

BENGALLA MINE
ANNUAL REVIEW 2025

Prepared by:
BENGALLA MINING COMPANY PTY LIMITED
LOCKED BAG 5
MUSWELLBROOK NSW 2333

Annual Review Title Block

Name of operation	Bengalla Mine
Name of operator	Bengalla Mining Company Pty Limited
Development consent	SSD-5170 (as modified)
Name of holder of development consent	Bengalla Mining Company Pty Limited
Mining Leases	See **Table 5**
Name of holder of mining leases	Bengalla Mining Company Pty Limited
Water licences	See **Table 5**
Name of holder of water licences	Bengalla Mining Company Pty Limited and the Bengalla Joint Venturers (New Hope Bengalla Pty Limited in 8/10 share and Taipower Bengalla Pty Limited in 2/10 share)
Annual Review start date	1 January 2025
Annual Review end date	31 December 2025

I, Cam Halfpenny, certify that this audit report is a true and accurate record of the compliance status of Bengalla Mining Company Pty Limited for the period 1 January 2025 to 31 December 2025 (as described in Section 1 of this report) and that I am authorised to make this statement on behalf of Bengalla Mining Company Pty Limited.

Note:

a) The Annual Review is an 'environmental audit' for the purposes of section 122B (2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.

b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications / information/documents—maximum penalty 2 years imprisonment or $22,000, or both).

Name of authorised reporting officer	Cam Halfpenny
Title of authorised reporting officer	General Manager
Signature of authorised reporting officer	Cam Halfpenny
Date	27.3.2026.

TABLE OF CONTENTS

1 STATEMENT OF COMPLIANCE 11

1.1 INTRODUCTION 11

2 INTRODUCTION 1

2.1 BACKGROUND 1

2.2 DOCUMENT PURPOSE 1

2.3 2.3 BMC CONTACTS 2

3 APPROVALS 7

3.1 DEVELOPMENT CONSENT AND COMMONWEALTH APPROVALS 7

3.2 MINING TENEMENTS 7

3.3 LICENCES 8

3.4 PENDING APPLICATIONS AT END OF REPORTING PERIOD 8

3.5 VARIATIONS 8

4 OPERATIONS SUMMARY 9

4.1 MINING OPERATIONS 9

4.2 COMPARISON AGAINST PREDICTIONS 10

4.3 OTHER OPERATIONS 10

4.4 WORKFORCE 11

5 ACTION REQUIRED FROM PREVIOUS ANNUAL REVIEW 11

6 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE 12

6.1 METEOROLOGY 12

6.2 NOISE 13

6.3 BLASTING 16

6.4 AIR QUALITY 21

6.5 WATER MANAGEMENT 25

6.6 SURFACE WATER 27

6.7 DAMS SAFETY REGULATION 2019 AND MINING APPROVALS (BENGALLA-2, BENGALLA-3, BENGALLA-4) 30

6.8 GROUNDWATER 31

6.9 STREAM HEALTH MONITORING 33

6.10 SPONTANEOUS COMBUSTION 33

6.11 GREENHOUSE GAS 34

6.12 NON-MINERAL WASTE 37

6.13 MINERAL WASTE 38
6.14 ABORIGINAL ARCHAEOLOGY AND CULTURAL HERITAGE 39
6.15 NON-ABORIGINAL HERITAGE 40
6.16 BIODIVERSITY OFFSET MANAGEMENT 51
6.17 ON-SITE BIODIVERSITY MANAGEMENT AND MITIGATION 55
6.18 WEEDS AND PEST MANAGEMENT 56
6.19 VISUAL AMENITY AND LIGHTING 58

7 REHABILITATION 59

7.1 REHABILITATION OBJECTIVES AND FINAL LAND USE 59

8 COMMUNITY RELATIONS 65

8.1 COMMUNITY ENGAGEMENT 65
8.2 COMMUNITY CONTRIBUTIONS 65
8.3 COMMUNITY COMPLAINTS 70

9 INDEPENDENT ENVIRONMENTAL AUDIT 71

9.1 SSD-5170 71

10 REPORTABLE INCIDENTS OR EXCEEDANCES 72

10.1 ACTIONS TO BE TAKEN TO PREVENT ENVIRONMENTAL INCIDENTS 76

11 ACTIVITIES PROPOSED IN THE NEXT REPORTING PERIOD 76

LIST OF TABLES

Table 1: Statement of Compliance for Major Approvals 11
Table 2: Non-Compliance Risk Matrix 12
Table 3: Development Consent and Mining Lease Requirements for Annual Review 2
Table 4: BMC Contacts 2
Table 5: Bengalla Approvals Summary 7
Table 6: Equipment Fleet 9
Table 7: Production and Waste Summary 9
Table 8: 2023-2025 Noise Trends 14
Table 9: Blast Monitoring Locations and Criteria 16
Table 10: Blast Performance Summary 2023-2025 18
Table 11: Summary of Deposited Dust Annual Average Monitoring Results 23
Table 12: Summary of Annual Average TSP Monitoring Results 24
Table 13: Summary of Annual Average PM10 Monitoring Results 24
Table 14: Site Water Take 2025 25
Table 15: Site Water Balance 2025 27
Table 16: Summary of Surface Water Monitoring Results (2023 – 2025) 29
Table 17: Greenhouse Gas Emission Reduction Research and Development Initiatives 34
Table 18: Energy Consumed and Produced FY 2022 to 2025 34
Table 19: GHG Emissions FY 2022 to 2025 34
Table 20: Non-mineral Waste Management 37
Table 21: Medium Term Maintenance of the Bengalla and Overdene Homesteads 2025 42
Table 22: Total Area of Weed Treatment 56
Table 23: Bengalla Rehabilitation Objectives (from SSD-5170 (as modified)) 59
Table 24: Bengalla Rehabilitation Status Summary 61
Table 25: Bengalla Rehabilitation Monitoring Program Transects (2025) 62
Table 26: Reportable Matters or Exceedances 2024 73
Table 27:Environmental Management Activities Proposed for 2025 76

LIST OF FIGURES

Figure 1: Regional Locality 3
Figure 2: Muswellbrook Locality 4
Figure 3: Approved Site Layout 5
Figure 4: Mining Leases 6
Figure 5: Noise Monitoring Network 15
Figure 6: Blast Monitoring Network 20
Figure 7: Air Quality Monitoring Locations 22
Figure 8: Existing Surface Water Monitoring Locations 28
Figure 9: Existing Groundwater Monitoring Locations 32
Figure 10: Locality Map of Biodiversity Offset Areas 54
Figure 11: Muswellbrook South Public School Colour Run 66
Figure 12: Muswellbrook Amateur theatrical Society - "First Date" a musical Comedy 67
Figure 13: Merriwa Spring Time Show 67
Figure 14: NCHA National Finals Show 2025 68
Figure 15: Upper Hunter Stock Dog Challenge 68
Figure 16: Environmental complaints received for the previous 6 years 70
Figure 17: Environmental Complaints Received 2025 71

LIST OF APPENDICES

Appendix A Meteorological Monitoring Summary

Appendix B Noise Monitoring Summary

Appendix C Blast Monitoring Summary

Appendix D Air Quality Monitoring Summary

Appendix E Annual Compliance Report for EPBC Approval 2012/6378

Appendix F Surface Water Monitoring Summary

Appendix G Annual Groundwater Monitoring Report 2024

Appendix H Rehabilitation Monitoring Report

Appendix I Summary of Cumulative Elevated PM_{10} Monitoring Results and Bengalla Increment

Appendix J Non-Aboriginal Heritage Sites

Appendix K 2023 Independent Environmental Audit Actions

ACRONYMS

ACARP	Australian Coal Association Research Programme
ACHMP	Aboriginal Cultural Heritage Management Plan
AGE	Australasian Groundwater and Environmental Consultants Pty Limited
AQMP	Air Quality Management Plan
ARD	Acid Rock Drainage
AS/NZS	Australian/New Zealand Standard
BDMP	Biodiversity Management Plan
Bengalla	Bengalla Mine
BJV	Bengalla Joint Venture
BMC	Bengalla Mining Company Pty Limited
BMP	Blast Management Plan
BOAs	Biodiversity Offset Areas
BOMP	Biodiversity Offset Management Plan
CCC	Bengalla Community Consultative Committee
CDF	Community Development Fund
CHPP	Coal Handling Preparation Plant
CO2-eq	Carbon Dioxide Equivalent
CST	Community Support Team
CW1	Clean Water Dam 1
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DPE	NSW Department of Planning and Environment
DPHI	NSW Department of Planning, Housing and Infrastructure
DW1	Bengalla Discharge Dam (Existing), also referred to as EPA26 under EPL6538
EC	Electrical Conductivity
ED3	Mt Pleasant Environmental Dam 3
EIS	Environmental Impact Statement titled *Continuation of Bengalla Mine, Environmental Impact Statement* (6 volumes), dated September 2013, as modified by the *Response to Submissions* dated March 2014
EMS	Environment Management Strategy
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	NSW Environment Protection Authority
EPBC	Environment Protection Biodiversity Conservation Approval
EPL 6538	Environment Protection Licence 6538
ERT	Emergency Response Team
FY	Financial Year (1 July - 30 June)
GDP	Ground Disturbance Permit
GHG	Greenhouse Gas
GJ	Gigajoule
Ha	Hectare
HDWV	High Density Woody Vegetation
HHMP	Historic Heritage Management Plan
HRSTS	Hunter River Salinity Trading Scheme

HVAS	High Volume Air Sampler
IEA	Independent Environmental Audit
IR	Infrared
LETA	Low Emissions Technology Australia
MAC	Mt Arthur Coal
MACH Energy	MACH Energy Australia Pty Ltd
Mbcm	Million Bank Cubic Meters
MEG	Department of Regional NSW, Mining Exploration and Geoscience
Mining Regulation	*Mining Regulation 2016* (NSW)
ML	Mining Lease (Followed by Number)
ML	Mega Litres (Preceded by Number)
MOD	SSD-5170 Modification (Followed by Number)
MSC	Muswellbrook Shire Council
Mt	Million Tonnes
Mtpa	Million Tonnes per annum
NGER	National Greenhouse and Energy Reporting
Night	Period between 10pm and 7am on Monday to Saturday and 10pm and 8am on Sundays
NMP	Noise Management Plan
NPI	National Pollutant Inventory
NSW	New South Wales
OEA	Overburden Emplacement Area
PIRMP	Pollution Incident Response Management Plan
PM_{10}	Particulate Matter less than 10 micrograms
$PM_{2.5}$	Particulate Matter less than 2.5 micrograms
POEO Act	Protection of Environment Operations Act 1997
RAP	Registered Aboriginal Party
Reporting Period	1 January 2024 - 31 December 2024
RL	Relative Level
RMP	Rehabilitation Management Plan
RMS	NSW Roads and Maritime Services
ROM	Run of Mine
RR	NSW Resources Regulator
Safeguard Mechanism	National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 Cth
SEE (MOD1)	Statement of Environmental Effects titled 'Bengalla Mine Development Consent Modification Statement of Environmental Effects' dated August 2015 and prepared by Hansen Bailey, including the Response to Submissions document dated October 2015
SEE (MOD2)	Statement of Environmental Effects titled 'Bengalla Mine Development Consent Modification Statement of Environmental Effects' dated April 2016 and prepared by Hansen Bailey, including the Response to Submissions document dated June 2016
SEE (MOD3)	Statement of Environmental Effects titled 'Bengalla Mine Development Consent Modification 3 Statement of Environmental Effects' dated September 2016 and prepared by Hansen Bailey, including the Response to Submissions document dated November 2016
SEE (MOD4)	Statement of Environmental Effects titled 'Bengalla Mine Development Consent Modification 4 Statement of Environmental Effects' dated December 2017 and prepared

	by Hansen Bailey, including the Response to Submissions document dated May 2018 and additional information dated July 2018 and November 2018
SEE (MOD5)	Modification Report titled 'Bengalla Mine Modification 5 Report' dated November 2021 and prepared by Bengalla Mining Company Pty Limited, including the Response to Submissions document dated 29 July 2022 (Prepared by James Bailey & Associates)
SSD-5170 (as modified)	State Significant Development 5170
t	Tonnes
TEOM	Tapered Element Oscillating Microbalance
TfNSW	Transport for NSW
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
VMP	Visual Impact Mitigation Plan
VPA	Voluntary Planning Agreement
WAL	Water Access Licence
WMP	Water Management Plan

1 STATEMENT OF COMPLIANCE

1.1 INTRODUCTION

This Annual Review has been prepared to provide a summary of the environmental performance of Bengalla Mine (Bengalla) over the period 1 January 2025 – 31 December 2025 (Reporting Period). The compliance status of Bengalla against relevant approvals for the Reporting Period is summarised in **Table 1**.

Any non-compliances recorded during the Reporting Period were ranked according to the risk matrix included in **Table 1**. Further information about the non-compliances is provided in **Section 11**.

The compliance status described in this Annual Review (**Section 11**) relates to the conditions of the relevant approvals listed in **Table 1** during the Reporting Period.

Table 1: Statement of Compliance for Major Approvals

Were all conditions of the relevant approvals complied with?	Risk Level	Yes/No
State Significant Development consent (SSD-5170 (as modified))	Administrative non-compliance	No
Environment Protection Biodiversity Conservation (EPBC) Approval 2012/6378	Administrative non-compliance	No
Mining Lease (ML) 1397		Yes
ML 1450		Yes
ML 1469		Yes
ML 1711		Yes
ML 1728		Yes
ML 1729		Yes
ML 1796		Yes
Exploration Licence (EL) 9431		Yes
EPL 6538	Administrative non-compliance	No

Table 2: Non-Compliance Risk Matrix

Risk Level	Risk Level	Description
High	**High**	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	**Medium**	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	**Low**	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	**Administrative non-compliance**	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).

Source: Annual Review Guideline, Post-approval requirements for State significant mining developments. (NSW Government, October 2015)

2 INTRODUCTION

2.1 BACKGROUND

Bengalla Mining Company Pty Limited (BMC) has been operating the Bengalla Mine since 1995 in the Upper Hunter Valley of New South Wales (NSW), approximately 130 km north-west of Newcastle and 4 km west of the township of Muswellbrook, as illustrated in **Figure 1** and **Figure 2**.

On 3 March 2015, the Secretary of what is now the Department of Planning, Housing and Infrastructure (DPHI), as delegate for the Minister for Planning, granted State Significant Development 5170 (SSD-5170) for the continuation of Bengalla to 2039 at a rate of up to 15 Mtpa Run of Mine (ROM) coal production. BMC commenced operations under SSD-5170 on 1 October 2015. Since 2015, six modifications to SSD-5170 have been approved with the latest Mod 7 being approved in August 2025.

The approved Bengalla layout is shown on **Figure 3**, mining leases held by BMC are shown on **Figure 4**. The location of the approved Biodiversity Offset Areas in relation to Bengalla is shown on **Figure 8.**

2.2 DOCUMENT PURPOSE

This report details the environmental performance of Bengalla for the from 01 January 2025 to 31 December 2025 (the reporting period), has been prepared in accordance with the Annual Review Guideline (DPE, 2015) and satisfies consent conditions outlined in **Table 4.**

Table 3: Development Consent and Mining Lease Requirements for Annual Review

Document	Where Addressed
SSD-5170 (Schedule 5, Condition 4)	
4. By the end of March each year (or as otherwise agreed by the Secretary), the Applicant must review the environmental performance of the development for the previous calendar year to the satisfaction of the Secretary. This review must:	This document
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**
b) include a comprehensive review of the monitoring results and complaints records of the development over the past year, which includes a comparison of these results against: • relevant statutory requirements, limits or performance measures/criteria; • monitoring results of previous years; • relevant predictions of the EIS;	**Sections 6 and 8**
c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;	**Sections 1 and 10**
d) identify any trends in the monitoring data over the life of the development;	**Sections 6** and 7
e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and	**Sections 6** and 7
f) describe what measures will be implemented over the next year to improve the environmental performance of the development.	**Section 11**

2.3 BMC CONTACTS

The relevant contacts for environmental management at Bengalla are outlined in **Table 5**.

Table 4: BMC Contacts

Contact	Contact Details
Cam Halfpenny General Manager	Phone: 02 6542 9501 Email: cam.halfpenny@newhopegroup.com.au
Hayley Frazer Environmental and Approvals Superintendent	Phone: 02 6542 9500 Email: hayley.frazer@newhopegroup.com.au
BMC Website (Copies of public notices, environmental management documents, monitoring results and other information relating to Bengalla's operations)	https://newhopegroup.com.au/bengalla-mining-company/
Phone	Bengalla General Enquiries 02 6542 9500; or Community Complaints Hotline 1800 178 984.



Figure 1: Regional Locality

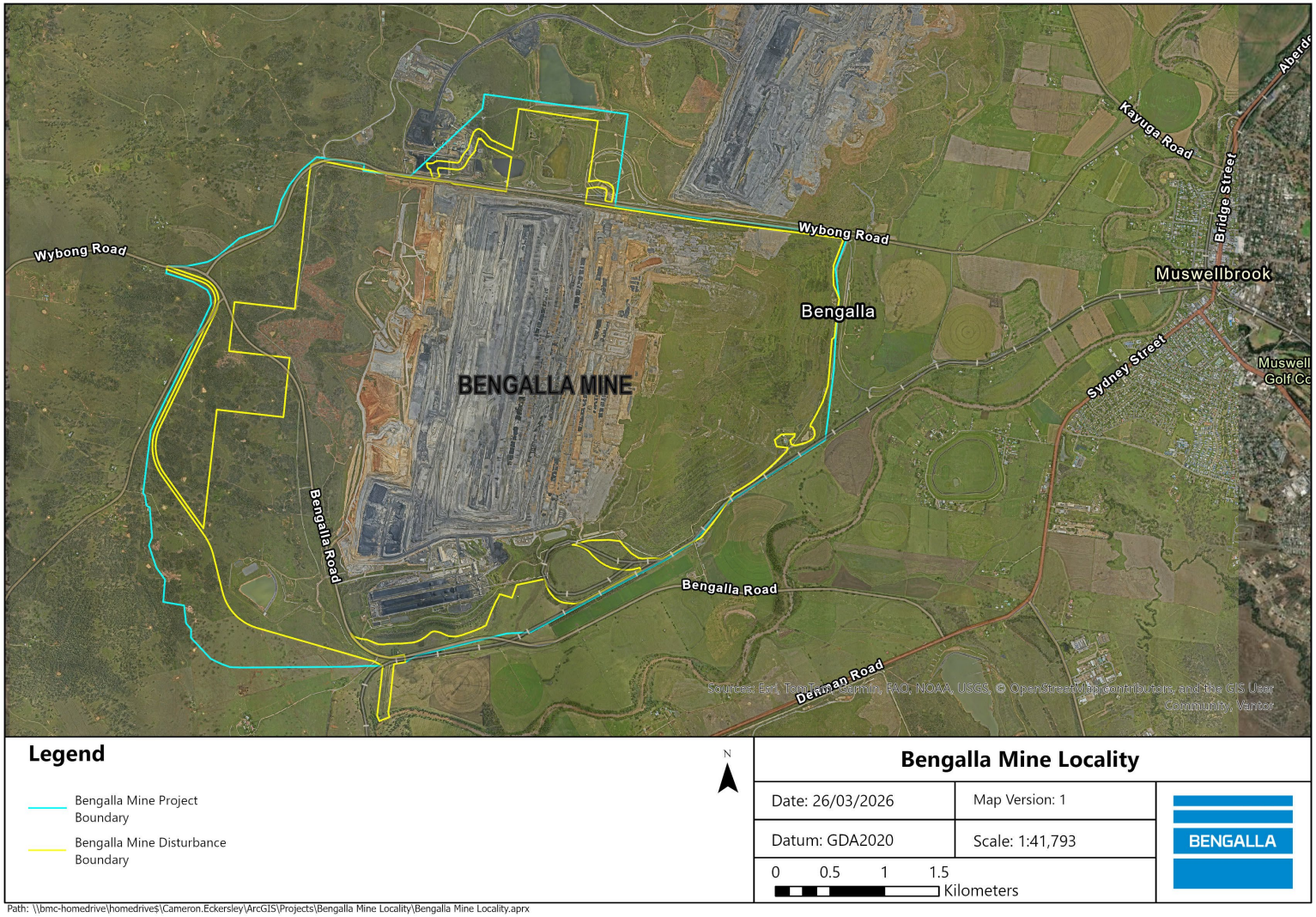


Figure 2: Muswellbrook Locality

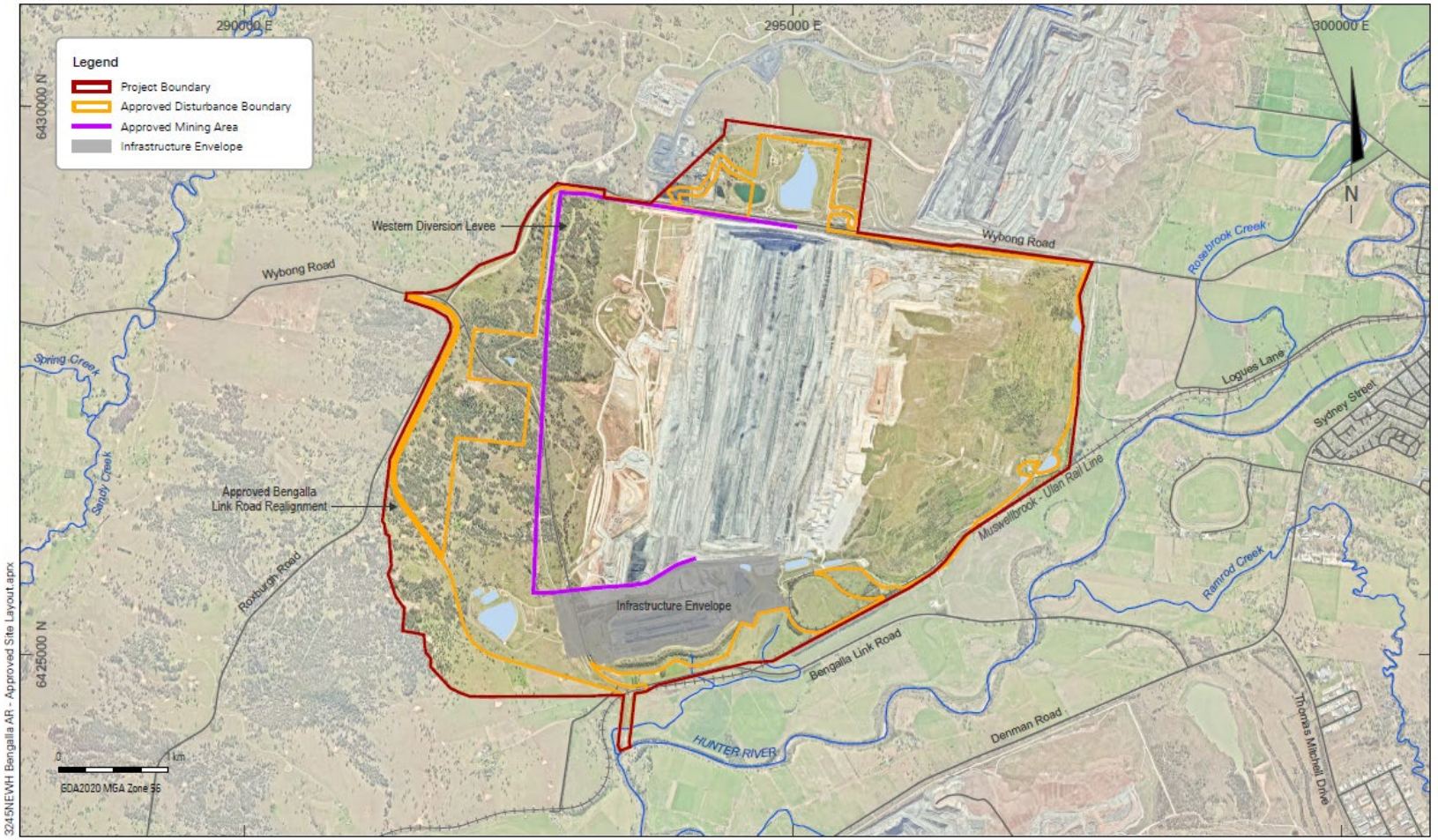


Figure 3: Approved Site Layout

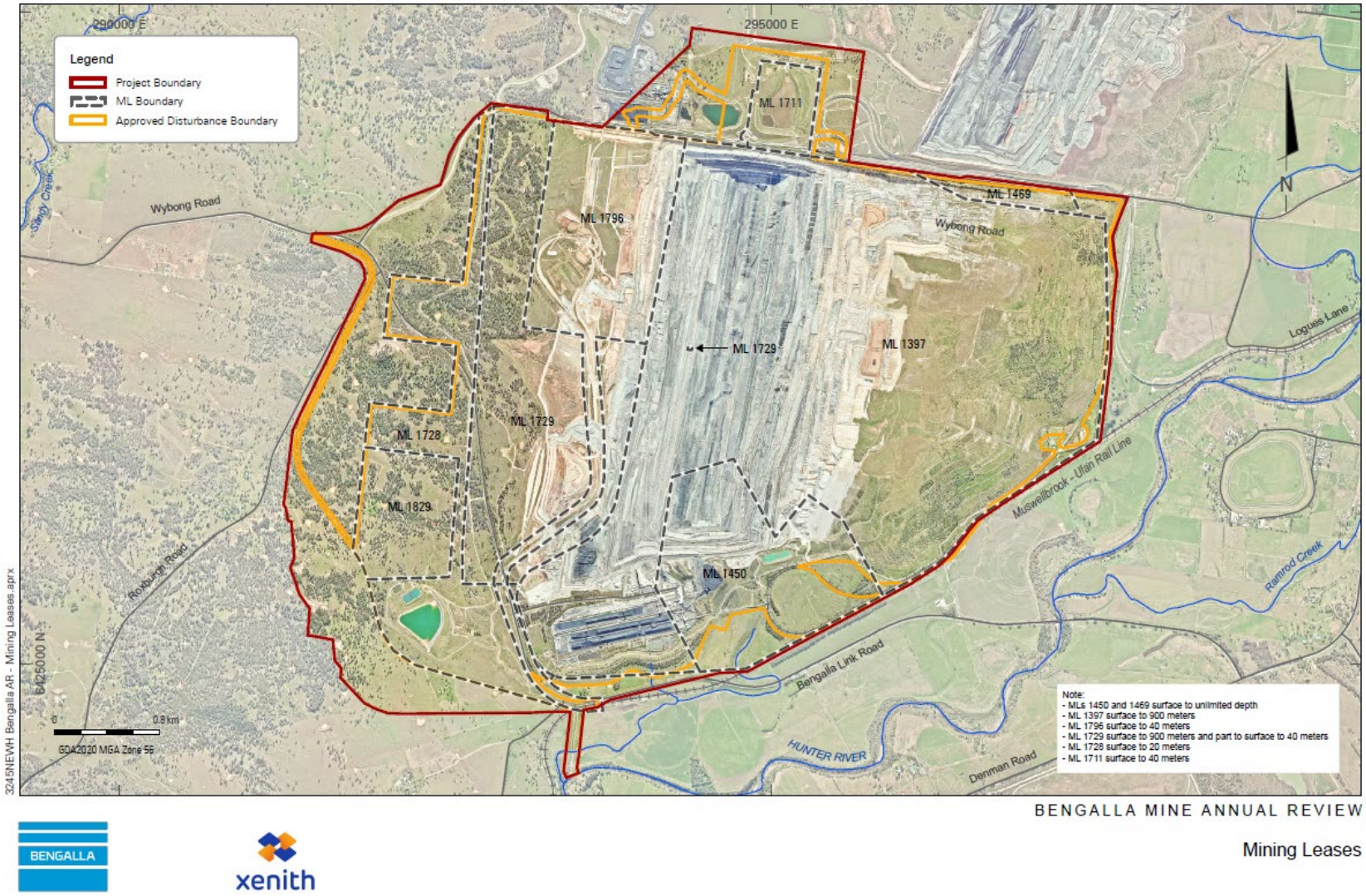


Figure 4: Mining Leases

3 APPROVALS

3.1 DEVELOPMENT CONSENT AND COMMONWEALTH APPROVALS

Copies of the Bengalla approvals and supporting documentation are available on the BMC website: https://newhopegroup.com.au/

Table 5: Bengalla Approvals Summary

Approval	Details	Approval Period(s)	Authority
Development Consent SSD-5170	Bengalla Coal Mine – Bengalla Continuation	03/03/2015 – 28/02/2039*	DPHI
	MOD 1 – approved 16 December 2015	03/03/2015 – 28/02/2039	
	MOD 2 – approved 1 July 2016	03/03/2015 – 28/02/2039	
	MOD 3 – approved 23 December 2016	03/03/2015 – 28/02/2039	
	MOD 4 – approved 19 December 2018	03/03/2015 – 28/02/2039	
	MOD 5 – approved 24 February 2023	03/03/2015 – 28/02/2039	
	MOD 7 – approved 7 August 2025	03/03/2015 – 28/02/2039	
EPBC 2012/6378		27/05/2015 – 31/12/2050	Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW)

** Schedule 2, Condition 5 of SSD-5170 provides that mining operations may be carried out until 28 February 2039. The consent continues to apply in all other respects other than the right to conduct mining operations until rehabilitation and other relevant obligations have been carried out satisfactorily.*

3.2 MINING TENEMENTS

Approval	Approval Period(s)	Authority
Mining Lease (ML) 1397	27/06/1996 – 27/06/2038	Department of Regional NSW, Mining Exploration and Geoscience (MEG)
ML 1450	10/06/1999 – 09/06/2043	MEG
ML 1469	05/06/2000 – 04/06/2042	MEG
ML 1711	29/09/2015 – 17/12/2031	MEG
ML 1728	10/02/2016 – 10/02/2037	MEG
ML 1729	10/02/2016 – 10/02/2037	MEG
ML 1796	30/03/2021 – 17/12/2031	MEG
Exploration Licence (EL) 9431	04/07/2022 – 04/07/2028	MEG

3.3 Licences

Approval	Approval Period(s)	Authority
EPL 6538	Anniversary Date 11 September	NSW Environment Protection Authority (EPA)
Water Access Licence (WAL) 1106**	Tenure Continuing	Water NSW
WAL 41547 (formerly 20BL169798)***	Tenure Continuing	Water NSW
20PE001354 (Hunter Pump River Permit)	01/05/1997 – Annual Renewal	Water NSW
XSTR200130 (Licence to Store Explosives)	10/08/2022 – 07/08/2027	SafeWork NSW
5061036 (Radiation Management Licence)	Expiry date: 08/08/2026	NSW EPA

*** WAL 1106 is for the Hunter Regulated River Water Source (High Security with 1,449 units).*

**** WAL 41547 is for the Sydney Basin-North Coast Groundwater Source (category aquifer with 365 units) authorising extraction of groundwater from the pit. These are the main WALs used in connection with take of water for mining operations at Bengalla. The Bengalla Joint Venturers (BJV) and BMC also hold other WALs for various water sources.*

3.4 PENDING APPLICATIONS AT END OF REPORTING PERIOD

The following applications were made during the Reporting Period and were pending as at 31 December 2025:

- Application and subsequent approval for modification of Development Consent SSD-5170 (Modification 7).
- Application for modification of Development Consent SSD-5170 (Modification 8)
- Application for EPBC referral of a controlled action regarding Modification 8.

3.5 VARIATIONS

Administrative updates to EPL 6538 were completed during the reporting period.

4 OPERATIONS SUMMARY

4.1 MINING OPERATIONS

During 2025, open cut coal mining operations at Bengalla continued to progress to the west as approved by SSD-5170. Indicative equipment fleet is outlined in Table 6 below.

Table 6: Equipment Fleet

Fleet – HME Type	2024	2025	2026	2025 EIS
Dragline	1	1	1	1
Excavators/ Loaders	9	11	11	11
Drill	5	5	5	7
Haul Trucks	44	46	51	53
Dozers	19	19	22	19
Graders	5	5	5	8
Water Carts	5	5	5	7

Note: EIS equipment fleet is indicative only. Operations will be undertaken to ensure compliance with noise and dust levels in accordance with consent conditions.

Exploration drilling: Bengalla complete (as part of normal mining operations) coal quality exploration drilling to inform mine planning. BMC is undertaking an exploration program within ML 1729 and EL9431. Activities within EL9431 are subject to separate Annual Activity Report in accordance with the licence conditions and the approval to undertake Assessable Prospecting Operations (APO0001424) granted on 20 November 2023, however a summary is included below.

During the 2025 reporting period, in ML 1729 and ML 1796 a total of 67 boreholes were drilled, including 4 cored holes sampled for gas content and composition for fugitive gas emissions modelling, 1 cored hole was drilled for geotechnical investigation, another 14 holes were cored for coal quality testing, and 48 holes were rotary-open chipped holes for structure definition.

During the calendar year of 2025 in EL9431 a total of 20 boreholes were drilled, including 6 cored holes sampled for coal quality and 14 rotary-open chipped holes, targeting structure. All holes targeted down to the Edinglassie seam.

Nine groundwater water monitoring boreholes were also drilled in 2025, in order to continue with the groundwater monitoring requirements set out in the Bengalla Water Management plan, these boreholes were drilled on Bengalla owned land to the West and South of the active Bengalla mine.

Table 8 provides actual waste rock, ROM coal, reject material and saleable product volumes for 2024 and 2025 and forecast volumes for 2026.

Table 7: Production and Waste Summary

Material	Unit	Approved Limit	Previous Reporting Period (2024 Actual)	This Reporting Period (2025 Actual)	Next Reporting Period (2026 Plan)
Waste Rock / Overburden	Mbcm	NA	58.39	59.07	70.97

ROM Coal	Mt	15	13.74	11.33	12.50
Reject Material	Mt	NA	3.74	3.35	4.04
Saleable Product	Mt	NA	10.51	9.44	.9.96

Notes:
1. Forecast data sourced from Forecast Plans.
2. Waste Rock/Overburden is prime waste.
3. Reject material includes fine and coarse material.

4.2 COMPARISON AGAINST PREDICTIONS

4.3 OTHER OPERATIONS

Coal Handling and Preparation Plant

During the Reporting Period, 9,349,331 tonnes (t) of product coal was transported via rail to the Port of Newcastle and domestic markets.

The total number of train movements during the Reporting Period was 1,095 with a maximum of 7 train movements per day and a maximum amount of 65,462 (t) of coal product in one day.

Infrastructure, Construction and Management

The following projects were commenced, progressed or completed during the Reporting Period:

- Workshop Apron & Hardstand upgrade - Completed
- Conveyor 302 road resurface - completed
- Exploration Core shed build - completed
- CHPP access road and carpark - completed.
- Warehouse upgrade – Scheduled for completion 2026.
- In Pit fuel Farm upgrade – Scheduled for completion 2026
- North End wall tree screening – scheduled for completion 2026
- West Diversion Levy Stage 3 – scheduled for completion 2026
- Bengalla Agricultural Company (BAC) - Hay shed and machinery Shed build – scheduled for completion 2026
- Commencement of dumping in the Temporary Overburden Emplacement area (Modification 7)

Forecast mining operations and related activities for the next reporting period include:

- Continue open cut coal mining westward.

- Pre-production and exploration drilling.
- Rehabilitation according to the RMP and Forward Program.
- Clean water diversion drain (Western Diversion Levee) Stage 3 construction completion.
- Commencement of Bengalla Link Road Realignment
- Installation of ground water bores
- Installation of “Spare dam” to the west of the operations

A summary of key environmental approval and management activities proposed for 2025 is provided in **Section 12**.

4.4 WORKFORCE

As of 31 December 2025, we had a total of 757 permanent employees and 173 CAT 1 contractors. Of the 757 permanent employees, 87% reside in the Muswellbrook, Upper Hunter and Singleton LGAs.

5 ACTION REQUIRED FROM PREVIOUS ANNUAL REVIEW

BMC received correspondence from the NSW Department of Planning, Housing and Infrastructure (DPHI) on 7 May 2025, stating that the Department had reviewed the 2024 Annual Review and considered it generally satisfied the requirements of the consent and the NSW Planning Annual Review Guideline (October 2015). The letter also noted that not all information required by Schedule 5, Condition 11 of SSD-5170 was available on the Bengalla website at that time. BMC rectified the oversights and made sure the required documents were published.

6 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

*Surface water and groundwater environmental management and performance are discussed in **Section 7.2** and **Section 7.3**, respectively. Rehabilitation is discussed in **Section 8.***

6.1 METEOROLOGY

6.1.1 Environmental Management

BMC operates a meteorological station and inversion tower in accordance with the requirements of SSD-5170 and EPL 6538 (see Development Consent and Commonwealth Approvals).

Maintenance and calibration activities were completed on the meteorological station on 09/01/2025, 15/09/2025 & 17/12/2025.

6.1.2 Environmental Performance

Wind speed, wind direction, air temperature, relative humidity, solar radiation, rainfall are recorded at the meteorological station. A summary of monthly rainfall, temperatures and wind roses being part of the 2025 meteorological data is included as **Appendix A**.

6.1.3 Further Actions

There are no major actions planned for 2026 regarding meteorological monitoring. BMC will continue routine maintenance and calibration activities.

6.2 NOISE

6.2.1 Environmental Management

BMC manages noise in accordance with the approved NMP, which describes measures for monitoring and managing noise from Bengalla.

Three methods of noise monitoring are utilised at Bengalla being:

- compliance attended noise monitoring;
- supplementary attended monitoring; and
- unattended (real-time) monitoring.

6.2.2 Environmental Performance

Compliance Attended Noise Monitoring

During the Reporting Period, compliance attended monitoring was undertaken by an appropriately qualified acoustic consultant nominally once per calendar month (but at least two weeks apart) during the night period (10 pm to 7 am) at three locations representative of the nearest private residences being AN01, AN03 and AN04 (see **Figure 5**).

The NMP outlines the applicable criterion for each of the three monitoring locations. Bengalla noise was measured at each monitoring location and assessed against the applicable criterion (see **Appendix B**).

Supplementary Attended Monitoring

Supplementary attended monitoring continued to be undertaken during the Reporting Period for night periods. Measurements are recorded by BMC personnel at the compliance attended monitoring sites.

Results from the supplementary attended monitoring are not used to determine compliance, however, will result in operational change where and if monitoring deems necessary.

Unattended (Real-time) Monitoring

BMC operates two continuous, unattended real-time noise monitoring units as a management tool. The locations of the two real-time noise monitoring units are shown on **Figure 5**.

The noise levels recorded at the real-time monitors are not used to determine compliance, however, are used for operational management as described in the BMC Noise Management Plan.

Noise Monitoring Results

Compliance with noise criteria in SSD-5170 was assessed via the compliance attended noise monitoring program. No exceedances of the noise monitoring criteria were recorded during the Reporting Period. A summary of the compliance criteria and compliance attended noise monitoring results for 2025 is provided in **Appendix B**.

Trend over Life of Project

Average noise levels at AN01, AN03 and AN04 during the Reporting Period had consistent with the previous reporting periods and continue to remain within the noise compliance criteria (see **Table 10**).

Table 8: 2023-2025 Noise Trends

Location	Noise Criteria dBA	BMC Only LAeq dBA		
		2025	**2024**	**2023**
		Max	**Max**	**Max**
AN01	35	33	33	**38**[1]
AN03	40	34	37	34
AN04	35	**39**[1]	**40**[1]	**37**[1]

[1] Maximum monthly results that exceeded criteria were assessed and re-tested as per the requirements of the NMP and determined to be not licensable due to invalid meteorological conditions. No exceedances recorded in the relevant reporting periods.

2025 Average and Maximum values are determined by the Noise monitoring values in Appendix B Summary of Compliance Attended Noise Monitoring Results 2025.

Averages (2023-2025) only use noise monitoring results that are recorded to be valid within the met conditions range.

Comparison to Assessment Predictions

Noise monitoring results recorded during the Reporting Period were generally consistent with the predictions in the Environmental Impact Statement for the Bengalla Continuation of Mining Project (EIS).

Private Residence Mitigation

No such noise mitigation requests were received during the Reporting Period.

6.2.3 Further Actions

BMC will continue to implement the NMP in accordance with SSD-5170. If amendments to the NMP are required, BMC will lodge the revised NMP with relevant regulatory agencies for comment and then with the DPHI for approval.

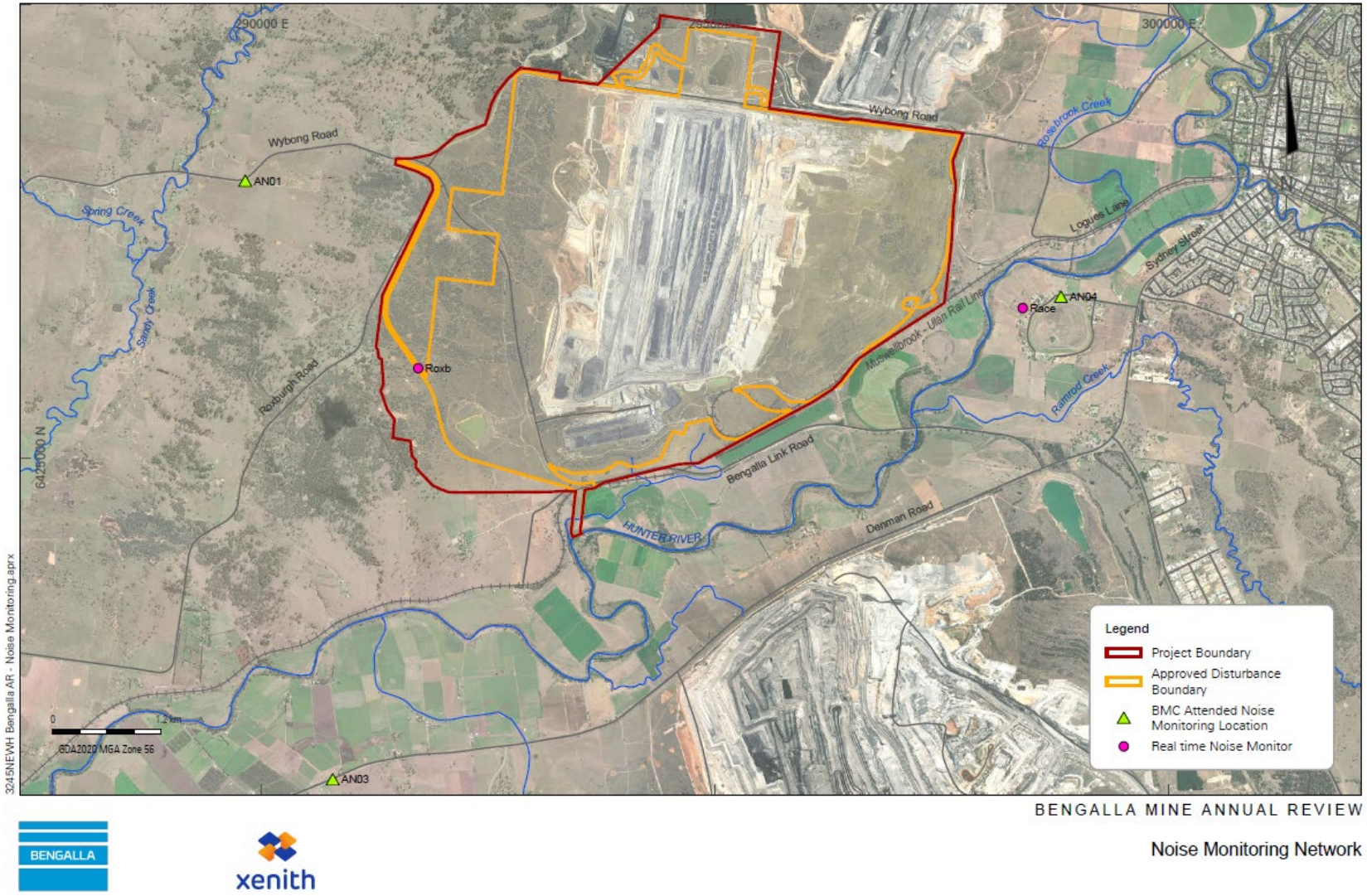


Figure 5: Noise Monitoring Network

6.3 BLASTING

6.3.1 Environmental Management

BMC manages blasting according to the approved Blast Management Plan (BMP), which describes measures for blast monitoring and management at Bengalla. Monitoring is undertaken to capture and assess airblast overpressure and ground vibration impacts at sensitive receivers. Fume generation is managed in accordance with BMC's Post Blast Fume Generation Mitigation and Management Plan.

6.3.2 Environmental Performance

Assessment of compliance with blast criteria for sensitive receivers is outlined in **Table 11.**

Blast Monitoring Results

A summary of performance against the applicable blasting criteria for the Reporting Period is provided in **Table 12** with monitoring results for locations representative of private receivers included in **Appendix C**.

During the Reporting Period, results from the compliance blast monitor in EPL 6538 on non-mine owned land (MRE) exceeded the relevant criteria for overpressure or ground vibration. Bengalla Mining Company recorded one air blast overpressure exceedance of 120.3 dB recorded at the MRE monitoring site on the 7 January 2025.

Trend and Comparison to Assessment Predictions

Table 12 details the 2025 blast performance compared to 2024 and 2023. A review of blast monitoring measurements over the period 2023 – 2025 indicates that results have remained generally consistent throughout that period. Results are aligned with the EIS forecast impact.

Table 9: Blast Monitoring Locations and Criteria

Location	Blast Monitoring ID	Criteria	
		Vibration	Overpressure
Private Receivers			
Moore	MRE	10 mm/s and 5% ≥ 5mm/s	120 dB (linear Peak) and 5% ≥ 115dB (linear Peak)
Mine Owned Historic Heritage Site Monitoring Locations			
Edinglassie Homestead	EGL	10 mm/s	120 dB (linear Peak)
Overdene Homestead	CTR		
Bengalla Homestead	BHS		
ARTC Infrastructure			
Wantana	WAN	100 mm/s	-
Dam Monitoring Locations			
Environmental Dam	ED3	100 mm/s	-

Location	Blast Monitoring ID	Criteria	
		Vibration	Overpressure
Clean Water Dam	CW1	100 mm/s	-
Discharge Water Dam	DW1	50 mm/s	-

Table 10: Blast Performance Summary 2023-2025

	2025		2024		2023	
Blast Summary	**Number of Blasts**	**% of Blasts**	**Number of Blasts**	**% of Blasts**	**Number of Blasts**	**% of Blasts**
Total blasts	164		180		175	
Average number of blasts per week	3.2		3.5		3.4	
Days with 2 blast events	29		30		29	
Days with 3 blast events	2		3		0	
Number of road closures – Wybong Road	43		33		45	
Number of road closures – Bengalla Road	3		4		2	
Number of rail loop closures	0		0		0	
Number of blast events within Clean Water Dam 1 (CW1) Notification Area	53		57		71	
Number of blast events within Mt Pleasant Environmental Dam 3 (ED3) Notification Area	54		56		71	
Number of blast events within Dirty Water Dam (DW1) Notification Area	8		11		2	
• Private Receivers Monitoring Locations Vibration (10 mm/sec)*	0	0	0	0	0	0
• Private Receivers Monitoring Locations Vibration (5 % ≥5mm/sec))*	9	5.5	0	0	0	0
• Private Receivers Monitoring Locations Overpressure (120dB)*	1	0.6	0	0	0	0
• Private Receivers Monitoring Locations Overpressure (5% ≥115dB)*	2	1.2	0	0	1	0.6
• Historic Heritage Site Monitoring Locations Vibration (10 mm/sec) • EGL, BHS, CTR	0		0		0	
• Historic Heritage Site Monitoring Locations Overpressure (120 dB) • EGL, BHS, CTR	0		0		0	
• ARTC Infrastructure (100 mm/sec) • WAN	0		0		0	

	2025		2024		2023	
Blast Summary	**Number of Blasts**	**% of Blasts**	**Number of Blasts**	**% of Blasts**	**Number of Blasts**	**% of Blasts**
Blast result capture rate, all non-mine owned monitors	164	100	180	100	175	100
Fume events (≥ Rating 3)	3	1.8	1	0.5	4	2

**A blast agreement was entered into between BMC and the private receiver represented by the MRE blast monitor on 25 September 2025. Details of this agreement were provided to DPHI in writing on 6 November 2025 as required under Schedule 3, Condition 8 of SSD-5170.*

6.3.3 Further Action

During the reporting period, BMC revised its blast planning assessment TARP to capture changes to potential near-site receivers when planning for a blast. This is to reflect the progression of operations westwards and capture changes in impact due to surrounding infrastructure and operations.

Property Investigation Report

Schedule 3, Condition 12 of SSD-5170 requires a property investigation to be commissioned within 2 months of receiving a claim by the owner of privately-owned land within 3 kilometres of the approved open cut mining area that buildings and/or structures on the land have been damaged as a result of blasting on site.

BMC did not receive a written request for a property investigation from any property owners during 2025.

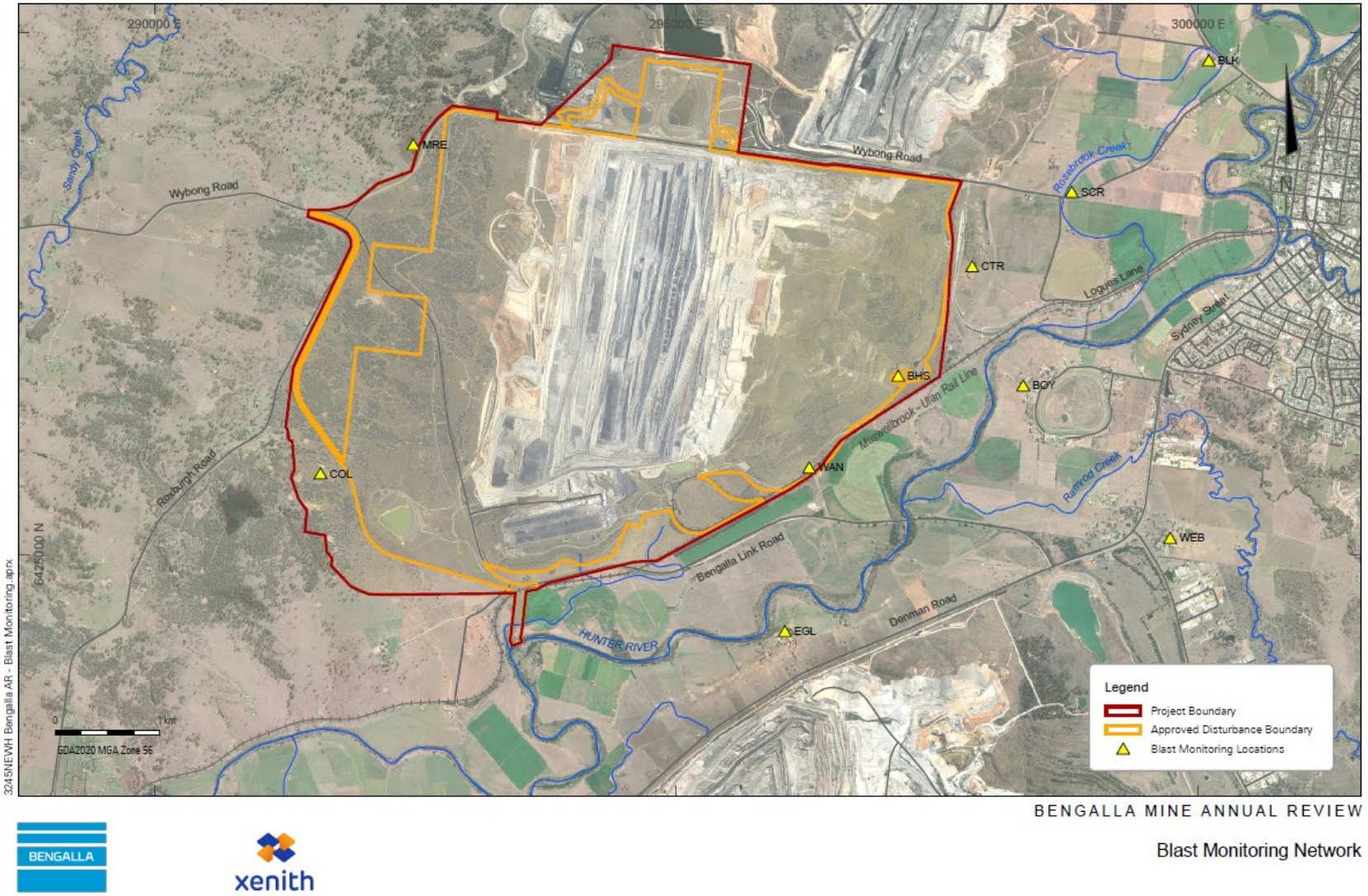


Figure 6: Blast Monitoring Network

6.4 AIR QUALITY

6.4.1 Environmental Management

BMC manages air quality according to the approved AQMP, which sets out procedures management of odour, dust and greenhouse gas emissions at Bengalla.

Air Quality Monitoring Program

SSD-5170 sets out air quality criteria for Particulate Matter less than 10 microns (PM_{10}), Particulate Matter less than 2.5 microns ($PM_{2.5}$), Total Suspended Particulates (TSP) and deposited dust. Compliance with these criteria is assessed via BMC's air quality monitoring network approved under the AQMP. As described further below, EPL 6538 also requires air quality monitoring for PM_{10} at certain locations.

During the reporting period, the interim air quality monitoring program approved under section 6.2.3 of the AQMP (2022) was implemented. The interim air quality monitoring network as shown in **Figure 7**, comprises of:

- One meteorological station and one inversion tower.
- Three real-time air quality monitors (E-Bam monitors), linked to the Real Time Environment Management System. These monitors are used as operational management tools.
- Four High Volume Air Samplers (HVAS) with two measuring TSP and two measuring PM10.
- 3 Deposition Dust Gauges were used to measure compliance against the relevant criteria in SSD-5170.
- PM2.5 is currently monitored through the Upper Hunter Air Quality Monitoring Network Muswellbrook monitor.
- BMC is also required to monitor PM10 at EPA22 and EPA24 in accordance with EPL 6538. Monitoring points EPA22 and EPA24 remain in place and are located on the primary wind axis relative to Bengalla.

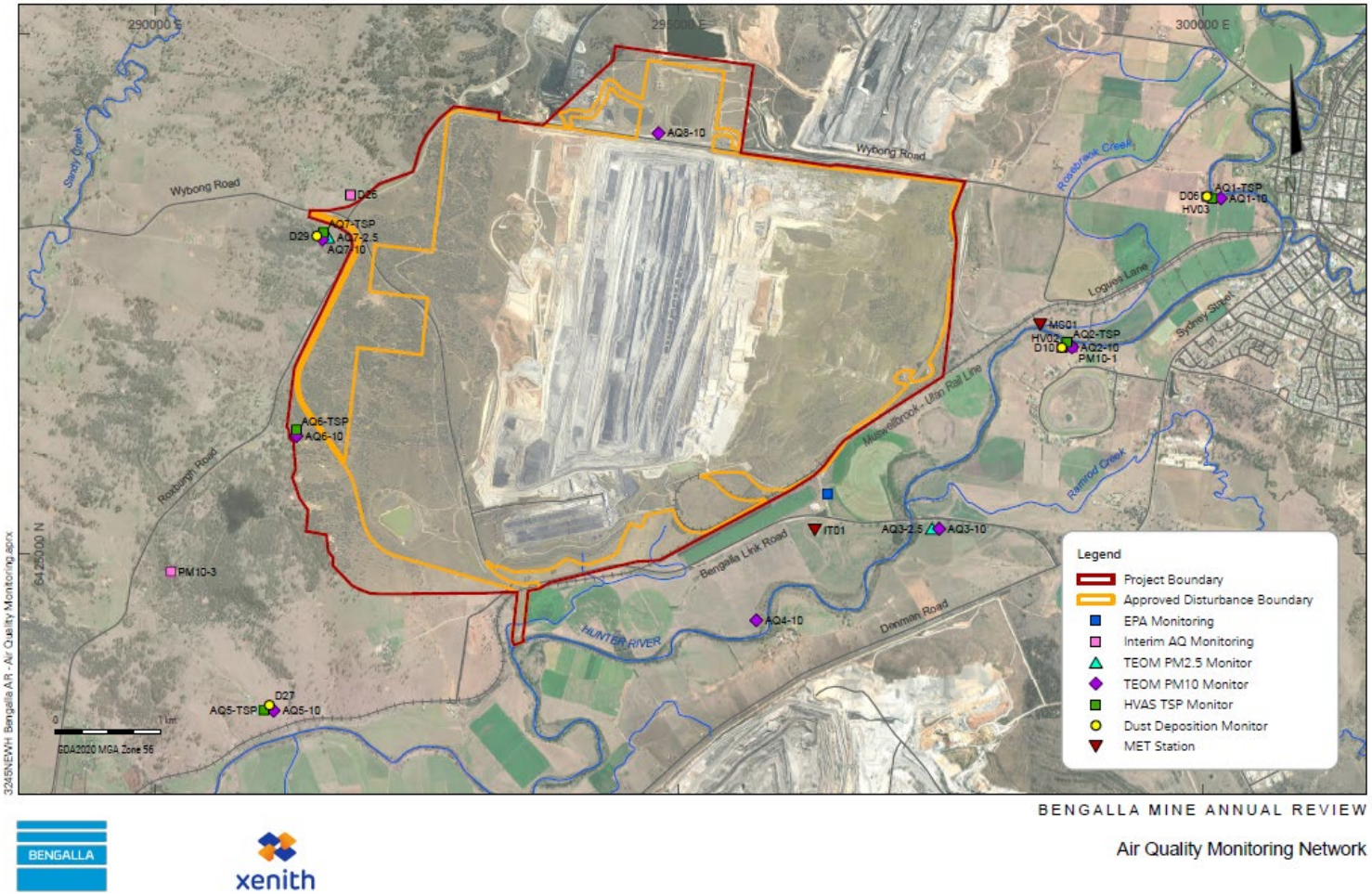


Figure 7: Air Quality Monitoring Locations

6.4.2 Environmental Performance

Air Quality Monitoring Results

There were no exceedances of the annual average air quality criteria for TSP, PM_{10}, $PM_{2.5}$ or deposited dust under Schedule 3, Condition 16 of SSD-5170 for the reporting period.

Elevated PM_{10} 24-hour all source measurements were recorded at PM-1 and PM-3 on various dates as well as an elevated Annual Average Deposited Dust Reading at D27 during the Reporting Period. DPE (now DPHI) was notified on each occasion and an air quality expert was engaged to prepare an investigation report. In all cases, the expert concluded that BMC had complied with Schedule 3, Condition 16. Further details about the PM_{10} 24-hour and Annual Average Deposited Dust Reading investigation reports are provided in **Section 11.2**.

Detailed air quality monitoring results for 2025 are included in **Appendix D**. A summary of the 2025 monitoring data is presented below.

- Deposited Dust

Table 13 details annual average deposited dust monitoring results for the Reporting Period (and for the previous two years). All compliance dust gauges recorded results for 2025 that are compliant with the applicable criteria for annual average total deposited dust (4g/m^2/month). The annual increase in deposited dust levels were 0.1 g/m^2/month for D06, 0.5 g/m^2/month for D10 and 0.3 g/m^2/month for D26 indicating compliance with the maximum annual increase in deposited dust levels (2g/m^2/month).

Table 11: Summary of Deposited Dust Annual Average Monitoring Results

Site	Annual Average Deposited Dust Criteria (g/m²/month)	2023 Annual Average Deposited Dust (g/m²/month)	2024 Annual Average Deposited Dust (g/m²/month)	2025 Annual Average Deposited Dust (g/m²/month)
D06	4.0	3.4	1.6	**1.7**
D10	4.0	3.1	2.2	**2.7**
D26	4.0	1.8	2.3	**2.6**
D27[1]	4.0	-	**4.1[2]**	**4.3***
D29[1]	4.0	-	**2.5[2]**	**3.4**

1 New depositional dust gauge locations (D27 (May 2024) & D29 (May 2024)) installed through the reporting as required under the AQMP.

2 Results are an average of the incomplete year and therefore not assessed against annual average.

** Value represents monitored results. Further investigation indicated results were below criterion as described in Appendix I*

- TSP

Table 14 details annual average TSP monitoring results for the Reporting Period (and for the previous two years). All TSP compliance monitors recorded results for 2025 that are compliant with the

applicable criterion for annual average TSP (90 µg/m³). This criterion excludes extraordinary events; however, the occurrence of extraordinary events was not examined for the Reporting Period as the monitoring results were already below 90 µg/m³.

Table 12: Summary of Annual Average TSP Monitoring Results

Site	Annual Average TSP Criteria (µg/m³)	Period	2023 Annual Average TSP (µg/m³)	2024 Annual Average TSP (µg/m³)	2025 Annual Average TSP (µg/m3)
HV2	90	All run days	85.1	61.2	**74.0**
		Excluding extraordinary events	-	-	**-**
HV3	90	All run days	51.5	41.1	**47.0**
		Excluding extraordinary events	-	-	**-**

- PM_{10}

Table 15 presents PM_{10} annual average monitoring results for the Reporting Period and the previous two years. The cumulative annual average PM_{10} concentration for the Reporting Period was below the annual average criterion (25 µg/m³) at all compliance monitoring sites.

Table 13: Summary of Annual Average PM10 Monitoring Results

Site	Annual Average PM10 Criteria (µg/m³)	Period	2023 Annual Average PM10 (µg/m3)	2024 Annual Average PM10 (µg/m3	2025 Annual Average PM_{10} (µg/m³)
PM-1	25	All Run days	28.5*	20.6	**25.5***
		Excluding extraordinary events	-	-	**-**
PM-3	25	All Run days	26.1*	21.6	**23.2**
		Excluding extraordinary events	-	-	**-**

* Value represents monitored results. Further investigation indicated results were below criterion as described in Appendix I

- PM2.5

As detailed in the approved AQMP (2022), during the Reporting Period BMC relied upon the Upper Hunter Air Quality Monitoring Network to record and monitor $PM_{2.5}$ concentrations. The monitor utilised by BMC is the Muswellbrook monitor located approximately 5 km east of Bengalla. The cumulative annual average $PM_{2.5}$ concentration for the Reporting Period at the Muswellbrook monitor was 6.7 µg/m³, below the criterion of 8 µg/m³.

The cumulative annual average $PM_{2.5}$ has decreased over the 2025 reporting period.

Trend and Comparison to Assessment Predictions

Table 13, Table 14 and **Table 15** present the annual average air quality monitoring results for deposited dust, TSP and PM_{10} progressively against the respective criteria over the 2023 – 2025 period. The cumulative measurements increased over the reporting period due to the adverse weather conditions experienced compared to the 2024 period.

Private Residence Mitigation

In accordance with Schedule 3, Condition 3 of SSD-5170, BMC is required to implement reasonable and feasible air quality mitigation measures upon receiving a written request from the owner of relevant residences listed in SSD-5170.

BMC did not receive any written mitigation request for implementation of air quality control measures during 2025.

Independent Review

There were no requests made for an independent review of impacts from Bengalla (for air quality or otherwise) during 2025.

6.4.3 Further Actions

BMC will continue the implementation of the revised air quality monitoring network during 2026 (as described in the 2022 AQMP). Until it is fully commissioned and operational, BMC will continue operating under the interim monitoring network described in the 2022 AQMP. BMC completed a thorough review and update of its AQMP for submission early in 2026.

6.5 WATER MANAGEMENT

6.5.1 Water Balance

The take of water associated with mining operations at Bengalla during the Reporting Period is summarised in **Table 22.** An overview of the site water balance is presented in **Table 23**.

A discussion of surface water and groundwater monitoring and management during the Reporting Period is provided **in Section 6.6** and **Section 6.7** respectively.

Table 14: Site Water Take 2025

Water Licence	Water Sharing Plan, Source and Management Zone	Entitlement	Passive Take / Inflows (ML)	Active Pumping (ML)	Total (ML)
WAL1106 (High Security)	Hunter Regulated River Water Source (Zone 1A)	1,449 units[1]	-	1,482[4]	1,482

	Water Sharing Plan for the Hunter Regulated River Water Source 2016 NSW				
WAL41547 (Aquifer)	Sydney Basin-North Coast Groundwater Source *Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016* NSW	365 units	184	-	184
Harvestable Rights	Muswellbrook Water Source *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009* NSW	109 ML[2]	39[2]	-	39
Total					**1,705**

[1] Permanent entitlement to a share of the water source per water year (1 July to 30 June) which generates water allocation based on available water determinations made by the Minister for Water (generally at the start of each water year).

[2] Harvestable rights entitlement calculation and maximum forecast harvestable rights take (EIS).

[3] Groundwater inflow to open cut pit estimated by WSP Report for 2025.

[4] This value includes portions from period from 2 reporting periods as water year follows financial year (Jul-Jun).

Table 15: Site Water Balance 2025

Aspect	Volume (ML)
Water Inputs	
Raw water sourced from Hunter River (ML/yr)	1,482
Rainfall and catchment runoff (ML/yr)	1,184
Groundwater inflow to open cut pits (ML/yr)	184
Water entrained in ROM coal processed (ML/yr)	1,075
Third party	14
Total Inputs	***3,939***
Outputs	
Water entrained in product coal	2,032
Dust suppression (stockpiles and haul roads)	1,130
Vehicle wash-down losses	177
Hunter River Salinity Trading Scheme (HRSTS) discharge	124
Other offsite discharges from mine water management system	0
Evaporation from dams	243
Total outputs	***3,706***
Water Balance for 2025	**200 ML**

During the Reporting Period, 124.37 ML was discharged across two discharge events under the Hunter River Salinity Trading Scheme.

6.6 SURFACE WATER

6.6.1 Environmental Management

BMC has an approved Water Management Plan (WMP) which describes the surface water management infrastructure and procedures in place at Bengalla.

Surface Water Use

During the Reporting Period, BMC pumped 1,482 ML from the Hunter River. This value accounts for 660 ML during the period 1 January 2025 – 30 June 2025 and 822 ML during the period 1 July 2025 – 31 December 2025. The Bengalla site water balance for 2025 is provided in **Section 6.5.1**.

Surface Water Monitoring Program

Surface water monitoring is undertaken in accordance with the approved WMP. Surface water monitoring locations are shown on **Figure 9.**

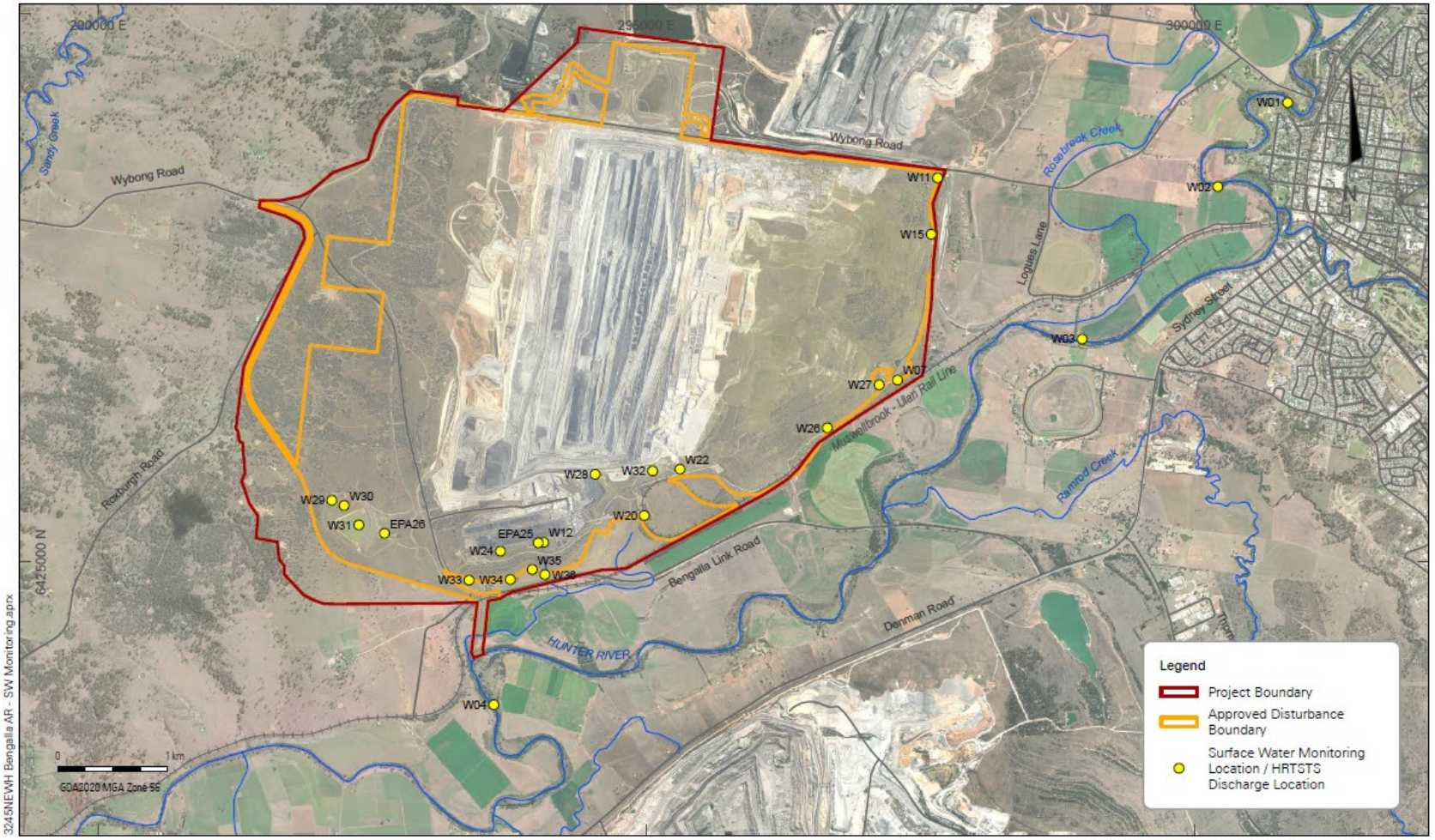


Figure 8: Existing Surface Water Monitoring Locations

6.6.2 Environmental Performance

Surface Water Monitoring Results

A comparison of the 2025 surface water average monitoring results with the results for previous years for the Hunter River is presented in **Table 24. Appendix F** details monthly data collected from the four Hunter River water monitoring sites.

