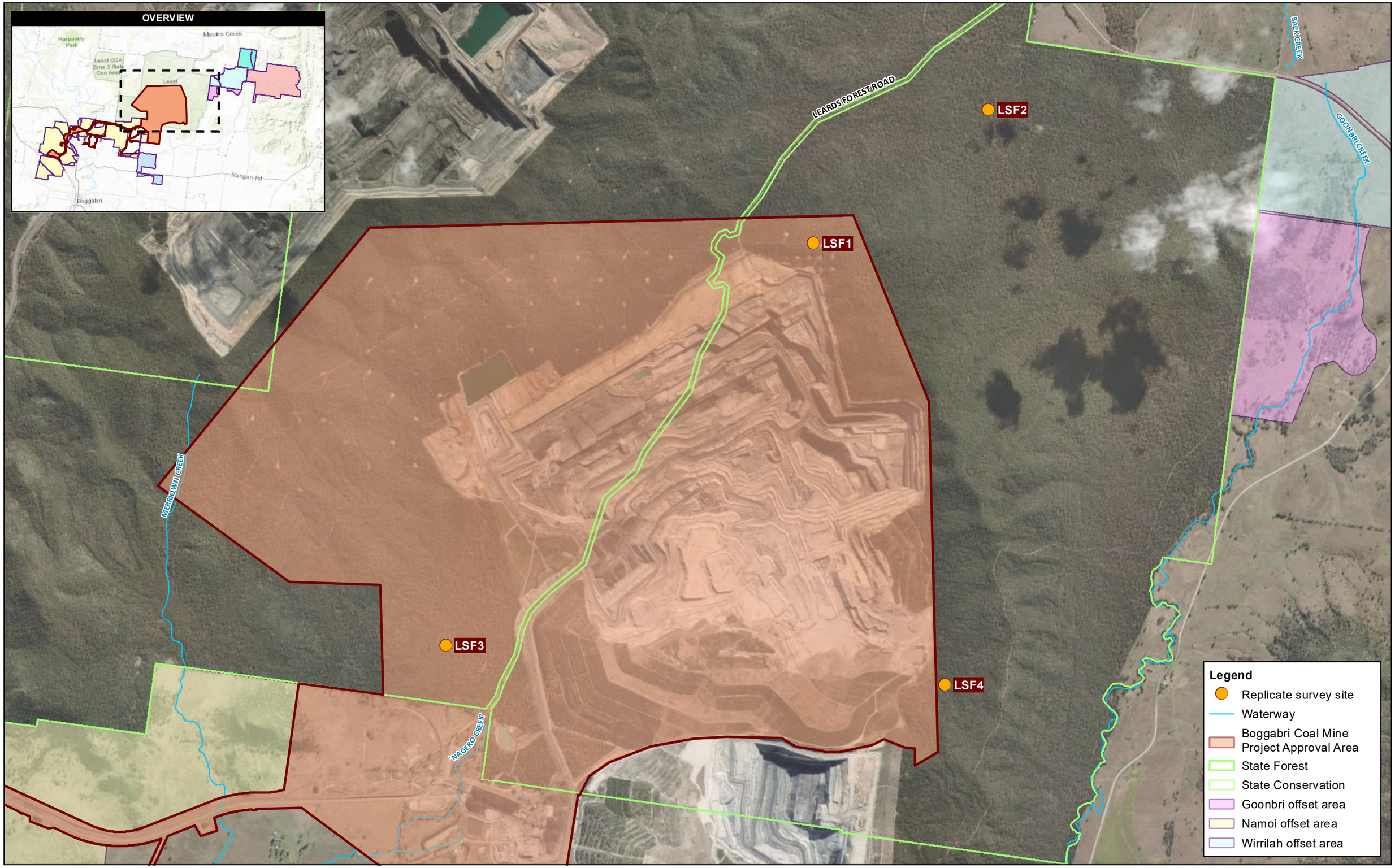
FIGURE **A-1**

TITLE. **BOGGABRI COAL MINE PROJECT BOUNDARY AND ENVIRONMENTAL MONITORING SITES**

Appendix C
Biodiversity Monitoring Maps



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Projection: Transverse Mercator
Coordinate System: GDA 1994 MGA Zone 56
Scale correct when printed at A3 Landscape

Imagery:
Basemap - World Imagery Sources: Esri, HERE, Garmin, Intermap, increment P Corp.,

DOCUMENT	B_1_BC2024_AEMR003_MON_LSF_r1v2
AUTHOR.	A.Carrillo
REVIEWED BY.	N.Cooper
DATE.	18/03/2024

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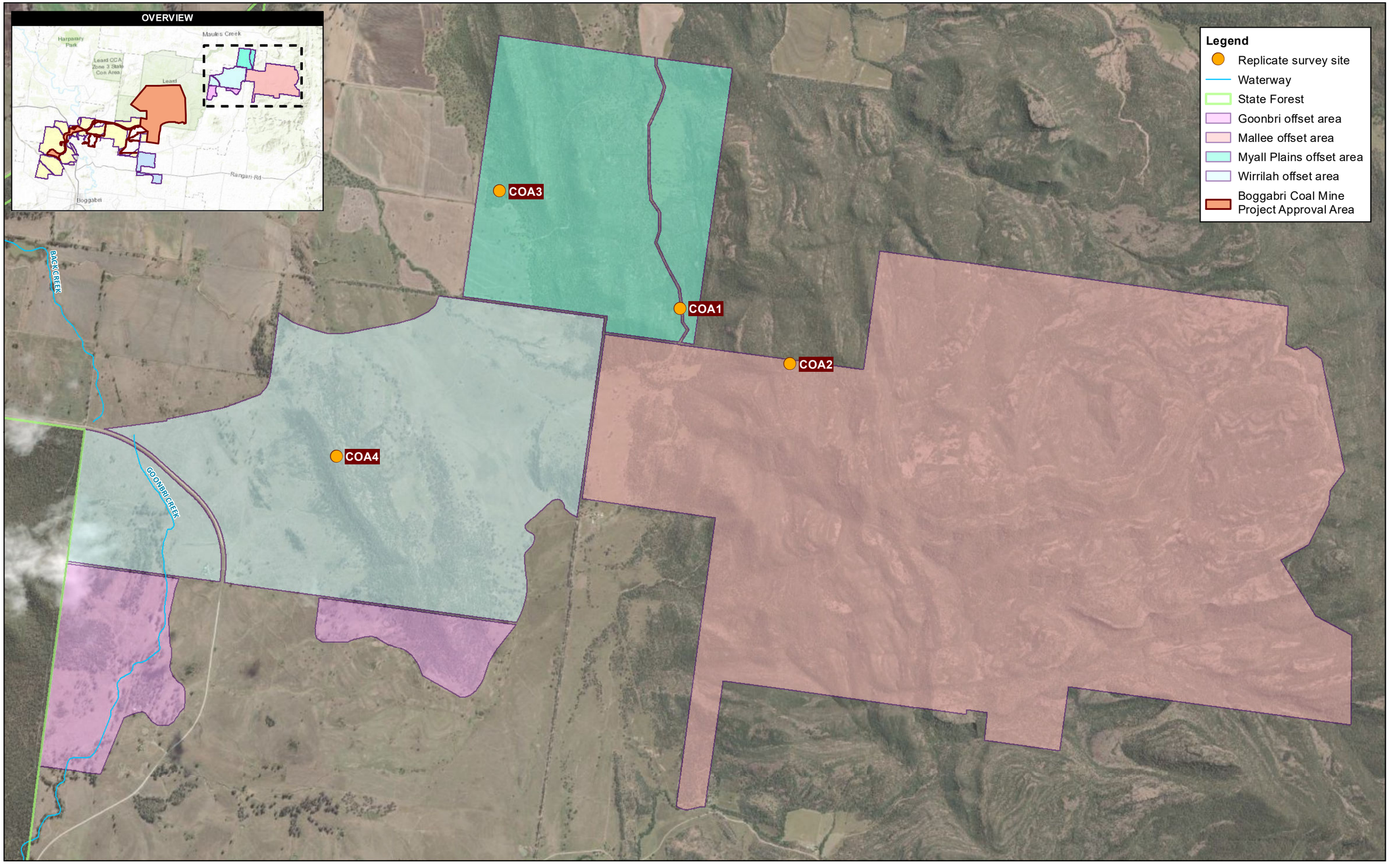
FIGURE **B-1**

TITLE. **LOCATION OF REPLICATE SURVEY SITES - LEARD STATE FOREST**

DRAWING: C:\Users\AUAC507280\WSP O365\Boggabri GIS-Ecology - General\5_Shared\54_Production\Maps\2024\AEMR\B_1_BC2024_AEMR003_MON_LSF_r1v2.mxd



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0 250 500 750 1,000 M

Scale 1:30,000

Projection: Transverse Mercator
Coordinate System: GDA 1994 MGA Zone 56
Scale correct when printed at A3 Landscape

Imagery:
Basemap - World Imagery Sources: Esri, HERE, Garmin, Intermap,

DOCUMENT	B_2_BC2024_AEMR004_MON_COA_r1v2
AUTHOR.	A.Carrillo
APPROVED BY.	N.Cooper
DATE.	18/03/2024

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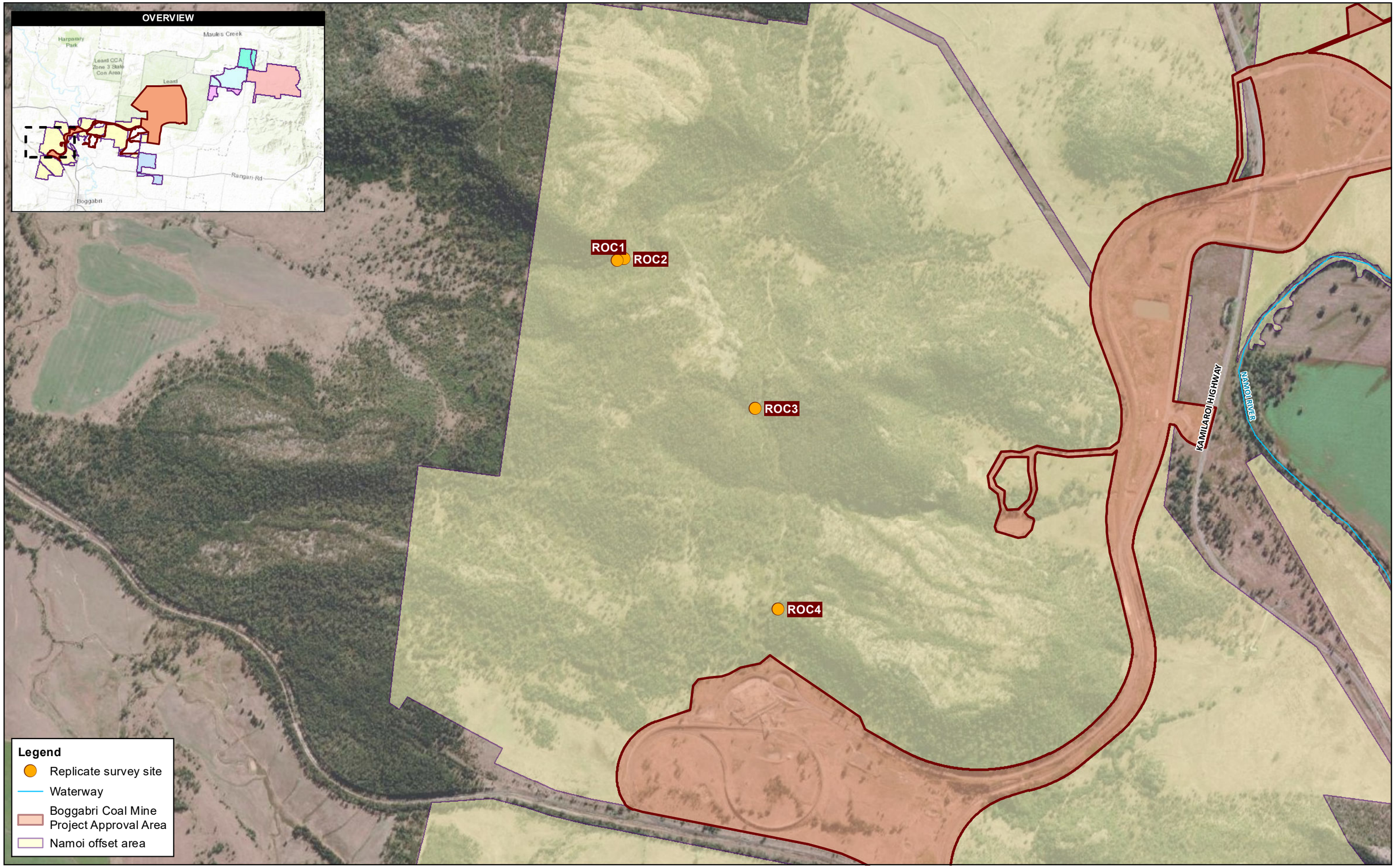
FIGURE **B-2**

TITLE. **LOCATION OF REPLICATE SURVEY SITES - CENTRAL OFFSET AREA**



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0 100 200 300 400 M

Scale 1:15,000

Projection: Transverse Mercator
Coordinate System: GDA 1994 MGA Zone 56
Scale correct when printed at A3 Landscape

Imagery:
Basemap - World Imagery Sources: Esri, HERE, Garmin, Intermap,

DOCUMENT	B_3_BC2024_AEMR005_MON_Rocklea_r1v2
AUTHOR.	A.Carrillo
REVIEWED BY.	N.Cooper
DATE.	18/03/2024

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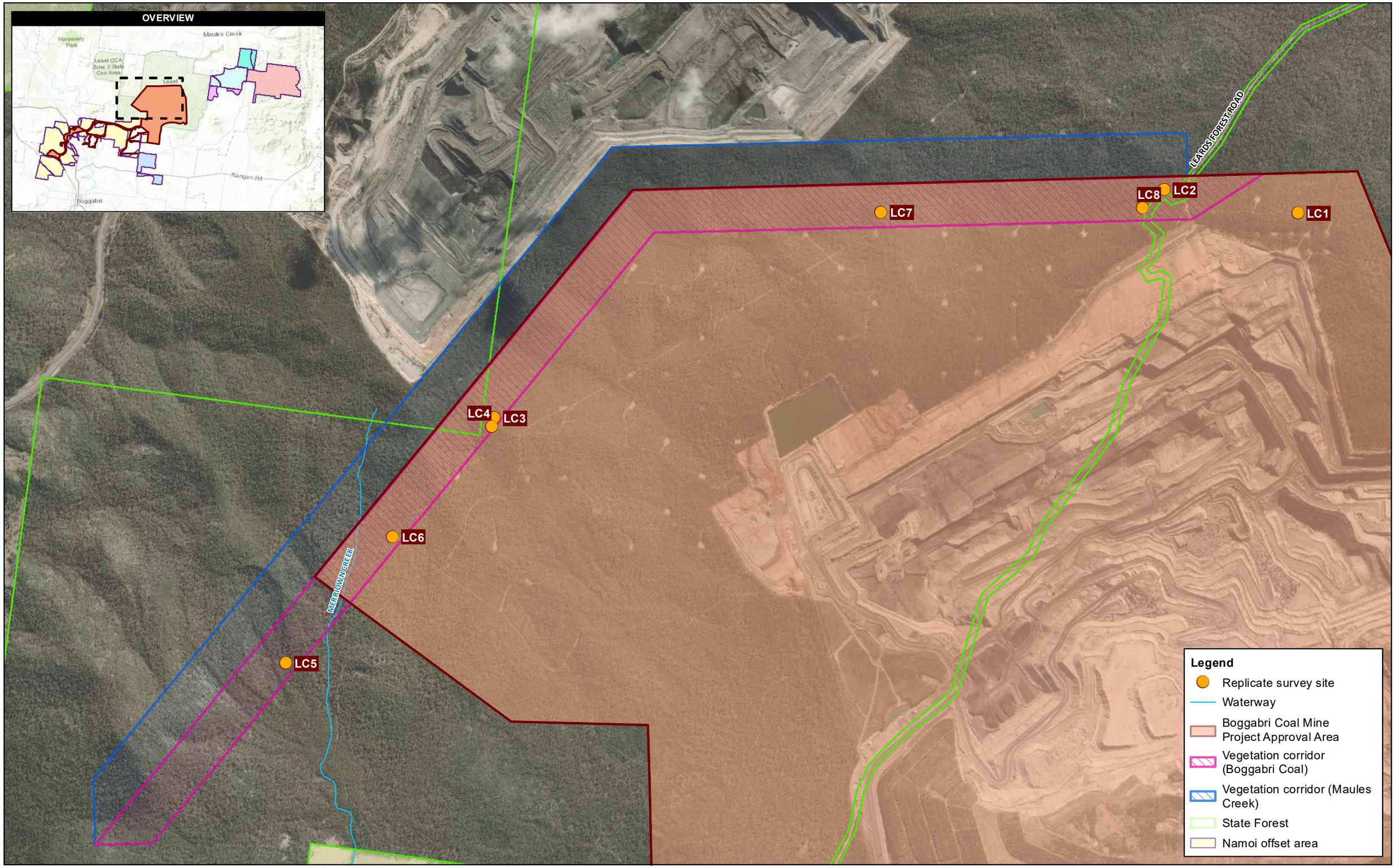
FIGURE **B-3**

TITLE. **LOCATION OF REPLICATE SURVEY SITES - ROCKLEA PROPERTY (NAMOI OFFSETS)**

Idemitsu Australia Resources Pty Ltd

DRAWING: C:\Users\AUAC507280\WSP O365\Boggabri GIS-Ecology - General\5_Shared\54_Production\Maps\2024\AEMR\B_3_BC2024_AEMR005_MON_Rocklea_r1v2.mxd



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Scale 1:20,000

Projection: Transverse Mercator
Coordinate System: GDA 1994 MGA Zone 56
Scale correct when printed at A3 Landscape

Imagery:
Basemap - World ImagerySources: Esri, HERE, Garmin, Intermap,

DOCUMENT B_4_BC2024_AEMR006_MON_Corridor_r1v3

AUTHOR. A.Carrillo

REVIEWED BY. N.Cooper

DATE. 19/03/2024

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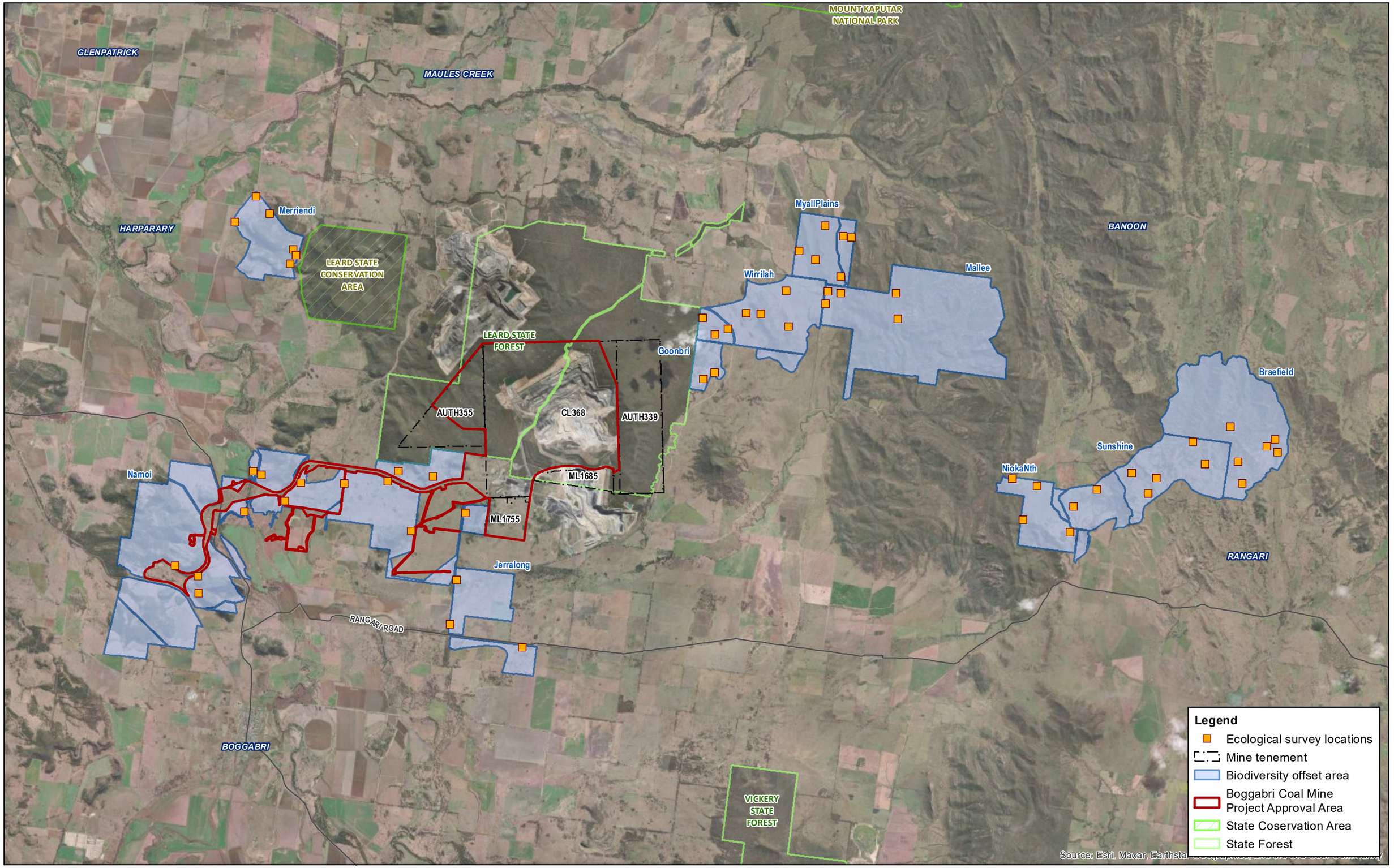
FIGURE **B-4**

TITLE. **LOCATION OF REPLICATE SURVEY SITES - LEARD STATE FOREST VEGETATION CORRIDOR**



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0 1.5 3 km
Scale 1:125,000
Projection: Transverse Mercator
Coordinate System: GDA 1994 MGA Zone 56
Scale correct when printed at A3 Landscape

Imagery: Basemap - World Imagery

DOCUMENT	B_5_BC2024_AEMR007_MON_Replicate_r1v2
AUTHOR.	A.Carrillo
REVIEWED BY.	N.Cooper
DATE.	18/03/2024

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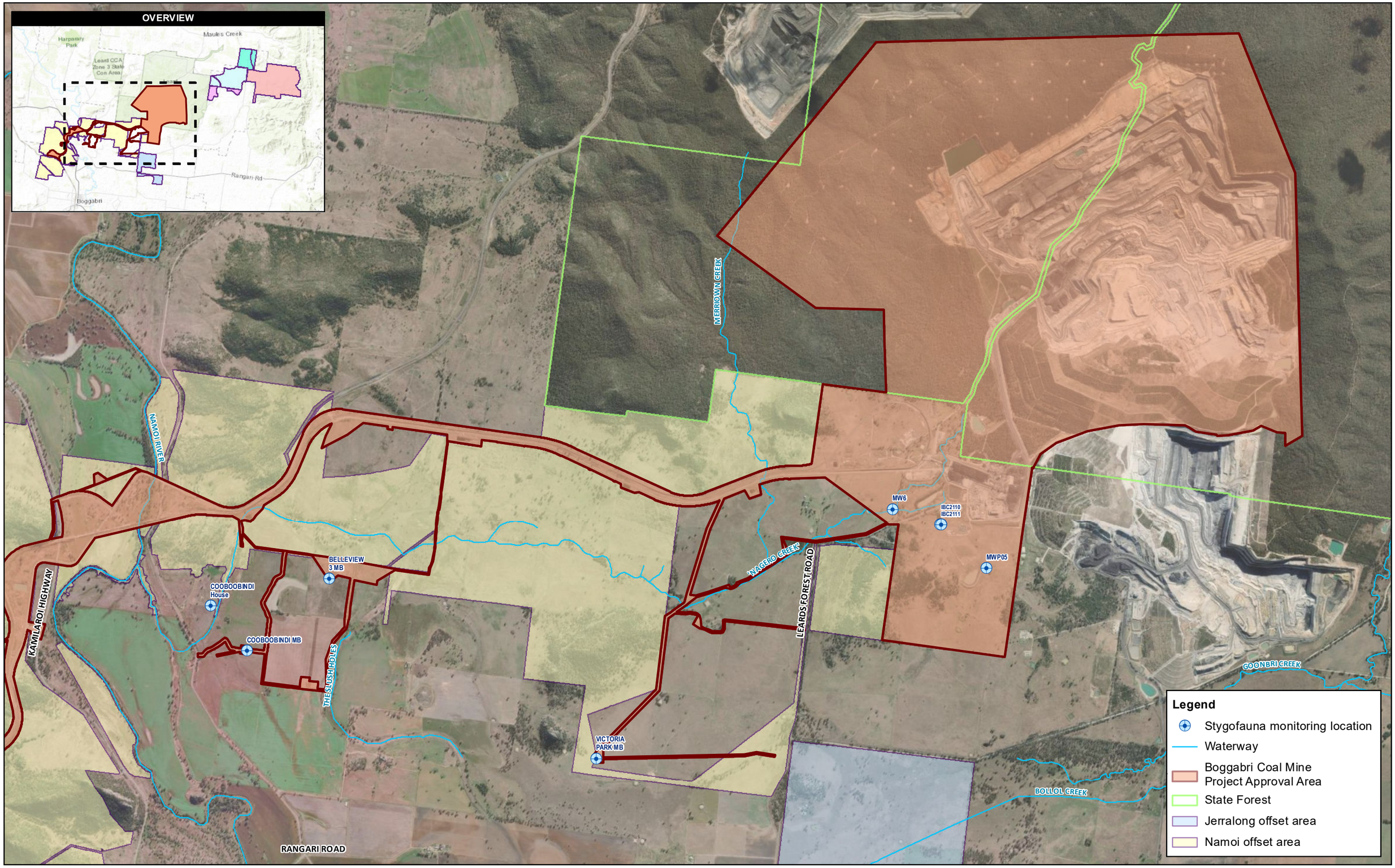
FIGURE **B-5**

TITLE. **LOCATION OF REPLICATE SURVEY SITES**



0 0.4 0.8 1.2 KM

Scale 1:40,000

Projection: Transverse Mercator
Coordinate System: GDA 1994 MGA Zone 56
Scale correct when printed at A3 Landscape

Imagery:
Basemap - World ImagerySources: Esri, HERE, Garmin, Intermap,

DOCUMENT B_6_BC2024_AEMR009_MON_stygo_r1v2

AUTHOR. A.Carrillo

REVIEWED BY. N.Cooper

DATE. 18/03/2024

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FIGURE **B-6**

TITLE. **LOCATION OF STYGOFAUNA MONITORING SITES**

Idemitsu Australia Resources Pty Ltd

DRAWING: C:\Users\AUAC507280\WSP O365\Boggabri GIS-Ecology - General\5_Shared\54_Production\Maps\2024\AEMR\B_6_BC2024_AEMR009_MON_stygo_r1v2.mxd

0 100 200 300 M

Scale 1:10,000

Projection: Transverse Mercator
Coordinate System: GDA 1994 MGA Zone 56
Scale correct when printed at A3 Landscape

Imagery:
Basemap - World Imagery Sources: Esri, HERE, Garmin, Intermap,

DOCUMENT	B_7_BC2024_AEMR011_MON_Rehab_r1v2
AUTHOR.	A.Carrillo
REVIEWED BY.	N.Cooper
DATE.	18/03/2024

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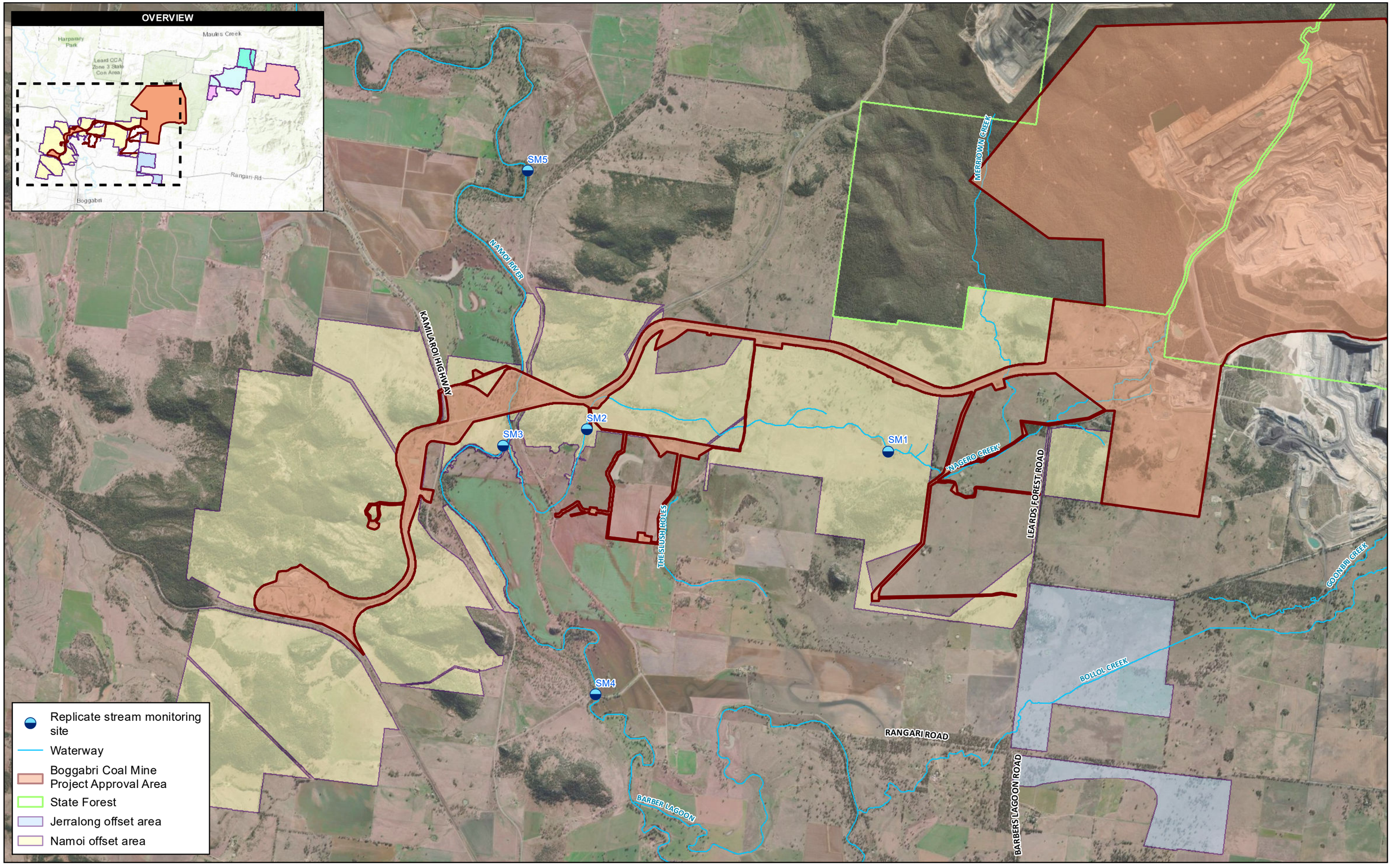
FIGURE **B-7**

TITLE. **LOCATION OF REPLICATE SURVEY SITES - MINE REHABILITATION AREA**

DRAWING: C:\Users\AUAC507280\WSP O365\Boggabri GIS-Ecology - General\5_Shared\54_Production\Maps\2024\AEMR\B_7_BC2024_AEMR011_MON_Rehab_r1v2.mxd



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Scale 1:50,000

Projection: Transverse Mercator
Coordinate System: GDA 1994 MGA Zone 56
Scale correct when printed at A3 Landscape

Imagery:
Basemap - World Imagery Sources: Esri, HERE, Garmin, Intermap,

DOCUMENT	B_8_BC2024_AEMR010_MON_Stream_r1v2
AUTHOR.	A.Carrillo
REVIEWED BY.	N.Cooper
DATE.	18/03/2024

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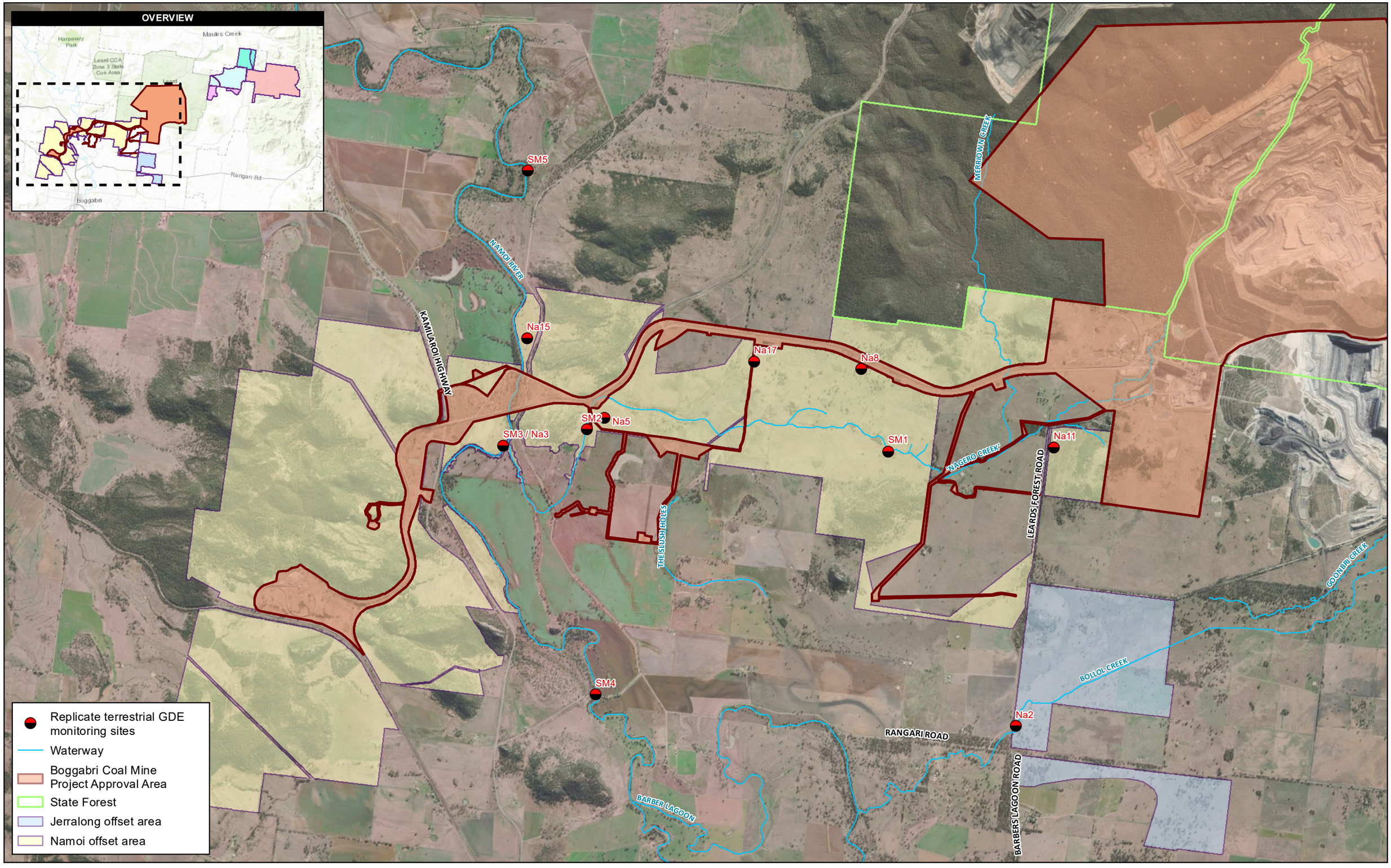
FIGURE **B-9**

TITLE. **LOCATION OF REPLICATE SURVEY SITES – STREAM AND RIPARIAN VEGETATION HEALTH MONITORING SITES**



0 0.5 1 1.5 KM

Scale 1:50,000

Projection: Transverse Mercator
Coordinate System: GDA 1994 MGA Zone 56
Scale correct when printed at A3 Landscape

Imagery:
Basemap - World Imagery Sources: Esri, HERE, Garmin, Intermap,

DOCUMENT	B_9_BC2024_AEMR011_MON_TerrestrialGDE_r1v2
AUTHOR.	A.Carrillo
REVIEWED BY.	N.Cooper
DATE.	18/03/2024

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FIGURE **B-9**

TITLE. **LOCATION OF REPLICATE MONITORING SITES – TERRESTRIAL GROUNDWATER DEPENDENT ECOSYSTEM MONITORING**

Appendix D
Regulator Correspondence

Department of Planning and Environment

Alex Williams
Environmental Superintendent
Idemitsu Boggabri Coal
Kamilaroi Country

By email only: alex.williams@boggabricoal.com.au

13/06/2023

Boggabri Coal (MP09_0182)
Annual Review 2022

Dear Ms Williams

Reference is made to your post approval matter, MP09_0182-PA-42, Boggabri Coal Mine Annual Review for the period 1January 2022 to 31 December 2022 (AR 2022), submitted as required by Schedule 5, Condition 4 of MP09_0182 as modified (the approval) to the Department of Planning and Environment (the department) on 31 March 2023. Reference is also made to the amended AR 2022 submitted in response to the department's request for information, RFI-57063466.

The department has reviewed the amended AR 2022 and considers it to generally satisfy the reporting requirements of the approval and the department's *Annual Review Guideline* (October 2015). Please make publicly available a copy of the amended AR 2022 on the company website.

Please note that the department's acceptance of this Annual Review is not an endorsement of the compliance status of the project.

The non-compliance identified in the amended AR 2022 with Schedule 5, Condition 4 of the approval has previously been addressed by the department and no further action is proposed.

The non-compliances identified in the amended AR 2022 with Schedule 3, Condition 9 (sound power level exceedances), Schedule 3, Condition 22 (missed rainfall and solar radiation data), and Schedule 3, Condition 22 (14 November 2022 missed blast monitoring data) of the approval have been assessed in accordance with the department's Compliance Policy with the department on this occasion, determining to record the breaches with no further enforcement action. However, please note that recording the breach does not preclude the department from taking alternative enforcement action, should it become apparent that an alternative response is more appropriate.

The department notes the ongoing non-compliances identified in the amended AR 2022 with Schedule 3, Conditions 38(b) and 38(c), and Condition 54 of the approval. Under the provisions of Schedule 2, Condition 4 of the approval, I, as nominee of the Planning Secretary, require an update to be provided to the department (via the Major Projects Portal) by 30 November 2023, or as otherwise agreed by the Planning Secretary, detailing all action taken during the period to resolve these non-compliances. This update should include a register of correspondence with the relevant parties.

Finally, the department notes that a search of its records cannot locate any notification of the non-compliances with Schedule 3, Condition 22 (missed rainfall and solar radiation data), and Schedule 3, Condition 22 (14 November 2022 missed blast monitoring data). In accordance with Schedule 5, Condition 15 of the approval the applicant must notify the department with 7 days of becoming aware of a non-compliance. Further correspondence may be sent in relation to these non-compliances with

Schedule 5, Condition 15 of the approval.

Should you wish to discuss the matter further, please contact Joel Curran, Senior Compliance Officer, on 02 4904 2702 or compliance@planning.nsw.gov.au

Yours sincerely

Heidi Watters
Team Leader Northern
Compliance

As nominee of the Planning Secretary

Natural Resources Access Regulator
Locked Bag 5123,
Parramatta NSW 2124
T 1800 633 362
www.industry.nsw.gov.au/nrar

Decision to Accept an Enforceable Undertaking under section 336E of the Water Management Act 2000

Entity	Boggabri Coal Operations Pty Ltd (BCOPL) ABN 76 600 191 455
Issue	Notification of decision to accept an enforceable undertaking
Legislation	Sections 336E and F of the *Water Management Act 2000*
Decision Maker	Grant Barnes Chief Regulatory Officer Natural Resources Access Regulator

I, Grant Barnes, Chief Regulatory Officer, delegate of the Natural Resources Access Regulator (**NRAR**), have decided to accept the enforceable undertaking (**Undertaking**) given by Boggabri Coal Operations Pty Ltd (BCOPL) ABN 76 600 191 455 attached to this decision. This instrument provides written notice of my decision and the reasons for this.

Legislation

1. Section 336E of the *Water Management Act 2000* (**WM Act**) and section 11(1)(e) and cl 1(pla) of Schedule 2 of the *Natural Resources Access Regulator Act 2017* (**NRAR Act**) empower NRAR to accept a written undertaking in connection with a matter in relation to which NRAR has a function under the WM Act. This function has been delegated to me by NRAR under s 14(c) of the NRAR Act.

2. Section 336F of the WM Act and section 11(1)(e) and cl 1(plb) of Schedule 2 of the NRAR Act require NRAR to give the person seeking to make an undertaking written notice of NRAR's decision to accept or reject the undertaking and the reasons for the decision. This duty has been delegated to me by NRAR under s 14(c) of the NRAR Act.

Background

3. A background to this matter is also provided within the body of the Undertaking itself and within the accompanying briefing note. The following summary is intended as supplementary to those materials.

4. BCOPL operates the Boggabri Coal Mine (**BCM**) located approximately 15km north-east of Boggabri in the Gunnedah Basin, New South Wales. BCOPL's address is 386 Leard Forrest Rd Boggabri NSW.

5. In September 2021, following receipt of a complaint, NRAR became concerned that BCOPL allegedly had and was continuing to impound surface water within the BCM, which varied in volume as rainfall increased from 2019, unlawfully from the Bluevale

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6. Water Source. The Bluevale Water Source is an unregulated water source within the Namoi Water Management Area to which the *Water Sharing Plan for the Namoi and Peel Unregulated River Water Sources 2012* applies.

7. On 16 December 2021, during an inspection of BCM by NRAR investigators evidence was collected that BCOPL had been capturing surface water in temporary and permanent storages located from minor and non-minor streams within the Bluevale Water Source. BCOPL was not required to hold water use approvals by virtue of its development consent. However, the impounding of water occurred in circumstances where it did not hold a requisite surface water access licence for an unregulated water source to divert that water and exemptions to licensing were not available. The water was being captured as a consequence of BCOPL's progressive removal, to facilitate its expansion, up to mid-2018 of clean water diversions in its upper catchment.

8. According to NRAR's calculations, factoring in average rainfall runoff (and not actual values), in the period from 1 July 2019 to 30 March 2022 (the period of alleged offending), a total theoretical volume of 1,105 ML may have been taken by BCOPL without a requisite licence.

9. It is alleged that, by capturing water without appropriate licensing during the period of alleged offending, BCOPL contravened s 60A(2) of the *Water Management Act 2000* (WMA).

10. On 9 December 2022, BCOPL submitted a draft Undertaking for NRAR's consideration. On 8 June 2023, following further discussion between the parties, BCOPL submitted a further proposed Undertaking for NRAR's consideration. By agreement, this Undertaking supersedes earlier iterations of an undertaking proposed by BCOPL.

Terms of the proposed enforceable undertaking

11. In summary, BCOPL undertakes, among other things:

    a) by 31 December 2023, to install additional water metering and telemetry at BCM's main water arterials to measure water transferred out of the pit into the mine water dams by 31 December 2023 (cl 4.1(a)(i));

    b) by 31 July 2023, to implement a GOLDSIM modelling licence by 31 July 2023 (cl 4.1(a) (ii)). This licence must, beyond 31 July 2023:

        (i) provide real time site water balances inclusive of all surface water inflows;

        (ii) forecast modelling to determine future surface water licensing requirements; and

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(iii) verify water intakes and usage and provide predictive modelling capacity for upcoming weather events.

c) by 31 December 2023, to submit to the NSW Department of Planning & Environment an updated Site Water Management Plan (cl 4.1(a)(iii));

d) use information and data derived from water metering, telemetry and monitoring improvements to report and account for surface water taken during each water year until 31 December 2027 in accordance with the Water Balance Modelling provided for in Appendix 2 to the Undertaking (cl 4.1(a) (iv));

e) within 28 business days of the commencement date, to make a payment to NRAR in the amount of A$54,240 in recognition of the value of the volume of water allegedly taken without a licence during the relevant period of 1 July 2019 and 20 April 2022 (cl 4.1(a)(v);

f) by 31 July 2023, to consult with the local indigenous community through the Boggabri Coal Aboriginal Stakeholder Consultative Forum at 6 monthly intervals up to 31 December 2024 (4.1(a) (vii); and

g) by 31 July 2023 to submit to NRAR for approval, a proposal to make a financial contribution of A$10,000 to a community project with a water management focus in the local and/or regional area proximate to but outside of the BCM (cl 4.1(a) (vi)).

Consideration

12. Having regard to NRAR's Enforceable Undertakings Guideline (**Guideline**), especially Part 3, I have decided to accept the Undertaking for the following reasons.

Breach of the WMA and its Seriousness

13. As referred to above, NRAR considers that BCOPL, by impounding water within BCM over the period 1 July 2019 to 30 March 2022, in circumstances where it did not hold an appropriate Water Access Licence to do so, allegedly contravened s 60A(2) of the WMA.

14. As is also noted above, on the basis of information provided by BCOPL and its calculations, NRAR considers that over the almost 33 months of the period of the alleged offending 1,105.5ML could theoretically have been unlawfully diverted by BCOPL. This is a significant amount of water. An approximate take of 1,000ML of water by a neighbouring mine resulted in conviction and the imposition of significant fines on its operator following proceedings brought by NRAR before the Land & Environment Court of NSW.

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15. In addition, while there is presently no evidence of harm environmentally or to neighbouring landholders, no assessment of actual harm has been undertaken and BCOPL owns or co-owns much of the land between the mine and the Namoi river so that it is only because of happenstance that it appears that there are no other affected landholders.

16. Nevertheless, it is acknowledged that when it impounded water at BCM during the period of the offending, BCOPL relied on the (albeit erroneous) advice of a consultant to the effect that the water was within BCOPL's harvestable right to impound. Further, since the investigation commenced, BCOPL has engaged constructively with NRAR during that time and during the negotiations concerning the Undertaking. BCOPL has also, since NRAR's investigation commenced, obtained a water access licence to address possible future water take.

17. Finally, the measures that BCOPL undertakes to adopt are, by the express wording of the Undertaking, to be implemented to provide redress to the community for impact to it and the environment (see [18] below) and provide for future oversight of its operations and licensing for taking water.

Acceptance of responsibility for conduct

18. In the Undertaking, BCOPL has acknowledged the alleged contravention of the WMA and has committed to the measures it must implement as a means of redressing the effects of its contravening conduct on the environment and the community.

Other subjective considerations

19. As far as is known to NRAR, BCOPL has not come to the attention of authorities previously for a breach of *WM Act*.

20. While, as a corporation, BCOPL arguably had the resources to avert the alleged contravention from occurring. As was noted above (see [7]), up to about 2018 (and just prior to the period of the alleged offending), BCOPL had clean water diversion measures in place that may have prevented the alleged contravention from occurring, which it removed on the basis of incorrect advice.

21. BCOPL has cooperated with NRAR during the course of its investigation of this matter and in the negotiations that have preceded the Undertaking. BCOPL's cooperation and the measures it proposes to implement are acknowledged as evidence of its entrance into the undertaking in good faith. In particular, BCOPL's commitment pursuant to cl 5.1(b) of the Undertaking to use accompanying metering and telemetry measures (see 4.1(a)(i)) to identify learnings that may contribute to the development by NRAR of best practice guidelines.

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for water reporting in mining is a positive initiative with industry wide application. Otherwise, measures within the Undertaking, such as those identified at [11](b), (c) and (d), above indicate a commitment to cease the conduct which led to the contravention and will practically assist to prevent recurrence.

22. The measures identified at [11] (a) and (b) above will provide for the accurate measurement of water captured within BCM and also serve to predict future water inflows so that adequate licensing can be acquired if needed. The measure at (d), coupled with that at 5.1(b) will ensure that BCOPL reports to NRAR regarding surface water taken and is accountable for it for at least the next four years. This should foreseeably ensure compliance and prevent recurrence of the impugned conduct.

23. Further, BCOPL will, by payment of the amount of $54,240 offered, make reparation that approximates the value of the water that is estimated to have been diverted ($40ML (as at April 2022) x 1105ML).

24. While the measures mentioned at [22] above may not directly address remediation, they do so indirectly by preventing a future unlicensed retention within BCM of surface water.

25. In terms of remedying community impact, again, the measures provided for under the Undertaking do not directly address harm that may have been caused by prior contravention. However, the measure referred to at [11](f) above, provides for consultation (though only in the short term up to December 2024) with the local indigenous community and for a forum in which concerns regarding the ongoing operation of the water management system at BCM can be aired. The measure referred to at [11](g) above, provides for BCOPL's funding of a community project.

26. While the community project is yet to be settled, it must be approved by NRAR and must be undertaken in a local area proximate to BCM. Further, as its focus will be on water management it will provide some redress to the community for alleged water misconduct and will further evidence a commitment on the part of BCOPL to managing water legally but also communally.

Assessment against water management principles

27. Acceptance of the undertaking generally reflects and promotes the Water Management Principles contained within s 5 of that Act. This is particularly because the undertaking aids in enhancing future compliance with the WM Act which will better protect the Bluevale water source, its dependent ecosystems, and associated habitats, animals and plants. An assessment of the undertaking against the water management principles is contained in **Annexure A** to these reasons.

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General conclusion

28. As set out above, it is considered that the Undertaking is the most effective and appropriate regulatory outcome in the circumstances. It will provide for appropriate compliance and oversight into the future and it will provide for social benefit among other things. Given the attitude and cooperative approach taken by BCOPL, resolution of this matter by Undertaking is also more appropriate.

29. I attach a signed copy of the Undertaking.

30. This decision takes effect and is in force immediately on the date the Undertaking is signed by me.

31. NRAR will follow up to ensure that all actions contained in the Undertaking have been complied with in full by the due dates stipulated. The NRAR may apply to the Land and Environment Court for an order enforcing the Undertaking if a term of the Undertaking is breached: see section 336E(4)).

Date of decision: 15 June 2023

Grant Barnes
Chief Regulatory Officer
Natural Resources Access Regulator

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Annexure A – Assessment against water management principles

Promotion of principles

When deciding whether or not to accept an enforceable undertaking, NRAR has a duty under s 9(1) of the WM Act to take all reasonable steps to do so in accordance with, and so as to promote, the water management principles in s 5 of the Act.

An assessment of the Undertaking against the applicable water management principles is detailed in Table 1 below.

Table 1:

Water management principles		Whether principles are promoted and, if so, why	Relevant clause of Undertaking
General	Water sources, floodplains and dependent ecosystems (including groundwater and wetlands) should be protected and restored and, where possible, land not degraded: s 5(2)(a)	BCOPL's undertakings to install additional, telemetered metering at main arterials in the mine site, to implement GOLDSIM modelling to achieve real time site water balances and forecast water take by the mine and report to NRAR with the data derived from these initiatives up to 31/12/27 will aid in enhancing future compliance with the WM Act. This will assist in protecting the Bluevale water source and its dependent ecosystems.	4.1(a)(i) 4.1(a) (ii) 4.1 (a) (iv)
	Habitats, animals and plants that benefit from water or are potentially affected by managed activities should be protected and (in the case of habitats) restored: s 5(2)(b)	BCOPL's undertakings as identified above in respect to s 5(2)(a), as they aid management of water take and licensing appropriate to the Bluevale water source, will also aid in the protection of habitats, animals and plants that benefit from or are potentially affected by that water take.	4.1(a)(i) 4.1(a) (ii) 4.1 (a) (iv)
	Water quality of all water sources should be protected and, wherever possible, enhanced: s 5(2)(c)	This is not directly addressed by this EU	

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Water management principles		Whether principles are promoted and, if so, why	Relevant clause of Undertaking
	Cumulative impact of water management licences, approvals and other activities on water sources and dependent ecosystems should be considered and minimised: s 5(2)(d)	BCOPL's undertakings as identified above in respect to s 5(2)(a) will better enable the cumulative impact of activities on the Bluevale water source to be considered and thereby minimised.	
	Geographical and other features of Aboriginal significance should be protected: s 5(2)(e)	This is not directly addressed by this EU. However, BCOPL's commitment to consult with the local indigenous community through the Boggabri Coal Aboriginal Stakeholder Consultative Forum at 6 monthly intervals up to 31 December 2024, on the impacts of future water take on practices and values and also to promote those practices and values, may aid in ensuring BCOPL is aware of sites and customs that are of significance to indigenous people.	4.1 (a) (vii)
	Geographical and other features of major cultural, heritage or spiritual significance should be protected: s 5(2)(f)	As above.	
	Social and economic benefits to the community should be maximised: s 5(2)(g)	BCOPL's commitment by 31 July 2023 to submit to NRAR for approval, a proposal to make a financial contribution of A$10,000 to a community project with a water management focus in the local and/or regional area proximate to, but outside of the BCM, will aid in maximising social benefits to the community.	4.1(a) (vi)
	Principles of adaptive management, responsive to monitoring and improvements in understanding of ecological water requirements, should be applied: s 5(2)(h)	This is not directly addressed by this EU.	
Water sharing	Sharing of water from a water source must protect the water source and its dependent ecosystems: s 5(3)(a)	N/A -not relevant to subject matter of EU	

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Water management principles		Whether principles are promoted and, if so, why	Relevant clause of Undertaking
	Sharing of water from a water source must protect basic landholder rights: s 5(3)(b)	N/A -not relevant to subject matter of EU	
	Sharing/extraction of water under any other right must not prejudice the above water sharing principles: s 5(3)(c)	N/A -not relevant to subject matter of EU	
Water use	Water use should avoid or minimise land degradation[1] and, where possible, land should be rehabilitated: s 5(4)(a)	N/A -not relevant to subject matter of EU	
	Water use should be consistent with the maintenance of productivity of land in the long term and should maximise the social and economic benefits to the community: s 5(4)(b)	N/A -not relevant to subject matter of EU	
	The impacts of water use on other water users should be avoided/minimised: s 5(4)(c)	N/A -not relevant to subject matter of EU	
Drainage management	Drainage activities should avoid/minimise land degradation and, where possible, land should be rehabilitated: s 5(5)(a)	N/A -not relevant to subject matter of EU	
	The impacts of drainage activities on other water users should be avoided/minimised: s 5(5)(b)	N/A -not relevant to subject matter of EU	
Floodplain management	Floodplain management must avoid/minimise land degradation and, where possible, land must be rehabilitated: s 5(6)(a)	N/A -not relevant to subject matter of EU	
	The impacts of flood works on other water users should be avoided/minimised: s 5(6)(b)	N/A -not relevant to subject matter of EU	

[1] "Land degradation" for the purposes of the specific principles includes soil erosion, compaction, geomorphic instability, contamination, acidity, waterlogging, decline of native vegetation or, where appropriate, salinity.

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Water management principles		Whether principles are promoted and, if so, why	Relevant clause of Undertaking
	The existing and future risk to human life and property arising from occupation of floodplains must be minimised: s 5(6)(c)	N/A -not relevant to subject matter of EU	
Controlled activities	The carrying out of controlled activities must avoid/minimise land degradation and, where possible, land must be rehabilitated: s 5(7)(a)	N/A -not relevant to subject matter of EU	
	The impacts of carrying out controlled activities on other water users must be avoided or minimised: s 5(7)(b).	N/A -not relevant to subject matter of EU	
Aquifer interference activities	The carrying out of aquifer interference activities must avoid/minimise land and, where possible, land must be rehabilitated: s 5(8)(a)	N/A – not relevant to subject matter of EU	
	The impacts of carrying out aquifer interference activities on other water users must be avoided/minimised: s 5(8)(b)	N/A -not relevant to subject matter of EU	

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Priority of water sharing principles [Delete this section if not applicable]

When deciding whether or not to accept an enforceable undertaking, NRAR has a duty under s 9(1) of the WM Act to give priority to the water sharing principles in s 5(3) in the order in which they are set out.

An assessment of how the Undertaking gives effect to the requisite priority of the water sharing principles is detailed in Table 2 below.

Table 2:

Water sharing principle	How is required priority demonstrated	Relevant clause of Undertaking
Protection of water source and its dependent ecosystem: s 5(3)(a)	**N/A – not relevant to subject matter of EU**	
Protection of basic landholder rights: s 5(3)(b)		
Sharing/extraction of water under any right must not prejudice above water sharing principles: s 5(3)(c)		

Department of Planning, Housing and Infrastructure

NSW Planning ref: MP09_0182-PA-57

Alex Williams
Environmental Superintendent
Boggabri Coal Pty Limited
Leard State Forest 386 Leards Forest Road
Boggabri NSW 2382
06/02/2024

Sent via the Major Projects Portal only

Subject: Boggabri Coal - 231210 Wilberoi East PM10 exceedance

Dear Miss Williams

Reference is made to your post approval matter, MP09_0182-PA-57, 231210 Wilberoi East PM10 exceedance, submitted as required by Schedule 5, Condition 15 of MP09_0182 as modified (the consent) to the NSW Department of Planning, Housing and Infrastructure (NSW Planning) on 18 January 2024.

NSW Planning notes that modification 8 of the consent (approved on 22 January 2024) changed the 24h PM10 criterion from absolute to incremental and removed the extraordinary event exclusion from the 24h PM10 criterion. As the exceedance event occurred prior to modification 8 being approved, NSW Planning considers the extra ordinary event exclusion, being the Duck Creek – Pilliga Forest fire, to apply, and, as such, no further reporting is required in relation to this exceedance event.

Should you wish to discuss the matter further, please contact Joel Curran, Senior Compliance Officer on 02 4904 2702 or email compliance@planning.nsw.gov.au

Yours sincerely

Heidi Watters
Team Leader Northern
Compliance

As nominee of the Planning Secretary

Department of Planning, Housing and Infrastructure

NSW Planning ref: MP09_0182-PA-56

Alex Williams
Environmental Superintendent
Boggabri Coal Pty Limited
ABORIGINAL COUNTRY
Leard State Forest 386, Leards Forest Road
Boggabri NSW 2382
27/02/2024

Sent via the Major Projects Portal only

Subject: Boggabri Coal - Independent Environmental Audit 2023

Dear Miss Williams

Reference is made to your post approval matter, MP09_0182-PA-56, 2023 Independent Environmental Audit (IEA) report [and Response to Audit Recommendations (RAR)] for the period 7 November 2020 to 12 October 2023, submitted as required by Schedule 5, Condition 10 of MP09_0182 as modified (the consent) to the NSW Department of Planning, Housing and Infrastructure (NSW Planning) on 20 December 2023.

NSW Planning considers the 2023 IEA report to generally satisfy the reporting requirements of the consent and the NSW Planning *Independent Audit Post Approval Requirements* (2020). As required by Schedule 5, Condition 12 of the consent, please make publicly available a copy of the 2023 IEA report on the company.

Please note that NSW Planning's acceptance of the 2023 IEA report is not an endorsement of the compliance status of the project.

Non-compliances identified in the 2023 IEA with Schedule 3, Conditions 40 and 68, and Schedule 5, Conditions 8, 10, and 14 have been assessed by NSW Planning in accordance with its Compliance Policy, with NSW Planning on this occasion determining to record the breaches with no further enforcement action proposed. However, please note that recording the breach does not preclude NSW Planning from taking an alternative enforcement action, should it become apparent that an alternative response is more appropriate.

All remaining non-compliances identified in the 2023 IEA were addressed by NSW Planning during the audit period. No further action is proposed at this time.

NSW Planning notes that its auditor approval letter dated 31 August 2023 contained a Secretary's Direction to carry out the 2023 IEA in accordance with the NSW Planning *Independent Audit Post Approval Guidelines* (2020), which require the audit report to be submitted to NSW Planning within 2-months of the site inspection component of the audit. The site inspection was undertaken on 12

October 2023 and the audit was not submitted to NSW Planning until 20 December 2023. This breach has been assessed by NSW Planning in accordance with its Compliance Policy, with NSW Planning on this occasion determining to record the breaches with no further enforcement action proposed. However, please note that recording the breach does not preclude NSW Planning from taking an alternative enforcement action, should it become apparent that an alternative response is more appropriate.

Please include a status update for all actions provided in the RAR in the next IEA and Annual Review until all actions are completed.

Should you wish to discuss the matter further, please contact Joel Curran, Senior Compliance Officer on 02 4904 2702 or email compliance@planning.nsw.gov.au

Yours sincerely

Heidi Watters
Team Leader Northern
Compliance

As nominee of the Planning Secretary

Appendix E

BCM 2023 Actual and 2024 Proposed Exploration Drilling Program

Table E-2: Exploration Drilling Holes 2023

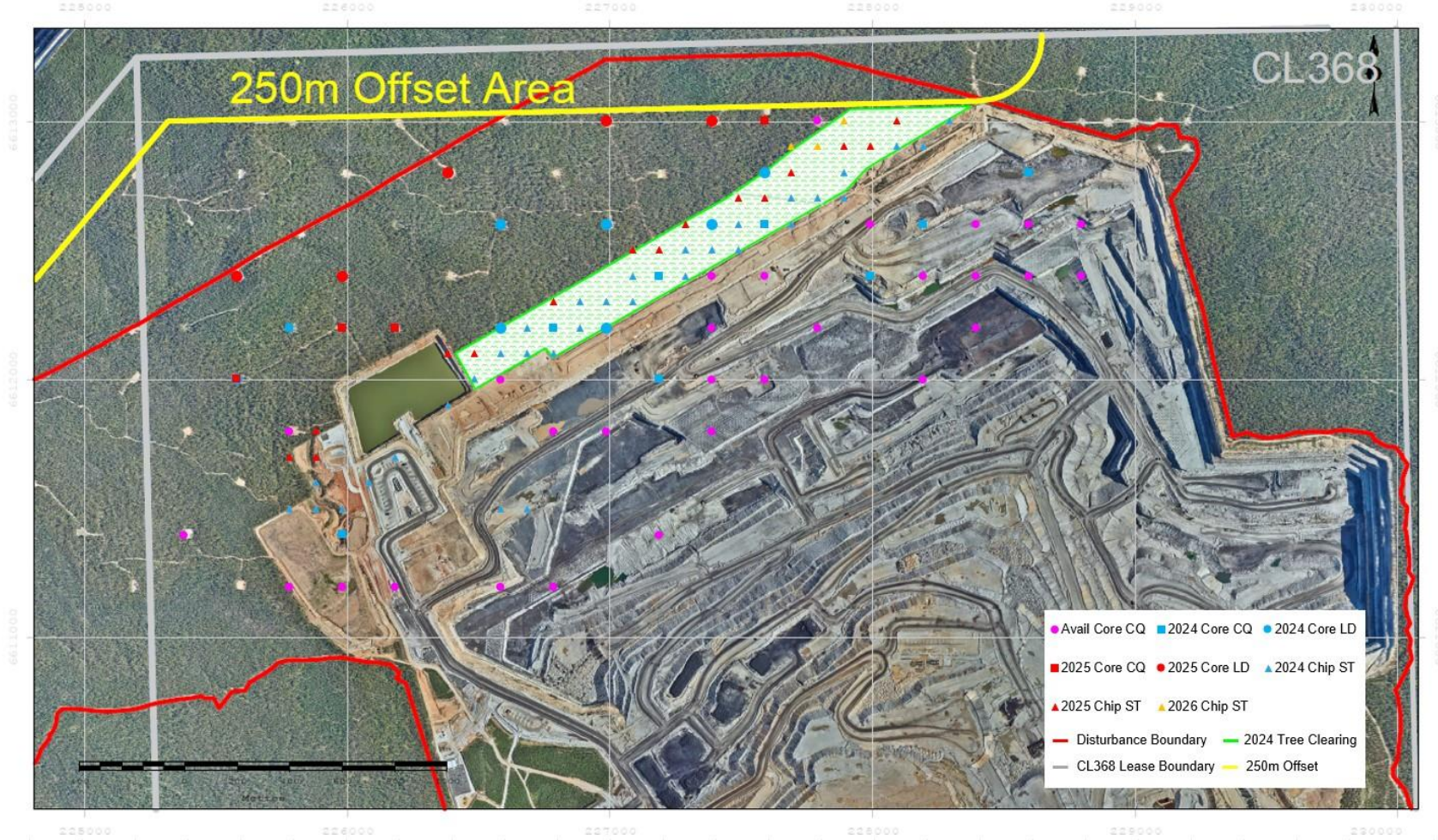
Borehole Name	MGAEasting	MGANorthing	Elevation (m)	Total Depth (m)	Drill Start	Drill Finish	Borehole Status	Purpose
BC2639	228302.65	6612205.65	349	12/01/2023	15/01/2023	307	Open core	Structure
BC2640	228199.92	6612220.26	347.6	13/01/2023	19/01/2023	303.26	Fully Cored	Coal Quality
BC2641	227737.57	6611689.01	345.8	16/01/2023	18/01/2023	235	Open core	Structure
BC2642	226423.19	6611318.2	349.1	18/01/2023	26/01/2023	259	Open core	Structure
BC2643	226201.03	6611598.1	333.3	27/01/2023	31/01/2023	273.2	Fully Cored	Coal Quality
BC2644	226102	6611222.79	333.2	27/01/2023	29/01/2023	241	Open core	Structure
BC2645	226685.12	6611902.16	330.6	1/02/2023	2/02/2023	277	Open core	Structure
BC2646	226609.39	6611899.02	328.5	8/02/2023	10/02/2023	277	Open core	Structure
BC2647	227192.87	6612192.44	328.3	13/02/2023	13/02/2023	267.21	Fully Cored	Coal Quality
BC2648	226502.53	6611099.33	325.9	13/02/2023	15/02/2023	253	Open core	Structure
BC2649	226499.41	6610994.98	327.6	12/02/2023	13/02/2023	253	Open core	Structure
BC2650	227010.25	6612012.71	319.5	15/02/2023	19/02/2023	270.29	Fully Cored	Coal Quality
BC2651	227203.83	6611493.21	317.5	1/03/2023	9/03/2023	235	Open core	Structure
BC2652LD	226404.03	6611810.44	322	8/03/2023	17/04/2023	240.7	Partially cored	Coal Level