Table 16: Summary of Surface Water Monitoring Results (2023 – 2025)

Year	Site W01 Average			Site W02 Average			Site W03 Average			Site W04 Average		
	pH	TSS	EC	pH	TSS	EC	pH	TSS	EC	pH	TSS	EC
2023	8.0	14	731	8.1	14	739	8.0	19	813	8.0	21	829
2024	8.1	15	623	8.2	35	625	8.1	20	656	8.1	21	613
2025	8.0	35	565	8.0	35	572	7.9	22	654	8.1	34	622

Trends Over the Life of the Project

The Hunter River water quality trigger values in the WMP are used to investigate potential surface water impacts from operations at Bengalla. Trigger values for the surface water parameters monitored monthly include:

- pH: 6.5 – 8.1;
- Total Suspended Solids (TSS): 40 mg/L; and
- Electrical Conductivity (EC): 650 µS/cm.

Bengalla only recorded six rain events[1] during 2025 which occurred on the 16 Jan, 12 Feb, 31 Mar, 22 May, 27 May and 4 Aug 2025.

Appendix F details monthly data collected from the four Hunter River water monitoring sites. Water quality results largely reflected background conditions in the Hunter River catchment, with relatively stable pH results throughout the reporting period and EC and TSS results that have fluctuated with increases and decreases in water flow levels in the Hunter River.

Comparison to Assessment Predictions

Surface water monitoring of pH, TSS and EC at the four Hunter River water monitoring sites in 2025 confirmed that water quality remains generally within the relevant WMP impact criteria for pH, TSS and EC. All surface water quality exceedances were investigated by a suitably qualified water consultant and determined to be reflective of in situ water conditions in the background Hunter River.

An overview of the Bengalla site water balance for 2025 is provided in **Section 6.5.1.** In comparing the 2025 water balance results to the EIS, Year 8 average results were selected as the most

[1] *Rain Event is defined as 25mm rainfall in 24-hour period in the WMP.*

appropriate. It should be noted that the Year 8 water balance also assumed a production rate of up to 15 Million tonnes per annum of product coal.

The EIS predicted a gross water balance deficit of 186 ML for Year 8[1]. The imbalance observed in 2025 (200ML surplus) is likely a result of the use of an updated water balance model and small modifications in the water runoff and evaporation models

[1] *Bengalla EIS Volume 1 Table 51.*

6.6.3 Further Actions

Should any amendments to the WMP be required, BMC will lodge the revised plan with relevant regulatory agencies for comment and then with DPHI for approval.

6.7 DAMS SAFETY REGULATION 2019 AND MINING APPROVALS (BENGALLA-2, BENGALLA-3, BENGALLA-4)

Dams Safety Regulation 2019 commenced on 1 November 2019. As of 1 November 2021, any transitional arrangements and savings provisions have concluded, and all clauses of the regulation has commenced.

Earthquake activities in 2025 did not impact dam operation or management in 2025.

No further updates to Dam Safety Approvals occurred during the 2025 reporting period.

6.8 GROUNDWATER

6.8.1 Environmental Management

BMC has an approved WMP which describes groundwater management at Bengalla.

Groundwater Monitoring

The groundwater monitoring network (shown on **Figure 10**) targets two aquifers being an alluvial aquifer associated with the Hunter River floodplain and a Permian aquifer system.

The alluvium, shallow bedrock and deep bedrock bores are all sampled for Standing Water Level, pH, EC, and Total Dissolved Solids at various frequencies. A chemical analysis including sulphate and metals is also undertaken on several bores annually according to the WMP.

6.8.2 Environmental Performance

Monitoring Results for Groundwater Levels, Quality and Baseline Data

During 2025, BMC undertook investigations into groundwater triggers as per Appendix E of WMP, of which all investigations concluded natural fluctuations and not as a result of mining activities. BMC also commissioned Specialist Consultant AGE to review and update the groundwater model with the updated model available for implementation in 2026.

Appendix G (see **Section 9**) reviews the trends via a summary of the 2025 groundwater monitoring results and comparison with EIS predictions for selected bore groundwater levels and EC in certain locations.

6.8.3 Further Actions

BMC will consider the groundwater monitoring and management recommendations identified in **Appendix G** (see **Section 10**) and if reasonable and feasible, implement the relevant 2025 actions.

BMC will review and where necessary update the WMP. BMC will lodge the revised plan with relevant regulatory agencies for comment and then with DPHI for approval.

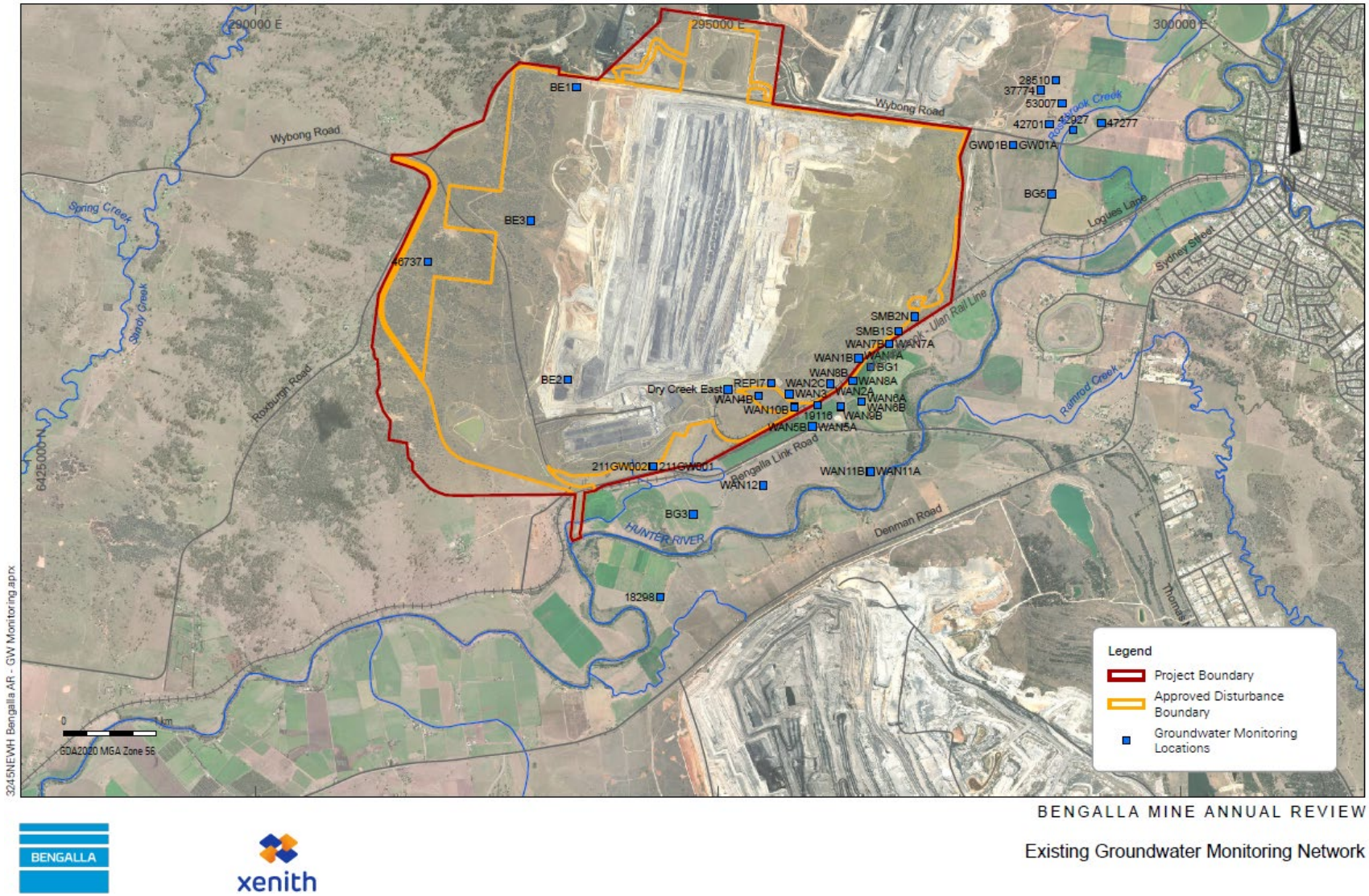


Figure 9: Existing Groundwater Monitoring Locations

6.9 STREAM HEALTH MONITORING

BMC is required under the WMP and SSD-5170 Schedule 3, Condition 25(ii) to monitor stream and riparian vegetation health in the Hunter River that is potentially affected by the development. This monitoring is conducted every three years coinciding with the Independent Environmental Audit and as such, was undertaken in November 2025.

Bank stability and riparian vegetation were assessed at all 13 sites along the Hunter River and Rosebrook Creek. Stream condition observations were recorded at all sites except for AqM3 and AqM5, as Rosebrook Creek was dry as the time of the survey.

The results of the 2025 assessment are summarised below:

- All sites indicated moderate, ongoing disturbance from land use and prior floods.
- Stream width, shading and bank stability were generally consistent with previous surveys.
- Water quality remained consistent with previous years and capable of supporting macroinvertebrate.
- Alkalinity and pH were within tolerances for aquatic life, and electrical conductivity (EC) and turbidity were within ANZECC guideline ranges.
- A total of 44 macroinvertebrates were recorded across 22 habitats, having higher richness at edge habitats than bed/riffle habitats.
- Comparison to previous years shows an improvement in taxa richness relative to the flood-impacted years.

Overall, the Hunter River riparian and aquatic ecosystem on BMC land is gradually recovering from past flood (2021 – 2022), drought (2019 – 2020) and bushfire (2019) impacts. Based on the data collected in 2025, no WMP triggers were exceeded, and therefore no specific action is required. Continued monitoring and management as per the WMP will be implemented as required to support long-term ecosystem resilience and to track trends in both edge and bed/riffle habitats.

6.10 SPONTANEOUS COMBUSTION

Occurrences of spontaneous combustion are relatively infrequent at Bengalla.

6.10.1 Environmental Management

Spontaneous combustion is managed in accordance with BMC various Spontaneous Combustion Management Plans. Inspections occur throughout the shift to identify any areas potentially affected by spontaneous combustion.

6.10.2 Environmental Performance

During the reporting period, two instances of spontaneous combustion were reported within the mining area. One occurred due to dragline spoils, located south of the dragline and across

from the South highwall ramp, affecting dragline line spoil pile. One occurred on the in-pit coal stockpile area due to self-heating coal between a stockpile and road windrow. Immediate Actions were implemented for both instances, including a Remediation Working Plan and ROM Stockpiling Guidelines (A_10300), reporting it to the OCE for further inspection. All instances were notified to the NSW Resources Regulator as required by S.124 (5) (w).

6.10.3 Further Actions

During this period, Bengalla implemented a Spontaneous Combustion TARP aimed at intervening before self-heating coal turns into spontaneous combustion.

6.11 GREENHOUSE GAS

6.11.1 Environmental Management

BMC implements controls to mitigate air quality impacts from greenhouse gas emissions. The revised AQMP has been reviewed to incorporate more detail regarding BMCs management measures and will be submitted to the NSW DHPI in 2026.

6.11.2 Environmental Performance

Bengalla reports greenhouse gas emissions in accordance with National Energy and Greenhouse Gases (NGER) legislation. Each financial yeah Bengalla Mining Company is required to submit to the federal government the emissions from Bengalla Mine as a NGER registered facility. Bengalla Mine also emits over 100kT of $CO_{2\text{-}e}$ each year which means it needs to report its emissions in accordance with the Safeguard Mechanism as a registered Safeguard Facility. Emissions above the baseline for that year need to be offset by retiring Australian Carbon Credit Units (ACCUS).

BMC contributes to research and development initiatives that investigate GHG minimisation (see **Table 16**).

Table 17: Greenhouse Gas Emission Reduction Research and Development Initiatives

Program	Outcomes
Low Emissions Technology Australia (LETA)	Certain Australian black coal producers contribute a voluntary levy on a quarterly basis to the LETA Fund to support the development of low emission coal technology in Australia.
Australian Coal Association Research Programme (ACARP)	Certain Australian black coal producers contribute five cents per tonne of product coal to fund research and the development of technologies that lead to the safe, sustainable production and utilisation of coal.

Table 18: Energy Consumed and Produced FY 2022 to 2025

Energy	FY 2022-2023	FY 2023-2024	FY 2024-2025
Consumed Gigajoule (GJ)	2,870,837	**3,284,653**	**3,058,042**
Produced (GJ)	241,384,833	**268,528,215**	**270,473,160**

Table 19: GHG Emissions FY 2022 to 2025

Greenhouse Gas Emissions	FY 2022-2023	FY 2023-2024	FY 2024-2025
Scope 1 (t CO_2-e)	573,941	626,512	692,775
Scope 2 (t CO_2-e)	54,854	51,155	47,355
Total (t CO_2-e)	**628,795**	**677,667**	**740,130**

GHG Emissions for Calendar Years 2021-2025 and Comparison to Predictions

Annual GHG emissions (Scope 1 and Scope 2) have been compared against the predictions in the *Air Quality and Greenhouse Gas Impact Assessment Continuation of Bengalla Mine* (AQIA) being Appendix G to the EIS. The method used to calculate Scope 1 and Scope 2 emissions is the method that was used in the EIS.

Overall, the annual Scope 1 and Scope 2 GHG emissions estimated for the 2023, 2024 and 2025 calendar years are generally lower than the AQIA predictions for Years 4 to 13 primarily due to reduced materials moved and ROM tonnes mined compared to the EIS.

BMC are required to manage and/or offset their emissions in response to this baseline until otherwise required from the CER. BMC was in excess of their emissions in 2024 and retired Australian Carbon Credit Units (ACCUs) as a result. BMCs baseline is available on the CER website.

6.11.3 Further Actions

BMC has continued to undertake activities to reduce greenhouse gas emissions from Bengalla being:

- Use of fuel-efficient machinery, electric motors and energy efficient lighting systems.
- Regular maintenance in accordance with OEM specifications and recommendations.
- Efficient fuel use by optimising mine design, to reduce travel and queueing time by haul trucks during resource and overburden extraction.
- Optimisation of mining practices e.g. blast design, conveying arrangements.
- Optimisation of engine performance in heavy mobile equipment e.g. studies undertaken in collaboration with OEMs to enhance fuel efficiency and emissions reduction as well as the implementation of alternative engines to improve fuel efficiency.
- Ongoing monitoring of potential biofuel and fuel additive opportunities.
- Ongoing monitoring and assessment of emerging technologies and their applicability and practical application to Bengalla Mine.
- New fleet is purchased with the most fuel-efficient engines available for on the road fleet.

6.12 NON-MINERAL WASTE

6.12.1 Environmental Management

Non-mineral waste generated at Bengalla during 2025 was 5,454t. A total of 2,023t was recycled, representing 76% of the total waste. These figures generally increased from 2024 and 2023. **Table 19** details non-mineral waste tonnes for the period 2022 to 2025.

Table 20: Non-mineral Waste Management

	2025	2024	2023	2022
Total (t)	5,454	3,029	2,775	1,916
Recycled (t)	2,023	2,388	2,226	1,474

6.12.2 Environmental Performance

A total of 5,454t of non-mineral waste was disposed of in 2025 consisting of predominantly scrap metal, oil and general waste.

The major waste streams recycled at Bengalla in 2025 were waste oil 866t, scrap metal 831t and timber 120t this also consisted of Oily Water 40t, paper and cardboard 41t, Oil filters 33t and batteries 32t.

2695t of effluent from onsite facilities was disposed of through Bengalla's wastewater treatment plant.

Comparison to Assessment Predictions and Trends

The EIS Volume 1 Table 84 contains predictions for waste streams. Relative to the two major waste streams:

the waste oil volume of 866t is slightly above the EIS prediction of 526t; and

the scrap metal volume of 831t is well below the EIS prediction of 1,902t due to variable timing of scrap steel removal.

6.12.3 Further Actions

There are no additional actions planned for 2025 regarding the management of non-mineral waste. Normal waste management practice will continue, and BMC are always looking for improvement opportunities for their waste management process.

6.13 MINERAL WASTE

6.13.1 Environmental Management

Management of mineral waste at Bengalla in 2025 was undertaken in accordance with the BMC Acid Rock Drainage (ARD) and Mineral Waste Management Plan.

6.13.2 Environmental Performance

In accordance with the BMC ARD and Mineral Waste Management Plan, BMC maintains a mineral waste inventory of the volumes of inert and potentially acid forming waste disposed of on site and the disposal locations.

The volumes of total mineral waste generated and stored at Bengalla in 2025 (and the previous calendar year) are summarised in **Table 8**.

Comparisons to Assessment Predictions and Trends

The trends for waste rock are influenced by operational decisions. It is anticipated that increased volumes will occur for 2026 (year 11) relative to 2025 (Year 10).

The EIS predicted at Year 8 overburden removal of 55 Million Bank Cubic Meters[1] and at year 15 overburden removal of 65 Million Bank Cubic Meters[1].

The waste rock/overburden volume referenced in **Table 8** for 2025 was within the predicted range of the EIS prediction.

6.13.3 Further Actions

There are no additional actions other than normal practices planned for 2025 regarding the management of mineral waste.

[1] *Bengalla EIS Volume 1, Table 10.*

6.14 ABORIGINAL ARCHAEOLOGY AND CULTURAL HERITAGE

6.14.1 Environmental Management

Bengalla continues to work with Registered Aboriginal Parties (RAPs) regarding aspects of Aboriginal heritage in accordance with the Aboriginal Cultural Heritage Management Plan (ACHMP).

6.14.2 Environmental Performance

All relevant Aboriginal heritage artefacts within the Bengalla Disturbance Boundary were salvaged in 2016 following the approved EIS.

Activities involving ground disturbance in 2025 were subject to desktop assessment for potential impacts to Aboriginal archaeology as part of Bengalla's Ground Disturbance Permit (GDP) process. Alongside the desktops assessments, field surveys were conducted in line with due diligence requirements.

During the planning and assessment phase of Modification 8 – Adjustments to the construction footprint of the proposed Bengalla Link Road (BLR) realignment, an ACHAR was prepared following field assessments completed with RAPs. Six Aboriginal sites were recorded after visual inspections were carried out during the reporting period comprising of Artefact scatter and isolated finds. Two during the ground disturbance permit process, and four during the field survey for BLR. an isolated find. BMC has undertaken measures to avoid impacts to both sites.

Previously identified Aboriginal sites located in ML 1728 and EL 9431 were inspected and the condition of each site was recorded.

6.14.3 Further Actions

BMC will clearly demarcate the remaining new sites. Should any amendments to the ACHMP be required, BMC will lodge the revised plan with the relevant regulatory agencies and stakeholders for comment and then for approval by DPHI.

6.15 NON-ABORIGINAL HERITAGE

6.15.1 Environmental Management

BMC has developed and implements the approved HHMP, which describes the requirements for ongoing management and conservation of the existing non-Aboriginal heritage sites identified in the EIS. Four sites are located within the Project Boundary and five are located adjacent to the Project Boundary. Photos of the sites are presented in **Appendix J**.

6.15.2 Environmental Performance

Annual inspections are undertaken at each site. Annual dilapidation surveys and structural assessments were conducted at the two most significant heritage sites, Bengalla Homestead and Overdene Homestead. These were conducted on23 September, 2025. The results of the inspections and surveys are summarised below.

Bengalla Homestead

The 2025 dilapidation survey of Bengalla Homestead and associated buildings concluded that there appeared to be no further major degradation since the 2024 survey.

Externally, the condition of the homestead and service wing remained stable, and the building is generally in good repair. Minor cracks were observed in the wall plaster and the ceiling in both the main building and the service wing at isolated locations.

Full renovation of the interior of the cottage services building has been undertaken and externally the building is generally in a good state of repair.

Full renovation of the interior of the book keepers cottage has been undertaken and externally the building is generally in a good state of repair.

The garden shed was in a good state of repair and has not deteriorated since the previous inspection.

The condition of the other remaining structures are consistent with previous inspections including the tool shed, and steel water tower.

All buildings and their repair work should continue to be monitored for any signs of cracks caused by foundation movement or mine workings nearby. Regular inspections should be carried out to ensure there is no termite activity in the vicinity of the buildings.

Overdene Homestead

The 2025dilapidation survey of Overdene Homestead concluded that there appeared to be no further major degradation since the 2024 inspection.

The works carried out in the previous years have been successful. The replacement of the roof sheeting and diversion of stormwater away from the building and the previous restoration of the sandstone and brickwork has stabilised the deterioration.

The remaining outstanding items for the external part of the building included the replacement of missing pipe props from the tie rod ends to assist in continually stabilising the structure. The veranda flooring and roof framing, sheeting and flashings still require reinstatement.

Internally, the condition of the cottage appeared to be stable. Installation of a new floor system, restoration of all windows, doors and internal walls was still outstanding. The external downpipe next to entry door is dislodged and the water is seeping into the soil and moistening the foundation soil and progressing internally.

A summary of the 2025 maintenance and preservation works completed by BMC at the Bengalla and Overdene Homesteads is presented in **Table 20**.

Appendix J contains photos from the 2025 inspections at Bengalla and Overdene Homesteads.

Ad hoc opportunistic inspections of several heritage sites were undertaken throughout the reporting period when carrying out other field inspections.

Keys Family Private Cemetery

An annual inspection was undertaken on the Keys Family Private cemetery in December 2025. The cemetery was in good condition with headstones remaining in good condition with no evidence of vandalism or deterioration.

Stockyards

An annual inspection was undertaken of the Stockyards in December 2025. The area was in good repair with a maintenance program being implemented for ongoing ground maintenance. The stockyards remain in good condition.

Old Bengalla

An annual inspection was undertaken of Old Bengalla in December 2025. The existing sandstone wall remains in good condition. The area remains fenced and signage still present.

House Site 1

An annual inspection was undertaken of House Site 1 in December 2025. The site remained fenced and signage was in place. No further works required.

This site is now located within a new Mining Lease ML 1829, which was granted to MACH Energy Australia Pty Ltd in 2023.

House Site 2

An annual inspection was undertaken of House Site 2 in December 2025. The site remained fenced and signage was in place. No further work required.

Blunts Butter Factory

An annual inspection was undertaken of Blunts Butter Factory in December 2025. Fencing around the site remained in good condition with signage in place. No further works required.

Table 21: Medium Term Maintenance of the Bengalla and Overdene Homesteads 2025

Reference	Maintenance	Response	Status
OVERDENE HOMESTEAD			
HHMP Appendix D, Section 6.5	Repair internal render all rooms	Continued being quoted through 2025 for works planned in 2026. 2025 – Preserved condition inspected, no further degradation. To be included in restoration scope	Upcoming
HHMP Appendix D, Section 6.5	Repair remaining damage caused by termites (i.e. that determined not to be integral to structural integrity).	Bait station system installed around house and maintained as per termite management plan. Damage continued being quoted through 2025 for works planned in 2026. 2025 – Included in site pest management 2026 – Included in site pest management	Ongoing
HHMP Appendix D, Section 6.5	Reinstate veranda.	Restoration continued to be designed in 2025 with works planned in 2026. 2025 - Drawings completed to enable market testing and submissions for further approvals to proceed. Documentation to support submission also completed. 2026 – Scope for execution of contracted restoration works in accordance with HHMP	Upcoming
HHMP Appendix D, Section 6.5	Reinstate veranda flooring, including repair of sandstone dwarf wall supporting veranda joists and eastern veranda slab.	Restoration continued to be designed in 2025 with works planned in 2026.	Upcoming
HHMP Appendix D, Section 6.5	Restore or replace woodwork around external openings and paint.	Restoration continued to be designed in 2025 with works planned in 2026. 2025 – Preserved condition inspected, no further degradation. To be included in restoration scope	Upcoming

Reference	Maintenance	Response	Status
HHMP Appendix D, Section 6.5	Replace steel vent grate or block from under Door 7.	This was carried out in 2018 repair works.	Completed
HHMP Appendix D, Section 6.5	Replace floorboards with like for like.	Restoration continued to be designed in 2025 with works planned in 2026.	Upcoming
HHMP Appendix D, Section 6.5	Replace ceiling boards with like for like.	Restoration continued to be designed in 2025 with works planned in 2026.	Upcoming
HHMP Appendix D, Section 6.5	Repair remaining cracks in brick and stonework (D7).	This was carried out in 2018 repair works.	Completed
HHMP Appendix D, Section 6.5	External - Raked cracking in mortar about sandstone lintels above doorways D1, D3 and D5, and Doorway D7 with erosion of sandstone blocks - Eastern chimney: brickwork collapsed - Steel vent under W3 dislodged	This was carried out in 2018 repair works.	Completed
HHMP Appendix D, Section 6.5	Internal - Room R1 – large amount of cracking to render in walls, worst above fireplace - Room R2 – render cracking adjacent fireplace, doors D1 and D2 to ceiling and corners of room - Room R3 – cracks at W3, previous termite damage, concrete hearth dropped further since last inspection (2014) to 40 mm, crack in brickwork of northern wall at 15 mm, doorway cracking at D12, ceiling loose at D6 and above fireplace - Room R4 – old water damage, cracking at W2 and separation of ceiling, some mortar fallen down - Room R5 – cracking of render, loose in various areas, south-western corner full height of wall with separating at the corner, and above window W1; and mortar missing in bottom 3 courses	Restoration continued to be designed in 2025 with works planned in 2026. 2025 – Preserved condition inspected, no further degradation. To be included in restoration scope.	Upcoming

Reference	Maintenance	Response	Status
	- Hallway – extensive cracking to render in walls, and at #8 and D9, render at D3 and D9 leaning out and should be removed, erosion of mortar with cracks above D12 and skirting board at D7.		
BENGALLA HOMESTEAD			
HHMP Appendix C, Section 7.4	**Building 1** – Homestead and Service Wing		
HHMP Appendix C, Section 7.4	Maintain Homestead to ensure stability and prevent further damage to all features	All works carried out in 2019.	Completed
HHMP Appendix C, Section 7.4	Remediate external faults to service wing including, but not limited to the following: - Repoint/repair mortar in lower courses of brickwork to northern face of service wing. - Repoint/repair mortar between Window 19 and Door 30; - Fix gap on northern side of Window 18 between window frame and brickwork; - Loss of mortar and brickwork to single lead brick projections on eastern side; - Damaged air vent grate on eastern elevation; - Loose mortar joints above Window 17; - Address D30 frame deterioration; - Replace missing brickwork on high window on the southern side of service wing; - Minor cracking to brickwork in various locations; and - Remove earthen bund from western wall adjacent to Window 7 as this is preventing water drainage and has caused damage to the plinth. Fix damage to plinth.	All works carried out in 2019.	Completed
HHMP Appendix C, Section 7.4	Investigate the cause of separation, splitting and warping of ceiling planks in Rooms 3 and 4. Repair or replace, if necessary, ceiling planks	All works carried out in 2019.	Completed

Reference	Maintenance	Response	Status
HHMP Appendix C, Section 7.4	Remediate external damage caused by footing defects, including, but not limited to the following: - Cracking above Door 14; - Cracking above Window 10; - Cracking above Window 7; - Cracking above and below Window 17.	All works carried out in 2019.	Completed
HHMP Appendix C, Section 7.4	Remediate internal damage to Room 1, including, but not limited to the following: - Repair cracking in brickwork where exposed by missing plaster; - Repair plaster missing or removed; - Reinstate/replace tiles in fireplace; and - Repair crack in metal plinth.	All works carried out in 2019.	Completed
HHMP Appendix C, Section 7.4	Remediate internal damage to Room 2, including, but not limited to the following: - Cracking in render above archway between Rooms 2 and 3; - Cracking in render above Door 4 and above and below W3; - Cracking in render in southern wall; and - Cracking in brickwork where exposed by removed plaster	All works carried out in 2019.	Completed
HHMP Appendix C, Section 7.4	Remediate internal damage to Room 3, including, but not limited to the following: - Cracking in render above Door 3; - Cracked brickwork in south eastern corner; - Cracking below Window 2.	All works carried out in 2019.	Completed
HHMP Appendix C, Section 7.4	Remediate internal damage to Room 4, including, but not limited to the following: - Render on southern side of Window 1; - Refix skirting board; and	All works carried out in 2019.	Completed

Reference	Maintenance	Response	Status
	- Cracking between ceiling cornice and western wall.		
HHMP Appendix C, Section 7.4	Remediate internal damage to Room 5, including, but not limited to the following: - Cracking in render above Doors 2,3,4,5,7 and 8; - Cracking of archway and cracking of ceiling between archway and ceiling; - Cracking between Doors 7 and 8; and - Cracking around air vent	All works carried out in 2019.	Completed
HHMP Appendix C, Section 7.4	Remediate internal damage to Room 7, including, but not limited to the following: - Cracking below Window 12; and - Cracking above and adjacent to Door 10.	All works carried out in 2019.	Completed
HHMP Appendix C, Section 7.4	Remediate internal damage to Room 9, including, but not limited to the following: - Cracking above Door 9	All works carried out in 2019.	Completed
HHMP Appendix C, Section 7.4	Remediate internal damage to Room 25, including, but not limited to the following: - Active moisture erosion of brick work, possibly rising damp; - Mortar loss to southern wall; and - Loose brickwork below Window 18.	All works carried out in 2019.	Completed
HHMP Appendix C, Section 7.4	Remediate internal damage to Room 26, including, but not limited to the following: - Cracks in brickwork above Door 33 and 34; - Ceiling vent dropped; and - Cracking above Window 14, Window 20 and below 14.	All works carried out in 2019.	Completed
HHMP Appendix C, Section 7.4	Remediate internal damage to Room 27, including, but not limited to the following:	All works carried out in 2019.	Completed

Reference	Maintenance	Response	Status
	- Cracks in brickwork on southern and eastern walls; - Loss of mortar in western wall, investigate active moisture erosion and possible rising damp; - Replace missing brick adjacent to Door 28; and - Repair/replace damp floorboards, if not already remediated as part of rising damp assessment.		
HHMP Appendix C, Section 7.4	Remediate internal damage to Room 28, including, but not limited to the following: - Thinning mortar on western wall; - Missing brickwork adjacent to Door 33; - Cracking in brickwork above Doors 32 and 33; - Investigate cause and remediate of concrete floor crack; - Cracking above Window 15.	All works carried out in 2019.	Completed
HHMP Appendix C, Section 7.4	Remediate internal damage to Room 29, including, but not limited to the following: - Cracking above Doors 31 and 32 and western wall; - Replace missing doorframe; and - Cracking in brickwork above and below Window 16.	All works carried out in 2019.	Completed
HHMP Appendix C, Section 7.4	Remediate internal damage to Room 30, including, but not limited to the following: - Cracking above Door 31 and extending to western wall; - Cracking above Window 17 and 18; - Replace removed skirting boards; - Termite damage in northern wall and Door 31 woodwork, if not already remediated.	All works carried out in 2019.	Completed
HHMP Appendix C, Section 7.4	**Building 2 – 1960 addition** Remove if this addition is impacting on integrity of the 1895 section of the Homestead, with due care that potential archaeological deposits relating to an earlier timber structure are not impacted or are archaeologically investigated	Garage maintained and refurbished for storage and toilet amenities.	Completed

Reference	Maintenance	Response	Status
HHMP Appendix C, Section 7.4	**Building 3 – Underground cistern** Maintain as required to ensure cistern does not deteriorate	Maintained as per maintenance schedule.	Ongoing
HHMP Appendix C, Section 7.4	**Building 4 – Garden Lodge** The Garden Lodge has been assessed as being unsafe and is recommended for removal (Archaeology Australia, 2009)	Restored to original condition 2019.	Completed
HHMP Appendix C, Section 7.4	**Building 5 – Toilet/Shower** Undertake required maintenance to ensure long-term stability of building	Repointed and roofed to maintain building integrity.	Completed
HHMP Appendix C, Section 7.4	**Building 6 - Gazebo** Undertake on-going maintenance	Repointed and roofed to maintain building integrity.	Completed
HHMP Appendix C, Section 7.4	**Building 7 – Laundry** The current structure has been archivally recorded and is earmarked for demolition due to termite damage (Archaeology Australia, 2009)	Restored to original condition 2019.	Completed
HHMP Appendix C, Section 7.4	**Building 8 – Book-keeper's Cottage** Maintain Book-keeper's Cottage to ensure stability and prevent further damage to all features	Restored and improved to liveable condition 2022.	Completed
HHMP Appendix C, Section 7.4	Remediate internal damage to Room 6, including, but not limited to the following: - termite damage to northern walls; - loss of mortar to fireplace brickwork; - ceiling collapse in south-west corner; and - remove wallpaper, using non damaging techniques, if impacting on the integrity of the walls.	Restored and improved to liveable condition 2022.	Completed
HHMP Appendix C, Section 7.4	Remediate internal damage to Room 7, including, but not limited to the following:	Restored and improved to liveable condition 2022.	Completed

Reference	Maintenance	Response	Status
	- buckling of ceiling lining.		
HHMP Appendix C, Section 7.4	**Building 9 – Tennis Court** Maintain in current condition	Maintained as per maintenance schedule.	Ongoing
HHMP Appendix C, Section 7.4	**Building 10 – Water-tower** The water tower has been slated for removal (Archaeology Australia, 2009)	Fell over in 2018 storm and was removed because of safety concerns.	Completed
HHMP Appendix C, Section 7.4	**Building 11 – Machinery shed** Undertake on-going maintenance.	Maintained as per maintenance schedule.	Ongoing
HHMP Appendix C, Section 7.4	**Building 12 – Modern Water-Tower** Undertake on-going maintenance.	Maintained as per maintenance schedule.	Ongoing
HHMP Appendix C, Section 7.4	**Building 13 – Stockyards** Maintain in current condition	Maintained as per maintenance schedule.	Ongoing
HHMP Appendix C, Section 7.4	**Building 14 – Stables (archaeological site)** No works required. Ensure the area is not impacted by works – fence if necessary.	Removed in 2022 because of safety concerns.	Completed
HHMP Appendix C, Section 7.4	**Building 15 – Hay-shed** The hay-shed has been earmarked for removal and an archival recording has been completed (Archaeology Australia, 2009)	Removed in 2022 because of safety concerns.	Completed
HHMP Appendix C, Section 7.4	**Building 16 – Shed and Yard** The shed has been earmarked for removal and an archival recording has been completed (Archaeology Australia, 2009).	Removed in 2022 because of safety concerns.	Completed

In May 2025, DPHI officers attended site to undertake a surveillance inspection focusing on European Heritage management. A review of site historic heritage management practices was undertaken and an inspection of a number of heritage site listed in BMC's Historical Heritage Management Plan. No issues were raised at the time of the inspection and no further correspondence has been received.

6.15.3 Further Actions

Should any amendments to the HHMP be required, BMC will lodge the revised HHMP with relevant regulatory agencies for comment and then with DPHI for approval.

BMC will continue to implement the program of inspections, maintenance and preservation works as identified by the HHMP in the next Reporting Period.

6.16 BIODIVERSITY OFFSET MANAGEMENT

6.16.1 Environmental Management

BMC manages approximately 6,215 ha of offset land. There are three distinct BOAs being Kenalea, Black Mountain and Merriwa River. The location of the BOAs in relation to Bengalla is illustrated on **Figure 8**. SSD-5170 and EPBC Approval 2012/6378 (the EPBC Approval) require BMC to manage in its Biodiversity Offset Areas (BOAs).

Appendix E includes an annual compliance report for 2025 against the conditions of EPBC Approval 2012/6378 (EPBC Compliance Report).

Biodiversity management at the offset properties is undertaken in accordance with the approved Biodiversity Offset Management Plan (BOMP).

The EPBC Compliance Report includes a summary of commitments from the BOMP against activities undertaken during the Reporting Period. There were no non-compliances with these commitments.

During the Reporting Period, BMC undertook management programs on the BOAs including but not limited to:

- weed inspections and weed spraying;
- dog baiting and trapping;
- fox management;
- feral pig management;
- wild deer management;
- fire trail maintenance; and
- summer and winter ecological surveys.

6.16.2 Environmental Performance

Ecological Monitoring

A total of 28 permanent flora monitoring sites and 12 additional monitoring plots were surveyed. A suite of additional surveys was undertaken by a suitably qualified expert, including bird census, terrestrial infra-red (IR) camera surveys for the Spotted-tailed Quoll and feral animals, arboreal IR camera surveys for the Squirrel Glider, ultrasonic bat detection and opportunistic observations.

The data collected in 2025 for this report represents the ninth year of annual monitoring. The BOMP contains measurable indicators and completion criteria for Years 5, 10 and 20 of the Project. The Offsets monitoring program in **Appendix E** compares the measurable indicators and performance criteria for Year 10 against the results of Year 9 (2025) annual monitoring.

The report noted a marked decrease of several variables however this may be attributed to lower rainfall during the survey period. Despite this, most woodland sites are within or above benchmark for most values and the majority of Performance Criteria have consistently been met by many of the monitoring sites.

A 10-year Implementation Plan and Assisted Revegetation Strategy has been developed, with implementation recommended to improve performance and support achievement of the Year 10 Performance Criteria. For further details are provided in the full report in **Appendix E**.

Bushfire Hazard Reduction Burns

There were no hazard reduction burns undertaken on the Biodiversity Offset properties during 2025. However, dry conditions and an electrical storm on 25 November 2025 resulted in the ignition of a bushfire which burnt a total area of approximately 267 ha. The fire was controlled by the RFS the same day as ignition, with further remedial works competed under watch and act conditions in the days following. No anthropogenic environmental harm or contravention of the approval occurred as a result of the event.

Credit Retirement and Stewardship Agreements

BMC have been actively working towards the retirement of credits and finalising Biodiversity Stewardship Agreements (BSA) since 2022. BMC prepared a BSA Application Plan in August 2023. During the reporting period (09 July 2025) BMC provided the NSW DPHI a written update regarding this matter and all consultation undertaken with NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) on this matter.

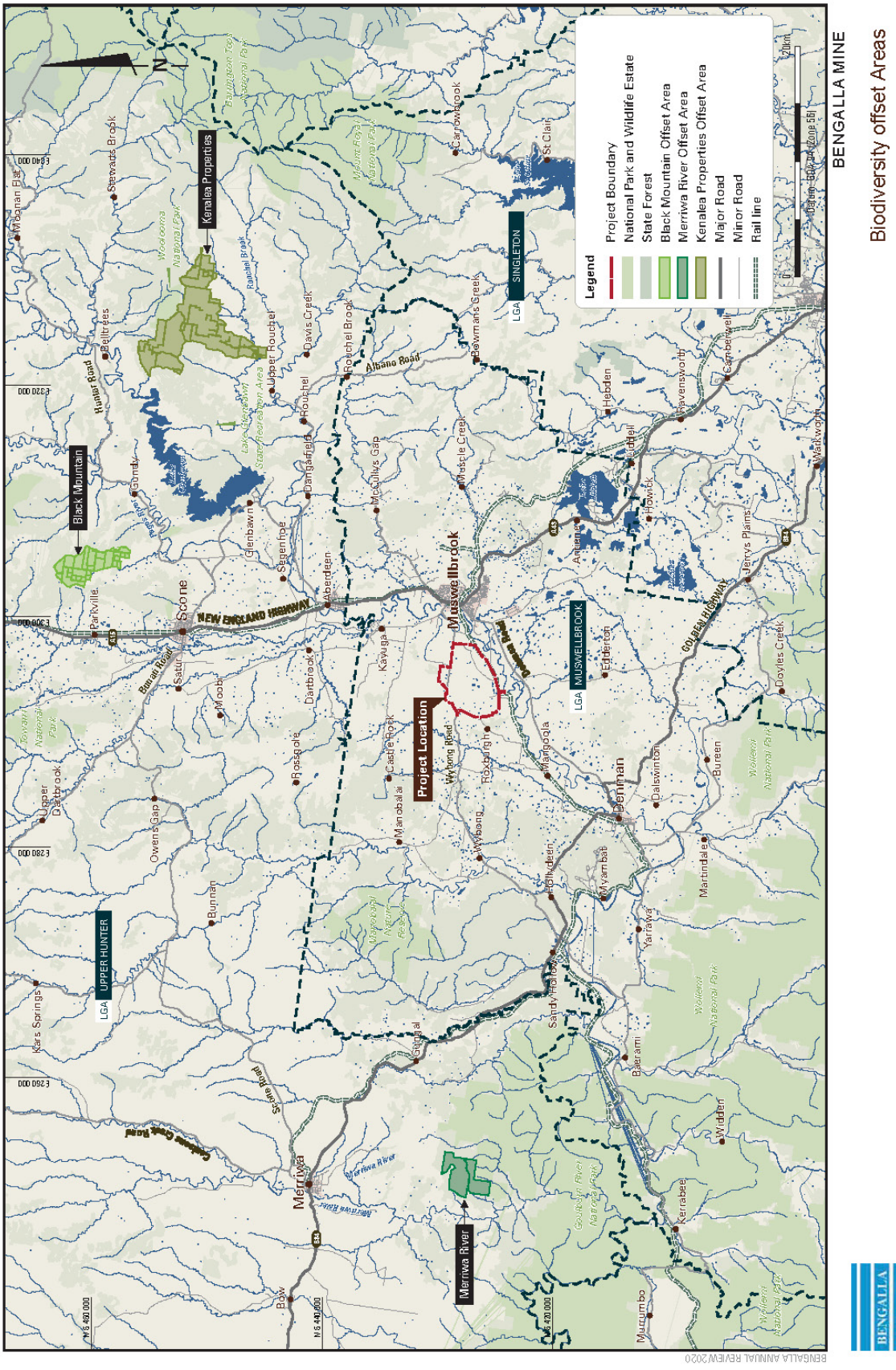
The most recent correspondence received from NSW DCCEEW was 14 April 2025. In the meantime, the offset areas will continue to be owned by the BJV and managed by BMC in accordance with the BOMP.

6.16.3 Further Actions

The assessment against performance criteria indicated that assisted regeneration would be required for the sites to meet the performance criterion by Year 10. An assisted regeneration

plan for the BOAs in order to achieve its targets has been developed and will be implemented in 2026.

BMC will continue to work with DCCEEW and the Nature Markets Offset Division on finalising the outstanding offset matters.


BENGALLA MINE
Biodiversity offset Areas
Legend
Project Boundary
National Park and Wildlife Estate
State Forest
Black Mountain Offset Area
Merriwa River Offset Area
Kenalea Properties Offset Area
Major Road
Minor Road
Rail line
Kenalea Properties
Black Mountain
Merriwa River
Project Location
SINGLETON
MUSWELLBROOK
UPPER HUNTER
LGA
Scone
Muswellbrook
Denman
Merriwa
NEW ENGLAND HIGHWAY
GOLDEN HIGHWAY
Wollemi National Park
Wollemi National Park
Goulburn River National Park
Wollemi National Park
Wollemi National Park
Wollemi

6.17 ON-SITE BIODIVERSITY MANAGEMENT AND MITIGATION

6.17.1 Environmental Management

BMC implements management activities and conducts annual ecological monitoring on mine rehabilitation at varying frequencies in accordance with the following:

- Biodiversity Management Plan (BDMP).
- Rehabilitation Strategy and Rehabilitation Objectives.
- Rehabilitation Forward Program.
- Rehabilitation Management Plan (RMP).
- Ground Disturbance Permits (GDP).

During the Reporting Period, BMC undertook management programs on the mine site and buffer lands including but not limited to:

- weed inspections and weed spraying;
- feral pest management
    - pig trapping and cull program
    - wild dog and fox baiting
    - opportunistic shooting.

6.17.2 Environmental Performance

Biodiversity management at Bengalla is undertaken in accordance with the approved BDMP.

The EPBC Compliance Report (**Appendix E**) contains a summary of commitments from the BDMP against activities undertaken during the Reporting Period. There were no non-compliances with these commitments.

The management, monitoring and performance of rehabilitation at Bengalla during the Reporting Period is described in **Section 8**.

During 2025, the presence of an isolated *Cymbidium canaliculatum* (species of Tiger Orchid) was identified during pre-clearing surveys for vegetation earmarked for clearing for mine progression. The orchid was successfully translocated to a recipient tree and relocated to an area of mine rehabilitation in 2025.

6.17.3 Further Actions

BMC will use the results of the monitoring reports to focus pest and weed management efforts in 2026. BMC will also continue to utilise the GDP management process to identify opportunities to reduce the impact to local ecology on the mine site.

6.18 WEEDS AND PEST MANAGEMENT

6.18.1 Environmental Management

Weed and pest management at Bengalla and its BOA's is undertaken in accordance with the BDMP and BOMP, respectively.

Targeted control programs involving seasonable herbicide application and baiting are implemented based on the findings of regular weed and pest inspections.

6.18.2 Environmental Performance

Weed Management

Weed management is undertaken using boom spray, spot spraying or stem application dependent upon weather, target species and local geography.

- ***Bengalla***

During 2025, approximately 554 ha of weed control was undertaken. Target weed species primarily included African boxthorn, Caster Oil, Green Cestrum, Paterson's Curse, Prickly Pear, St John's Wort, and other general woody weeds. Priority areas for treatment included the pre-clearing areas and rehabilitation areas.

- ***Biodiversity Offset Areas***

Weed management across the BOA's involves quarterly inspections and weed control programs.

Quarterly inspections are undertaken to determine weed control required for each quarter in each of the offset areas. Following identification, weed control commences and quarterly work records of site attendance are submitted which detail the sites treated, area (ha) treated, techniques and chemicals utilised and rates of application.

The chemicals to be utilised are based on their effectiveness depending on the type of weeds present.

The weeds controlled during the Reporting Period included Blackberry, Blue Heliotrope, Lantana, Paterson's Curse, Prickly Pear, St John's Wort, Yellow Bells and other general woody weeds across each BOA.

Table 21 shows total area of weed treatment completed at Bengalla Mine and Bengalla Offset properties from 2022 to 2025.

Table 22: Total Area of Weed Treatment

Location	2025	2024	2023	2022

Bengalla Mine (Ha)	554	196	211	255
Offsets (Ha)	423	387	114	93

Pest Management

Bengalla

A feral pig control program was conducted throughout 2025 at various locations across Bengalla. This involved the installation of feral pig traps using a penning system, with grain and molasses utilised as the main attractant.

Wild dog and fox baiting programs occurred in Autumn and Spring 2024 in collaboration with Local Land Services (LLS) and local wild dog associations. These programs formed part of a broader regional baiting initiative targeting foxes and wild dogs in the Hunter Valley. The LLS is authorised to provide 1080 poisoned baits and ejector capsules for these programs.

During the autumn baiting program, 35 bait stations and four ejectors were installed and monitored over a three-week period, with a total of 117 baits laid. A total of 69 bait takes were recorded, of which 22 were attributed to target species (foxes), resulting in an overall baiting efficiency of 19%. Evidence of bait shyness was detected, with four instances recorded during the campaign.

During the spring baiting program, 35 bait stations and four ejectors were installed again over a three-week period, with a total of 117 baits laid. A total of 53 bait takes were recorded, including 23 by target species (foxes), yielding an overall baiting efficiency of 20%, representing a slight increase from the autumn program. No wild dog takes were recorded. Minor evidence of bait shyness was detected, with one instance recorded. Trail cameras were used during the baiting programs to monitor bait uptake and identify species.

Offset Properties

During the Reporting Period, BMC undertook two four-week wild dog and fox ground baiting programs across the BOAs in Autumn and Spring 2025, in consultation with LLS.

During these baiting programs, a total of 616 baits were laid. Of these, 118 baits were taken by target species, with 90% consumed by foxes and 10% by wild dogs.

Analysis of data over the past three years indicates variability in wild dog bait uptake: 39 in 2022, 36 in 2023, 8 in 2024 and 12 in 2025. This suggests a potential increase in wild dog activity on the offset properties compared to 2024.

In addition, opportunistic feral animal control was undertaken during weed management activities. This included the removal of 35 pigs, three wild dogs, four deer and one rabbit utilising open range opportunistic shooting. BMC will continue to implement annual baiting programs and opportunistic shooting to manage feral animal populations.

6.18.3 Further Actions

Ongoing management of weeds and feral animals at Bengalla and BOA’s will continue during 2026.

6.19 VISUAL AMENITY AND LIGHTING

6.19.1 Environmental Management

BMC mange visual and lighting impacts in accordance with the *Visual Impact Management Plan* (VIMP).

6.19.2 Environmental Performance

Tree Screening Along Public Roads

BMC had undertaken tree screen planting on Wybong Road (in September 2019) and Roxburgh Road (in March 2019 and July 2020). Ongoing maintenance work on the trees will consist of replacement of failed plantings where significant and replacement of guards.

During the previous reporting period, BMC completed consultation with relevant private residences and TfNSW to identify opportunities for visual screening measures along Denman Road. Following this consultation, no stakeholders (including Transport for NSW) permitted the installation of visual screening measures along areas of Denman Road that provided visual mitigations to mine activity.

During the reporting period, BMC installed tree screening on mine-owned land along Wybong road to assist in future mitigation of visual impact of the mine from Wybong road.

6.19.3 Further Actions

The detail design for the realigned of Bengalla Link Road is in progress. Upon completion of the detailed design, an assessment regarding plantings that can be undertaken in locations that have direct views of mining operations will be completed and executed.

7 REHABILITATION

REHABILITATION OBJECTIVES AND FINAL LAND USE

Progressive rehabilitation of disturbed areas is an important aspect of open cut coal mining at Bengalla. Ongoing rehabilitation of areas disturbed by operations has continued throughout the reporting period. Rehabilitation is completed in accordance with BMCs Forward Work Program and BMC Rehabilitation Strategy (RS). Compliance with the site's rehabilitation objectives is reported in the Annual Rehabilitation Report and is based on scientific plot-based monitoring undertaken by experienced rehabilitation consultants Moss Environmental. Results from the rehabilitation monitoring can be viewed in **Appendix H**.

Table 23: Bengalla Rehabilitation Objectives (from SSD-5170 (as modified))

Feature	Objective	Status
Mine site (as a whole)	• Safe, stable and non-polluting	• Ongoing. See **Section 6.13** for a description of Bengalla mineral waste management during 2025.
	• Final landforms designed to incorporate natural micro-relief and natural drainage lines, which, where reasonable and feasible, further avoid straight run drainage drop structures, to integrate with surrounding landforms	• Overburden emplacement and rehabilitation activities are undertaken with the objective of achieving the conceptual final landform approved under SSD-5170 (as modified), Forward Program and Rehabilitation Management Plan.
Overburden Emplacement Area – exposed to Muswellbrook and Denman	• Rehabilitate the entire face with high density woody vegetation as soon as practicable following the completion of mining operations	• Ongoing. Rehabilitation Management Plan describes implementation of HDWV.
Final void	• Designed as a long-term groundwater sink and to maximise groundwater flows across back-filled pits to the final void • Minimise to the greatest extent practicable: o the size and depth of the final void; o the drainage catchment of the final void; o any high wall instability risk; and o risk of flood interaction (flows in and out of the void) • Maximise to the greatest extent practicable the final void landform to be in keeping with the natural terrain features of the surrounding landscape	• Final void designs approved under SSD-5170 to be reviewed at least five years from closure of Bengalla.

Feature	Objective	Status
Agricultural land	• Restore or maintain land capability generally as described in the EIS and shown conceptually in Appendix 9 of SSD-5170.	• Ongoing. Rehabilitation activities are undertaken with the objective of achieving the land capability approved under SSD-5170 and the Rehabilitation Management Plan.
Revegetation areas	• Restore a minimum 10% treed coverage at the mine site • Higher density planting along the riparian zone of the Dry Creek reinstatement, and around the final void	• Noted per Appendix 9 of SSD-5170. • The rehabilitation of riparian areas along Dry Creek and the final void are not within the current Forward Program period.
Dry Creek reinstatement	• No net loss of creek length; • Restore, maintain and/or improve hydrological and ecological function, quality and geomorphic stability; • Incorporate erosion control measures based on vegetation and engineering revetments; and • Revegetate with suitable native species	• Dry Creek reinstatement planned to commence from around 2036 subject to operational progress.
Surface infrastructure	• To be decommissioned and removed, unless RR agrees otherwise	• Stage 3 of the western diversion levee was under construction during 2025. This new stage will be commissioned in 2026.
Community	• Ensure public safety; • Minimise the adverse socio-economic effects associated with mine closure	• Mining areas restricted to BMC personnel and contractors; • Socio-economic impacts to be reviewed at least five years from closure of Bengalla.

As described in Section 8.21.5 of the EIS, a mixture of native bushland and cattle grazing have been identified as the most suitable post-mining land uses for most of the land within the Project Boundary except for the eastern face of the OEA (which will be re-vegetated to contain higher density natural woodland). Grazing and native bushland regeneration has therefore been adopted as the preferred post-mining land use in suitable areas of the site.

7.1.1 Rehabilitation Management

Rehabilitation Status

Rehabilitation at Bengalla is undertaken in accordance with SSD-5170, the current Bengalla Mine Forward Program (1 January 2026 – 31 December 2028) and the RMP.

The Year 1 (20215) Forward Work Program targeted 26.05 ha for HDWV and pasture rehabilitation in the northern OEA. During the reporting period, 19.32 ha of new rehabilitation was shaped to final landform height. Of this, 4.3 ha was topsoiled, hydromulched, and seeded. Additionally, an area of existing rehabilitation in the ecosystem and land use establishment phase was reshaped and returned to the growth media development phase. These areas were

located in the northern OEA to ensure smooth integration of the landform with the new rehabilitation area and the southern OEA to address erosion, improve drainage, and prepare the area for reseeding, as identified through rehabilitation monitoring results.

In addition, a total of 41,400 HDWV tubestock were planted in the northeastern part of the OEA. Following this, the progressive installation of HDWV across existing rehabilitation areas in the southern and eastern OEA has been completed.

The rehabilitation completed for 2024 (previous reporting period), 2025 (this Reporting Period) and the predicted rehabilitation activities for 2026 is summarised in **Table 26**.

Table 24: Bengalla Rehabilitation Status Summary

Mine Area Type	Previous Reporting Period 2024 (ha)	This Reporting Period 2025 (ha)	Next Reporting Period 2026 (ha)[6]
A. Total mine footprint[1]	1,522.84	1,556.17	1,653.74
B. Total Active Disturbance[2]	1,197.34	1,210.26	1,304.93
C. Land being prepared for rehabilitation[3]	0	28.75	2.9
D. Land Under Active Rehabilitation[4]	325.49	317.16	345.91
E. Completed Rehabilitation[5]	0	0	0

Notes:

1. Total mine footprint includes all areas within a mining lease that either have at some point in time or continue to pose a rehabilitation liability due to mining and associated activities. As such it is the sum of total active disturbance, decommissioning, landform establishment, growth medium development, ecosystem establishment, ecosystem development and relinquished lands.
2. Includes all areas ultimately requiring rehabilitation including exploration areas, stripped areas ahead of mining, infrastructure and water management areas, sewage treatment facilities, access tracks and haul roads, topsoil stockpiles, active mining areas, overburden emplacements, tailings dams, etc.
3. Disturbed land that is under decommissioning, landform establishment and growth medium development.
4. Areas under rehabilitation that are being managed to achieve relinquishment.
5. Areas of rehabilitation that have been formally signed off by the RR as having successfully met agreed land use objectives and rehabilitation completion criteria.
6 Data presented for "Next Reporting Period 2026" is consistent with Bengalla Mine Forward Program and RMP.

7.1.2 Rehabilitation Performance

Rehabilitation monitoring at Bengalla is undertaken annually through the implementation of the following:

- a transect-based monitoring program; and
- a rehabilitation audit.

Historically, all monitoring transects established across the rehabilitation were monitored on an annual basis. However, as mining progressed and additional rehabilitation was completed at the site, the density of transects (which is correlated to the area of rehabilitation) increased to the point that the monitoring effort required to assess every transect annually became

impractical. In addition, ongoing annual monitoring of transects was deemed excessive, especially as the rehabilitation becomes better established, mature and ecological successional processes start to slow down.

Consequently, a decision was made in 2024 to change the monitoring frequency for each transect to biennial and establish a rotational schedule whereby half of the transects are monitored in Year A and the second half in Year B (and the alternance then repeats). All transects coded with an even number are monitored in even years and those coded with odd number in odd years. This approach allows for a relatively consistent and reasonable monitoring effort to be maintained every year, without compromising on the quality or scientific validity of the collected datasets.

Accordingly, the geographical scope for the annual rehabilitation audit is generally limited to the areas containing the transects for the given monitoring year, i.e. assessing the broader areas surrounding the transects and whilst travelling to and between monitoring transects. This way, comprehensive coverage of the rehabilitation is achieved every two years.

During the Reporting Period, rehabilitation monitoring was undertaken in November 2025 and assessed 21 existing rehabilitation sites comprising of one Class III pasture site and 20 HDWV sites.

The transect based monitoring conducted for 2025 is presented in **Table 27**, with the locations of each transect shown in Rehabilitation Monitoring report in **Appendix H**.

Table 25: Bengalla Rehabilitation Monitoring Program Transects (2025)

Transect Name	Description	Rehabilitation Established	Monitoring Established
PAS 03	Pasture	2012	2014
HDWV01 (NW1)	High density woodland on Class IV or V land	2005	2009
HDWV03 (NW3)	High density woodland on Class IV or V land	2008	2012
HDWV07 (NW7)	High density woodland on Class IV or V land	2015	2017
HDWV09 (NW9)	High density woodland on Class IV or V land	2016	2018
HDWV11 (NW11)	High density woodland on Class IV or V land	2004	2018
HDWV15 (NW15)	High density woodland on Class IV or V land	2020	2020
HDWV17 (NW17)	High density woodland on Class IV or V land	2020	2020
HDWV19 (NW19)	High density woodland on Class IV or V land	2020	2020
HDWV21 (NW21)	High density woodland on Class IV or V land	2020	2020
HDWV23 (NW23)	High density woodland on Class IV or V land	2020	2021
HDWV25 (NW25)	High density woodland on Class IV or V land	2020	2021
HDWV27 (NW27)	High density woodland on Class IV or V land	2020	2021
HDWV29 (NW29)	High density woodland on Class IV or V land	2021	2021

HDWV31 (NW31)	High density woodland on Class IV or V land	2021	2022
HDWV33 (NW33)	High density woodland on Class IV or V land	2021	2021
HDWV35 (NW35)	High density woodland on Class IV or V land (tubestock)	2022	2022
HDWV37 (NW37)	High density woodland on Class IV or V land (tubestock)	2022	2022
HDWV39 (NW39)	High density woodland on Class IV or V land (tubestock)	2022	2022
HDWV41 (NW41)	High density woodland on Class IV or V land (Direct seeding)	2022	2022
HDWV43 (NW43)	High density woodland on Class IV or V land (tubestock)	2023	2023

Source: Moss Environmental Pty Ltd, 2025

Rehabilitation Monitoring Results

The key findings of the 2025 rehabilitation monitoring program are summarised below:

- One pasture monitoring transect was assessed in 2025 (PAS 03), located in Class III rehabilitation established in 2012. Overall, pasture establishment performance at PAS 03 continued to display a satisfactory performance, with vegetative cover showing a high biomass and feed quality.
- Soil and slope stability were excellent at most HDWV monitoring sites with limited active erosion processes recorded. A few instances of minor rill and sheet erosion were recorded and are likely to require ongoing management. Significant gully and channel erosion were noted as part of the wider walkover audit inspection.
- Protective cover remained above the 70% minimum cover benchmark at all historic rehabilitation areas (HDWV01, HDWV03, HDWV07, HDWV09 and HDWV11).
- Native species in the establishing vegetation communities across the rehabilitation zones have decreased slightly in proportion to exotics in 2025. The wetter conditions could have resulted in the increase in exotic ground covers recorded which outcompeted native species.
- Areas of historic HDWV rehabilitation are well established and have shown minimal change in condition in the past couple of years.
- The density of canopy eucalypts remained unsatisfactory and will need to be increased through supplementary infill tree plantings.
- Overall, it is considered that there is adequate potential for the established communities to be self-sustainable.
- Newer HDWV rehabilitation (established since 2020 under the RMP) was highly variable in condition, influenced by the different revegetation techniques and approaches implemented.
- In total, only 5 of the 20 monitoring sites met the defined tree density benchmark. However, this is an improvement on the previous year's results.

- Soil results generally indicated no key deficiencies in the various growth media, except for pH at the majority of sites and salinity at two sites. The results from the 2025 monitoring are currently outside completion criteria for pH however these are likely to reduce over time.
- Additional issues observed during the walkover audit and requiring management inputs included weed infestations (particularly of Galenia, African Boxthorn and Prickly Pear) and insufficient incorporation of artificial habitat features.

For further detail, the full rehabilitation monitoring report is provided in **Appendix H**.

7.1.3 Further Actions For the Next Reporting Period

Rehabilitation activities for 2025 will be carried out generally in accordance with the Forward Program and Rehabilitation Management Plan subject to operational progress.

Weed control measures will continue over areas of previous rehabilitation as part of Bengalla overall weed management program.

Remediation works identified in GeoFluv structures are under review to define ongoing maintenance strategy. This will be continued during 2026.

BMC will undertake the recommended actions detailed in **Appendix H** where reasonable and feasible that have been identified as part of the 2025 rehabilitation monitoring program.

BMC is in the process of gaining modification of SSD-5170 which in part has elements associated with the final landform. As part of this modification application and ongoing closure planning, BMC engage suitably qualified experts to complete Landform Evolution Modelling to assess the long-term stability of structures and the post-mining landform in accordance with the relevant legislation and best-practice industry information.

8 COMMUNITY RELATIONS

8.1 COMMUNITY ENGAGEMENT

BMC undertook a range of community engagement activities during 2025.

Bengalla Community Consultative Committee (CCC) meetings.

The meetings were held in February, May, August, and November 2025. Minutes of each of these meetings are available on the BMC website. The CCC provides a forum for constructive dialogue and discussion enhancing the relationship between the community and Bengalla. The CCC representatives act as a point of contact to provide feedback between Bengalla and the community.

Near neighbour consultation regarding impacts, sale of land and other interactions.

Upper Hunter Mining Dialogue School Mines Tours

Four tours were held with a total of 125 students from Muswellbrook Public School, Denman Public School, Singleton Christian College, and Muswellbrook High School participating.

8.2 COMMUNITY CONTRIBUTIONS

BMC contributes to programs identified by, and preferably in partnership with, the local community. The BMC Community Support Team (CST) meets regularly to assess requests from the local community for donations, sponsorship, and in-kind contributions. Many projects and events have been developed and supported through sponsorship funding and assistance from the BMC CST who provide their time and expertise towards these initiatives. During the Reporting Period some of the groups, schools and clubs supported through approved applications with the CST are pictured below and include:

- Muswellbrook South Public School
- Denman Pony Club
- Wybong Community Hall
- Blackroo Community Indigenous Corporation
- Rotary Club of Muswellbrook
- Sandy Hollow Charity Motor Fest
- Aberdeen Highland Games
- Merriwa Springtime Show
- Muswellbrook Amateur Theatrical Society
- Muswellbrook Football Club
- Aberdeen Junior Rugby League
- Muswellbrook Polocrosse

During 2025, BMC contributed to the education and career development of students from Muswellbrook, Aberdeen, Singleton and Scone High Schools with the provision of undergraduate scholarships. BMC awarded eight (8) scholarships valued at $5,000 each to local students pursuing an undergraduate degree. Bengalla will also continue to award the

Bengalla Undergraduate Mining Scholarship for students pursuing a career in Engineering, Human Relations, Accounting, Health and Safety, Surveying, Information Technology or Geology which includes paid vacation work at Bengalla. BMC will continue to support local students with scholarship programs again in 2026. In addition, each year in partnership with MIGAS, BMC takes on local apprentices so that at any one time there are a minimum 16 apprentices employed by BMC. In 2025, eight first year apprentices commenced employment, and they will be undertaking their diesel mechanic and electrical studies whilst also working onsite. This brings the total number of apprentices onsite in 2025 to 28.

The work experience/placement program with local High Schools continued in 2025, offering 14 placements to local students and the opportunity to experience the various careers in the mining industry. In addition to this Bengalla attended 5 Careers Information sessions aimed at providing information on careers in mining.



Figure 11: Muswellbrook South Public School Colour Run



Figure 12: Muswellbrook Amateur theatrical Society - "First Date" a musical Comedy



Figure 13: Merriwa Spring Time Show



Figure 14: NCHA National Finals Show 2025



Figure 15: Upper Hunter Stock Dog Challenge

BMC Community Development Fund (CDF)

The CDF provides funding that is allocated by BMC to support the local community to build community capacity, address development challenges and to take advantage of emerging opportunities. Some of the organisations and projects funded from the CDF in 2025 included:

- Merriwa Festival of the Fleeces
- Murrurundi King of the Ranges
- Denman Football Club- Large screen TV
- Polly Farmer Foundation- Muswellbrook Follow the Dream Program
- Denman Chamber of Commerce- Denman Food and Wine Affair

Community Partnerships

In 2025, BMC sponsored and partnered with local community groups including:

- Muswellbrook Shire Council (MSC) for the Blue Heeler Film Festival, Muswellbrook Art Prize and the Easter Family Fun Day
- The Bengalla Upper Hunter Show
- Muswellbrook Race Club Bengalla Race Day
- Muswellbrook PCYC Health and Fitness Resource
- Upper Hunter Conservatorium of Music
- Upper Hunter Education Fund
- Group 21 Rugby League Competition Naming Rights
- Muswellbrook Chamber of Commerce and Industry Business Awards
- Muswellbrook Netball Association Major Sponsor
- Muswellbrook Touch Football Association Major Sponsor
- Sponsorship of School Presentation Days in Muswellbrook, Aberdeen, Scone, and Denman

Voluntary Planning Agreement

BMC provides funds to MSC according to the Voluntary Planning Agreement (VPA). A total of $899,900 was provided/allocated under the VPA to MSC during the Reporting Period.

Other Community Benefits

In addition, BMC provides funds towards events, organisations, clubs, and charities in the local community. The following funds were allocated/provided during the Reporting Period:

- Community Development Fund: $302,230
- 2025 Scholarships allocated - eight local scholarships valued at $5,000 each and two undergraduate Mining Scholarships valued at $8,500 per year: $57,000
- Bengalla currently has a total of 19 Undergraduate Mining Program students whose Scholarship are valued at $8,500 per student per year working across the business.
- CST and Sponsorships: $440,241

8.3 COMMUNITY COMPLAINTS

BMC maintains a register of complaints and a complaints hotline (1800 178 984) which operates 24 hours, 7 days per week. BMC received 23 complaints during the Reporting Period, a decrease compared to the 37 complaints in 2024.

During the Reporting Period, the most common environmental complaints raised by complainants related to blasting (18) and air quality (5) making up 100% of the total complaints received. One complainant accounted for 73% of all complaints during 2025. **Figure 12** shows the environmental complaints trend from 2020 to 2025.

A summary of complaints received during the Reporting Period is provided in **Figure 13**.

BMC responds to complaints by assessing whether any action is required. If action is undertaken those actions are generally recorded and displayed in the complaints register displayed on the BMC website.