Borehole Name	MGAEasting	MGANorthing	Elevation (m)	Total Depth (m)	Drill Start	Drill Finish	Borehole Status	Purpose
BC2653	228700.91	6612499.1	322	9/03/2023	22/03/2023	374	Open core	Structure
BC2654	228596.43	6612502.32	322	24/03/2023	30/03/2023	324	Open core	Structure
BC2655	226453.27	6611488.37	321.2	7/04/2023	8/04/2023	218	Open core	Structure
BC2656	226902.26	6611804.1	326.4	9/04/2023	13/04/2023	248	Open core	Structure
BC2657LD	226193.47	6611596.2	265.1	18/04/2023	27/04/2023	240.6	Partially cored	Coal Level
BC2658	226769.3	6611866.12	272.9	19/04/2023	22/04/2023	272	Open core	Structure
BC2659	226872.17	6611928.62	263.8	25/04/2023	4/05/2023	266	Open core	Structure
BC2660	227218.96	6612122.24	270.5	5/05/2023	7/05/2023	265	Open core	Structure
BC2661	227930.42	6612634.06	252.9	8/05/2023	11/05/2023	319	Open core	Structure
BC2662LD	226783.28	6612050.2	271	3/07/2023	11/07/2023	249	Partially cored	Coal Level
BC2662LDR	226791.28	6612041.52	269.3	3/07/2023	11/07/2023	100	Partially cored	Coal Level
BC2663	226796.37	6612043.94	260	11/05/2023	18/05/2023	253	Open core	Structure
BC2664	227499.35	6612102.51	277.3	25/05/2023	29/05/2023	283	Open core	Structure
BC2665	227395.82	6612077.13	263	29/05/2023	31/05/2023	277	Open core	Structure
BC2666	227259.25	6612005.94	276.2	1/06/2023	10/06/2023	259	Open core	Structure

Borehole Name	MGAEasting	MGANorthing	Elevation (m)	Total Depth (m)	Drill Start	Drill Finish	Borehole Status	Purpose
BC2667	227189.76	6611932.39	265.6	10/06/2023	14/06/2023	253	Open core	Structure
BC2668	226814.97	6611635.39	252.7	21/06/2023	27/06/2023	217	Open core	Structure
BC2669	227113.93	6611847.18	278.1	28/06/2023	8/07/2023	259	Open core	Structure
BC2670	226702.42	6611613.17	280.3	9/07/2023	11/07/2023	247	Open core	Structure
BC2671	227998.88	6611898.24	281.5	11/07/2023	21/07/2023	259	Open core	Structure
BC2672LD	227187.11	6612199.25	268.7	13/07/2023	20/07/2023	242.78	Partially cored	Coal Level
BC2672LDR	227187.12	6612199.26	274.3	4/08/2023	6/08/2023	180.5	Partially cored	Coal Level
BC2672LDR2	227107.58	6612204.27	265.1	12/09/2023	14/09/2023	173.73	Partially cored	Coal Level
BC2673	226503.66	6611087.14	255.5	22/07/2023	24/07/2023	205	Open core	Structure
BC2674	226707.39	6611192.74	274.1	24/07/2023	26/07/2023	205	Open core	Structure
BC2675	227297.48	6612299.97	254.1	26/07/2023	6/08/2023	246	Open core	Structure
BC2676	227102.06	6612200.33	280.7	7/08/2023	9/08/2023	277	Open core	Structure
BC2677LD	225606.73	6611196.9	276.3	9/08/2023	28/08/2023	180.87	Open core	Coal Level
BC2678	227004.55	6612130.14	286	9/08/2023	19/08/2023	271	Open core	Structure
BC2679	228117.6	6611969.62	310.5	20/08/2023	23/08/2023	265	Open core	Structure

Borehole Name	MGAEasting	MGANorthing	Elevation (m)	Total Depth (m)	Drill Start	Drill Finish	Borehole Status	Purpose
BC2680	228727.48	6612390.7	236.6	3/09/2023	14/09/2023	300	Open core	Structure
BC2681	227602.38	6612109.3	271	19/09/2023	30/10/2023	277	Open core	Structure
BC2682	226802.51	6611606.22	288.5	29/09/2023	4/10/2023	229	Partially cored	Coal Quality
BC2683	227291.7	6611506.4	267.3	12/10/2023	17/10/2023	235	Open core	Structure
BC2684	227590.83	6611693.86	217.6	29/10/2023	30/10/2023	229	Open core	Structure
BC2685	227512.3	6611611.11	215.98	30/10/2023	31/10/2023	229	Open core	Structure
BC2686C	226383.06	6611212.66	307.12	9/11/2023	15/11/2023	201.45	Partially cored	Coal Quality
BC2687	227719.502	6612496.755	219.4	15/11/2023	30/11/2023	319	Open core	Structure
BC2689	227192.695	6612285.413	322.53	10/12/2023	12/12/2023	277	Open core	Structure

Figure E.1 Proposed Exploration for 2024



Appendix F
2023 BCM IEA Response Action Plan

<table>
<tr><th>Reference</th><th>Schedule and Condition Number</th><th>Condition</th><th>Compliance status</th><th>Evidence</th><th>Recommendation</th><th>Response/Proposed action</th><th>Target Completion Date</th></tr>
<tr><td colspan="8">Project Approval 09_0182</td></tr>
<tr><td>NC1</td><td>Schedule 2, Condition 2</td><td>The Proponent shall carry out the project:
Generally in accordance with the EA; and
In accordance with the statement of commitments and the conditions of this approval.
Notes:
The general layout of the project is shown in Appendix 1 and Appendix 2; and
The Statement of Commitments is reproduced in Appendix 5.</td><td>Non-Compliant</td><td>This table and the IEA report have assessed compliance with the EA, statement of commitments and conditions of the approval. This indicates the BCM is generally in accordance with requirements of this condition. Non-compliances were noted against the following conditions:
- Condition 9 , Schedule 3
- Condition 15, Schedule 3
- Condition 22, Schedule 3
- Condition 38(b), Schedule 3
- Condition 38(c), Schedule 3
- Condition 68, Schedule 3
- Condition 4, Schedule 5
- Condition 5, Schedule 5
- Condition 8, Schedule 5
- Condition 14, Schedule 5
- Condition 15, Schedule 5
- Statement of Commitments 3
- Statement of Commitments 4

Non-compliances against these conditions are captured and addressed below in this table.</td><td>Corrective actions are provided below for each of the non-compliances.</td><td></td><td>NA</td></tr>
<tr><td>NC2</td><td>Schedule 3 Condition 9</td><td>The Proponent shall:
(a) Ensure that:
• All new trucks, dozers, drills and excavators purchased for use on the site after the date of this approval are commissioned as noise suppressed (or attenuated) units;
• Ensure that all equipment and nose control measures deliver sound power levels that are equal to or better than the sound power levels identified in the EA and that correspond to best practice or the application of best available technology economically achievable.
• Where reasonable and feasible, improvements are made to existing noise suppression equipment as technologies become available; and
(b) monitor and report on the implementation of these requirements annually on its website.</td><td>Non-Compliant</td><td>2020 IEA Recommendation: continue investigations and dialogue with DPIE regarding sound power level requirements.

Sound power testing is undertaken annually and reported upon in the Annual Reviews, which are published on the website. As reported in the 2020, 2021 and 2022 Annual Reviews, sound power screening identified plant with exceedances of 3dB or greater, constituting a non-compliance with this condition.</td><td>CA 1: Continue to implement mitigation on plant identified as non-compliant with this condition.</td><td>Action 1:
While SPL testing shows exceedances of noise levels, investigations into suitable solutions will undertaken and implemented.</td><td>Ongoing</td></tr>
<tr><td>NC3</td><td>Schedule 3 Condition 15</td><td>The Proponent shall ensure that the blasting on the site does not cause exceedances of the criteria in Table 6.

<table><tr><th>Location</th><th>Airblast overpressure (dB(Lin Peak))</th><th>Ground vibration (mm/s)</th><th>Allowable exceedance</th></tr><tr><td rowspan="2">Residence on privately owned land</td><td>120</td><td>10</td><td>0%</td></tr><tr><td>115</td><td>5</td><td>5% of the total number of blasts over a period of 12 months</td></tr><tr><td>All public infrastructure</td><td>-</td><td>50 or alternatively a specific limit determined to the satisfaction of the Secretary by the structural design methodology in AS 2187.2-2006, or its latest version</td><td>0%</td></tr></table>
However, these criteria do not apply if the Proponent has a written agreement with the relevant owner or infrastructure provider/owner, and the Proponent has advised the Department in writing of the terms of this agreement.</td><td>Non-Compliant</td><td>2020 IEA Recommendation : Ensure blasts are undertaken under appropriate weather conditions. Delays to blasts should be implemented if required based on real time weather data review.

2020 IEA Recommendation :Implement changes to the TARP notifications system to distinguish "triggers" from "exceedances" so that reportable exceedances are not missed

A review of monitoring data indicated that there was one occasion where blasting criteria was exceeded. BCOPL received a penalty notice from the EPA on 21 July 2022 for this exceedance.
BCOPL undertook an internal investigation and response to the EPA with the findings of the investigation, which determined that the exceedance was due to wind gusts and not blasting operation. The EPA withdrew the penalty notice in December 2022. In addition, DPE provided a response to the reported exceedance on 7 July 2023, stating that from the</td><td>CA 2: Ensure that blast monitoring equipment is regularly maintained and working prior to blasting so that blasts are adequately reported</td><td>NO ACTION REQUIRED.
BCOPL will continue to ensure blast monitors are calibrated every 3 months and maintained as required as per contract with blast monitor supplier.</td><td>NA</td></tr>
</table>

Reference	Schedule and Condition Number	Condition	Compliance status	Evidence	Recommendation	Response/Proposed action	Target Completion Date
				evidence presented by BCOPL an exceedance of criteria had not occurred. There were no other exceedances of criteria within the audit period. As reported in the 2022 Annual Review, a blast which was conducted on 14 November 2022 was not recorded by the 'Goonbri' blast monitoring station, constituting a non-compliance In response to the recommendations of the 2020 IEA, BCOPL continue to engage with blast monitoring contractors delineating the definition of 'triggers' and 'exceedances', BCOPL have engaged a consultant to review planning and fume protocols. BCOPL note that the current technology that is available on site does not allow for this level of reporting and that they will improve processes to review results of monitoring. BCOPL delivered training with supervisors in October 2021 to improve environmental performance regarding ensuring blasts are only undertaken during appropriate weather conditions. Once the BMP is approved, post MOD 8 as per approval from DPE, training of staff will occur again.			
NC4	Schedule 3 Condition 22	The proponent shall prepare and implement a Blast Management Plan for the project to the satisfaction of the Secretary. This plan must: (a) Be submitted to the Secretary for approval within 6 months from the date of project work. (b) be prepared in consultation with the EPA, the CCC and interested members of the local community potentially affected by blasting operations; (c) propose any alternative ground vibration limits for public infrastructure in the vicinity of the site; (d) describe the measures that would be implemented to ensure: • best management practice is being employed; and • compliance with the relevant conditions of this approval; (e) include a road closure management plan for blasting within 500 metres of a public road, that has been prepared in consultation with Council; (f) include a specific blast fume management protocol to demonstrate how emissions will be minimised including risk management strategies if blast fumes are generated; (g) include a monitoring program for evaluating the performance of the project including: • compliance with the applicable criteria; and • minimising fume emissions from the site; and (h) include a Leard Forest Mining Precinct Blast Management Strategy that has been prepared in consultation with other mines within the Leard Forest Mining Precinct to minimise cumulative blasting impacts. *Note: The Leard Forest Mining Precinct Blast Management Strategy can be developed in stages and will need to be subject to ongoing review dependent upon the determination of and commencement of other mining projects in the area.*	Non-Compliant	*2020 IEA Recommendation: Ensure blasts are undertaken under appropriate weather conditions. Delays to blasts should be implemented if required based on real time weather data review - recommendation was addressed in 2020 Annual Review, with target completion 01/08/2021* The latest version of the Blast Management Plan (BMP) is dated November 2018 and was approved by DPIE on 21 February 2019. The Blast Management Strategy is dated April 2020. The preparation of the BMP meets the requirements of the relevant consent conditions The Blast Management Plan was originally prepared in January 2013, with this being within six months of the Project Approval. Key sections for items required by this condition: - Consultation summary - Appendix D - Alternate ground vibration limits - Section 5.1 - Management Measures including road closures - Section 6 - Blast fume management protocol - Appendix C - Weather monitoring program - Section 7.2 and 7.3 - Leard Forest Mining Blast Management Strategy - Section 6.5 and Appendix E The Blast Management Plan is currently under revision. As described above, DPE have granted approval for the submission of the updated plans within three months of MOD8 determination which is currently being assessed. Implementation of the requirements over the audit period were generally satisfactory. However, as reported in the 2022 annual review, the continuous rainfall readings at the 60 m AWS were not recorded for the period between 5-12 May 2022. The readings for continuous solar radiation at the weather stations were also not recorded for the period between 21 July 2022 and 7 December 2022. BCOPL also advised that data capture for sigma theta was 90% in May 2023 due to a faulty sensor. The sensor has been fixed and is	CA 3: Ensure that maintenance routines include the weather station for regular inspection and maintenance	NO ACTION REQUIRED. BCOPL will continue to have all weather stations including the 60m AWS Met Station Calibrated and maintained on a biannual basis and as required as per the contract with supplier.	NA

Reference	Schedule and Condition Number	Condition	Compliance status	Evidence	Recommendation	Response/Proposed action	Target Completion Date
				now capturing data continuously.			
NC5	Schedule 3 Condition 38b	a Surface Water Management Plan, which includes: • detailed baseline data on surface water flows and quality in the water-bodies that could potentially be affected by the project; • detailed baseline data on soils within the irrigation management area; • detailed baseline data on hydrology across the downstream drainage system of the Namoi River floodplain from the mine site to the Namoi River; • a detailed description of the water management system on site, including the: o clean water diversion systems; o erosion and sediment controls (dirty water system); o mine water management systems including irrigation areas; o discharge limits in accordance with EPL requirements; o water storages; o haul road and Boggabri Rail Spur Line and bridge flood and water diversions; detailed plans, including design objectives and performance criteria for: o design and management of final voids; o design and management for the emplacement of reject materials, sodic and dispersible soils and acid or sulphate generating materials; o design and management for construction and operation of the Boggabri Rail Spur Line and bridge across the Namoi River floodplain and upstream adjoining Nagero/Bollol creek catchments; o reinstatement of drainage lines on the rehabilitated areas of the site; and o control of any potential water pollution from the rehabilitated areas of the site; • performance criteria for the following, including trigger levels for investigating any potentially adverse impacts associated with the project: o the water management system; o soils within the irrigation area; o downstream surface water quality; o downstream flooding impacts, including flood impacts due to the construction and operation of the Boggabri Rail Spur Line and rail bridge; and o stream and riparian vegetation health, including the Namoi River; • a program to monitor: o the effectiveness of the water management system; o soils within the irrigation area; and o surface water flows and quality in the watercourses that could be affected by the project; o downstream flooding impacts; and • reporting procedures for the results of the monitoring program; • a plan to respond to any exceedances of the performance criteria, and mitigate and/or offset any adverse surface water impacts of the project; and	Non-Compliant	*2020 IEA Recommendation: continue to liaise with DPIE with regard to the approval of the revised water management system and the removal of the clean water diversion.* The most recent approved Surface Water Management Plan is dated May 2017. Key sections that address the requirements of this condition: - Baseline information - Section 3 - The Surface Water Management System - Section 4 - Water Management Trigger Levels and Responses - Section 7 - Monitoring program - Section 6 The SWMP generally is compliant with the requirements of this condition, however as identified in the 2020 IEA the clean water drain presented in Appendix A of the SWMP to the north of the disturbance area has been mined through and has not been reinstated. BCOPL are preparing an update to the SWMP that depicts that this drain has been removed, however the updated plan has not been approved constituting a non-compliance against this condition. BCOPL are required to submit the updated plan within 3 months of the determination of MOD8.	CA 4: Ensure the recommendations of the 2020 IEA are included in the updated SWMP	Action 2: BCOPL will include the recommendations of the 2020 IEA in the next version of the Surface Water Management Plan to be submitted within 3 months of MOD 8 approval by the DPE.	Within 3 months of MOD 8 approval by the DPE.
NC6	Schedule 3 Condition 38(c)	a Groundwater Management Plan, which includes: • detailed baseline data of groundwater levels, yield and quality in the region, and privately-owned	Non-Compliant	*2020 IEA Recommendation: Vary the EPL in consultation with EPA to align with the appropriate borehole locations and remove those that have been*	CA 5: Ensure that the updated GMP accurately reflects the Groundwater Monitoring Regime and the latest variation of EPL 12407	Action 3: The Groundwater Management Plan will be updated and sent for	Within 3 months of MOD 8 approval by

Reference	Schedule and Condition Number	Condition	Compliance status	Evidence	Recommendation	Response/Proposed action	Target Completion Date
		groundwater bores including a detailed survey/schedule of groundwater dependent ecosystems (including stygo-fauna), that could be affected by the project; • the monitoring and testing requirements specified in the PAC recommendations for groundwater management as set out in Appendix 6; • detailed plans, including design objectives and performance criteria, for the design and management of the proposed final void; • groundwater assessment criteria including trigger levels for investigating any potentially adverse groundwater impacts; • a program to monitor and assess: o groundwater inflows to the open cut mining operations; o the seepage/leachate from water storages, backfilled voids and the final void; o interconnectivity between the alluvial and bedrock aquifers; o background changes in groundwater yield/quality against mine-induced changes; o the impacts of the project on: - regional and local (including alluvial) aquifers; - groundwater supply of potentially affected landowners; - aquifers potentially affected by the mine irrigation area; - groundwater dependent ecosystems (including potential impacts on stygo-fauna) and riparian vegetation. • a program to validate the groundwater model for the project, including an independent review of the model every 3 years, and comparison of monitoring results with modelled predictions; and • a plan to respond to any exceedances of the performance criteria; and		*mined through.* The most recent Groundwater Management Plan is dated 10 February 2020 and is generally compliant with the requirements of this condition. Key sections that address the requirements of this condition: - Baseline information - Section 3 - Groundwater Monitoring Program - Section 4 - Water Management Trigger Levels and Management Measures- Sections 6 and 7 A review of water quality monitoring data indicates that there were exceedances of trigger values during the audit period. The following points were also not monitored over the reporting period: - IBC2181 - Unable to access in the March 2023 GME - IBC2181 - Unable to access in the November 2022 GME - MWP01 - Unable to access in the January 2021 GME - IBC2181 - Unable to access in the June 2021 GME The Annual Review documents note that the GMP is required to be reviewed to account for the destroyed monitoring bores. It is understood that BCOPL intend to submit an updated plan for DPE approval within 3 months of the determination of MOD8 which is currently being assessed. The groundwater model was reviewed and updated in late 2020 by Australasian Groundwater and Environmental Consultants. In response to 2020 IEA Improvement Recommendation, EPL 12407 was varied in 2021 to remove mined though bores.		approval within 3 months of MOD 8 approval. It will reflect the latest variation of EPL 12407 and monitoring regime that is being undertaken on site.	the DPE.
NC7	Schedule 3 Condition 40	The Proponent shall commission and fund the preparation of a Leard Forest Mining Precinct Regional Biodiversity Strategy, jointly with all other coal mines within the Precinct. The Strategy shall be co-ordinated through the Department (refer condition 42 below) and prepared by suitably qualified, experienced and independent person/s whose appointment has been endorsed by BCS and subsequently approved by the Secretary, in the following stages: Stage 1 – Scoping Stage A scoping report for development of the Strategy must be submitted, within 6 months of the date of this approval, for endorsement by BCS and subsequent approval by the Secretary. The Secretary may extend this period with the agreement of BCS. The scoping report must: include terms of reference, scope and objectives for the Strategy, including recommendations for the Strategy's geographic extent; identify the ongoing functions and members of the working group (see condition 41 of Schedule 3); include a project management plan of the Strategy, with a time schedule, indicative dates for working group meetings, review and milestones for completion; include a funding program for the development of the Strategy, including provision of adequate resources for the participation of working group members; and include a consultation/communications program for the	Non-Compliant	The Leard Forest Regional Biodiversity Strategy Stage 1 – Scoping Report was prepared in July 2015, prior to the commencement of this audit period. The Leard Forest Regional Biodiversity Strategy Stage 2 – Strategy Report was prepared in August 2017, prior to the commencement of this audit. Umwelt prepared a preliminary review of the Leard Forest Regional Biodiversity Strategy in 2018. The scope of the review was reduced to solely focussing on the implementation of the strategy in the revised biodiversity management plans to provide a list of recommendations to the BTM Complex for future revisions of the Leard Forest Regional Biodiversity Strategy. The preliminary review included a recommendation (recommendation 4.6) that a comprehensive review of the strategy should be undertaken by 31 December 2021. A letter of response was provided by BCD on 26 July 2019 providing comments on the preliminary review supported this recommendation. The Comprehensive Review of the strategy has not been undertaken and therefore the recommendations of the preliminary review have not been implemented. This is considered a non-compliance against this condition.	CA 6: Undertake the comprehensive review of the Leard Forest Regional Biodiversity Strategy in 2024.	Action 4: BCOPL will work with other mines in the BTM complex and have a comprehensive review of the Leard Forest Regional Biodiversity Strategy completed by the 31st December 2024.	31/12/2024

Reference	Schedule and Condition Number	Condition	Compliance status	Evidence	Recommendation	Response/Proposed action	Target Completion Date
		Strategy. Note: The broad terms of reference must be guided by the Planning Assessment Commission (PAC) merit review for the Boggabri Coal Mine (February 2012) – Recommendation 1 for the development of a regional biodiversity strategy. Stage 2 – Strategy Development The Strategy must be developed in accordance with the approved Scoping Stage report and submitted for endorsement by BCS and subsequent approval by the Secretary within 18 months of the date of this approval. The Secretary may extend this period with agreement of BCS. Stage 3 – Strategy Review The Strategy must be reviewed by the end of December 2018, following completion of audits of the rehabilitation and Biodiversity Offset Areas required to be undertaken under approvals for coal mines within the Precinct. The Review shall be conducted by suitably qualified, experienced and independent person/s whose appointment has been endorsed by BCS and approved by the Secretary. Any modifications to the Strategy arising from the review must be endorsed by BCS prior to approval by the Secretary					
NC8	Schedule 3 Condition 68	The Proponent shall: (a) implement all reasonable and feasible measures to minimise the waste (including coal reject) generated by the project; (b) ensure that the waste generated by the project is appropriately stored, handled and disposed of; (c) monitor and report on the effectiveness of the waste minimisation and management measures in the Annual Review.	Non-Compliant	Generally waste was managed appropriately on site, with waste receptacles clearly labelled. The site is also neat and tidy. However it was noted that the correct waste was not always deposited into the correct bins, with plastic wrap observed in the steel bin, constituting a non-compliance. Waste is reported on in the annual reviews.	CA 7: Ensure that staff are made aware of correct waste management procedures and that waste slides are included in the toolbox talks quarterly.	Action 5: BCOPL will ensure quarterly waste toolbox talks are presented to the workforce.	20/02/2024
NC9	Schedule 5 Condition 4	By the end of March each year, the Proponent shall review the environmental performance of the project for the previous calendar year to the satisfaction of the Secretary. This review must: (a) describe the development (including any rehabilitation) that was carried out in the past calendar year, and the development that is proposed to be carried out over the current calendar year; (b) include a comprehensive review of the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the: • relevant statutory requirements, limits or performance measures/criteria; • monitoring results of previous years; and • relevant predictions in the EA; (c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance; (d) identify any trends in the monitoring data over the life of the project; (e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and (f) describe what measures will be implemented over the next year to improve the environmental performance of the project.	Non-Compliant	*2020 IEA Improvement Recommendation: Include additional information in the annual reviews regarding longer term trends particularly in terms of surface water, noise and air quality* The format and presentation of the Annual Review documents satisfies the requirements of this condition. BCOPL have also integrated the 2020 IEA recommendation of including additional information in the annual reviews regarding longer term trends particularly in terms of surface water, noise and air quality. As noted in the 2022 Annual Review, the 2021 Annual Review was submitted after the due date.	CA 8: Ensure that annual reviews are submitted by the due date.	NO ACTION REQUIRED. BCOPL will continue to submit the Annual Review by the 31st of March each year as required by the Project Approval.	NA

Reference	Schedule and Condition Number	Condition	Compliance status	Evidence	Recommendation	Response/Proposed action	Target Completion Date
NC10	Schedule 5 Condition 5	Within 3 months of the submission of: (a) an annual review under condition 4 above; (b) an incident report under condition 8 below; (c) an audit under condition 10 below; and (d) any modification to the conditions of this approval, the Proponent shall review the strategies, plans, and programs required under this approval. Where this review results in revisions to any such document, then within 4 weeks of the completion of the revision, unless the Secretary agrees otherwise, the revised document must be submitted to the Secretary for approval.	Non-Compliant	*2020 IEA Improvement Recommendation: Prepare a document review register to evidence dates when documents are reviewed. Register should identify if any changes are identified as being required.* It is noted that most plans required under this development consent have not been revised over the audit period and require updating, constituting a non-compliance against this condition. However it is noted that DPE have written to BCOPL indicating that they may submit the updated management plans for approval within 3 months of the determination of MOD8. In response to the 2020 IEA Improvement Recommendation, BCOPL have developed a document register for EMS documents.	CA 9: Ensure that all plans required under this consent are reviewed and updated (if applicable) 3 months after the triggers outlined in Schedule 5, Condition 5 occur	Action 6: Submit all required management plans to the DPE for approval within 3 months of MOD 8 approval. All other plans will be reviewed and updated (if applicable) in the same time period.	Within 3 months of MOD 8 approval by the DPE.
NC11	Schedule 5 Condition 8	The Proponent shall notify, at the earliest opportunity, the Secretary and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incident associated with the project, the Proponent shall notify the Secretary and any other relevant agencies as soon as practicable after the Proponent becomes aware of the incident. Within 7 days of the date of the incident, the Proponent shall provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.	Non-Compliant	No environmental incidents causing material harm have occurred during the audit period. BCOPL provided the following notices relating to environmental non-compliances during the audit period: - Notification of blast overpressure exceedance on 30 April 2022 sent to DPE (3 May 2022) - Exceedance on 6 March 2023 of criteria at Glenhope HVAS sent to DPE on 2 May 2023. Given that this occurred more than a week from the incident occurring, this constitutes a non-compliance against this condition.	CA 10: Ensure that non-compliances are reported within 7 days of occurrence.	NO ACTION REQUIRED. BCOPL will continue to report non-compliances within 7 days of becoming aware of an incident.	NA
NC12	Schedule 5 Condition 10	By the end of June 2014 and every 3 years thereafter, unless the Secretary directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit must: be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary; include consultation with the relevant agencies; assess the environmental performance of the project and assess whether it is complying with the requirements in this approval, and any other relevant approvals, relevant EPL/s and/or Mining Lease (including any assessment, plan or program required under these approvals); assess whether the Proponent is implementing best noise, blasting and air quality management practice; investigate and report on the measures taken to minimise the noise impacts of the project during meteorological conditions when the noise limits in this approval do not apply, including: the effectiveness of these measures in maintaining noise impacts within the relevant noise criteria in this approval and/or the limits in the relevant EPL; and any additional measures available to mitigate noise impacts under such meteorological conditions investigate and report on the measures taken to minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events (see condition 30(d) of Schedule 3), including: the effectiveness of these measures in maintaining air quality impacts within the criteria in Table 9, Table 10 and Table 11 of Schedule 3; and	Non-Compliant	Previous audits were undertaken in 2014, 2017 and 2020. The 2020 IEA was undertaken by SLR Consulting. This audit was undertaken in compliance with the requirements of this condition. The audit team for this audit was approved on 31 August 2023. Key sections of this audit that demonstrate compliance with this condition are: - Section 4.2 (summary of compliance) - Section 4.6 (Adequacy of plans and strategies) - Section 4.7 and Appendix B (Agency consultation) - Section 5.2 (Corrective actions) - This table (compliance assessment against the requirements of the consent, licences and leases) This audit was commissioned on the 11 October 2023, four months after the end of June as required by this condition. BCOPL were not granted an extension from DPE, and therefore a non-compliance against this component of the condition is recorded.	CA 11: Ensure that future Independent Environmental Audits are commissioned by the end of June.	Action 7: BCOPL will commission the next independent environmental audit by 30 June 2026.	30/06/2026

Reference	Schedule and Condition Number	Condition	Compliance status	Evidence	Recommendation	Response/Proposed action	Target Completion Date
		any additional measures available to mitigate air quality impacts under such conditions; review the adequacy of any approved strategy, plan or program required under the abovementioned approvals; and recommend measures or actions to improve the environmental performance of the project and/or any strategy, plan or program required under these approvals. Note: This audit team must be led by a suitably qualified auditor, and include experts in noise, air quality, ecology, Aboriginal heritage and any other fields specified by the Secretary.					
NC13	Schedule 5 Condition 14	The Applicant must immediately notify the Department and any other relevant agencies after it becomes aware of an incident. The notification must be in writing via the Department's Major Projects Website and identify the development (including the application number and name) and set out the location and nature of the incident.	Non-Compliant	As described in the compliance findings for Condition 8 of Schedule 5, the exceedance of air quality criteria at the Glenhope HVAS was sent to DPE more than a week from the incident occurring (incident occurring 6 March 2023, notification sent 2 May 2023).	CA 10: Ensure that non-compliances are reported within 7 days of occurrence.	NO ACTION REQUIRED. BCOPL will continue to report non-compliances within 7 days of becoming aware of an incident.	NA
NC14	Statement of Commitments 3	Boggabri Coal 's Environmental Monitoring Programs for air quality, water quality, noise and blasting will be reviewed and updated as required, in consultation with the relevant regulators for approval by DP&I as specified in conditions of Project Approval.	Non-Compliant	The NMP, BMP, AQGHGMP and GMP have not been updated during the audit period. The WMP and SWMP have been submitted to DPE but not have not been approved. DPE have granted approval for the submission of the updated plans within three months of MOD8 determination.	CA 9: Ensure that all plans required under this consent are reviewed and updated (if applicable) 3 months after the triggers outlined in Schedule 5, Condition 5 occur	Action 8: BCOPL will ensure review and update (if applicable) of management plans within 3 months of triggers outlined in Schedule 5, Condition 5.	Within 3 months of MOD 8 approval by the DPE.
NC15	Statement of Commitments 4	Boggabri Coal's EMPs will be revised and updated as required, in consultation with the relevant regulators for approval by DP&I as specified in any conditions of Project Approval for Surface and Groundwater Management, Flora and Fauna, Rehabilitation and Landscape Management (including Void Management) and Aboriginal Archaeology and Cultural Heritage Management.	Non-Compliant	The Biodiversity Management Plan, GMP and the CHMP have not been updated during the audit period. The WMP and SWMP have been submitted to DPE but not have not been approved. DPE have granted approval for the submission of the updated plans within three months of MOD8 determination. The RMP would be superseded following the approval of the new RMP (replacing the former MOP under the Mining Regulation 2016). This plan is currently in draft.	CA 9: Ensure that all plans required under this consent are reviewed and updated (if applicable) 3 months after the triggers outlined in Schedule 5, Condition 5 occur	See Action 8: BCOPL will ensure the review and update (if applicable) of management plans within 3 months of triggers outlined in Schedule 5, Condition 5.	Within 3 months of MOD 8 approval by the DPE.
EPL 12407							
NC16	L3.1	The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.	Non-Compliant	The EPA issued an Official Caution letter on 30 July 2021 in relation to burying 937 end-of-life haul truck tyres, at depth, between 2014 and 2020, constituting a non-compliance against this condition. Condition L3.3 has since been added to the EPL permitting the disposal of tyres at BCM, and therefore no corrective action is required.		NO ACTION REQUIRED.	NA
NC17	L3.3	The licensee may dispose of up to 300 end-of-life mining heavy plant tyres on the premises in each annual return year period up until 11 January 2023. Should the report provided in accordance with condition R3.5: be submitted to the EPAs satisfaction at intervals of 2 years; and find that recycling options are not feasible; then the onsite disposal of the end-of life heavy mining plant tyres may continue for the subsequent 2 annual reporting periods. Only waste tyres generated at the premises may be disposed of in accordance with this condition.	Non-Compliant	Following the addition of this condition on the licence, BCOPL disposed of tyres within the pit as per this condition. The R3.5 report has been prepared and was submitted to the EPA on 3 October 2023. Based on the information supplied, BCOPL continued to dispose of tyres between 11 January 2023 and the date of submission for the R3.5 report, constituting a non-compliance against this condition. Given that the R3.5 report has been provided to the EPA, no corrective action is proposed.		No further action required. Approval in place for onsite HV trye disposal from 11 January 2023 until 11 January 2025.	NA
NC18	O1.1	Licensed activities must be carried out in a competent manner. This includes: the processing, handling, movement and storage of	Non-Compliant	Site inspection confirmed that site operations are undertaken in a competent manner. Generally, waste was managed appropriately with waste	CA 7: Ensure that staff are made aware of correct waste management procedures	See Action 5 above: BCOPL will ensure quarterly waste toolbox talks are presented to the	20/02/2024

Reference	Schedule and Condition Number	Condition	Compliance status	Evidence	Recommendation	Response/Proposed action	Target Completion Date
		materials and substances used to carry out the activity; and the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.		receptacles clearly labelled. However, it was noted that the correct waste was not always deposited into the correct bins, with plastic wrap observed in the steel bin, constituting a non- compliance.		workforce.	
NC19	M2.2	Air Monitoring Requirements Air Monitoring Requirements	Non-Compliant	*2020 IEA Recommendation: Continue to liaise with EPA regarding EPL variation to ensure that monitoring points in EPL align with those utilised by the site.* Air monitoring was generally sampled in accordance with the requirements of this condition. In response to the 2020 IEA recommendation, monitoring points were modified as per the February 2021 variation. As reported in the 2021 Annual Review, the High Velocity Air Sampler (HVAS) unit located at the Glenhope property could not be accessed due to regional flooding and accordingly did not obtain samples on 23 and 29 November 2021. No corrective action is proposed. During 2021, PM10 samples were not taken for Monitoring Point 45 constituting a low risk non-compliance with this condition. This event has not occurred again and therefore no corrective action is proposed. In addition, the HVAS monitoring network in place for the BCM was not in line with monitoring sites specified within the EPL. The Cooboobindi HVAS was relocated to the Glenhope property during June 2020. An EPL variation was approved on 5 February 2021.	No action proposed.	NO ACTION REQUIRED.	NA
NC20	M4.1	For each monitoring point specified below in the table below, the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency specified opposite in the other columns.	Non-Compliant	Weather monitoring over the reporting period was generally in accordance with the requirements of this condition. As reported in the 2022 annual review, the continuous rainfall readings at the 60 m AWS were not recorded for the period between 5-12 May 2022. The readings for continuous solar radiation at the weather stations were also not recorded for the period between 21 July 2022 and 7 December 2022. BCOPL also advised that data capture for sigma theta was 90% in May 2023 due to a faulty sensor. The sensor has been fixed and is now capturing data continuously.	CA 3: Ensure that maintenance routines include the weather station for regular inspection and maintenance	NO ACTION REQUIRED. BCOPL will continue to have all weather stations including the 60m AWS Met Station Calibrated and maintained on a biannual basis and as required as per the contract with supplier.	NA
NC21	M7.1	To determine compliance with limit condition(s) for blasting: Airblast overpressure and ground vibration levels experienced at the following noise sensitive locations must be measured and recorded for all blasts carried out in or on the premises; - Identified on "Goonbri" and "Wilberoi East" identified on the map titled Plan No. 1 EPL Boundary and Environmental Monitoring locations dated 05/03/2019 (DOC19/227801) Instrumentation used to measure the airblast overpressure and ground vibration levels must meet the requirements of Australian Standard AS 2187.2-2006.	Non-Compliant	As reported in the 2022 Annual Review, a blast which was conducted on 14 November 2022 was not recorded by the 'Goonbri' blast monitoring station, constituting a low risk non-compliance. BCOPL received a penalty notice from the EPA on 30 April 2022 for an alleged breach of blast criteria reported on 30 April 2022. BCOPL undertook and internal investigation and response to the EPA with the findings of the investigation, which determined that the exceedance was due to wind gusts and not blasting operation. The EPA withdrew the penalty notice in December 2022.	CA 2: Ensure that blast monitoring equipment is regularly maintained and working prior to blasting so that blasts are adequately reported	NO ACTION REQUIRED. BCOPL will continue to ensure blast monitors are calibrated every 3 months and maintained as required as per contract with blast monitor supplier.	NA

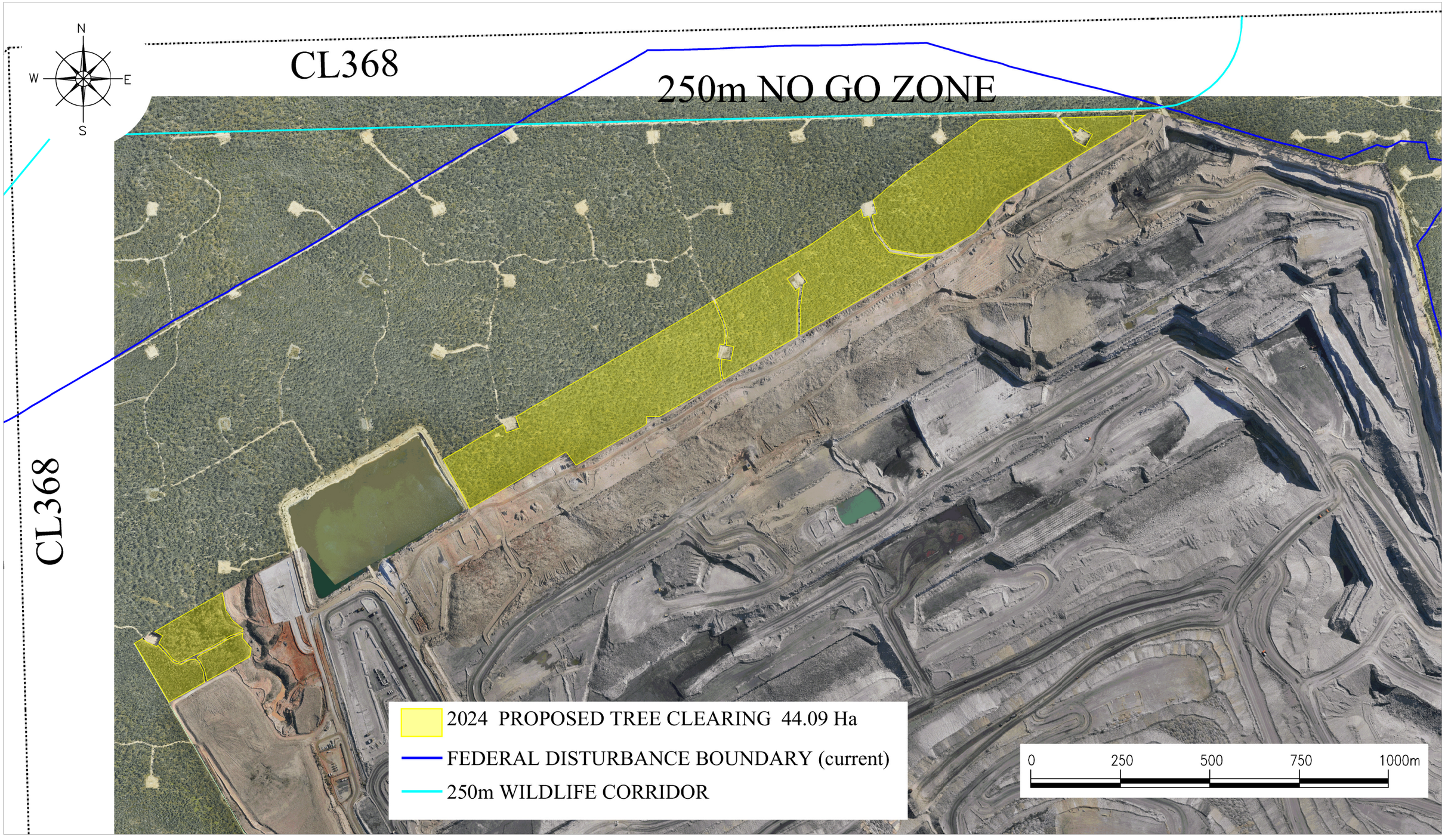
Reference	Schedule and Condition Number	Condition	Compliance status	Evidence	Recommendation	Response/Proposed action	Target Completion Date
		Note: A breach of the licence will still occur where airblast overpressure or ground vibration levels from the blasting operations at the premises exceeds the limit specified in conditions L3.1 to L3.4 at any noise sensitive locations other than the locations identified in the above condition.					
Standard Conditions Mining Regulation 2016 Schedule 8A Part 2							
NC22	11	The holder of a mining lease must amend the rehabilitation management plan for the mining lease as follows— to substitute the proposed version of a rehabilitation outcome document with the version approved by the Secretary—within 30 days after the document is approved, as a consequence of an amendment made under clause 14 to a rehabilitation outcome document—within 30 days after the amendment is made, to reflect any changes to the risk control measures in the prepared plan that are identified in a rehabilitation risk assessment—as soon as practicable after the rehabilitation risk assessment is conducted, whenever given a written direction to do so by the Secretary—in accordance with the direction.	Non-Compliant	NSW Resources Regulator approved the rehabilitation objectives for the site on 13 October 2023. The latest revision of the RMP is dated 10 November 2023, which is within 30 days of the Rehabilitation Objectives approval. The updated RMP however does not incorporate the approved rehabilitation objectives as required by condition (a).	CA 12: Ensure that the next update of the RMP captures the approved Rehabilitation Objectives and completion criteria for the site.	Action 9: The final version of the RMP will include the Rehabilitation Objectives that were approved October 2023.	31/03/2024
NC23	15(1)	The holder of a mining lease must do the following before the end of the initial period— prepare a rehabilitation management plan, and prepare rehabilitation outcome documents and give them, other than the rehabilitation completion criteria statement, to the Secretary for approval, and prepare a forward program and give it to the Secretary.	Non-Compliant	The initial period is defined as *'30 days, or other period approved by the Secretary, after this Division first applies to the mining lease, or if this Division applies to the mining lease because of an increase in the required security deposit— when the surface of the mining area is disturbed by activities under the mining lease, or at a later date approved by the Secretary.* The Conditions of Schedule 8A were applicable to large mines on 2 July 2022, meaning that the initial period is defined as concluding 1 August 2022. The RMP (Original, dated 2 July 2022) was prepared within the initial period and has since been updated. According to Section 4.1.2 of the RMP, the proposed rehabilitation outcomes were submitted to DPE on 15 March 2023, outside the initial period. The forward program was submitted on 31 March 2023, which was also after the initial period. As the initial period has concluded, no corrective action is proposed.		NO ACTION REQUIRED	NA
NC24	15(2)	The holder of the mining lease must prepare a forward program and annual rehabilitation report and give them to the Secretary before— 60 days after the last day of each annual reporting period, commencing with the annual reporting period in which the forward program was given to Secretary under subclause (1)(c), or a later date approved by the Secretary.	Non-Compliant	BCOPL requested a change in the annual reporting period to 1 January to 31 December. This was accepted by Resources Regulator on 22 December 2022. The forward program was submitted on 31 March 2023, which was more than 60 days from the completion of the reporting period. The Annual Rehabilitation report reviewed did not have a date of submission, and therefore compliance with this condition cannot be verified.	CA 13: Include the date of submission on the Annual Rehabilitation Report	ACTION 10: The Annual Rehabilitation Report will be submitted by the 31st March each year with the Annual Review.	31/03/2024
NC25	16(2)	The holder of a mining lease must make a document to which this clause applies publicly available by— publishing it on its website in a prominent position, or if the holder does not have a website— providing a copy of it to a person— on the written request of a person, and without charge, and	Non-Compliant	The forward program and rehabilitation report are published on the project website, however the Rehabilitation Management Plan is not, constituting a non-compliance.	CA 15: Publish the Rehabilitation Management Plan on the website	Action 11: BCOPL will Publish the Rehabilitation Management Plan once finalised.	31/03/2024

Reference	Schedule and Condition Number	Condition	Compliance status	Evidence	Recommendation	Response/Proposed action	Target Completion Date
		within 14 days after the request is received.					
	16(3)	If a document is published on the website of the holder of the mining lease, the holder must ensure that it is published— for a rehabilitation management plan—within 14 days after it is prepared or amended, or for a forward program or an annual rehabilitation report—within 14 days after it is given to the Secretary or amended,	Non-Compliant	The rehabilitation management plan has not been published on the website despite it being more than 14 days since its preparation.	CA 15: Publish the Rehabilitation Management Plan on the website	As Above. Action 11: BCOPL will Publish the Rehabilitation Management Plan once finalised.	31/03/2024

Recommendations

Rec #	Condition	Commentary	Recommendation	Response	Target Completion Date
MP09_0182					
REC 1	Schedule 3 Condition 13	The NMP was last updated in April 2019 (Rev. 2019). The 2020 IEA identified that the NMP is required to be updated to capture updated practices at BCOPL. This update has not occurred in the reporting period; however correspondence has been received from DPE approving the submission of the updated plan within 3 months from the determination of MOD8.	Update NMP to reflect the latest TARPS.	BCOPL is currently revising the NMP to reflect the latest TARPS and will be submitted to the DPE within 3 months of MOD8 determination.	Within 3 months of MOD8 determination
REC 2	Schedule 3 Condition 20	The 2020 IEA recommended that drone footage would continue longer so that future complaints could be verified. BCOPL have extended drone footage procedures beyond the initial blast. This procedural change was implemented in 2021. It is recommended that this procedure be captured in the updated Blast Management Plan.	Include drone recording procedure in updated blast management plan.	BCOPL is currently revising the BMP and will include a blast recording procedure in the next update of the blast management plan to be submitted to the DPE within 3 months of MOD8 determination.	Within 3 months of MOD8 determination
REC 3	Schedule 3 Condition 31	The 2020 IEA recommended a standard methodology should be developed for the investigation and reporting of any exceedances recorded by the air quality monitors	Ensure that the updated AQGGMP addresses issues outlined in the 2020 IEA. Consultation with parties outlined in this condition is also recommended.	BCOPL is currently revising the AQGHGMP and will include a procedure for investigating and reporting exceedances recorded by compliance air quality monitors. This will be submitted to the DPE within 3 months of MOD 8 determination.	Within 3 months of MOD8 determination
REC 4	Schedule 3 Condition 38(a)	The most recent approved Site Water Balance is dated May 2017 and was approved by DPIE on 24 May 2017. An update to the Site Water Balance was completed and submitted to the DPIE for approval in July 2019.	Ensure the revised Site Water Balance and stormwater management systems are included in the updated SWMP	BCOPL is currently revising the SWMP and will be submitted to the DPE with 3 months of MOD8 determination.	Within 3 months of MOD8 determination
REC 5	Schedule 3 Condition 56	The 2020 IEA recommended that the outstanding recommendations from the 2017 Audit as reported in the 2019 Annual Review be incorporated in the updated CHMP.	Implement the outstanding recommendations from the 2017. Audit as reported in the 2019 Annual Review in the updated CHMP.	The CHMP is currently being revised and will include recommendations from previous Independent Environmental Audits.	Within 3 months of MOD8 determination
REC 6	Schedule 5 Condition 1	Ensure that the updated EMS reflects the updates to management plans outlined in this audit.	Ensure that the updated EMS reflects the updates to management plans outlined in this audit	The EMS will be updated and submitted to the DPE within 3 months of MOD 8 determination.	Within 3 months of MOD8 determination
EPL 12407					
REC 8	P1.1	Monitoring locations and procedures are documented in the AQGHGMP and shown in Appendix A. EPA point 45 (HVAS 'Glenhope') is not shown on the map in the AQGHGMP. This should be updated next time the plan is reviewed.	Improvement recommendation: Ensure the updated AQGHGMP reflects the current points outlined in EPL 12407	This will be included in the AQGHGMP to be submitted to the DPE within 3 months of MOD8 determination.	Within 3 months of MOD8 determination Within 3 months of MOD8 determination

Appendix G
Proposed Tree Clearing 2024



REV	REVISIONS	DATE

Completion of the Quality Record is evidence that the design and drawing have been verified conforming with the requirements of the Quality Plan. Where the Quality Record is incomplete all information on this drawing is intended for preliminary purposes only as it is unchecked.

IDEMITSU
BOGGABRI COAL

QUALITY RECORD			
REVIEW	NAME	SIGNATURE	DATE
DRAWN	NIC GARDNER		17/10/23
DWG CHECKED			

SCALE
See Bar Scale

FILE REF:
2024 proposed tree clearing plan 171023.dwg

PLOT FILE:
2023 proposed tree clearing plan 171023.pdf

JOB REF:
0045

ORIG. FILE SIZE :
A3

Boggabri Coal Mine

2024 TREE CLEARING AREA PROPOSED

DRAWING NO.:
171023d

REV

Appendix H
2023 Site Water Balance

Boggabri Coal Operations Pty Ltd

Site Water Balance Report

Prepared for Idemitsu Australia

March 2024

Boggabri Coal Operations Pty Ltd

Site Water Balance Report

Idemitsu Australia

E240055 RP1

March 2024

Version	Date	Prepared by	Approved by	Comments
V1	13 March 2024	Jason O'Brien	Sally Callander	Draft

Approved by

Sally Callander
Associate Surface Water Engineer
13 March 2024

Level 3 175 Scott Street
Newcastle NSW 2300

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Appendices

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1 Introduction

1.1 Project description

Boggabri Coal Mine (BCM or the project) is an open cut coal mine located 15 kilometres (km) north-east of the township of Boggabri in north-western New South Wales (NSW) (refer to Figure 1.1). BCM is managed by Boggabri Coal Operations Pty Ltd (BCOPL), a subsidiary of Idemitsu Australia Resources Pty Limited (Idemitsu).

Mining activities at BCM commenced in 2006. The mine currently operates under State Significant Development (SSD) Project Approval (SSD 09_0182), which allows BCOPL to produce 8.6 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal from BCM until the end of 2036. Approval was granted by the NSW Planning Assessment Commission (PAC) under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 18 July 2011 and has been subject to several modifications.

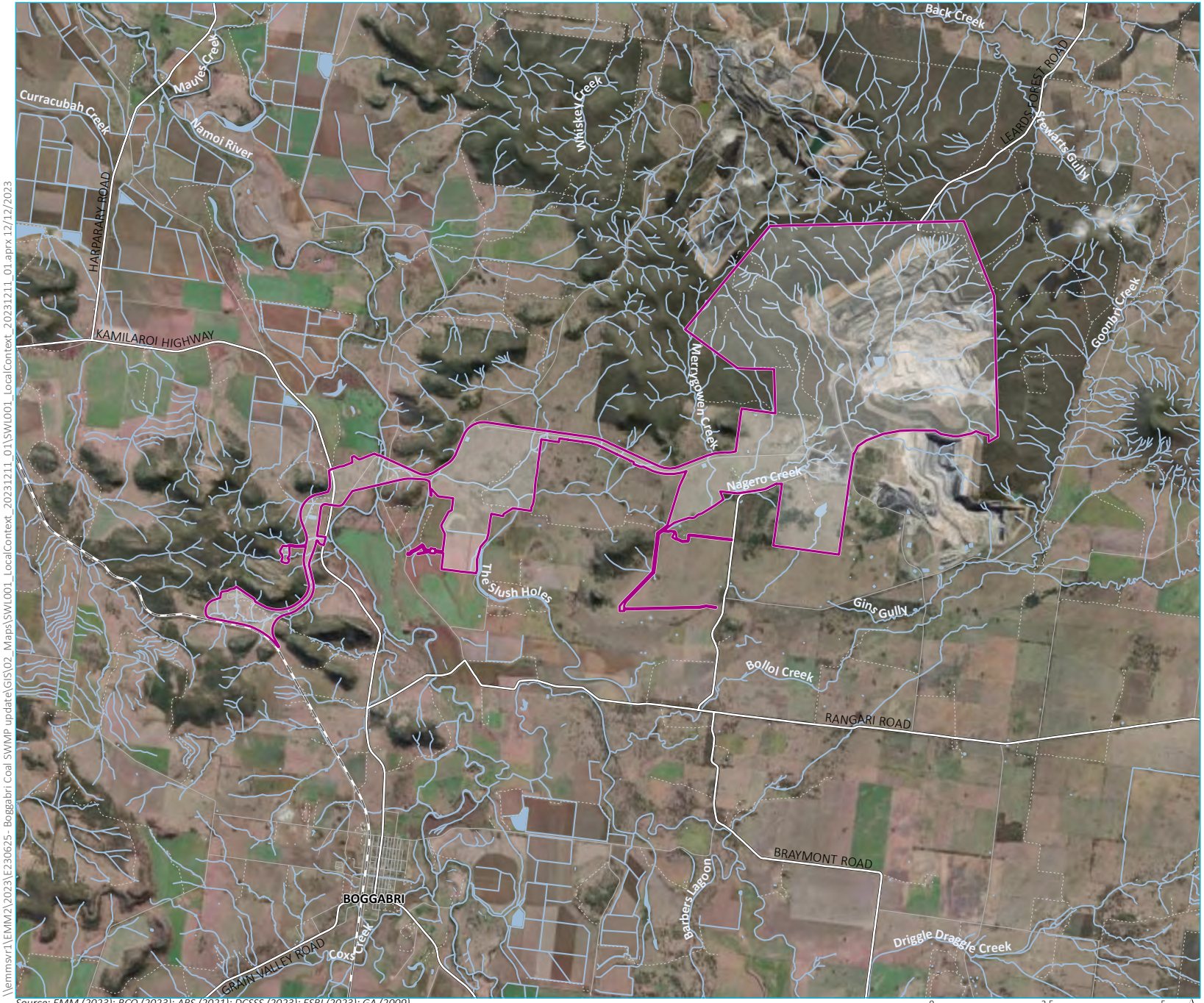
1.2 Purpose

The purpose of this Site Water Balance Report (SWBR) is to define the components of the Site Water Balance (SWB) model at BCM with respect to current Life-of-Mine (LOM) planning and all relevant available information. The SWBR was prepared to directly address SWB related conditions outlined in the Project Approval (SSD 09_0182), the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) approval and mining lease conditions. The key objectives of this SWBR are to:

- address the relevant approval conditions
- describe any changes to the SWB model since the 2022 SWBR (BCOPL 2023)
- validate the SWB model using observed climate and operational data recorded since the 2022 SWBR (BCOPL 2023)
- forecast the future water balance for the water management system (WMS) over the approved LOM
- describe proposed water efficiency initiatives, improvement programs and reporting requirements.

This SWBR was prepared with consideration of the relevant statutory requirements (Commonwealth, State or local), regulations, and environmental planning instruments relevant to mine water management, as summarised in Chapter 2.

The WMS that forms the basis of the SWB is documented in the BCM Surface Water Management Plan (SWMP). This SWBR should be read in conjunction with the SWMP.



KEY

- Project approval area

Existing environment

- Rail line
- Major road
- Minor road
- Vehicular track
- Watercourse/drainage line
- Waterbody

INSET KEY

- NPWS reserve
- State forest

Source: EMM (2023); BCO (2023); ABS (2021); DCSSS (2023); ESRI (2023); GA (2009)

0 2.5 5 km

GDA2020 MGA Zone 56

N

\\emmsvr1\EMM2\2023\E230625 - Boggabri Coal SWMP update\GIS\02_Maps\SWL001_LocalContext_20231211_01\SWL001_LocalContext_20231211_01.aprx 12/12/2023

Local context

Boggabri Coal Operations Pty Ltd
Site Water Balance Report
Figure 1.1

EMM
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1.3 Related water management documents

This SWBR is a subplan of the overarching BCOPL Water Management Plan (WMP). The water management documents applicable to the BCM are listed in Table 1.1. The WMP document hierarchy is shown in Figure 1.2.

Table 1.1 Related water management documents

Document	Description
Boggabri – Tarrawonga – Maules Creek (BTM) Complex Water Management Strategy	Regional strategy prepared in consultation with Tarrawonga Coal Pty Ltd (TCPL) and Maules Creek Coal Project (MCC).
BCOPL Water Management Plan (WMP)	Overarching document setting out water management framework, statutory requirements, and procedural requirements.
BCOPL Surface Water Management Plan (SWMP)	Surface water baseline data, performance criteria, monitoring program, response plan, water management system description, erosion and sediment controls.
BCOPL Groundwater Management Plan (GWMP)	Groundwater baseline data, performance criteria, monitoring program, response plan, and groundwater model validation program.
BCOPL Site Water Balance Report (SWBR)	**Water balance modelling methodology, assumptions and results, and mine water management system operating philosophy.**

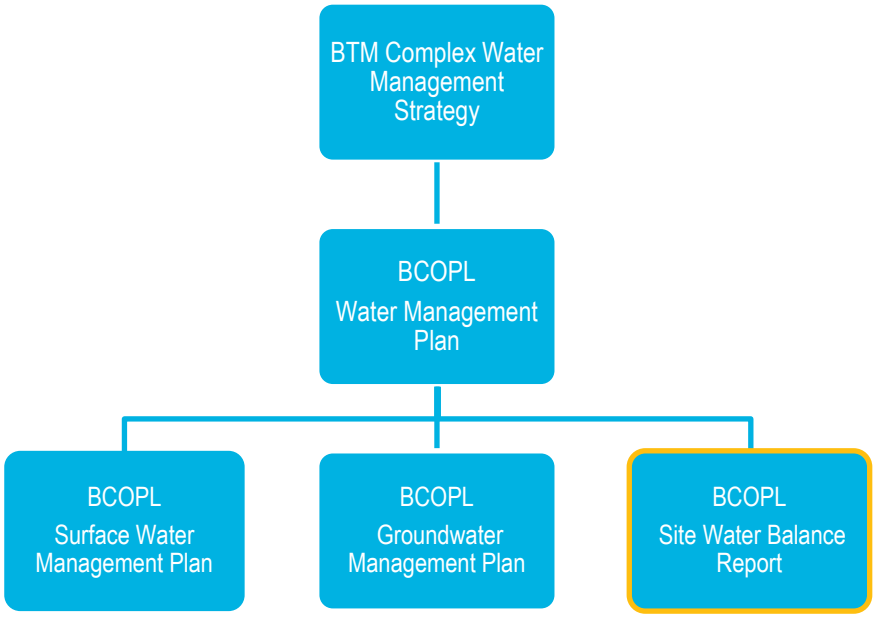


Figure 1.2 Water management plan document hierarchy

1.4 Agency consultation

As required by consent condition 38 of Schedule 3 of the Project Approval, previous versions of the SWBR and this version of the SWBR were prepared in consultation with several NSW government agencies including:

- Department of Planning and Environment (DPE) – Water (DPE-Water), Biodiversity Conservation (BSC) and Natural Resources Access Regulator (NRAR) divisions
- North West Local Land Services (NLLS) (formerly Namoi Catchment Management Authority [NCMA])
- Community Consultative Committee (CCC)
- Environment Protection Authority (EPA).

1.5 Report preparation

This SWBR has been prepared by Senior Water Resource Engineer Jason O'Brien and reviewed by Associate Water Resource Engineer Sally Callander. Jason has eight years' experience as a water resource engineer preparing surface water assessments, water management plans, water balance modelling and flood risk assessments. Sally has 15 years' experience in the water industry specialising in surface water assessments and management plans, water balance assessments, water quality assessments, hydrologic and hydraulic modelling and floodplain impact assessment, and risk management development and policy.

1.6 Revision history

The SWBR has been progressively updated to address agency feedback, including modifications to the approval conditions, and to maintain relevancy with operations. A record of SWBR updates and revisions is provided in Table 1.2.

Table 1.2 Revision status

Rev No.	Author	Approval	Date	Comment
0	L. Doeleman	J. Rennick	27 April 2012	Issue to NSW Department of Planning and Infrastructure (DP&I), NSW Office of Environment and Heritage (OEH), NSW Office of Water (NOW), NSW Division of Resources and Energy (DRE), and NCMA.
1	L. Doeleman	J. Green	14 September 2012	-
2	N. Harcombe A. Hedjripour	C. Dingle	19 July 2013	-
3	N. Harcombe, A. Hedjripour	C. Dingle	9 October 2013	Revised to address BCOPL comments. Issue to DP&I.
4	N. Harcombe	J. Green	18 November 2013	Revised to address DP&I comments. Issue to EPA and Department of Environment and Energy (DoEE).
5	K. Agllias	J. Green	12 February 2014	Revised to address relevant agencies comments. Issue to DP&I.
6	L. Doeleman	J. Green	4 June 2015	-
7	L. Doeleman	J. Green	10 September 2015	-

Table 1.2 Revision status

Rev No.	Author	Approval	Date	Comment
8	T. Tinkler A. Wyatt	P. Forbes	18 May 2017	Include Modification 5 approval conditions.
9	M. Best A. Wyatt	H. Russell	23 April 2021	2020 Annual Review.
10	M. Best A. Wyatt	H. Russell	30 August 2021	Regular management plan revision.
11	M. Best A. Wyatt	H. Russell	3 May 2022	2021 Annual Review.
12	J. O'Brien	A. Williams	27 March 2023	2022 Annual Review.
13	J. O'Brien S. Callander	L. Tolson	13 March 2024	2023 Annual Review. Include Modification 8 approval conditions.

2 Statutory requirements

2.1 Relevant legislation

Key legislation that is relevant to this SWBR include:

- *Environmental Protection and Biodiversity Conservation Act (1999)* (EPBC Act) – Commonwealth
- *Environmental Planning and Assessment Act 1979* (EP&A Act) – NSW
- *Mining Act 1992* – NSW
- *Protection of the Environment Operations Act 1997 (POEO Act)* – NSW
- *Water Management Act 2000* (WM Act) – NSW.

2.2 Project approval conditions

2.2.1 Commonwealth approval conditions

Commonwealth approval for the project was granted 11 February 2013 pursuant to Sections 130 (1) and 133 of the EPBC Act (EPBC Act referral 2009/5256). A variation to the EPBC Act conditions of approval was authorised in February 2020. The EPBC Act approval conditions relevant to this SWBR are reproduced in Table 2.1.

Table 2.1 Site water balance related EPBC approval conditions

Condition	Description	Where addressed
Surface Water and Groundwater Management Plans		
No. 18	The person taking the action must within 6 months of this approval, or such other timeframe specified by the Minister, provide to the Minister a report on: a) any updated modelling of surface and groundwater impacts that has been undertaken in preparing the surface and groundwater management plans b) how the surface and groundwater management plans addressed groundwater and surface water impacts on native vegetation.	Updated surface water modelling is provided in Chapter 3. Groundwater impacts are addressed in the GWMP. Impacts to riparian health are addressed in the SWMP.

2.2.2 State project consent conditions

State development consent (SSD 09_0182) was granted 18 July 2012 pursuant to Section 75J of the EP&A Act by the Planning and Assessment Commission of NSW as delegate of the Minister for Planning. Development consent for Modification 8 (MOD 8) was issued in January 2024. The NSW State development consent conditions relevant to this SWBR are reproduced in Table 2.2.

Table 2.2 Site water balance related consent conditions

Condition	Description	Where addressed
Water Supply		
Sch 3, 33	The Proponent must ensure that is has sufficient water for all stages of the project, and if necessary, adjust the scale of mining operations on site, to match its available water supply to the satisfaction of the Secretary.	Section 3.4.4
Water Management Plan		
Sch 3, 38	The Proponent must prepare and implement a Water Management Plan for the project to the satisfaction of the Secretary. This plan must be prepared in consultation with the EPA, DPE Water, North West LLS and the CCC, by suitably qualified and experienced person/s whose appointment has been approved by the Secretary, and be submitted to the Secretary for approval within 6 months of the date of this approval. In addition to the standard requirements for management plans (see Schedule 5, Condition 3), this plan must include:	Section 1.4 Section 1.5
	(c) a Site Water Balance, that:	
	• includes details of:	
	– sources and security of water supply, including direct and indirect water take, and contingency for future reporting periods	Section 3.4.4 Section 3.4.5
	– prioritisation strategy for water sources	Appendix B.3.6
	– water use onsite	Appendix B.3.7
	– water management on site	Described in detail in the SWMP
	– any off-site water discharges and management of water during high rainfall years and periods of flooding, including water storage options	Section 3.4.6
	– reporting procedures, including the preparation of a site water balance for each calendar year	Chapter 6
	– a program to validate the surface water model, including monitoring discharge volumes from the site and comparison of monitoring results with modelled predictions	Section 5.2
	– methodologies used in the preparation of thew site water balance, including provision of data sources, measurement type (direct sample/mass balance/engineering calculations/ factors) and formulas used for all inflows, processes and outflows	Appendix B
	• is supported by an annual improvement program to identify and address deficiencies and improvements within monitoring, measurement and calculation methods	Chapter 5
	• includes an action plan and schedule to implement annual water efficiency initiatives, and the recommendations in the Advisian peer review report titled “Peer Review of Site Water Use Aspects of Boggabri Coal MOD 5 Project, 22 July 2016”, as set out in Appendix 6A	Chapter 4
	• describes the measures that would be implemented to minimise clean water use on site.	Appendix B.3.6

2.2.3 Mining lease conditions

The objectives of the *Mining Act 1992* are to encourage and facilitate discovery and development of mineral resources having regard to the need to encourage ecologically sustainable development. In relation to water, the Act requires that BCOPL ensure effective rehabilitation of disturbed land and water and to ensure mineral resources are identified and developed in ways that minimise impact to the environment. BCOPL hold coal lease CL368 under this Act. Mining lease conditions are not directly relevant to the SWBR and are addressed in the SWMP.