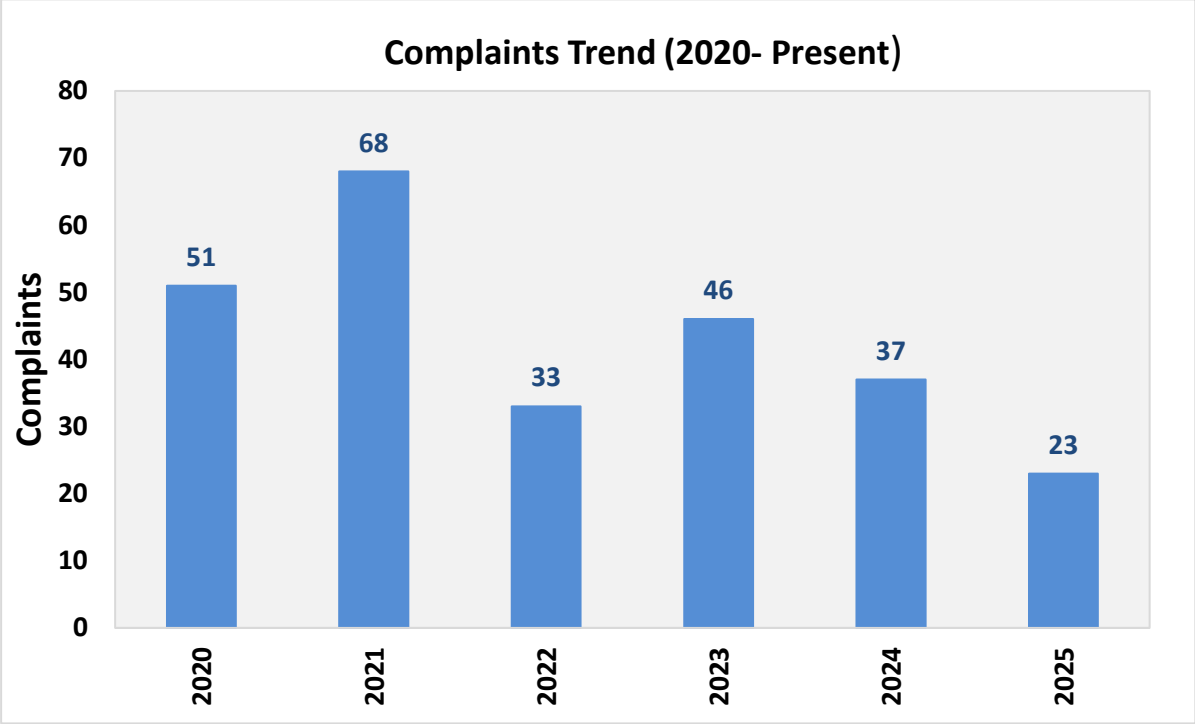


Figure 16: Environmental complaints received for the previous 6 years

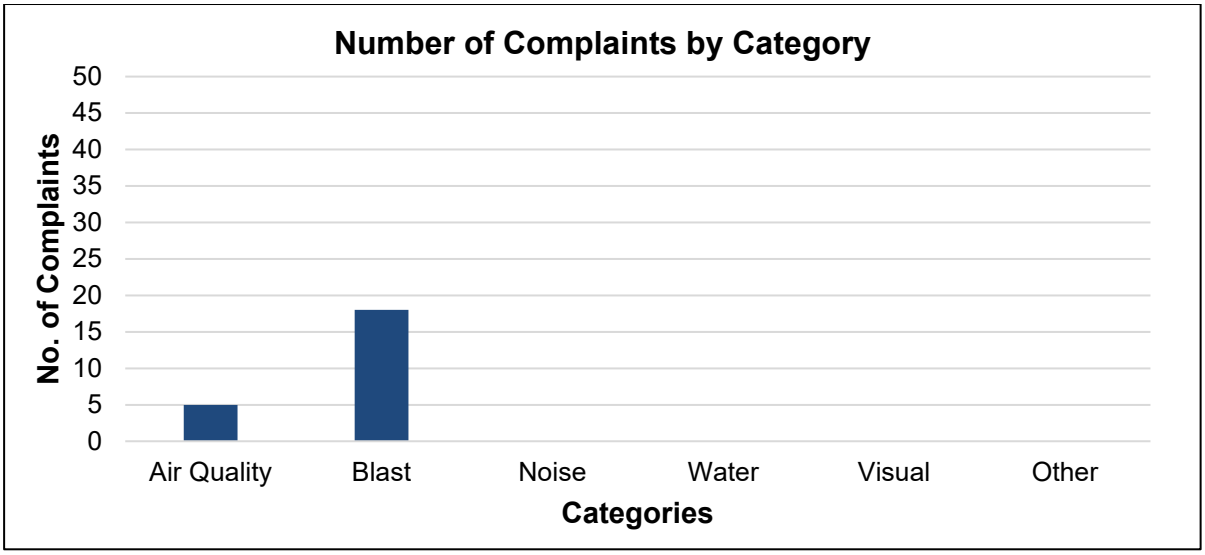


Figure 17: Environmental Complaints Received 2025

9 INDEPENDENT ENVIRONMENTAL AUDIT

This section discusses the requirement for an Independent Environmental Audit (IEA) of the development the subject of SSD-5170.

9.1 SSD-5170

In accordance with Schedule 5, Condition 9 of SSD-5170, BMC is required to commission an IEA of Bengalla within 1 year of the commencement of SSD-5170 (i.e. 2016) and every 3 years thereafter.

The most recent IEA was conducted in November 2025 with the audit report finalised and submitted to the Department of Planning, Housing and Infrastructure on 13 March 2026. Actions arising from this audit are being addressed and will be detailed in future Annual Reviews.

The next IEA is scheduled to be completed in 2028.

Correspondence received from Department of Climate Change, Energy, the Environment and Water (DCCEEW) on 25 September 2025 requesting Bengalla conduct an independent audit of compliance as per Condition 14 of EPBC2012/6378. BMC discussed including this independent audit as part of the SSD-5170 Schedule 5, Condition 9 Independent Environmental Audit that was already being scheduled.

As a result, DCCEE requested a copy of the Independent Environmental Audit Report which was submitted on 13 March 2026.

10 REPORTABLE INCIDENTS OR EXCEEDANCES

Table 26 provides details of matters or exceedances during the Reporting Period that were reported by BMC to regulatory authorities.

Table 26: Reportable Matters or Exceedances 2024

No	Date	Reported To	Nature	Details	Action Taken	Matter Status
1	6 January 2025	DPHI	Air Quality	Potential exceedance of 24-hour air quality criteria at PM10-1	Expert report (concluding BMC did not exceed criteria) supplied to DPHI. BMC also supplied operations summary for relevant date to DPHI.	No further action required. Completed and closed.
2	7 January 2025	DPHI	Blast-Overpressure	Potential exceedance of air blast overpressure criteria at Moore Compliance Monitor site	BMC supplied requested blast monitoring data and operations summary for relevant date to DPHI	BMC issued with DPHI Warning letter on 25 June 2025, regarding breach of Section 4.2 of the Environmental planning and Assessment Act 1979. No further action required. Completed and closed.
3	23 January 2025	EPA	Blast- Fume	Potential Blast Fume	NSW EPA issued a s191 (under the Protection of the Environment Operations Act 1997) Notice to Provide Information and Records.	BMC have responded to this matter and no further action was taken by the EPA.
4	23 February 2025	DPHI	Air Quality	Potential exceedance of 24-hour air quality criteria at PM10-3	Expert report (concluding BMC did not exceed criteria) supplied to DPHI. BMC also supplied operations summary for relevant date to DPHI.	No further action required. Completed and closed.
5	01 March 2025	DPHI	Air Quality	Potential exceedance of 24-hour air quality criteria at PM10-3	Expert report (concluding BMC did not exceed criteria) supplied to DPHI. BMC also supplied operations summary for relevant date to DPHI.	No further action required. Completed and closed.

No	Date	Reported To	Nature	Details	Action Taken	Matter Status
6	28 August 2025	DPHI	Air Quality	Recorded all-source exceedance of 24-hour air quality criteria at PM10-1	Expert report (concluding BMC did not exceed criteria) supplied to DPHI. BMC also supplied operations summary for relevant date to DPHI.	No further action required. Completed and closed.
7	9 September 2025	DPHI	Air Quality	Recorded all-source exceedance of 24-hour air quality criteria at PM10-1	Expert report (concluding BMC did not exceed criteria) supplied to DPHI. BMC also supplied operations summary for relevant date to DPHI.	No further action required. Completed and closed.
8	27 September 2025	DPHI	Air Quality	Recorded all-source exceedance of 24-hour air quality criteria at PM10-1	Expert report (concluding BMC did not exceed criteria) supplied to DPHI. BMC also supplied operations summary for relevant date to DPHI.	No further action required. Completed and closed.
9	21 October 2025	DPHI	Air Quality	Recorded all-source exceedance of 24-hour air quality criteria at PM10-3	Expert report (concluding BMC did not exceed criteria) supplied to DPHI. BMC also supplied operations summary for relevant date to DPHI.	No further action required. Completed and closed.
10	8 November 2025	DPHI	Air Quality	Recorded all-source exceedance of 24-hour air quality criteria at PM10-1	Expert report (concluding BMC did not exceed criteria) supplied to DPHI. BMC also supplied operations summary for relevant date to DPHI.	No further action required. Completed and closed.

No	Date	Reported To	Nature	Details	Action Taken	Matter Status
11	14 December 2025	DPHI	Air Quality	Recorded all-source exceedance of 24-hour air quality criteria at PM10-1	Expert report (concluding BMC did not exceed criteria) supplied to DPHI. BMC also supplied operations summary for relevant date to DPHI.	No further action required. Completed and closed.
12	31 December 2025	DPHI	Air Quality	Recorded all-source exceedance of Annual Average deposited dust level recorded at D27 monitor	Expert Investigation Report (concluding that BMC was compliant with SSD-5179 Schedule 3 Condition 16) supplied to DPHI. BMC also supplied Annual operations summary to DPHI.	No further action required. Completed and closed.
13	31 December 2025	DPHI	Air Quality	Recorded all-source exceedance of Annual Average PM10 level recorded at PM1 HVAS monitor	Expert Investigation Report (concluding that BMC was compliant with SSD-5179 Schedule 3 Condition 16) supplied to DPHI. BMC also supplied Annual operations summary to DPHI	No further action required. Completed and closed.

10.1 ACTIONS TO BE TAKEN TO PREVENT ENVIRONMENTAL INCIDENTS

BMC seeks to continuously improve environmental and community performance through training of employees and contractors and establishment and implementation of the BMC environmental management system.

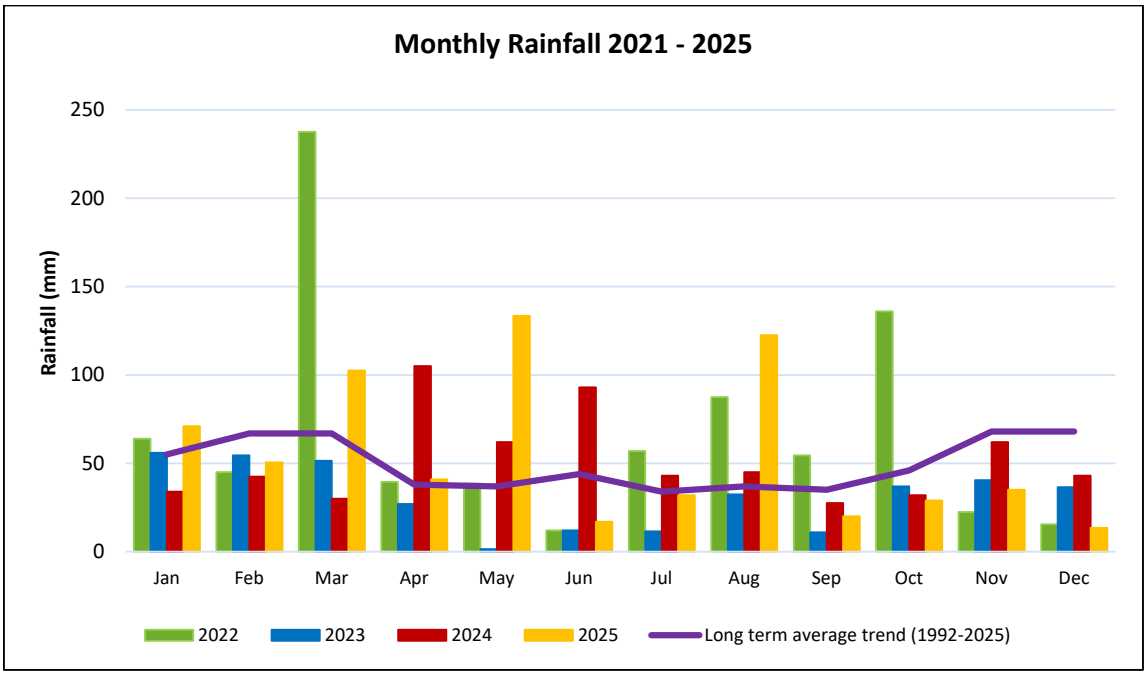
11 ACTIVITIES PROPOSED IN THE NEXT REPORTING PERIOD

A summary of key environmental management activities proposed for 2025 is presented in **Table 27.** Progress against these activities will be reported in the next Annual Review.

Table 27:Environmental Management Activities Proposed for 2025

Area / Issue	Actions Proposed	Timeline for Implementation
Air quality	Continue installation and commissioning of updated Air Quality monitoring network.	August 2026 (subject to change due to delivery time of monitors, mains power supply to monitor site and easement registration).
Regulatory	SSD-5170 Modification Application 6 currently on hold.	On hold.
Regulatory	SSD-5170 Modification 9 Application	Q2 2026
Audit	Engage independent environmental auditor as per the 3-yearly audit requirements.	Audit completed in November 2025. Final report Issued Q1 2026 to be provided as an addendum to this report.
Management Plans	Undertake reviews of management plans in accordance with SSD-5170 (as required)	To be progressed during 2026.
Tree Screening	Progress Wybong Road tree screening (Schedule 3, Condition 40 and 41A of SSD-5170).	To be progressed during 2026 where opportunities identified.
Offsets	Progress long-term security of biodiversity offset areas (Schedule 3, Condition 28 of SSD-5170).	To be progressed during 2026.
Rehabilitation	Undertake new rehabilitation and installation of HDWV into existing rehabilitation according to the Rehabilitation Management Plan and Forward Program. Continue implementation of Rehabilitation Strategy (Schedule 3, Condition 47 of SSD-5170).	To be progressed during 2026.
Regulatory	SSD-5170 Modification 8 approval and commencement for Bengalla Link Road realignment.	2026

Appendix A
Meteorological Monitoring Summary



Graph A1
Bengalla Monthly Rainfall 2022 to 2025

Table A1
Monthly Temperatures 2025

Month	Minimum Daily Temperature (°C)	Maximum Daily Temperature (°C)
January	10.2	40.43
February	4.1	38.0
March	11.7	37.0
April	5.5	29.6
May	5.0	25.3
June	-3.4	21.2
July	-3.4	20.3
August	-1.0	23.2
September	1.3	29.2
October	3.1	35.7
November	2.4	36.7
December	13.8	39.8

Figure A1
Bengalla January 2025 Windrose

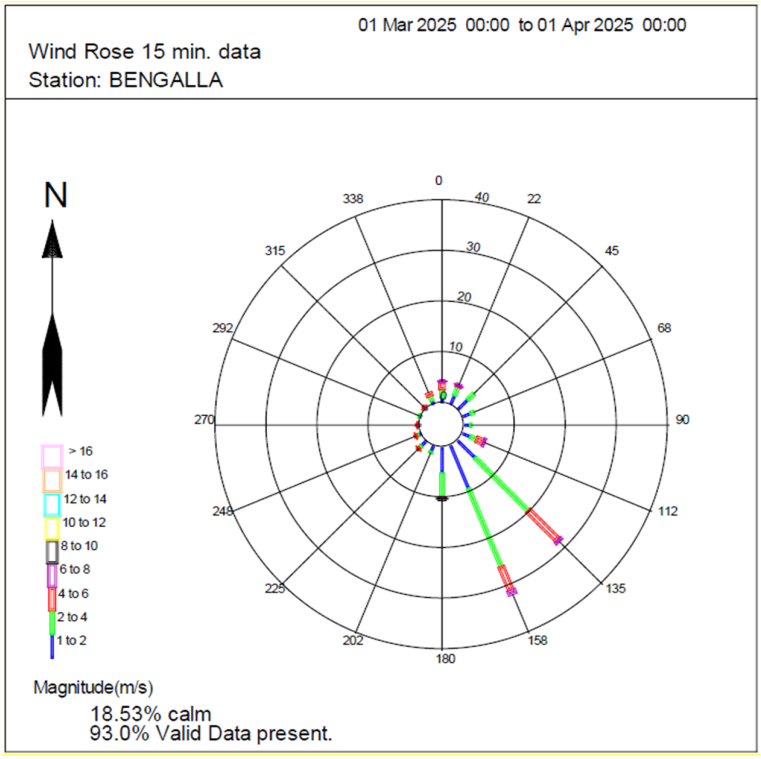


Figure A2
Bengalla February 2024 Windrose

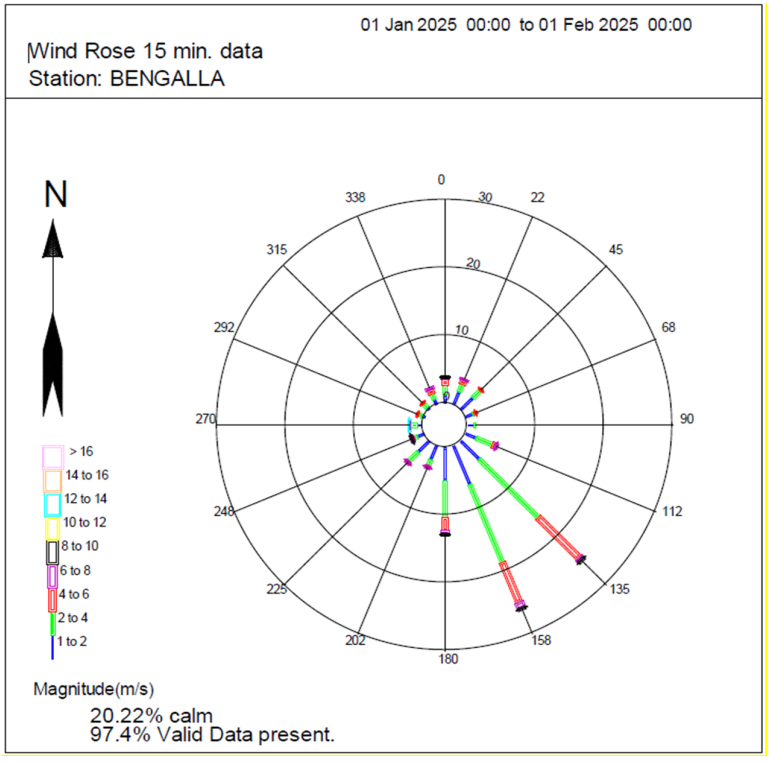


Figure A3
Bengalla March 2024 Windrose

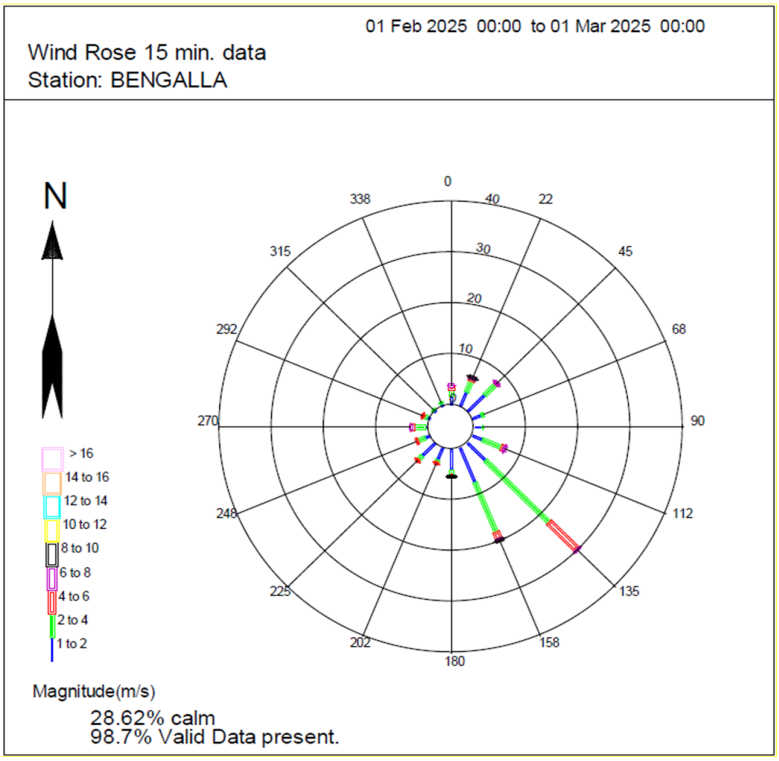


Figure A4
Bengalla April 2024 Windrose

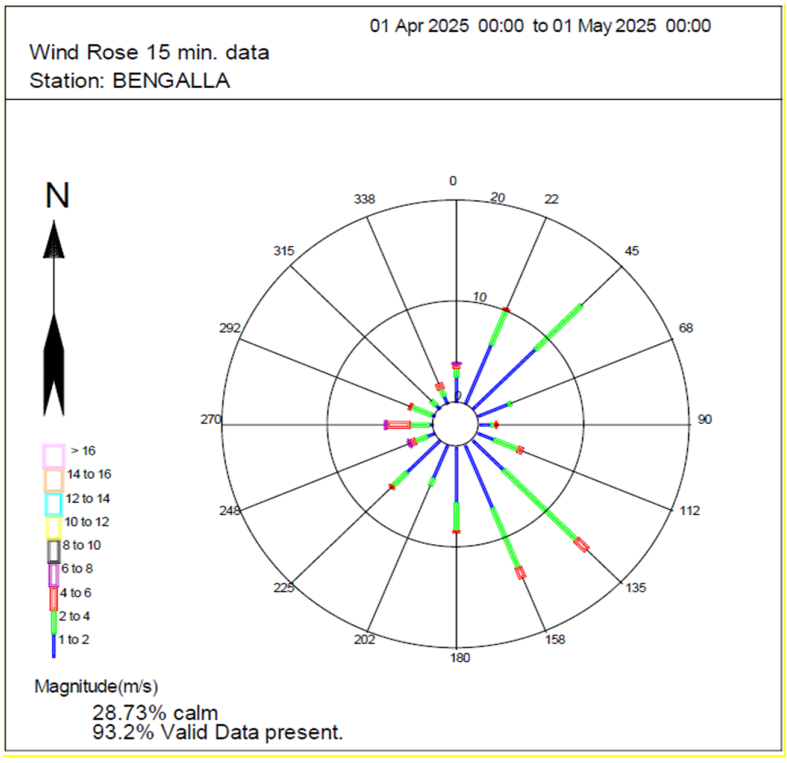


Figure A5
Bengalla May 2024 Windrose

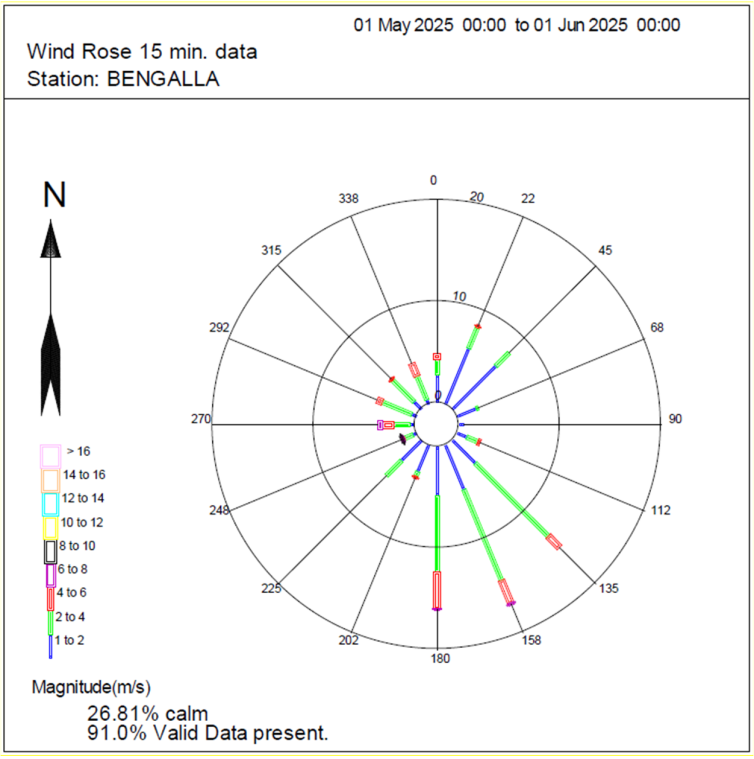


Figure A6
Bengalla June 2024 Windrose

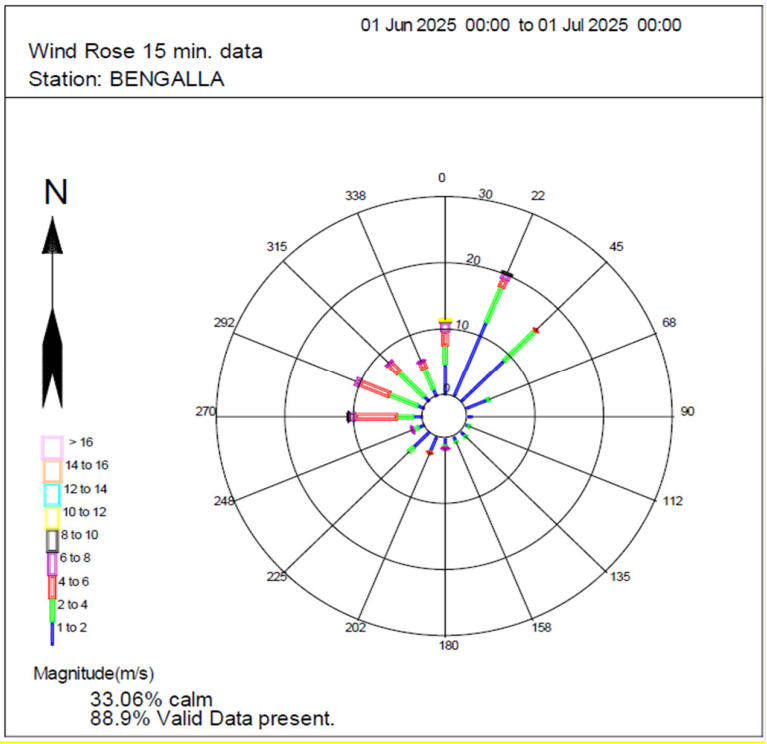


Figure A7
Bengalla July 2024 Windrose

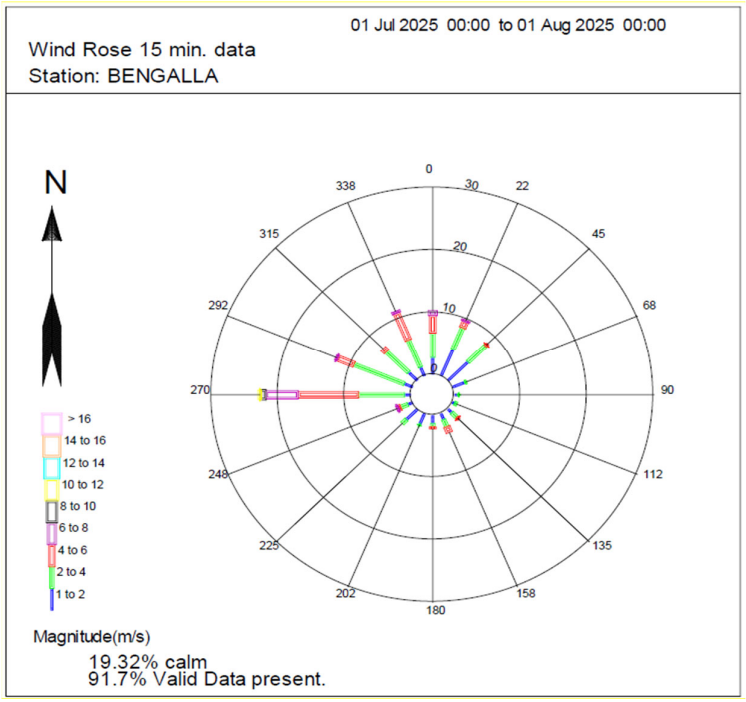


Figure A8
Bengalla August 2024 Windrose

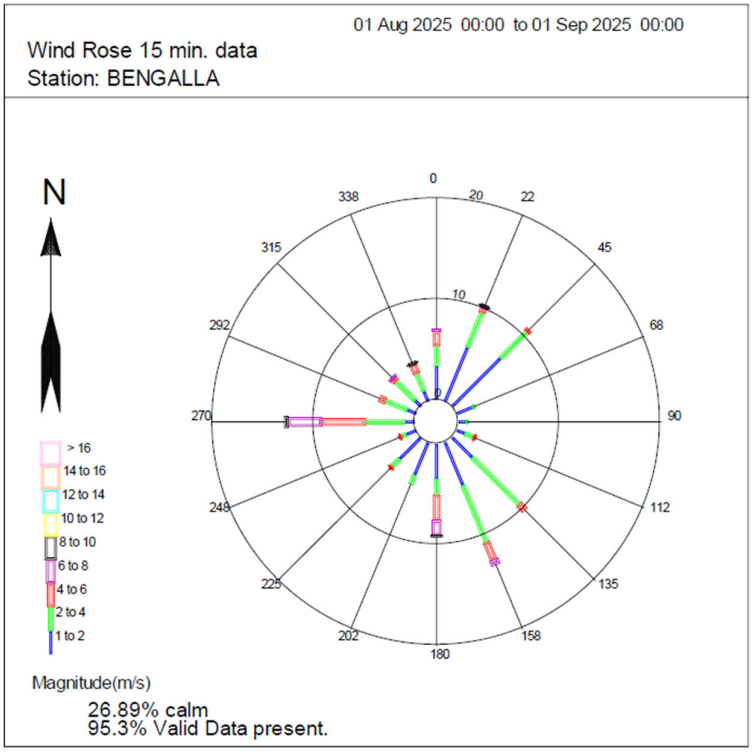


Figure A9
Bengalla September 2024 Windrose

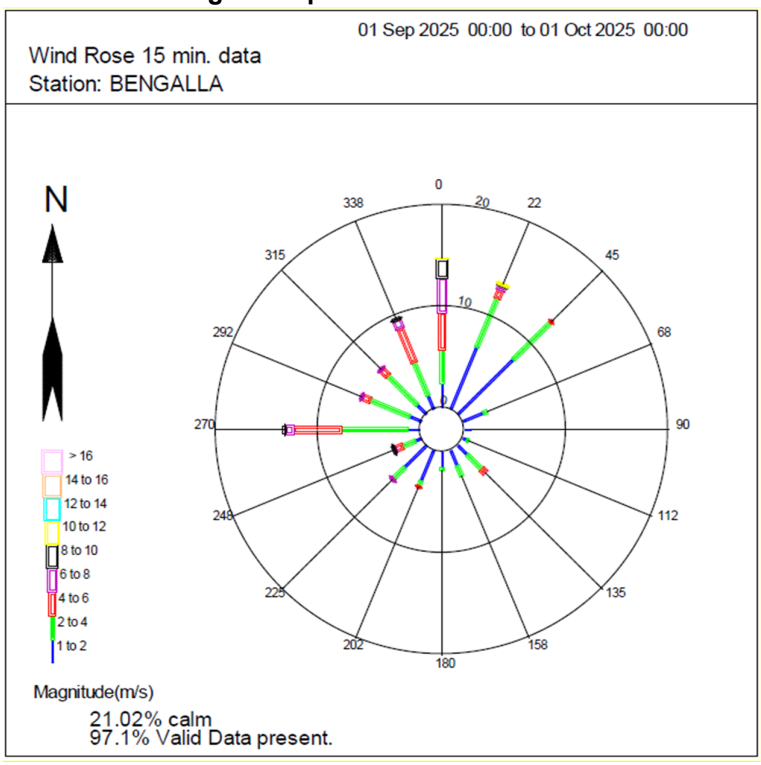


Figure A10
Bengalla October 2024 Windrose

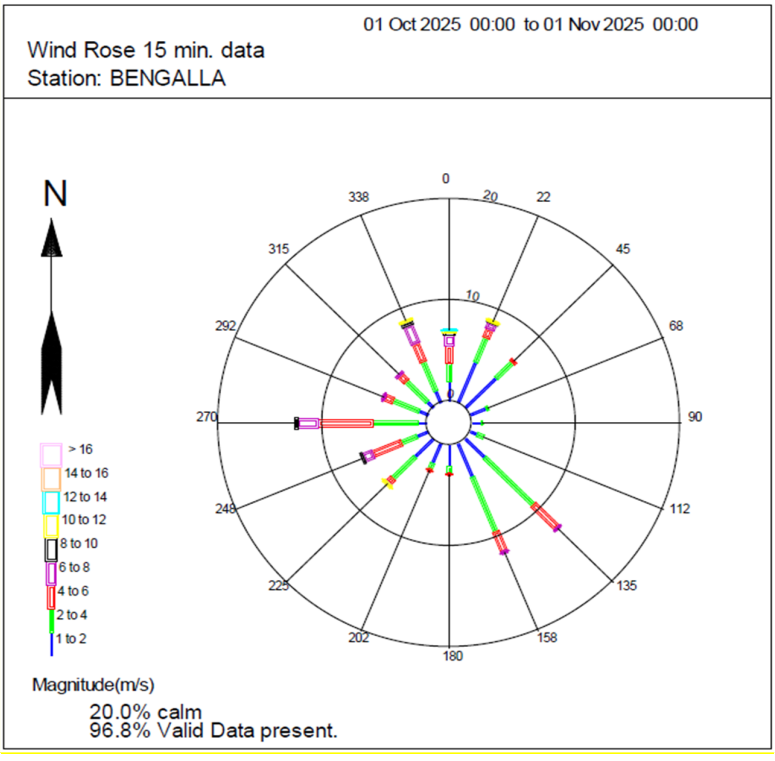


Figure A11
Bengalla November 2024 Windrose

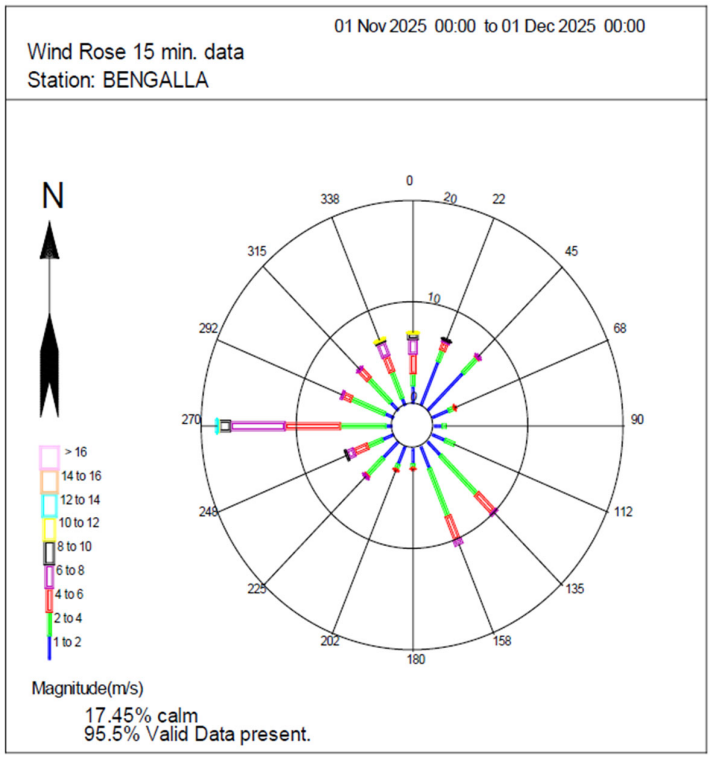
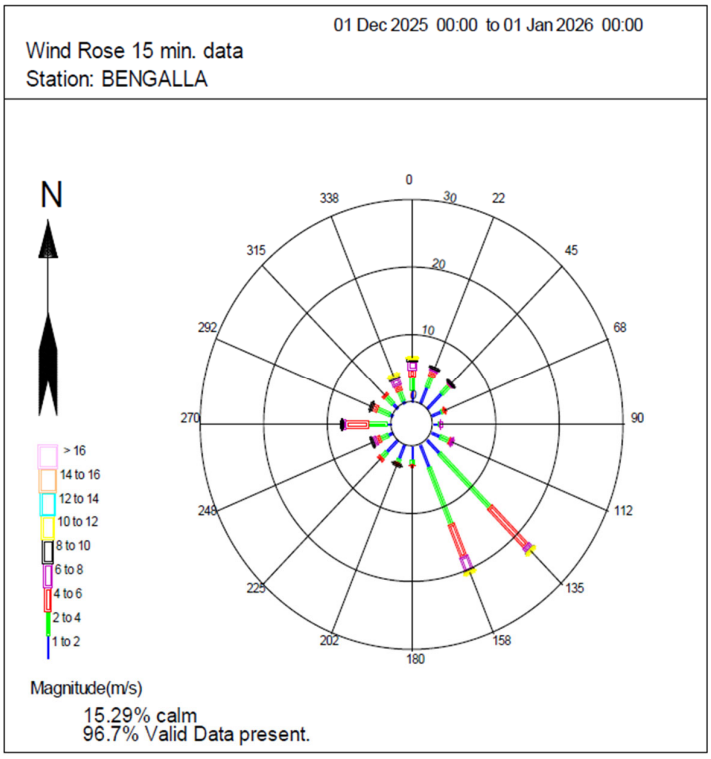


Figure A12
Bengalla December 2024 Windrose



Notes:
Sourced from Benchmark Monitoring.

Appendix B

Noise Monitoring Summary

Table B1
Summary of Compliance Attended Noise Monitoring Results 2025

Site	Month	Met Conditions within Range? [3]	BMC only LA_{eq} dB [1]	BMC Impact Assessment LA_{eq} criterion [1, 4]	BMC only LC_{eq} dB [2]	BMC Impact Assessment LC_{eq} criterion [2, 4]	BMC only $LA_{1,1\ min}$ dB [5]	BMC $LA_{1,1\ min}$ criterion [4]	Exceedance dB
AN01	Jan-25	Yes	30	35	50	60	37[6]	45	No
	Feb-25	Yes	27	35	52	60	36[6]	45	No
	Mar-25	Yes	28	35	47	60	35[6]	45	No
	Apr-25	Yes	33	35	54	60	42[6]	45	No
	May-25	Yes	28	35	54	60	37[6]	45	No
	Jun-25	Yes	31[6]	35	54	60	39[6]	45	No
	Jul-25	No	27	35	52	60	40[6]	45	No
	Aug-25	No	26	35	45	60	28	45	No
	Sep-25	Yes	IA	35	IA	60	IA	45	No
	Oct-25	Yes	25	35	46	60	33[6]	45	No
	Nov-25	Yes	IA	35	IA	60	23[6]	45	No
	Dec-25	No	27	35	47	60	33[6]	45	No

Site	Month	Met Conditions within Range? [3]	BMC only LA_{eq} dB [1]	BMC Impact Assessment LA_{eq} criterion [1, 4]	BMC only LC_{eq} dB [2]	BMC Impact Assessment LC_{eq} criterion [2, 4]	BMC only $LA_{1,1\ min}$ dB [5]	BMC $LA_{1,1\ min}$ criterion [4]	Exceedance dB
AN03	Jan-25	Yes	34	40	57	60	41[6]	45	No
	Feb-25	Yes	31	40	NM	60	IA	45	No
	Mar-25	Yes	IA	40	IA	60	IA	45	No
	Apr-25	Yes	IA	40	IA	60	IA	45	No
	May-25	No	NM	40	IA	60	IA	45	No
	Jun-25	Yes	IA	40	IA	60	IA	45	No
	Jul-25	No	28	40	56	60	30	45	No
	Aug-25	No	IA	40	IA	60	IA	45	No
	Sep-25	Yes	IA	40	IA	60	IA	45	No
	Oct-25	Yes	IA	40	IA	60	IA	45	No
	Nov-25	No	IA	40	IA	60	IA	45	No
	Dec-25	Yes	25	40	NM	60	NM	45	No

Site	Month	Met Conditions within Range? [3]	BMC only LA_{eq} dB [1]	BMC Impact Assessment LA_{eq} criterion [1, 4]	BMC only LC_{eq} dB [2]	BMC Impact Assessment LC_{eq} criterion [2, 4]	BMC only $LA_{1,1\ min}$ dB [5]	BMC $LA_{1,1\ min}$ criterion [4]	Exceedance dB
AN04	Jan-25	Yes	29	35	50	60	40[6]	45	No
	Feb-25	Yes	IA	35	IA	60	IA	45	No
	Mar-25	Yes	IA	35	IA	60	IA	45	No
	Apr-25	Yes	IA	35	IA	60	IA	45	No
	May-25	No	32	35	54	60	**46**[6]	45	N/A
	Jun-25	No	**39**	35	59	60	**46**[6]	45	N/A
	Jul-25	No	34	35	51	60	42[6]	45	No
	Aug-25	No	35	35	58	60	36	45	No
	Sep-25	Yes	34	35	51	60	**46**[6,8]	45	No[8]
	Oct-25	Yes	IA	35	IA	60	IA	45	No
	Nov-25	No	**38**[6,7]	35	**61**[6.7]	60	**49**[6,7]	45	N/A
	Dec-25	Yes	30	35	48	60	38[6]	45	No

Source: Bridges Acoustics (2025)

Notes *(modified from Bridges Acoustics, 2025)*

1. *LAeq,15minute operational noise levels for BMC in the absence of all other noise sources.*
2. *LCeq,15minute operational noise levels for BMC in the absence of all other noise sources.*
3. *'Yes' denotes meteorological conditions result in relevant criteria being applicable. 'No' denotes meteorological conditions are outside those specified in NSW Industrial Noise Policy.*
4. *From SSD-5170 (as modified) and EPL 6538. Monitoring locations AN02 and AN03 are closer to mining operations than the nearest private receiver. A correction factor has been applied based on noise modelling for the continuation of Bengalla Mine EIS (Hanson Bailey, 2013) as outlined in the approved NMP.*
5. *LA1,1minute operational noise levels for BMC in the absence of all other noise source.*
6. *The reported LA1,1min level includes a +5 dBA correction to periods of tonal noise.*
7. *Mine-attributed noise levels at were above criteria, however inversion conditions greater than 3ºC/100m rendered the noise criteria invalid at this time and therefore noise limits did not apply. On this basis, no exceedance of the SSD-5170 noise limits occurred during this noise survey.*
8. *Mine-attributed noise levels at AN04 were +1dBA above LA1,1 noise limits specified in SSD-5170. This criterion exceedance was within the 2dBA tolerance allowed in the approved Noise Management Plan and is therefore not considered a breach of the SSD-5170 noise limits.*

N/A – Noise criteria do not apply due to a strong temperature inversion at the time of the survey (Bridges Acoustics – 2025).
IA = Inaudible.
NM = Not measurable.

Appendix C

Blast Monitoring Summary

Appendix C

Blast Monitoring Summary

Table C1

Blast Monitoring Summary – 2025

BLAST DETAILS				GROUND VIBRATION (mm/s)	OVERPRESSURE (dB)
Event No.	Date	Time of Blast	Blast Code	MRE	MRE
1	2/01/2025	12:30:50 PM	S44-02-IB-MA1	1.69	107.30
2	2/01/2025	12:31:38 PM	S43-03-IB-BY1	1.64	108.40
3	3/01/2025	11:27:53 AM	S44-16-IB-PF2	0.21	101.50
4	6/01/2025	12:01:34 PM	S52-29-IB-WW2	1.36	98.80
5	7/01/2025	3:55:18 PM	S44-13-IB-PF2	0.47	120.30
6	11/01/2025	2:36:15 PM	S43-23-IB-BY1	0.97	102.50
7	13/01/2025	12:26:24 PM	S43-10-IB-WN & S43-11-IB-WN	0.62	98.40
8	16/01/2025	2:08:14 PM	S46-19-CI-MAPF	1.97	108.40
9	23/01/2025	4:05:00 PM	S44-26-IB-VARL	1.20	101.30
10	25/01/2025	11:56:00 AM	S44-10-IB-PF2	3.21	104.90
11	28/01/2025	2:42:36 PM	S43-20-IB-WN	0.43	101.70
12	28/01/2025	2:45:18 PM	S44-02-CI-MAPF	1.29	92.60
13	31/01/2025	3:02:08 PM	S44-17-IB-VARL	2.72	110.60
14	4/02/2025	11:49:15 AM	S44-13-IB-VA1	5.70	104.40
15	6/02/2025	2:34:08 PM	S43-07-IB-WN	0.31	101.50
16	8/02/2025	3:32:35 PM	S43-12-IB-WN	0.36	101.30
17	10/02/2025	2:56:21 PM	S47-19-IB-WW3	0.75	109.00
18	11/02/2025	3:54:41 PM	S44-29-IB-PF2	0.50	96.90
19	13/02/2025	3:07:13 PM	S43-17IB-WN	0.45	101.40
20	15/02/2025	11:24:21 AM	S44-11-IB-VA1	2.97	95.00
21	18/02/2025	2:33:03 PM	S44-06-IB-PF2	2.96	99.60
22	19/02/2025	3:57:03 PM	S43-25-IB-WN	0.60	116.60
23	21/02/2025	3:56:31 PM	S43-21-IB-WN	0.62	112.90

24	24/02/2025	12:39:21 PM	S44-03-IB-PF2	1.62	96.30
25	26/02/2025	11:32:00 AM	S47-14-IB-WW3	1.54	105.30
26	28/02/2025	2:54:06 PM	S43-03-IB-WN	0.50	101.10
27	1/03/2025	11:23:06 AM	S47-15-IB-WW3	0.78	104.70
28	6/03/2025	12:30:20 PM	S44-15-IB-VA1	2.18	114.80
29	8/03/2025	10:34:32 AM	S46-05-IB-WW2	1.62	112.10
30	11/03/2025	12:01:46 PM	S44-21-IB-VA1	3.21	104.30
31	13/03/2025	4:02:36 PM	S44-24-IB-VA1	1.62	96.80
32	19/03/2025	11:07:39 PM	S44-08-IB-VA1	1.21	98.30
33	22/03/2025	12:27:10 PM	S47-12-IB-WW3 & S46-11-IB-WW3	2.82	110.50
34	22/03/2025	12:29:02 PM	S47-01-IB-RL181	4.57	109.90
35	28/03/2025	11:09:45 AM	S43-22-IB-BY1	0.62	95.70
36	28/03/2025	11:11:09 AM	S47-19-IB-WW4	2.53	114.20
37	5/04/2025	12:27:00 PM	S44-04-IB-VA1	2.40	102.00
38	9/04/2025	3:56:11 PM	S44-26-IB-VA1	1.69	104.30
39	11/04/2025	10:58:00 AM	S46-14-IB-WW4	2.83	101.50
40	11/04/2025	10:57:00 AM	S47-17-IB-WW4	4.70	108.10
41	14/04/2025	11:58:45 AM	S47-15-IB-WW4	3.25	101.00
42	16/04/2025	4:07:36 PM	S46-30-IB-WW3	1.85	104.50
43	17/04/2025	11:58:07 AM	S47-26-IB-WW1	0.74	106.90
44	22/04/2025	2:07:00 PM	S46-01-IB-WW1	5.75	108.30
45	23/04/2025	10:55:19 AM	S44-15-IB-BR1	1.79	112.40
46	24/04/2025	2:01:10 PM	S44-02-IB-PF2	0.91	100.30
47	26/04/2025	2:27:50 PM	S45-19-PS-BYWN	2.18	101.00
48	3/05/2025	12:36:39 PM	S44-03-IB-VA1	1.71	97.90
49	3/05/2025	12:35:04 PM	S44-12-IB-BR1	3.53	107.70
50	5/05/2025	3:00:05 PM	S44-17-IB-BR1	0.34	97.20
51	5/05/2025	3:02:19 PM	S52-26-IB-WW1	0.67	101.80
52	10/05/2025	2:55:42 PM	S44-10-IB-BR1	4.97	104.40

53	10/05/2025	2:57:29 PM	S44-27-IB-VA1	0.92	108.00
54	13/05/2025	11:55:00 AM	S44-02-PS-VA1 & S44-02-IB-VA1	0.98	107.90
55	14/05/2025	2:55:53 PM	S46-16-CI-MAPF	1.37	101.20
56	16/05/2025	1:29:00 PM	S46-08-IB-WW3	1.96	104.50
57	19/05/2025	4:18:54 PM	S46-12-IB-WW4	2.72	107.40
58	24/05/2025	2:57:15 PM	S45-27-PS-BYWN	0.97	90.00
59	27/05/2025	9:03:32 AM	S46-11-IB-WW4	3.38	111.50
60	2/06/2025	10:58:32 AM	S44-07-IB-BR1	2.95	104.30
61	6/06/2025	3:30:36 PM	S45-17-PS-BYWN	1.81	95.00
62	7/06/2025	3:39:00 PM	S45-21-PS-BYWN	2.25	106.20
63	7/06/2025	3:39:00 PM	S47-22-IB-WW4	2.20	103.10
64	10/06/2025	12:32:41 PM	S47-03-IB-RL181	3.89	107.10
65	11/06/2025	3:01:25 AM	S44-18-IB-BR2C	0.55	92.80
66	14/06/2025	4:00:22 PM	S44-27-IB-BR2C	0.89	102.50
67	14/06/2025	3:59:21 PM	S46-30-IB-WW4	0.09	96.60
68	18/06/2025	4:34:08 PM	S47-26-IB-WW2	1.89	105.20
69	21/06/2025	11:51:09 AM	S44-21-IB-BR2C	0.27	105.70
70	23/06/2025	11:56:41 AM	S44-03-IB-VA1A	0.18	93.10
71	27/06/2025	3:45:53 PM	S44-24-IB-BR2C	0.21	90.40
72	27/06/2025	3:44:27 PM	S46-26-CI-MAPF	0.12	99.30
73	7/07/2025	4:03:37 PM	S44-03-IB-BR1	3.15	98.50
74	10/07/2025	10:49:00 AM	S44-05-IB-BR1	3.53	102.60
75	11/07/2025	3:18:51 PM	S44-12-PS-BYWN	2.30	112.10
76	14/07/2025	3:48:36 PM	S46-01-IB-WW2	1.62	106.10
77	14/07/2025	3:45:15 PM	S46-15-CI-MAPF	1.14	100.00
78	16/07/2025	3:58:56 PM	S44-12-IB-BR2C	0.11	83.40
79	17/07/2025	3:26:09 PM	S44-21-PS-BYWN	2.27	84.90
80	19/07/2025	2:55:49 PM	S46-30-CI-MAPF	0.24	83.40
81	21/07/2025	3:50:40 PM	S44-19-IB-PF2	0.87	113.70

82	23/07/2025	1:09:37 PM	S47-13-IB-WW3	0.83	99.40
83	23/07/2025	1:08:07 PM	S44-23-IB-BR2A	0.78	96.90
84	26/07/2025	1:32:56 PM	S44-15-IB-BR2A	1.83	102.40
85	30/07/2025	1:07:43 PM	S44-20-IB-BR2A	0.83	108.20
86	30/07/2025	1:09:10 PM	S47-08-IB-RL181	5.44	107.50
87	1/08/2025	3:03:18 PM	S46-04-IB-WW2	1.87	106.70
88	6/08/2025	12:02:12 PM	S44-12-IB-BY1	1.76	102.40
89	9/08/2025	2:56:31 PM	S44-03-PS-BYWN	2.15	100.70
90	9/08/2025	2:55:03 PM	S46-09-IB-WW4	5.09	108.50
91	12/08/2025	2:37:09 PM	S47-19-CI-MAPF	1.50	93.50
92	12/08/2025	2:39:13 PM	S47-26-IB-WW3	1.12	102.10
93	16/08/2025	3:04:00 PM	S46-01-PS-MA2	1.69	107.00
94	16/08/2025	3:04:38 PM	S49-09-IB-RL181	3.92	106.30
95	16/08/2025	3:05:16 PM	S50-26-IB-WW1	1.43	112.20
96	18/08/2025	4:05:55 PM	S44-27-IB-BR2A	0.48	105.50
97	20/08/2025	3:02:08 PM	S44-07-PS-BYWN	1.76	94.40
98	20/08/2025	3:03:47 PM	S46-19-IB-VARL	2.76	97.90
99	22/08/2025	12:34:21 PM	S44-20-PS-BYWN	0.53	79.10
100	25/08/2025	11:58:00 AM	S46-26-IB-PF2	1.87	99.80
101	26/08/2025	3:55:09 PM	S44-20-RA-BY1	0.86	93.40
102	29/08/2025	3:59:47 PM	S44-16-IB-BY1	0.62	105.60
103	2/09/2025	12:28:07 PM	S46-03-IB-WW3	3.45	104.90
104	3/09/2025	3:34:01 PM	S46-12-IB-MA1	0.74	107.70
105	3/09/2025	3:32:37 PM	S46-25-CI-MAPF	0.29	97.60
106	4/09/2025	11:03:04 AM	S44-25-PS-BYWN	1.17	92.60
107	6/09/2025	3:57:34 PM	S44-23-IB-BY1	1.40	104.70
108	9/09/2025	12:00:53 PM	S46-02-IB-WW3	3.68	94.00
109	11/09/2025	3:32:43 PM	S47-21-CI-MAPF	1.13	102.60
110	13/09/2025	4:02:19 PM	S47-04-IB-WW1	6.40	105.80

111	15/09/2025	3:52:45 PM	S46-13-CI-MAPF	1.12	99.20
112	19/09/2025	12:10:40 PM	S44-27-IB-BY1	1.36	92.30
113	19/09/2025	12:12:01 PM	S46-22-IB-VARL	3.60	97.70
114	20/09/2025	11:52:02 AM	S44-09-IB-BY1	1.93	115.80
115	24/09/2025	4:34:17 PM	S50-27-IB-WW2	0.90	102.90
116	25/09/2025	10:57:28 AM	S46-26-IB-PF2	1.89	96.00
117	27/09/2025	11:26:10 AM	S47-26-IB-WW4	4.64	95.80
118	30/09/2025	4:11:08 PM	S47-01-IB-WW1	0.36	98.50
119	30/09/2025	4:14:00 PM	S44-20-IB-WN	9.07	101.80
120	3/10/2025	12:31:03 PM	S44-06-IB-BY1	1.98	107.40
121	3/10/2025	12:33:31 PM	S46-25-IB-VARL	1.82	108.60
122	7/10/2025	1:01:16 PM	S49-05-IB-BF2	2.23	100.90
123	7/10/2025	1:02:22 PM	S46-05-IB-WW4	2.75	109.20
124	11/10/2025	3:58:27 PM	S46-02-IB-WW4	2.19	106.90
125	11/10/2025	3:59:00 PM	S47-13-IB-WW4	5.06	111.00
126	14/10/2025	4:02:56 PM	S47-30-IB-WW3	1.04	105.20
127	16/10/2025	12:03:35 PM	S46-16-IB-PF2	0.35	111.20
128	18/10/2025	11:59:25 AM	S49-17-IB-WW2	0.89	107.80
129	18/10/2025	11:59:37 AM	S49-19-IB-WW3	0.42	87.10
130	20/10/2025	3:54:22 PM	S47-06-IB-WW2	3.51	105.20
131	24/10/2025	3:04:13 PM	S46-26-IB-VARL	1.69	111.60
132	25/10/2025	3:29:56 PM	S46-14-IB-PF2	0.44	102.20
133	25/10/2025	3:30:26 PM	S50-05-IB-BF2	3.63	112.80
134	27/10/2025	3:12:04 PM	S44-03-IB-BY1	2.45	100.70
135	29/10/2025	12:03:27 PM	S46-17-IB-VARL	3.39	96.90
136	3/11/2025	3:58:19 PM	S44-28-IB-WN	0.25	99.80
137	3/11/2025	11:01:21 AM	S46-06-IB-MA1	1.49	97.30
138	3/11/2025	3:59:33 PM	S46-30-IB-PF2	0.54	104.10
139	6/11/2025	12:32:00 PM	S44-11-IB-WN	0.46	100.70

140	7/11/2025	4:04:51 PM	S49-01-IB-RL181	7.95	106.00
141	7/11/2025	4:02:49 PM	S49-15-IB-WW3	2.03	101.90
142	11/11/2025	11:53:09 AM	S46-03-IB-MA1	2.32	103.80
143	12/11/2025	3:53:10 PM	S44-09-IB-WN	0.38	102.20
144	13/11/2025	11:32:45 PM	S46-14-IB-VARL	5.28	106.70
145	14/11/2025	1:30:47 PM	S44-24-IB-WN	0.47	112.00
146	18/11/2025	12:39:00 PM	S46-10-CI-MAPF	1.69	99.30
147	18/11/2025	12:41:00 PM	S47-04-IB-WW2	3.45	105.50
148	20/11/2025	12:27:00 PM	S44-21-IB-WN	0.76	107.50
149	24/11/2025	12:05:00 PM	S46-22-IB-VA1	2.44	98.30
150	25/11/2025	1:57:00 PM	S44-16-IB-WN	0.56	111.80
151	26/11/2025	9:32:00 AM	S46-23-IB-VA1	3.00	102.30
152	28/11/2025	2:42:00 PM	S46-07-CI-MAPF	1.57	108.30
153	2/12/2025	12:58:00 PM	S44-12-IB-WN	0.45	104.50
154	4/12/2025	3:14:00 PM	S44-03-IB-WN	0.48	109.40
155	6/12/2025	2:56:00 PM	S46-29-IB-VA1	1.33	112.30
156	9/12/2025	12:13:34 PM	S44-03-IB-WN	0.32	101.80
157	13/12/2025	1:54:00 PM	S42-02-IB-MA1 & S46-03-CI-MAPF	2.50	104.30
158	15/12/2025	3:11:00 PM	S46-30-IB-VA1	0.39	97.60
159	15/12/2025	3:12:00 PM	S47-30-IB-WWRL	1.84	99.80
160	17/12/2025	11:26:45 AM	S46-19-IB-VA1	2.09	95.80
161	19/12/2025	3:02:00 PM	S47-01-IB-WW2	1.90	104.10
162	23/12/2025	2:02:00 PM	S46-16-IB-VA1	2.34	101.70
163	23/12/2025	2:03:00 PM	S47-16-CI-MAPF	1.31	109.90
164	30/12/2025	1:30:36 PM	S46-10-IB-PF2	3.74	101.00

Appendix D

Air Quality Monitoring Summary

Table D1
Particulate Matter <10µm (PM_{10}) Summary (Compliance Monitors Only)

Run Date	PM_{10}-1		PM_{10}-3		24-hour Assessment Criteria (µg/m³)	Annual Assessment Criteria (µg/m³)
	Run Date Reading (µg/m³)	Annual Rolling Average (µg/m³)	Run Date Reading (µg/m³)	Annual Rolling Average (µg/m³)		
06/01/2025	62.2	21.3	46.3	21.9	50	25
12/01/2025	19	21.2	39.9	22.2	50	25
18/01/2025	8.8	21.0	29.0	22.6	50	25
24/01/2025	34.1	20.9	36.0	22.7	50	25
30/01/2025	1.6	20.2	21.8	22.2	50	25
05/02/2025	31.4	19.9	24.6	21.9	50	25
11/02/2025	11.9	19.8	9.8	21.7	50	25
17/02/2025	15.2	19.6	37.4	21.5	50	25
23/02/2025	24.7	19.5	97.3	22.8	50	25
01/03/2025	40.2	19.7	53.5	23.2	50	25
07/03/2025	15.6	19.3	19.7	22.9	50	25
13/03/2025	13.4	19.0	35.4	22.6	50	25
19/03/2025	22.5	19.2	49.8	23.1	50	25
25/03/2025	7.1	19.0	35.3	23.2	50	25
31/03/2025	9.3	18.7	6.3	22.7	50	25
06/04/2025	9.2	18.6	18.4	22.9	50	25
12/04/2025	8.9	18.4	33.8	23.1	50	25
18/04/2025	26.6	18.5	34.5	23.2	50	25
24/04/2025	10.9	18.4	21.3	23.3	50	25
30/04/2025	9.2	18.2	5.9	23.0	50	25

06/05/2025	22.0	18.5	13.2	23.2	50	25
12/05/2025	7.4	18.5	17.3	23.3	50	25
18/05/2025	12.5	18.5	16.7	23.4	50	25
24/05/2025	19.1	18.6	5.3	23.2	50	25
30/05/2025	22.5	18.7	16.5	23.3	50	25
05/06/2025	7.0	18.5	5.9	23.3	50	25
11/06/2025	16.5	18.7	3.8	23.3	50	25
17/06/2025	17.6	18.9	11.4	23.5	50	25
23/06/2025	15.6	19.0	12.9	23.6	50	25
29/06/2025	11.8	18.9	7.0	23.4	50	25
05/07/2025	9.3	18.9	12.6	23.3	50	25
11/07/2025	24.8	19.2	7.5	23.4	50	25
17/07/2025	15.8	19.3	13.1	23.5	50	25
23/07/2025	32.9	19.8	5.9	23.5	50	25
29/07/2025	9.8	19.8	3.6	23.5	50	25
04/08/2025	12.2	19.8	2.7	23.4	50	25
10/08/2025	8.3	19.7	2.7	23.2	50	25
16/08/2025	38.0	20.2	4.8	23.1	50	25
22/08/2025	12.2	20.0	3.5	22.9	50	25
28/08/2025	54.2	20.6	7.6	23.0	50	25
03/09/2025	23.8	20.2	18.2	22.8	50	25
09/09/2025	50.1	20.6	14.6	22.7	50	25
15/09/2025	33.8	20.9	7.0	22.6	50	25
21/09/2025	24.4	20.9	7.2	22.5	50	25
27/09/2025	62.0	21.6	35.2	23.0	50	25
03/10/2025	33.7	22.0	-	23.0	50	25
09/10/2025	42.1	22.3	12.4	22.5	50	25
15/10/2025	31.2	22.7	28.2	22.7	50	25

21/10/2025	44	23.1	57.1	23.3	50	25
27/10/2025	46.2	23.5	32.9	23.1	50	25
02/11/2025	22.3	23.5	23.9	22.8	50	25
08/11/2025	53.9	23.6	16.2	22.3	50	25
14/11/2025	54.5	24.0	18.1	22.4	50	25
20/11/2025	34.7	24.3	44.5	22.6	50	25
26/11/2025	26.9	24.2	36.3	22.5	50	25
02/12/2025	13.4	24.1	17.4	22.6	50	25
08/12/2025	42.3	24.4	53.1	23.3	50	25
14/12/2025	67.7	24.9	15.7	22.5	50	25
20/12/2025	35.2	25.3	54.1	23.0	50	25
26/12/2025	25.1	25.5	26.6	23.2	50	25

Source: AECOM (2024)

Table D2
Total Suspended Particulates (TSP) Summary

Run Date	HV2		HV3		Annual Assessment Criteria (µg/m^3)
	Run Date Reading (µg/m^3)	Annual Rolling Average (µg/m^3)	Run Date Reading (µg/m^3)	Annual Rolling Average (µg/m^3)	
06/01/2025	174	63.5	78.3	42.0	90
12/01/2025	47.4	62.5	38.8	42.1	90
18/01/2025	21.9	61.9	15.6	41.5	90
24/01/2025	82.5	61.5	69.0	41.5	90
30/01/2025	41.9	61.2	28.5	41.0	90
05/02/2025	84.5	60.8	40.4	40.6	90
11/02/2025	27.6	60.6	20.1	40.4	90
17/02/2025	51	60.3	35.8	40.3	90
23/02/2025	84.2	60.3	70.1	40.1	90
01/03/2025	92.3	60.5	65.3	40.2	90
07/03/2025	52.5	59.9	36.8	39.6	90
13/03/2025	37.2	58.9	42.6	39.3	90
19/03/2025	61.3	59.2	48.0	39.8	90
25/03/2025	19.9	58.7	13.5	39.5	90
31/03/2025	21.6	57.9	12.3	39.0	90
06/04/2025	79	58.3	51.7	39.6	90
12/04/2025	46.2	58.1	23.3	39.7	90
18/04/2025	53.2	58.3	32.6	39.6	90
24/04/2025	23.9	57.8	20.2	39.4	90
30/04/2025	24.6	57.2	24.6	39.2	90
06/05/2025	65.6	58.0	46.3	39.9	90

12/05/2025	22.9	58.2	17.3	40.0	90
18/05/2025	29.3	58.0	22.6	40.0	90
24/05/2025	57.8	58.4	14.1	39.9	90
30/05/2025	25.4	58.3	21.7	39.9	90
05/06/2025	19.1	57.6	12.8	39.9	90
11/06/2025	77.9	58.3	39.2	40.3	90
17/06/2025	82.7	58.9	34.2	40.2	90
23/06/2025	62.1	59.3	22.6	40.3	90
29/06/2025	52.9	59.3	33.3	40.3	90
05/07/2025	42.2	59.4	19.1	40.2	90
11/07/2025	104	60.4	66.7	41.1	90
17/07/2025	73.7	60.6	43.6	41.4	90
23/07/2025	29.9	60.3	31.8	41.6	90
29/07/2025	17.2	60.0	9.7	41.4	90
04/08/2025	19.6	59.6	12.1	41.2	90
10/08/2025	11.8	59.1	10.7	40.9	90
16/08/2025	79.8	60.0	56.2	41.6	90
22/08/2025	43.6	59.3	21.5	40.8	90
28/08/2025	109	59.6	66.0	41.4	90
03/09/2025	58.2	57.6	37.6	40.0	90
09/09/2025	124	58.0	31.9	39.4	90
15/09/2025	100	58.6	48.5	39.1	90
21/09/2025	99.1	58.8	56.9	38.3	90
27/09/2025	169	60.8	115.0	39.6	90
03/10/2025	121	62.3	87.4	40.7	90
09/10/2025	132	63.3	83.3	41.3	90
15/10/2025	87.5	64.3	63.4	41.9	90
21/10/2025	106	65.6	80.7	42.8	90

27/10/2025	132	66.8	114.0	43.9	90
02/11/2025	60.1	67.0	39.8	43.7	90
08/11/2025	163	67.5	107.0	43.9	90
14/11/2025	161	68.4	84.2	44.5	90
20/11/2025	97.8	69.4	56.8	44.8	90
26/11/2025	68	69.0	37.8	44.4	90
02/12/2025	58.8	69.4	61.5	44.9	90
08/12/2025	122	70.2	101.0	45.6	90
14/12/2025	207	72.2	96.4	46.2	90
20/12/2025	87.5	72.9	69.7	46.9	90
26/12/2025	118	74.0	42.0	47.0	90

Source: AECOM (2024)

Table D3
Total Deposited Dust Summary

Month	D06	D10	D26	D27	D29
January	2.4	3.0	4.5	5.7	3.5
February	1.4	2.2	4.3	-	7.1
March	1.2	1.2	3.3	31.9c	4.2
April	0.9	1.7	3.6	18.4c	8.7c
May	1.3	1.4	2.9	40.3c	3.7
June	0.9	2.7	1.2	4.9	1.4
July	1.2	2.9	1.7	2.0	1.9
August	0.9	1.9	1.7	-	1.2
September	2.0	4.0	1.6	4.7	2.5
October	2.6	3.5	2.8	4.4	3.6
November	2.3	4.9	1.4	4.5	4.9
December	3.2	3.0	-	4.1	3.8
Annual Average	**1.7**	**2.7**	**2.6**	**4.3**	**3.4**
Criteria (g/m^2/month)	**4**	**4**	**4**	**4**	**4**

D27 & D29 locations installed May 2024 as required under approved AQMP
c = contaminated sample
**Newly installed dust gauge at D27 dislodged and broken, reinstalled June*
#Average results calculated from six/seven months data since installed

Table D4
Increase in Deposited Dust

Month	D06	D10	D26	D27	D29
January	1.5	2.2	2.3	-	-
February	1.5	2.3	2.5	-	-
March	1.4	2.3	2.6	-	-
April	1.5	2.3	2.7	-	-
May	1.5	2.3	2.8	-	-
June	1.4	2.4	2.7	4.5	3.3
July	1.4	2.4	2.8	4.3	3.3
August	1.3	2.3	2.8	4.2	3.3
September	1.4	2.4	2.8	4.2	3.3
October	1.5	2.5	2.9	4.4	3.4
November	1.6	2.7	2.6	4.4	3.4
December	1.7	2.7	2.6	4.3	3.4
Annual Increase	**-1.8**	**-0.9**	**0.5**	**-**	**-**
Criteria (g/m^2/month)	**2**	**2**	**2**	**2**	**2**

D27 & D29 installed May 2024 and therefore have not been in place for full calendar year to be able to assess Annual Increase

Table D5
Particulate Matter <2.5µm ($PM_{2.5}$) Summary

$PM_{2.5}$ ($\mu g/m^3$)		
Monitor	**Annual Assessment Criteria**	**Result**
DPIE Upper hunter Air Quality Monitoring Network "Muswellbrook" Monitor	8.0	6.7

Note: BMC currently relies upon the Upper Hunter Air Quality Monitoring Network managed by the DPIE to record and monitor particulate matter less than 2.5 microns ($PM_{2.5}$) levels. The monitor adopted by BMC is the Muswellbrook monitor located approximately 5 km to the east of Bengalla.

Table D6
Continuous PM_{10} Monitoring (EPA22 and EPA24) 24 Hour Average Summary

Date	EPA-22 PM10 Avg (ug/m3)	EPA-24 PM10 Avg (ug/m3)
1/01/2025	18.07	20.58
2/01/2025	18.83	19.06
3/01/2025	15.38	16.92
4/01/2025	7.09	9.44
5/01/2025	8.19	13.33
6/01/2025	12.87	14.68
7/01/2025	14.25	14.33
8/01/2025	10.69	10.02
9/01/2025	3.22	2.61
10/01/2025	5.14	4.61
11/01/2025	6.36	8.59
12/01/2025	3.04	6.14
13/01/2025	4.64	5.85
14/01/2025	14.24	14.91
15/01/2025	18.87	17.01
16/01/2025	11.09	6.69
17/01/2025	8.77	7.06
18/01/2025	4.95	5.47
19/01/2025	4	4.71
20/01/2025	5.54	8.03
21/01/2025	6.54	11.04
22/01/2025	7.7	14.29
23/01/2025	11.81	15.73
24/01/2025	11.56	14.86
25/01/2025	12.82	14.15
26/01/2025	5.39	10.6
27/01/2025	7.5	13.34
28/01/2025	9.15	12.74
29/01/2025	11.69	13.7
30/01/2025	18.97	25.34
31/01/2025	13.2	16.99
1/02/2025	5.35	8.03
2/02/2025	5.65	9.22
3/02/2025	4.25	8.47
4/02/2025	6.48	9.39
5/02/2025	5.71	9.09
6/02/2025	10.87	8.5
7/02/2025	25.4	25.22
8/02/2025	9.03	14.91
9/02/2025	11.25	12.68
10/02/2025	30.47	27.44
11/02/2025	24.68	18.62
12/02/2025	13.45	11.82
13/02/2025	15.17	20.86
14/02/2025	7.18	11.35
15/02/2025	7.97	11.94
16/02/2025	8.07	4.73
17/02/2025	3.93	4.93
18/02/2025	4.31	10.92
19/02/2025	6.69	10.95
20/02/2025	6.65	11.37
21/02/2025	6.24	10.05
22/02/2025	8.95	12.34
23/02/2025	7.78	13.35
24/02/2025	6.35	11.31
25/02/2025	12.78	14.15
26/02/2025	12.9	16.5
27/02/2025	14.81	18.88
28/02/2025	10.97	15.81
1/03/2025	12.06	15.19
2/03/2025	27.79	34.39
3/03/2025	19.95	26.02
4/03/2025	8.9	12.64
5/03/2025	6.34	10.26
6/03/2025	5.32	6.53
7/03/2025	6.11	9.49
8/03/2025	4.61	9.28
9/03/2025	3.01	5.95
10/03/2025	3.11	7.2
11/03/2025	3.42	7.36
12/03/2025	4.74	9.45
13/03/2025	3.69	7.09
14/03/2025	10.18	13.41
15/03/2025	8.83	11.03
16/03/2025	8.59	11.71
17/03/2025	7.63	4.81
18/03/2025	6.11	9.37
19/03/2025	4.65	9.7
20/03/2025	5.61	11.77
21/03/2025	8.33	13.54
22/03/2025	8.88	7.44
23/03/2025	11.92	17.41
24/03/2025	7.59	10.74
25/03/2025	8	10.91
26/03/2025	8.48	10.62
27/03/2025	3.54	6.69
28/03/2025	4.35	8.04

29/03/2025	2.31	4.94
30/03/2025	4.39	8.05
31/03/2025	5.21	4.82
1/04/2025	2.49	3.42
2/04/2025	1.52	6.79
3/04/2025	6.59	10.23
4/04/2025	8.78	8.14
5/04/2025	14.18	10.65
6/04/2025	10.71	9.71
7/04/2025	9.41	8.43
8/04/2025	4.76	6.01
9/04/2025	4.83	11.16
10/04/2025	10.51	15.19
11/04/2025	12.19	13.62
12/04/2025	14.73	26.57
13/04/2025	17.55	22.09
14/04/2025	3.82	8.53
15/04/2025	11.97	14.98
16/04/2025	7.2	10.85
17/04/2025	3.66	8.3
18/04/2025	8.35	8.36
19/04/2025	9.44	23.27
20/04/2025	13.51	10.84
21/04/2025	12.55	16.43
22/04/2025	7.51	4.59
23/04/2025	7.27	5.41
24/04/2025	10.33	10.76
25/04/2025	8.1	9.29
26/04/2025	10.86	14.36
27/04/2025	14.1	16.79
28/04/2025	4.54	3.52
29/04/2025	3.97	0.26
30/04/2025	7.97	0.46
1/05/2025	7.06	0.35
2/05/2025	3.56	0.49
3/05/2025	3.74	0.57
4/05/2025	5.25	1.08
5/05/2025	6.51	0.4
6/05/2025	14.44	0.52
7/05/2025	14.97	1.82
8/05/2025	9.27	2.66
9/05/2025	7.98	-2.17
10/05/2025	5.53	0.3
11/05/2025	6.12	0.56
12/05/2025	5.82	0.38
13/05/2025	8.7	0.68
14/05/2025	6.61	0.74
15/05/2025	21.56	1.19
16/05/2025	17.01	0.59
17/05/2025	13.82	7.85
18/05/2025	22.54	12.34
19/05/2025	10.03	14.59
20/05/2025	2.99	1.54
21/05/2025	3.53	3.52
22/05/2025	3.57	3.86
24/05/2025	3.7	3.91
25/05/2025	8.9	5.93
26/05/2025	11.63	3.07
27/05/2025	14.77	12.8
28/05/2025	9.95	11.36
29/05/2025	3.25	12.14
30/05/2025	8.67	1.64
31/05/2025	10.28	6.37
1/06/2025	11.66	11.43
2/06/2025	13.01	12.62
3/06/2025	16.68	16.36
4/06/2025	13.89	11.25
5/06/2025	11.06	9.74
6/06/2025	7.47	6.28
7/06/2025	9.51	9.5
8/06/2025	6.01	5.7
9/06/2025	4.8	2.44
10/06/2025	1.92	3.43
11/06/2025	2.74	0.89
12/06/2025	5.62	1.16
13/06/2025	8.94	1.39
14/06/2025	9.77	3.43
15/06/2025	16.38	4.41
16/06/2025	14.3	24.56
17/06/2025	12.9	7.83
18/06/2025	8.87	15.85
19/06/2025	11.61	3.34
20/06/2025	18.65	18.34
21/06/2025	21.9	17.23
22/06/2025	16.97	46.08
23/06/2025	17.05	29.86
24/06/2025	11.75	19.61
25/06/2025	5.73	12.17
26/06/2025	3.08	2.28
27/06/2025	4.81	1.88
28/06/2025	10.85	11.99
29/06/2025	15.58	25.45
30/06/2025	21.82	15.53
1/07/2025	20.46	20.06

2/07/2025	10.63	23.76
3/07/2025	4.16	5.65
4/07/2025	3.13	1.58
5/07/2025	10.16	1.47
6/07/2025	16	4.02
7/07/2025	15.67	24.15
8/07/2025	7.05	13.32
9/07/2025	6.32	1.92
10/07/2025	3.37	4.45
11/07/2025	5.51	2.59
12/07/2025	3.43	2.54
13/07/2025	8.1	1.84
14/07/2025	8.55	2.63
15/07/2025	5.45	3.24
16/07/2025	6.47	2.03
17/07/2025	7.85	7.9
18/07/2025	10.41	5.55
19/07/2025	9.82	10.61
20/07/2025	13.25	12.94
21/07/2025	16.91	9.71
22/07/2025	12.83	23.09
23/07/2025	16.18	22.7
24/07/2025	10.11	17.74
25/07/2025	8.49	3.1
26/07/2025	10	3.49
27/07/2025	6.97	13.32
28/07/2025	1.78	4.97
29/07/2025	2.51	0.71
30/07/2025	3.8	1.26
31/07/2025	7.39	2.56
1/08/2025	2.64	10.81
2/08/2025	6.79	4.05
3/08/2025	6.83	6.34
4/08/2025	2.56	5.98
5/08/2025	5.74	2.75
6/08/2025	11.44	6.4
7/08/2025	7.39	5.34
8/08/2025	7.47	10.37
9/08/2025	7.59	11.07
10/08/2025	7.31	10.15
11/08/2025	3.82	9.06
12/08/2025	8.66	8.12
13/08/2025	16.24	9.91
14/08/2025	11.25	17.45
15/08/2025	7.22	6.92
16/08/2025	16.65	6.79
17/08/2025	9.24	18
18/08/2025	4.76	4.41
19/08/2025	4.16	1.75
20/08/2025	4.32	14.85
21/08/2025	8.23	9.24
22/08/2025	5.28	9.8
23/08/2025	19.01	4.87
24/08/2025	8.57	11.36
25/08/2025	10.67	4.34
26/08/2025	9.3	15.41
27/08/2025	10.5	7.57
28/08/2025	8.17	14.36
29/08/2025	5.66	5.3
30/08/2025	4.07	1.82
31/08/2025	4.38	2.59
1/09/2025	7.08	2.15
2/09/2025	9.04	2.52
3/09/2025	14.87	13.28
4/09/2025	13.67	21.29
5/09/2025	15.5	7.98
6/09/2025	12.16	12.35
7/09/2025	7.36	16.19
8/09/2025	14.76	14.25
9/09/2025	12.5	17.26
10/09/2025	11.91	8.56
11/09/2025	8.9	9.06
12/09/2025	2.28	5.99
13/09/2025	7.02	1.71
14/09/2025	8.07	5.02
15/09/2025	11.44	15.9
16/09/2025	15.57	14.76
17/09/2025	19.81	10.56
18/09/2025	11.94	15.85
19/09/2025	7.56	8.04
20/09/2025	13.69	14.34
21/09/2025	6.47	27.36
22/09/2025	5.74	3.68
23/09/2025	6.15	4.26
24/09/2025	2.8	5.3
25/09/2025	10.57	4.96
26/09/2025	18.07	7.4
27/09/2025	24.76	13.81
28/09/2025	28.29	25.36
29/09/2025	34.75	25.94
30/09/2025	21.43	34.77
1/10/2025	27.85	24.9
2/10/2025	10.9	22.76
3/10/2025	5.82	7.63

4/10/2025	4.04	4.63
5/10/2025	6.73	3.38
6/10/2025	18.85	15.66
7/10/2025	15.73	18.49
8/10/2025	15.63	15.46
9/10/2025	15.8	16.1
10/10/2025	24.41	16.15
11/10/2025	13.81	26.48
12/10/2025	9.03	9.03
13/10/2025	5.02	16.06
14/10/2025	4.51	9.05
15/10/2025	7.36	4.41
16/10/2025	7.42	10.31
17/10/2025	13.6	20.59
18/10/2025	15.82	21.8
19/10/2025	12.22	9.69
20/10/2025	9.34	15.05
21/10/2025	17.98	17.01
22/10/2025	16.83	15.23
23/10/2025	21.28	20.76
24/10/2025	0	20.7
25/10/2025	7.06	11.49
26/10/2025	14.01	10.78
27/10/2025	13.64	15.01
28/10/2025	8.13	11.37
29/10/2025	3.52	6.62
30/10/2025	6.34	4.58
31/10/2025	23.33	7.07
1/11/2025	14.4	20.07
2/11/2025	15.71	15.22
3/11/2025	28.51	15.22
4/11/2025	27.77	27.28
5/11/2025	5.85	22.52
6/11/2025	4.37	1.47
7/11/2025	5.71	3.03
8/11/2025	17.46	18.38
9/11/2025	29.85	17.58
10/11/2025	3.27	24.62
11/11/2025	7.39	4.38
12/11/2025	7.12	10.26
13/11/2025	7.89	10.85
14/11/2025	19.22	10.18
15/11/2025	20.2	11.46
16/11/2025	19.62	28.82
17/11/2025	8.92	14.67
18/11/2025	5.92	1.63
19/11/2025	4.34	-1
20/11/2025	7.65	-0.95
21/11/2025	14.81	4.21
22/11/2025	8.11	-9.85
23/11/2025	12.21	10.27
24/11/2025	17.73	13.54
25/11/2025	14.06	13.7
26/11/2025	7.37	14.04
27/11/2025	9.12	4.89
28/11/2025	10.87	4.45
29/11/2025	11.13	8.39
30/11/2025	9.56	32.98
1/12/2025	8.86	8.9
2/12/2025	10.09	10.67
3/12/2025	3.95	9.6
4/12/2025	8.81	4.97
5/12/2025	10.33	14.07
6/12/2025	21.85	16.36
7/12/2025	24.58	15.21
8/12/2025	19.22	18.63
9/12/2025	32.31	18.01
10/12/2025	54.39	36.1
11/12/2025	29.27	55.13
12/12/2025	14.03	31.91
13/12/2025	8.31	14.35
14/12/2025	11.82	10.38
15/12/2025	12.36	10.23
16/12/2025	15.53	8.04
17/12/2025	8.3	18.43
18/12/2025	7.89	9.91
19/12/2025	12.08	11.78
20/12/2025	11.91	14.87
21/12/2025	16.54	11.44
22/12/2025	17.57	20.68
23/12/2025	6.34	24.6
24/12/2025	5.52	8.36
25/12/2025	9.25	10.07
26/12/2025	7.72	13.28
27/12/2025	3.29	13.3
28/12/2025	2.88	7.94
29/12/2025	2.98	9.59
30/12/2025	2.9	11.36
31/12/2025	6.68	11.85

Appendix E

Annual Compliance Report for EPBC Approval 2012/6378

BENGALLA MINING COMPANY





Bengalla Mine (EPBC APPROVAL 2012/6378)

2025 ANNUAL COMPLIANCE REPORT







Prepared by:
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March 2026

BENGALLA

TABLE OF CONTENTS

1 Background 1
2 Purpose and Scope 1
3 Clearing Activities in 2025 1
4 Weed and Pest Management in 2025 3
5 Compliance Report 5
6 Conclusion 14
Appendix A Biodiversity Management Plan Commitments 15
Appendix B Biodiversity Offset Management Plan Commitments 18
Appendix C Annual Clearing Report 2025 23
Appendix D Weed and Pest Management 24

LIST OF TABLES

Table 1 Staged Clearing Approach 2
Table 2 BMC Compliance Status against Conditions of EPBC Approval for 2025 5

LIST OF FIGURES

Figure 1 - Vegetation Communities 4
Figure 2 – Bengalla Mine Weed Management Q1 2025 26
Figure 3 – Bengalla Mine Weed Management Q2 2025 27
Figure 4 – Bengalla Mine Weed Management Q3 2025 28
Figure 5 – Bengalla Mine Weed Management Q4 2025 29
Figure 6 – Kenalea Weed Management Q1 2025 30
Figure 7 – Kenalea Weed Management Q2 2025 31
Figure 8 – Kenalea Weed Management Q3 2025 32
Figure 9 – Black Mountain Weed Management Q3 2025 33
Figure 10 – Kenalea Weed Management Q4 2025 34
Figure 11 – Black Mountain Weed Management Q4 2025 35
Figure 12 – Merriwa River Weed Management Q4 2025 36
Figure 13 – Bengalla Mine Wild Dog Bait Locations Autumn 2025 37
Figure 14 – Bengalla Mine Wild Dog Bait Locations Spring 2025 38
Figure 15 – Black Mountain Wild Dog Bait Locations Autumn 2025 39
Figure 16 – Black Mountain Wild Dog Bait Locations Spring 2025 40
Figure 17 – Kenalea Wild Dog Bait Locations Autumn 2025 41
Figure 18 – Kenalea Wild Dog Bait Locations Spring 2025 42
Figure 19 – Merriwa River Wild Dog Bait Locations Autumn 2025 43
Figure 20 – Merriwa River Wild Dog Bait Locations Spring 2025 44

BENGALLA MINE

ANNUAL COMPLIANCE REPORT FOR EPBC APPROVAL 2012/6378

1 Background

Bengalla Mining Company Pty Limited (BMC) operates the Bengalla Mine (Bengalla) on behalf of the Bengalla Joint Venture (comprising New Hope Bengalla Pty Ltd as to 8/10 share and Taipower Bengalla Pty Limited as to 2/10 share). Bengalla is located 130 km north-west of Newcastle and 4 km west of the township of Muswellbrook.

On 3 March 2015, State Significant Development Consent (SSD-5170) for the Bengalla Continuation of Mining Project was granted by the Secretary of the NSW Department of Planning and Environment (DPE) under the *Environmental Planning and Assessment Act 1979* NSW. SSD-5170 has since been modified on various occasions.

On 27 May 2015, BMC was granted *Environment Protection and Biodiversity Conservation Act 1999* Commonwealth (EPBC Act) Approval 2012/6378 (the EPBC Approval).

The Biodiversity Offset Management Plan (BOMP) has been developed to meet relevant requirements under the EPBC Approval and SSD-5170. The current version of the BOMP was approved by what was then the Commonwealth Department of Environment and Energy (DoEE)[1] on 8 March 2017 and by DPE on 18 August 2017.

The Biodiversity Management Plan (BDMP) has also been developed to meet relevant requirements under the EPBC Approval and SSD-5170. The current version of the BDMP was approved by DPE on 18 August 2017 and by DoEE on 20 September 2017. The BDMP incorporates the Vegetation Clearance Protocol and Landscape Management Plan (VCPLMP) referred to in the EPBC Approval.

2 Purpose and Scope

This report has been prepared in accordance with Condition 12 of the EPBC Approval:

> *"By the end of March each year, the approval holder must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of the BOMP and VCLMP as specified in the conditions. Documentary evidence providing proof of the date of publication must be provided to the Department at the same time as the compliance report is published.*
>
> *Note: The Annual Review required under NSW Approval condition 4 (of Schedule 5) may be used to satisfy this condition if it meets the above content and submission requirements)."*

This report applies to the period 1 January 2025 to 31 December 2025 (Reporting Period).

This report is published as a stand-alone report and will also form an Appendix to the 2025 Annual Review for Bengalla required under SSD-5170 Schedule 5 Condition 4.

3 Clearing Activities in 2025

Table 1 is a reproduction of Figure 6 from the BDMP. It provides details of the staged clearing approach undertaken at Bengalla.

[1] Now the Department of Climate Change, Energy, the Environment and Water (DCCEEW).

Table 1
Staged Clearing Approach

Stage	Actions
Pre-Clearing Survey	• Performed within one month of clearing • All fauna, flora and *Cymbidium canaliculatum* recorded • Vegetation health assessed and documented • Habitat features marked and flagged • Fauna captured and relocated
Clearing – Stage 1	• Removal of all vegetation other than habitat trees • Habitat features left standing overnight
Clearing – Stage 2	• A final pre-clearing inspection will be conducted to identify and capture any fauna • Habitat trees lightly shaken by machinery prior to felling • Appropriate machinery used to fell the tree • Any *Cymbidium canaliculatum* (Tiger Orchid) translocated • Remaining fauna captured and relocated • Felled habitat trees left overnight and then appropriate sections are removed and relocated to a storage location, rehabilitation areas or disposed

The Bengalla Mine Annual Clearing Report for 2025 (Clearing Report) is presented in **Appendix B** and contains details about the procedures and results for all pre-clearing and clearing activities completed at Bengalla during the Reporting Period.

Clearing works in 2025 were undertaken in relation to, but not limited to the following:

- General pit progression and relocation of infrastructure,
- Construction of new infrastructure, and
- Maintenance works.

The Clearing Report summarises the 2025 pre-clearance and clearance surveys, which included:

- Identification of 154 hollow-bearing trees, 21 habitat trees with bird nests, and 28 wombat burrows were identified during pre-clearance inspections in January, March and April;
- Approximately 154 hollow-bearing trees / habitat trees were felled during Stage 2 clearing activities completed early in the reporting period (March/April);
- 33 animals were relocated or captured during pre-clearance and clearance surveys;
- Observation of 15 animals that evaded capture during clearing;
- Five animals were killed as a result of tree felling;
- One *Cymbidium canaliculatum* (listed as endangered under the EPBC Act) was identified in the 2025 clearing area in April. The orchid was located in the fork of the host tree, a mature Narrow-leaved Ironbark (*Eucalyptus crebra*). This host tree was planned to be translocated in August 2025, however due to weather conditions and access constraints, the translocation occurred on 4

September 2025 under the supervision of an ecologist to a recipient site (separate to previously translocated orchids) within established rehabilitation with a similar aspect.

Error! Reference source not found. is a reproduction of Figure 3 from the approved BOMP and has been updated to illustrate areas cleared during the Reporting Period, including Critically Endangered Ecological Communities (CEEC) listed under the EPBC Act.

CEEC identified in environmental assessments completed for the EIS and RTS included the following four communities identified as conforming to Upper Hunter White Box-Ironbark Grassy Woodland (Box Gum Woodland):

- Grey Box/White Box Intergrade Grassy Woodland;
- Upper Hunter White Box -Ironbark Grassy Woodland;
- Central Hunter Ironbark – Spotted Gum Forest; and
- Derived Native Grassland.

4 Weed and Pest Management in 2025

Information about the weed and pest management programs implemented at Bengalla and the offset areas during the Reporting Period is presented in **Appendix D**.

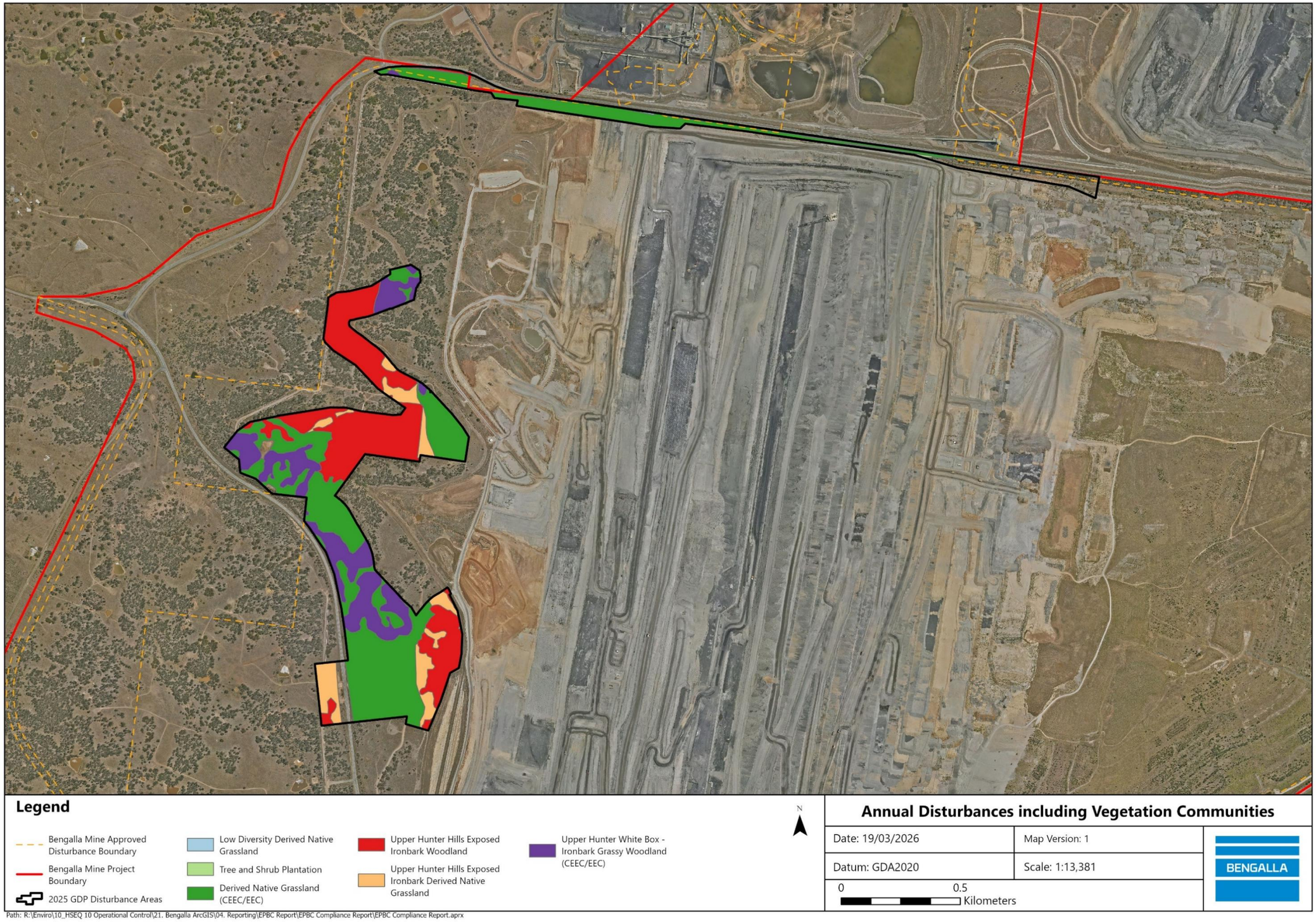


Figure 1 - Vegetation Communities

5 Compliance Report

The commitments made in the approved BDMP and BOMP, along with the compliance status of each for the Reporting Period, are presented in **Appendix A** and **Appendix B** respectively with comments provided against each where required.

Table 2 lists the conditions of the EPBC Approval and indicates the compliance status of each for the Reporting Period as 'compliant', 'not compliant' or 'not triggered'. Comments are provided against each condition, where required.

Table 2
BMC Compliance Status against Conditions of EPBC Approval for 2025

Ref	Condition	Status	Comment
1	The approval holder must not clear more than 535 hectares of *White Box-Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland* ecological community (Box Gum Woodland) and must limit clearing to within the project disturbance boundary defined at Schedule 1.	Compliant	In 2025 clearing was undertaken within the Project Disturbance Boundary shown on the plan at Schedule 1 of the EPBC Approval. BMC has not cleared more than 535 hectares of Box Gum Woodland (see Error! Reference source not found.).
2	To mitigate impacts of the action on Box Gum Woodland, the Grey Headed Flying Fox, Large-eared Pied Bat, South-eastern Long-eared Bat, Regent Honeyeater, Swift Parrot and Spotted-tail Quoll, the approval holder must prepare and submit, prior to the proposed date of commencement of the action, a mine site Vegetation Clearance Protocol and Landscape Management Plan (VCPLMP) for the Minister's written approval. The VCPLMP must: a. Delineate areas to be cleared, describe pre-clearance survey methods, specify actions to minimise fauna impacts and detail vegetation clearance procedures b. Require collection and stockpiling of habitat features important to threatened fauna species for reinstatement in rehabilitation areas c. Require use of native, locally sourced seed for propagation for rehabilitation activities d. Include measures to avoid, suppress and control the spread of plant pathogens (such as *Phytophthora cinnamomi*) e. Specify a two stage clearing protocol where non-habitat trees are cleared 24 hours prior to any habitat trees being cleared, to encourage fauna to move out of an area. The approval holder must not commence the action until the VCPLMP is approved by the	Compliant	A BMP was developed to meet this requirement and is implemented at Bengalla. **Appendix A** sets out the commitments from the BMP and the compliance status of each for the Reporting Period. The original BMP was approved by each of (then) DPE and DoEE on 14 August 2015. BMC commenced implementation of the BMP from that date (before operations commenced under SSD-5170). The current (revised) version of the BMP was approved by DPE on 18 August 2017 and DoEE on 20 September 2017. The BMP addresses each of the requirements in Condition 2(a)-(e) of the EPBC Approval (refer to Table 1 of the BMP).

Ref	Condition	Status	Comment
	Minister. The approved VCPLMP must be implemented. Note: The Biodiversity Management Plan required under NSW Approval condition 29 may be used to satisfy this condition if it meets the above content and submission requirements.		
3	To compensate for the loss of 535 hectares of Box Gum Woodland ecological community and 272 hectares of habitat for the Grey Headed Flying Fox, Large-eared Pied Bat, South-eastern Long-eared Bat, Regent Honeyeater, Swift Parrot and the Spotted-tail Quoll, the approval holder must prepare and submit, by 3 September 2015, a Biodiversity Offset Management Plan (BOMP) for the Minister's written approval. The BOMP must: a. Identify those lands described as the Offset Areas at Schedule 2 (Figures 1- 6) of this notice. This must include offset attributes, shape files, textual descriptions and maps to clearly define the location and boundaries of the offset area(s) b. Provide a survey and description of the current condition (prior to any management activities) of the offset areas identified in Condition 3a c. Detail management actions and regeneration and revegetation strategies to be undertaken on the offset areas to improve the ecological quality of these areas, including: (i) a description and timeframe of measures that would be implemented to improve the condition of Box Gum Woodland and habitat for the Grey Headed Flying Fox, Large-eared Pied Bat, South-eastern Long-eared Bat, Regent Honeyeater, Swift Parrot and the Spotted-tail Quoll on the offsets sites; (ii) performance and completion criteria for evaluating the management of the offset areas, and criteria for triggering remedial action; (iii) a program to monitor and report on the effectiveness of	Compliant	A BOMP was developed to meet this requirement and is implemented at Bengalla. Appendix B sets out the commitments from the BOMP and the compliance status of each for the Reporting Period. The draft BOMP was submitted to then DoEE and DPE on 2 September 2015. Following an extensive consultation process (see Appendix A of the BOMP), the BOMP was approved by DoEE on 8 March 2017 and by DPE on 18 August 2017. The BOMP addresses each of the requirements in Condition 3(a)-(c) of the EPBC Approval (refer to Table 1 of the BOMP). The approved BOMP was published on Bengalla's website within 1 month after being approved and continues to be available on the website. As noted in previous reports, BMC has taken all necessary steps towards entering into a Biodiversity Stewardship Agreement for each of the three offset properties (refer to Condition 4 below). The currently approved BOMP continues to be implemented in the interim.

Ref	Condition	Status	Comment
	these measures, and progress against the performance and completion criteria; (iv) a description of potential risks to the successful implementation of the plan, a description of the measures that will be implemented to mitigate against these risks and a description of the contingency measures that will be implemented if defined triggers arise; and (v) details of who would be responsible for monitoring, reviewing, and implementing the plan. The approved BOMP must be implemented. The approved BOMP must be published on the approval holder's internet web site within 1 month of being approved. The most recently approved version of the BOMP must be published on the approval holder's internet web site for a period of 5 years after it is approved. Note: The Biodiversity Management Plan required under NSW Approval condition 29 may be used to satisfy this condition if it meets the above content and submission requirements.		
4	The approval holder must secure the lands identified as the *Offset Areas* at Schedule 2 (Figures 1- 6) of this notice as a biodiversity offset, in accordance with NSW Approval condition 28.	DCCEEW concluded not compliant with Condition 4 – no further action taken	All Biodiversity Offset Areas identified in Schedule 2 (Figures 1-6) of the EPBC Approval are owned by the Bengalla Joint Venturers (BJV) and managed by BMC. All Biodiversity Offset Areas are managed in accordance with the BOMP. By letter dated 6 October 2020, the Secretary agreed to an extension of time until 30 June 2022 to finalise the long-term security of the Biodiversity Offset Areas under Schedule 3 Condition 28 of SSD-5170 (Condition 28). At this stage, the DPE has not granted a further extension in which to comply with Condition 28. BMC corresponded with the relevant NSW government departments during 2022 to determine the appropriate long-term mechanism for securing the offsets. Following that correspondence, BMC has taken steps to progress Biodiversity Stewardship Agreements (BSAs) for the offset areas. BMC notified the non-compliance with Condition 28 to DCCEEW on 7 September 2022. By letter dated 12 October 2022, DCCEEW advised that it had reviewed the matter and "*concluded that the issuing of an infringement notice would not be an appropriate course*

Ref	Condition	Status	Comment
			of action in this case. Consequently, no further action will be taken regarding this matter". During the Reporting Period communication continued between BMC and the DPHI and the Biodiversity Conservation Trust (BCT) being: - BMC letter dated 6 April 2023 to what is now the NSW Department of Planning, Housing and Infrastructure (DPHI) where BMC confirmed the 'Department's [DPHI] advice that it considers that the establishment of a BSA to be the appropriate mechanism for securing the required offset areas. Based on that advice, BMC has instructed its consultants to proceed with preparing the relevant BSAs ….' - Meeting 20 July 2023 with BMC and its advisors presented to the DPHI and the BCT, discussion occurred regarding: o Background and Biodiversity Stewardship Agreement Site Overview; o Long Term Security Process; o Biodiversity Stewardship Agreement Applications; o Consultation with Local Land Services and Council; and o Future Land Management. - BMC Action Plan dated 18 August 2023 provided by email to DPHI and BCT outlining steps to establishment of BSA's for each offset property. - The BSA's applications continue to be prepared for each offset property during the Reporting Period. During 2024 and continuing into the 2025 reporting period, BMC have been actively working towards the retirement of credits and finalising Biodiversity Stewardship Agreements (BSAs). Stakeholder consultation with the relevant Authorities included: - Pre-lodgement meetings with the Department of Climate Change, Energy, the Environment and Water (DCCEEW) Credit Supply Task Force division (now Nature Markets and Offsets Division) 18 January 2024. Relevant officers provided an outline of the process of entering in to a BSA.

Ref	Condition	Status	Comment
			- BSA lodgment to DCCEEW on 11 April 2024 seeking clarification in regards to clarification on the terms associated with the BSA. - Follow-up correspondence with DPHI and DCCEEW throughout 2024. - BMC received email from DCCEEW 02 December 2024 notifying of staffing changes and indicated they were "looking into" the BSA and associated maters, and would provide an update as soon as possible. - BMC received correspondence from NW DCCEEW on 14 April 2025 regarding the details being sought for the BSA application and further advice is impending. BMC have not received further advice to date. - BMC received an email from the NSW DPHI on 02 July 2025 requesting an update on the matter. BMC responded to DPHI on 09 July outlining the correspondence to date. In the meantime, the offset areas will continue to be owned by the BJV and managed by BMC in accordance with the BOMP
5	In order to protect listed threatened species and listed threatened ecological communities, the approval holder must undertake rehabilitation activities in accordance with NSW approval conditions 44, 45 and 46.	Compliant	**Condition 44** • <u>Requirement</u> Schedule 3 Condition 44 of SSD-5170 (Condition 44) requires BMC to rehabilitate the site in accordance with the provisions under the *Mining Act 1992*. The rehabilitation must comply with the objectives in Table 15 of SSD-5170 and be consistent with the conceptual final landform shown in Appendix 9 of SSD-5170. • <u>Status</u> Rehabilitation at Bengalla is ongoing. It is undertaken in accordance with SSD-5170 (as modified) and the current Forward Program and Rehabilitation Management Plan. The current Forward Program covers a period from 1 January 2026 to 31 December 2028. The proposed rehabilitation activities for 2026 include pasture rehabilitation on the northern overburden emplacement area (OEA). A total of 19.32 ha of new rehabilitation was shaped to final landform height during the reporting period in the OEA. Of the shaped area, 4.3 ha was topsoiled, hydromulched and seeded.

Ref	Condition	Status	Comment
			BMC also continued the retrofit HDWV tubestock in to existing rehabilitation on the Eastern OEA. Further detail about the rehabilitation carried out at Bengalla during the Reporting Period will be available in Section 8 of the Annual Review for 2025. **Condition 45** • Requirement Schedule 3 Condition 45 of SSD-5170 requires BMC to carry out progressive rehabilitation. Interim stabilisation measures are to be used where reasonable and feasible to control dust emissions in disturbed areas that are not active but not ready for final rehabilitation. • Status Rehabilitation is carried out progressively at Bengalla, as soon as reasonably practicable following disturbance. Interim stabilisation measures are used where required. **Condition 46** • Requirement Schedule 3 Condition 46 of SSD-5170 (Condition 46) requires BMC to prepare a Rehabilitation Management Plan in accordance with the provisions under the *Mining Act 1992*, and carry out the development in accordance with the plan. • Status The Rehabilitation Management Plan was updated in 2024 and is implemented at Bengalla as part of mining operations. Note that Condition 45 and 46 were removed from SSD-5170 in Modification 7, approved August 2025. As such, Conditions 45 and 46 are not applicable from August 2025 onwards.
6	The approval holder must undertake management and monitoring of water resources in accordance with NSW approval conditions 23 to 25.	Compliant	**Condition 23** • Requirement Schedule 3 Condition 23 of SSD-5170 requires BMC must comply with section 120 of the *Protection of the Environment Operations Act 1997* and the *Protection of the Environment Operations (Hunter River Salinity Trading Scheme) Regulation 2002*. • Status No uncontrolled water releases during the reporting period. Two authorized discharges of water under the HRSTS scheme were undertaken during the reporting period in May and August 2025.

Ref	Condition	Status	Comment
			Condition 24 • Requirement Schedule 3 Condition 24 of SSD-5170 requires BMC to ensure that mining operations comply with the performance measures in Table 12 of SSD-5170 to the satisfaction of the Secretary. • Status Water management at Bengalla during the Reporting Period was undertaken in accordance with the performance measures in Table 12 of SSD-5170. The approved Water Management Plan (WMP) also addresses the performance measures (see Table 1 of the WMP). Further detail about the site water balance and results of surface water monitoring and groundwater monitoring during the Reporting Period will be available in the Annual Review for 2025. **Condition 25** • Requirement Schedule 3 Condition 25 of SSD-5170 requires BMC to prepare a Water Management Plan to the satisfaction of the Secretary. The plan must be prepared in accordance with and incorporate the elements specified in Condition 25. BMC must implement the plan as approved by the Secretary. • Status The WMP was developed to meet this requirement and is implemented at Bengalla. The current WMP was updated in 2023 and was approved by the Secretary on 8 August 2023. The WMP was prepared in consultation with the relevant authorities and addresses each of the requirements of Schedule 3 Condition 25 of SSD-5170 (see Table 2 of the WMP).
7	In order to protect water resources, the approval holder must undertake rehabilitation activities in accordance with NSW approval conditions 44 and 46.	Compliant	Refer to comments at Conditions 5 above.
8	Upon request, the approval holder shall supply the groundwater monitoring data for the Bengalla Mine to the Department, NSW Government agencies, operators of the Mt Arthur and/or Mount Pleasant mines or other adjacent mine operators. A protocol for the supply of the data must be included in the approval holder's Water Management Plan.	Not Triggered	No request was made during the Reporting Period. In accordance with Schedule 5 Condition 11 of SSD-5170 and BMC's approved Water Management Plan, groundwater monitoring results are published as part of the Annual Review on Bengalla's website each year.
9	The approval holder must make available to the Minister on request, all plans or programs and any review of plans or programs required	Not Triggered	No request was made during the Reporting Period.

Ref	Condition	Status	Comment
	under the Project Approval issued for the project under the Environmental Planning and Assessment Act, 1979 (NSW), including the Biodiversity Management Plan, the Rehabilitation Management Plan and the Water Management Plan, which must include a Site Water Balance, Surface Water Management Plan and Groundwater Management Plan.		Approved Bengalla management plans are available on Bengalla's website. BMC's approved Water Management Plan includes a Site Water Balance, Surface Water Management Plan and Groundwater Management Plan.
10	Within 30 days after the commencement of the action, the approval holder must advise the Department in writing of the actual date of commencement.	Compliant	By email dated 30 October 2015, BMC advised the then DoEE that the action the subject of the EPBC Approval commenced on 1 October 2015.
11	The approval holder must maintain accurate records substantiating all activities associated with or relevant to these conditions of approval, including measures taken to implement the BOMP and VCPLMP, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also be publicised through the general media.	Not Triggered	BMC maintains accurate records substantiating all activities associated with or relevant to the EPBC Approval conditions, including measures to implement the BOMP and the BDMP (which incorporates the VCPLMP). No request was made during the Reporting Period to make any records available to DCCEEW. **Appendix A** describes the commitments made in the approved BDMP and how each has been addressed in the Reporting Period. **Appendix B** describes the commitments made in the approved BOMP and how each has been addressed in the Reporting Period. **Appendix A** describes pre-clearing and clearing activities implemented in accordance with the BDMP during the Reporting Period.
12	By the end of March each year, the approval holder must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of the BOMP and VCPLMP as specified in the conditions. Documentary evidence providing proof of the date of publication must be provided to the Department at the same time as the compliance report is published. Note: The Annual Review required under NSW Approval condition 4 (of Schedule 5) may be used to satisfy this condition if it meets the above content and submission requirements.	Compliant	This report addresses compliance with each of the conditions of the EPBC Approval for the Reporting Period. **Appendix A** describes the commitments made in the approved BDMP and how each has been addressed in the Reporting Period. **Appendix B** describes the commitments made in the approved BOMP and how each has been addressed in the Reporting Period. **Appendix A** describes pre-clearing and clearing activities implemented in accordance with the BDMP during the Reporting Period. This report will be uploaded to Bengalla's website by the end of March 2026 and documentary evidence of publication will be provided to DCCEEW at the same time.
13	Non-compliance with any of the conditions of this approval must be reported to the Department within 2 business days of the approval holder becoming aware of the non-compliance.	Not Triggered	Not triggered during the reporting period.

Ref	Condition	Status	Comment
14	Upon the direction of the Minister, the approval holder must ensure that an independent audit of compliance with the conditions of approval is conducted, and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.	Compliant	Correspondence received from DCCEEW on 25 September 2025 of a potential request to conduct an independent audit of compliance as per Condition 14 of EPBC2012/6378. BMC discussed capturing this independent audit as part of the IEA requirements in SSD-5170 Schedule 5, Condition 9 scheduled for November 2025. DCCEEW authorised the independent auditor to conduct an EPBC audit in accordance with Condition 14, in concurrence with the DPHI audit and requested a copy of the final independent audit be provided to DCCEEW upon completion. The final audit report due date was extended into early 2026 and a copy was provided to DCCEEW on 13 March 2026 to audit@dcceew.gov.au.
15	If the approval holder wishes to carry out any activity other than in accordance with a Plan as specified in the conditions, the approval holder must submit to the Department for the Minister's written approval a revised version of that Plan. The approval holder must not commence the varied activity until the Minister has approved the varied Plan in writing. The Minister will not approve a varied Plan unless the revised Plan would result in an equivalent or improved environmental outcome over time. If the Minister approves the revised Plan, that Plan must be implemented in place of the Plan originally approved.	Not Triggered	No relevant activities other than those described in the BMP or BOMP were required during the Reporting Period.
16	If the Minister believes that it is necessary or convenient for the better protection of listed threatened species and ecological communities to do so, the Minister may request that the approval holder make specified revisions to a Plan specified in the conditions and submit the revised Plan for the Minister's written approval. The approval holder must comply with any such request. The revised approved Plan must be implemented. Unless the Minister has approved the revised Plan then the approval holder must continue to implement the Plan originally approved, as specified in the conditions.	Not Triggered	No request was made during the Reporting Period.
17	If, at any time after 5 years from the date of this approval, the approval holder has not commenced the action, then the approval holder must not commence the action without the written agreement of the Minister.	Not Triggered	By email dated 30 October 2015, BMC advised the then DoEE that the action the subject of the EPBC Approval commenced on 1 October 2015.

6 Conclusion

During the Reporting Period, there was one ongoing non-compliance with EPBC Approval conditions which has previously been reported to the DCCEEW. This related to Condition 4 which requires the offset lands to be secured as a biodiversity offset. DCCEEW previously advised that it had reviewed the matter and that no further action will be taken regarding this matter.

BMC will continue to review and document all relevant activities at Bengalla during the 2026 reporting period to assist in maintaining compliance with the EPBC Approval conditions.

Appendix A and **Appendix B** provide comments about the implementation of the BMP and BOMP commitments respectively during the Reporting Period. In summary, BMC has generally complied with the BMP and BOMP commitments for the Reporting Period.

Appendix A Biodiversity Management Plan Commitments

BDMP Section	Control / Action	Timing / Trigger	Responsibility	Monitoring	Reporting	Status	Comment
4.1	Marking Limits of Clearing	Prior to clearing	Environment Superintendent / Mining Manager / Surveyors	Inspection to be undertaken throughout duration of clearing.	Documented in Ground Disturbance Permit (GDP) form and signed off.	Compliant	GDP boundaries are demarcated prior to clearing, where required. Refer section 2.3 of **Appendix A.**
4.2	Identification of suitable fauna relocation sites	Prior to clearing	Environment Superintendent / Mining Manager	N/A	Documented in GDP form and/or pre-clearing report.	Compliant	Refer Section 2.3.6 of **Appendix A**.
4.2	Pre-clearing surveys	Within one month prior to clearing	Suitably qualified person	Monitoring of fauna and flora (including Tiger Orchid, pest and weed species), habitat features and plant pathogens.	Documented and signed off in the pre-clearing report. Results are reported in Annual Review. OEH notified if new threatened species identified.	Compliant	Refer Section 3.1 of **Appendix A**.
4.2	Clearing Surveys	Within one month of the pre-clearing survey	Suitably qualified person	Monitoring of fauna and flora (including Tiger Orchid, pest and weed species), habitat features and plant pathogens.	Documented and signed off in the clearing report. Results are reported in Annual Review. OEH notified if new threatened species identified.	Compliant	Refer Section 3.2 of **Appendix A**.
4.3	Pre-clearing weed management	Prior to clearing and during clearing	Suitably qualified person and Environment Superintendent	Inspection to be undertaken prior to clearing.	Documented and signed off in the GDP. Results are reported in Annual Review.	Compliant	Refer Section 3.1.7 of **Appendix A**.
4.2.3	Relocation of habitat features to rehabilitation areas, adjacent vegetation or storage location.	During and/or after clearing	Environment Superintendent	N/A	Documented and signed off in the GDP. Results are reported in Annual Review.	Compliant	Refer Section 3.1.8 and Section 3.2 of **Appendix A**.

BDMP Section	Control / Action	Timing / Trigger	Responsibility	Monitoring	Reporting	Status	Comment
4.1	Inductions and Staff Education	Ongoing as part of the existing induction process or as part of toolbox talks prior to commencement of ground disturbance works.	Environment Superintendent	N/A	As per BMC Induction procedure	Compliant	Inductions provided to BMC staff and contractors include a component on biodiversity management.
4.2	Vehicle Driving Policy and Signage	Ongoing or when wildlife crossing areas are identified	Mining Manager / Environment Superintendent	N/A	N/A	Compliant	No wildlife crossing areas were identified by the suitably qualified expert (SLR) during 2025. Site access tracks and controls are included in site procedures.
4.2.5	Seed collection	Targeted throughout year and opportunistically before and immediately after clearing	Environment Superintendent	Observations to be made throughout year to check flowering / seeding development of key species. Ensure correct licences are held by any contractors.	To be documented and reported in Annual Review.	Compliant	Refer Section 3.1.6 of **Appendix A**.
4.3	Weed control	Ongoing over life of mine	Environment Superintendent	Routine field observations and management undertaken in Weed Control Zones, including rehabilitation areas.	Results to be reported in Annual Review.	Compliant	Refer **Appendix D.**
4.4	Feral animal control	Ongoing over life of mine	Environment Superintendent	Routine field observations undertaken and management undertaken including rehabilitation areas.	Results to be reported in Annual Review.	Compliant	Refer **Appendix D.**
5.0	Ecological Monitoring and Inspections	Ongoing over life of mine	Ecologist	N/A	Results to be reported in Annual Review.	Compliant	The purpose of the ecological monitoring program is primarily to monitor the risks posed by

BDMP Section	Control / Action	Timing / Trigger	Responsibility	Monitoring	Reporting	Status	Comment
							plant pathogens, exotic weeds and feral animals in biodiversity offsets, residual vegetation and rehabilitation areas and to indicate where management actions are required. For weed and feral animal monitoring programs for Bengalla and the biodiversity offset areas refer to **Appendix D.** Rehabilitation monitoring was completed during November 2025 for the 2025 reporting period. Details of results are presented in Section 8 of the 2025 Annual Review. As stated at section 5.4 of the BMP, no immediate management actions are required for the management of plant pathogens at Bengalla. However, signs of pathogens outbreaks (e.g. in pre-clearing surveys) may require measures to be taken in the future.

Appendix B Biodiversity Offset Management Plan Commitments

BOMP Section	Commitment	Status	Comment
Notification			
2.3	Following approval, all actions detailed within this BOMP will be implemented. Within one month of receiving approval, this BOMP will be made available to the public on the BMC website.	Compliant	The BOMP is implemented as part of BMC's operations. The BOMP (with regulatory approval letters) (August 2017) is publicly available on Bengalla's website.
Fencing, Gates and Signage			
8.1	Boundary fencing will remain around all BOS Areas and will be inspected annually to identify areas that may require maintenance.	Compliant	An annual inspection of boundary fencing for all biodiversity offset areas (BOS Areas) was undertaken in 2025.
8.1	Internal fencing within Kenalea properties and Black Mountain will be maintained (where appropriate) to allow for the management of controlled grazing in these properties.	Compliant	No internal fence repairs were required in 2025 at Kenalea or Black Mountain.
8.1	Stock proof fencing will be utilised where existing fences are absent to protect sensitive areas.	Not Triggered	Not required during the Reporting Period.
8.1	Current gates for access to BOS Areas will be retained and kept locked.	Compliant	Gates to BOS Areas remained secured and locked during 2025.
8.1	BMC will install signage at the entrances to the BOS Areas to inform the public of restricted access to properties.	Compliant	Restricted access signage at the entrances to the BOS Areas has been installed prior to 2025.
Controlled Activities			
8.2	All contractors, stakeholders and visitors to the BOS Areas will be inducted. The induction will include information on activities prohibited in BOS Areas unless explicitly undertaken for the purposes of ongoing management.	Compliant	BMC has established internal polices which require all staff/contractors, stakeholders and visitors working at Bengalla (or BOS Areas) to be inducted prior to undertaking specified work. The BOS Areas induction identifies relevant compliance obligations including under applicable management plans.

BOMP Section	Commitment	Status	Comment
Control Grazing			
8.3	Control grazing will only be permitted in Zone 1 and Zone 2 management areas.	Not Triggered	No control grazing was undertaken during 2025.
8.3	Best practice for control grazing will be implemented wherever control grazing is employed, including: • Providing adequate rest periods and adjusting rest periods to suit the recovery needs and growth rates of the desirable plants; • Targeting defined areas with high fuel loads or weed infestations; • Cattle stocking numbers kept below 4 dray sheep equivalent; • Pre and post grazing monitoring; • Periods of grazing must be kept as short as practicable; and • Control grazing will not be conducted during declared drought periods.	Not Triggered	No control grazing was undertaken during 2025.
8.3	Control grazing will be monitored against Trigger and Performance Criteria.	Not Triggered	No control grazing was undertaken during 2025.
7.1	Should monitoring results indicate that regeneration is not occurring naturally after Year 5, assisted revegetation will take place in areas that require this management action.	Not Triggered	An assisted regeneration program will be developed and implemented to mid and over storey covers in identified areas as required.
8.3	Stock will be excluded from riparian areas and will access water primarily from farm dams or water troughs.	Not Triggered	No cattle grazing was undertaken during 2025.
8.3	Monitoring will be undertaken pre and post grazing with the use of photo reference points. Areas subject to control grazing will be monitored as part of annual monitoring program.	Not Triggered	No cattle grazing was undertaken during 2025.
Bushfire management			

BOMP Section	Commitment	Status	Comment
8.4	BMC will take practicable steps to prevent the occurrence of bushfires on the land and minimise the spread of bushfire.	Compliant	No bushfire hazard reduction burns were conducted on any of the offset areas in 2025. Dry conditions and an electrical storm on 25 November 2025 resulted in the ignition of a bushfire which burnt a total area of approximately 267 ha. The fire was controlled by the RFS the same day as ignition, with further remedial works competed under watch and act conditions in the days following. No anthropogenic environmental harm or contravention of the approval occurred as a result of the event.
8.4	BMC will provide maps (including water fill points) and contact details of the properties to the RFS.	Compliant	Maps, keys and relevant contact information have previously been provided to local RFS captains. Updated site contact details and fire trail mapping was provided to the RFS in 2025.
Weed Control			
8.5	Weed management actions will target Weeds of National Significance and Noxious Weeds across BOS Areas.	Compliant	Enright Land Management undertook a weed monitoring and control program in BOS Areas during the Reporting Period. Records of the locations of weed control are detailed in **Appendix D**.
8.5	Weed control will focus on species that exclude or have the potential to exclude native species, disrupt the recruitment of native species or impede ecological progress.	Compliant	A summary of the weed monitoring and control program undertaken during the Reporting Period is provided in **Appendix D**.
8.5	Weed management will be undertaken in accordance with the management principles listed in Section 8.5 of the BOMP.	Compliant	Weed management practices were undertaken during the Reporting Period in accordance with Section 8.5 of the BOMP.
8.5	The results and outcomes of weed management will be documented and analysed for each year in the Annual Review. This will include documentation of areas subject to weeding, techniques used, target species controlled, new species identified, chemicals used and revised approaches to weed control in light of learnings during the previous reporting period.	Compliant	A summary of the weed monitoring and control program for the Reporting Period is provided in **Appendix D**.
8.5	Weed infestation maps will be updated annually and annotated as required with information about previously implemented weed controls.	Compliant	A weed monitoring and control program was undertaken during the Reporting Period. The location of weeds identified during the program were recorded for GIS input and is presented in **Appendix D**.

BOMP Section	Commitment	Status	Comment
Feral Animal Control			
8.6	BMC will conduct an annual feral animal control program in conjunction with current Local Land Services programs.	Compliant	A feral animal control program was undertaken in 2025. This was undertaken in line with neighbouring properties and the Local Land Services baiting program and is described in **Appendix D**.
8.6	Should any native fauna deaths be recorded during 1080 baiting and if sufficient carcass is available the animal will be sent to a veterinarian to provide a cause of death should there be any evidence of poisoning.	Not triggered	No native fauna deaths were reported during the 2025 feral animal control program.
8.6	The results and outcomes of feral animal management will be documented for each year in the Annual Review. This will include documentation of the techniques used for each feral species, the quantity of bait material purchased and deployed, the areas subject to control, estimate of the numbers of animals culled, new species identified (if any) and any other chemicals used.	Compliant	A summary of the 2025 feral animal control program is provided in **Appendix D**.
8.6	All personnel involved in feral animal management must hold relevant and valid licences/permits, including any relevant chemical licences for pesticide use or a firearms licence for shooting.	Compliant	Staff and/or contractors involved in feral animal management held all relevant licences and accreditations to undertake the feral animal control works in 2025.
Maintenance Track Improvement and Additional Infrastructure			
8.7	Maintenance of existing tracks and installation of additional infrastructure may be required to provide safe access to BOS Areas. Maintenance or construction works may result in minor/localised disturbance. BMC will ensure compliance with all legal and environmental protection measures prior to any significant disturbance.	Compliant	All existing access tracks in all offsets were assessed and regraded (where necessary) in 2025.
8.7	BMC will record and store all relevant GIS information related to the improvement or installation of additional infrastructure.	Compliant	BMC has recorded and stored GIS information for all improvements and installation of additional infrastructure on the BMC GIS database.
8.7	BMC will undertake routine inspections and maintenance of BOS infrastructure (e.g. tracks, fence lines, gates)	Compliant	Inspections and maintenance of tracks was undertaken in 2025. Fence lines and gates were also inspected.

BOMP Section	Commitment	Status	Comment
Contingency Measures			
8.8	Contingency measures will be utilised should monitoring indicate that performance measures or contingency measures are not being met.	Not Triggered	No contingency measures were required during the Reporting Period.

Appendix C Annual Clearing Report 2025

Bengalla Annual Clearing Report

2025 EPBC Clearance Report

Bengalla Mining Company Pty Ltd (BMC)

Prepared by:

SLR Consulting Australia

SLR Project No.: 610.032334.00003

24 February 2026

Revision: 2.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1.0	23 February 2026	Ashleigh Rosenkranz	Jeremy Pepper	Jeremy Pepper
2.0	24 February 2026	Ashleigh Rosenkranz	Jeremy Pepper	Jeremy Pepper

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Bengalla Mining Company Pty Ltd (BMC) (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Executive Summary

Bengalla is an open-cut coal mine situated four kilometres west of Muswellbrook in the Upper Hunter Valley, NSW. Pre-clearing and clearing operations were undertaken at Bengalla mine over the course of 2025 for the construction of new infrastructure, the relocation and maintenance of infrastructure and service roads, and the westward extension of the open-cut mining pit. All procedures and works were conducted in accordance with the Bengalla Mine Biodiversity Management Plan.

Pre-clearance surveys included the assessment of vegetation prior to clearing to identify fauna habitat features, specifically hollow bearing trees and stick nests, which were subsequently marked and recorded as habitat trees. Other habitat features including salvageable logs and wombat burrows were also recorded. A total of 154 hollow-bearing trees, 21 trees containing nests, and 28 areas with wombat burrows were identified within the disturbance area during the 2025 pre-clearance survey period.

A previously identified clump of Tiger Orchids *Cymbidium canaliculatum*, which formed part of an endangered population listed under the *NSW Biodiversity Conservation Act 2016* located on a single tree within the disturbance area was relocated to a recipient site within an existing rehabilitation area outside of the future mine disturbance area.

Clearing works during 2025 were undertaken in a two-stage process with Stage 1 involving removing all vegetation, with the exception of habitat trees. Stage 2 included the removal of habitat trees under the supervision of the project ecologist. Stage 2 clearing occurred over eight days (non-consecutive) in January, March and April in 2025. All habitat trees were checked by an ecologist after being felled. A total of 53 displaced fauna were observed during tree felling activities. Thirty-three of these were relocated and released in suitable habitat nearby, 15 individuals escaped into adjoining habitats (without being handled); and five individuals were killed during the works. All habitat trees felled during Stage 2 clearing works were left for a minimum of 24 hrs to allow any resident fauna to relocate overnight.

Table of Contents

Basis of Report i
Executive Summary ii
Acronyms and Abbreviations v
1.0 Introduction 1
1.1 Background 1
1.2 Existing Operation 1
1.3 Aims and Objectives 1
2.0 Methods 3
2.1 Personnel 3
2.2 Licences and Permits 3
2.3 Pre-clearing survey procedure 3
2.3.1 Fauna habitat identification 4
2.3.2 Species inventory 4
2.3.3 Surveys for Tiger Orchid 4
2.3.4 Salvageable habitat material 4
2.3.5 Surveys for *Phytophthora cinnamomi* 4
2.3.6 Fauna relocation sites 5
2.3.7 Collection of seeds for rehabilitation purposes 5
2.3.8 Identification of weed and pests species infestations 5
2.4 Clearing Procedure 5
2.4.1 Overview 5
2.4.2 Fauna handling and relocation 5
3.0 Results 6
3.1 Stage 1 pre-clearance surveys 6
3.1.1 Vegetation community structure 6
3.1.2 Habitat, hollow-bearing and significant trees 7
3.1.3 Species inventory 7
3.1.4 Tiger Orchid *Cymbidium canaliculatum* 7
3.1.5 *Phytophthora cinnamomi* surveys 10
3.1.6 Collection of seeds for rehabilitation purposes 10
3.1.7 Weed species 10
3.1.8 Salvageable material 10
3.2 Stage 2 Tree Clearing 14
3.2.1 Schedule of Stage 2 Works in 2025 14

3.2.2 Fauna recorded and relocated 14
3.2.3 Salvage of habitat resources 15
3.2.4 Stage 2 clearing works completed outside approved clearing time 15
4.0 Conclusion 16
5.0 References 17

Tables

Table 1 Staff Roles and Qualifications 3
Table 2 Pre-clearance surveys undertaken in 2025 6
Table 3 Vegetation communities on site 6
Table 4 Weed species recorded on site 10
Table 5 Clearing works undertaken in 2025 14
Table 6 Fauna recorded during Stage 2 clearing works 14

Figures

Figure 1 Site Location 2
Figure 2 Ground Disturbance Permit Areas 11
Figure 3 Tiger Orchid Relocation Areas 12
Figure 4 Relocated Fauna and Habitat Trees 13

Photos

Photo 1 Translocated Tiger Orchid *Cymbidium canaliculatum* in position at recipient site. 8
Photo 2 Tiger Orchid *Cymbidium canaliculatum* on the host tree 9

Appendices

Appendix A Flora Species List
Appendix B Fauna Species List
Appendix C Bengalla Clearing Procedure

Acronyms and Abbreviations

BC Act	*NSW Biodiversity Conservation Act 2016*
BMC	Bengalla Mining Company Pty Ltd.
BMP	Biodiversity Management Plan
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
GDP	Ground Disturbance Permit
LGA	Local Government Area
SLR	SLR Consulting Australia Pty Ltd

1.0 Introduction

1.1 Background

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Bengalla Mining Company (BMC) to prepare the 2025 Bengalla Annual Clearing Report.

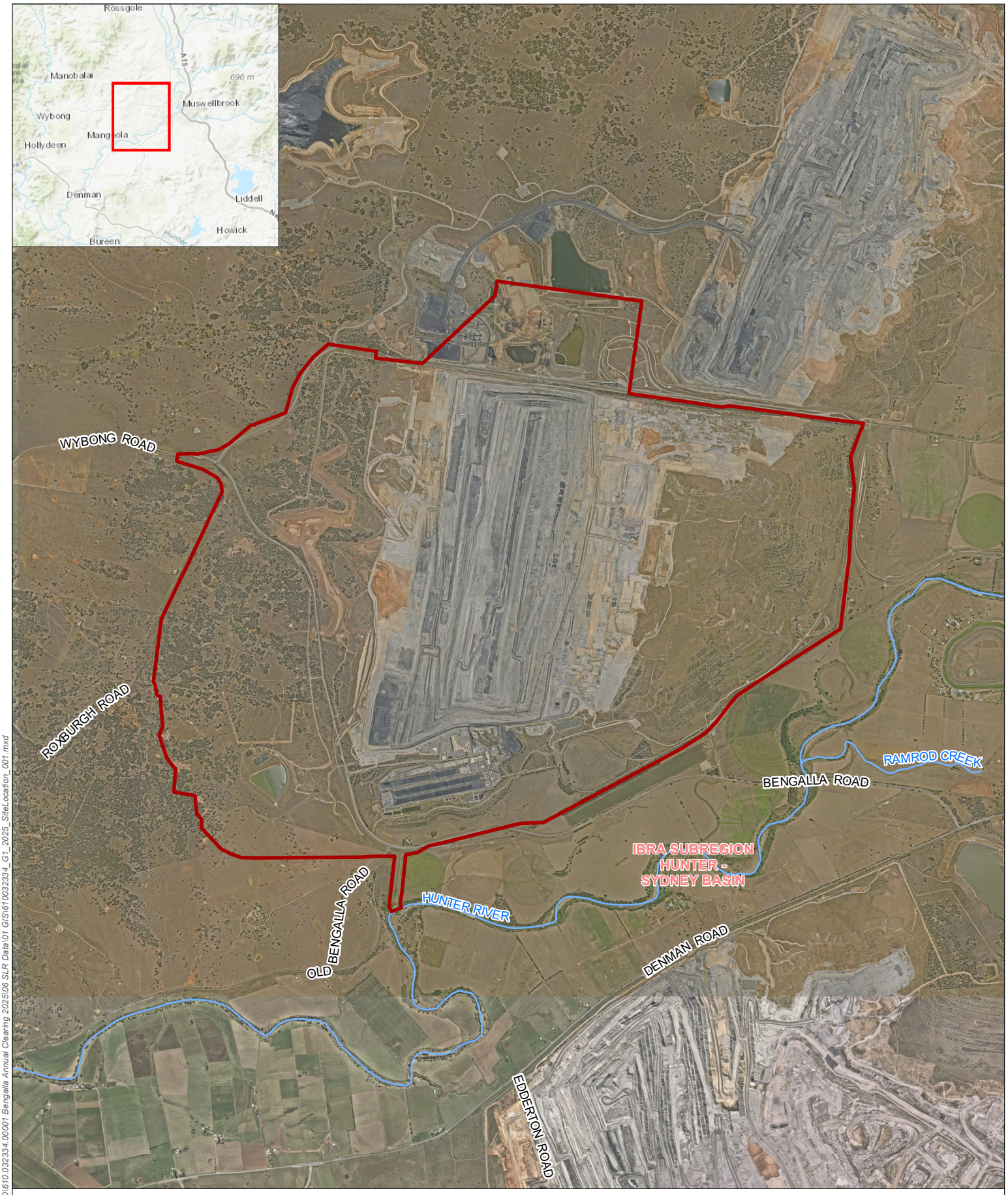
1.2 Existing Operation

BMC operates Bengalla Mine, an open-cut coal mine situated approximately four kilometres west of Muswellbrook in the Upper Hunter Valley, NSW (Figure 1). During the reporting period, clearing operations were carried out for the construction of new infrastructure, the relocation and maintenance of infrastructure and service roads, and the westward extension of the open-cut mining pit.

1.3 Aims and Objectives

The purpose of this Annual Clearing Report is to outline the procedures and outcomes of all pre-clearing and clearing activities conducted at Bengalla in 2025. This includes:

- Ecology pre-clearing operations
- Stage 1 and Stage 2 clearing operations
- Fauna handling and relocation
- Habitat salvage and procedures



0 500 1,000 m

Watercourse

SSD-5170 Project Boundary

BENGALLA ANNUAL CLEARING 2025

Site Location

Coordinate System:	GDA2020 MGA Zone 56
Scale:	1:45,000 at A4
Project Number:	610.032334
Date:	24-Feb-2026
Drawn by:	JG

SLR

Data Sources:
NSW Spatial information exchange catalogue,
Imagery (27 Dec 2025) provided by client and Nearmap imagery WMS (February 2026)

FIGURE 1

\\au.slr.local\Corporate\Projects-SLR\610-SYD\610-SYD\610.032334.00001 Bengalla Annual Clearing 2026\06 SLR Data\01 GIS\610032334_G1_2025_SiteLocation_001.mxd

2.0 Methods

2.1 Personnel

The roles and qualifications of all staff responsible for the preparation of this report are listed in Table 1.

Table 1 Staff Roles and Qualifications

Staff Name & Title	Qualifications and Training	Role
Jeremy Pepper Technical Director	BSc (Hons 1), UNSW, Cert II Bushland Regeneration (TAFE) Cert III Horticulture (Arboriculture)(TAFE) BAM Accredited Assessor (BAAS17104)	Report technical review, pre-clearance surveys
Ashleigh Rosenkranz Project Ecologist	Bachelor of Environmental Science and Management, University of Newcastle	Report drafting, pre-clearance surveys, clearing supervision
Vander Bertoldo Project Ecologist	MMESM - SCU BBs (Hons 1) – UNESC	Pre-clearance surveys
Elise Newberry Project Ecologist	Bachelor of Environmental Biotechnology – University of Technology Sydney	Project management
Joshua Drane Senior Ecologist	Bachelor of Environmental Science - Australian Catholic University	Tiger Orchid translocation supervision

2.2 Licences and Permits

The SLR ecology team operates under a Scientific Licence (licence number SL100176, issued under the *NSW Biodiversity Conservation Act 2016* (BC Act), which authorises field staff to trap, capture, harm, hold and release plants and animals protected under the BC Act and *National Parks and Wildlife* Act *1974*, as well as Animal Research Authority (issued by the Secretary of the NSW Animal Care and Ethics Committee of DPIE), which allows trapping of animals in NSW for 'animal research'.

2.3 Pre-clearing survey procedure

Ecology pre-clearance surveys were undertaken throughout 2025 in alignment with section 4.2.1 of the *Bengalla Biodiversity Management Plan* (BMP) (Hansen Bailey 2017), which specifies management actions for vegetation pre-clearance procedures. The objectives of the ecology pre-clearance surveys include:

- Identifying the presence or absence of threatened species and their habitats, including the Tiger Orchid (*Cymbidium canaliculatum*).
- Identification of hollow bearing trees as habitat trees and marked with an 'H' to be removed during stage 2 clearing.
- Suitable salvage habitat features such as hollow bearing logs to be marked with an 'S' for relocation to provide fauna habitat.

- Identification of threatened flora and fauna species located within the disturbance boundaries and locations recorded.

2.3.1 Fauna habitat identification

Pre-clearance areas were assessed for trees with important habitat features that are suitable for arboreal fauna (e.g. gliders, birds, microchiropteran bats). Trees with suitable hollows or stick nests were identified as habitat trees and marked accordingly with an 'H' on the trunk and flagged with pink flagging tape to be cleared under stage 2 of the two-stage clearing procedure as outlined in the Bengalla BMP (Hansen Bailey, 2017).