2.3 Permits and licences

2.3.1 Environmental protection licence

Environmental protection licence (EPL) No. 12407 applies to the BCM operations. The EPL outlines surface water quality monitoring requirements and discharge criteria. The EPL also includes a requirement to maintain an air capacity (cumulative freeboard) of 1,000 megalitres (ML) within the BCM mine water inventory. EPL water quality and quantity monitoring requirements are addressed the SWMP.

2.3.2 Water access licences

BCOPL are required to hold water access licences (WAL) for surface water take associated with the BCM. Water licensing requirements, existing WALs and water supply works approvals, and the methodology to account for surface water take at the BCM are described in the SWMP. Water licensing requirements and existing WALs associated with groundwater take are described in the GWMP.

3 Site water balance

3.1 Overview

The SWB model is built using GoldSim software and was originally developed as a part of the Continuation of Boggabri Coal Mine Project Surface Water Assessment (WSP 2010). The SWB model is updated annually to reflect development of the mine and ensure on-site conditions are adequately simulated.

The SWB model is a key strategic planning tool to assess the resilience of the BCM WMS by testing it under a wide range of climate scenarios that may occur over the LOM, each generated by sampling historic rainfall records. By simulating the BCM WMS under these scenarios, the corresponding water inflows, outflows and the likely range of water deficits, surpluses, and discharges from BCM can be quantified.

The SWB model is based on the mine plan layout and WMS documented in *the Continuation of Boggabri Coal Mine Environmental Assessment* (Hansen Bailey 2010), *Boggabri Coal Forward Program: Sunday 1 January 2023 to Wednesday 31 December 2025*, and *Modification 8 (MOD 8) Amendment Report* (JBA 2022).

This chapter describes the SWB model updates that have been made since the 2022 SWBR (BCOPL 2023), the outcomes of the model validation process, and provides forecast model results for the WMS over the approved LOM. The WBM methodology including key inputs and assumptions is described in Appendix B.

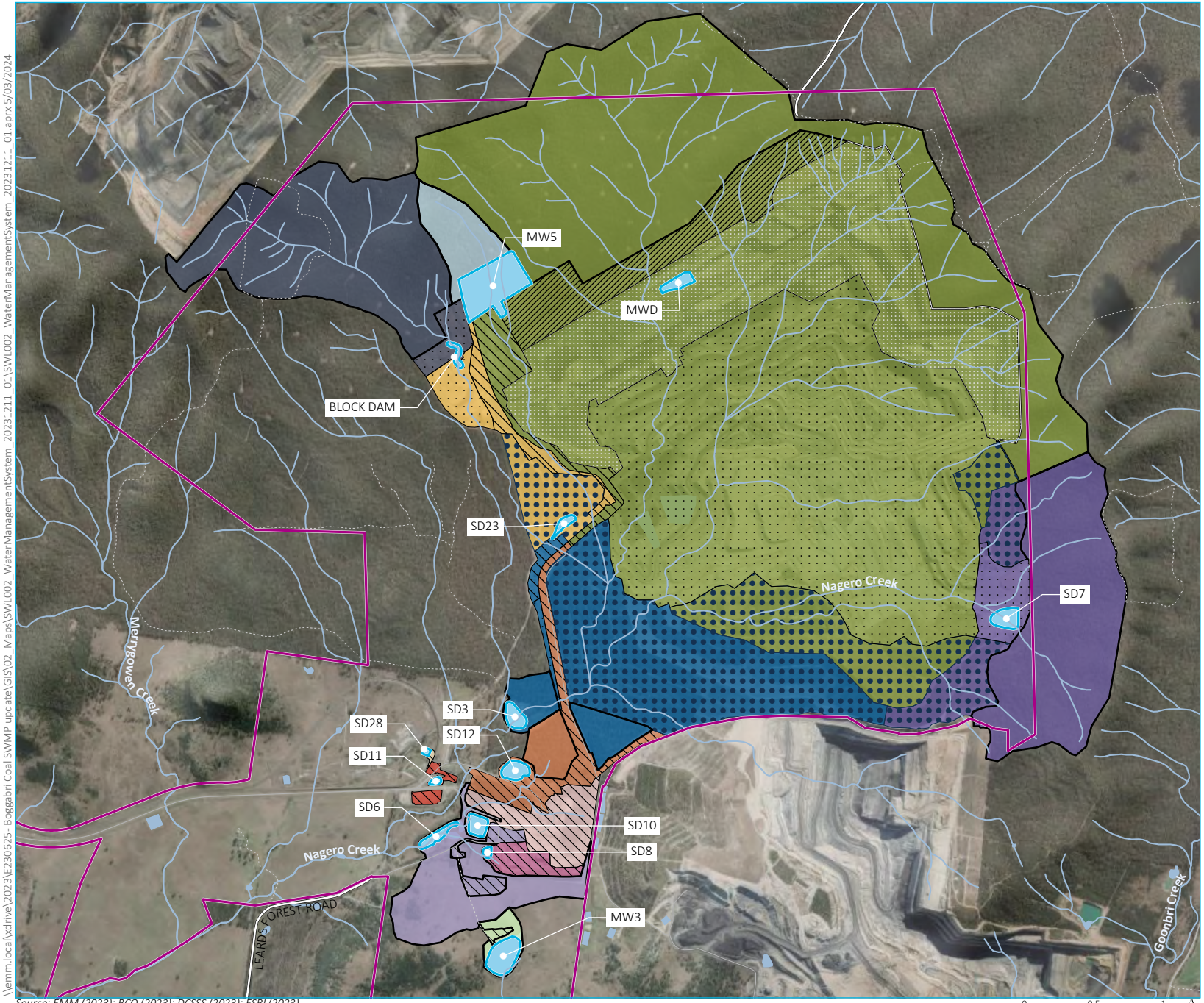
3.2 Model updates

The following key components of the WMS were reviewed as part of the 2023 SWB model update:

- catchment areas and land use
- pump rates and transfers
- storage data (including number of storages, capacity and operating levels)
- Australian Water Balance Model (AWBM) runoff parameters.

The following key updates were made to the model:

- Catchment areas and land use inputs for the 2023 calendar year were updated to represent the current BCM layout and WMS for the 2023 Calander year as shown in Figure 3.1.
- New water storage metering installed by BCOPL during the 2023 calendar year and described in the SWMP indicated that runoff volumes from undisturbed catchment areas were being slightly underestimated by the existing SWB model. The AWBM runoff parameters for the undisturbed catchment areas were recalibrated to achieve a better match for observed values (refer to Appendix B.3.2).
- It was identified the forecast water demand for the coal handling and preparation plant (CHPP) and mine infrastructure area (MIA) were being overestimated compared to historical records. The forecast water demand for the CHPP and MIA was adjusted to be representative of recorded historical values (refer to Appendix B.3.7).
- Groundwater inflows to the mine void were updated to those established in the MOD 8 Groundwater Impact Assessment Amendment Report (AGE 2022).
- Mine water management dam MW11 was added to the model as a replacement for MW5 which will be mined through by 2026. MW11 was assumed to come online by the start of 2025 and have a similar capacity and functionality as MW5.



KEY

- Project approval area
- Water storage

Storage catchment

- MW3
- MW5
- Pit
- Block Dam
- SD3
- SD4
- SD6
- SD7
- SD8
- SD10
- SD11
- SD12
- SD23
- SD28

Land use type

- Industrial
- Mine void
- Pre strip
- Rehabilitation
- Undisturbed
- Unshaped spoil dump

Existing environment

- Major road
- Minor road
- Vehicular track
- Regulation hydroline
- Waterbody

Source: EMM (2023); BCO (2023); DCSSS (2023); ESRI (2023)

0 0.5 1 km

GDA2020 MGA Zone 56

N

\\emm.local\xdrive\2023\E230625- Boggabri Coal SWMP update\GIS\02_Maps\SWL002_WaterManagementSystem_20231211_01\SWL002_WaterManagementSystem_20231211_01.aprx 5/03/2024

Existing water management system- 2023

Boggabri Coal Operations Pty Ltd
Site Water Balance Report
Figure 3.1

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3.3 Model validation

This section presents of the outcomes of the model validation for the 2023 calendar year. Model validation was completed by comparing modelled results to observed results for the following key model elements:

- total site water storage volume
- stored water volume at key storages (MW5 and SD10)
- external water import
- dust suppression water use.

3.3.1 Water inventory

BCOPL routinely records storage levels in accordance with the monitoring program described in the SWMP. Recorded storage levels were used to validate storage volumes for the total site, MW5, and SD10.

i Total site storage

The observed and modelled total site stored volume from January 2020 to December 2023 are compared in Figure 3.2.

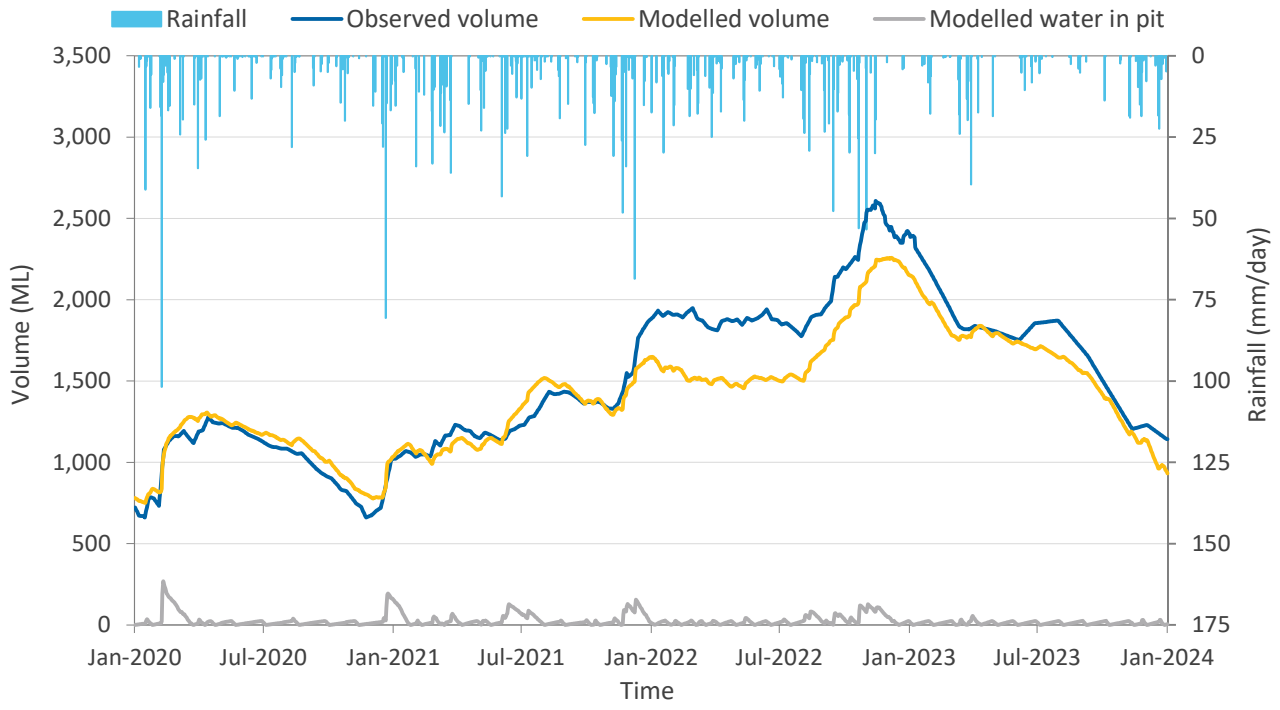

Figure 3.2 Observed vs modelled total site storage volume

Figure 3.2 shows the modelled storage volume (yellow line) provides a good representation of the observed storage volume (blue line) with similar responses to rainfall occurring for both results. The modelled and observed storage volume are a good match from January 2020 to November 2021. The modelled results show a subdued response to the wet weather period in November and December 2021. After which, the modelled results are shown to follow a similar rise and fall in response to rainfall and storage outflows to the end of 2023. The total storage volume from January 2022 to December 2023 is generally lower than the observed storage volume due to the underestimation of the 2021 rainfall event.

Overall, the model shows an acceptable fit for total inventory, with the modelled rate of drawdown after rainfall events correlating well with the observed data. Except for the November and December 2021 rainfall event, the magnitude of inflows from rainfall events is also captured by the runoff model.

ii MW5 storage

The observed and modelled storage volume in MW5 from January 2020 to December 2023 are compared in Figure 3.3.

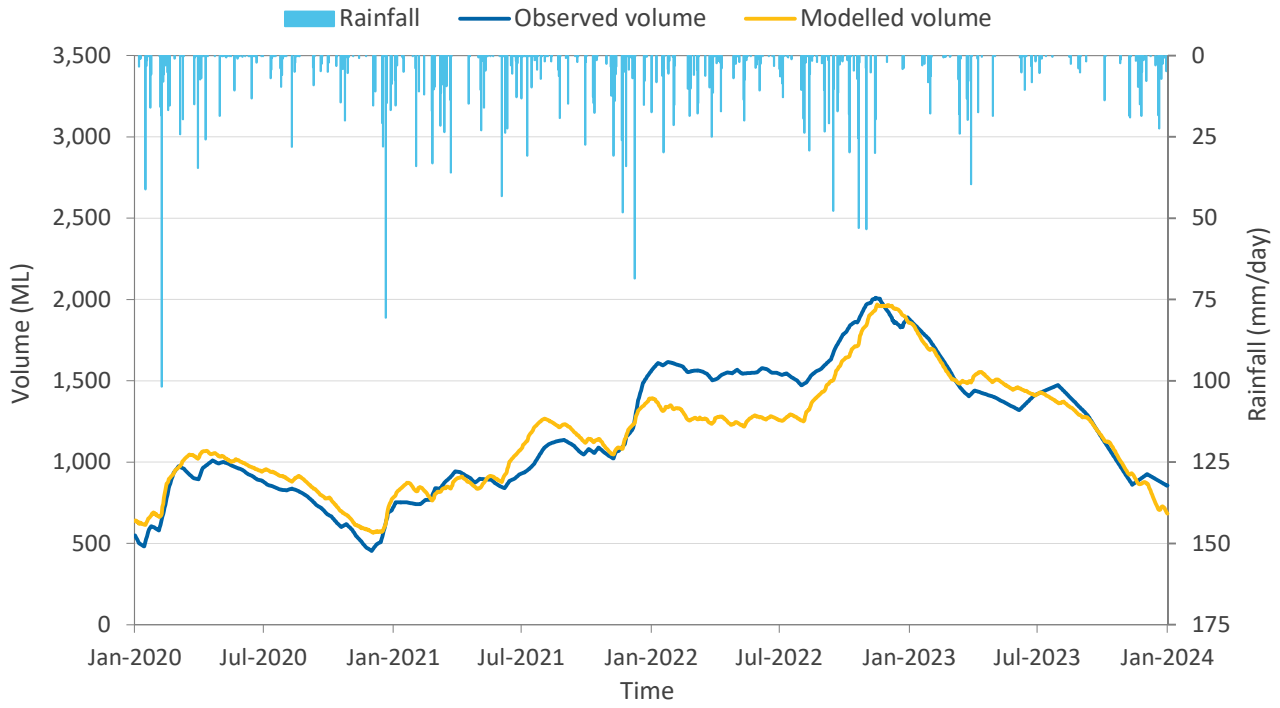

Figure 3.3 Observed vs modelled MW5 storage volume

Figure 3.3 shows the modelled storage volume in MW5 is a good match to the observed storage volume with similar responses to rainfall occurring for both results. The modelled volume is underestimated following the November and December 2021 rainfall event as per the total site stored water. The modelled MW5 volume matches the observed peak that occurred During the November 2022 rainfall event as the pumping and transfer rules described in Appendix B preferentially send water to MW5 from the rest of the WMS whenever an excess is observed up until MW5 reaches its HOV.

iii SD10 storage

The observed and modelled storage volume in SD10 from January 2020 to December 2023 are compared in Figure 3.4.

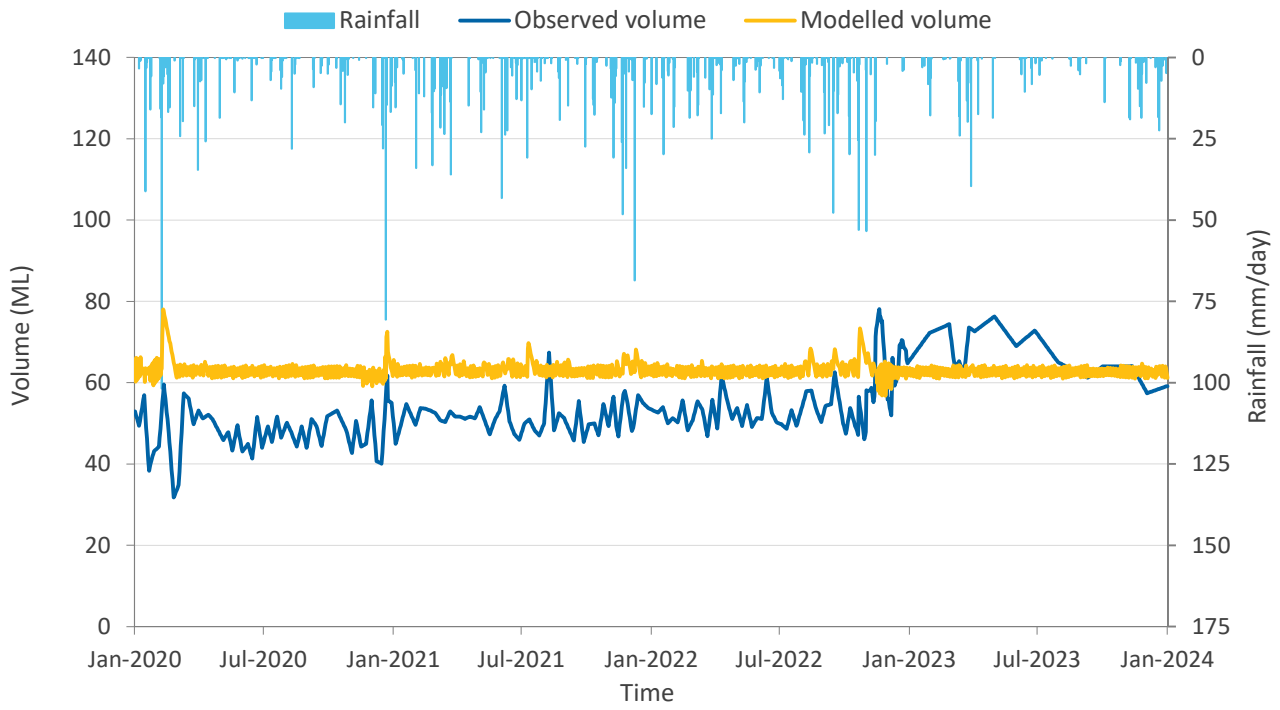

Figure 3.4 Observed vs modelled SD10 storage volume

SD10 operates as a transfer point for water to and from MW5 as well as supplying water to the CHPP and MIA. Modelled storage volumes are elevated compared to observed values prior to January 2023. The modelled storage volumes are similar to observed values from January 2023 onwards. Modelled storage volumes are shown to follow a relatively stable trend as per the observed values. This is expected as SD10 has a relatively small contributing catchment area and is therefore strongly influenced by pumped transfers to and from other aspects of the WMS. The modelled operating logic is considered to be capturing the operation of SD10 adequately.

iv Summary

Modelled storage volumes generally match observed storage volumes with the key trends in rainfall and runoff adequately represented. Typically, modelled results differ from observed results due to the model operating rules described in Appendix B. In reality, water may be preferentially held in one storage or another on a case-by-case basis which is difficult to replicate in a model based on rules and assumptions.

3.3.2 Water import

Consistent with the water source prioritisation strategy described in the SWMP and summarised in Appendix B.3.6, the SWB model preferentially sources import water from groundwater sources as water from the Namoi River is often unreliable during dry periods. As a result, modelled water import has been classified as either groundwater import or additional import, where the additional import is assumed to be sourced from the purchase of additional temporary groundwater entitlements (but other options such as river water may be explored). Modelled water imports are compared to observed water imports on a water year (July to June) basis in Figure 3.5.

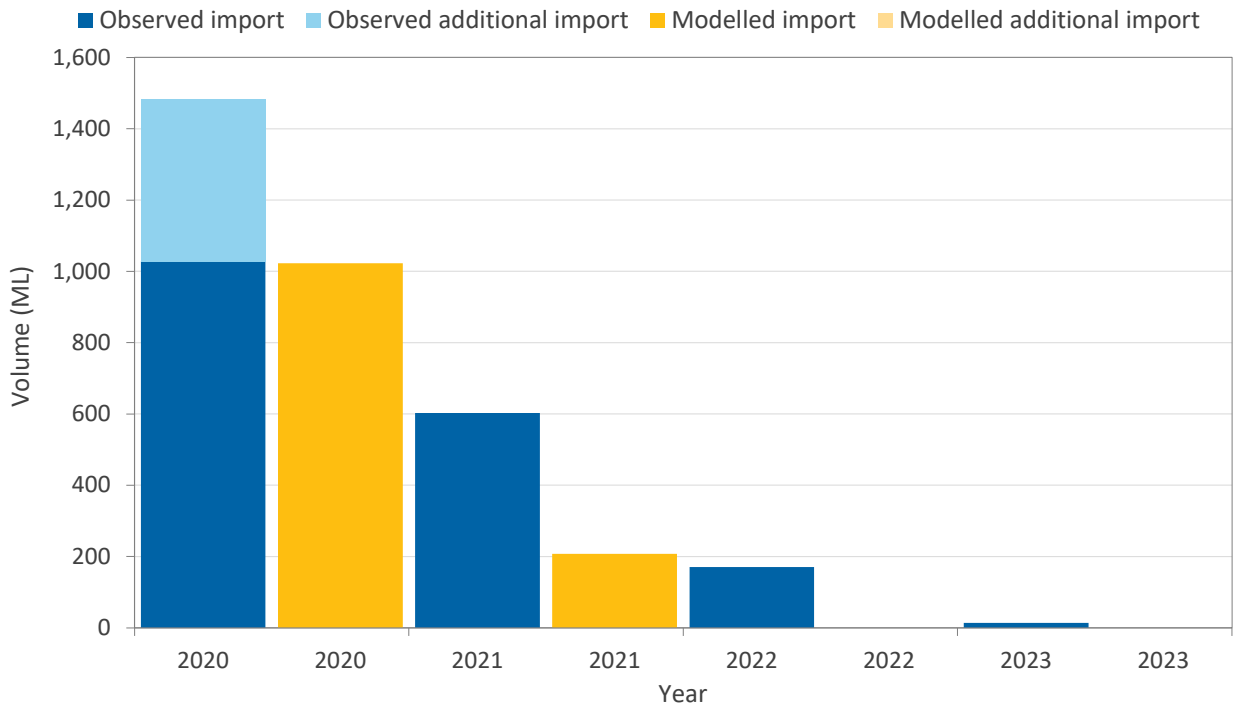

Figure 3.5 Observed vs modelled water import: water year (July to June)

The SWB model is shown to generally underestimate the volume of water imported from the borefield or additional sources. The underestimation of imported water from 2020 to 2022 is primarily associated with the updated SWB model logic which preferentially sources CHPP and MIA water demand (several hundred megalitres a year) from SD10 via a filtration system (implemented in the 2022 calendar year) rather than directly from the borefield.

Due to the substantial volume of water stored onsite (refer to Figure 3.7) through 2022 and 2023, only 13.6 ML was imported from the borefield during the 2022/2023 water year. The SWB model predicted zero water imports during 2022 and 2023 which is consistent with the observed values. However, it remains uncertain whether the model can adequately simulate water imports for the updated WMS under drier conditions. Should the total site water inventory continue to decrease into 2024 due to drier conditions, it is probable that water imports will be necessary. The performance of the SWB model in simulating water imports under drier conditions should be reviewed as part of the 2024 SWB review.

3.3.3 Dust suppression

Monthly and annual modelled dust suppression use is compared to observed values in Figure 3.6. Modelled dust suppression usage generally shows a good match to observed values. Annual modelled dust suppression values range from 18% higher than observed values in 2020 to 6% less than observed values in 2023. Monthly modelled dust suppression is shown to follow similar trends to observed values (i.e. higher in summer and lower in winter).

Total haul road area and the applied evaporation rate both have a degree of uncertainty around them when estimating dust suppression, as such the small variance from observed usage is acceptable for the SWB model. The methodology for modelling dust suppressions is outlined in Appendix B.3.7.

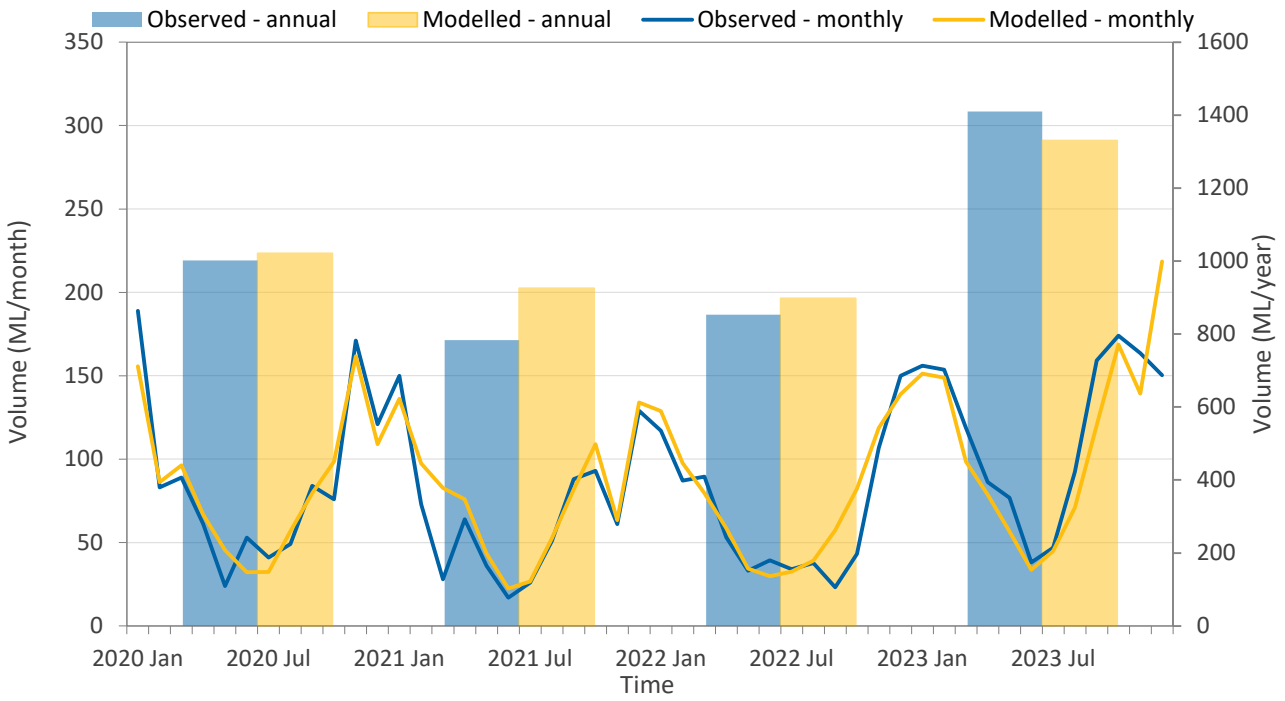

Figure 3.6 Observed vs modelled dust suppression

3.3.4 Validation outcome

The validation of the SWB model against total and key storage volumes, water import, and dust suppression was found to provide a suitable estimation of observed values. As a result, the SWB model is considered adequate and suitable to forecast conditions for the LOM. Recommendations to improve validation outcomes and the veracity of the model in future model updates are made in Section 5.1.

3.4 Forecast model results

The SWB model was used to forecast the performance of the BCM WMS over the LOM to assess the risk of water shortfall or water excess and to allow for mine planning to be undertaken to mitigate potential risks.

The SWB model was run for a total of 130 times using simulated rainfall and evaporation conditions sampled from the historical climate record (refer to Appendix A). The results of the simulation are presented in the following sections.

3.4.1 Model results summary

The median annual site water balance for the 2024, 2025, 2028 and 2033 mine years is provided in Table 3.1. It should be noted the median values of the different inflows and outflows do not coincide and result in an increase or decrease in site water storage volumes. Unlike mean values, the median of the total inflows and total outflows do not balance exactly. Nonetheless, median values have been shown as they are a more representative measure of central tendency for processes with skewed distribution such as rainfall/runoff.

Table 3.1 Median site water balance for select mine years

Water management system component	2024	2025	2028	2033
Inflows (ML)				
Runoff and direct rainfall:				
• Dirty water storages	101	118	359	420
• Contaminated water storages and pit	681	638	416	401
Groundwater interception	584	424	238	230
Imported water from borefield	545	781	871	688
Import water from additional sources	0	0	0	0
Total inflows (ML)	**1,910**	**1,961**	**1,883**	**1,738**
Outflows (ML)				
Demands:				
• Dust suppression – haul roads	1,563	1,610	1,459	1,157
• CHPP/MIA	311	310	311	310
Evaporation:				
• Dirty water sediment dams	37	40	136	217
• Contaminated water dams, MWDs and pit	250	210	201	199
Discharges:				
• Dirty water sediment dams	0	0	0	0
• Mine water dams and pit	0	0	0	0
Total outflows (ML)	**2,161**	**2,170**	**2,107**	**1,883**
Change in storage (ML)	**-278**	**-30**	**10**	**23**

The SWB model results presented in Table 3.1 indicate water imported from the borefield represents between 29% and 46% of total median inflows. Less water is required from the borefield in 2024 due to the volume of water stored onsite (1,150 ML) at the end of 2023 (refer to Figure 3.2). Rainfall and runoff make up between 39% and 47% of total median inflows while groundwater interception represents between 13% and 31% of total median inflows. Import from additional water sources is not predicted to be required under median conditions.

Water used for dust suppression is the largest outflow from the system, representing approximately 70% of total median outflows. CHPP and MIA water demand represent 15% of total median outflows while evaporation losses range from 12% to 22% of total median outflows. No discharges are expected under median conditions.

3.4.2 Total site storage

Forecasted estimates for total site storage volume (less the volume stored in the pit) are shown in Figure 3.7. The results are presented as the range between the minimum and 5th percentile, 5th percentile and 25th percentile, 25th percentile and median, median and 75th percentile, 75th percentile and 95th percentile, and 95th percentile and maximum values. Note the percentile values for stored volumes represent the daily results, whereas the values shown in Table 3.1 represent annual results.

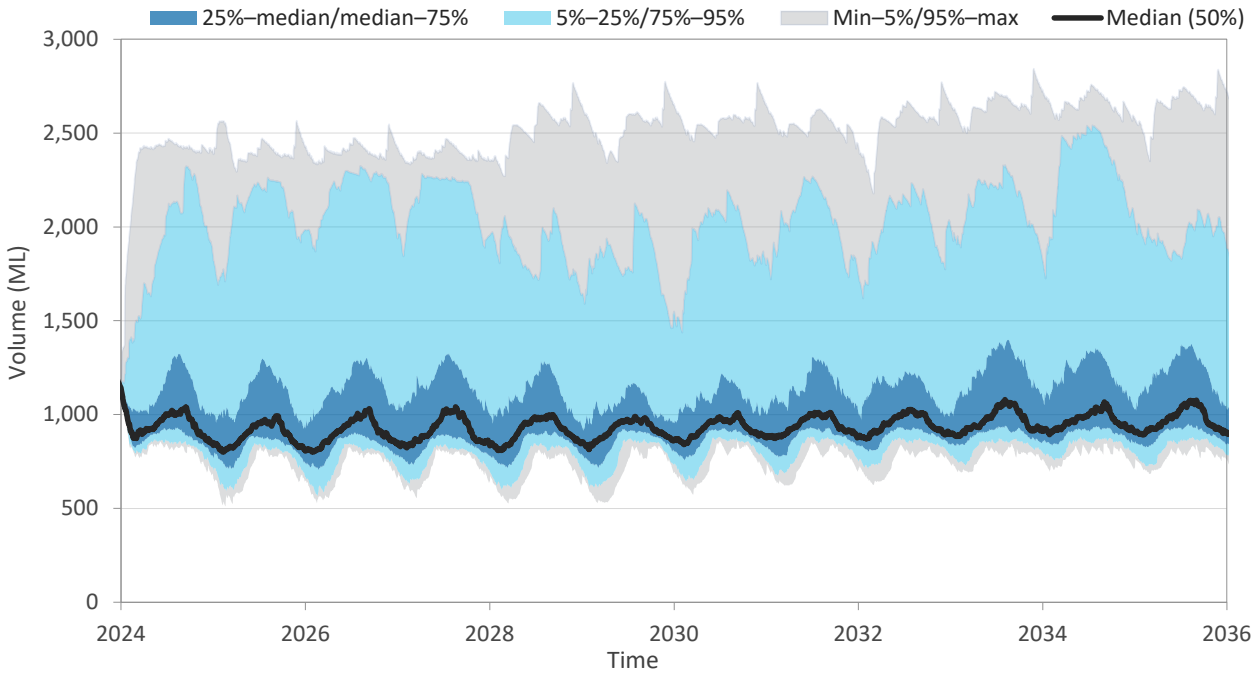

Figure 3.7 Modelled daily timeseries for total site volume

Total site storage is shown to remain relatively stable as the mine progresses with minimum to 75th percentile value range tightly grouped to the median result (shown as the black line). This is expected as the mine is generally in water deficit on an annual basis as rainfall and runoff volumes are typical less than water demands. Hence, the volume of stored water in the system is maintained at a constant level due to imports from the borefield. The 75th percentile to maximum result represents the WMS response to significant wet weather periods that could occur in the future (based on historical rainfall events).