2.3.2 Species inventory

Flora and fauna species recorded during the preclearance surveys and clearing surveys are included in Appendix A and Appendix B.

2.3.3 Surveys for Tiger Orchid

All preclearance areas were surveyed for evidence of the Tiger Orchid *Cymbidium canaliculatum*, which is listed as an 'endangered population' in the Hunter Valley[1] under Schedule 1, Part 2, Division 4 of the *NSW Biodiversity Conservation Act* 2016 (BC Act). Tiger Orchids found within the clearing zones were recorded with GPS coordinates and assessed for relocation in accordance with section 4.2 of the Bengalla BMP. Refer to Appendix C for the clearing procedure.

2.3.4 Salvageable habitat material

Salvageable habitat material was assessed as outlined in 4.2.3 of the Bengalla BMP which identifies selection criteria including:

- *Woody ground debris selected based on size, structural integrity and presence of good hollows.*
- *Stags will be selected if they appear solid and have good hollows in the trunk*
- *Rocks >500 mm width that appear solid enough to survive translocation.*

The presence of suitable salvageable habitat material were assessed during the preclearance surveys and GPS recorded. Due to the limited number of pre-clearance surveys undertaken in 2025, no salvageable material was identified.

2.3.5 Surveys for *Phytophthora cinnamomi*

The preclearance surveys included assessing the presence of Root Rot (or Cinnamon Fungus) *Phytophthora cinnamomi*, which is listed as a key threatening process under the Schedule 4 of the BC Act and under the EPBC Act and can cause permanent damage to native trees and their ecosystems. Any visual signs of the disease (e.g. wilting and discolouration of leaves, dieback of canopy foliage) was recorded, where present.

[1] Listed as '*Cymbidium canaliculatum population in the Hunter Catchment*' under BC Act

2.3.6 Fauna relocation sites

Areas of appropriate habitat for fauna rescued during clearing supervision were assessed and recorded as fauna relocation sites. The features assessed as to their suitability for fauna relocation include:

- Areas outside of the impacted clearing zone with suitable habitat connectivity to prevent fauna relocating back within the clearing zone limits after release.
- The prevalence of suitable hollow bearing trees to provide habitat to fauna, specifically arboreal fauna (e.g. possums, gliders, microchiropteran bats).
- Presence of hollow-bearing logs to provide habitat and protection from predators for relocated reptiles.

Identified fauna relocation areas were used for displaced fauna found during Stage 2 clearing in 2025.

2.3.7 Collection of seeds for rehabilitation purposes

The Bengalla BMP outlines the following in relation to native seed collection:

"*Harvest of native species at Bengalla will be conducted throughout the year to coincide with the seeding period for target* species"

Native flora species were assessed as to their viability for seed collection purposes for future rehabilitation during the 2025 pre-clearing surveys. Due to the limited number of pre-clearing surveys undertaken in 2025 and the lack of seed availability, no seeds were collected for rehabilitation purposes.

2.3.8 Identification of weed and pests species infestations

An assessment of significant infestations of weed species was conducted during the pre-clearing surveys, specifically focussed on noxious weed and Weeds of National Significance (WONS) as outlined in section 4.1.1 of the Bengalla BMP.

2.4 Clearing Procedure

2.4.1 Overview

Section 4.2.2 of the Bengalla BMP outlines the required two-stage clearing procedure:

- **Stage 1**: Removal of all vegetation other than habitat trees. Habitat features left standing overnight.
- **Stage 2**: Removal of habitat trees 24hrs or more after Stage 1 clearing. Habitat trees lightly shaken prior to felling and subsequently checked for fauna by an ecologist once felled. Felled habitat trees were left overnight to allow any remaining fauna to relocate.

Refer to Appendix C for the full clearing procedure.

2.4.2 Fauna handling and relocation

Fauna species found during the clearing procedure were identified and location was recorded. The following outlines the procedures undertaken when displaced fauna are identified. All activities were undertaken in accordance with the Animal Research Authority Code of Practice (National Health and Medical Research Council):

- Uninjured fauna were relocated to identified fauna relocation areas with suitable habitat (e.g. Hollow bearing trees) outside of the clearing footprint.
- Injured fauna were handed over to wildlife rehabilitation agencies.

Severely injured fauna that were assessed as non-viable for rescue were euthanised on site.

3.0 Results

3.1 Stage 1 pre-clearance surveys

All pre-clearance works undertaken in 2025 are listed in Table 2.

Table 2 Pre-clearance surveys undertaken in 2025

Date	Type of Works	Location	Vegetation Community
14 January 2025	Pre-Clearance	Broad Inspection Area Mulching 2025	Central Hunter Ironbark Grassy Woodland
23 January 2025	Pre-Clearance	Broad Inspection Area Mulching 2025	Central Hunter Ironbark Grassy Woodland
4 March 2025	Pre-Clearance	Broad Inspection Area Mulching 2025	Central Hunter Ironbark Grassy Woodland
5 March 2025	Pre-Clearance	Broad Inspection Area Mulching 2025	Central Hunter Ironbark Grassy Woodland
1 April 2025	Pre-Clearance	Broad Inspection Area Mulching 2025	Central Hunter Ironbark Grassy Woodland
1 April 2025	Pre-Clearance	Broad Inspection Area Mulching 2025	Central Hunter Ironbark Grassy Woodland

3.1.1 Vegetation community structure

The vegetation on site consists predominantly of a mixture of native and exotic species. The canopy is dominated by Narrow-leaved Ironbark *Eucalyptus crebra* with occasional Grey Box *Eucalyptus moluccana* and Forest Red Gum *Eucalyptus tereticornis.* The shrub layer is predominantly weed species including dense thickets of African Boxthorn *Lycium ferocissimum* and patches of Purpletop *Verbena bonariensis*. The groundcover consists of a mixture of native species, including Wallaby Grass *Rytidosperma caespitosum* and Slender Bamboo Grass *Austrostipa verticillata* and weed species, such as African Lovegrass *Eragrostis curvula* and occasional Rhodes Grass *Chloris gayana.*

The vegetation communities recorded and mapped within the 2025 pre-clearance areas are outlined in Table 3.

Table 3 Vegetation communities on site

Location	Vegetation Community
Broad Inspection Area	Central Hunter Ironbark Grassy Woodland
Stage 3 Diversion Levee	Central Hunter Ironbark Grassy Woodland

3.1.2 Habitat, hollow-bearing and significant trees

A total of 154 hollow-bearing trees (HBTs), 21 habitat trees with bird nests, and 28 areas with wombat burrows were identified within the disturbance areas during the 2025 pre-clearing survey. These trees were identified over three two-day periods undertaken in January, March and April. The hollow bearing tree species primarily consisted of Narrow-leaved Ironbark *E. crebra*. Habitat trees identified in the pre-clearing surveys are shown in Figure 4.

3.1.3 Species inventory

Flora and fauna species recorded on site are listed in Appendix A.

3.1.4 Tiger Orchid *Cymbidium canaliculatum*

A Tiger Orchid clump was identified within the clearing zone (Photo 2) in April 2025. The recorded Tiger Orchid clump was located at the GDA94 coordinates 56H 293074 E 6427809 S, oriented at 40° northeast (NE) and 207° southwest (SW) on a 4.2° sloping ridge with a southeast (SE) aspect (160°) at 223 m elevation. The orchid clump was growing in the fork of a large over-mature Narrow-leaved Ironbark *Eucalyptus crebra* (the host tree).

Translocation works occurred in September 2025, where the Tiger Orchid was moved to a location outside of the clearing zone ‘recipient site’ (see Figure 3). The crown of the host tree containing the Tiger Orchids was trimmed for transport to the recipient site. The host tree was safely felled and transported to its recipient site. The host tree was then buried approximately 2 m in the ground and stabilised by compacting soil and rocks above the retained host tree root ball (see Photo 1).

The recipient site for the orchid was selected based on the advanced rehabilitation of the area and minimal risk from threats and disturbance. The translocated orchid was spread from previously translocated Tiger Orchids to try reduce potential localised environmental threats. The host tree was placed in a location that best emulated the donor site conditions, positioned facing 40° (NE) and 207° (SE) on a 4.2° sloping ridge with a SE aspect (160°) at 264 m elevation.

Photo 1 Translocated Tiger Orchid *Cymbidium canaliculatum* in position at recipient site



Photo 2 Tiger Orchid *Cymbidium canaliculatum* on the host tree



3.1.5 *Phytophthora cinnamomi* surveys

No visible signs of *Phytophthora cinnamomi* were observed during the 2025 pre-clearing survey.

3.1.6 Collection of seeds for rehabilitation purposes

No collection of seeds was undertaken during the 2025 pre-clearing surveys due to the limited availability of seed and limited duration of pre-clearing surveys undertaken in 2025.

3.1.7 Weed species

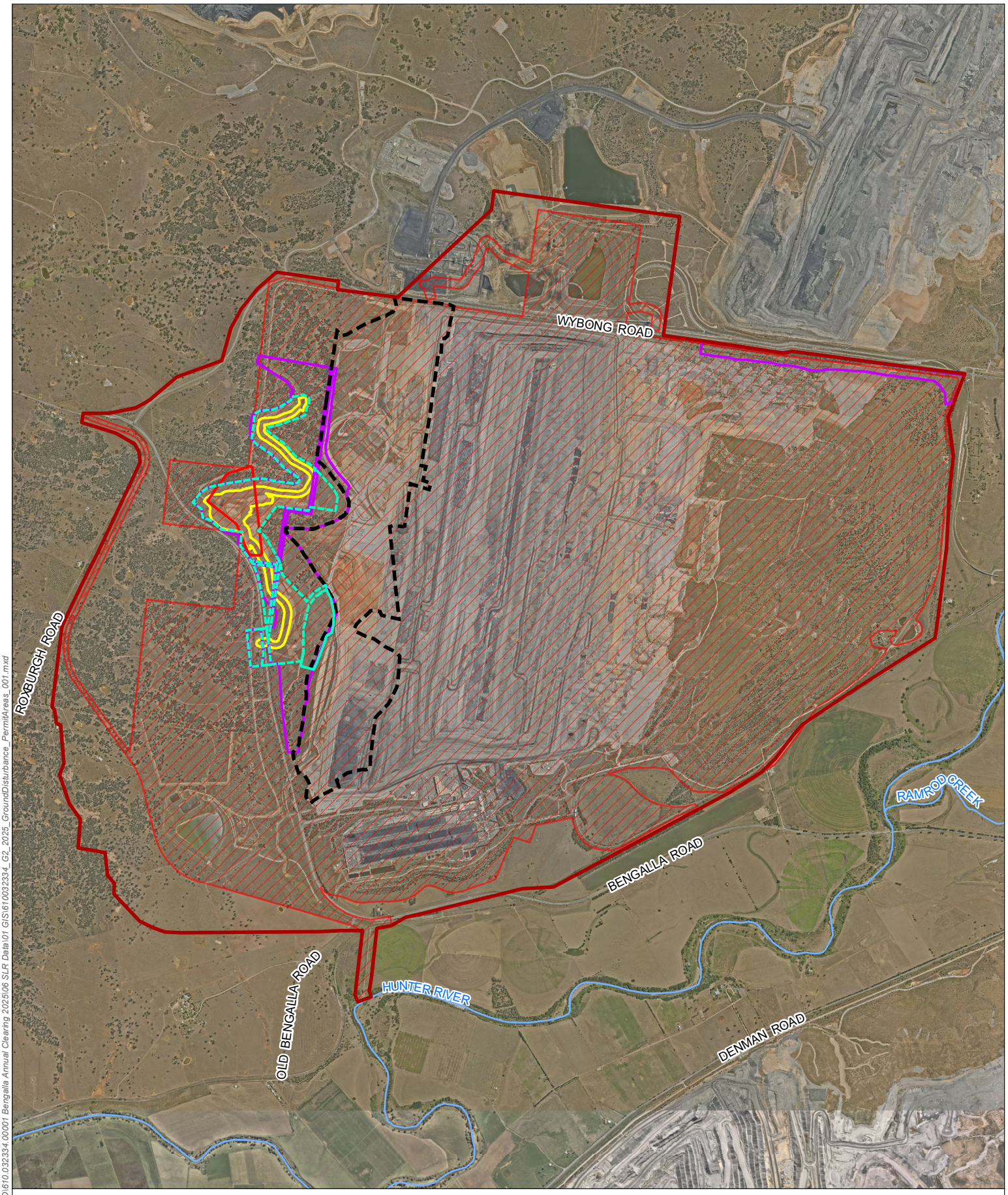
Weed species recorded during the 2025 pre-clearing surveys are listed in Table 4

Table 4 Weed species recorded on site

Scientific Name	Common Name	Weed of National Significance (WONS)	Noxious Weed Class
Cirsium vulgare	Spear Thistle	No	n/a
Eragrostis curvula	African Lovegrass	No	n/a
Lycium ferocissimum	African Boxthorn	Yes	4
Verbena bonariensis	Purpletop	No	n/a
Sisymbrium officinale	Mustard Weed	No	n/a
Chloris gayana	Rhodes Grass	No	n/a
Rubus fruticosus aggregate	Blackberry	Yes	4

3.1.8 Salvageable material

No salvageable habitat features were identified in the 2025 pre-clearing surveys.



0 500 1,000 m

Coordinate System:	GDA2020 MGA Zone 56
Scale:	1:35,000 at A4
Project Number:	610.032334
Date:	24-Feb-2026
Drawn by:	JG

SLR

- Watercourse
- SSD-5170 Project Boundary
- Client Boundary Digitised
- Broad Inspection Area Mulching 2025
- Stage 3 Diversion Levee Disturbance Boundary
- Approved Disturbance Boundary
- 2024 Clearing Area
- 2025 Clearing Area

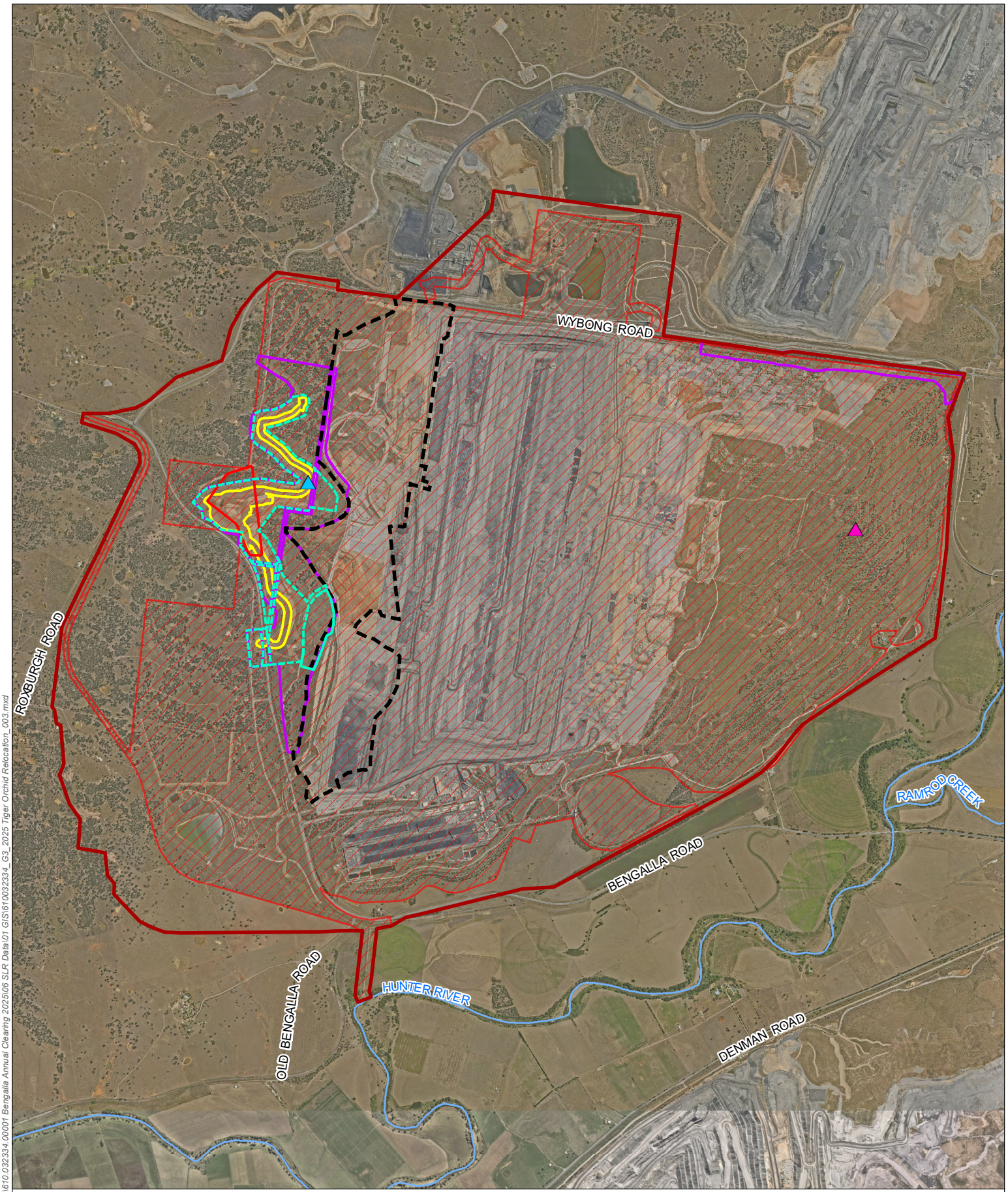
Data Sources:
NSW Spatial information exchange catalogue,
Imagery (27 Dec 2025) provided by client

BENGALLA ANNUAL CLEARING 2025

Ground Disturbance Permit Areas

FIGURE 2

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0 500 1,000 m

Coordinate System:	GDA2020 MGA Zone 56
Scale:	1:35,000 at A4
Project Number:	610.032334
Date:	24-Feb-2026
Drawn by:	JH

- Tiger Orchid Donor Location (19/03/2025)
- Tiger Orchid Relocation (04/09/2025)
- Watercourse
- SSD-5170 Project Boundary
- Client Boundary Digitised
- Broad Inspection Area Mulching 2025
- Stage 3 Diversion Levee Disturbance Boundary
- Approved Disturbance Boundary
- 2024 Clearing Area
- 2025 Clearing Area

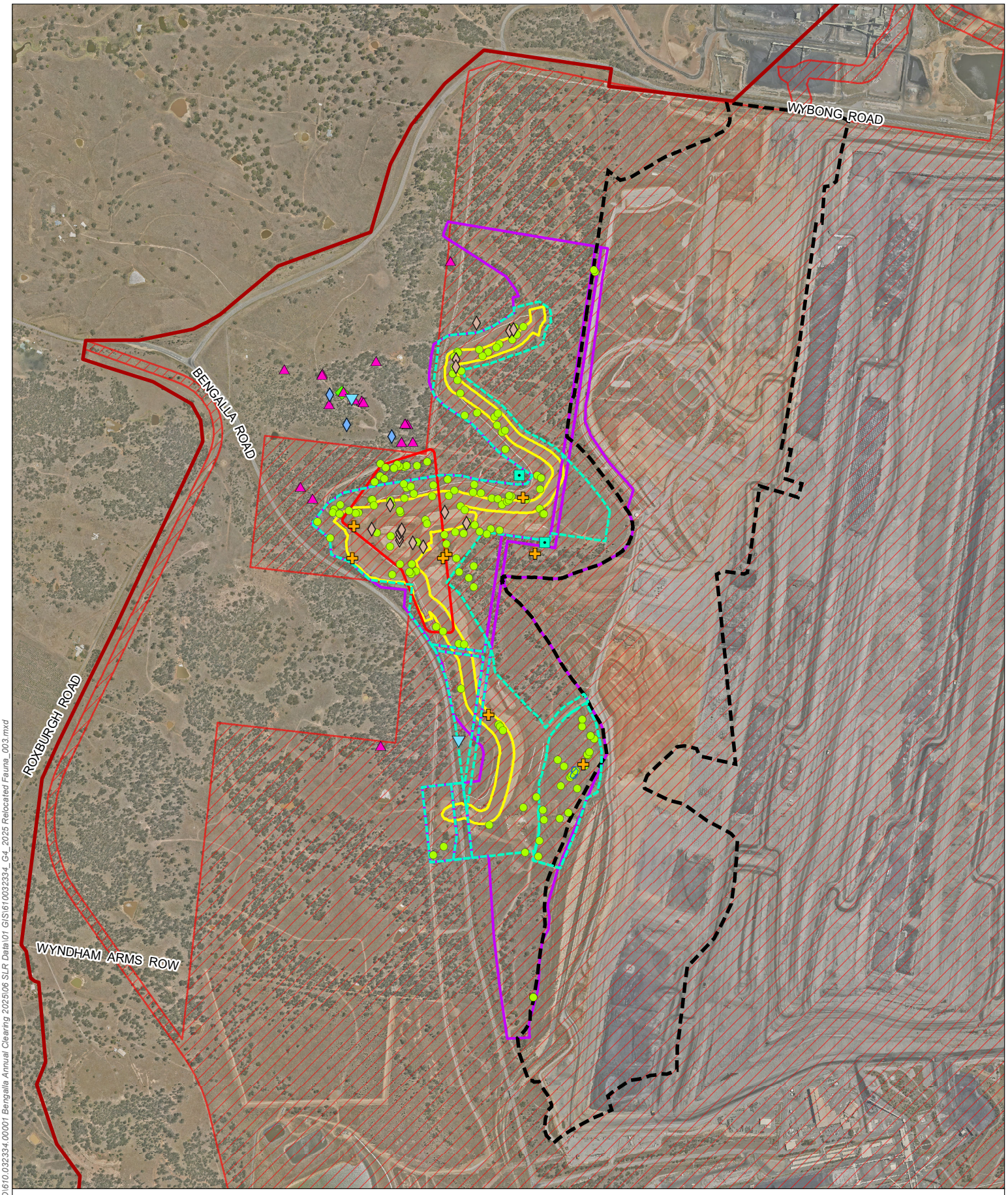
Data Sources:
NSW Spatial information exchange catalogue,
Imagery (27 Dec 2025) provided by client

BENGALLA ANNUAL CLEARING 2025

Tiger Orchid Relocation

FIGURE 3

\\au.slr.local\Corporate\Projects-SLR\610-SrvSYD\610.032334.00001 Bengalla Annual Clearing 2025\06 SLR Data\01 GIS\610032334_G3_2025 Tiger Orchid Relocation_003.mxd



0 250 500 m

Coordinate System:	GDA2020 MGA Zone 56
Scale:	1:17,000 at A4
Project Number:	610.032334
Date:	24-Feb-2026
Drawn by:	JH

SLR

Fauna Habitat
- Bird Nest
- Wombat Burrow

Relocated Fauna Species
- Bearded Dragon
- Brushtail Possum
- Lace Monitor
- Microbat
- Sugar Glider
- Habitat Tree
- Clump of Habitat Trees
- SSD-5170 Project Boundary
- Client Boundary Digitised
- Broad Inspection Area Mulching 2025
- Stage 3 Diversion Levee Disturbance Boundary
- Approved Disturbance Boundary
- 2024 Clearing Area
- 2025 Clearing Area

Data Sources:
NSW Spatial information exchange catalogue,
Imagery (27 Dec 2025) provided by client

BENGALLA ANNUAL CLEARING 2025

Fauna Habitat, Relocated Fauna and Habitat Trees

FIGURE 4

\\au.slr.local\Corporate\Projects-SLR\610-SrvSYD\610-SYD\610.032334.00001 Bengalla Annual Clearing 2025\06 SLR Data\01 GIS\610032334_G4_2025 Relocated Fauna_003.mxd

3.2 Stage 2 Tree Clearing

3.2.1 Schedule of Stage 2 Works in 2025

Table 5 outlines the schedule of Stage 2 clearing works undertaken in 2025.

Table 5 Clearing works undertaken in 2025

Date	Works Undertaken	Location	Vegetation Community
5 March 2025	Stage 2 Clearing	GDP2401	Central Hunter Ironbark Grassy Woodland
6 March 2025	Stage 2 Clearing	GDP2401	Central Hunter Ironbark Grassy Woodland
18 March 2025	Stage 2 Clearing	GDP2401	Central Hunter Ironbark Grassy Woodland
19 March 2025	Stage 2 Clearing	GDP2401	Central Hunter Ironbark Grassy Woodland
20 March 2025	Stage 2 Clearing	GDP2401	Central Hunter Ironbark Grassy Woodland
21 March 2025	Stage 2 Clearing	GDP2401	Central Hunter Ironbark Grassy Woodland
14 April 2025	Stage 2 Clearing	GDP2401	Central Hunter Ironbark Grassy Woodland
15 April 2025	Stage 2 Clearing	GDP2401	Central Hunter Ironbark Grassy Woodland

3.2.2 Fauna recorded and relocated

Table 6 outlines the number of fauna found, relocated and injured during Stage 2 clearing works in 2025. Incidental fauna sightings are listed in Appendix B.

Table 6 Fauna recorded during Stage 2 clearing works

Common Name	Scientific Name	Fled	Relocated	Injured	Killed
Tree Skink	*Egernia striolata*	0	1	0	0
Eastern Bearded Dragon	*Pogona Barbata*	0	3	0	2
Blue Tongue Lizard	*Tiliqua scincoides*	1	0	0	0
Common Brushtail Possum	*Trichosurus vulpecula*	1	19	0	2
Lace Monitor	*Varanus varius*	2	2	0	0
Noisy Miner	*Manorina melanocephala*	0	0	0	1
Sugar Glider	*Petaurus breviceps*	0	4	0	0
Unidentified Microbat	-	11	4	0	0
Total		**15**	**33**	**0**	**5**

3.2.3 Salvage of habitat resources

No habitat resources suitable for salvage, including hollows, logs, or other fauna habitat resources, were identified during the 2025 surveys.

3.2.4 Stage 2 clearing works completed outside approved clearing time

No Stage 2 clearing works were completed outside of the determined clearing area during 2025.

4.0 Conclusion

Pre-clearing surveys were undertaken over January, March and April 2025 and Stage 2 clearing occurred over March and April 2025. All works undertaken by qualified ecologists and were in accordance with the Bengalla BMP, which outlines the required processes for pre-clearance and staged clearing.

During the pre-clearance survey, a total of 154 hollow-bearing trees, 21 habitat trees with bird nests, and 28 areas containing wombat burrows were identified within the disturbance area in 2025 (Figure 4).

The translocation of identified Tiger Orchids located within the impacted clearing zone was undertaken in September 2025 under the supervision of an ecologist. The orchids were attached a host tree (large over-mature Narrow-leaved Ironbark), which was safely relocated to a recipient site located outside of the disturbance area (Figure 3). The location and position of the translocated orchids was established to best mimic the original conditions they were found in.

Stage 2 clearing was undertaken over the course of eight non-consecutive days within the broad inspection mulching area (Figure 2), with an estimated 30 habitat trees cleared per day. All habitat trees were checked for displaced fauna immediately after felling. A total of thirty-three (33) fauna individuals were relocated by hand. Twenty-nine individuals (Bearded Dragon, Common Brushtail Possum, Lace Monitor, Tree Skink, Sugar Glider) relocated approximately 2 km north-west of the clearing area. One Eastern Bearded Dragon approximately 200 m west of the clearing area, and one Common Brushtail Possum was relocated approximately 2 km west of the clearing area. All relocated fauna were moved to areas identified as suitable habitat for their species. Four microbats were released at dusk following the competition of clearing works. A total of 15 fauna individuals were displaced and dispersed naturally to outside of the clearing area and 5 fauna individuals were killed during stage 2 clearing works.

All clearing activities in 2026 will continue to follow the same methodology outlined in the BMP.

5.0 References

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Appendix A Flora Species List

Bengalla Annual Clearing Report

2025 EPBC Clearance Report

Bengalla Mining Company Pty Ltd (BMC)

SLR Project No.: 610.032334.00003

24 February 2026

Table A-1: Flora Species List

Scientific Name	Common Name	Native/Exotic	EPBC Act	BC Act
Acacia implexa	Hickory Wattle	N	Not Listed	Not Listed
Allocasuarina luehmannii	Bull Oak	N	Not Listed	Not Listed
Angophora floribunda	Rough-barked Apple	N	Not Listed	Not Listed
Austrostipa verticillate	Bamboo Grass	N	Not Listed	Not Listed
Bothriochloa macra	Red Grass	N	Not Listed	Not Listed
Brachychiton populneus	Kurrajong	N	Not Listed	Not Listed
Cirsium vulgare	Spear Thistle	E	Not Listed	Not Listed
Chrysocephalum apiculatum	Golden Buttons	N	Not Listed	Not Listed
Corymbia maculata	Spotted Gum	N	Not Listed	Not Listed
Cymbidium canaliculatum	Tiger Orchid	N	Not Listed	Endangered
Dichondra repens	Kidney Weed	N	Not Listed	Not Listed
Einada hastata	Berry Saltbush	N	Not Listed	Not Listed
Eragrostis curvula	African Lovegrass	E	Not Listed	Not Listed
Eucalyptus crebra	Narrow-leaved Ironbark	N	Not Listed	Not Listed
Eucalyptus moluccana	Grey Box	N	Not Listed	Not Listed
Eucalyptus tereticornis	Forest Red Gum	N	Not Listed	Not Listed
Lycium ferocissimum	African Boxthorn	E	Not Listed	Not Listed
Verbena bonariensis	Purpletop	E	Not Listed	Not Listed

Appendix B Fauna Species List

Bengalla Annual Clearing Report

2025 EPBC Clearance Report

Bengalla Mining Company Pty Ltd (BMC)

SLR Project No.: 610.032334.00003

24 February 2026

Table B-2: Fauna Species List

Scientific Name	Common Name	Native/Exotic	EPBC Act	BC Act
Ave				
Gymnorhina tibicen	Australian Magpie	N	Not listed	Not listed
Manorina melanocephala	Noisy Miner	N	Not listed	Not listed
Falco cenchroides	Nankeen Kestrel	N	Not listed	Not listed
Corvus coronoides	Australian Raven	N	Not listed	Not listed
Cacatua galerita	Sulphur-crested Cockatoo	N	Not listed	Not listed
Eolophus roseicapilla	Galah	N	Not listed	Not listed
Pardalotus punctatus	Spotted Pardalote	N	Not listed	Not listed
Platycercus elegans	Crimson Rosella	N	Not listed	Not listed
Malurus cyaneus	Superb Fairywren	N	Not listed	Not listed
Aquila audax	Wedge-tailed Eagle	N	Not listed	Not listed
Platycercus eximius	Eastern Rosella	N	Not listed	Not listed
Rhipidura leucophrys	Willie Wagtail	N	Not listed	Not listed
Mammals				
Macropus giganteus	Eastern Grey Kangaroo	N	Not listed	Not listed
Oryctolagus cuniculus	European Rabbit	E	-	-
Petaurus breviceps	Sugar Glider	N	Not listed	Not listed
Vombatus ursinus	Common Wombat	N	Not listed	Not listed
Trichosurus vulpecula	Common Brushtail Possum	N	Not listed	Not listed
-	Unidentified Microbat	N	-	-
Reptiles				
Varanus varius	Lace Monitor	N	Not listed	Not listed
Egernia striolata	Tree Skink	N	Not listed	Not listed
Nebulifera robusta	Robust Velvet Gecko	N	Not listed	Not listed
Ctenotus taeniolatus	Copper-tailed Skink	N	Not listed	Not listed
Pogona barbata	Eastern Bearded Dragon	N	Not listed	Not listed
Tiliqua scincoides	Blue Tongue Lizard	N	Not listed	Not listed

Appendix C Bengalla Clearing Procedure

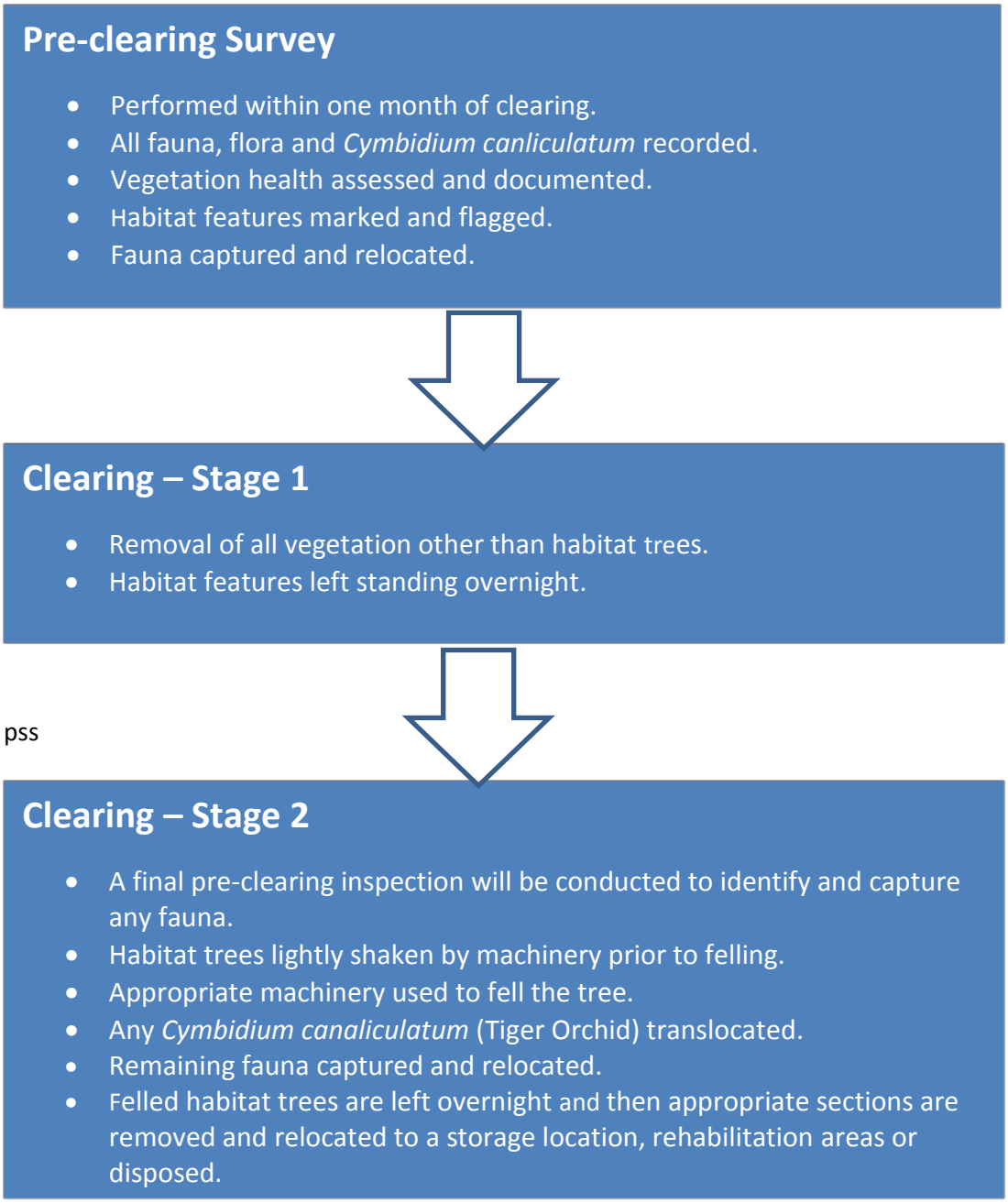
Bengalla Annual Clearing Report

2025 EPBC Clearance Report

Bengalla Mining Company Pty Ltd (BMC)

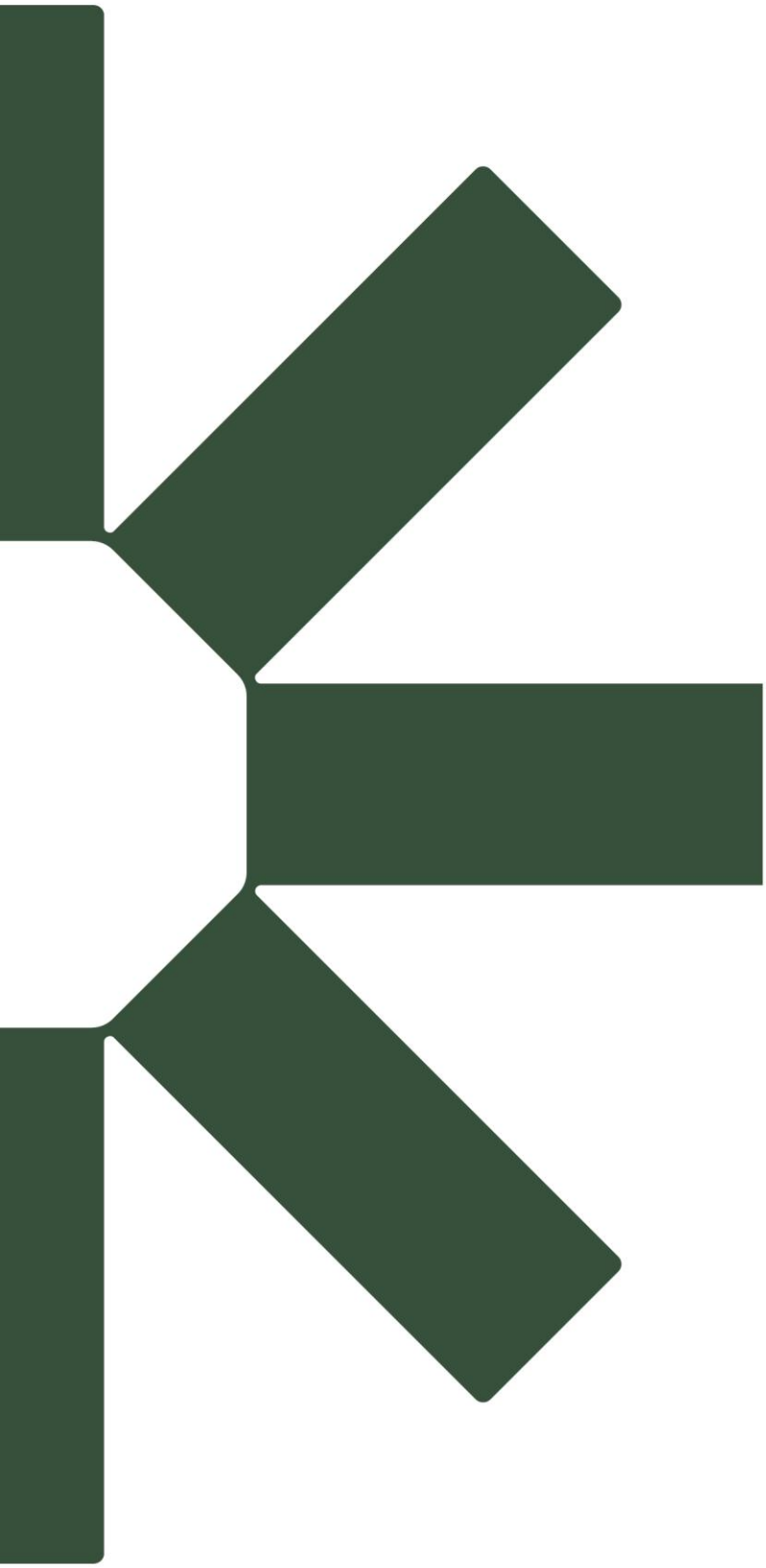
SLR Project No.: 610.032334.00003

24 February 2026



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Figure 6
Clearance Procedure



Making Sustainability Happen

Appendix D Weed and Pest Management

1 Introduction

Weed and pest management at Bengalla and on the offset properties is undertaken in accordance with the BMP and BOMP, respectively.

Inspections are undertaken for weeds and pests, as required. Weed and pest control at Bengalla and on the offset properties is undertaken through targeted chemical and baiting applications.

2 Weed Management

Weed control is undertaken using boom spray, spot spraying or stem application dependent upon the specific weed and the terrain.

Bengalla

During 2025, approximately 554 ha of weed control was undertaken. Target weed species primarily included African Boxthorn, Castor Oil, Green Cestrum, St John's Wort, Paterson's Curse, Prickly Pear and other general woody weeds. Priority areas for treatment included the pre-clearing areas and rehabilitation areas.

Weed management undertaken at Bengalla in 2025 is shown in Error! Reference source not found. to **Figure 5.**

Biodiversity Offset Areas

Weed management across the BOA's involves quarterly inspections and weed control programs.

Quarterly inspections are undertaken to determine weed control required for each quarter in each of the offset areas. Following identification, weed control commences and quarterly work records of site attendance are submitted which detail the sites treated, area (ha) treated, techniques and chemicals utilised and rates of application.

The chemicals to be utilised are based on their effectiveness depending on the type of weeds present.

The weeds controlled during the Reporting Period included Blackberry, Prickly Pear, Lantana, Patterson's Curse, St John's Wort, Blue Heliotrope, Yellow Bells and several general woody weeds across each BOA.

Minimal seasonal weeds were observed in Merriwa and Black Mountain. **Figure 6** to **Figure 12** below show locations of weed control in 2025 at the Black Mountain, Kenalea and Merriwa offset properties.

3 Pest Management

Bengalla

A pig control program was conducted throughout 2025 at various locations across Bengalla. Feral pig traps were installed utilising a penning system using grain and molasses as the main attractant. A total of 53 pigs were trapped in 2025.

Dog baiting programs at Bengalla occurred in the Autumn and Spring 2025. Each program was undertaken in conjunction with Local Land Services and local wild dog associations and additionally forms part of a broader scale baiting program targeting foxes and wild dogs in the Hunter Valley.

Both buffer lands and rehabilitation areas were utilised in the programs. **Figure 13** and **Figure 14** shows the location of wild dog bait stations utilised at Bengalla. The distribution of bait locations covered both buffer land west of the mine site and rehabilitation areas.

During the autumn baiting program, 39 bait stations were laid over a three-week period with a total of 117 baits. Results indicate 69 takes of which 22 takes were by target species being foxes only. Evidence of bait shyness was detected.

During the spring baiting program, 39 stations were laid over a three-week period with a total of 117 baits. Results indicate 23 takes were by target species being foxes. No wild dog takes were recorded. Evidence of bait shyness was also detected. Trail cameras were used in conjunction with the baiting program to record species taking the baits.

Offset Properties

During the Reporting Period, BMC undertook two 4-week dog ground baiting programs across the BOAs in Autumn and Spring 2025 in consultation with Local Land Services.

During the 2025 ground baiting program targeting foxes and wild dogs, a total of 616 baits were laid. Of these, 113 baits were taken by the targeted species, with 90% consumed by foxes and 10% by wild dogs.

Figure 15 to **Figure 20** show locations of wild dog baiting locations on each BOA for each baiting period in 2025.

Analysis of trends over the past three years indicates variability in wild dog bait uptake: 28 in 2021, 39 in 2022, 36 in 2023, 8 in 2024 and 12 in 2025. This data suggests an increase in wild dog numbers on the offset properties during this period.

Opportunistic feral animal control was also undertaken during weed control works targeting 21 pigs, 3 deer, 3 wild dogs and 1 rabbit utilising open range shooting. BMC will continue its annual dog baiting program and opportunistic shooting to manage the wild dog population.

4 Further Actions

Ongoing management of weeds and feral animals at Bengalla and BOA's will continue during 2026.

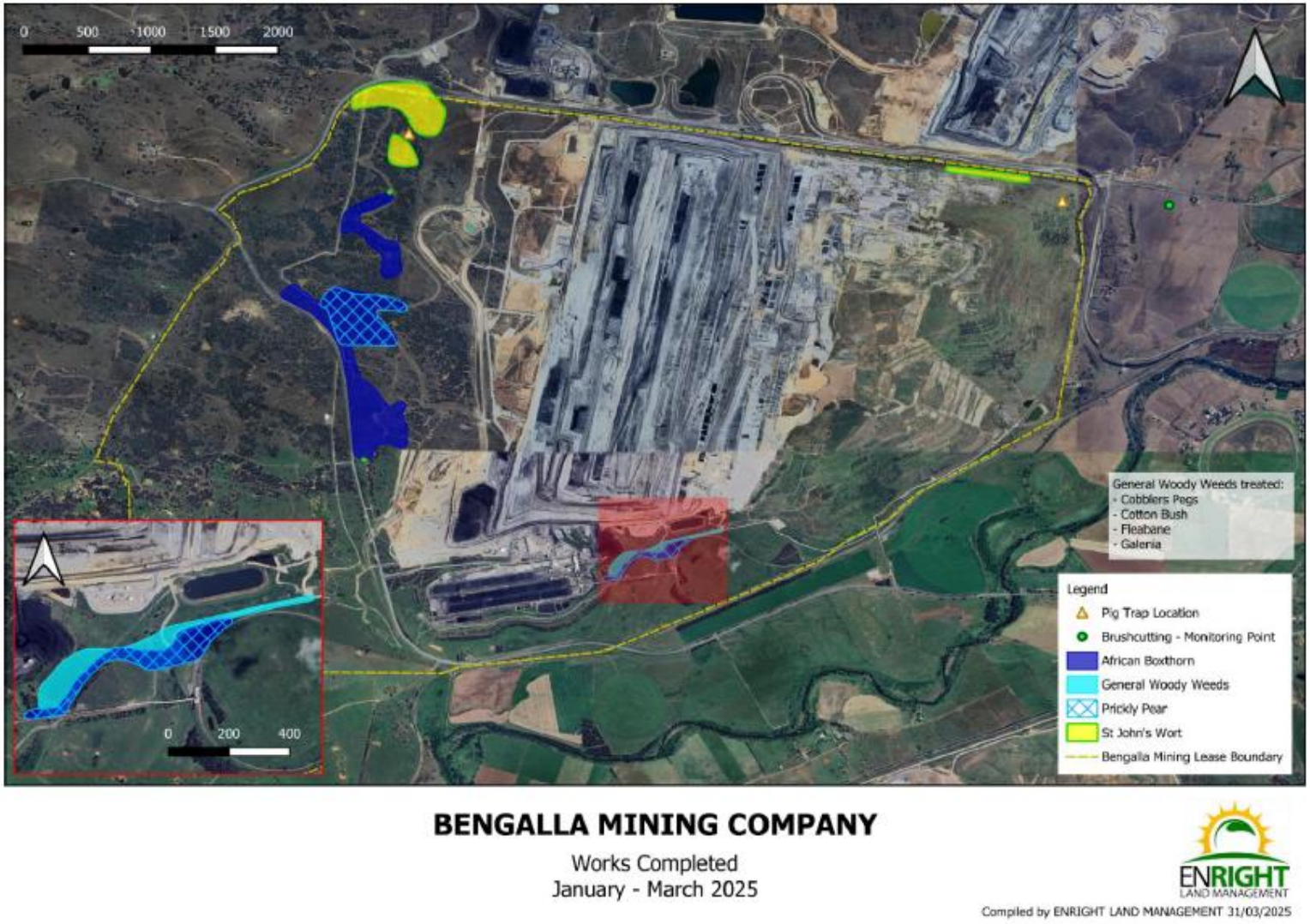


Figure 2 – Bengalla Mine Weed Management Q1 2025



Figure 3 – Bengalla Mine Weed Management Q2 2025

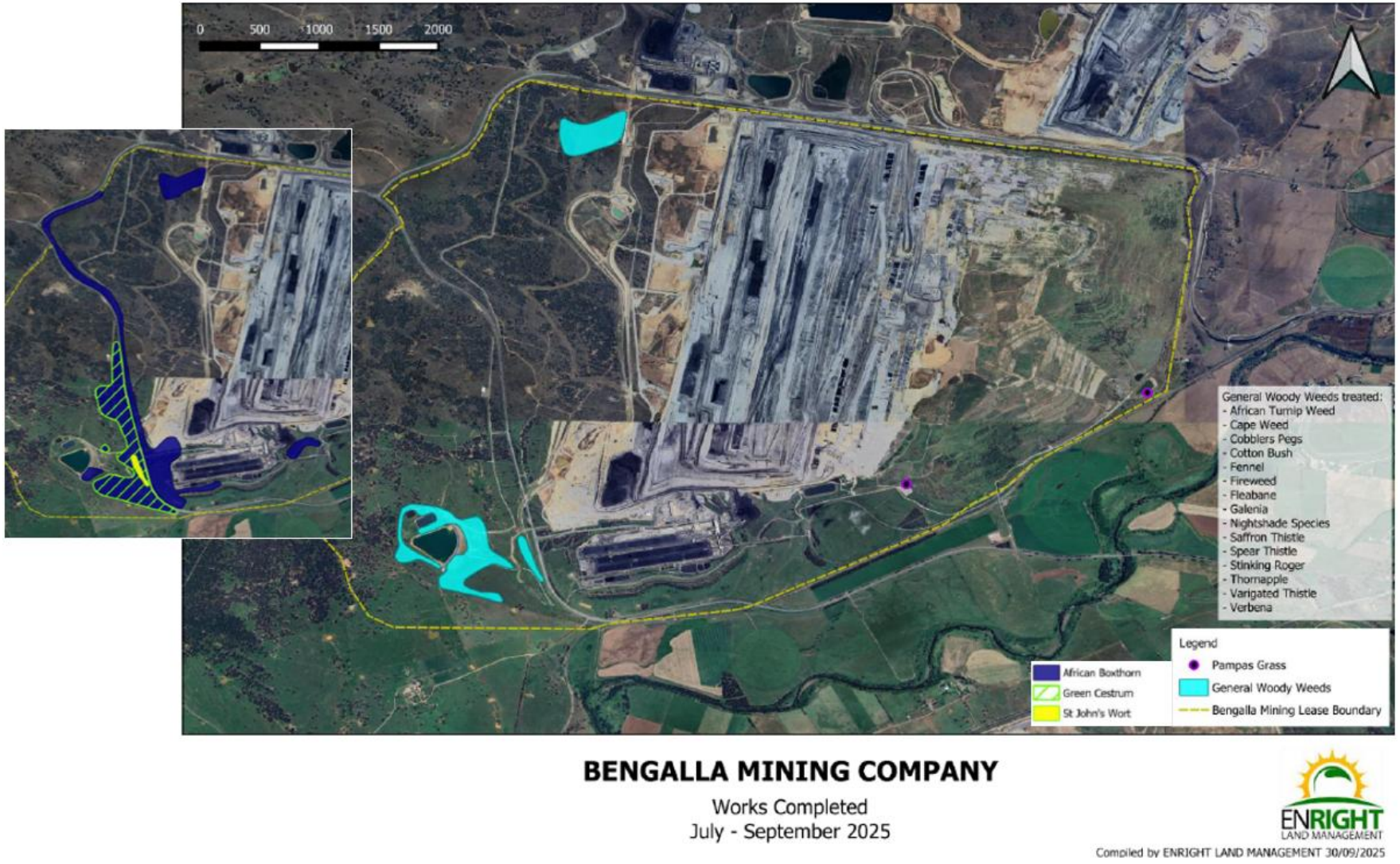


Figure 4 – Bengalla Mine Weed Management Q3 2025

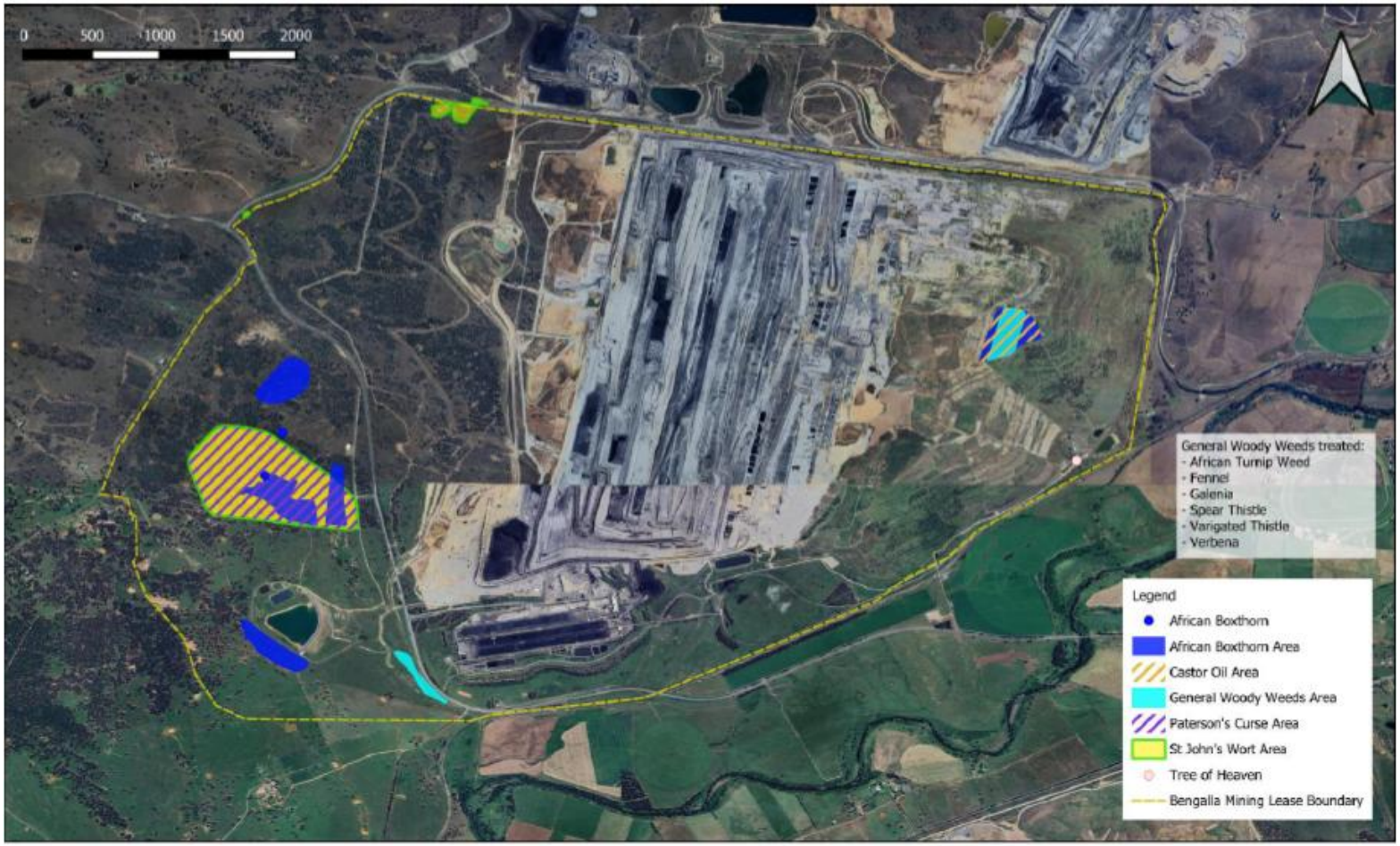


Figure 5 – Bengalla Mine Weed Management Q4 2025

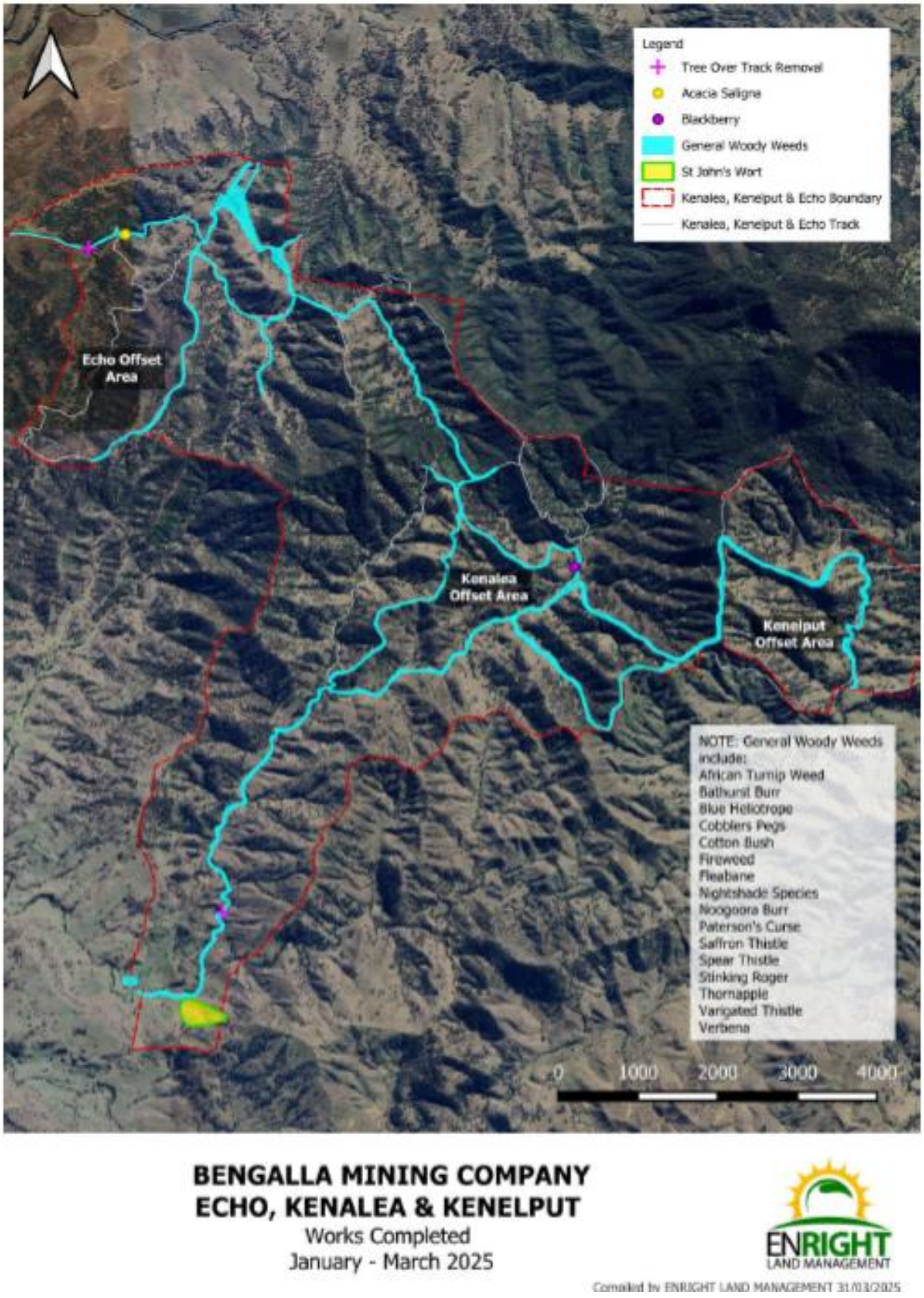


Figure 6 – Kenalea Weed Management Q1 2025

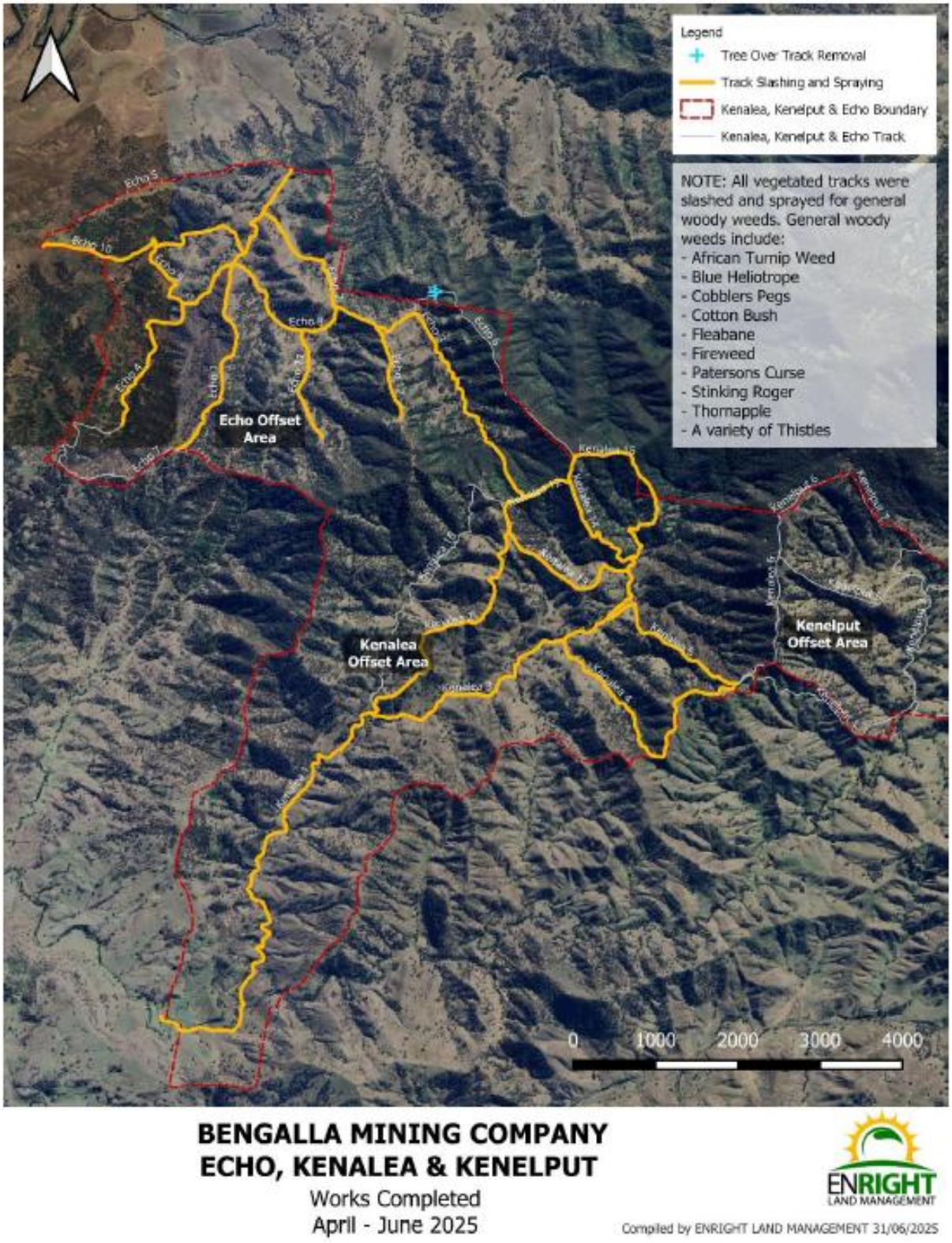


Figure 7 – Kenalea Weed Management Q2 2025

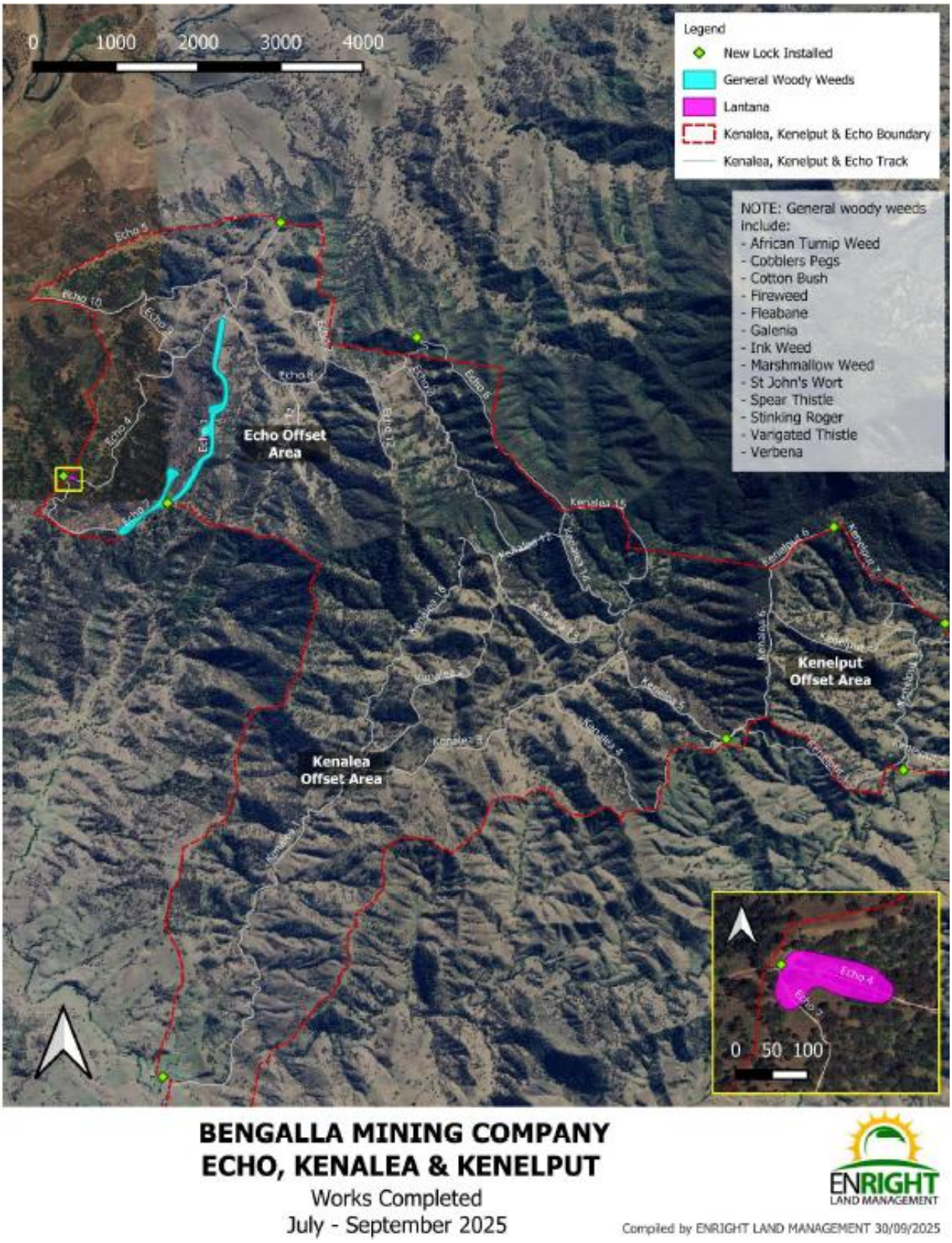


Figure 8 – Kenalea Weed Management Q3 2025

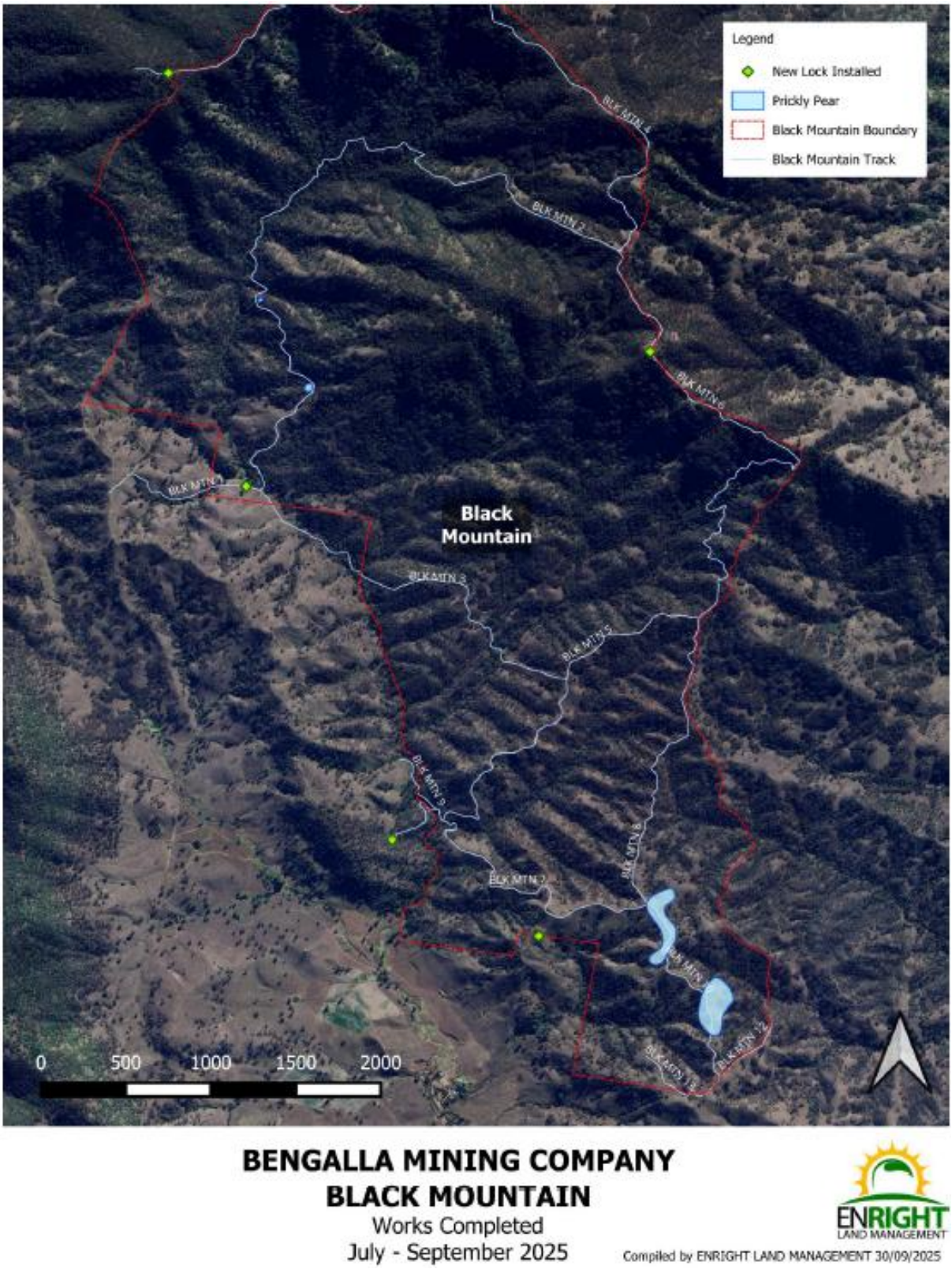


Figure 9 – Black Mountain Weed Management Q3 2025

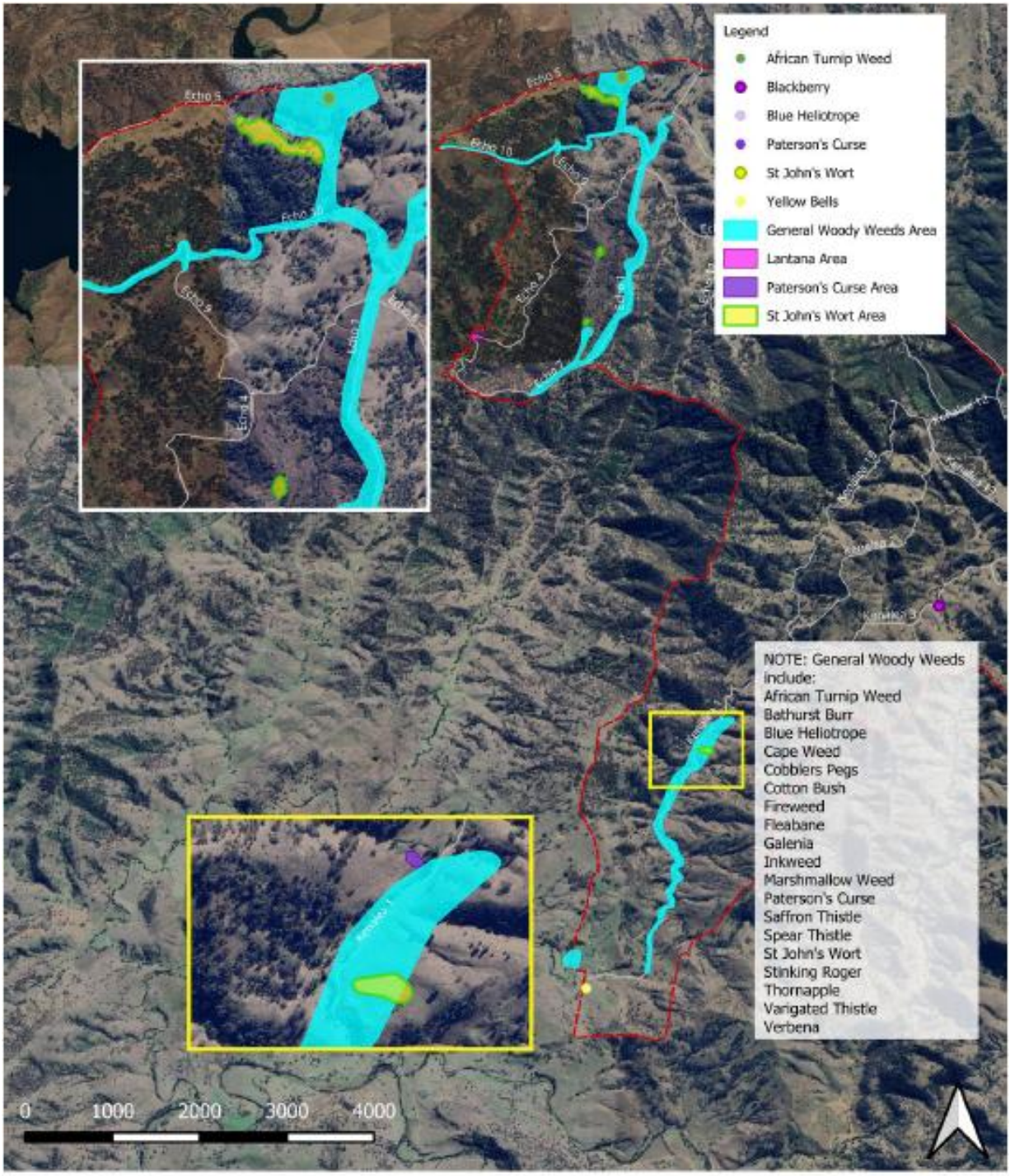


Figure 10 – Kenalea Weed Management Q4 2025

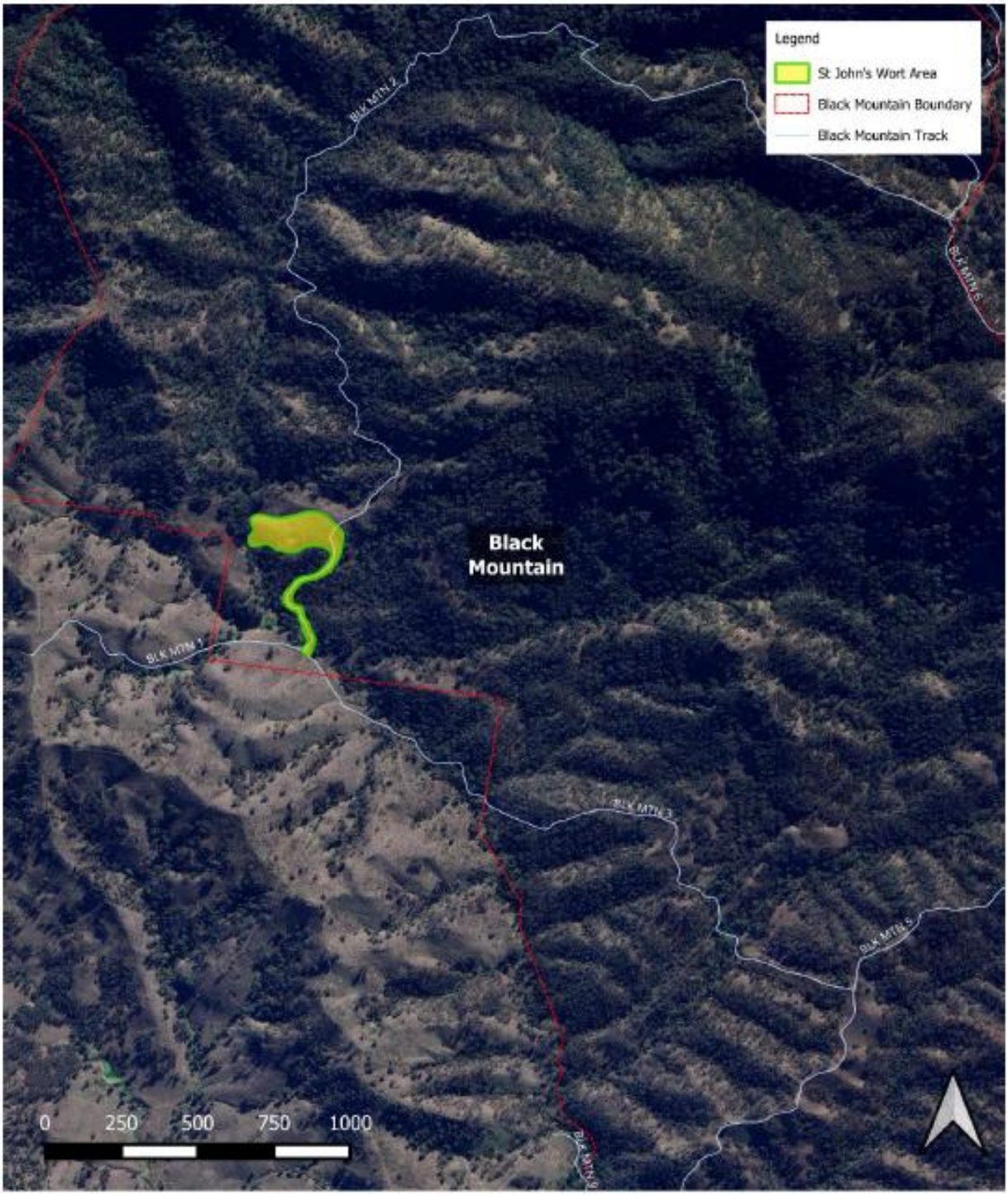


Figure 11 – Black Mountain Weed Management Q4 2025



Figure 12 – Merriwa River Weed Management Q4 2025

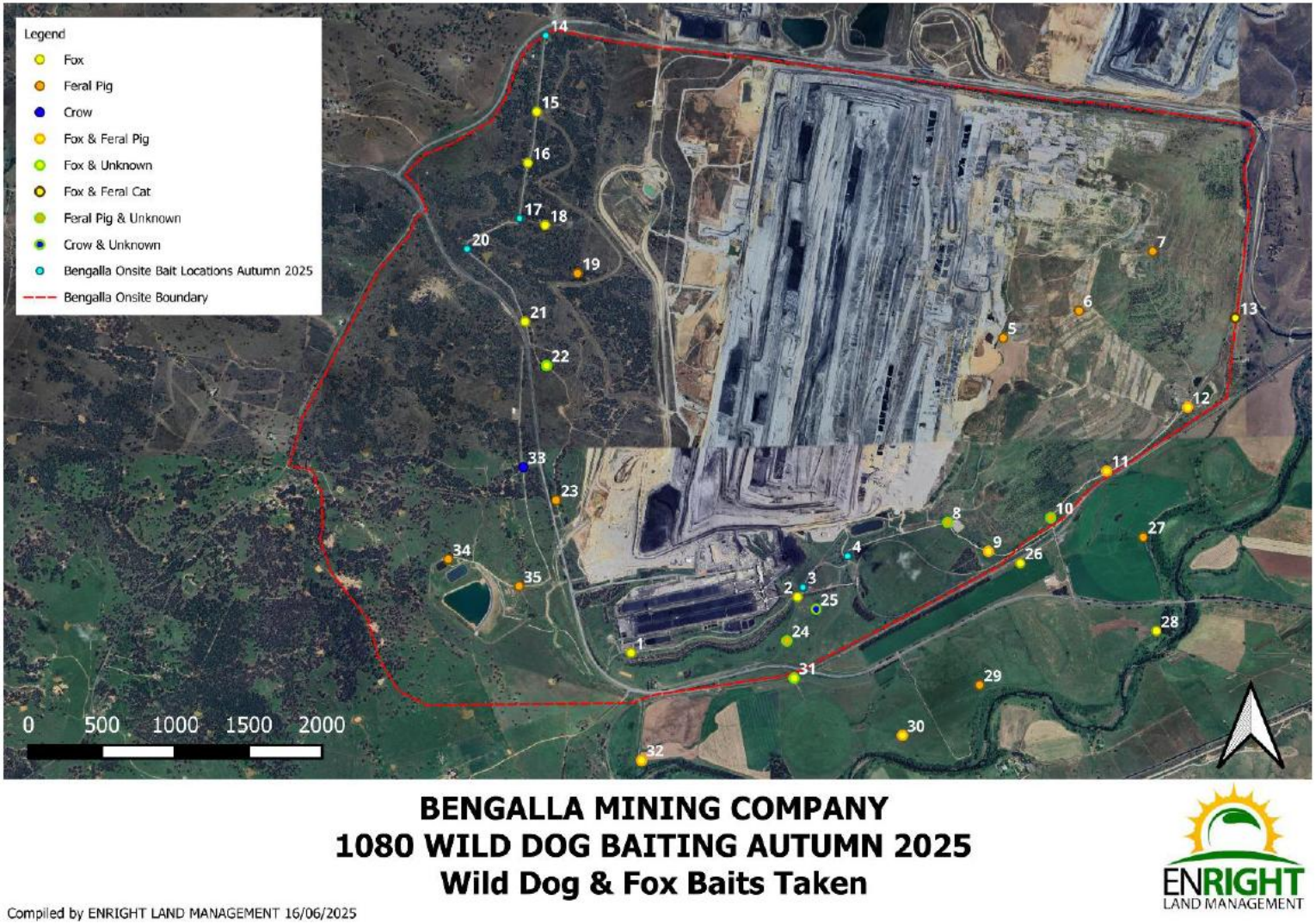


Figure 13 – Bengalla Mine Wild Dog Bait Locations Autumn 2025

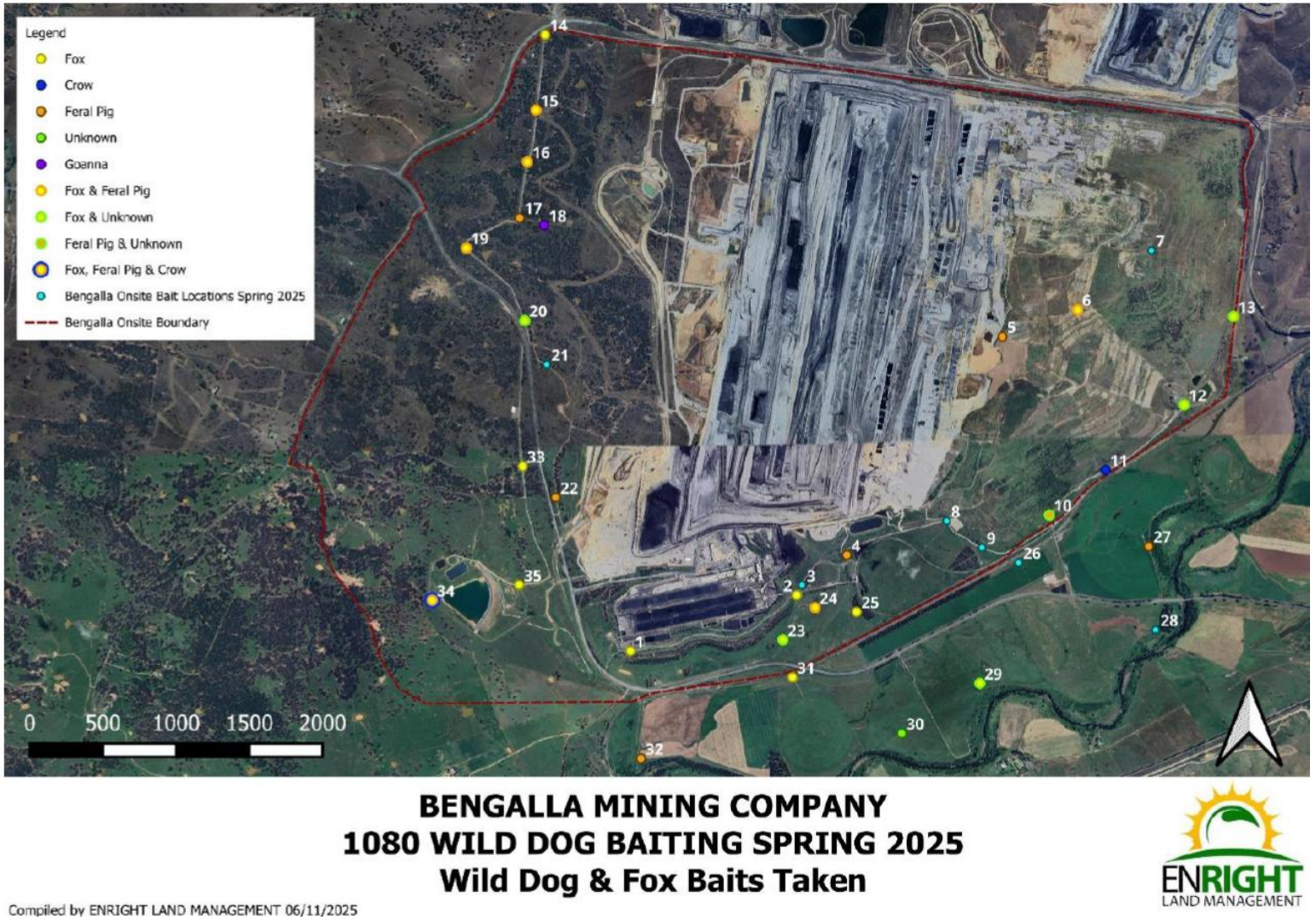


Figure 14 – Bengalla Mine Wild Dog Bait Locations Spring 2025

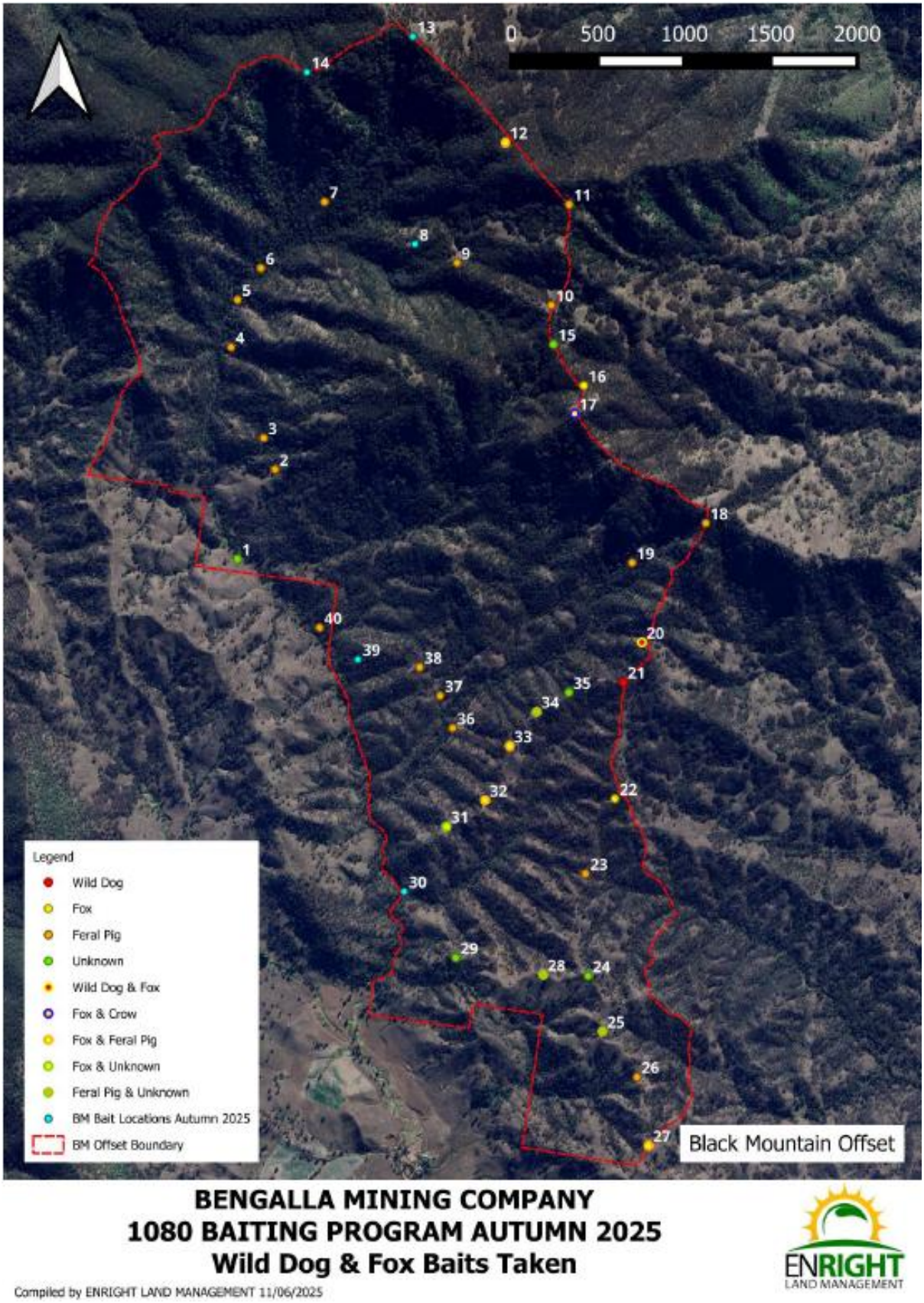


Figure 15 – Black Mountain Wild Dog Bait Locations Autumn 2025

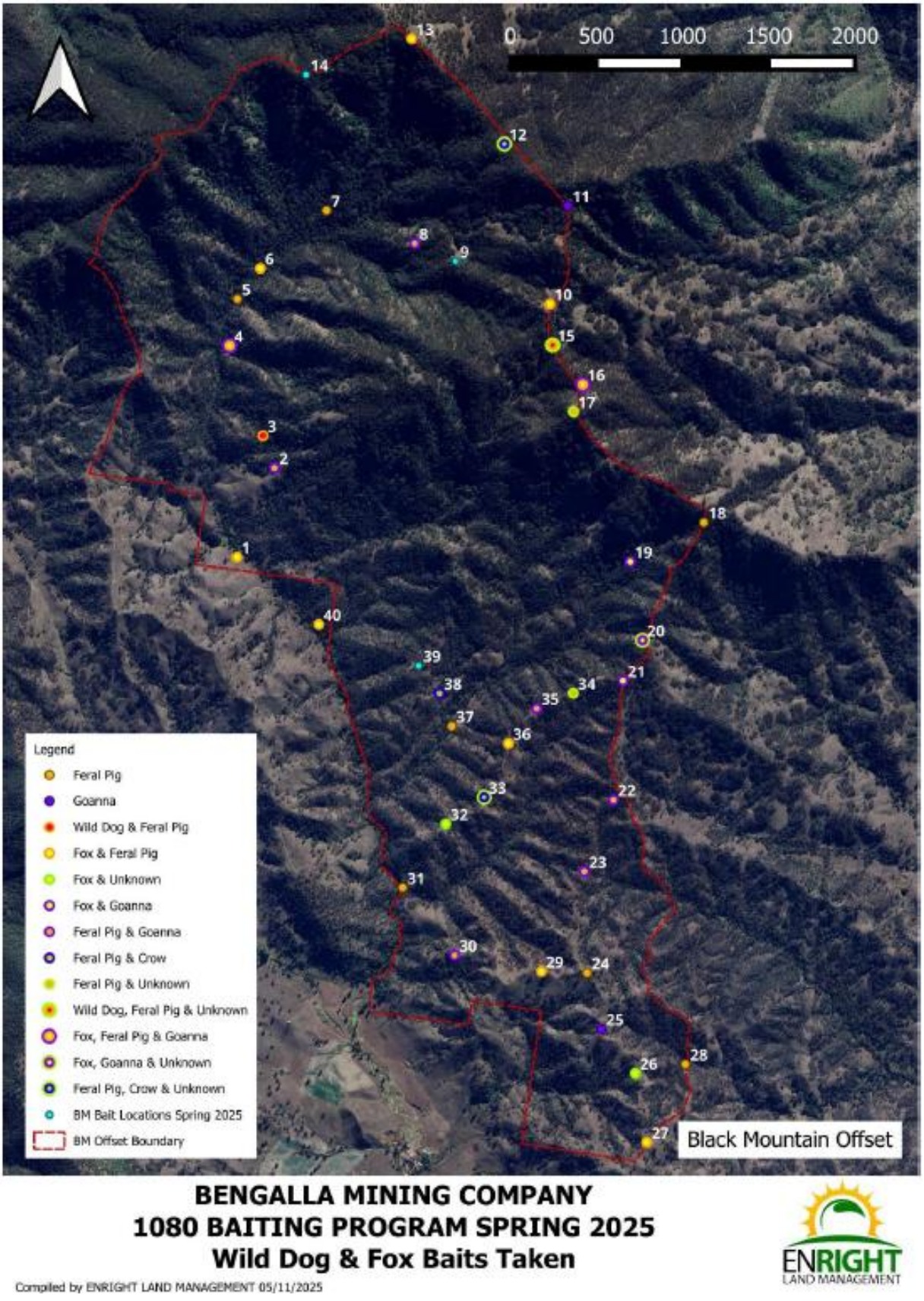


Figure 16 – Black Mountain Wild Dog Bait Locations Spring 2025

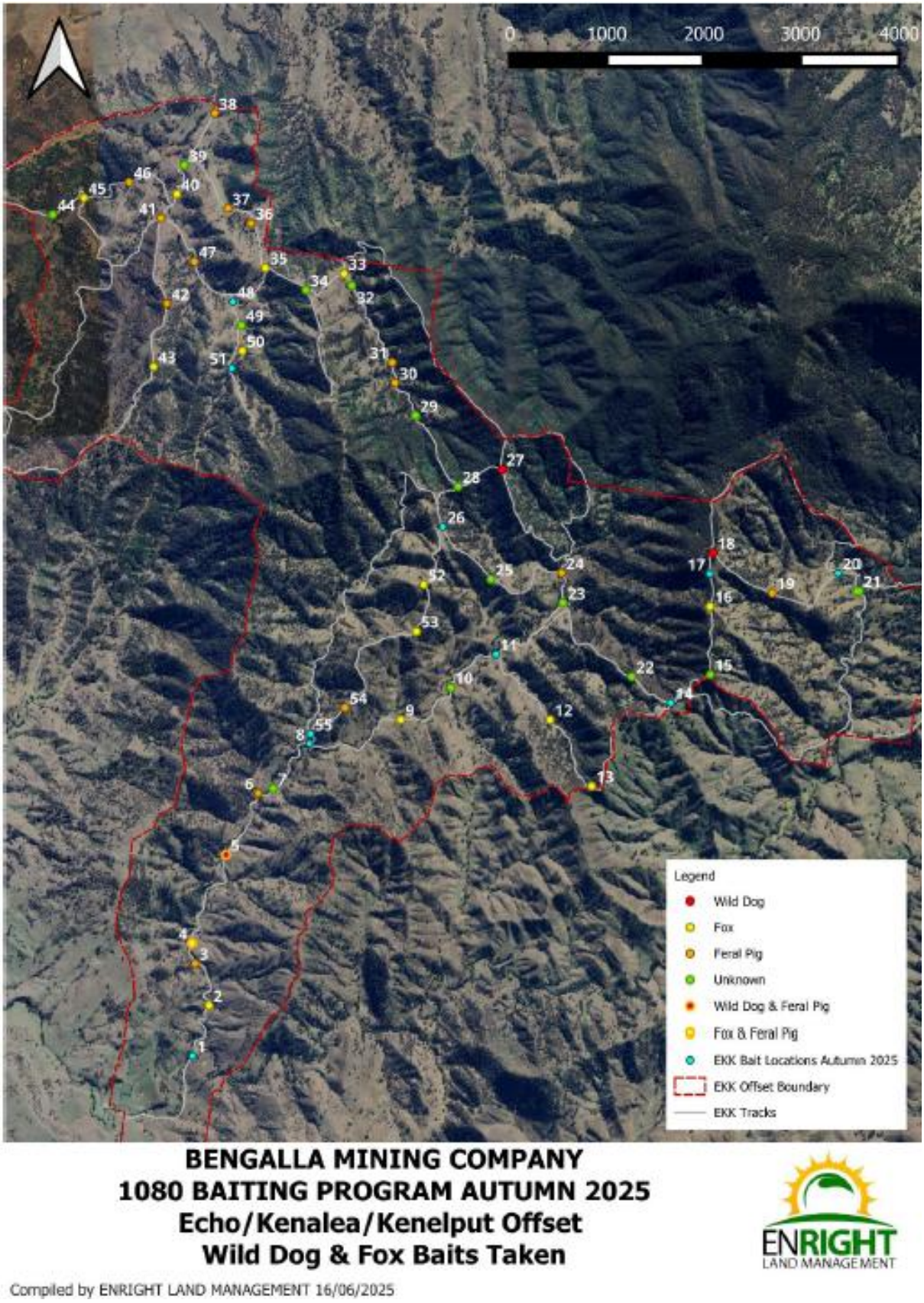


Figure 17 – Kenalea Wild Dog Bait Locations Autumn 2025

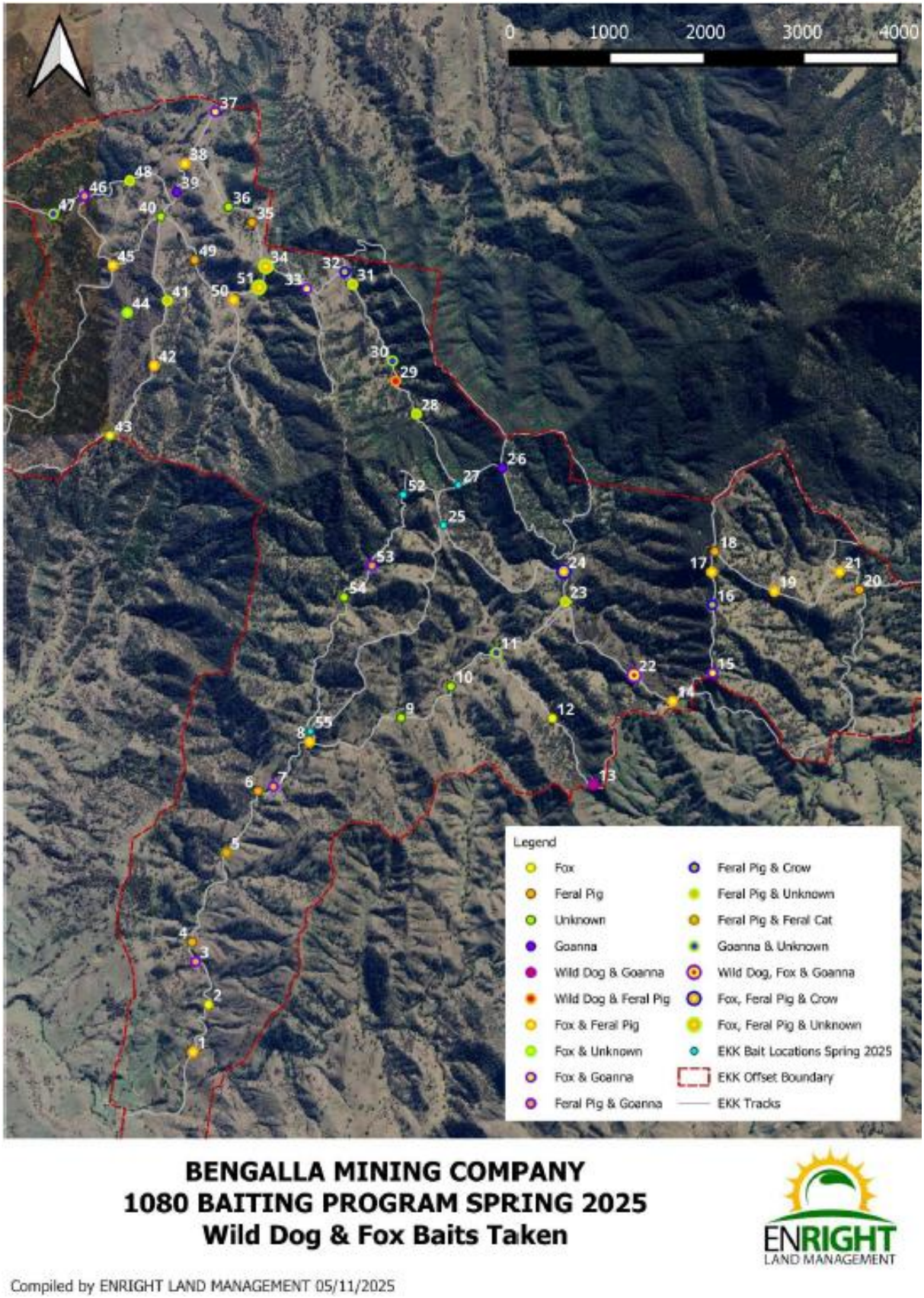


Figure 18 – Kenalea Wild Dog Bait Locations Spring 2025

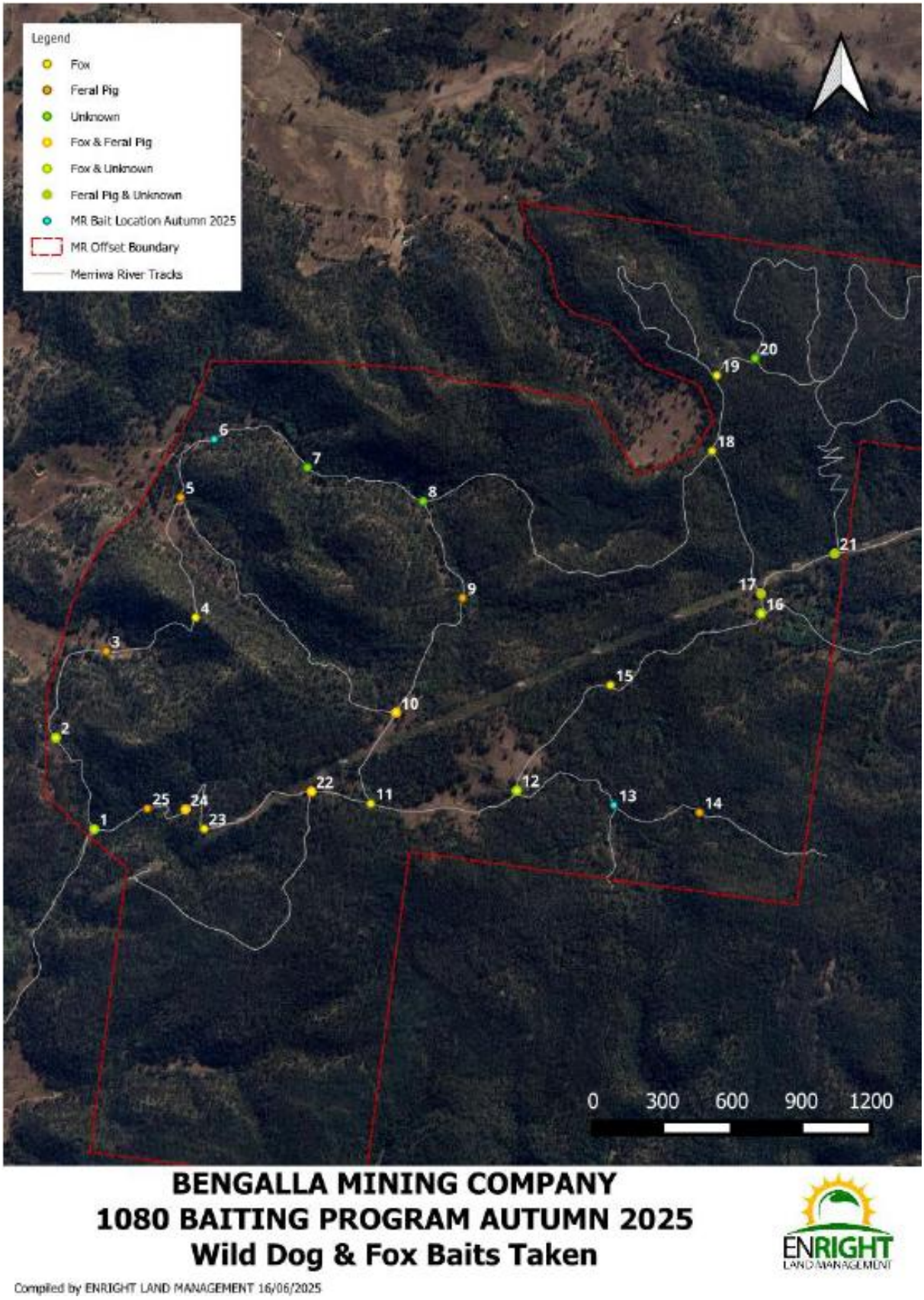


Figure 19 – Merriwa River Wild Dog Bait Locations Autumn 2025

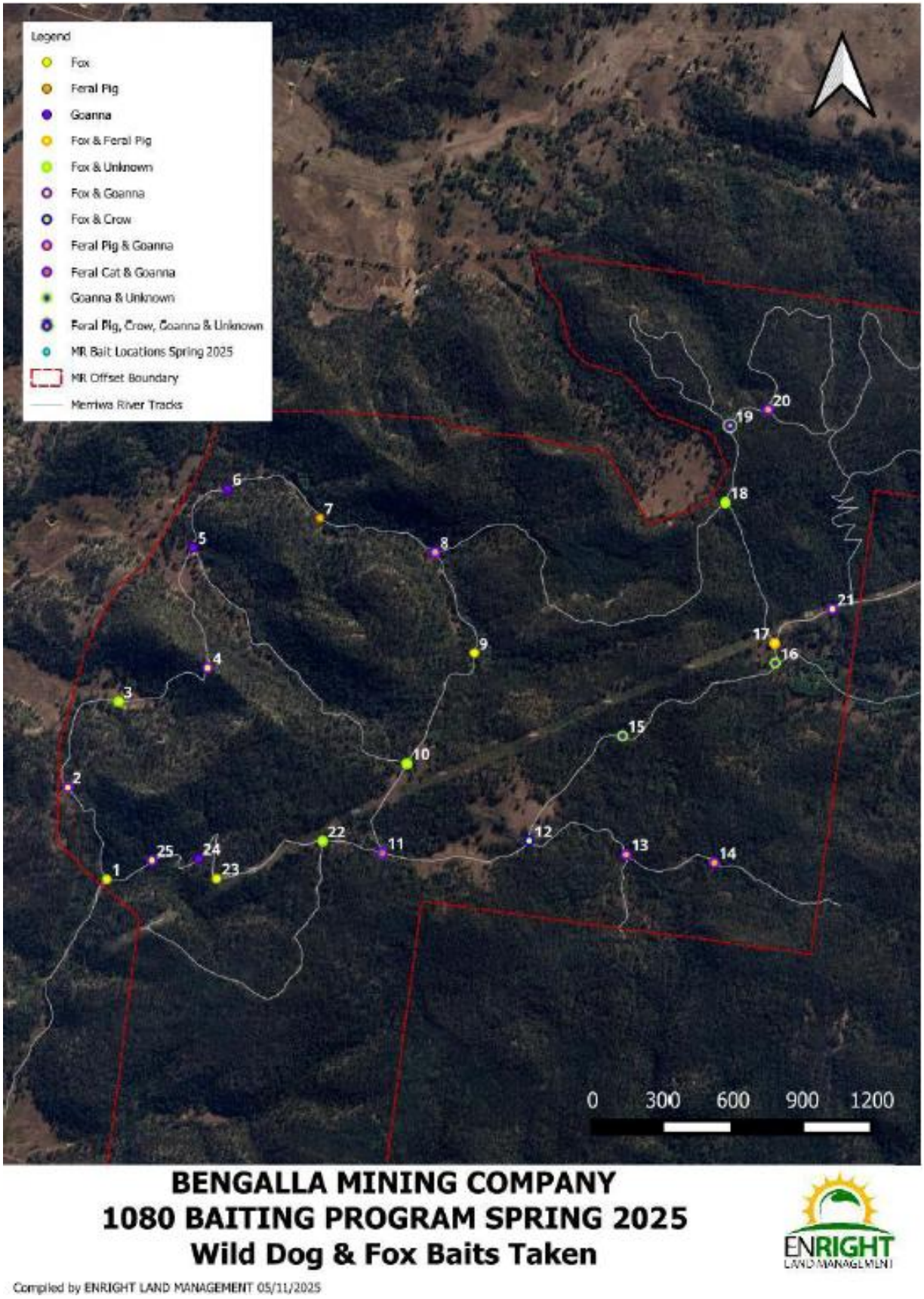


Figure 20 – Merriwa River Wild Dog Bait Locations Spring 2025

Appendix F

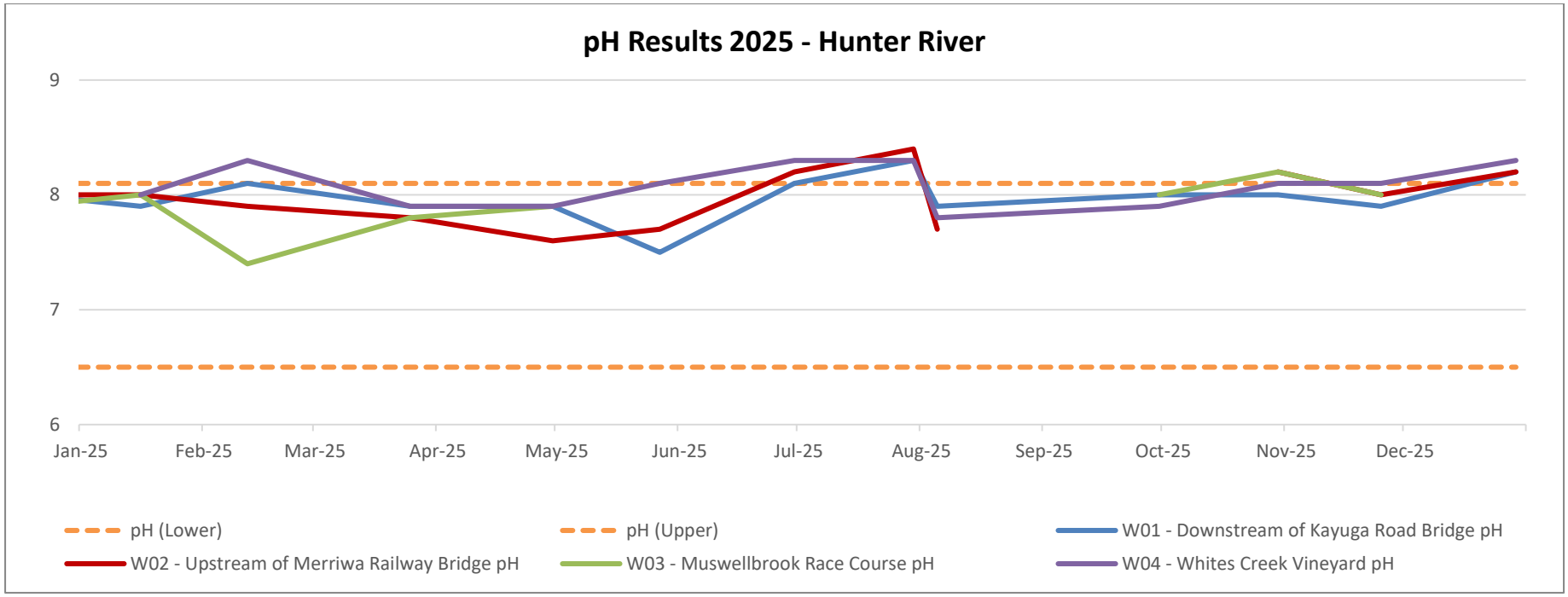
Surface Water Monitoring Summary

Table F1
Hunter River (W01 – W04) Surface Water Monitoring Results 2025

Criteria		16-Jan-25	12-Feb-25	25-Mar-25	30-Apr-25	27-May-25	30-Jun-25	30-Jul-25	05-Aug-25	30-Sep-25	30-Oct-25	25-Nov-25	29-Dec-25
W01													
pH	6.5 – 8.1	7.9	8.1	7.9	7.9	7.5	8.1	**8.3**	7.9	8.0	8.0	7.9	**8.2**
TSS (mg/L)	40	24	18	20	27	**153**	7	17	**94**	19	12	12	16
EC (µS/cm)	650	534	648	596	355	300	572	463	384	597	**833**	**872**	**620**
W02													
pH	6.5 – 8.1	8.0	7.9	7.8	7.6	7.7	**8.2**	**8.4**	7.7		**8.2**	8.0	**8.2**
TSS (mg/L)	40	**131**	18	24	27	27	9	18	**92**		10	14	17
EC (µS/cm)	650	575	649	590	350	385	589	500	324		**833**	**879**	**620**
W03													
pH	6.5 – 8.1	8.0	7.4	7.8	7.9			**8.2**		8.0	**8.2**	8.0	
TSS (mg/L)	40	31	31	18	29			24		18	9	16	
EC (µS/cm)	650	665	773	620	349			477		573	**859**	**917**	
W04													
pH	6.5 – 8.1	8.0	**8.3**	7.9	7.9	8.1	**8.3**	**8.3**	7.8	7.9	8.1	8.1	**8.3**
TSS (mg/L)	40	26	**54**	24	27	**84**	11	18	**83**	21	14	19	22
EC (µS/cm)	650	**662**	**881**	639	344	356	**675**	466	306	554	**911**	**965**	**706**

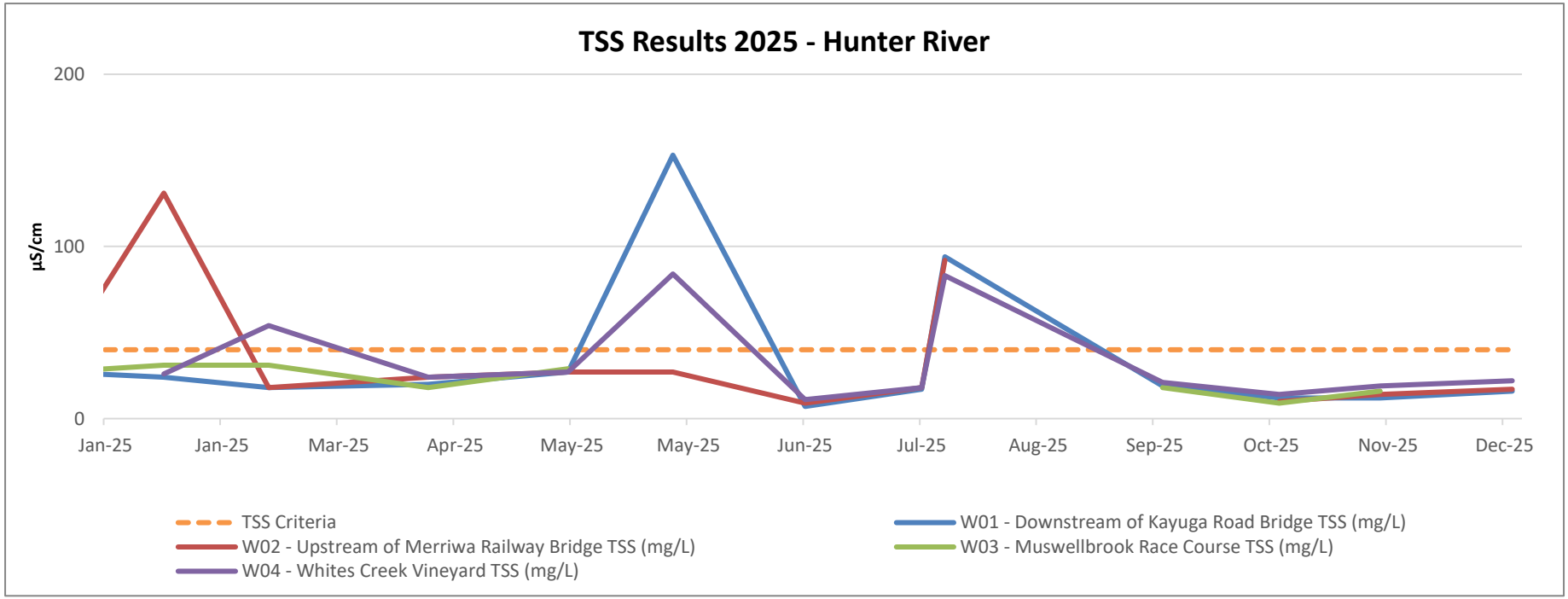
Greyed out cells denote, unable to access to sample.

Data sourced from AECOM.



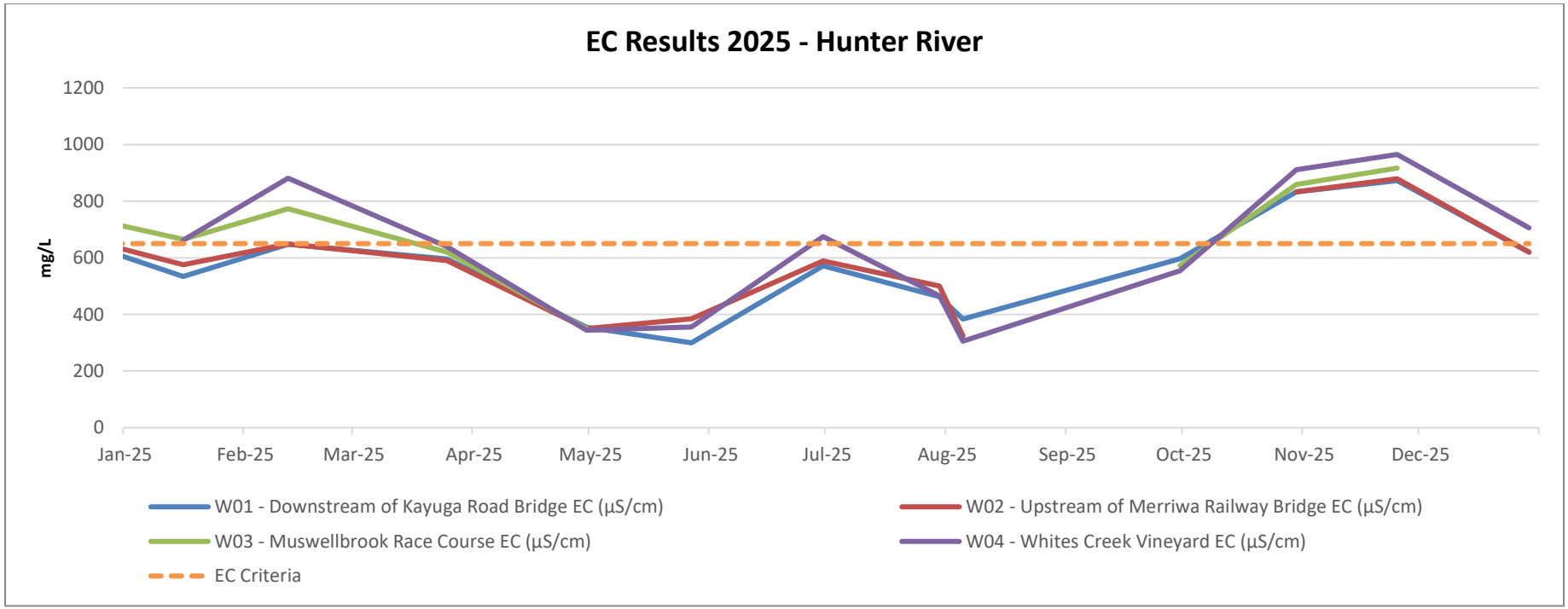
Nb. Some data missing due to unsafe access from weather conditions and environmental factors.

Graph F1
Hunter River pH Results 2025



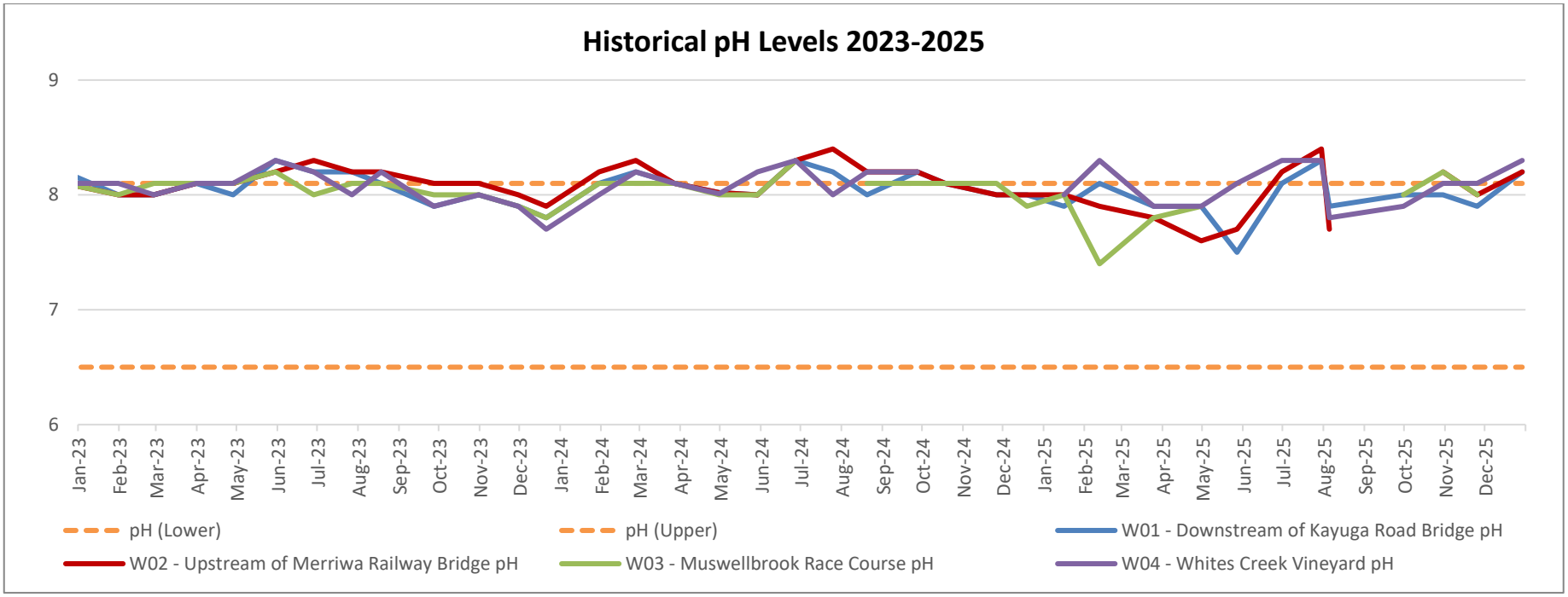
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Graph F2
Hunter River TSS Results 2025

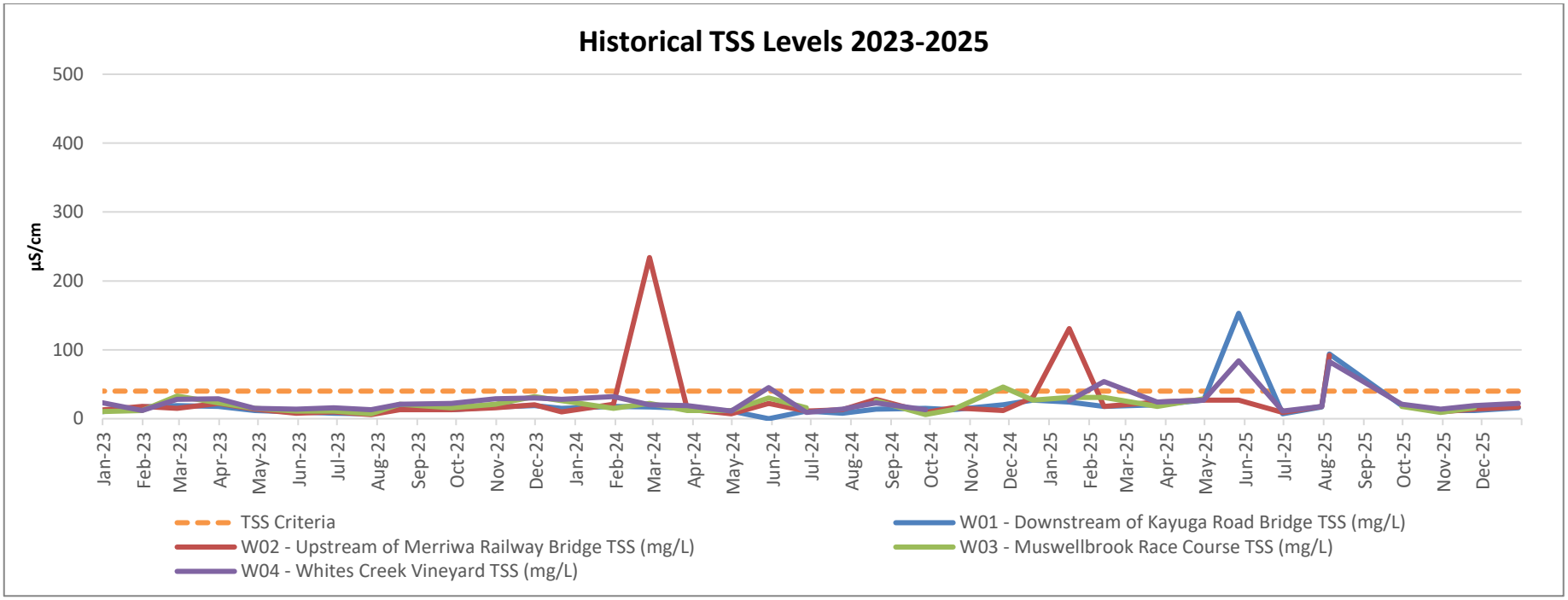


Nb. Some data missing due to unsafe access from weather conditions and environmental factors.

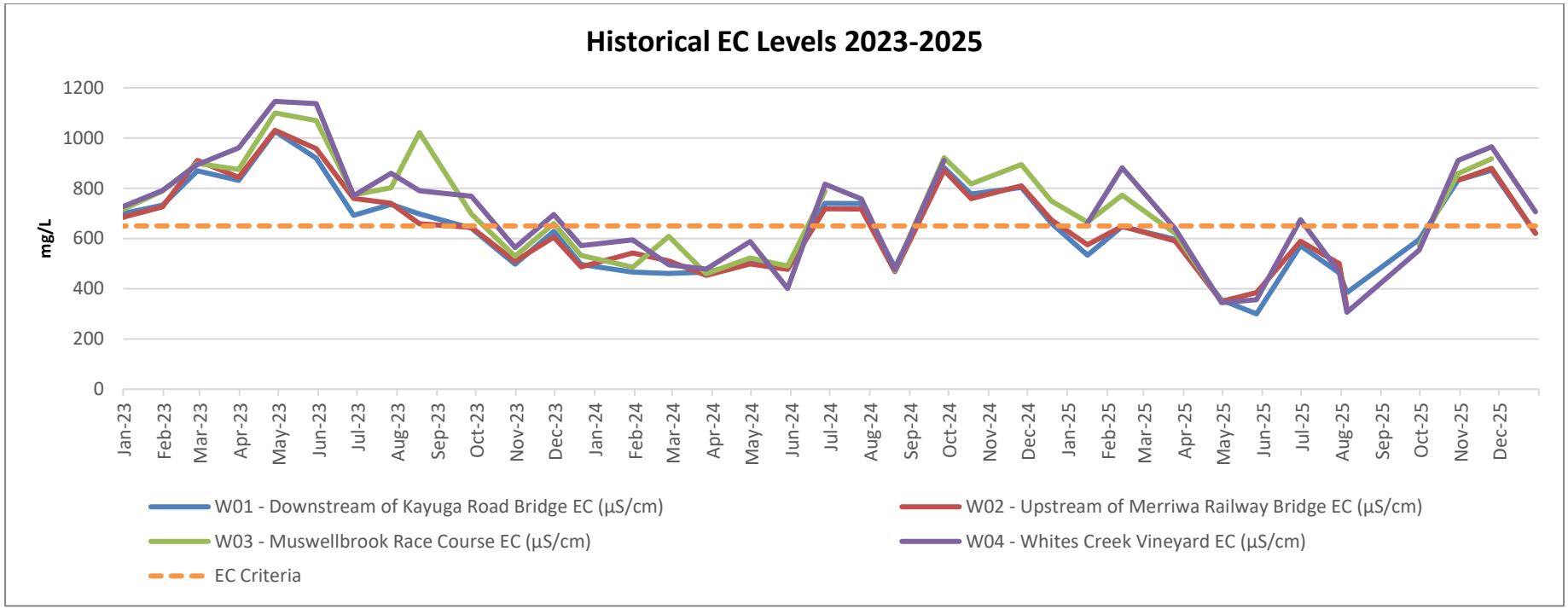
Graph F3
Hunter River EC Results 2025



Graph F4
Hunter River pH Results 2023 - 2025



Graph F5
Hunter River TSS Results 2023 – 2025



Graph F6
Hunter River EC Results 2023 – 2025

Appendix G

Annual Groundwater Monitoring Report 2024

Australasian Groundwater & Environmental Consultants

Report on

Bengalla Mine Annual Groundwater Monitoring Report for 2025

Prepared for
Bengalla Mining Company Pty Ltd

Project No. 20250008.BEN5029.001
March 2026

ageconsultants.com.au

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Table of contents

1 Introduction and scope of works 1

2 Climate 2

3 Groundwater regime 4

4 Bengalla groundwater monitoring network 5

5 Water management plan 9

6 Water levels assessment 12

6.1 Alluvium aquifer water levels 12

6.1.1 Wantana Extension Bores 12

6.1.2 Regional Hunter River alluvial bores 13

6.1.3 Alluvial groundwater level contours 13

6.2 Coal seam/interburden water levels 15

6.2.1 Permian monitoring bore hydrographs 15

6.2.2 Nested monitoring bore hydrographs 17

6.3 Permian groundwater levels – northwest of active mining 27

6.4 Groundwater level assessment against baseline data 29

6.4.1 Baseline assessment 29

6.4.2 Trigger level assessment 31

7 Groundwater quality and monitoring 32

7.1 Quality monitoring overview 32

7.2 Alluvial water quality 32

7.2.1 pH 32

7.2.2 EC 34

7.3 Coal seam and interburden water quality 36

7.3.1 pH 36

7.3.2 EC 37

7.4 Permian groundwater quality – northwest of active mining 38

7.5 Water quality trigger events 40

7.5.1 pH 40

7.5.2 EC 40

8 Comparison to ANZECC guidelines 42

9 Summary 44

9.1 Groundwater levels 44

9.2 Groundwater quality 44

10 Recommendations 46

11 References 47

Table of contents

List of figures

Figure 2.1 Cumulative rainfall departure (1992 to 2025) for Bengalla weather monitoring station 3
Figure 4.1 Monitoring bore network and Surface water sites 8
Figure 6.1 Hydrographs of alluvial bores - Wantana extension area 12
Figure 6.2 Hydrographs of regional alluvial bores 13
Figure 6.3 Alluvial groundwater levels (July 2025) 14
Figure 6.4 Hydrographs of coal seam/interburden bores – Wantana extension area 16
Figure 6.5 Hydrographs of deep Permian monitoring bores 16
Figure 6.6 Alluvium and coal seam hydrographs – WAN1A/B 17
Figure 6.7 Alluvium and coal seam hydrographs – WAN2A/B/C 18
Figure 6.8 Alluvium and interburden hydrographs – WAN4A/B 19
Figure 6.9 Alluvium and interburden hydrographs – WAN5A/B 20
Figure 6.10 Alluvium and interburden hydrographs – WAN6A/B 20
Figure 6.11 Alluvium and coal seam hydrographs – WAN7A/B 21
Figure 6.12 Alluvium and coal seam hydrographs – WAN8A/B 22
Figure 6.13 Alluvium and coal seam hydrographs – WAN9A2/B 23
Figure 6.14 Alluvium and coal seam hydrographs – WAN10A/B 24
Figure 6.15 Shallow Permian groundwater levels (July 2025) 25
Figure 6.16 Deep Permian groundwater levels (July 2025) 26
Figure 6.17 Northwest Permian monitoring bore groundwater levels 27
Figure 6.18 Northwest Permian VWP porewater pressure – BE1 28
Figure 6.19 Northwest Permian VWP porewater pressure – BE2 29
Figure 6.20 Hydrograph of BG3 and BG5 showing groundwater levels near trigger levels 31
Figure 7.1 pH trends – Hunter River alluvial bores 33
Figure 7.2 pH trends – other alluvial bores 33
Figure 7.3 pH trends – Regional Bores 34
Figure 7.4 EC trends – Hunter River Alluvium (Wantana Bores) 35
Figure 7.5 EC trends – Hunter River Alluvium (Regional Bores) 35
Figure 7.6 pH tends – coal seam aquifers 36
Figure 7.7 pH trends – coal seam aquifers (Wantana Area) 36
Figure 7.8 Electrical conductivity trends – Coal seam bores (Wantana Area) 37
Figure 7.9 Electrical conductivity trends – deep Permian bores 38
Figure 7.10 pH of Permian bores to the northwest of active mining 39
Figure 7.11 Electrical conductivity of Permian bores to the northwest of active mining 39

Table of contents

List of tables

Table 2.1 2025 rainfall data from Bengalla weather station 2
Table 3.1 Coal seams and interburden at Bengalla Mine 4
Table 4.1 Current Bengalla groundwater monitoring network 6
Table 5.1 Bengalla WMP water quality triggers (December 2023) 9
Table 5.2 Bengalla WMP water level triggers (Updated December 2023) 10
Table 6.1 Groundwater level statistics compared to trigger levels 30
Table 7.1 Summary of EC trigger exceedances for 2025 41
Table 8.1 July 2025 water chemistry data and ANZECC guidelines 42

List of appendices

Appendix A Monitoring bore summary data
Appendix B Annual surface water review

Bengalla Mine
Annual Groundwater Monitoring Report for 2025

1 Introduction and scope of works

The Bengalla Mining Company Pty Ltd (BMC) is a joint venture ownership between New Hope Group (80%) and Taipower (20%). BMC operate the Bengalla open cut coal mine (Bengalla), which was officially opened in 1999. Bengalla is located approximately 4 km west of Muswellbrook in the Upper Hunter Valley of New South Wales (NSW). Mining operations target coal from the Warkworth to Edderton Seams of the Permian Wittingham Coal Measures.

This report is a review of groundwater monitoring data collected during the one-year monitoring period 1 January 2025 to 31 December 2025. Australasian Groundwater and Environmental Consultants Pty Ltd (AGE) were commissioned by BMC to undertake the following scope of work:

- update all groundwater monitoring hydrographs;
- discuss how groundwater levels respond to rainfall and mining over the reporting period;
- discuss groundwater chemistry trend analyses;
- identify any changes/observations made during the past 12 months and compare to historic behaviour;
- assess the adequacy of the existing monitoring bore network and monitoring program; and
- provide recommendations if necessary.

The review shall also address the additional scope:

- fulfil the requirements of Schedule 5, Condition 4 of SSD-5170 (as modified) which states:

  "*By the end of March each year (or as otherwise agreed by the Secretary), the Applicant must review the environmental performance of the development 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 development 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 EIS;*

  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 development;

  e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and

  f) describe what measures will be implemented over the next year to improve the environmental performance of the development."

AGE will report on the above with regards to groundwater issues for all items except item (a).

In addition, AGE are providing a review of the surface water data collected by Bengalla at their monitoring sites along the Hunter River, and comparison against in situ conditions of the river measured above and below Bengalla Mine area.

2 Climate

The climate at Bengalla is temperate and is characterised by hot, wet summers and mild, dry winters. Temperature data for 2025 were sourced from the on-site meteorological station at Bengalla. The maximum monthly mean temperature for the year was recorded in December 2025 (26.5°C), whilst a minimum monthly mean temperature of 11.9°C was recorded in June 2025.

Monthly rainfall totals for 2025 along with long-term monthly averages (from 1992 to 2025) were obtained from the onsite Bengalla weather station and are summarised in Table 2.1.

The total annual rainfall recorded at the Bengalla for 2025 was 667 mm. May was the wettest month, with 134 mm of recorded rain, and September the driest with 20 mm of rain. A comparison of the total annual 2025 rainfall (667 mm) with the longer-term average (599 mm) indicates slightly above average rainfall for 2025 (Table 2.1). Total annual rainfall from 1996 through 2026 is shown in Figure 2.1.

Table 2.1 2025 rainfall data from Bengalla weather station

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Monthly Total Rainfall (mm) 2025	71	50	103	41	134	17	32	123	20	29	34	14	667
Long term monthly average rainfall (mm) 1992 - 2025	55	68	67	38	37	44	35	37	35	46	69	69	599

Historical rainfall trends at Bengalla were contextualised using the Cumulative Rainfall Departure (CRD) method (Figure 2.1). This method is a summation of the monthly departure of rainfall from the long-term average monthly rainfall. A rising trend in the CRD plot indicates periods of above average rainfall, whilst a falling slope indicates periods when rainfall is below average. The Hunter River water level is also plotted in Figure 2.1 using data from the Muswellbrook Bridge monitoring station[1] (210002), which is located approximately 5 km up-stream of Bengalla.

The overall pattern of the CRD over the past 30 years is marked by significant below-average rainfall from 2002 through 2007 and again in 2017 through 2020. Following this where three above-average years (2020 through 2023) and near-average years through 2025.

The Hunter River stage generally responds to rainfall and indicates that, whilst periods of higher rainfall correlate with elevated river levels, the Hunter River generally displays relatively stable levels with fluctuations generally less than 2 m, primarily due to being regulated by the Glenbawn Dam. Recent significant flood events were recorded in late-2022 and 2025.

[1] https://realtimedata.waternsw.com.au/water.stm.