3.4.3 Water stored in the pit

Forecasted model results of water stored in the pit over the LOM are provided in Figure 3.8. The pit void is predicted to be empty most of the time with the maximum predicted volume stored in the pit estimated at 1,200 ML. The volume of water that is expected to be stored in the pit decreases over time as the contributing catchment area to the pit decreases as rehabilitation progresses.

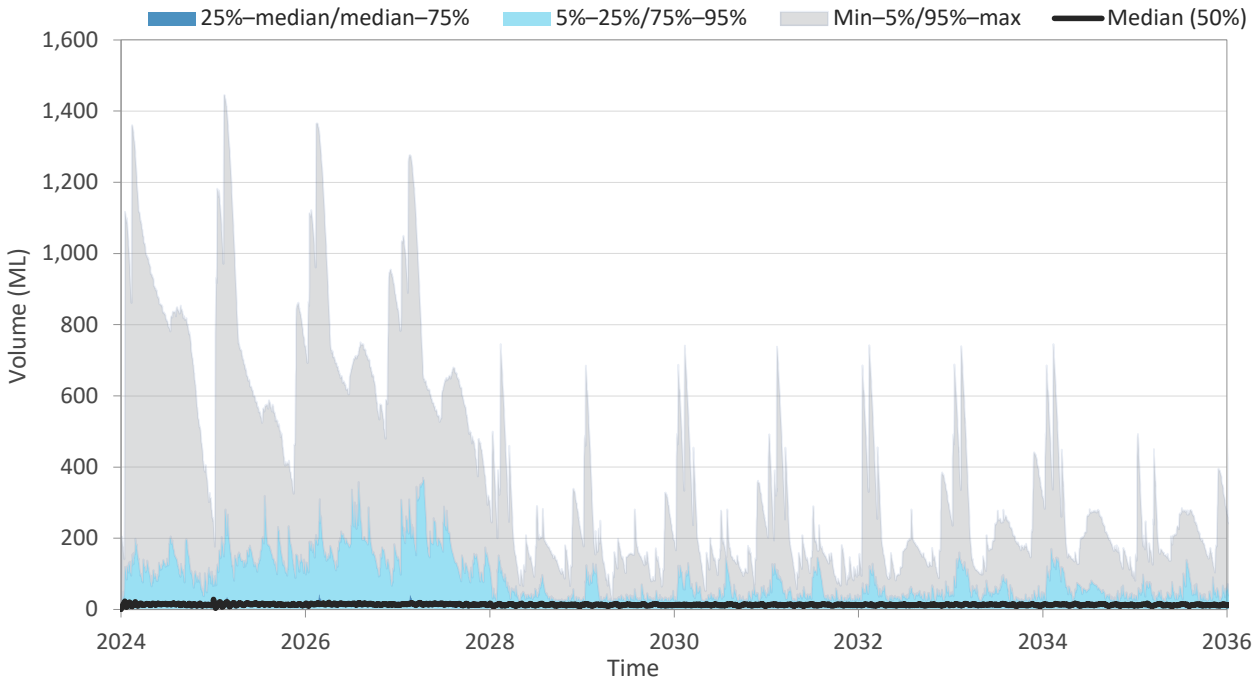

Figure 3.8 Modelled daily timeseries of water stored in-pit

3.4.4 Water supply reliability

Annual predicted water imports over the LOM are shown in Figure 3.9. The volume of imported water is compared to BCOPL's existing groundwater entitlements (1,028 unit shares) to extract from the borefield and surface water entitlements (322 unit shares) to extract from the Namoi River. BCOPL preferentially sources import water from groundwater sources and typically utilises account carryover as set out under the rules of the water sharing plan or the temporary trade of entitlement to meet onsite water demands. However, the use of river water is still an option and has therefore been included for consideration in this section.

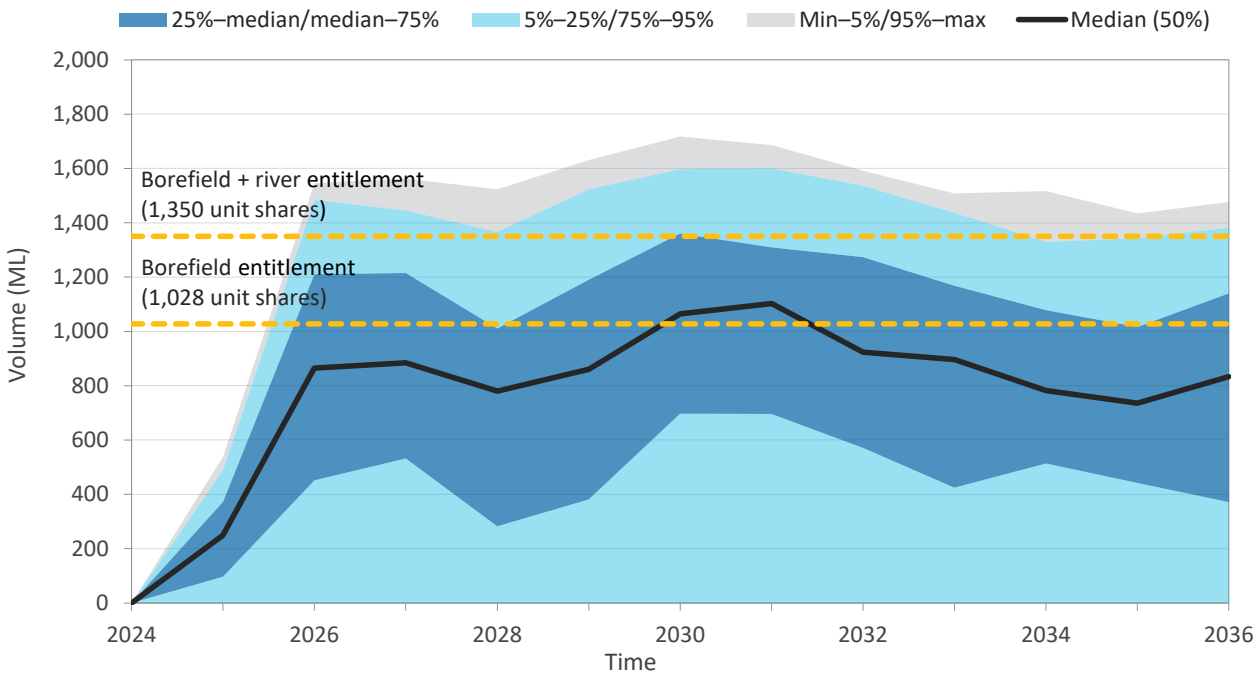

Figure 3.9 Annual modelled water imports

Figure 3.9 shows imported water is expected to peak at the end of 2029 due to increased dust suppression requirements associated with longer proposed haul roads and decreased runoff potential as larger areas of the existing mine void become rehabilitated. The maximum predicted volume of 1,720 ML/year exceeds BCOPL's existing groundwater and surface water entitlements by 370 ML. The probability of requiring additional water entitlements in excess of BCOPL's existing entitlements ranges from 5–25% per year over the LOM.

Condition 33 of the Project Approval requires BCOPL to have sufficient water for all stages of the Project, and if necessary, adjust the scale of mining operations on site, to match its available water supply. Historically, BCOPL have been able to successfully secure additional water requirements through temporary trade, including during the recent 2018/2019 drought. However, there is a risk mining operations may be impacted if BCOPL are unable to successfully temporary trade additional water entitlements to meet potential water demands in the future.

3.4.5 Intercepted catchment runoff

Annual runoff from undisturbed catchment area that is predicted to be intercepted over the LOM is shown in Figure 3.10. It should be noted the volumes shown in Figure 3.10 represent all intercepted runoff from undisturbed catchment areas including runoff that is licensable and runoff that does not require licensing due to exemptions.

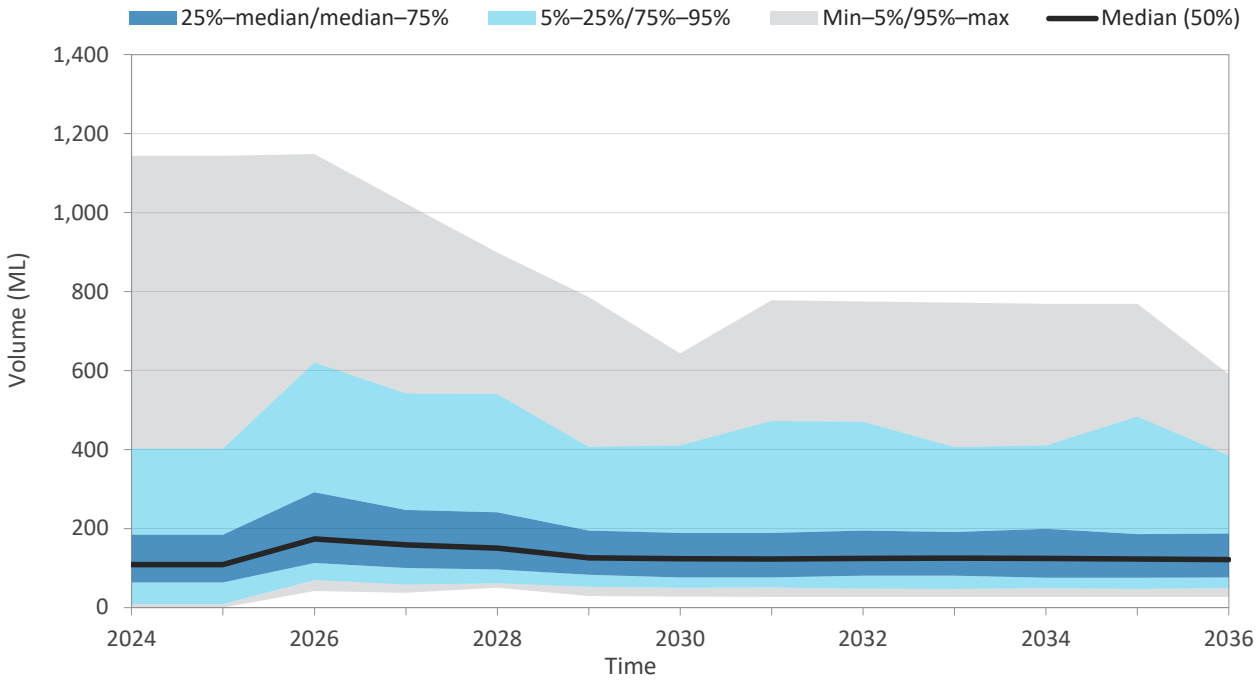

Figure 3.10 Annual modelled intercepted undisturbed catchment runoff

The predicted volume of intercepted runoff generally decreases over time as mining progresses to the north, reducing the overall contributing catchment area. The median runoff volume over the LOM is 130 ML/year while the 75th percentile is 205 ML/year. BCOPL hold 93-unit shares in the Bluevale Water Source to account for the licensable portion of intercepted catchment runoff. Water accounting is completed quarterly using recorded data and the SWB model. This allows for the actual volume of water take to be accounted for in the year that the take occurs and for the total catchment area that requires licensing to be modified as mining progresses. Additional entitlements are purchased via temporary trade should the SWB model indicate BCOPL may exceed their entitlement.

3.4.6 Modelled overflows

The modelled overflows from dirty water storages are shown in Figure 3.11. No overflows are predicted under median conditions due to the design capacity of MW5/MW11 providing storage space for dirty water runoff in small to moderate rainfall events.

The occurrence of dirty water discharges generally increases over the LOM as rehabilitation progresses and a larger portion of the disturbance area drains to dirty water dams rather than the mine void. A maximum dirty water overflow of up to 970 ML/year is predicted to occur in 2035 when a substantial portion of the disturbed area will drain to sediment dams which are not currently proposed to be harvested from for reuse onsite.

No overflows from contaminated water dams are predicted for the LOM. Any excess contaminated water will be stored in the pit to prevent overflows.

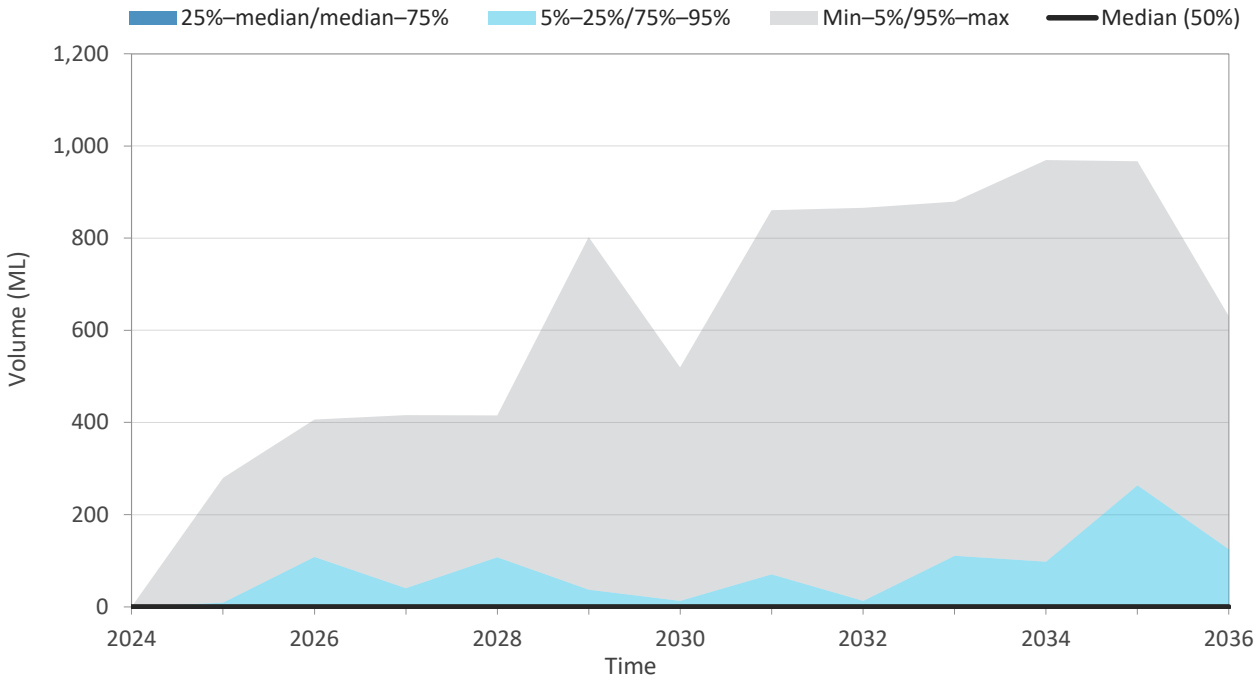

Figure 3.11 Annual modelled dirty water overflows

4 Water efficiency initiatives

The action plan to implement water efficiency initiatives and the recommendations (Advisian 2016) referenced in Appendix 6A of the Project Approval are provided in Table 4.1.

Table 4.1 Water balance initiatives action plan

Action plan	Schedule
BCOPL water efficiency initiatives	
Propose water efficiency initiatives.	Annually during the SWB review process
Report on the effectiveness of water efficiency initiatives.	Annually in the Annual Review
Water efficiency initiatives (Project Approval Appendix 6A)	
Install meters for all major water flows including:	
Water transfers from sediment dams and mine pits into mine water storages.	Complete
All water-cart fill points.	Complete
All elements of the anticipated water demand for various purposes associated with CHPP (as identified in Table 4 of the letters dated 8 July).	Complete
All water imports including any bore water obtained onsite.	Complete
Install water level meters on all significant water storages as a check on inflows and outflows and a means of assessing evaporation and seepage losses. This data will also provide a basis for improving estimates of runoff from different surface types (hardstand, mine pit, “raw’ overburden, etc.).	Complete
Collect moisture content data for all coal flows associated with the CHPP to permit full water balance accounting.	In progress
Record all flow meters and water levels at least weekly (preferable by means for continuous recording) and analyse the data on a monthly basis to develop a full accounting of all water sources and losses.	Complete
Compare monitored gains from rainfall and losses by evaporation from water storages to the rainfall and evaporation data from the weather station.	Modelled storage volumes are compared to observed storage volumes in Section 3.4.
Update the site water balance annually based on monitored data and provide details in the Annual Report to the Department.	Commitment to update annual SWB provided in Section 5.2.

5 Annual improvement program

5.1 Recommended improvements

BCOPL undertake annual reviews to identify and address deficiencies and make improvements to the monitoring, measurement, and calculation methods presented in the SWB. The results of the improvement program will be incorporated into the annual revision of the SWB.

It is recommended the following elements of the water balance are reviewed as part of the 2024 SWBR:

- Model calibration – verification of water import volumes following the implementation of water efficiency initiatives at SD6 and SD10 was limited in recent years due to extended wet weather removing the need to import water (refer to Section 3.3.2). If water imports are required during the 2024 calendar year, the model verification and if necessary, calibration should be reviewed accordingly.
- Review of AWBM parameters – data from the expanded BCM surface water monitoring program should be utilised to improve calibration of the AWBM runoff parameters including for undisturbed catchment areas.
- Water storages – the capacity and stage storage details of MW11 should be confirmed and incorporated into the SWB model.
- Water storage staging – the staging of any new storages or storage upgrades should be reviewed to make sure they are current for the 2024 calendar year and forecasted mine plan.

5.2 Validation program

BCOPL is committed to performing a validation of the SWB model annually. In this validation procedure, the existing model is used to simulate the WMS for the previous year using observed climate data as an input. The modelled results such as water imports, dust suppression water use, and storage volumes (total, MW5, and SD10) are then compared to observed values.

If the SWB model is not representative of the WMS, an investigation into any discrepancies will be conducted with the aim of calibrating the model correctly. The updated model will be used to update the predictions described in Section 3.4.

The outcomes of the validation program will be included as a part of the Annual Review in the annual revision of the SWBR.

6 Reporting and review

6.1 Reporting

General and specific reporting requirements relevant to this SWBR are described in Table 6.1.

Table 6.1 Reporting requirements

Reporting aspect	Reporting procedure
Annual return	EPL 12407 contains conditions that require BCOPL supply the EPA with an annual return. Details of the annual return reporting requirements and procedures are documented in the WMP.
Incidents and non-compliance	BCOPL will manage and report environment incidents, complaints, non-conformances with relevant statutory requirements and exceedances of performance criteria as outlined in the BCOPL Incident Management Standard and documented in the WMP.
Annual SWBR	BCOPL will prepare an annual SWBR in accordance with Schedule 3, Condition 38 of the Project Approval. The annual SWBR will be included in the Annual Review report for each calendar year.

6.2 Review

General and specific review requirements relevant to this SWBR are described in Table 6.2.

Table 6.2 Review requirements

Review aspect	Review procedure
Annual review	BCOPL prepares and submits an Annual Review with respect to the environmental performance of the development to relevant agencies. Details of the Annual Review requirements are documented in the WMP.
SWB review	BCOPL will review the SWB in accordance with Schedule 5, Condition 4 of the Project Approval. Details of the review process are documented in the WMP.

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Appendix A
Climate data

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A.1 Rainfall data

Daily rainfall data at the Boggabri Post Office gauge was obtained as SILO (Scientific Information for Land Owners) patched point data from the Queensland Climate Change Centre of Excellence. SILO patched point data is based on historical data from the BoM rainfall stations, with missing data 'patched' in by interpolating data from nearby operating stations. SILO data was obtained for Boggabri Post Office gauge from January 1889 to December 2023.

Monthly rainfall statistics for the Boggabri Post Office gauge are shown in Figure A.1. Monthly rainfall totals for the 2022 and 2023 calendar year recorded at the site rainfall gauge are also shown for comparative purposes.

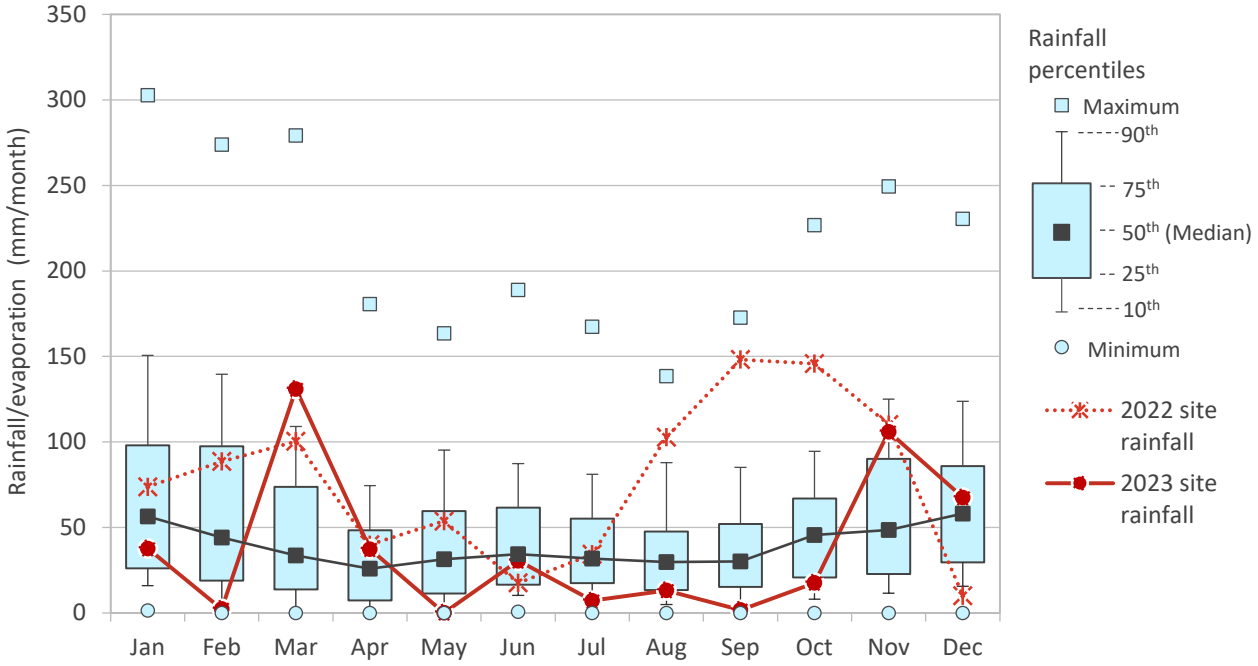

Figure A.1 Monthly rainfall statistics – Boggabri Post Office and site rainfall gauge

Rainfall during the 2022 calendar year was generally wetter than typical conditions with most months exceeding the historical median value at Boggabri Post Office gauge. Rainfall during the 2023 calendar year was generally drier than the historical median at Boggabri Post Office gauge. Monthly rainfall totals in 2022 from August to November either exceed or were similar to the 90th percentile rainfall totals (i.e. rainfall conditions that are only exceeded in 10% of years). Conversely, 2023 rainfall only exceeded the 90th percentile rainfall total in March. The 2022 annual rainfall total at the site gauge of 926 mm is approximately equivalent to a 95th percentile rainfall year based on the 135 years of rainfall data at the Boggabri Post Office gauge, whilst the 2023 annual rainfall of 453 mm equates to roughly a 20th percentile rainfall year.

A.2 Evaporation data

Daily evaporation rates were obtained as SILO patched point data at the Boggabri Post Office gauge over the January 1889 to December 2023 period. Evaporation data was sourced as Class A pan evaporation, Morton's potential evapotranspiration, and Morton's shallow lake evaporation.

The BoM records daily evaporation data at the Gunnedah Resource Centre (GRC) (055024) weather station which is approximately 46 km south-east of the site. The GRC weather station has recorded evaporation data since 1948. The Gunnedah Resource Centre evaporation data is compared to the SILO patched point data for Boggabri Post Office in Figure A.2. The comparison is intended to provide confidence the SILO data reflects actual recorded evaporation values. Average monthly rainfall totals are also presented in Figure A.2 for context.

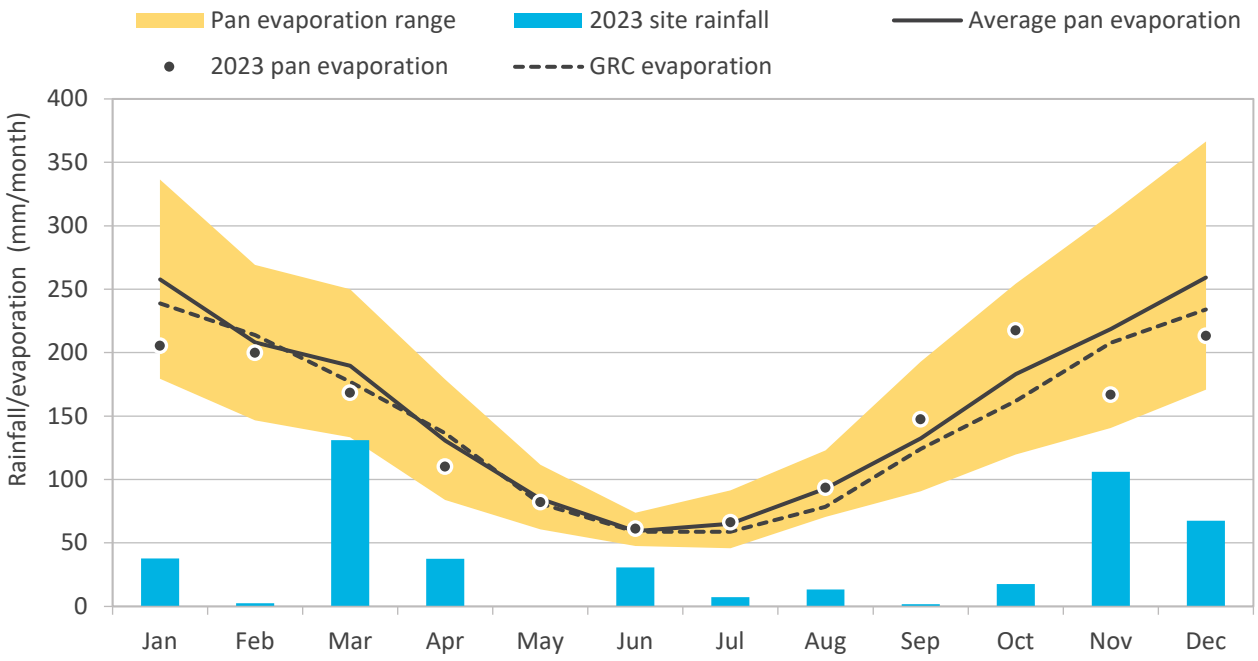

Figure A.2 Monthly pan evaporation rates – Boggabri Post Office

Figure A.2 shows the long-term average data from the SILO patched point data at Boggabri Post Office matches well with the data recorded at the GRC. Monthly evaporation totals are up to four times larger in summer compared to winter. Monthly evaporation totals are shown to have substantially exceeded monthly rainfall totals in all months over the 2023 calendar year.

Appendix B
Water balance methodology

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B.1 Overview

The Site Water Balance (SWB) model was developed in GoldSim (version 14). The model applies a continuous simulation methodology that assesses the performance of the Boggabri Coal Mine (BCM) water management system (WMS) under a range of climate conditions. The model was created by representing the WMS as a series of elements, each containing pre-set rules and data, that were linked together to simulate the interaction of these elements.

The water balance model simulated the volume of water stored within the BCM WMS based on the following equation:

Change in volume over time = inflows – outflows

Where:

- Modelled inflows consisted of direct rainfall onto the water surface area of each storage, catchment runoff, groundwater inflows, and make up water imported from the BCM borefield and the Namoi River.
- Modelled outflows consisted of evaporation from the water surface area of each storage, dust suppression water use, Coal Handling and Preparation Plant (CHPP) and Mine Infrastructure Area (MIA) water use, and via discharge from storage outlets due to overflows.

The modelled WMS including how each component is linked is shown schematically in Appendix C**.**

B.2 Modelling approach

B.2.1 Simulation period

The SWB model simulates the historical WMS performance (back to approximately 2019) for verification purposes as well as the next 12 years (between 2024 and 2036) of the Life-of-Mine (LOM) for forecasting purposes. The simulation period can be updated as needed to investigate a shorter or longer LOM or future operational scenarios.

The SWB model includes 135 years of historical rainfall and evaporation data allowing the LOM to be simulated using a range of climate conditions (refer to Appendix A).

B.2.2 Timestep

Water is pumped across the BCM WMS based on pre-determined rules and pump rates (refer to Table B.4). Daily pump rates for some transfers, such as those between MW5 and SD23 to meet dust suppression demands, may exceed the actual volume of water that requires pumping in each day resulting in more water being transferred than what would occur under actual operations.

A sub-daily timestep is required to allow less than the maximum daily pump rate to be transferred per day. The SWB model applies a 6-hour timestep to adequately simulate the ability to operate pumps at sub-daily intervals.

B.3 Model assumptions

B.3.1 Climate

i Rainfall

Historical daily rainfall data from 1889 to 2023 (135 years) obtained as patched point data from the SILO database, as discussed in Appendix A was applied the SWB model. Daily rainfall was applied to calculate direct rainfall onto the simulated water surface of each modelled storage whereby the volume of direct rainfall was calculated as the product of the simulated rainfall depth and the water surface area of the storage, calculated from surveyed stage-storage-area relationships.

Daily rainfall was also applied to the rainfall runoff model described in Appendix B.3.2 to estimate runoff from the WMS contributing catchment.

ii Evaporation

Daily evaporation rates at the Boggabri Post Office gauge were obtained as SILO patched point data from 1889 to 2023 (135 years). Evaporation data was sourced as Morton's potential evapotranspiration and Morton's shallow lake evaporation and applied to the SWB model as follows:

- Morton's potential evapotranspiration – applied to the rainfall runoff model and to calculate dust suppression demand.
- Morton's shallow lake evaporation – applied to calculate evaporation from pond water surface areas.

B.3.2 Runoff model

i Australian Water Balance Model (AWBM) overview

The volume of surface water runoff from the mine site catchment has been estimated using the Australian Water Balance Model (AWBM). The AWBM was developed by Boughton (2004) and is widely used across Australia to estimate stream flow and runoff. The AWBM has been incorporated into the SWB model.

The AWBM is a 'bucket model'. It describes catchment runoff processes using the concept of surface stores (buckets), which trap rainfall and must fill before runoff can occur. Spatial variability is incorporated by using three stores, each with a different capacity (C1, C2 and C3) and partial areas (A1, A2 and A3, where A1+A2+A3=1). Hence, parts of the catchment generate runoff after only a small depth of rain has fallen, while other parts of the catchment only generate runoff after significant ponds have formed and overflowed.

Since the AWBM is a continuous simulation model, antecedent moisture conditions within the catchment are tracked over time within the stores such that catchment wetness from preceding rainfall affects runoff generated by subsequent rainfall. For example, the first day of rain after a dry summer may generate a lower percentage of runoff than subsequent days of rainfall.

The AWBM was used to estimate catchment runoff from the various land use categories across BCM. The land use categories considered were undisturbed, rehabilitated spoil, industrial (hardstand and infrastructure areas), mining void (pit), active spoil and pre-strip.

A schematic of how the AWBM represents rainfall runoff is shown in Figure B.1.

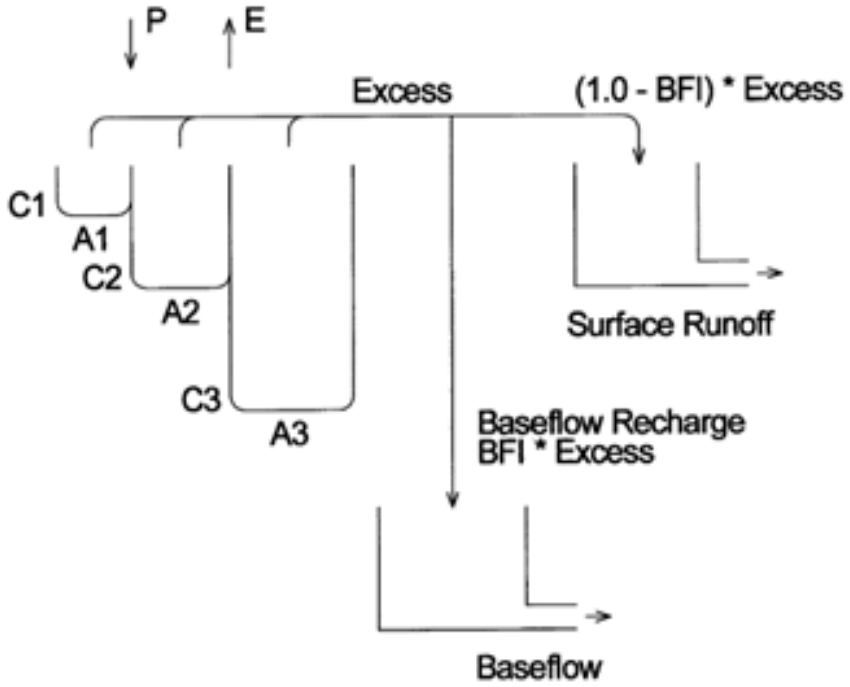


Figure B.1 Schematic layout of the AWBM rainfall-runoff model (Boughton 2004)

ii AWBM model parameters

The AWBM is defined by nine parameters: three soil storage capacities, three partial areas, and three recession parameters. The AWBM parameters were selected to reflect the different hydrological responses of each of the six catchment land use types included in the SWB model. The AWBM parameters applied to the SWB model are presented in Table B.1. The model validation results presented in Section 3.3 indicate the adopted AWBM parameters are representing the WMS processes adequately.