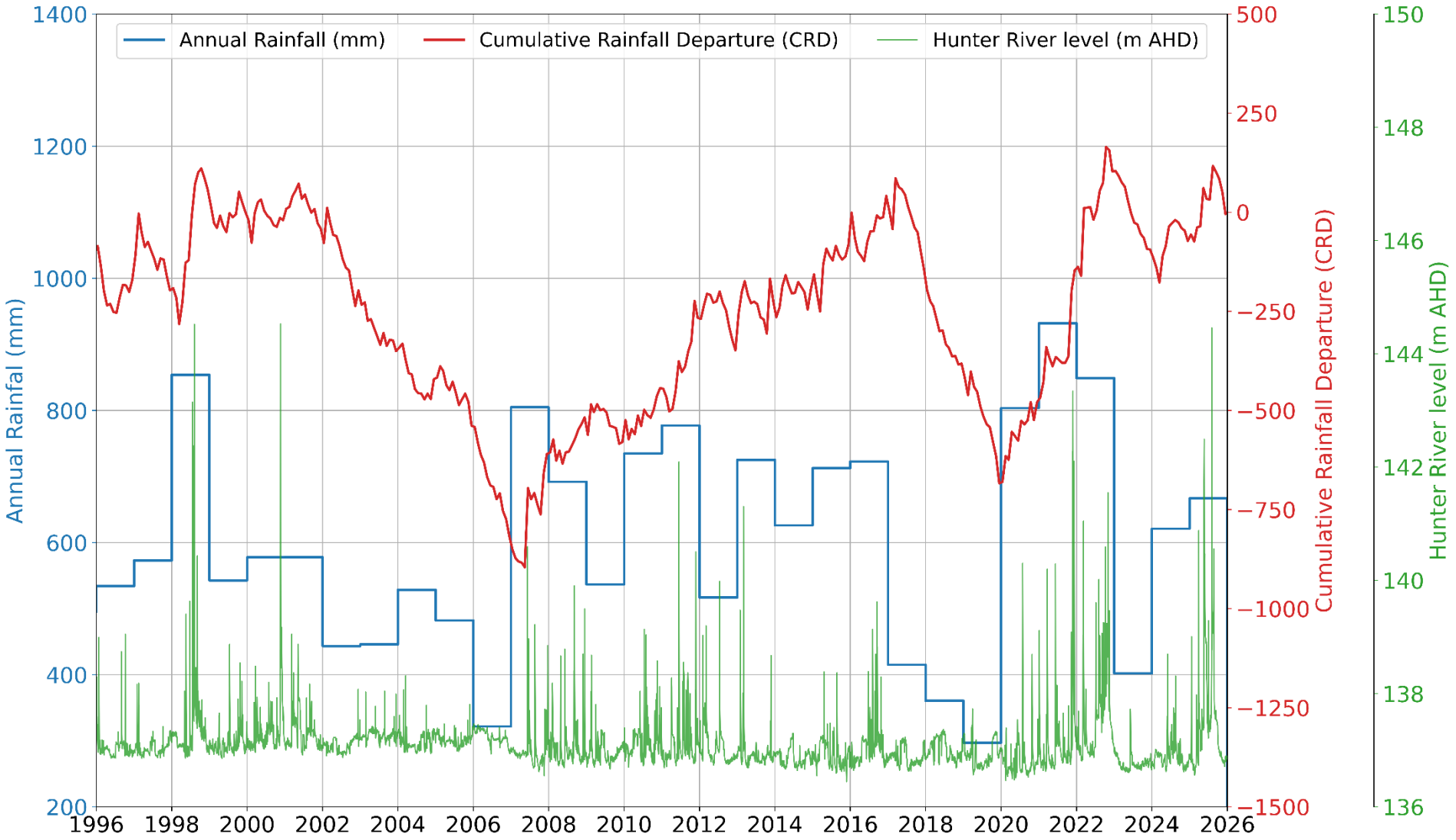


Figure 2.1 Cumulative rainfall departure (1992 to 2025) for Bengalla weather monitoring station

3 Groundwater regime

The groundwater regime at Bengalla consists primarily of two systems:

- Unconsolidated aquifer of the Hunter River alluvium deposits, which is up to 14 m thick and consists of a silty-clay to sand layers overlying a basal gravel.
- Permian coal measures (includes non-coal strata), comprising a multi-layered bedrock aquifer in which the coal seams are the prime water bearing strata and the interburden is hydrogeologically "tight" and very low-yielding.

The coal seams strike in a generally north-south direction, and dip westward at approximately 5 degrees. The coal seams subcrop beneath the Hunter River alluvium to the south of Bengalla. Table 3.1 summarises the approximate thicknesses of coal seam and interburden units at Bengalla (AGE 2025a).

Table 3.1 Coal seams and interburden at Bengalla Mine

	Seam name	Average seam thickness (m)	Average thickness of overlying interburden (m)
Mined at Bengalla	Warkworth	1.0	35
	Mount Arthur	4.5	5
	Piercefield	2.3	12
	Vaux	4.0	35
	Broonie	1.3	13
	Bayswater	2.5	10
	Wynn	2.5	5
	Edderton	2.0	10
Not mined at Bengalla	Clanricard	1.8	10
	Bengalla	2.5	10
	Edinglassie	3.9	30
	Ramrod Creek	6.5	-

Generally, in undisturbed conditions, the potentiometric surface (pressure head) of groundwater in the coal seams is higher than the alluvial water table (i.e. an upward hydraulic gradient). Therefore, in areas where the coal seams subcrop beneath the alluvium, there is potential for groundwater from the coal measures to discharge to the Hunter River alluvium. Depressurisation of the coal seams by open cut mining has the following potential impacts on the Hunter River alluvial aquifer:

- reduced discharge rate from the coal seams to the alluvium; and
- reversed hydraulic gradients, resulting in leakage from the Hunter River alluvial aquifer to the coal seams where they subcrop beneath the alluvium to the south of Bengalla, and eventual discharge of this alluvial water to the Bengalla pit.

The objective of the groundwater monitoring program at Bengalla is to assess these potential impacts.

Generally, the Hunter River level is above the water table in the Hunter River alluvium, and near Bengalla the river is losing water to the alluvium. The level of the Hunter River is relatively constant under normal conditions due to the regulation of water discharge from Glenbawn Dam (refer Figure 2.1) and only fluctuates by approximately 1 to 2 m annually, although occasionally rises several metres during flooding events.

4 Bengalla groundwater monitoring network

BMC has established a groundwater monitoring network around Bengalla with data from 1992 onwards. Table 4.1 summarises the monitoring bore network and the Vibrating Wire Piezometer (VWP) locations. Figure 4.1 shows the bore and VWP locations. The following text provides a chronological summation of monitoring bore network upgrades.

In March 2009 and June 2010, nine bores were installed in the alluvial fringe area as part of a commitment from the Wantana Extension Statement of Environmental Effects (SEE; March 2009). Three of these were bore clusters, with one bore screened in the alluvium and one in an underlying coal seam at each monitoring location (e.g. WAN8A/B, WAN9A/B and WAN10A/B). WAN9A was replaced by bore WAN9A2 in July 2017. A bedrock bore (REPI7) was installed to replace bore I7. Two alluvial monitoring bores, SMB1 and SMB2, were installed in June 2010 to the east of Wantana Extension as part of investigations to obtain approval for spoil placement on an alluvial embayment adjacent to the mine.

Bore WAN8A has been recorded as 'dry' for some time and has been recommended to be replaced.

In 2017, two VWPs (BE4 and BE5) were installed between ML 1645 and the westward advancing pit. The BE4 and BE5 VWPs were positioned to replace the A10 and E12 bores (E12 was mined out in 2017) and to complement the existing BE1 and BE3 VWPs further to the west. BE4 and BE5 have since been decommissioned as mining progressed.

In late 2018, BMC commenced drilling five new monitoring bores that target both alluvial and shallow Permian strata (GW01A, GW01B, WAN11A, WAN11B and WAN12). These bores have been included in the monitoring bore network summary (Appendix A) but do not form part of this compliance review.

As the neighbouring Mount Pleasant Project progresses, 64092 has been covered by a visual bund and access to groundwater monitoring sites 11953 has become restricted. No data have been recorded for these bores since 2023. Monitoring bore E12 was mined through in May 2017. VWP BE4 was removed on 27 October 2021 due to blasting operations. VWP sites BE3 and BE5 were decommissioned in October 2023, and April 2024 respectively due to the westward progression of the pit.

In December 2021, BMC commenced drilling a nested monitoring site that target both alluvial (211GW001) and shallow Permian (211GW002) strata south of Bengalla, along strike to the actively mined seams in the region nearby to BG3 (approximately 1 km), as recommended in Bengalla Mine Groundwater Annual Report 2020 (AGE, 2021). The purpose of these bores is to provide a control point that enables a comparison of the two sites. The monitoring bores were installed in a 'nested' configuration (i.e., in proximity at a single site), with one shallow monitoring bore targeting shallow strata (211GW002) and another deeper bore installed into subcropping Permian strata (211GW001). These bores have been included in the monitoring bore network summary (Appendix A) for record completeness however are not part of this compliance review.

Installation of additional monitoring sites is currently underway at Bengalla with these sites located west and south of the mine. The purpose of these installations is to supplement the current monitoring network and provide additional groundwater level and groundwater quality data, as well as support future numerical model development.

Table 4.1 Current Bengalla groundwater monitoring network

Bore ID	Easting (m)	Northing (m)	Ground level (mAHD)	Top of casing (mAHD)	Stick up (m)	Screen Interval / Sensor Depth (mbGL)	Total depth (mBGL)	Bore base elevation (mAHD)	Geology/ Target Seam
11953 [a]	298129	6428693	148.0	148.0	0.97	-	-	-	Deep Permian
18298 [b]	294375	6423521	132.9	133.5	0.61	-	-	-	Alluvium
19116 [b]	296078	6425589	135.6	136.4	0.82	-	-	-	Alluvium
28510 [b]	298649	6429105	142.7	144.0	1.30	-	-	-	Deep Permian
37774 [b]	298488	6428998	145.6	146.0	0.40	-	-	-	Deep Permian
42701 [b]	298586	6428632	144.0	144.9	0.97	-	-	-	Deep Permian
42927 [b]	298843	6428570	144.3	145.4	1.10	-	-	-	Alluvium
46737 [b]	291862	6427143	227.7	227.9	0.21	-	-	-	Shallow Permian
47277 [b]	299145	6428643	143.5	144.6	1.06	-	-	-	Alluvium
53007 [b]	298720	6428857	144.0	144.0	0.04	-	-	-	Deep Permian
BE1 (bore)	293469	6429033	241.5	242.7	1.19	69-75	75.0	166.5	Permian Sandstone
BE2 (bore)	293374	6425866	204.2	205.4	1.16	45-48	48.0	156.2	Permian Sandstone
BG1 [b]	296656	6426003	138.2	138.8	0.58	-	-	-	Alluvium
BG3 [b]	294731	6424413	133.6	133.8	0.16	-	-	-	Alluvium
BG5 [b]	298609	6427874	142.2	142.5	0.31	-	-	-	Alluvium
REPI7	295575	6425832	135.5	136.4	0.91	49-52	52.0	83.5	Vaux Seam
SMB1	296955	6426391	141.2	142.5	1.27	13-19	19.0	122.2	Alluvium
SMB2	297124	6426549	141.7	142.6	0.92	15-21	21.0	120.7	Alluvium
WAN10A	295828	6425571	135.1	136.1	1.06	41548	13.8	121.2	Alluvium
WAN10B	295825	6425578	135.0	136.1	1.06	44-47	47.0	88.0	Vaux Seam
WAN1A	296519	6426099	140.6	141.4	0.75	16-20	20.0	120.6	Alluvium/ Wynn seam
WAN1B	296519	6426099	140.6	141.4	0.75	29-33	33.0	107.6	Edderton Seam
WAN2A	296217	6425824	137.7	138.4	0.70	13-16	16.0	121.7	Alluvium/ Vaux seam
WAN2B	296217	6425824	137.7	138.4	0.74	36-39	39.0	98.7	Wynn Seam
WAN2C	296217	6425824	137.7	138.4	0.73	51-54	55.0	83.7	Edderton Seam
WAN3 [b]	295772	6425713	136.4	136.7	0.30	2.5-87	87.0	49.4	Deep Permian
WAN4A	295442	6425690	135.1	135.9	0.83	11.5-14.5	14.5	120.6	Alluvium
WAN4B	295442	6425690	135.1	135.9	0.79	21-24	24.0	111.1	Deep Permian

Bore ID	Easting (m)	Northing (m)	Ground level (mAHD)	Top of casing (mAHD)	Stick up (m)	Screen Interval / Sensor Depth (mbGL)	Total depth (mBGL)	Bore base elevation (mAHD)	Geology/ Target Seam
WAN5A [b]	296019	6425360	135.9	136.8	0.88	26-29	29.0	107.8	Deep Permian
WAN5B [bc]	296019	6425360	135.9	136.7	0.84	10.5-13.5	15.57	121.2	Alluvium
WAN6A	296553	6425634	136.9	137.7	0.77	7.5-10.5	10.5	126.4	Alluvium
WAN6B	296553	6425634	136.9	137.7	0.76	30-33	33.0	103.9	Edderton Seam
WAN7A	296856	6426254	138.1	138.9	0.76	12.0-15.0	15.0	123.1	Alluvium
WAN7B	296856	6426254	138.1	138.9	0.79	80-83	83.0	55.1	Edinglassie Seam
WAN8A	296457	6425854	136.41	137.5	1.07	10.7-11.9	12.9	124.5	Alluvium
WAN8B	296450	6425855	136.33	137.4	1.09	15-18.6	19.6	117.8	Wynn Seam
WAN9A2	296326	6425582	136.88	138.0	1.10	8.5-10.5	10.5	126.4	Alluvium
WAN9B	296328	6425576	136.93	137.9	0.95	21-24	24.0	112.9	Wynn Seam
BE1 (VWP)	293475	6429036	241.48	-	-	120	120	121.5	Warkworth/Mt Arthur
BE1 (VWP)	293475	6429036	241.48	-	-	264.5	264.5	-23.0	Edderton Seam
BE2 (VWP)	293374	6425866	204.22	-	-	97.8	97.8	106.4	Warkworth/Mt Arthur
BE2 (VWP)	293374	6425866	204.22	-	-	212.5	212.5	-8.28	Edderton Seam
BE5 (VWP)	293696	6427245	181.3	-	-	74	210.15	-28.9	Mt Arthur
BE5 (VWP)	293696	6427245	181.3	-	-	197.5	210.15	-28.9	Edderton Seam
GW01A [c]	298190	6428409	TBC	TBC	TBC	9-12	12.0	TBC	Alluvium
GW01B [c]	298190	6428409	TBC	TBC	TBC	24-27	27.0	TBC	Shallow Permian
WAN11A [c]	296649	6424875	135.4	136.4	1.05	9-12	12.0	123.4	Alluvium
WAN11B [c]	296645	6424876	135.5	136.5	0.95	24-27	27.0	108.5	Shallow Permian
WAN12 [bc]	295491	6424725	135.3	136.1	0.76	11-14	14.0	121.3	Alluvium
211GW00 [d]	294301	6424930	138.33	139.2	0.87	49.4-55.4	55.4	83.8	Shallow Permian
211GW00 [d]	294294	6424927	138.3	139.2	0.90	14.8-20.8	20.8	118.4	Alluvium

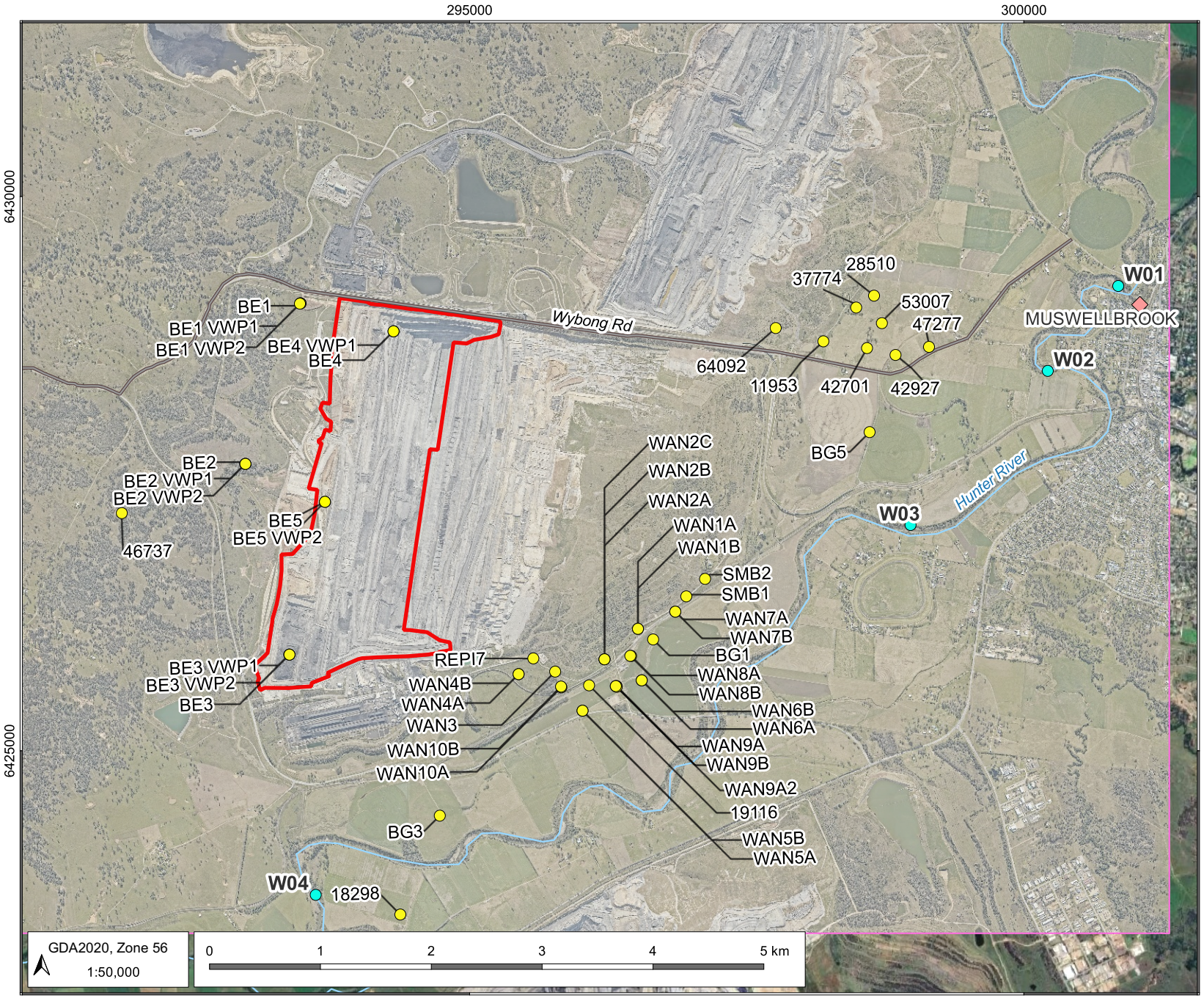
Notes: * MGA94 z56.

[a] no access or mined through for 2025 monitoring.

[b] recommended camera survey on bores to determine screened interval and bore depth.

[c] survey data to be added to WMP.

[d] not included in groundwater management plan to date.



LEGEND

- Monitoring Bores
- Surface Water Sites
- Hunter River stations
- Major Watercourse
- Void Boundary Aug2025
- Bengalla Imagery Bound

Bengalla Annual Groundwater Review (BEN5029.001)

Monitoring bore netweork and surface water sites

DATE
17/03/2026

FIGURE No:
4.1

©2026 Australasian Groundwater and Environmental Consultants Pty Ltd (AGE) - www.ageconsultants.com.au; Source: 1 second SRTM Derived DEM-S - © Commonwealth of Australia (Geoscience Australia) 2011; GEODATA TOPO 250K Series 3 - © Commonwealth of Australia (Geoscience Australia) 2006
G:\Projects\BEN5029.001 2025 Monthly Monitoring and Reporting\3_GIS\Workspaces\006_Deliverable6_GW Annual Review\Figure 4.1 AR2025 Groundwater Monitoring Network.qgz

5 Water management plan

Bengalla manages its water resources as per the Bengalla Water Management Plan (WMP) Revision 6, which was approved December 2023 (BMC 2023).

The current WMP groundwater quality triggers are summarised in Table 5.1 and the water level triggers are summarised in Table 5.2. The 2025 monitoring data are compared against these triggers.

Table 5.1 Bengalla WMP water quality triggers (December 2023)

Site	Min pH trigger	Max pH trigger	Stage 1 EC Trigger (µS/cm)	Stage 2 EC Trigger (µS/cm)	Target aquifer
18298	6.0	8.5	1226	1432	Alluvium
19116	6.0	8.5	1231	1350	Alluvium
28510	6.0	8.5	1041	1052	Deep Permian
37774	6.0	8.5	2511	2560	Deep Permian
42701	6.0	8.5	991	1035	Deep Permian
42927	6.0	8.5	1254	1280	Alluvium
46737	6.0	8.5	9059	9290	Shallow Permian
47277	6.0	8.5	1244	1247	Alluvium
53007	6.0	8.5	947	975	Deep Permian
BE1	6.0	8.5	7420	8280	Permian Sandstone
BE2	6.0	8.5	6585	6740	Permian Sandstone
BG1	6.0	8.5	1042	1450	Alluvium
BG3	6.0	8.5	3463	3660	Alluvium
BG5	6.0	8.5	1309	1341	Alluvium
REPI7	6.0	8.5	4370	4470	Vaux Seam
SMB1	6.0	8.5	2140	2790	Alluvium
SMB2	6.0	8.5	2420	2460	Alluvium
WAN1A	6.0	8.5	2109	2510	Alluvium
WAN1B	6.0	8.5	1880	2000	Shallow Permian
WAN2A	6.0	8.5	1358	1881	Alluvium
WAN2B	6.0	8.5	3800	3930	Edderton Seam
WAN2C	6.0	8.5	3746	4180	Edderton Seam
WAN3	6.0	8.5	4348	4550	Deep Permian
WAN4A	6.0	8.5	3654	4170	Alluvium
WAN4B	6.0	8.5	3450	3570	Deep Permian
WAN5A	6.0	8.5	6062	6240	Alluvium
WAN5B	6.0	8.5	1290	1900	Deep Permian
WAN6A	6.0	8.5	1063	1280	Alluvium
WAN6B	6.0	8.5	1294	1461	Edderton Seam

Site	Min pH trigger	Max pH trigger	Stage 1 EC Trigger (µS/cm)	Stage 2 EC Trigger (µS/cm)	Target aquifer
WAN7A	6.0	8.5	2220	2300	Alluvium
WAN7B	6.0	8.5	3100	3220	Edinglassie Seam
WAN8A	6.0	8.5	8804	8870	Alluvium
WAN8B	6.0	8.5	3216	3550	Wynn Seam
WAN9A2	6.0	8.5	959	1230	Alluvium
WAN9B	6.0	8.5	2090	2370	Wynn Seam
WAN10A	6.0	8.5	1367	1647	Alluvium
WAN10B	6.0	8.5	5290	5440	Vaux Seam

Note: ' – ' indicates insufficient data for statistical analysis.

Table 5.2 Bengalla WMP water level triggers (Updated December 2023)

Bore ID	Geology / Target Seam	Max. drawdown (m)	Trigger water level (mAHD)
11953	Deep Permian	7.1	129.3
18298	Alluvium	0.3	123.2
19116	Alluvium	4.2	123.2
28510	Deep Permian	3.3	129.0
37774	Deep Permian	5.4	128.7
42701	Deep Permian	1.9	131.3
42927	Alluvium	1.2	131.1
46737	Shallow Permian	0.7	185.3
47277	Alluvium	0.8	132.8
53007	Deep Permian	1.8	131.9
BE1	Permian Sandstone	15.5	156.8
BE2[a]	Permian Sandstone	18.8	148.9
BG1	Alluvium	1.4	126.8
BG3	Alluvium	0.2	126.3
BG5	Alluvium	0.9	132.4
REPI7	Vaux Seam	39	63.1
SMB1	Alluvium	1.5	127.2
SMB2	Alluvium	1.6	127.3
WAN1A	Alluvium	4.2	117.5
WAN1B	Edderton Seam	15.8	100.1
WAN2A	Alluvium	6.8	118.5
WAN2B	Wynn Seam	25.4	86.4
WAN2C	Edderton Seam	25.4	75.0
WAN3	Deep Permian	26.3	100.3
WAN4A	Alluvium	5.5	121.2

Bore ID	Geology / Target Seam	Max. drawdown (m)	Trigger water level (mAHD)
WAN4B	Deep Permian	26.3	98.2
WAN5A	Alluvium	2.4	124.3
WAN5B	Deep Permian	10.7	116.0
WAN6A	Alluvium	1.1	126.9
WAN6B	Edderton Seam	4.1	123.8
WAN7A	Alluvium	1.4	125.4
WAN7B	Edinglassie Seam	2.3	126.4
WAN8A	Alluvium	2.4	123.3
WAN8B	Wynn Seam	9.5	108.5
WAN9A	Alluvium	2.6	123.7
WAN9B	Wynn Seam	8.1	111.4
WAN10A	Alluvium	4.6	122.2
WAN10B	Vaux Seam	20.9	98.3

Note: [a] drawdown and elevation are flipped in WMP.

6 Water levels assessment

6.1 Alluvium aquifer water levels

Groundwater levels for the bores monitoring groundwater levels in the Hunter River alluvium were analysed in two subsets, as follows:

- bores to the immediate south of the current pit and in the approved Wantana Extension, referred to as the Wantana Extension Bores; and
- bores located in the alluvium at a greater distance from Bengalla, which are unlikely to be impacted by mining, referred to as Regional Hunter River Alluvium Bores ('Regional Bores').

6.1.1 Wantana Extension Bores

Figure 6.1 shows the groundwater level trends in the Wantana Extension area along with the CRD and monthly-average Hunter River stage. Water levels in the Wantana Extension bores remained stable for the first half of 2025, coincident with CRD and river stage, and increased gradually then declined in the second half of the year, also consistent with a rise in the CRD and an approximate 1.5 m rise in the river stage.

No Wantana Extension bores recorded groundwater levels below their respective trigger levels in 2025 (Appendix A). Trigger levels are not shown in Figure 6.1 for clarity.

Although all these bores are located in the alluvial plain, groundwater levels demonstrate variable response compared to the Hunter River level, the CRD, or other Wantana Extension bores (i.e. total change and rate of change). This variability among bore behaviour may be due to the specific location of the bore (e.g., some bores located on the fringe of the alluvium), the screened intervals not being completely representative of the Hunter River alluvium or variable screen lengths, or the presences of low-permeability clay lenses creating local confined conditions across the alluvial aquifer.

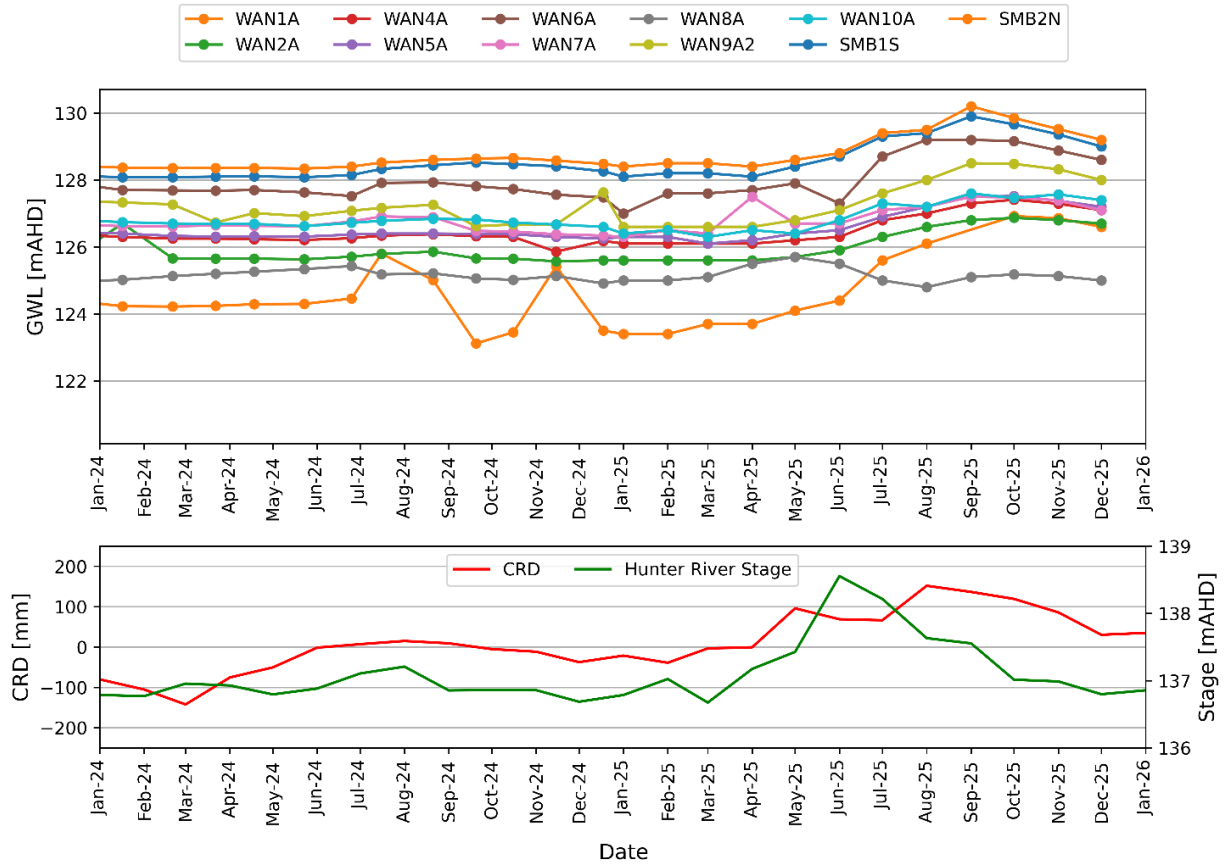


Figure 6.1 Hydrographs of alluvial bores - Wantana extension area

6.1.2 Regional Hunter River alluvial bores

Figure 6.2 shows groundwater levels measured in the Regional Bores (BG1, BG3, and BG5) along with their groundwater level trigger values. Groundwater levels in BG1 remained at least 1 m above the trigger level throughout 2025 whereas BG3 and BG5 where just below (0.2 m) or at their trigger levels for a single measurement round in January and February, respectively. As this was a single trigger event, no additional investigation is required. All three bores show the same increase in groundwater levels through the second half of 2025.

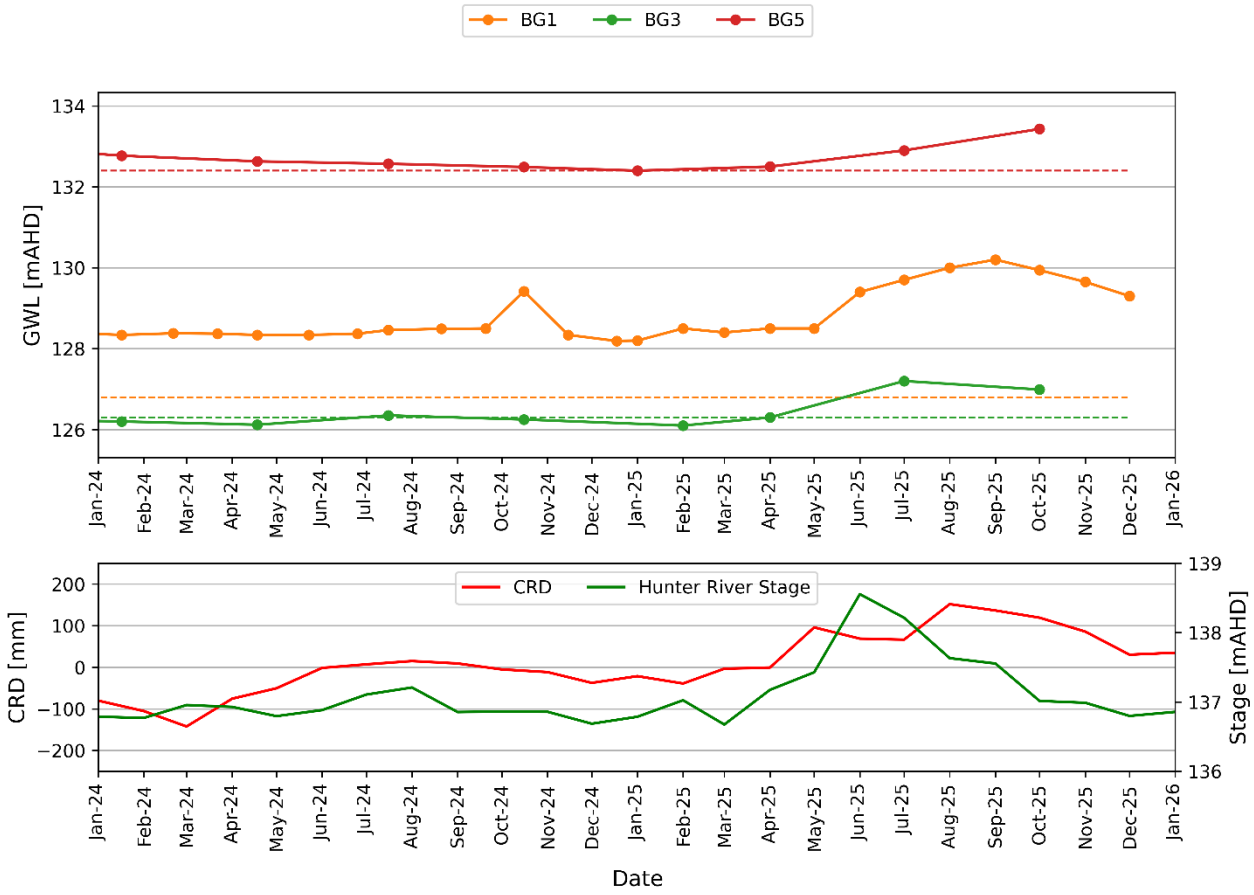
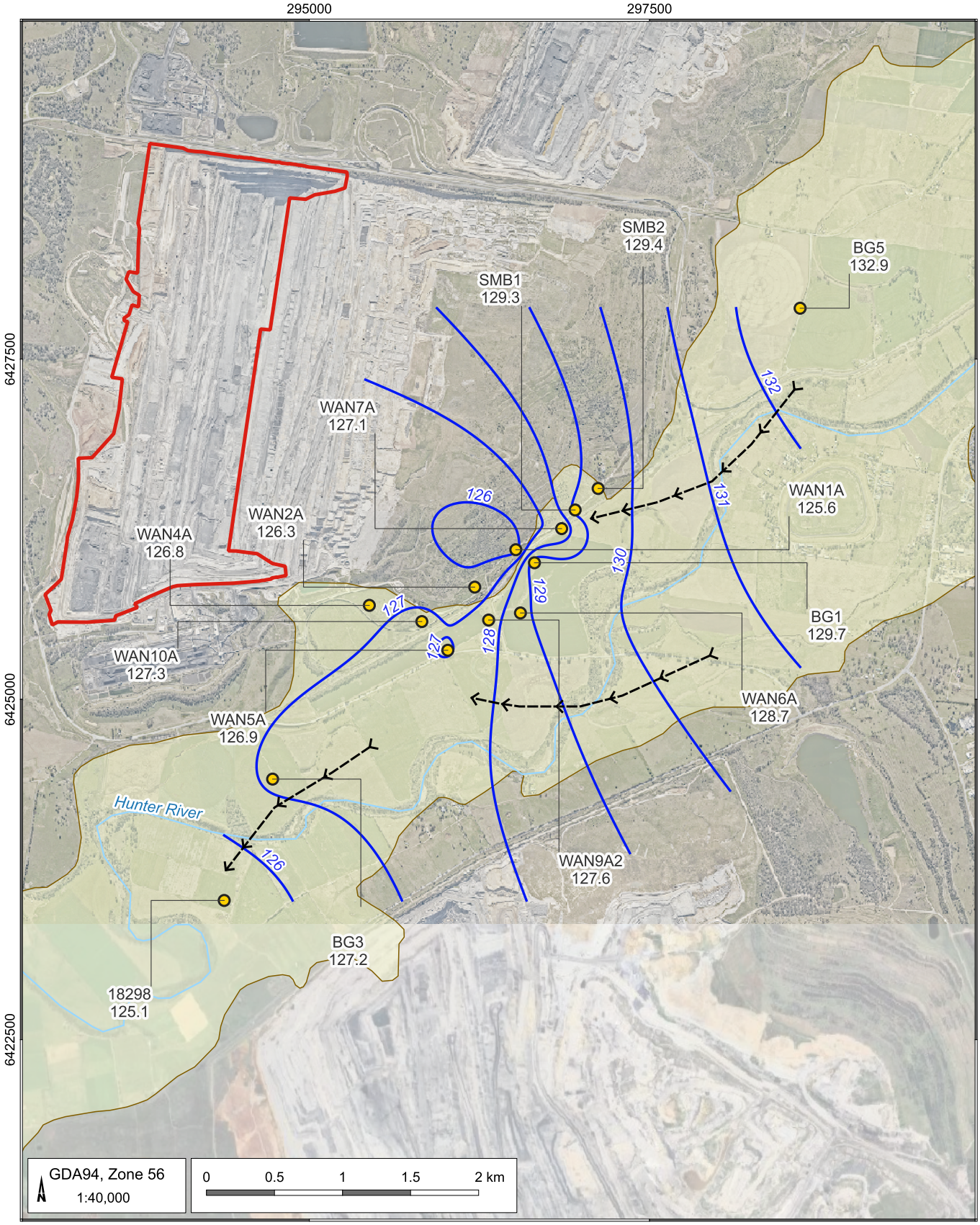


Figure 6.2 Hydrographs of regional alluvial bores

6.1.3 Alluvial groundwater level contours

Figure 6.3 shows the water table within the Hunter River alluvium interpolated from water elevation measurements observed during July 2025. The water level contours indicate that flow direction is along the direction of the Hunter River, which is from northeast to southwest across the alluvial plain. The contours also indicate a potentiometric 'low' centred around WAN1A and WAN2A. Rather than indicative of a groundwater depression, this may represent a higher permeability zone within the alluvium where the groundwater gradient flattens somewhat, suggesting heterogeneity within the alluvium.

As was the case in previous years, the bore data implies a steep hydraulic gradient adjacent to WAN1A and BG1 (Figure 6.3). This is likely due to a combination of the proximity of bores to the open cut and to the edge of the alluvium. It is likely that mining related depressurisation of shallow Permian strata at the southern margin of the pit continues to cause movement of alluvial water towards Bengalla Mine. This would explain the decline of water levels to below the screened interval of the bore in WAN8B (screened in the shallow Permian/Wynn Seam; refer Section 6.2.1). Regardless of groundwater flow direction, any loss of water to the pit from the alluvium fringe is likely to be masked by both the regulated nature of the Hunter River and the Hunter River recharge to the alluvium (the river is considered a losing stream at this point).



LEGEND

- Alluvium Bores (July 2025)
- Alluvium groundwater contours (1m)
- Groundwater flow direction
- Drainage
- 2025 void boundary
- Alluvium boundary

NOTE:
Aerial Image Capture Date : July 2025
Source: BMC

Bengalla Groundwater Annual Review 2025 (BEN5029.001)

Alluvial groundwater levels (July 2025)

AGE

DATE 13/03/2026

FIGURE No: **6.3**

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6.2 Coal seam/interburden water levels

6.2.1 Permian monitoring bore hydrographs

Groundwater levels in all Permian monitoring bores remained above established trigger values throughout 2025. Figure 6.4 shows shallow Permian groundwater levels monitored in the Wantana Extension area. Key observations are:

- Groundwater levels are generally stable overall, with no substantial declines recorded in 2025. While the mined seams have been depressurised to a varying extent, groundwater levels in a number of seams have stabilised (as expected) as the pit progresses westward.
- Groundwater levels in several bores (WAN1A, WAN2A, WAN5A, WAN6B, and WAN7A) show similar patterns to Figure 6.1, specifically a notable rise in the second half of 2025, correlated with river stage and climate.
- WAN2B and WAN10B displayed a gradual but steady rise in groundwater level from through 2024/2025. This recover is likely related to gradual recovery in pressure as mining operations move further away from this bore.
- REPI7 is recording a decline of approximately 0.7 m from 2024 through 2025.
- WAN7B screens the Edinglassie Seam and has remained stable through 2024 and the first half of 2025, after which it rose notably (along with other bores and the Hunter River). The Edinglassie Seam is not mined at Bengalla and therefore the water elevation in this seam is considered most representative of the pre-mining potentiometric surface in the Wantana Extension area.
- WAN8B has been dry since 2016 and has been omitted from Figure 6.4.
- WAN3A has had insufficient water for sampling and measurement nearly throughout all of 2025 and has been omitted from Figure 6.4.

Figure 6.5 shows the groundwater levels for the deeper Permian monitoring bores (WAN4B, WAN5A, and WAN1B) along with trigger values. Key observations can be summarised as follows:

- Groundwater levels in WAN1B and WAN5A gradually increased in the second half of 2025 while level in WAN4B remained stable.
- WAN4B, WAN5A, and WAN1B all remained above established triggers throughout 2025.

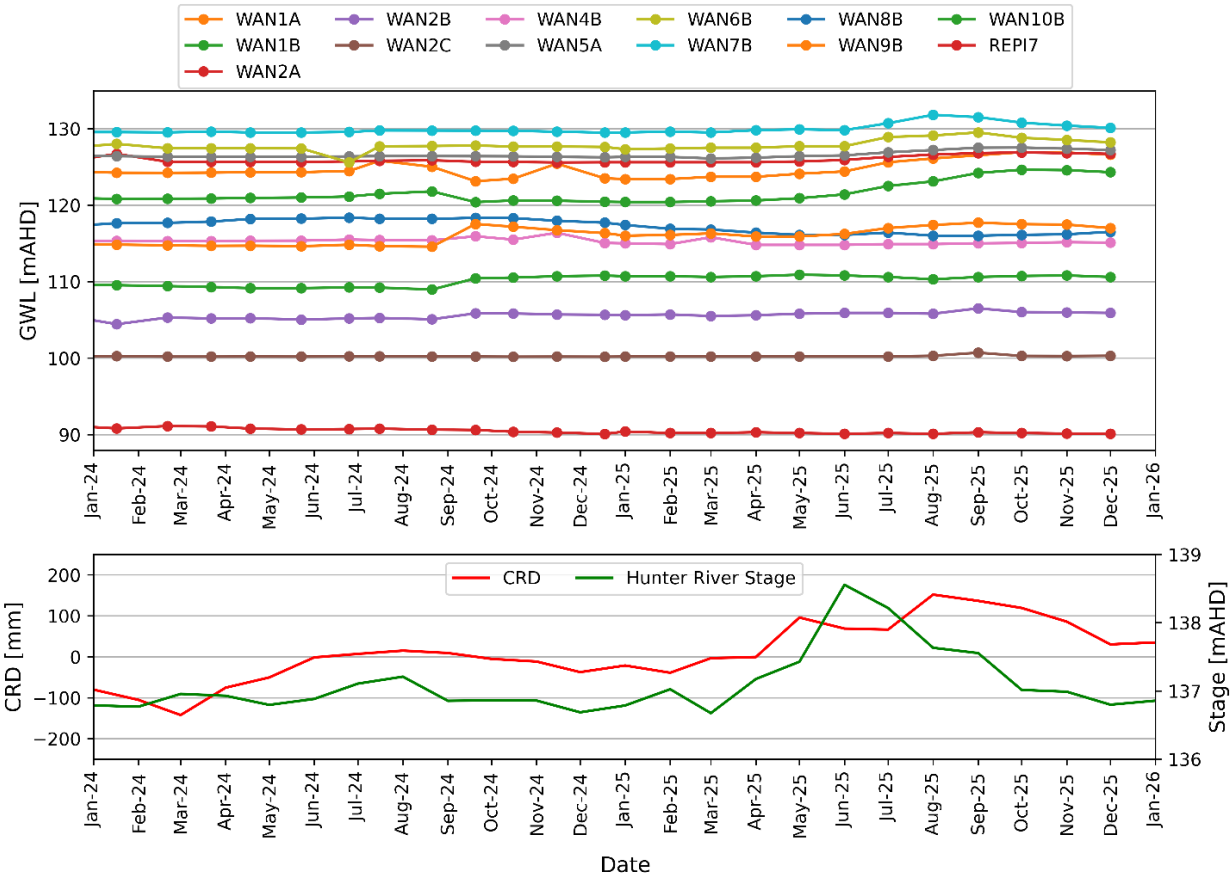


Figure 6.4 Hydrographs of coal seam/interburden bores – Wantana extension area

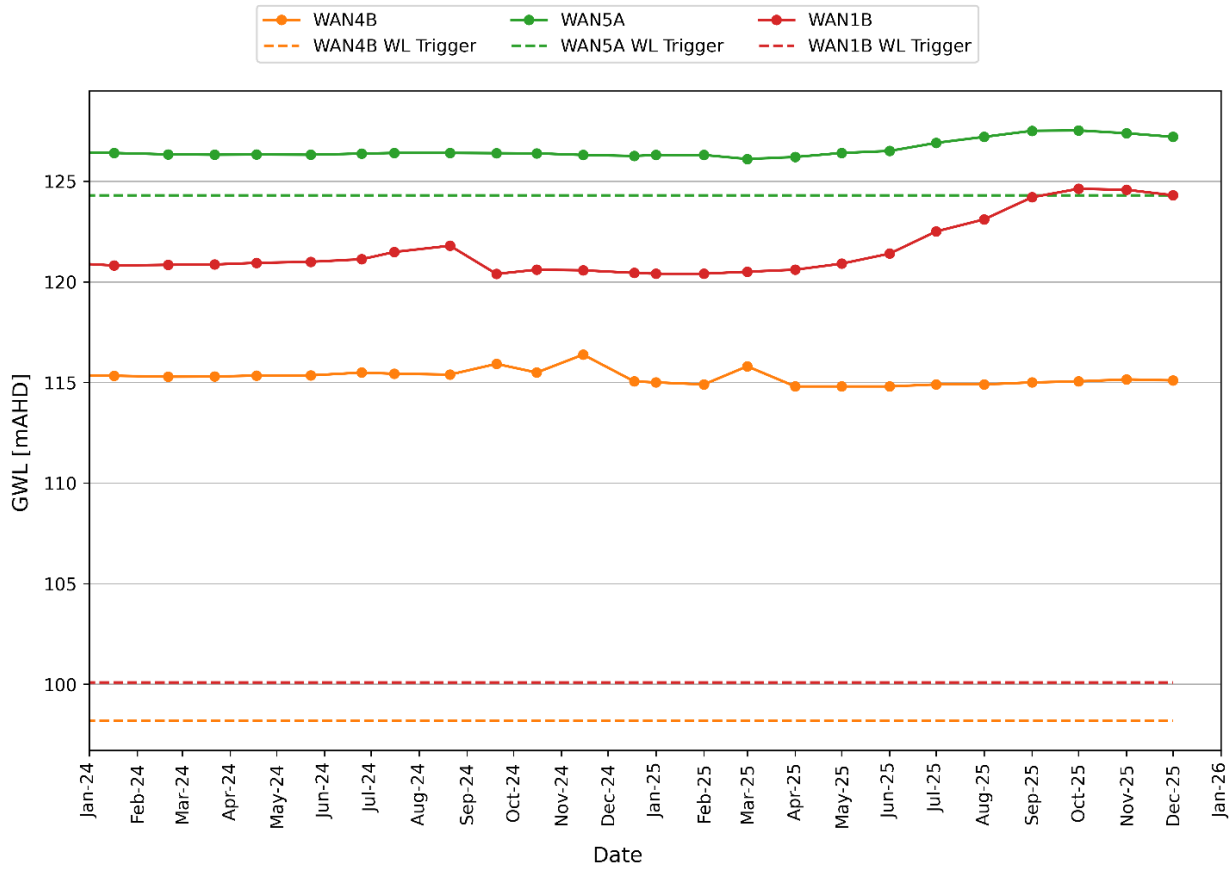


Figure 6.5 Hydrographs of deep Permian monitoring bores

6.2.2 Nested monitoring bore hydrographs

Nested monitoring bore installations in the Wantana Extension are used to monitor water levels in several aquifers at the one location. Each nested installation generally comprises one alluvium bore (sub A) and one (or more) coal seam bore(s) (sub B/C). Groundwater levels in all nested monitoring bores remained above the trigger level for 2025. The hydrographs of the clustered bores (Figure 6.6 to Figure 6.14) are discussed in the following subsections.

Trigger levels for the Wantana bores are summarised in Section 5, and are based on groundwater modelling for Bengalla (AGE 2013). The trigger levels were further revised in 2018 to avoid false exceedances and to reflect potential mining related impacts (AGE 2018). The trigger values are also displayed in the hydrographs.

6.2.2.1 WAN1

Figure 6.6 shows the WAN1A/B nested site water levels (WAN1A – alluvium; WAN1B – Edderton Seam). WAN1 bores retained levels above the trigger levels throughout 2025. WAN1A is screened in the Wynn seam and possibly also over part of the alluvium. At this location, the Wynn seam subcrops close to the base of the alluvium. WAN1A gradually increased through 2025 from 123.4 mAHD in January 2025 to 126.6 mAHD in December 2025 (3.2 m increase) with a slight shift to declines at the end of the year. WAN1B recorded a similar increase through 2025 (3.9 m from January to December). Pre-mining groundwater level in WAN1B was 115.87 mAHD, demonstrating that water levels in coal seams can recover in a post-mining phase.

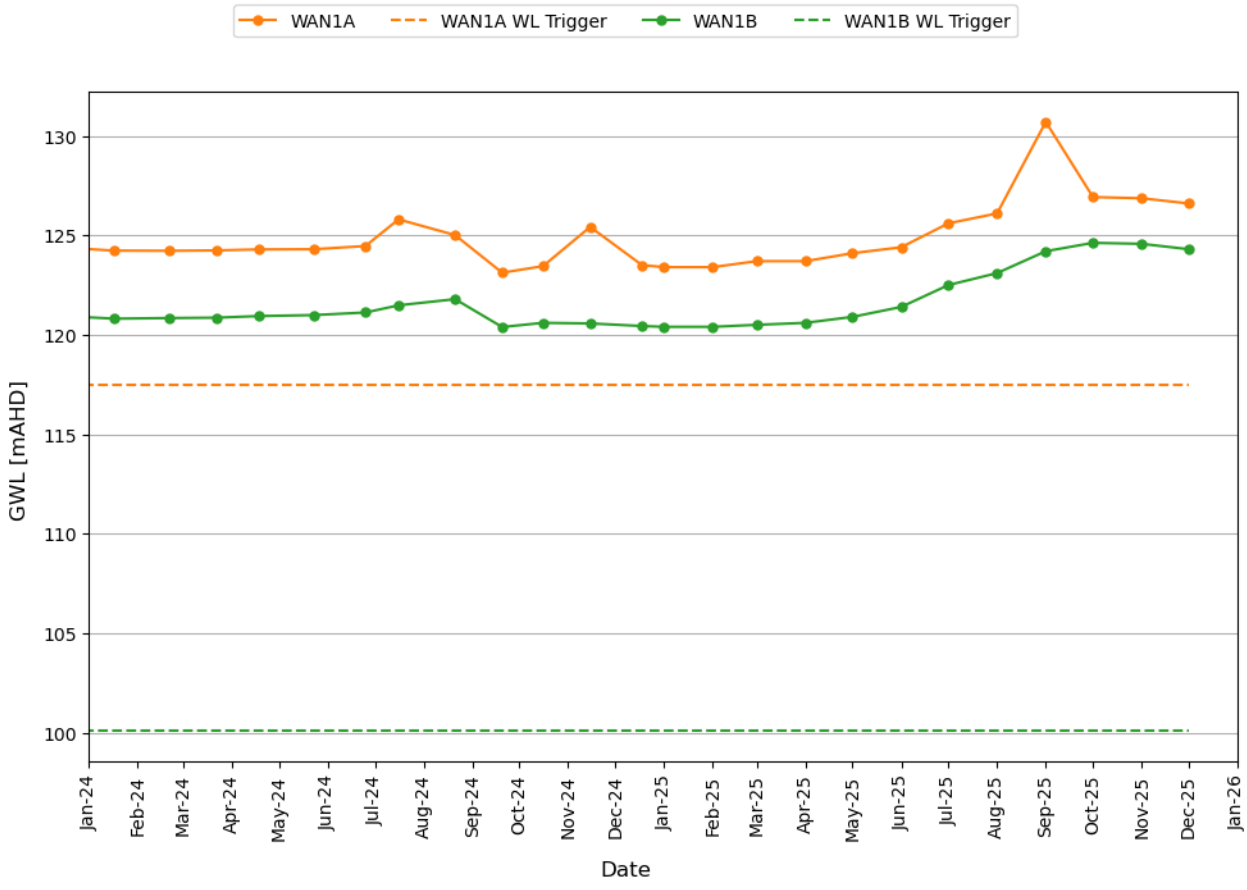


Figure 6.6 Alluvium and coal seam hydrographs – WAN1A/B

6.2.2.2 WAN2

Figure 6.7 shows the WAN2 nested site water levels (WAN2A – Alluvium; WAN2B – Wynn Seam, and WAN2C – Edderton Seam). All bores remained above the trigger levels throughout 2025. Water levels in WAN2A rose slightly in the second half or the 2025 monitoring period whereas WAN2B and WAN2C remained generally stable over 2025.

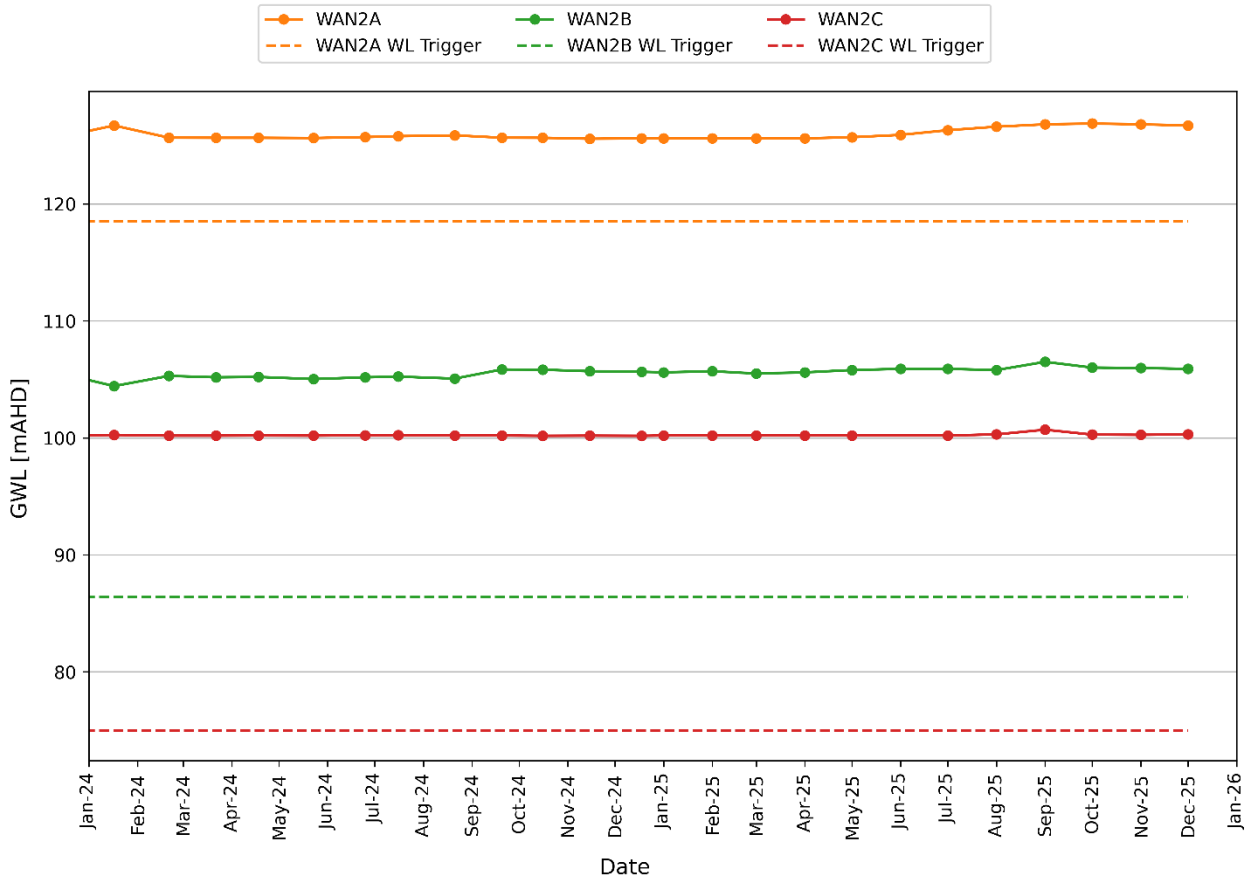


Figure 6.7 Alluvium and coal seam hydrographs – WAN2A/B/C

6.2.2.3 WAN4

Bores at the WAN4 site (WAN4A – Alluvium; WAN4B – Permian interburden) retained groundwater levels above the trigger values through 2025 (Figure 6.8). WAN4A recorded a similar rise in levels in the second half of 2025 and WAN4B remained generally stable.

Historically, the groundwater level in WAN4B prior to 2011 was 2 m lower than the water level observed in WAN4A. Since December 2011, the water level in WAN4B declined by 9.32 m before stabilising to an elevation approximately 115 mAHD. WAN4A water levels are generally 126 mAHD.

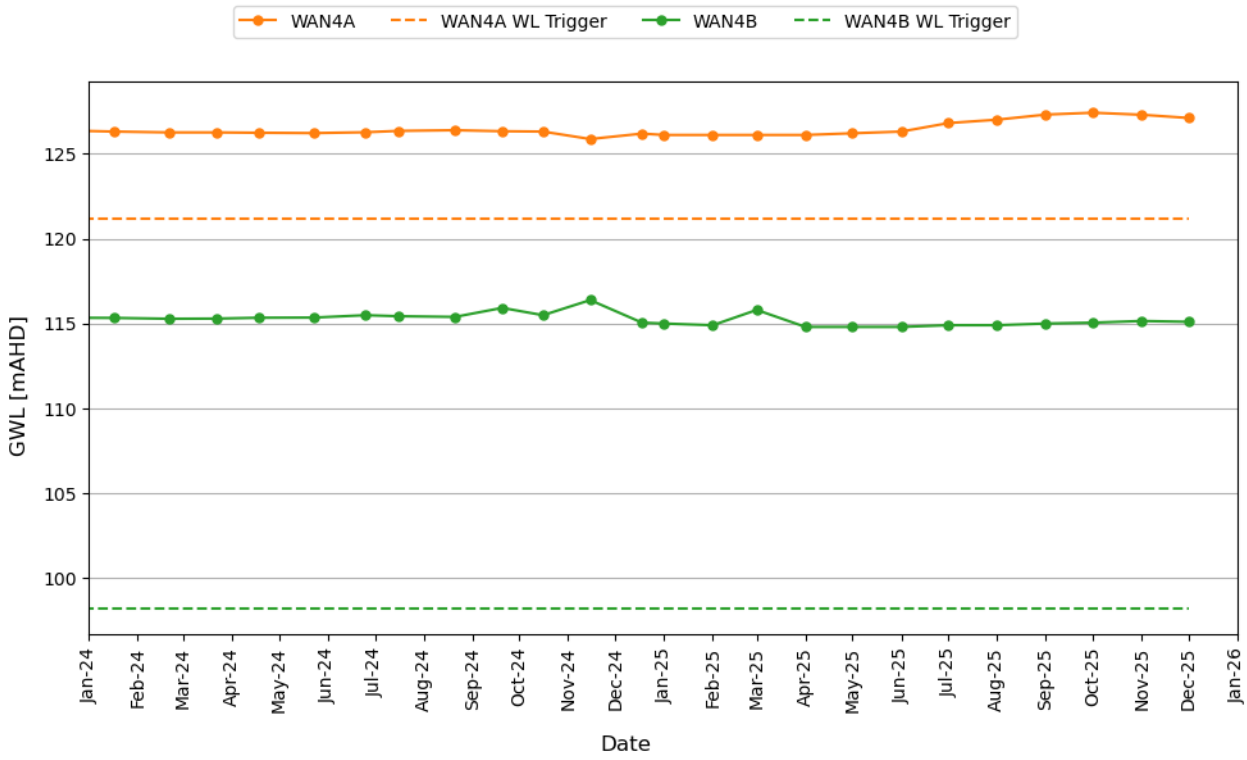


Figure 6.8 Alluvium and interburden hydrographs – WAN4A/B

6.2.2.4 WAN5 and WAN6

WAN5A/B and WAN6A/B also both have paired Alluvium/Permian bores but at both these sites the Permian bores have nearly identical groundwater level elevations and trends as the alluvium bores (trends being increasing levels in the second half of 2025) (Figure 6.9 and Figure 6.10).

WAN5A/B and WAN6A/B are farther from the active pit than WAN4A/B (see Figure 4.1) and the behaviour in these bores suggest that either the water levels in the interburden and Edderton Seam at WAN5A/B and WAN6A/B show minimal response to mining, or that the rate of recharge from the alluvium to the interburden is greater than the rate of seepage to the pit at this location.

WAN5A/B (Figure 6.9) and WAN6A/B (Figure 6.10) were above established trigger levels throughout 2025.

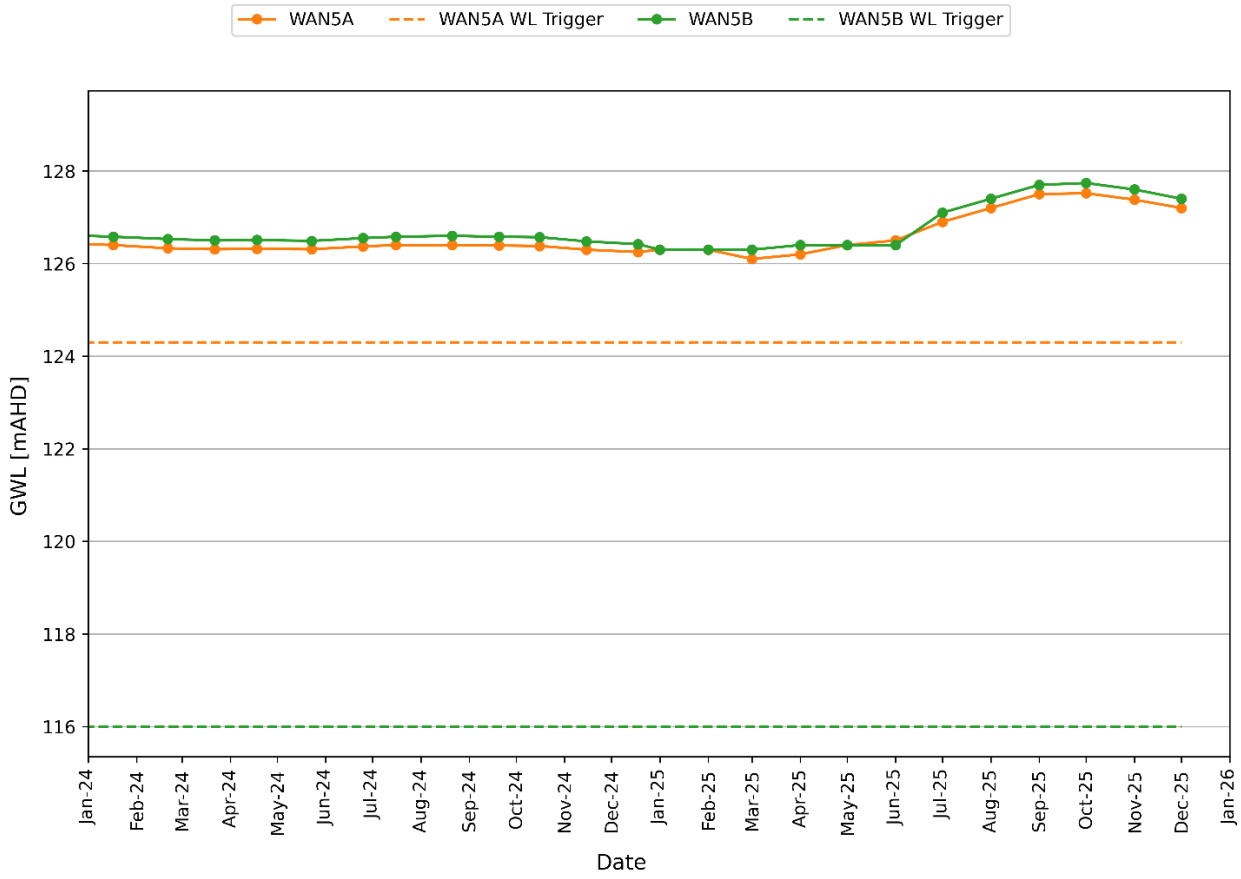


Figure 6.9 Alluvium and interburden hydrographs – WAN5A/B

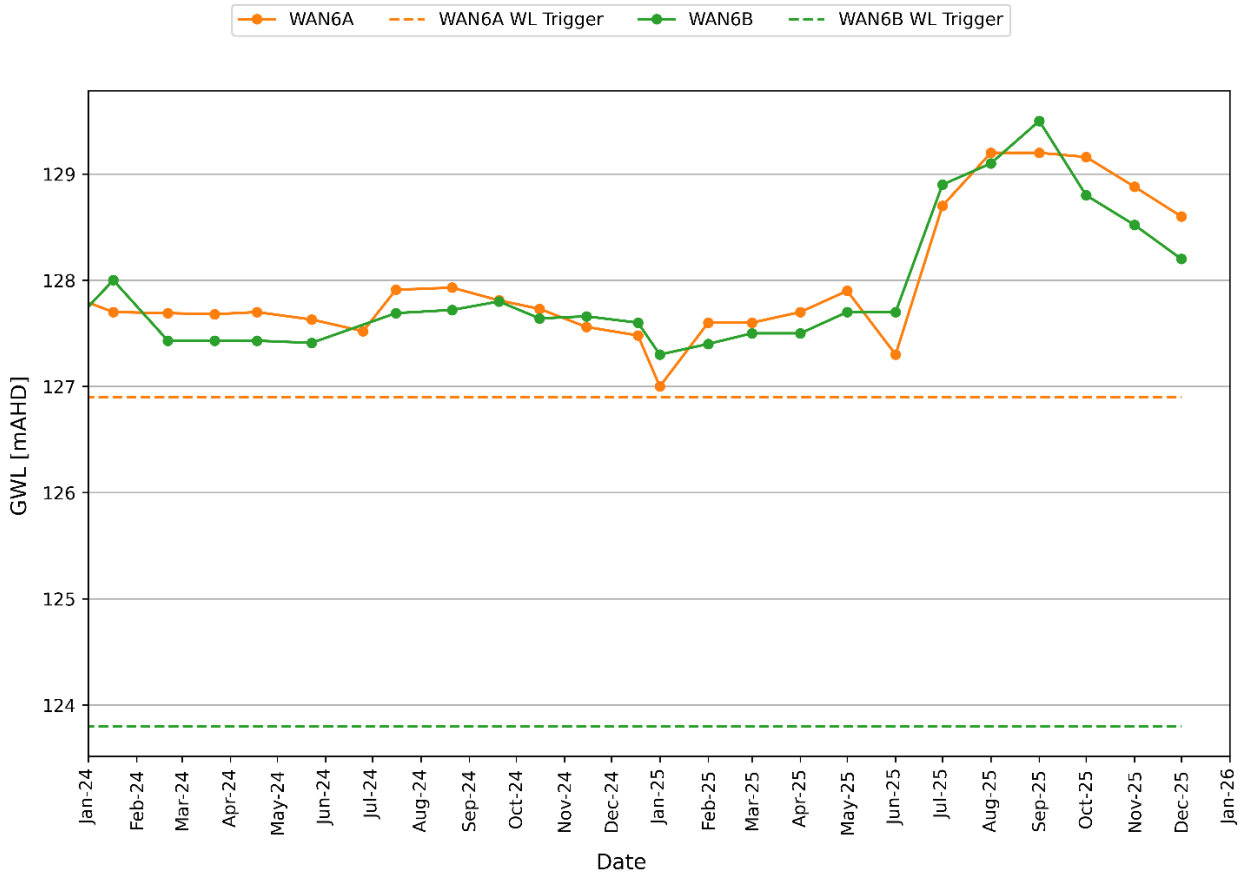


Figure 6.10 Alluvium and interburden hydrographs – WAN6A/B

6.2.2.5 WAN7

Site WAN7 comprises two paired bores (WAN7A – Alluvium; WAN7B – Edinglassie Seam). Figure 6.11 shows that groundwater level in the Edinglassie Seam (WAN7B) is approximately 3 m above the groundwater level in the alluvium (WAN7A), indicating that the Edinglassie Seam is pressurised relative to the alluvium and that groundwater flow direction is upwards. The Edinglassie Seam is not mined at Bengalla and hence should not be impacted by mining related drawdown. Water levels in both WAN7A and WAN7B show rise in the second half of 2025 despite different overall elevations. This implies that both systems are responding to the same external stressors, namely climate and river stage.