Table B.1 Adopted AWBM parameter values

Land use	BFI	K_{base}	K_{surf}	A1	A2	A3	C1	C2	C3
Industrial	0.0	0.0	0.0	0.134	0.433	0.433	10	35	85
Open cut	0.0	0.0	0.0	0.2	0.2	0.6	15	50	150
Pre-strip	0.2	0.98	0.0	0.134	0.433	0.433	15	60	150
Rehabilitation	0.6	0.99	0.0	0.2	0.2	0.6	20	120	200
Spoil	0.9	0.99	0.0	0.2	0.2	0.6	20	130	220
Undisturbed	0.05	0.98	0.0	0.134	0.433	0.433	13	120	200

B.3.3 Water storages

All water management dams to be included in the water balance model, and their key operating volumes, are summarised in Table B.2. BCOPL maintain an in-pit mine water dam (MWD) during operations. The in-pit MWD is typically relocated and renamed frequently as the mine progresses. However, the functionality of the storage to transfer water from the pit to MW5/MW11 and to provide a dust suppression fill point for the pit area remain similar over time.

Table B.2 Water storage assumptions

Storage	Type	Online	Dead storage (ML)	LOV (ML)	HOV (ML)	Capacity (ML)	Overflows to
Existing storages							
MW3	Contaminated water dam	-	1.0	5.0	131.0	153.5	Bollol Creek
MW5	Mine water dam	-	1.0	600	1,961	2,200	Pit
MWD	Contaminated water dam	-	1.0	1.0	33.8	92.8	Pit
Pit	Mining void	-	1.0	25.0	200.0	-	-
SD3	Sediment dam	-	16.7	33.3	34.3	102.3	Nagero Creek
SD6	Sediment dam	-	8.7	17.4	18.4	55.9	Nagero Creek
SD7	Sediment dam	-	11.7	23.3	24.3	95.1	Pit
SD8	Sediment dam	-	1.6	3.3	4.3	13.4	SD6
SD10	Mine water dam	-	9.7	19.4	61.7	116.4	SD6
SD11	Contaminated water dam	-	1.4	2.7	3.7	16.4	Nagero Creek
SD12	Contaminated water dam	-	17.2	34.4	35.4	206.6	Nagero Creek
SD23	Contaminated water dam	-	1.6	3.2	4.2	17.0	Pit
SD28	Sediment dam	-	1.0	0.6	1.6	3.5	Nagero Creek
Proposed storages							
SD19	Sediment dam	2028	30.0	60.0	61.0	179.9	SD3
SD20	Sediment dam	2033	7.0	13.9	14.9	41.8	SD19
SD21	Sediment dam	2033	9.3	18.5	19.5	55.6	Nagero Creek
SD22	Sediment dam	2033	1.0	0.8	1.8	2.4	Nagero Creek
SD24	Sediment dam	2033	1.2	2.4	3.4	7.3	Nagero Creek
MW11	Mine water dam	2025	1.0	600	2,000	2,200	Pit

B.3.4 Catchment areas

The contributing catchment area to each water management dam at several stages in the LOM are provided in Table B.3. The contributing catchment area to each storage is linearly interpolated between these years for the purposes of the water balance model.

It is assumed the Tarrawonga Coal Mine (TCM) catchment area to Nagero Creek discharging across the western boundary of mining lease 1579 discharges directly to Nagero Creek. However, it is understood that these discharges are captured within SD6. The volumes discharged from TCM are not expected to result in any material impact to the SWB model due to the relatively large volume of water storage available at BCM and have therefore been excluded from the SWB model.

Table B.3 Catchment areas over life of mine

Catchment	Catchment area (ha)				
	2023	2024	2025	2028	2033
Existing					
MW3	10.7	10.7	10.7	10.7	10.7
MW5	208	208	-	-	-
MWD	1.7	1.7	1.7	1.7	1.7
Pit	1,405	1,405	1,493	741	741
SD3	194	194	314	314	314
SD6	64	64	64	64	64
SD7	208	208	208	208	208
SD8	10.9	10.9	10.9	10.9	10.9
SD10	32	32	32	32	32
SD11	3.9	3.9	3.9	3.9	3.9
SD12	46	46	46	46	46
SD23	57	57	-	-	-
SD28	0.6	0.6	0.6	0.6	0.6
Proposed					
SD19	-	-	-	657	657
SD20	-	-	-	95	95
SD21	-	-	-	-	116
SD22	-	-	-	-	7
SD24	-	-	-	-	17
MW11	-	-	57	57	57
Total	**2,242**	**2,242**	**2,242**	**2,242**	**2,382**

B.3.5 Pump transfers

The operating rules applied to pump transfers in the water balance model are summarised in Table B.4. All pumping operations and rules are based on the existing and proposed infrastructure. The pumps are modelled to switch on when the on trigger occurs and the specific conditions are true. The pump remains on until the off trigger occurs, or the conditions become false. The pump triggers and conditions are based on the low operating volume (LOV) and high operating volume (HOV) for each storage. It was assumed that pumping occurs at an average pump rate and no allowance has been made for changes to flowrate with changes in head.

Table B.4 Pump operating rules

Pump from	Pump to	Pump rate (ML/day)	On trigger	Off trigger	Conditions
Existing					
Pit	MW8	5.0 (10.0 if pit volume exceeds 200 ML)	Pit > LOV	Pit < LOV	MW8 < HOV
Pit	MW5	5.0 (10.0 if pit volume exceeds 200 ML)	Pit > LOV	Pit < LOV	MW5 < HOV
Pit	SD23	5.0 (10.0 if pit volume exceeds 200 ML)	Pit > LOV	Pit < LOV	SD23 < HOV
MW3	SD10	3.5	MW3 > HOV	MW3 < LOV	SD10 < HOV
MW5	MWD	5.0	MW5 > dead storage volume	MW5 < dead storage volume	MWD< HOV
MW5	SD23	5.0	MW5 > dead storage volume	MW5 < dead storage volume	SD23 < HOV
MW5	SD10	5.0	MW5 > dead storage volume	MW5 < dead storage volume	SD10 <HOV
SD3	SD12	5.0	SD3 > HOV	SD3 < LOV	SD12 < HOV Pit < HOV
SD6	SD10	2.0	SD6 > HOV	SD6 < LOV	SD10 < HOV Pit < HOV
SD7	SD12	10.0	SD7 > HOV	SD7 < LOV	SD12 < HOV
SD8	SD10	1.9	SD8 > HOV	SD8 < LOV	SD10 < HOV
SD10	MW5	10.0	SD10 > HOV	SD10 < HOV	MW5 < HOV
SD10	MW3	10.0	SD10 > HOV	SD10 < HOV	MW3 < HOV MW5 > HOV
SD10	Pit	10.0	SD10 > HOV MW3 > HOV MW5 > HOV	SD10 < HOV MW3 < HOV MW5 < HOV	-
SD11	SD10	2.0	SD11 > HOV	SD11 < LOV	SD10 < HOV
SD12	MW5	20.0	SD12 > HOV	SD12 < LOV	MW5 < HOV
SD23	MW5	3.0	SD23 > HOV	SD23 < HOV	MW5 < HOV
Proposed					
Pit	MW11	5.0 (10.0 if pit volume exceeds 200 ML)	Pit > LOV	Pit < LOV	MW11 < HOV
MW11	MWD	5.0	MW11 > dead storage volume	MW11 < dead storage volume	MWD < HOV
MW11	SD10	5.0	MW11 > dead storage volume	MW11 < dead storage volume	SD10 <HOV
SD10	MW11	10.0	SD10 > HOV	SD10 < HOV	MW11 < HOV

Table B.4 Pump operating rules

Pump from	Pump to	Pump rate (ML/day)	On trigger	Off trigger	Conditions
SD12	MW11	20.0	SD12 > HOV	SD12 < LOV	MW11 < HOV
SD19	MW11	3.0	SD23 > HOV	SD23 < HOV	MW11 < HOV

B.3.6 Water sources

i Water prioritisation strategy

Water is required for several activities on site including dust suppression, use in the CHPP and as washdown water in the MIA. To minimise clean water use on site, water requirements are sourced from water storages and supplemented with imported water in the following priority:

1. surface water captured on site in contaminated water dams and sediment dams and stored in mine water dams
2. imported groundwater from the Upper Namoi Zone 4 Groundwater Source via the borefield
3. imported surface water from the Lower Namoi Regulated River Water Source via the pump station on the Namoi River.

The water balance model sources water in accordance with the above priorities. Further details on clean water management and water source prioritisation are provided in the SWMP.

ii Rainfall and runoff

Surface water runoff that drains into the water management dams is stored for use onsite. The volume of inflows to each storage is calculated as the sum of direct rainfall onto the storage water surface and the runoff generated from the contributing catchment.

The volume of direct rainfall is calculated as the product of the rainfall depth and the storage water surface area. Each storage includes a stage storage relationship whereby the assumed exposed surface area of stored water varies with the volume of water stored each day.

The volume of catchment runoff is calculated as the product of catchment area (refer to Table B.3) and the runoff depth calculated by the AWBM described in Appendix B.3.2.

iii Water Imports

External water supply can be sourced from the BCM borefield or the Namoi River via pump and pipeline. Water imports are triggered in the model when the volume of water stored in MW5/M11 recedes below the LOV of 600 ML. Water imports enter the WMS via SD10 prior to being pumped to the CHPP and MIA to meet water demands or MW5/M11 to meet dust suppression demands via the fill points in SD23 and the MWD. Water imports are assumed to occur at a rate of 5.6 ML/day.

Allowing MW5/M11 to drawdown to the LOV before importing water is intended to maximise the reuse of dirty and contaminated water stored on site before sourcing water from external sources.

iv Groundwater

Groundwater inflows to the mining void were adopted from *Groundwater Impact Assessment Boggabri Coal Mine MOD 8 Amendment to SSD 09_0182* (AGE 2022), which represents the most current groundwater modelling results for the Boggabri, Tarrawonga, Maules Creek (BTM) Complex. The predicted annual groundwater inflow volumes for BCM were applied to the water balance model and are presented in Figure B.2.

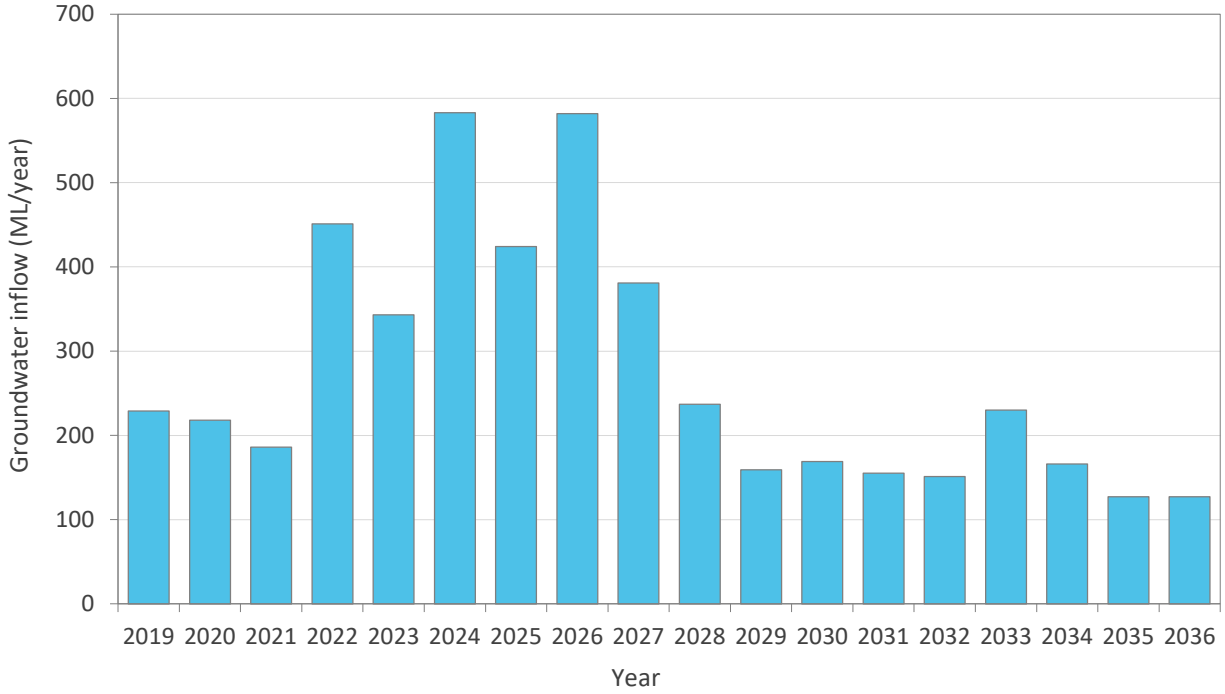


Figure B.2 Estimated groundwater inflows to mining void (AGE 2022)

Figure B.2 shows groundwater inflows to the mining void are predicted to peak in 2024 and 2026. After which, groundwater inflows are predicted to gradually decline over the LOM so that inflows are approximately 150 ML/year from 2029 onwards. Some of the predicted groundwater inflows will be lost through evaporation. Any excess groundwater that is collected in the mine void is pumped to the water storages in accordance with the pump operational rules described in Table B.4.

B.3.7 Water demands

i Evaporation

Evaporation loss from each storage water surface was calculated as the product of the daily Morton's shallow lake evaporation depth and the water surface area of the storage. Morton's potential evapotranspiration data was used in the AWBM runoff calculations to estimate soil moisture losses.

ii Dust Suppression

Water is required for dust suppression on haul roads and other disturbed areas. Dust suppression for the CHPP coal stockpiles, coal crushing areas, and coal loading areas and MIA are accounted for in the CHPP demands (refer to Appendix B.3.7iii).

Modelled dust suppression demand is calculated as a factor of haul road surface area multiplied by the daily evaporation rate less rainfall so that no dust suppression occurs on days where the rainfall rate exceeds the evaporation rate. An effective width of 50 m was assumed for all haul roads as calibrated in previous versions of the SWB model. Future hall length roads were adopted from the MOD 8 surface water impact assessment (Engeny 2022) whereby values were interpolated between years. The haul road lengths applied to the SWB model are shown in Figure B.3.

Water used for dust suppression is preferentially sourced from recycled contaminated water from various storages depending on the mine progression. Currently, there are fill points at the MWD and SD23. There is also a fill point located at SD7 which is not currently being utilised.

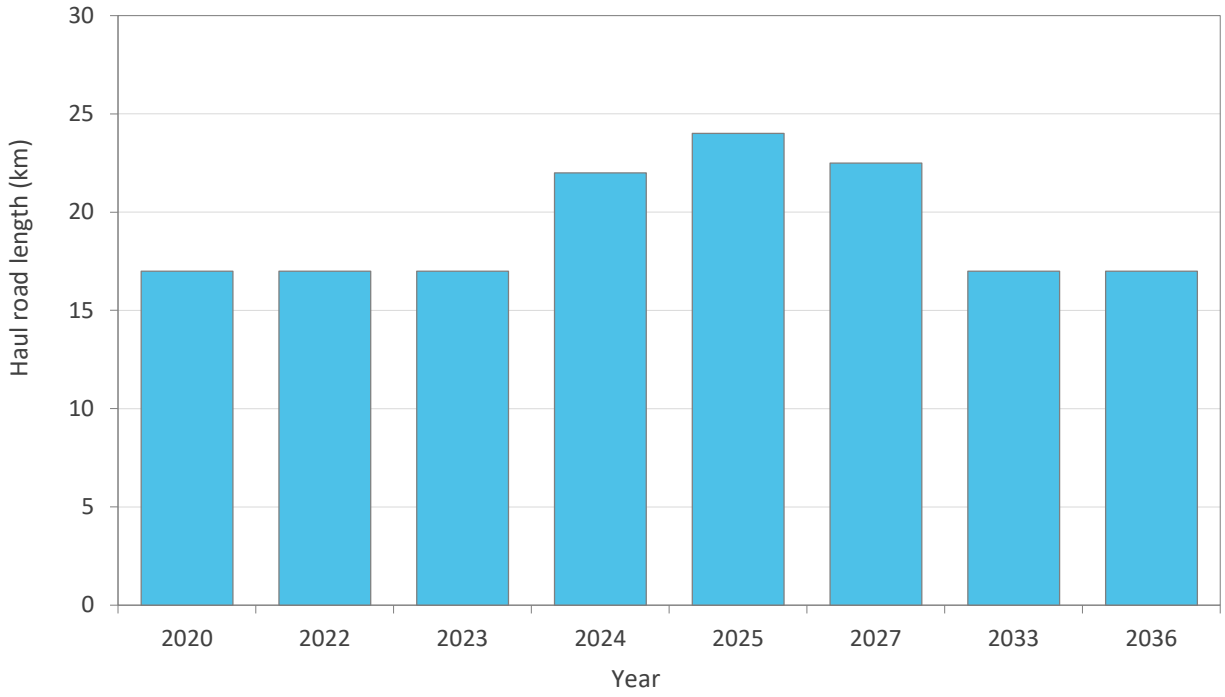


Figure B.3 Haul road lengths applied to the SWB model

iii CHPP and MIA water demand

The CHPP requires water for coal washing, dust suppression, and as fire suppression. Water is required for vehicle washdown in the MIA. Washdown water is recycled, however, water is required to make-up evaporative losses. Make-up water for the CHPP and MIA is currently sourced from SD6 and SD10 via a filtration system.

Potable water is used in the administration building and amenities during operations. Potable water is currently sourced from groundwater entitlements (WAL 29473) assigned to the Lovton Bore. Wastewater from the administration building and amenities will be treated in an onsite treatment plant. Potable water demand and wastewater generated by the onsite treatment plant were not considered in the water balance analysis due to the relatively minor volumes involved.

A combined CHPP and MIA water demand of 0.85 ML/day was applied the water balance model based on recent historical recorded values which are shown in Figure B.4. The demand is simulated in the model as a constant flow rate that is extracted from SD10. The assumption of a constant flow rate is appropriate for the purpose of the SWB model as actual day to day variations in operations will be attenuated by the water storage on site.

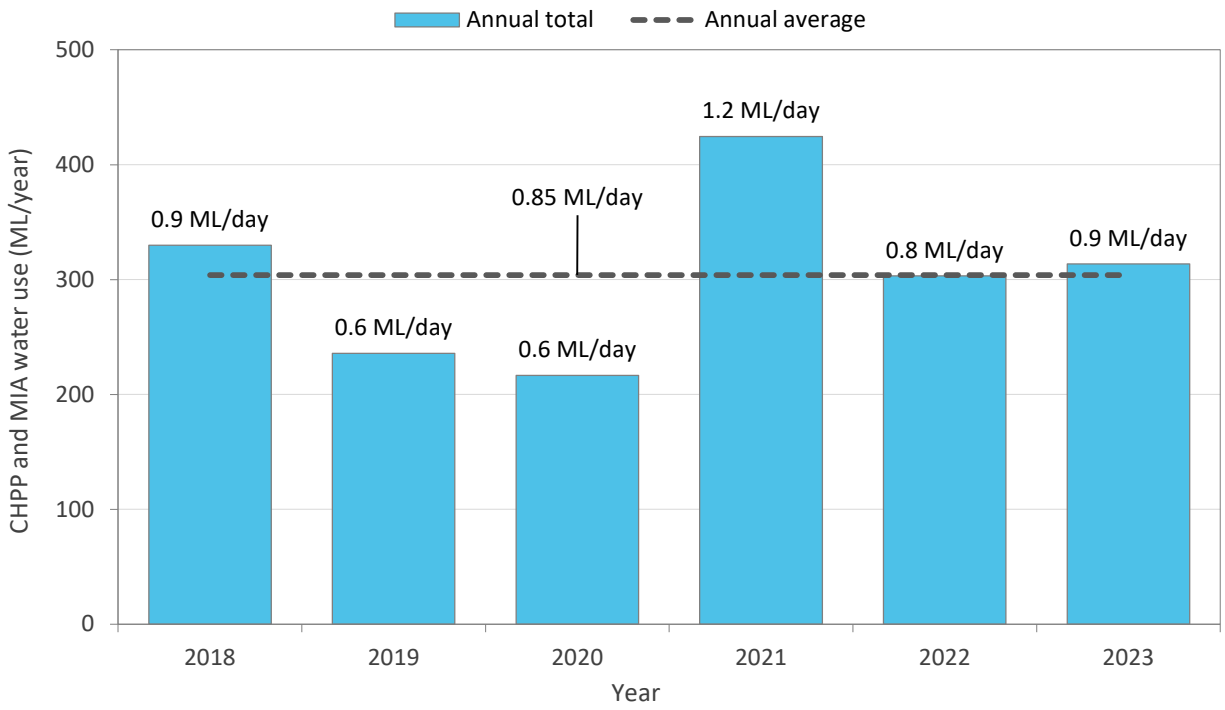


Figure B.4 Recorded CHPP and MIA water use

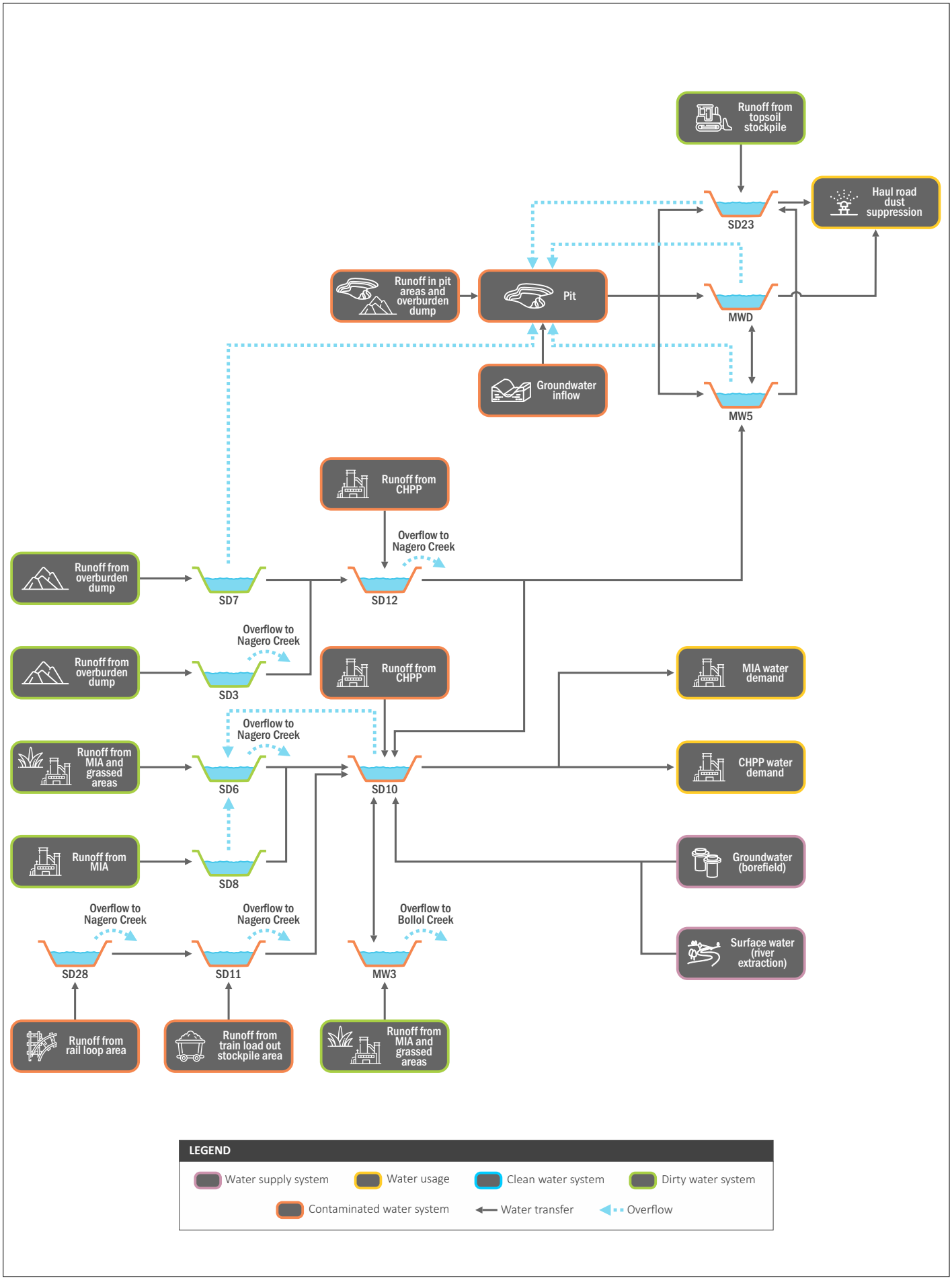
iv Seepage

Typically, losses associated with seepage from water storages are minor compared to evaporation and pumped outflows. Hence, seepage losses are assumed to be negligible for modelling purposes and are therefore set to zero in the WBM.

Appendix C

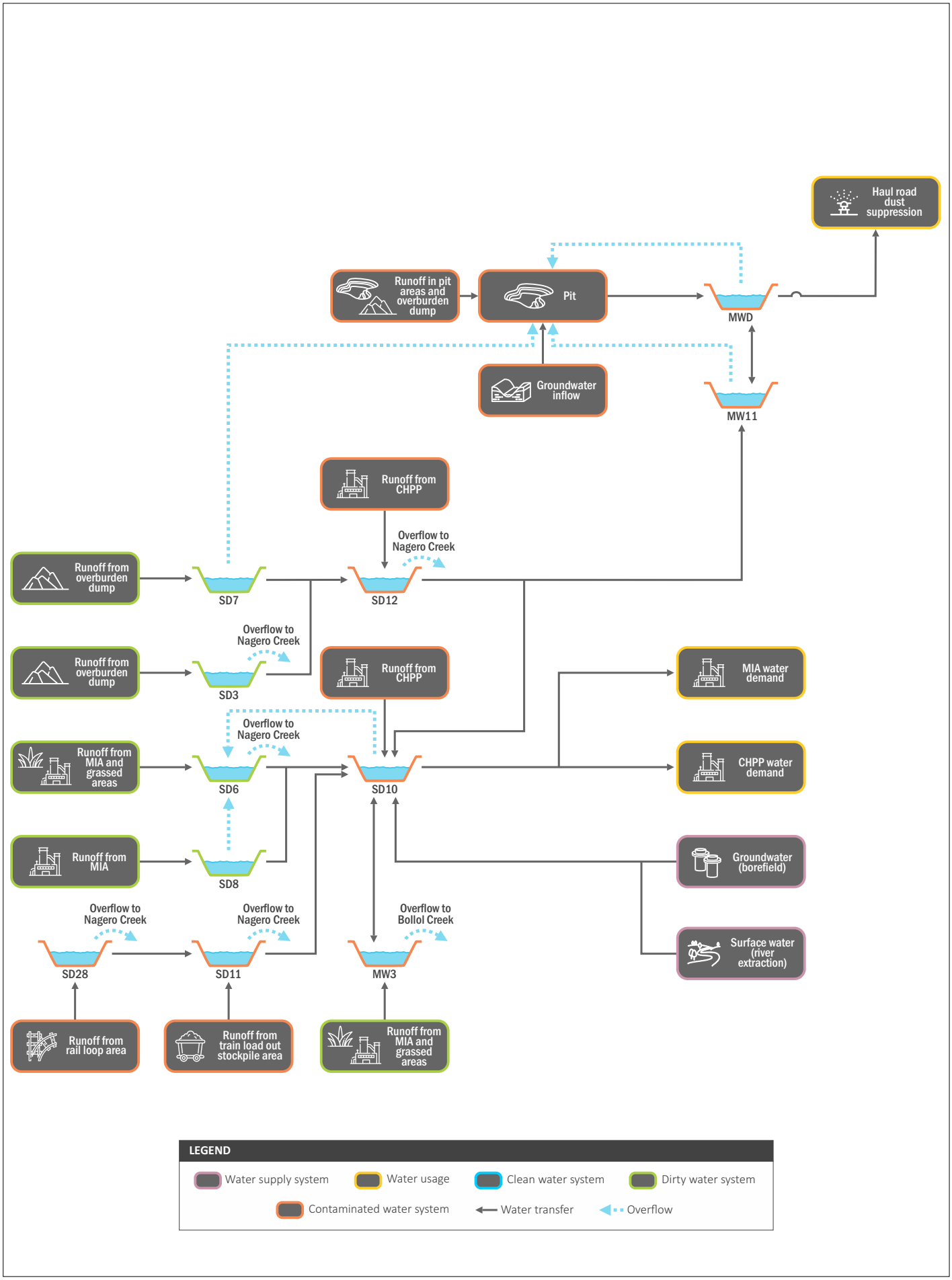
Water management system schematics

EMM
creating opportunities



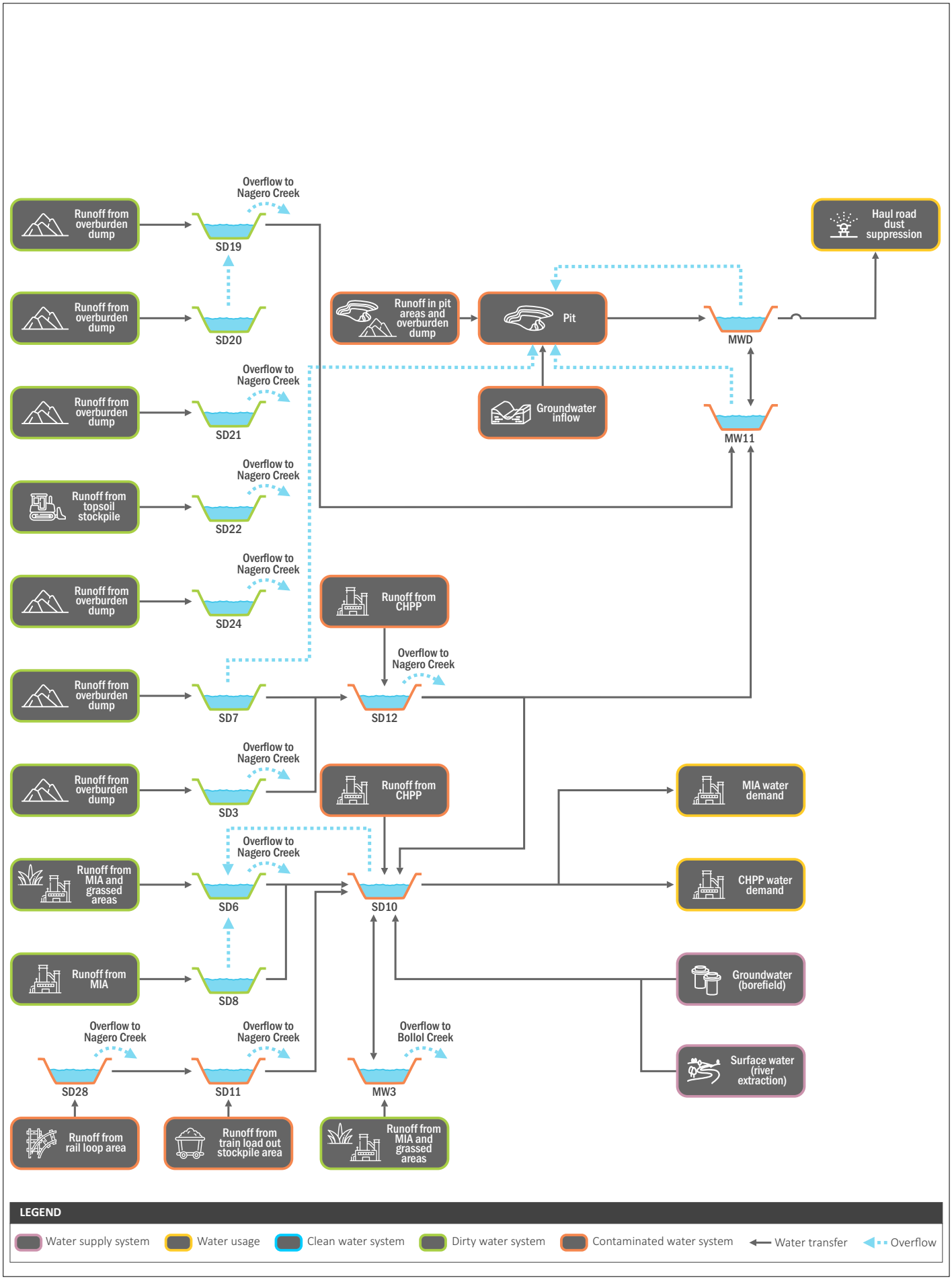
Water balance model schematic (2023)

Boggabri Coal Operations Pty Ltd
Site Water Balance
Figure C.1



Water balance model schematic – indicative conditions (2025)

Boggabri Coal Operations Pty Ltd
Site Water Balance
Figure C.2



Water balance model schematic – indicative conditions (2033)

Boggabri Coal Operations Pty Ltd
Site Water Balance
Figure C.3

EMM
creating opportunities

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Appendix I
Annual Rehabilitation Report

NSW GOVERNMENT

NSW Resources Regulator

ARR0001255

BOGGABRI COAL ANNUAL REHABILITATION REPORT

Sunday 1 January 2023 to Sunday 31 December 2023

Contents

Summary table

DETAIL	
Mine	Boggabri Coal
Reference	ARR0001255
Annual report period commencement date	Sunday 1 January 2023
Annual report period end date	Sunday 31 December 2023
Forward program	FWP0001147
Mining leases	ML 1755 (1992), CL 368 (1973)
Lease holder(s)	CHUGOKU ELECTRIC POWER AUSTRALIA RESOURCES PTY. LTD., NS BOGGABRI PTY LIMITED, BOGGABRI COAL PTY LIMITED
Contact	Elsie Gretton
Date of submission	Saturday 30 March 2024

Important

The department may make the information in your report and any supporting information available for inspection by members of the public, including by publication on its website or by displaying the information at any of its offices. If you consider any part of your report to be confidential, please communicate this to the department via the message function on this submission within the NSW Resources Regulator Portal.

Mine details

Project description

Boggabri Coal Mine (BCM) is an open cut coal mine located 15 km north-east of the township of Boggabri in north-western NSW. BCM is managed by Boggabri Coal Operations Pty Ltd on behalf of Idemitsu Australia's (IA) subsidiary Boggabri Coal Pty Ltd and its JV partners (Chugoku Electric Power Australia Resources Pty Ltd and NS Boggabri Pty Limited). BCM operates in accordance with SSD09_0182 which was granted on 18 July 2012 which enables the continuation of open cut mining until the end of 2033. Mining operations are progressing northward, extracting up to 8.6 Mtpa of ROM coal utilising truck and shovel mining methods. Progressive rehabilitation of the overburden emplacement areas is undertaken as areas achieve the final landform design. Up to 4.2 Mtpa of ROM coal can be processed at the CHPP, with the ability to bypass ROM coal to produce high quality semisoft coking, PCI and thermal coal products which is transported to the Port of Newcastle by rail for sale to the export market.

Life of mine

13 years

Current development consents, leases and licences

Development consents granted under the *Environmental Planning and Assessment Act 1979*

SSD 09-0182 (MOD 7)
SSD 09-0182 (MOD 7)
SSD 09-0182 (MOD 7)
SSD 09-0182 (MOD 7)
SSD 09-0182 (MOD 7)
SSD 09-0182 (MOD 7)
SSD 09-0182 (MOD 7)

Authorisations covering the mining area granted under the *Mining Act 1992*

ML 1755 (1992), CL 368 (1973)

Any other approvals, licences, or authorities issued by government agencies that are relevant to the progress of mining operation and rehabilitation activities

EPL 12407
EPBC 2009/5256 (as varied)

Summary of the scope and/or purpose of the new applications or modifications to existing approvals (if applicable)

Modification 8 (MOD 8) to SSD 09_0182 progressed through the planning approvals process throughout the reporting period. An amendment was sought to the MOD 8 application in November 2022, to vary the mine plan and ultimately seek approval to increase the depth of mining to the Templemore seam to recover approximately 28.1 Mt of additional ROM coal. MOD 8 was proposed to extend the mine life by three years until the end of 2036. This application was approved on the 22 January 2024. Approvals under the Commonwealth EPBC Act are yet to be issued, with the final assessment being considered by the Commonwealth Department of Climate Change, Energy, the Environment and Water. Modification 9 (MOD 9) to SSD 09_0182 was lodged on 21 October 2022 and sought approval for the operation of a mobile rock crushing facility and associated fleet within the approved Mine Disturbance Boundary at BCM; the construction and use of a new Pre-Shift Information (PSI) Site at a location closer to active mining operations and access to the new site via a section of the former Leard Forest Road (which has previously been closed to the public), and minor administrative changes to conditions of SSD 09_0182 relating to the management of rehabilitation activities to align requirements with recent amendments to the Mining Regulation 2016. MOD 9 was granted on 2 March 2023.

Changes to land ownership and land use

There have been no changes to land ownership and land use within the Project Boundary during the reporting period.

Surface disturbance and rehabilitation activities during the reporting period

Surface disturbance and rehabilitation activities that were conducted and an analysis of the progress against the rehabilitation schedule

There was 35.97 ha of additional surface disturbance during the reporting period. The Forward Program had forecast three areas of disturbance to the south of the Mine Infrastructure Area which is associated with the approved Irrigation Area. Following further investigations, it was decided that the Irrigation Area would not be used during the reporting period. There was 21.44 ha of Land Prepared for Rehabilitation during the reporting period. This additional area has been shaped ready for the application of seeds and tubestock in 2024. Areas of rehabilitation planted in 2019/2020 have progressed from the Ecosystem and Land Use Establishment phase to Ecosystem and Land Use Development phase during the reporting period.

Rehabilitation planning activities that were conducted, including any specialist studies

Rehabilitation planning activities were completed throughout the reporting period to align the site with the requirements under the NSW Rehabilitation Reforms. These include the planning for: · A tree thinning trial proposed by WSP to lower stem density in older rehabilitation to increase native groundcover and midstory species. · Existing rehabilitation management practices to be carried out including weed and pest management and repair works for any erosional structures as they appear; and · Continued progressive rehabilitation in accordance with the rehabilitation schedule.

Overview of subsidence repair and/or remediation works undertaken

No underground mining is undertaken at BCM and hence no subsidence repairs were undertaken during the reporting period. During the 2023 reporting period, focus continued to be given to the investigation of and planning for the repair and stabilisation of areas which have been affected by the numerous storm events experienced over the last few years.

Overview of rehabilitation management and maintenance activities

Monitoring of rehabilitation areas and analogue sites is undertaken by specialist independent consultants on an annual basis. This monitoring is undertaken by WSP using a modified Landscape Function Analysis methodology. Ecological rehabilitation monitoring is undertaken at three replicate sites per each stage of rehabilitation on a 1:14,000 scale to provide statistically valid data that is used to guide rehabilitation maintenance activities. Maintenance/contingency activities included a range of activities including: ·

Supplementary seeding of vegetated areas; · Weed and pest control; · Application of soil ameliorants; and · Repair of any eroded areas. Maintenance and corrective actions continued to focus on the monitoring and identification of areas requiring further control and/or remedial actions. This included the planning and repair of areas of erosion which have been identified following the numerous storm events which have been experienced during 2020 to 2023.

Details of any rehabilitation actions taken as required by any letters, notices or directions issued by government agencies, including the NSW Resources Regulator

BCOPL did not receive any regulatory actions in relation to rehabilitation during the reporting period.

Details of any rehabilitation areas that have achieved the final land use

Whilst monitoring has demonstrated that areas of rehabilitation are trending well towards the final land use objectives, no areas of rehabilitation have achieved the final land use during the reporting period.

Key production milestones

MATERIAL	UNIT	FWP0001147 YEAR 1	THIS REPORT
Stripped topsoil (if applicable)	(m^3)	43,800	91,113
Rock/overburden	(m^3)	62,453,265	60,331,673
Ore	(Mt)	8.22	8.07
Reject material[1]	(Mt)	1.61	1.06
Product	(Mt)	6.7	6.89

[1] This includes coarse rejects, tailings and any other wastes resulting from beneficiation.

Disturbance and rehabilitation statistics

Current disturbance and rehabilitation progression

	ELEMENT	UNIT	THIS REPORT
A	**Total surface disturbance footprint**	(ha)	1,532.92
B	**Total active disturbance**	(ha)	1,212.38
C	**Land prepared for rehabilitation**	(ha)	21.44
D	**Ecosystem and land use establishment**	(ha)	30.88
E	**Ecosystem and land use development**	(ha)	268.22
F	**Rehabilitation completion**	(ha)	0

Rehabilitation key performance indicators (KPIs)

	ELEMENT	UNIT	THIS REPORT
G	**Total new active disturbance area**	(ha)	NA - this value will display after 2nd year ARR submission as calculation relies on comparison between sequential yearly ARR data
H	**New rehabilitation commenced during annual reporting period**	(ha)	NA - this value will display after 2nd year ARR submission as calculation relies on comparison between sequential yearly ARR data
I	**Established rehabilitation**	(ha)	268.22
J	**Annual rehabilitation to disturbance ratio**	%	NA - this value will display after 2nd year ARR submission as calculation relies on comparison between sequential yearly ARR data
K	**Rehabilitated land to total mine footprint**	%	17.5

Progressive achievement of established rehabilitation

	ELEMENT	UNIT	THIS REPORT
L	**Established rehabilitation - agricultural final land uses**	%	0
M	**Established rehabilitation - native ecosystem final land uses**	%	99.99
N	**Established rehabilitation - other/non-vegetated final land uses**	%	0

Variation to the rehabilitation schedule

Identify the components of the most recent forward program that were not achieved

All components of the previous forward program were achieved for 2023.

Key factors that delayed progressive rehabilitation

During 2020 to 2022, multiple storm events occurred which resulted in sections of erosions on the previously rehabilitated landform. No new rehabilitation was completed during 2022 due to the focus on repairs for this area. Rehabilitation recommenced progress in accordance with the rehabilitation schedule in 2023 with approximately 21.44 ha of Land being Prepared for Rehabilitation.

Outline actions that will be included in the forward program and carried out to minimise disturbance and undertake progressive rehabilitation as far as reasonably practical

N/A

Rehabilitation monitoring and research findings

Rehabilitation monitoring

The rehabilitation monitoring carried out in the annual reporting period

Biodiversity monitoring of rehabilitation areas is completed annually to assess the biodiversity status of rehabilitated areas to further guide rehabilitation methodologies, procedures and maintenance activities, in order to achieve site rehabilitation objectives. The monitoring reports on aspects of ecosystem establishment and ecosystem development. Generally, the monitoring has shown: · Mean species richness is highest in the 2010 and 2011 rehabilitation, with lowest in 2008 rehabilitation; · Most mine rehabilitation sites met or exceeded the native species richness, native overstorey projected foliage cover and mid storey cover BBAM benchmarks.; · All rehabilitation monitoring locations failed to meet the relevant criteria for exotic species richness; and · Structural characteristics are mostly absent across the rehabilitation area, except where stag trees had been replaced. Fauna surveys identified 52 diurnal species from the seven replicate monitoring sites. Four threated species were recorded, including the Brown Treecreeper, Painted Honeyeater, Speckled Warbler and Turquoise Parrot. Four native species were recorded via infra-red/motion sensor cameras, including Short-beaked Echidna, Red-necked Wallaby, Common Wallaroo and Eastern Grey Kangaroo.

Status of performance against rehabilitation objectives and rehabilitation completion criteria

The monitoring program that has been implemented

The biodiversity monitoring program has identified that the native species richness within the rehabilitation areas is trending towards or exceeding the native species richness of the neighbouring analogue sites. The monitoring has identified that the exotic species richness is greater than the required benchmark in the neighbouring Leard State Forest sites. Ongoing weed management on the rehabilitation areas will be undertaken over time in order to bring these into alignment. Structural characteristics are mostly absent within the rehabilitation areas. The installation of stag trees and bush timber salvaged during clearing has built on the structural characteristics of the rehabilitation whilst woodland areas are further developed and these features establish naturally. No salinity was observed on rehabilitation areas. Whilst the landform is identified to be generally showing signs of stability, the extreme rainfall conditions experienced during the period of 2020 to 2022 resulted in areas of erosion and slumping. Works programs were developed and completed to repair and remediate these areas during 2022 and 2023. The remediation works will be subject to ongoing monitoring and maintenance to ensure the best chance of success.

Are all rehabilitation areas in Landform Establishment phase or higher represented in the monitoring program to assess performance against the rehabilitation objectives and approved or, if not yet approved rehabilitation completion criteria and final landform and rehabilitation plan?

0

Year rehabilitation areas will be included as part of the monitoring program

2024

An appraisal of whether rehabilitation is moving towards achieving the proposed rehabilitation objectives, approved or, if not yet approved, rehabilitation completion criteria and final landform and rehabilitation plan as soon as reasonably practicable.

The completed rehabilitation areas are progressing towards meeting the rehabilitation completion criteria. As noted above, there were areas of significant erosional features which have since been remediated and repaired. These areas will require further attention and are subject to ongoing work programs.

Appraisal description

Rehabilitation is moving towards achieving the final land use as soon as reasonably practicable.

Rehabilitation monitoring program findings

Landform erosion was identified in areas with well established woodland vegetation which required remediation works to be completed. During 2022, a specialist rehabilitation consultant was commissioned to undertake a review of these landform erosion areas and to develop the required work program. Following the completion of the remediation and repair works in 2023, monitoring was undertaken to assess the effectiveness of these works. Monitoring of these areas will be completed annually. Biodiversity monitoring of rehabilitation areas is completed annually to assess the biodiversity status of rehabilitated areas to further guide rehabilitation methodologies, procedures and maintenance activities, in order to achieve site rehabilitation objectives. The monitoring reports on aspects of ecosystem establishment and ecosystem development. Monitoring for the reporting period commenced on 8 October 2023 at seven (of 10) replicate monitoring sites located within the 3, 5, 6, 7, 12, 13 and 15-year-old mine rehabilitation age-classes. Grassy woodland native ecosystem (secondary domain) within the mine rehabilitation area is known from two replicate monitoring sites: being RH2017 and RH2020. Sampling was undertaken at these locations during 2023 as well as a further five sites associated with shrubby woodland/ forest native ecosystem (RH2008D, RH2010, RH2011, RH2016 and RH2018A). The 2023 monitoring program involved the following sampling methodologies: · One single modified BioBanking Assessment Methodology (BBAM) plot, species inventories only. · Photo point monitoring (to track changes in plant growth and ecology of the rehabilitated areas). · Salinity monitoring within the BioBanking vegetation 20 x 20 m quadrat (observational). · Canopy species recruitment and presence of reproductive structures monitoring

(observational). · One 20-minute bird and general fauna area search within 80 m (approximately 2 ha) of fixed monitoring sites on separate mornings.

Performance issues and their causes including identification of any knowledge gaps that must be addressed

Further work is proposed to be undertaken as part of the Final Void and Mine Closure Plan. This Plan is required to be prepared by the end of December 2025 in accordance with conditions of SSD 09_0182. The Plan is to investigate future stability of the landforms, long term groundwater recovery and void characteristics. The Plan will be required to demonstrate that the long term landform will not generate a pit lake, the emplaced spoil has the capacity to drain to the natural environment and drained water will not adversely affect the downstream environment.

Outcomes of rehabilitation research and trials

RRT NUMBER	PROJECT/TRIAL NAME	OBJECTIVE OF TRIAL/PROJECT	METHODOLOGY	EXPECTED DATE OF COMPLETION	STATUS	ON TRACK?
RRT0001069	Flora and Fauna Monitoring	To collect baseline information (including from analogue sites beyond CL 368) to provide comparative data for assessment of the success of rehabilitation works.	As part of the ongoing biodiversity monitoring program for the BCM as described within the approved Biodiversity Management Plan, this monitoring of flora and fauna communities will be conducted within and beyond the surrounding Leard State Forest (including analogue sites beyond CL 368).	14 Dec 2033	Ongoing	Yes
RRT0001070	Nest Box Management Plan	Installation of nest boxes in rehabilitation areas to provide suitable habitat for displaced fauna.	Further detail is described within the approved Biodiversity Management Plan. The total hollow numbers for rehabilitation areas are to match the estimated loss of hollows in the clearing area, with 50% of these to be installed within 10 years of rehabilitation age and all nest boxes are to be installed within 15 years of offset establishment. Each nest box will be monitored every five years.	31 Dec 2033	Ongoing	Yes
RRT0001071	Eucalypt Thinning Monitoring Program Trial	To determine the baseline condition and any subsequent changes to biodiversity values within the BCM mine rehabilitation in response to the thinning trials (as per biodiversity audit recommendation).	Monitoring to evaluate the success of the thinning trials and/or identify potential failures to enable adaptive management of future thinning activities to occur within the mine rehabilitation areas.	31 Dec 2033	Ongoing	Yes

RRT NUMBER	PROJECT/TRIAL NAME	OBJECTIVE OF TRIAL/PROJECT	METHODOLOGY	EXPECTED DATE OF COMPLETION	STATUS	ON TRACK?
RRT0001072	Growth Media Evaluation	Analysis to confirm the adequacy of the were any limitations	xx	31 Dec 2033	Ongoing	Yes
RRT0001073	Growth Media Evaluation (Full Detail)	To investigate the suitability of growth media utilised on mine rehabilitation and to determine any limitations requiring remediation.	In early 2016, BCOP commissioned a preliminary evaluation of growth media within the 2008 to 2014 rehabilitation areas (Landloch, 2016). The assessment was conducted in accordance with the procedure detailed in the Soil Management Protocol (SMP). Samples were subject to soil surface descriptions, morphological descriptions, field tests and laboratory analysis. Recommendations from this work have been incorporated into the rehabilitation methodology implemented onsite.	31 Dec 2033	Ongoing	Yes

Outcomes of completed trials and research

N/A

Attachment 1 – Reporting Definitions

REPORTING CATEGORY		DEFINITION
A1	Total disturbance footprint – surface disturbance	All areas within a mining lease that either have at some point in time or continue to pose a rehabilitation liability due to surface disturbance activities. The total disturbance footprint is the sum of the total active disturbance, decommissioning, landform establishment, growth medium development, ecosystem and land use establishment, ecosystem and land use development and rehabilitation completion (see definitions below). Underground mining operations should not include the footprint of underground mining areas/subsidence management areas in the total disturbance footprint.
A2	Underground Mining Area	Underground mining operations areas/subsidence management areas.
B	Total active disturbance	Includes on-lease exploration areas, stripped areas ahead of mining, infrastructure areas, water management infrastructure, sewage treatment facilities, topsoil stockpile areas, access tracks and haul roads, active mining areas, waste rock emplacements (active/unshaped/in or out-of-pit), tailings dams (active/unshaped/uncapped) and temporary stabilised areas (e.g. areas sown with temporary cover crops for dust mitigation and temporary rehabilitation).
C	Rehabilitation – land preparation	Includes the sum of all disturbed land within a mining lease that have commenced any, or all, of the following phases of rehabilitation – decommissioning, landform establishment and growth medium development. Refer to the glossary of terms in this document for the definition of these phases of rehabilitation.

REPORTING CATEGORY		DEFINITION
D	Ecosystem and land use establishment	Includes the area which has been seeded/planted with the target vegetation species for the intended final land use. However, vegetation has not matured to a stage where it can be demonstrated that it will be sustainable for the long term and or require only a maintenance regime consistent with target reference/analogue sites. Typically, rehabilitation areas would be in this phase for at least two years (and usually more) before rehabilitation can be classified as being in the ecosystem and land use development phase. This phase does not apply to infrastructure areas that are being retained as part of final land use for the site.
E	Ecosystem and Land Use Development	Rehabilitation has matured to a level where target revegetation outcomes are on a trajectory towards meeting the final rehabilitation objectives and rehabilitation completion criteria (as verified by monitoring). This phase includes infrastructure areas that are to be retained for an approved post mining land use, following completion of all necessary measures to render the infrastructure fit for this purpose (for example structural integrity).
F	Rehabilitation Completion	The NSW Resources Regulator has determined in writing that the mining area has achieved the approved rehabilitation objectives and approved rehabilitation completion criteria and final landform and rehabilitation plan following the submission of *Form: ESF2 Rehabilitation completion and/or review of rehabilitation cost estimate and/or notification of mine or petroleum site closure.*
G	New active disturbance area	The area of any new active disturbance that has been created during the annual reporting period (definition A1 in Table 5).
H	New rehabilitation commenced during annual reporting period	The sum of any new rehabilitation commenced in the annual reporting period. These areas may be in the rehabilitation land preparation phase or the ecosystem & land use establishment phase (definitions C and D in Table 5).
I	Established rehabilitation (hectares)	The total area of land that is verified to be within either the ecosystem and land use development phase or the rehabilitation completion phase (definitions E & F in Table 5).

REPORTING CATEGORY		DEFINITION
J	Annual rehabilitation to disturbance ratio	The rehabilitation to disturbance ratio (H/G) indicates how many hectares of new rehabilitation are undertaken for each hectare of land disturbed during the year. A ratio of 1/1 indicates that the area of new rehabilitation and disturbance in that year are the same.
K	% Rehabilitated land to total mine footprint	The proportion of the total mine footprint (area of land that has been disturbed by past or present surface disturbance activities) that has established rehabilitation (I/A1 x 100). For open cut mining, the proportion of the total mine footprint verified to be "established rehabilitation" should substantially increase as an operation progresses towards mine closure.
L	Established rehabilitation for agricultural final land uses (hectares)	The percentage of total area of land that is verified to be within either the ecosystem and land use development phase or the rehabilitation completion phase (definitions E & F in Table 5) that have been returned to an agricultural final land use.
M	Established rehabilitation for native ecosystem final land uses (hectares)	The percentage of total area of land that is verified to be within either the ecosystem and land use development phase or rehabilitation completion phase (definitions E & F in Table 5) that have been returned to native ecosystem final land use.
N	Established rehabilitation for other/non-vegetated final land uses (hectares)	The percentage of total area of land that is verified to be within either the ecosystem and land use development phase or the rehabilitation completion phase (definitions E & F in Table 5) that have been returned to other/non-vegetated final land use.

Attachment 2 – Definitions

WORD	DEFINITION
Active	In the context of rehabilitation, land associated with mining domains is considered 'active' for the period following disturbance until the commencement of rehabilitation.
Active mining phase of rehabilitation	In the context of rehabilitation, the active mining phase of rehabilitation constitutes the rehabilitation activities undertaken during mining operations such as salvaging and managing soil resources, salvaging habitat resources, and native seed collection. This phase also includes management actions taken during operations to manage risks to rehabilitation and enhance rehabilitation outcomes such as selective handling of waste rock and management of tailings emplacements.
Analogue site	In the context of rehabilitation, an analogue site is a 'reference site' that represents an example of the defining characteristics (such as vegetation composition and structure or agricultural productivity) of the final land use. Characteristics of analogue sites can be assessed to develop the rehabilitation objectives and completion criteria for final land use domains.
Annual rehabilitation report and forward program	As described in the Mining Regulation 2016.
Annual reporting period	As defined in the Mining Regulation 2016.
Closure	A whole-of-mine-life process, which typically culminates in the relinquishment of the mining lease. It includes decommissioning and rehabilitation to achieve the approved final land use(s).
Decommissioning	The process of removing mining infrastructure and removing contaminants and hazardous materials.
Decommissioning Phase of Rehabilitation	Activities associated with the removal of mining infrastructure and removal and/or remediation of contaminants and hazardous materials. In the context of the rehabilitation management plan this phase of rehabilitation may also include studies and assessments associated with decommissioning and demolition of infrastructure or works carried out to make safe or 'fit for purpose' built infrastructure to be retained for future use(s) following lease relinquishment.

WORD	DEFINITION
Department	The Department of Regional NSW.
Disturbance	See Surface Disturbance.
Disturbance area	An area that has been disturbed and that requires rehabilitation. This may include areas such as on-licence exploration areas, stripped areas ahead of mining, infrastructure areas, water management infrastructure, sewage treatment facilities, topsoil stockpile areas, access tracks and haul roads, active mining areas, waste emplacements (active/unshaped/in or out-of-pit), tailings dams (active/unshaped/uncapped), and areas requiring rehabilitation that are temporarily stabilised (i.e. managed to minimise dust generation and/or erosion).
Domain	An area (or areas) of the land that has been disturbed by mining and has a specific operational use (mining domain) or specific final land use (final land use domain). Land within a domain typically has similar geochemical and/or geophysical characteristics and therefore requires specific rehabilitation activities to achieve the associated final land use.
Ecosystem and Land Use Development	This phase of rehabilitation consists of the activities to manage maturing rehabilitation areas on a trajectory to achieving the approved rehabilitation objectives and completion criteria. For vegetated land uses this phase may include processes to develop characteristics of functional self-sustaining ecosystems, such as nutrient recycling, vegetation flowering and reproduction, and increasing habitat complexity, and development of a productive, self-sustaining soil profile. This phase of rehabilitation may include specific vegetation management strategies and maintenance such as tree thinning, supplementary plantings and weed management.
Ecosystem and Land Use Establishment	This phase of rehabilitation consists of the processes to establish the approved final land use following construction of the final landform. For vegetated land uses this rehabilitation phase includes establishing the desired vegetation community and implementing land management activities such as weed control. This phase of rehabilitation may also include habitat augmentation such as installation of nest boxes.
Exploration	Has the same meaning as that term under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

WORD	DEFINITION
Final landform and rehabilitation plan	As defined in the Mining Regulation 2016.
Final land use	As defined in the Mining Regulation 2016.
Form and way	Means the form and way approved by the Secretary. Approved form and way documents are available on the Department's website.
Growth Medium Development	This phase of rehabilitation consists of activities required to establish the physical, chemical and biological components of the substrate required to establish the desired vegetation community (including short lived pioneer species. This phase may include spreading the prepared landform with topsoil and/or subsoil and/or soil substitutes, applying soil ameliorants to enhance the physical, chemical and biological characteristics of the growth media, and actions to minimise loss of growth media due to erosion.
Habitat	Has the same meaning as that term under the *Biodiversity Conservation Act 2016* and the *Fisheries Management Act 1994* (as relevant).
Indicator	An attribute of the biophysical environment (e.g. pH, topsoil depth, biomass) that can be used to approximate the progression of a biophysical process. It can be measured and audited to demonstrate (and track) the progress of an aspect of rehabilitation towards a desired completion criterion (i.e. defined end point). It may be aligned to an established protocol and used to evaluate changes in a system.
Land	As defined in the *Mining Act 1992.*
Landform Establishment	This phase of rehabilitation consists of the processes and activities required to construct the final landform. In addition to profiling the surface of rehabilitation areas to the approved final landform profile this phase may include works to construct surface water drainage features, encapsulate problematic materials such as tailings, and prepare a substrate with the desired physical and chemical characteristics (e.g. rock raking or ameliorating sodic materials).
Large mine	As defined in the Mining Regulation 2016.
Lease holder	The holder of a mining lease.

WORD	DEFINITION
Life of mine	The timeframe of how long a mine is approved to mine, from commencement to closure.
Mine rehabilitation portal	Means the NSW Resources Regulator's online portal that lease holders must use (via a registered account) to: ■ upload rehabilitation geographical information system (GIS) spatial data ■ develop rehabilitation GIS spatial data (using online tracing functions) ■ generate rehabilitation plans and rehabilitation statistics using the map viewer and Rehabilitation Key Performance Indicator functionalities. Data submitted to the mine rehabilitation portal is collated in a centralised geodatabase for use by the NSW Resources Regulator to regulate rehabilitation performance of lease holders.
Mining area	As defined in the *Mining Act 1992*.
Mining domain	A land management unit with a discrete operational function (e.g. overburden emplacement), and therefore similar geophysical characteristics, that will require specific rehabilitation treatments to achieve the final land use(s).
Mining land	As defined in the *Mining Act 1992.*
Native vegetation	Has the same meaning as that term under section 60B of the *Local Land Services Act 2013.*
Overburden	Material overlying coal or a mineral deposit.
Performance indicator	An attribute of the biophysical environment (for example pH, slope, topsoil depth, biomass) that can be used to demonstrate achievement of a rehabilitation objective. It can be measured and audited to demonstrate (and track) the progress of an aspect of rehabilitation towards a desired completion criterion, that is, a defined end point. It may be aligned to an established protocol and used to evaluate changes in a system.

WORD	DEFINITION
Phases of rehabilitation	The stages and sequences of actions required to rehabilitate disturbed land to achieve the final land use. The phases of rehabilitation are: ■ active mining ■ decommissioning ■ landform Establishment ■ growth medium development ■ ecosystem and land use establishment ■ ecosystem and land use development.
Progressive rehabilitation	The progress of rehabilitation towards achieving the approved rehabilitation completion criteria. This may be described in terms of domains, phases, performance indicators and rehabilitation completion criteria.
Rehabilitation Completion	The final phase of rehabilitation when a rehabilitation area has achieved the approved rehabilitation objectives and rehabilitation completion criteria for the final land use. Rehabilitation areas may be classified as complete when the NSW Resources Regulator has determined in writing that the relevant rehabilitation obligations have been fulfilled following submission of *Form ESF2 Rehabilitation completion and/or review of rehabilitation cost estimate* application by the lease holder.
Rehabilitation Completion criteria	As defined in the Mining Regulation 2016.
Rehabilitation cost estimate	As defined in the Mining Regulation 2016.
Rehabilitation management plan	As defined in the Mining Regulation 2016.
Rehabilitation objectives	As defined in the Mining Regulation 2016.
Rehabilitation risk assessment	As defined in the Mining Regulation 2016.
Rehabilitation schedule	The defined timeframes for progressive rehabilitation set out in the forward program.

WORD	DEFINITION
Relevant stakeholders	Means any persons or bodies who may be affected by the mining operations, including rehabilitation, carried out on the lease land, and includes: ■ the relevant development consent authority ■ the local council ■ the relevant landholder(s) ■ community consultative committee (if required under the development consent) or equivalent consultative group ■ affected land holder(s) ■ government agencies relevant to the final land use ■ affected infrastructure authorities (electricity, telecommunications, water, pipeline, road, rail authorities) ■ local Aboriginal communities, and ■ any other person or body determined by the Minister to be a relevant stakeholder in relation to a mining lease.
Risk	The effect of uncertainty on objectives. It is measured in terms of consequences and likelihood (AS/NZS ISO 31000:2009).
Secretary	The Secretary of the Department.
Security deposit	An amount that a mining lease holder is required to provide and maintain under a mining lease condition, to secure funding for the fulfilment of obligations under the lease (including obligations that may arise in the future).
Surface disturbance	Includes activities that disturb the surface of the mining area, including mining operations, ancillary mining activities and exploration.
Tailings	A combination of the fine-grained solid material remaining after the recoverable metals and minerals have been extracted from the mined ore, and any process water[2].
Waste	Has the same meaning as that term under the *Protection of the Environment Operations Act 1997*.

[2] Commonwealth of Australia (DITR), 2007. *Tailings Management*.

Attachment 3 – Rehabilitation Complaints

DATE	COMPLAINANT	COMPLAINT DETAILS	RESPONSE DETAILS	STATUS OF RESPONSE	DATE RESPONSE COMPLETED (IF APPLICABLE)

Attachment 4 – Stakeholder consultation

DATE	STAKEHOLDER	CONSULTATION ACTIVITIES AND FORMS	MATTERS SUBJECT TO CONSULTATION	ACTIONS TAKEN
13 Oct 2023	NSW Resources Regulator	Response via the NSW Resources Regulator's online portal	Proposed rehabilitation objectives for BCM	NSW Resources Regulator provided approval of Rehabilitation Objectives
1 Feb 2023	NSW Resources Regulator	Response from NSW Resources Regulator via the NSW Resources Regulator's online portal	Spatial theme data to support the Final Landform and Rehabilitation Plan	NSW Resources Regulator refused spatial theme data and provided comments
15 Mar 2023	NSW Resources Regulator	Submission via the NSW Resources Regulator's online portal	Spatial theme data to support the Final Landform and Rehabilitation Plan	Updated in response to the comments provided 1 February 2023
6 Sep 2023	NSW Resources Regulator	Response via the NSW Resources Regulator's online portal	Proposed rehabilitation objectives for BCM	NSW Resources Regulator refused Objectives and provided comments
29 Sep 2023	NSW Resources Regulator	Submission via the NSW Resources Regulator's online portal	Spatial theme data to support the Final Landform and Rehabilitation Plan	Updated in response to the comments provided 6 September 2023
25 Nov 2022	NSW Resources Regulators	Submission via the NSW Resources Regulator's online portal	Spatial theme data to support the Final Landform and Rehabilitation Plan	NSW Resources Regulator to provide approval or feedback
15 Mar 2023	NSW Resources Regulator	Submission via the NSW Resources Regulator's online portal	Proposed rehabilitation objectives for BCM	NSW Resources Regulator to provide approval or feedback

DATE	STAKEHOLDER	CONSULTATION ACTIVITIES AND FORMS	MATTERS SUBJECT TO CONSULTATION	ACTIONS TAKEN
6 Oct 2023	NSW Resources Regulator	Submission via the NSW Resources Regulator's online portal	Proposed rehabilitation objectives for BCM	Updated in response to the comments provided 6 September 2023

Attachment 5 – Plans

Plan 1A Current Status of Mining and Rehabilitation.pdf

Plan 1B Current Landform Contours.zip