WAN7A and WAN7B were above established trigger levels throughout the entirety of 2025 (Figure 6.11).

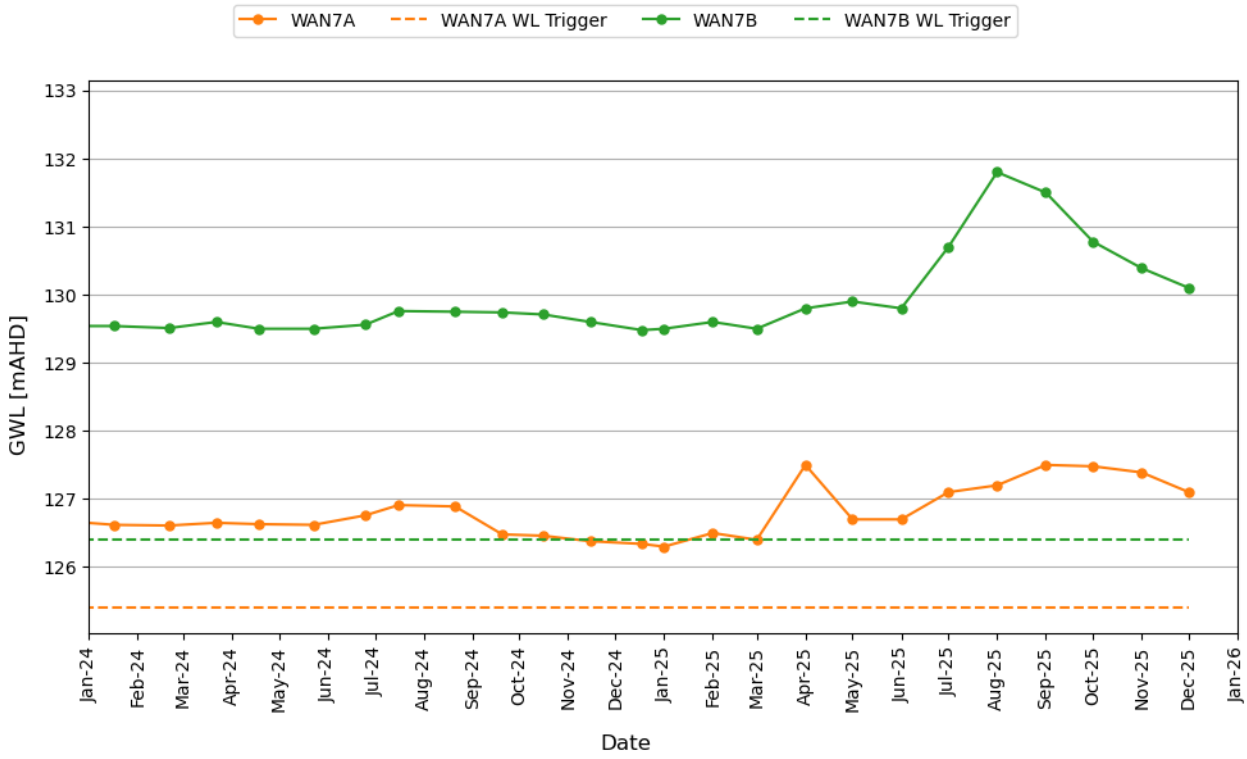


Figure 6.11 Alluvium and coal seam hydrographs – WAN7A/B

6.2.2.6 WAN8

Figure 6.12 shows the water levels at the nested site WAN8 (WAN8A – Alluvium; WAN8B – Wynn Seam). The water levels are approximately 125 mAHD and 118 mAHD for the alluvium and the Wynn seam), respectively. However, as previously noted, WAN8A is essentially dry and does not likely record in situ aquifer conditions so has little values for comparison.

WAN8B shows a decline in groundwater levels between mid-2024 and mid-2025 (1.4 m) but this decline is within the historic variability of the bore which is typically closer to 117 mAHD.

WAN8B remained above established groundwater level trigger throughout 2025.

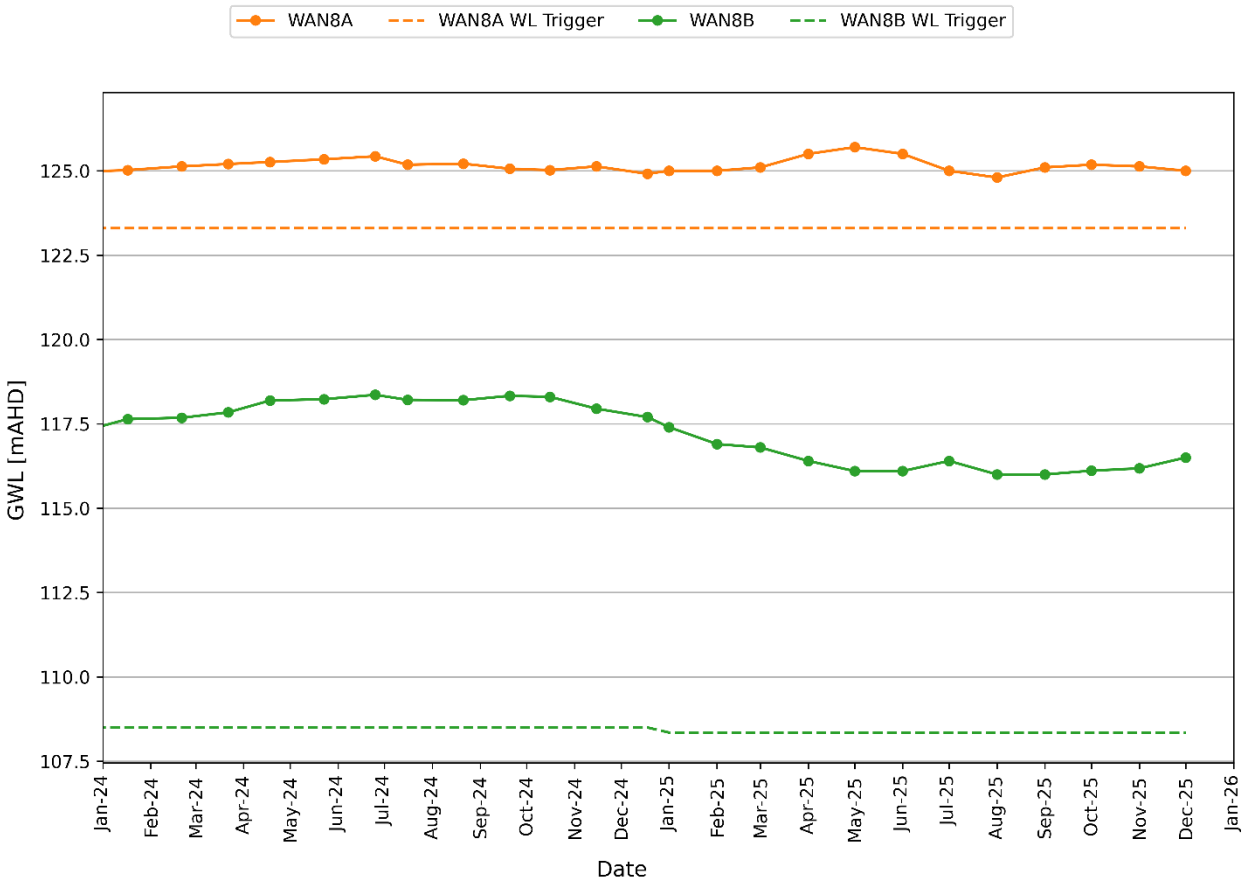


Figure 6.12 Alluvium and coal seam hydrographs – WAN8A/B

6.2.2.7 WAN9

Groundwater levels in WAN9A2 (Alluvium) and WAN9B (Wynn Seam) are also distinct with approximately 10 m of separation, but both show similar behaviour of rising in the second half of 2025 (Figure 6.13). As with other bores, this suggests moderate separation between the Permian and alluvium aquifer but response to the same stressors (climate and river stage).

WAN9A2 and WAN9B both remained above established trigger values throughout 2025.

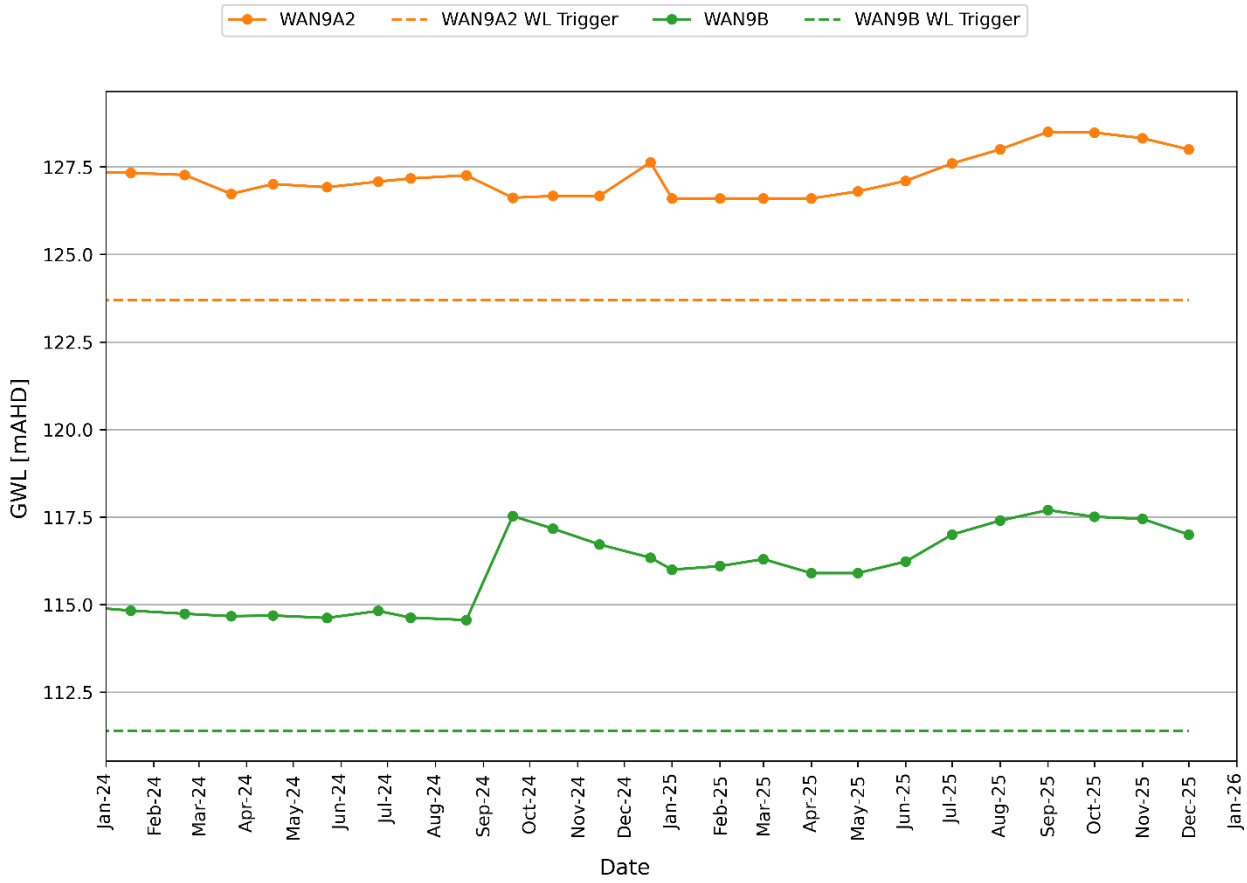


Figure 6.13 Alluvium and coal seam hydrographs – WAN9A2/B

6.2.2.8 WAN10

WAN10 monitoring bores (WAN10A – Alluvium; WAN10B – Vaux Seam) remained above trigger values for 2025 (Figure 6.14) and both remained relatively stable during 2025, although WAN10A recorded a slight increase (1 m) in the second half of 2025. Since September 2012, the water level in WAN10B has been steadily declining. The head differential between the bores at WAN10 remains at approximately 16 m, indicating a strong downward gradient from the alluvium to the Permian aquifer.

The initial groundwater level at WAN10B (119.2 mAHD in May 2009) has declined overall to 110.60 mAHD, a change of 8.60 m. This represents a decline in groundwater level of approximately 50% of the range above the adopted trigger level (Figure 6.14). Despite this, the decline is still above the trigger level and within the limits of predicted impacts.

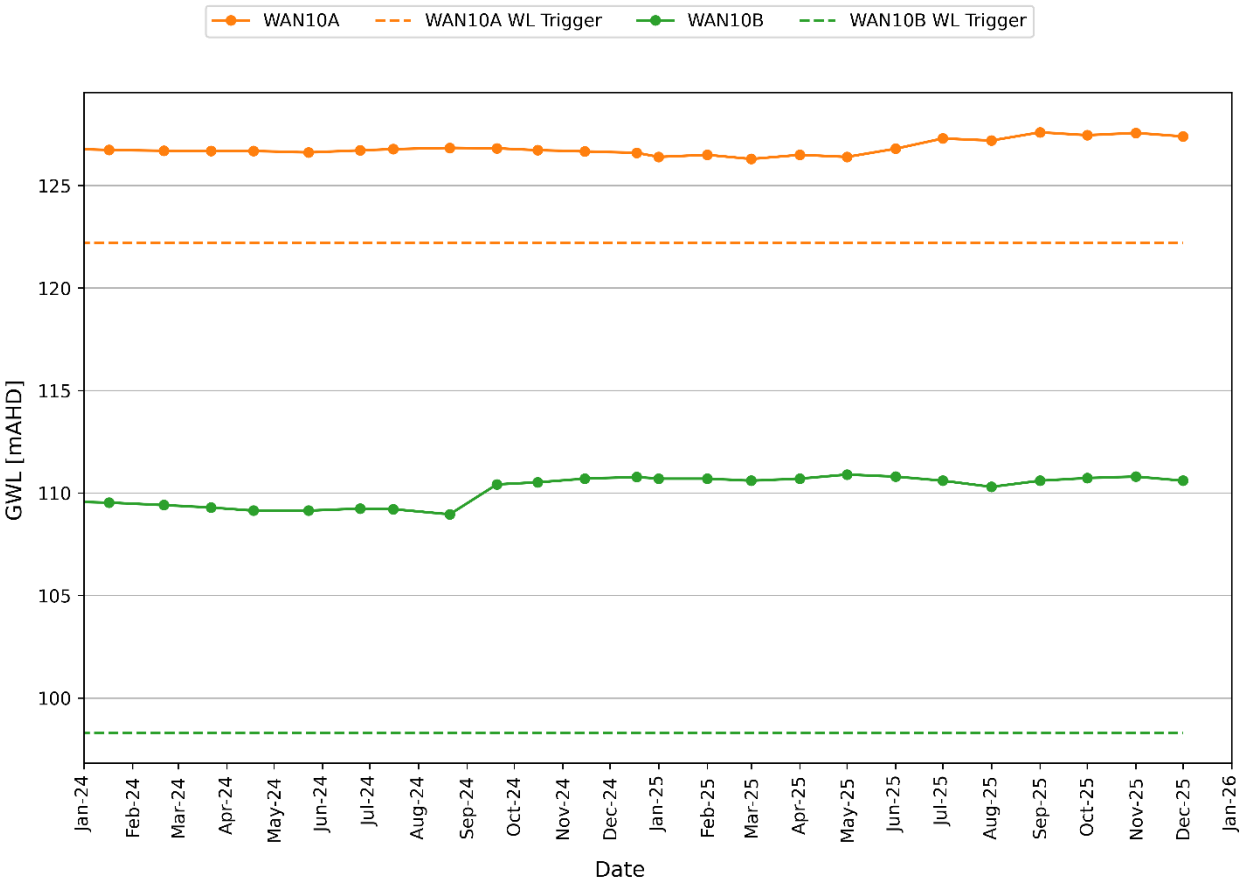


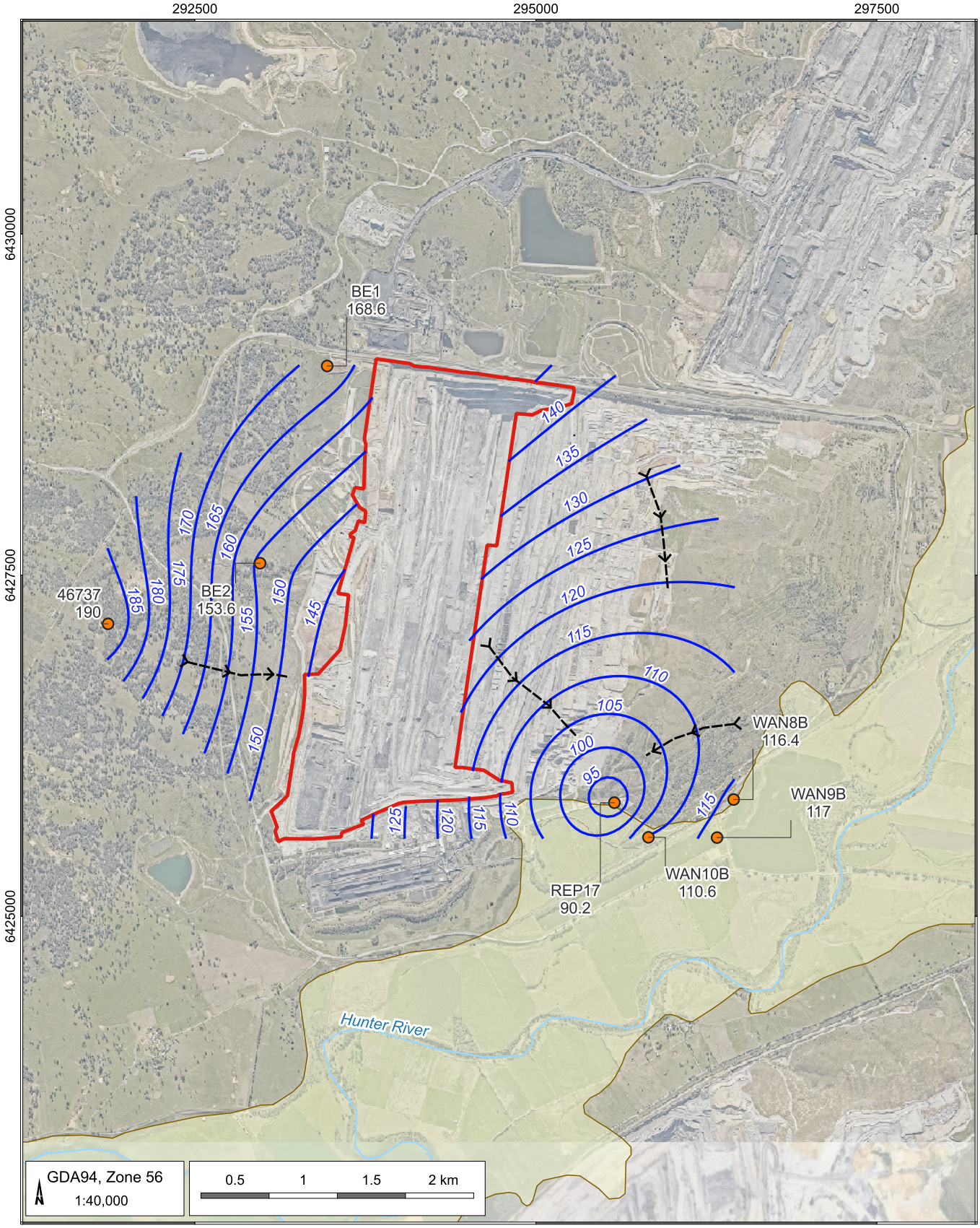
Figure 6.14 Alluvium and coal seam hydrographs – WAN10A/B

6.2.2.9 Permian groundwater level contours

Figure 6.15 and Figure 6.16 show the interpreted groundwater flow contours for the shallow Permian units (Wynn Seam, Vaux Seam, and interburden) and deeper Permian units (Edderton Seam, Edinglassie Seam, and interburden), respectively. Given that there is not considerable coverage over the area and the pit is intercepting the groundwater, the information available from these figures is somewhat limited, specifically in the northeast of the area. Both Figure 6.15 and Figure 6.16 show the highest groundwater levels west of the pit (higher topography) and the deepest to the southeast of the pit. In the absence of mining this aligns with the conceptual understanding that groundwater in the Permian strata is from west to east and toward the Hunter River.

Comparison between the shallow Permian (Figure 6.15) and the deep Permian (Figure 6.16) shows that, while the flow directions are the same, groundwater levels in the deep Permian are several metres below those in the shallow Permian. This is particularly evident west of the pit in BE1 and BE2 (see Figure 6.18 and Figure 6.19 in next Section).

The water level contours and flow directions are consistent with historic data and the drawdown is within predicted and approved ranges.



LEGEND

- Shallow Permian bores (July 2025)
- Shallow Permian groundwater contours (5m)
- Groundwater flow direction
- Drainage
- 2025 void boundary
- Alluvium boundary

NOTE:
Aerial Image Capture Date : June 2025
Source: BMC

Bengalla Groundwater Annual Review (BEN5029.001)

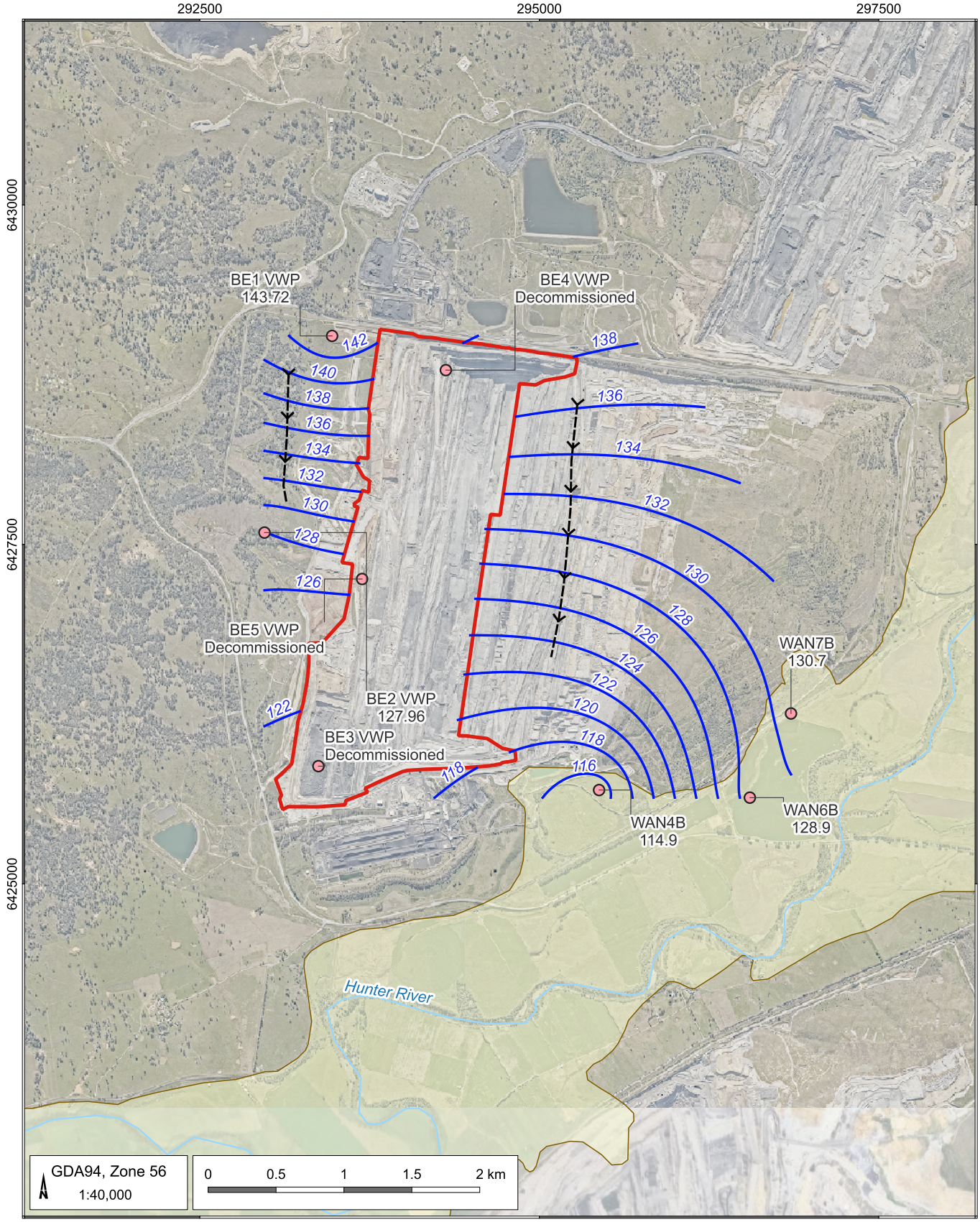
Shallow Permian groundwater levels (July 2025)

AGE

DATE 13/03/2026

FIGURE No: **6.16**

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LEGEND

- Deep Permian bores (July 2025)
- Deep Permian groundwater contours (5m)
- Groundwater flow direction
- Drainage
- 2025 void boundary
- Alluvium boundary

NOTE:
Aerial Image Capture Date : July 2025
Source: BMC

Bengalla Groundwater Annual Review 2025 (BEN5029.001)

Deep Permian groundwater levels (July 2025)

AGE

DATE 13/03/2026

FIGURE No: **6.17**

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6.3 Permian groundwater levels – northwest of active mining

Figure 6.17 shows the groundwater level hydrographs for those bores and VWPs located to the northwest of the active mining area, including:

- 46737.
- BE1: overburden monitoring bore; Mt Arthur Seam VWP; Edderton Seam VWP.
- BE2: overburden monitoring bore; Mt Arthur Seam VWP; Edderton Seam VWP.
- BE3: overburden monitoring bore; Mt Arthur Seam VWP; Edderton Seam VWP.
  - Site decommissioned and mined through.
- BE4: Mt Arthur Seam VWP; Edderton Seam VWP.
  - Site decommissioned October 2021.
- BE5: Mt Arthur Seam VWP; Edderton Seam VWP.
  - Site decommissioned April 2024.

Little change is evident in the groundwater level in the monitoring bore sites to the northwest of the active mining area over 2025 which includes BE1, BE2 and 46737 (Figure 6.17). Groundwater level in these bores remained generally stable over 2025 with slight evidence of declines, but all were above their relative water level triggers.

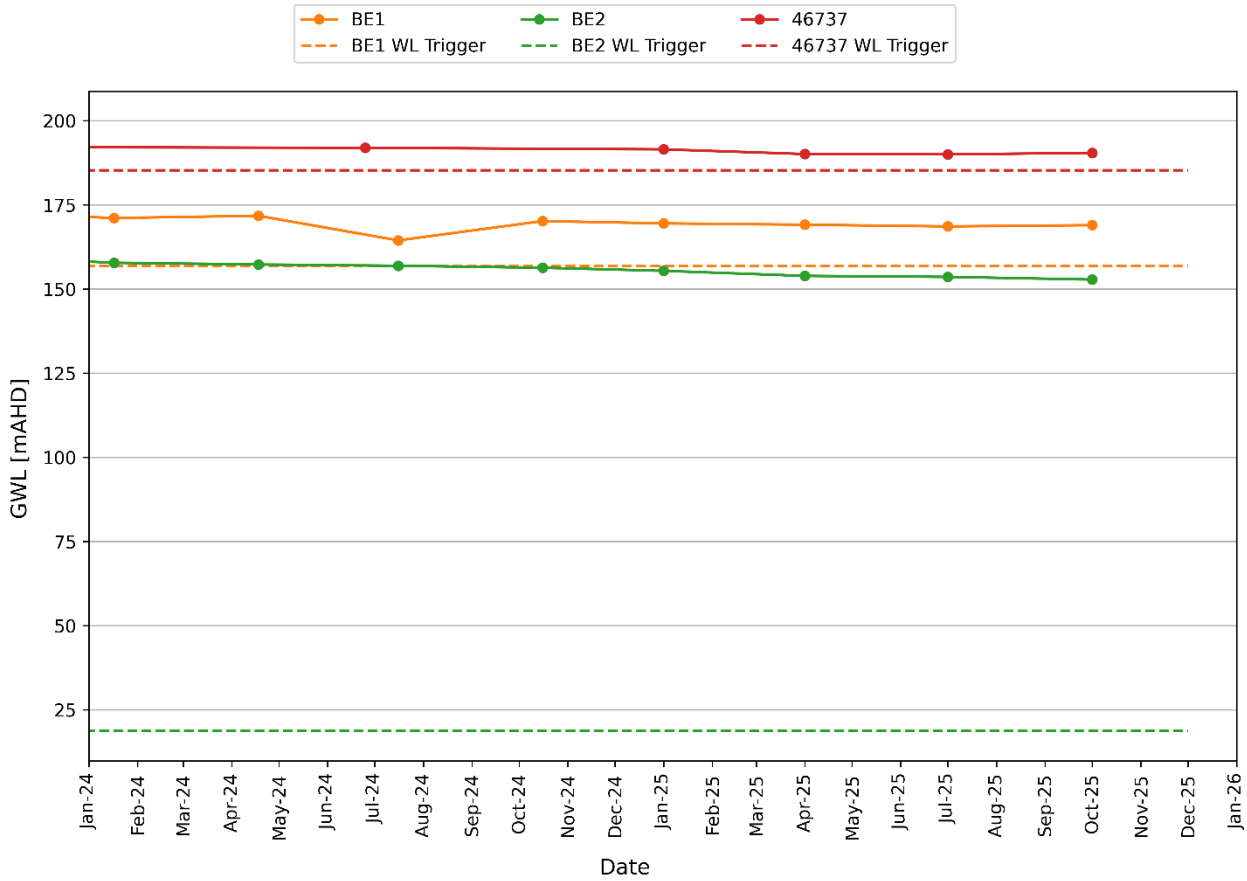


Figure 6.17 Northwest Permian monitoring bore groundwater levels

Figure 6.18 and Figure 6.19 show the potentiometric heads measured in VWP installations at BE1 and BE2. Each of these installations has one VWP sensor in the Mt Arthur Seam, and another sensor in the Edderton Seam. BE4 was removed in October 2021 due to blasting operations and BE3 and BE5 were decommissioned in 2023 and 2024 (respectively) due to mining progress – data from these sites are not discussed in this report.

The following observations are made for the remaining sites (BE1, BE2):

- BE1 (Figure 6.18):
  - Potentiometric pressure in both the Mt Arthur Seam and the Edderton Seam are generally stable around 98 m and 113 mAHD, respectively.
  - Bore groundwater levels have declined slightly over 2025 but are overall stable between 168 mAHD and 170 mAHD.
- BE2 (Figure 6.19):
  - Potentiometric pressure in both the Mt Arthur Seam and the Edderton Seam are generally stable around 98 m and 113 mAHD, respectively, similar to BE1.
  - Bore groundwater levels have declined by approximately 3 m over 2025 but remain above the trigger level.

The reason for the discrepancy in groundwater level trends between the VWP sensors and the monitoring bores is that pressure dissipation is greatest in the deeper coal seams, due to differences in hydraulic conductivity in comparison to the shallow coal overburden. Additionally, the 'BE' series monitoring bores are screened in Permian sandstone/overburden, which may not yet be intersected by the pit, and is continuing to receive recharge via seepage from overlying strata and lateral groundwater flow from the north and west.

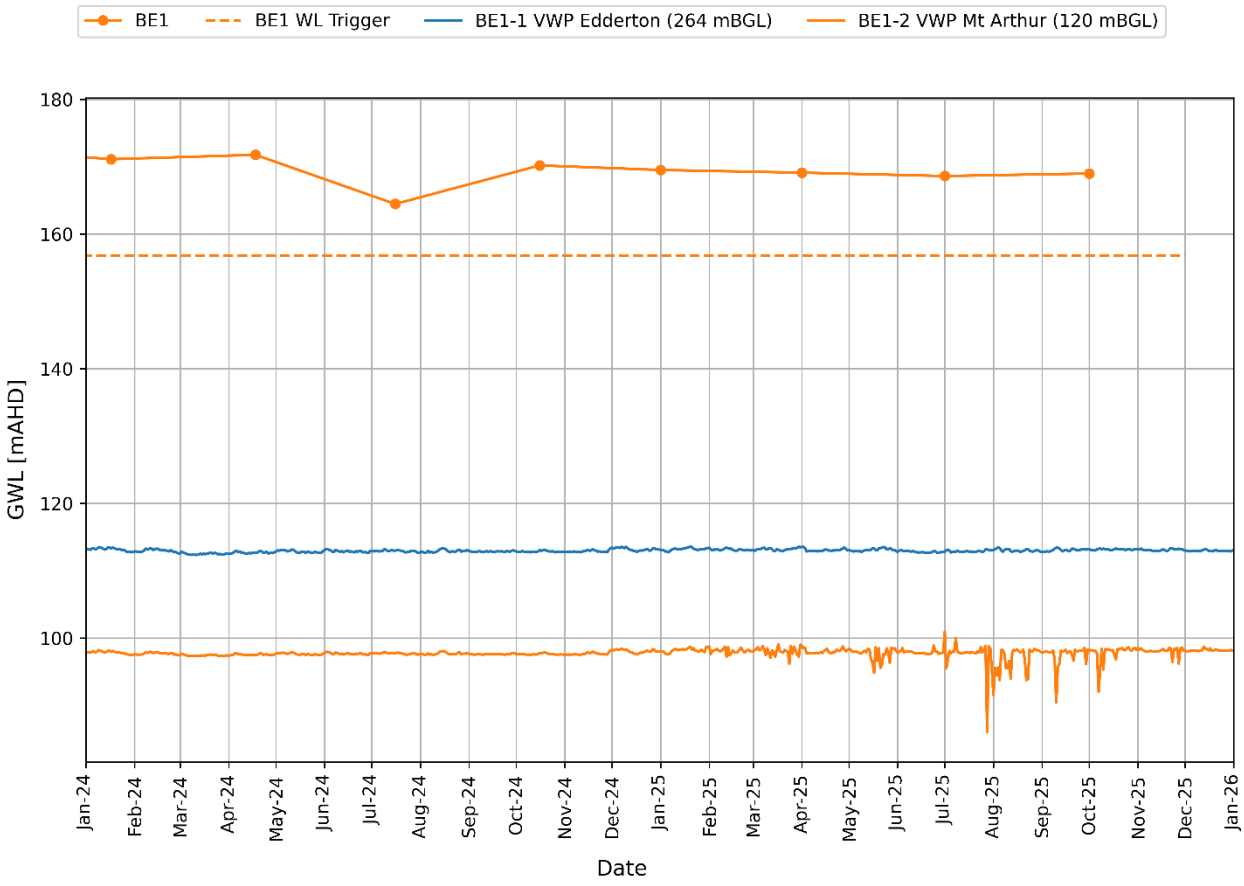


Figure 6.18 Northwest Permian VWP porewater pressure – BE1

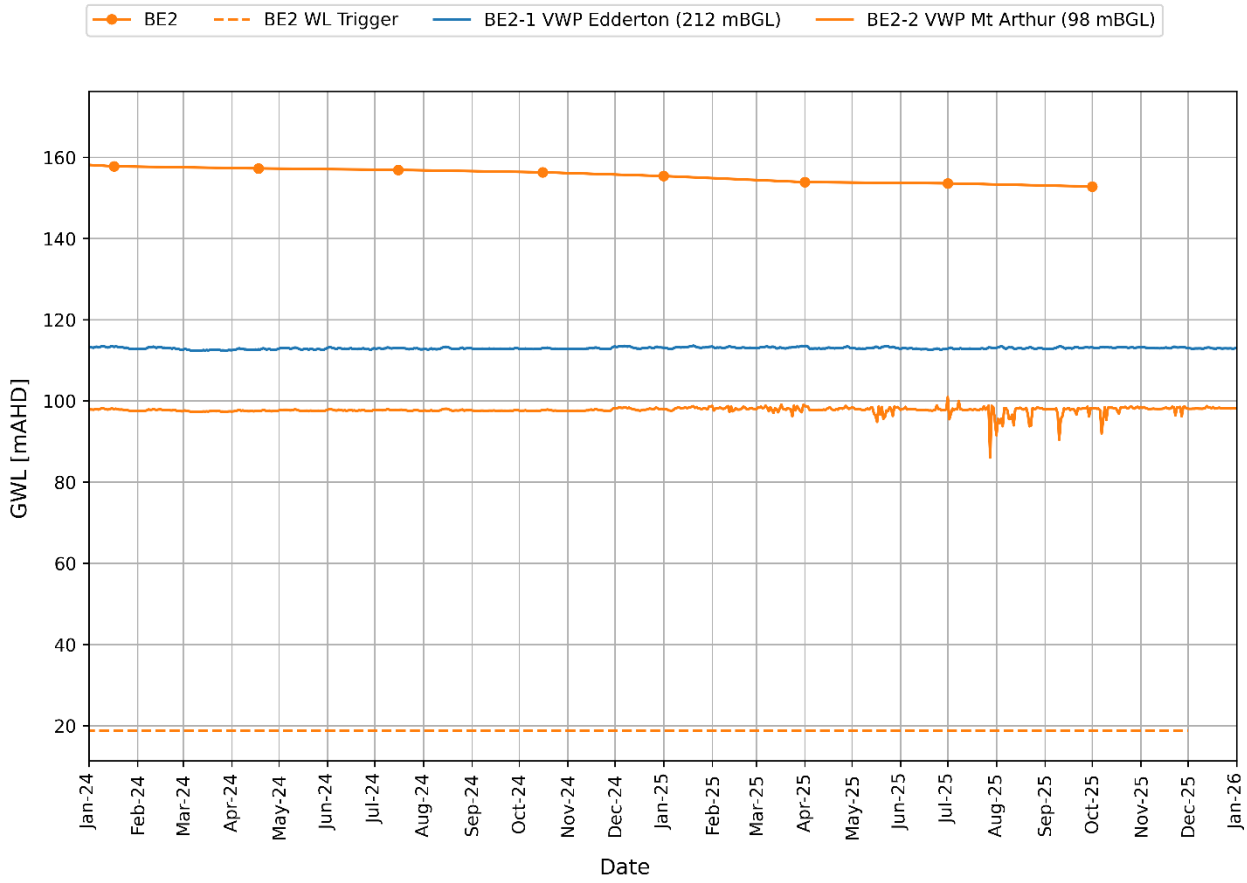


Figure 6.19 Northwest Permian VWP porewater pressure – BE2

6.4 Groundwater level assessment against baseline data

Groundwater level data recorded over the 2025 reporting period has been compared against baseline (historic) data. Maximum predicted drawdown (trigger level) data is also reviewed, as set out in the Bengalla WMP. A summary of groundwater level data for bores is provided in Table 6.1 and full bore details are presented in Appendix A.

6.4.1 Baseline assessment

Table 6.1 shows the minimum, median, 25th, and 75th percentile values for groundwater levels for each monitoring bore. The table also shows the average groundwater level over the period of record and the average value over 2025. Comparison between the minimum groundwater level minus the trigger and the 2025 average groundwater level minus the trigger provides an indication of how near groundwater levels are to trigger values.

Only one bore reported a groundwater level below the trigger level in 2025: BG3 by 0.2 m in February, but the average groundwater level in 2025 was still above the trigger level. This bore has recovered since February, and the last measurement (December 2025) was 0.7 m above the trigger level. For all other bores, the December 2025 measurement was at least 1 m above the trigger level and average 2025 levels were above trigger levels with a median difference (average 2025 minus trigger) of 4.7 m above the trigger level.

The analysis provided in Table 6.1 suggests that groundwater levels across Bengalla are generally above trigger values. Trigger values are based on maximum total drawdown predicted by the latest groundwater model and this assessment, in a broad sense, implies that the observed drawdown is in line with predictions by the numerical model predictions. However, as discussed previously, AGE are currently updating Bengalla's numerical groundwater model.

Table 6.1 Groundwater level statistics compared to trigger levels

Date	Trigger	median	25th	75th	min	2025 Average	median - trigger	min - trigger	2025 - trigger
18298	123.2	123.47	123.37	123.87	123.25	124.25	0.27	0.05	1.05
19116	123.2	126.39	126.19	126.89	124.90	127.00	3.19	1.70	3.80
42701	131.3	133.27	132.99	133.76	132.87	133.60	1.97	1.57	2.30
42927	131.1	133.58	132.87	133.66	131.70	133.70	2.48	0.60	2.60
46737	185.3	188.90	187.70	191.58	186.37	190.51	3.60	1.07	5.21
47277	132.8	133.5	133.14	133.64	133.06	133.70	0.70	0.26	0.90
53007	131.9	133.51	133.02	133.78	132.92	133.55	1.61	1.02	1.65
BE1	156.8	173.59	171.95	174.10	164.45	169.04	16.79	7.65	12.24
BE2	-	167.03	159.23	168.40	152.81	153.93	-	-	-
BG1	126.8	128.50	128.24	129.19	127.14	129.19	1.70	0.34	2.39
BG3	126.3	126.20	125.96	126.47	125.72	126.65	**-0.10**	**-0.58**	0.35
BG5	132.4	132.52	132.5	133.15	132.33	132.81	0.12	**-0.07**	0.41
REPI7	63.1	91.06	90.77	91.26	90.08	90.20	27.96	26.98	27.10
SMB1S	127.2	128.26	128.05	128.67	127.92	128.86	1.06	0.72	1.66
SMB2N	127.3	128.5	128.22	128.87	128.04	129.07	1.20	0.74	1.77
WAN10A	122.2	126.44	126.15	127.15	125.98	126.95	4.24	3.78	4.75
WAN10B	98.3	109.58	109.21	110.25	108.64	110.67	11.28	10.34	12.37
WAN1A	117.5	123.75	121.63	125.51	120.61	124.98	6.25	3.11	7.48
WAN1B	100.1	120.35	118.50	121.63	117.57	122.29	20.25	17.47	22.19
WAN2A	118.5	125.65	125.38	126.25	125.22	126.17	7.15	6.72	7.67
WAN2B	86.4	105.64	105.48	105.9	104.43	105.85	19.24	18.03	19.45
WAN2C	75.0	100.19	100.14	100.2	100.00	100.28	25.19	25.00	25.28
WAN4A	121.2	126.11	125.82	126.36	124.76	126.65	4.91	3.56	5.45
WAN4B	98.2	114.8	114.65	115.29	114.43	115.02	16.60	16.23	16.82
WAN5A	124.3	126.3	125.99	126.83	125.8	126.79	2.00	1.50	2.49
WAN5B	116	126.4	126.13	126.79	125.95	126.92	10.40	9.95	10.92
WAN6A	126.9	127.73	127.57	128.11	127.00	128.24	0.83	0.10	1.34
WAN6B	123.8	127.6	127.41	127.94	127.22	128.18	3.80	3.42	4.38
WAN7A	125.4	126.75	126.45	127.09	126.30	126.99	1.35	0.90	1.59
WAN7B	126.4	129.56	129.26	129.92	128.84	130.28	3.16	2.44	3.88
WAN8A	123.3	124.94	124.84	125.1	124.68	125.17	1.64	1.38	1.87
WAN8B	108.5	116.97	116.78	117.6	116.00	116.41	8.47	7.50	7.91
WAN9A2	123.7	126.98	126.67	127.64	126.54	127.43	3.28	2.84	3.73
WAN9B	111.4	115.49	114.76	116.13	114.56	116.71	4.09	3.16	5.31

6.4.2 Trigger level assessment

Groundwater trigger levels have been developed based on the maximum drawdown predicted by the primary Bengalla groundwater model, which was constructed in 2013 (AGE, 2013). An update of the Bengalla groundwater model is currently being undertaken by AGE. Once the updated model is finalised, its results can be used to review and, if necessary, revise the existing trigger levels. However, for the purposes of this report, the 2013 model remains the only available groundwater model and has therefore been used as the basis for trigger level assessment. The trigger level is equal to the most applicable pre-mining groundwater level (sourced from historic data) minus the predicted drawdown.

Water level triggers are considered to have triggered a response when:

- three or more alluvial bore levels fall below the trigger levels in one round of monitoring; and/or
- water levels in any bores fall below the trigger levels for three consecutive readings.

The groundwater levels for bore BG3 and BG5 have fluctuated near their trigger levels throughout much of the period of record (since 2018) with water level only remaining significantly above their triggers around 2022 and 2023, which was a period of sustained above-average rainfall (see Figure 6.20). A similar pattern is observed in the second half of 2025 (as discussed in previous sections).

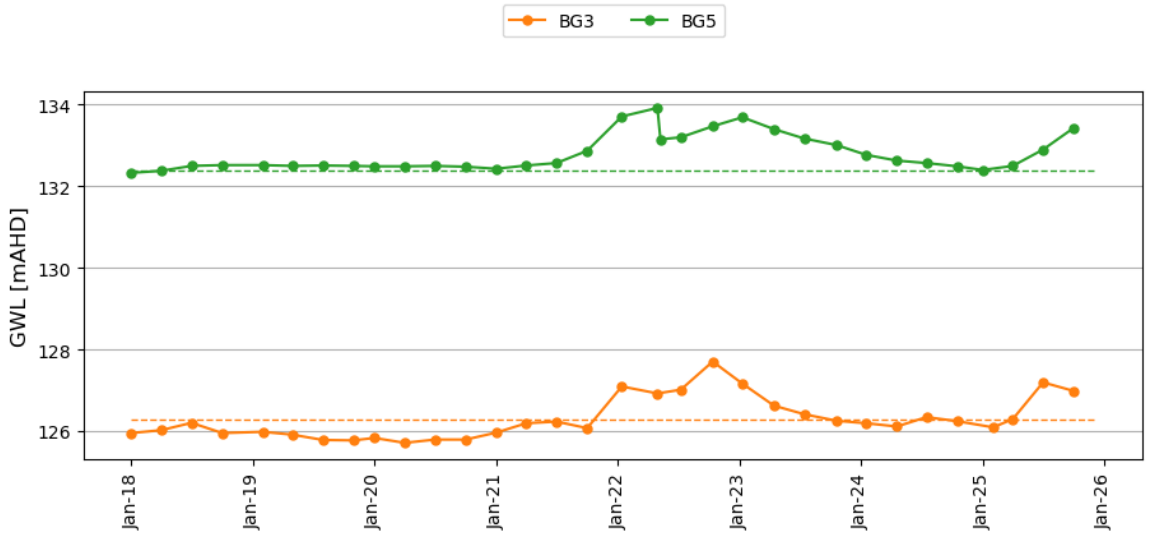


Figure 6.20 Hydrograph of BG3 and BG5 showing groundwater levels near trigger levels

7 Groundwater quality and monitoring

7.1 Quality monitoring overview

Groundwater quality monitoring at Bengalla includes the following analyses:

- Electrical Conductivity (EC).
- Total Dissolved Solids (TDS).
- pH.
- Sulphate.
- Dissolved metals (Al, As, Be, B, Cd, Cr, Co, Cu, F, Fe, Pb, Li, Hg, Mo, Ni, Se, V, and Zn).

EC, Temperature, and pH are required to be measured monthly form the Wantana Extension Bores and Quarterly (including TDS) from the Wantana Extension Bores and other monitoring bores. Groundwater speciation (including major ions and metals) is required annually from all bores.

EC and pH triggers have been established for monitoring bores in the WMP and are discussed in this section. TDS and groundwater speciation is not required to be compared against defined trigger values or required to be assessed in this annual review.

7.2 Alluvial water quality

7.2.1 pH

Figure 7.1, Figure 7.2, and Figure 7.3 show pH trends in alluvial bores for 2024 through 2025. Groundwater pH trends for all alluvium bores have remained consistent across 2025 with some minor fluctuations due to natural variability. With the exception of WAN8A, all bores remained within the pH trigger criteria of between 6.0 and 8.5.

Groundwater pH in WAN8A remained anomalously high and near 12.0. The bore has historically contained insufficient water for sampling or, when water is present, is not representative of in situ aquifer conditions. It is recommended that WAN8A be replaced.

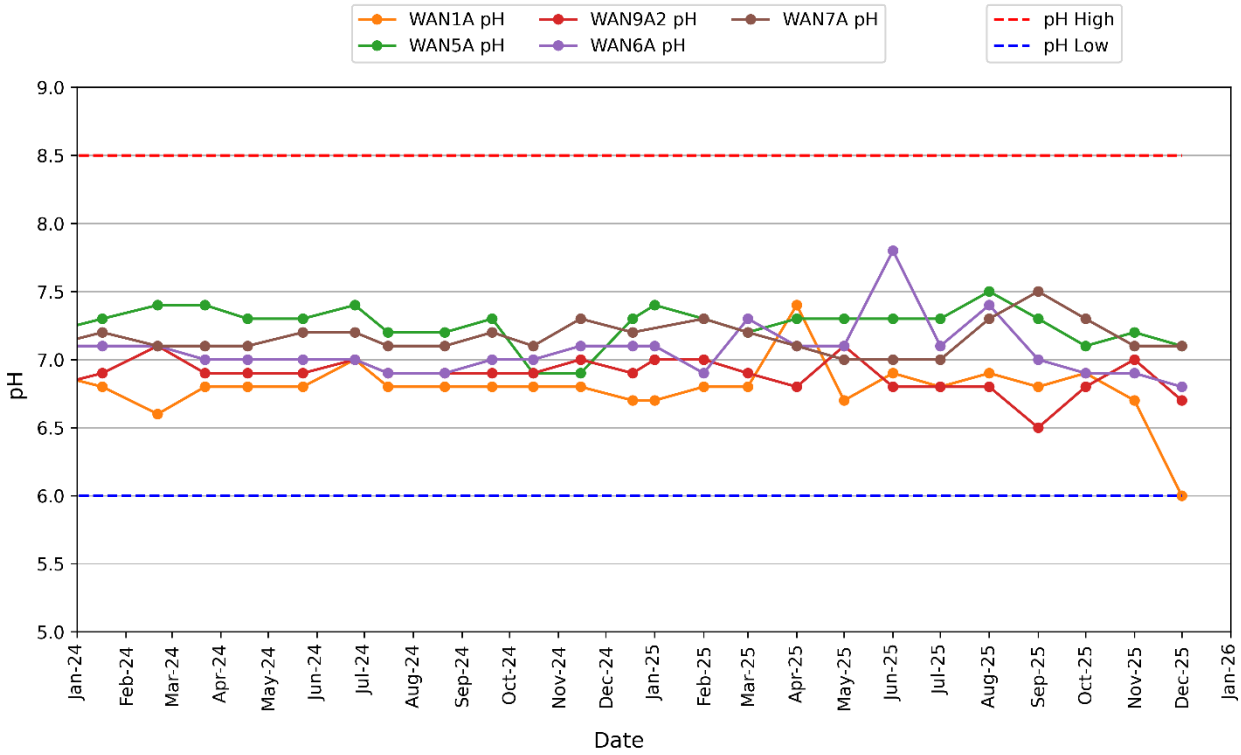


Figure 7.1 pH trends – Hunter River alluvial bores

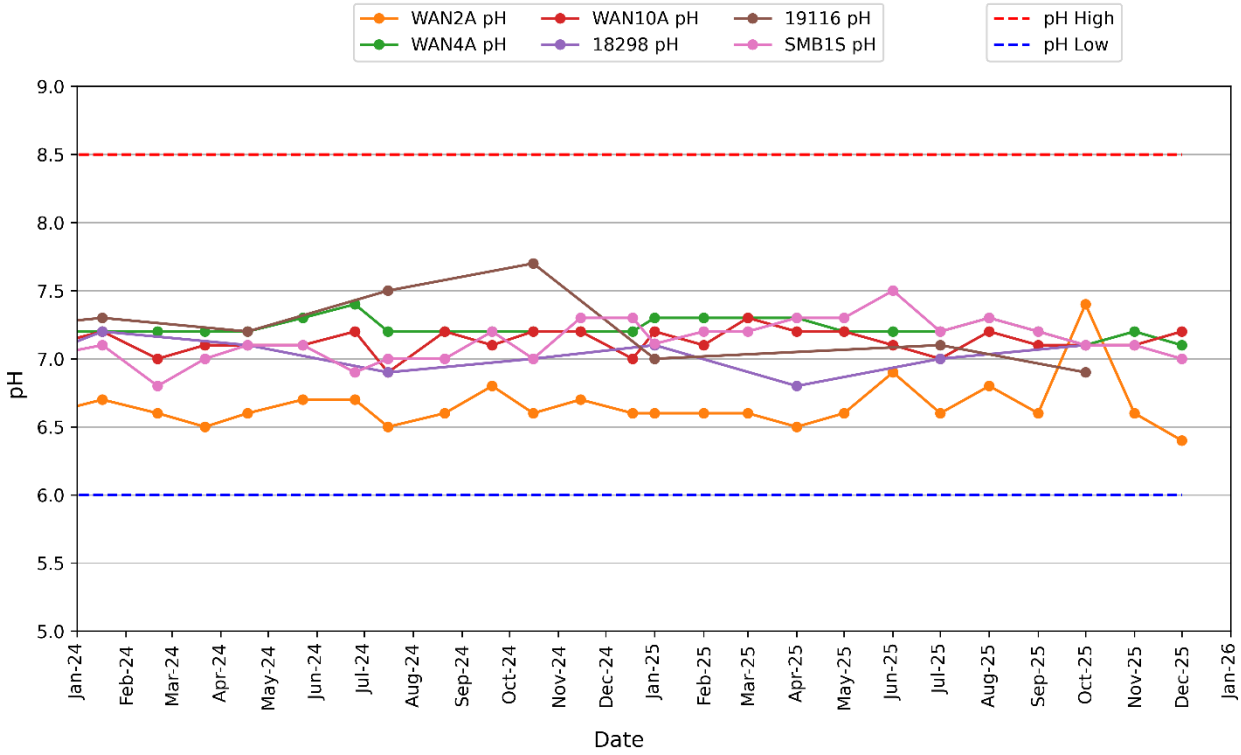


Figure 7.2 pH trends – other alluvial bores

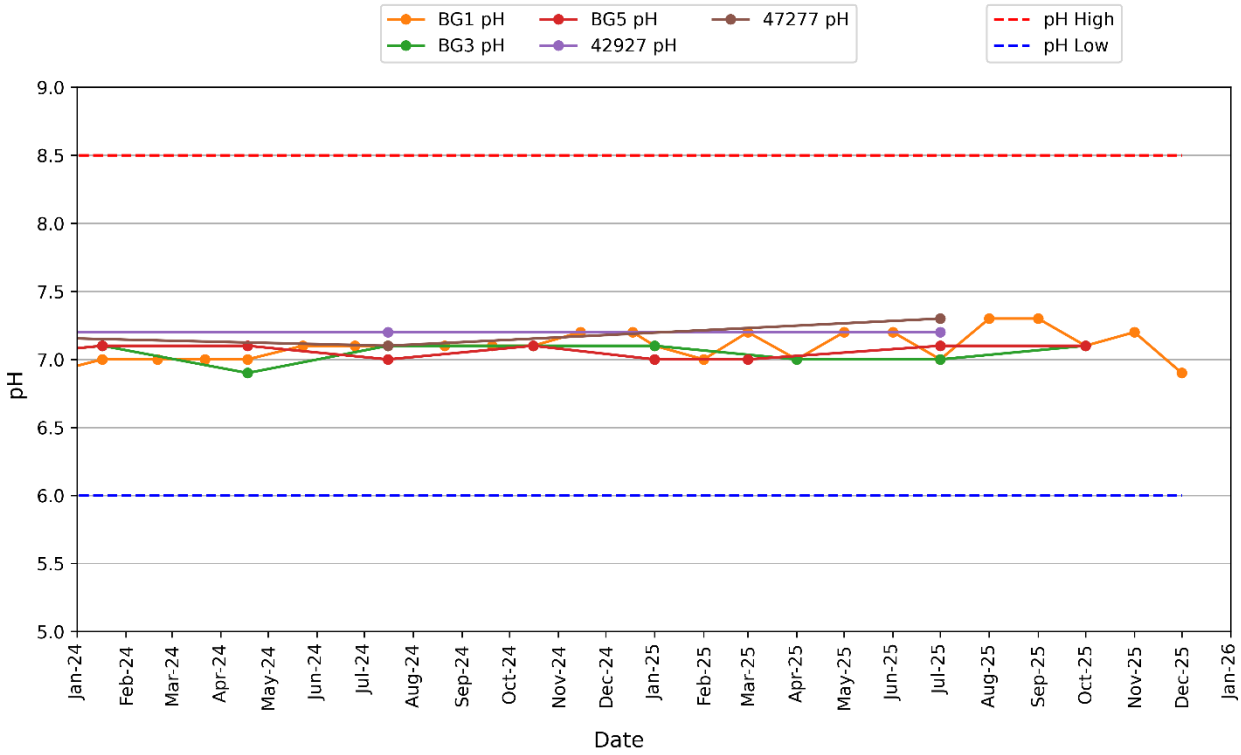


Figure 7.3 pH trends – Regional Bores

7.2.2 EC

Figure 7.4 and Figure 7.5 show EC trends in alluvium bores in the Wantana Bores and Regional Bores, respectively.

Generally, the EC in the alluvium is less than 2000 µS/cm, indicating that the alluvial groundwater in the Wantana Extension area (800 µS/cm to 2000 µS/cm) is similar to groundwater in the regional alluvial bores (500 µS/cm to 1700 µS/cm). Bores SMB1S and SMB2N recorded the highest EC values and were above 1500 µS/cm in 2025. WAN8A is excluded from this analysis for reasons already stated.

Through 2025 the general trend was declining EC values in these bores. This followed from slightly elevated values in late-2024 to early-2025 where a number of bores recorded exceedances (see Section 7.5). A few significant spikes were noted in several bores in February and September 2025. The gentle rise and fall has been investigated in monthly reviews and attributed to changes in groundwater level causing dissolution of salts from the unsaturated zone (AGE 2025).

Regional Bores BG1, BG3, and BG5 are located centre, south, and north of the main Wantana bores (see Figure 4.1) and these bores, along with bores 42927 and 47277 (located near BG5) are shown in Figure 7.5. Generally, these bores all record EC below 1700 µS/cm. Due to the low EC and stable trends observed in these bores, only slight increased can cause trigger value exceedances. BG5 and 47277 both recorded an increase in EC beginning in mid-2022 and exceeded Stage 2 trigger values (historic maximum) in 2025 with BG5 exceeding the trigger in each quarter. Trigger exceedances are discussed in Section 7.5

BG3 is situated south of the main cluster of Wantana bores and has historically shown significant variation in EC with early values (2016) exceeding 3000 µS/cm. Recently, EC values rose sharply in late-2022 from approximately 1200 µS/cm to over 2000 µS/cm in early-2023. Since 2023, however, EC values have been declining with the last three measurements below 1300 µS/cm.

Bores 42927 and 47277 have been generally stable around 1200 µS/cm since 2017.

Overall, EC behaviours in the alluvium bores appear to be correlated to climate (CRD and river stage) and do not appear to be impacted by mining.

Water quality trigger events in 2025 are described in Section 7.5.

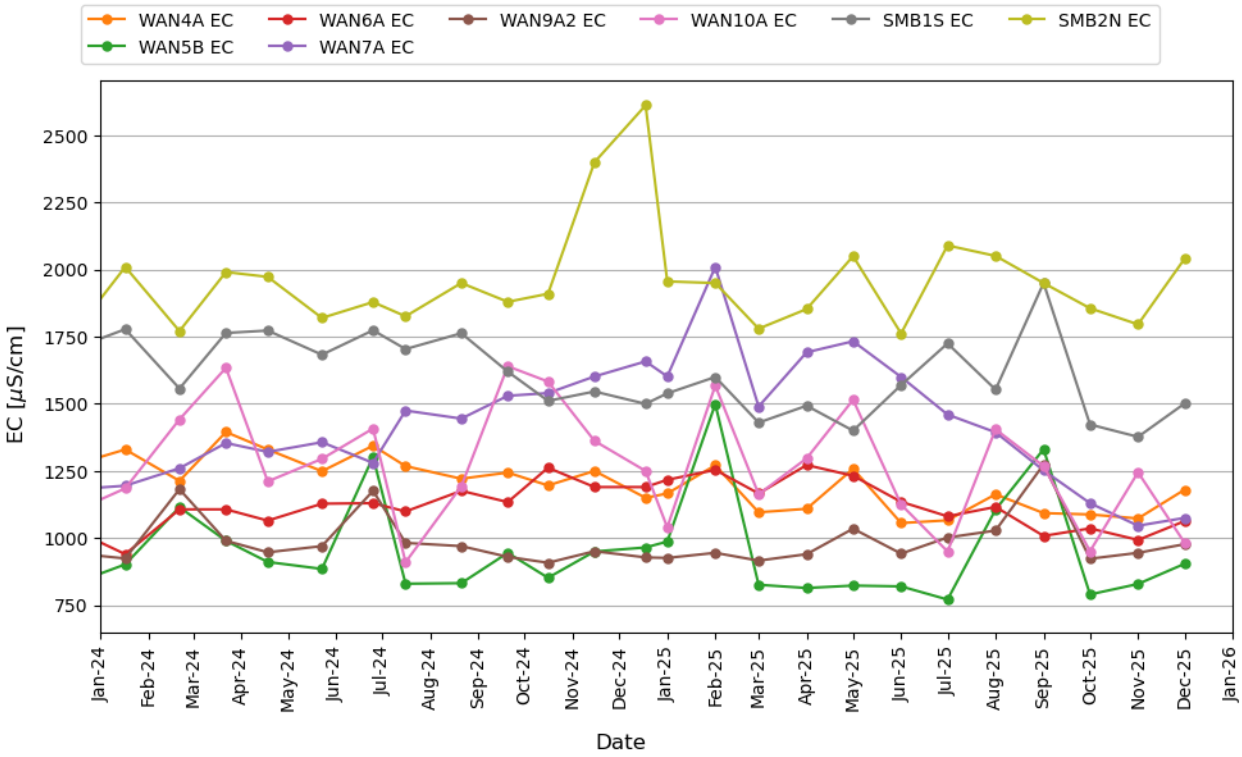


Figure 7.4 EC trends – Hunter River Alluvium (Wantana Bores)

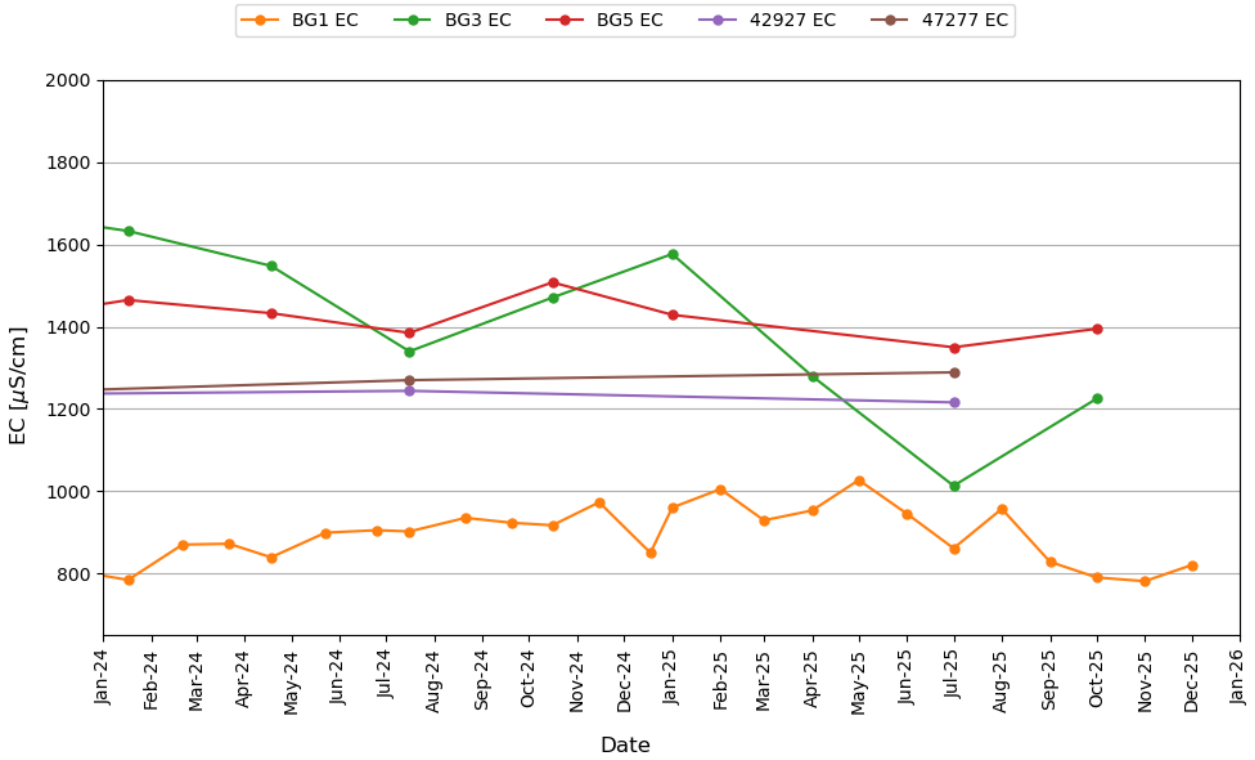


Figure 7.5 EC trends – Hunter River Alluvium (Regional Bores)

7.3 Coal seam and interburden water quality

7.3.1 pH

Figure 7.6 and Figure 7.7 show pH trends for Permian coal seam and interburden bores in the Wantana area, respectively. Groundwater pH trends have remained circum-neutral (near 7.0) and generally stable over 2025. No Permian bores exceeded pH trigger values throughout 2025.

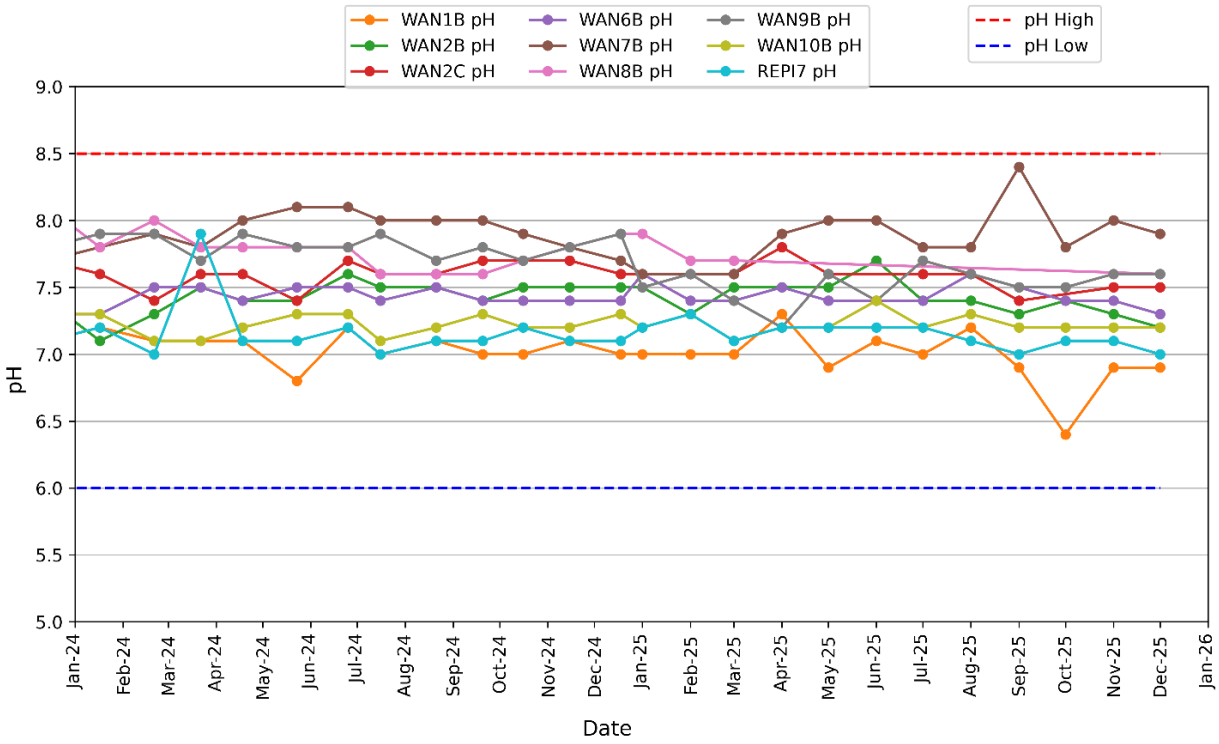


Figure 7.6 pH tends – coal seam aquifers

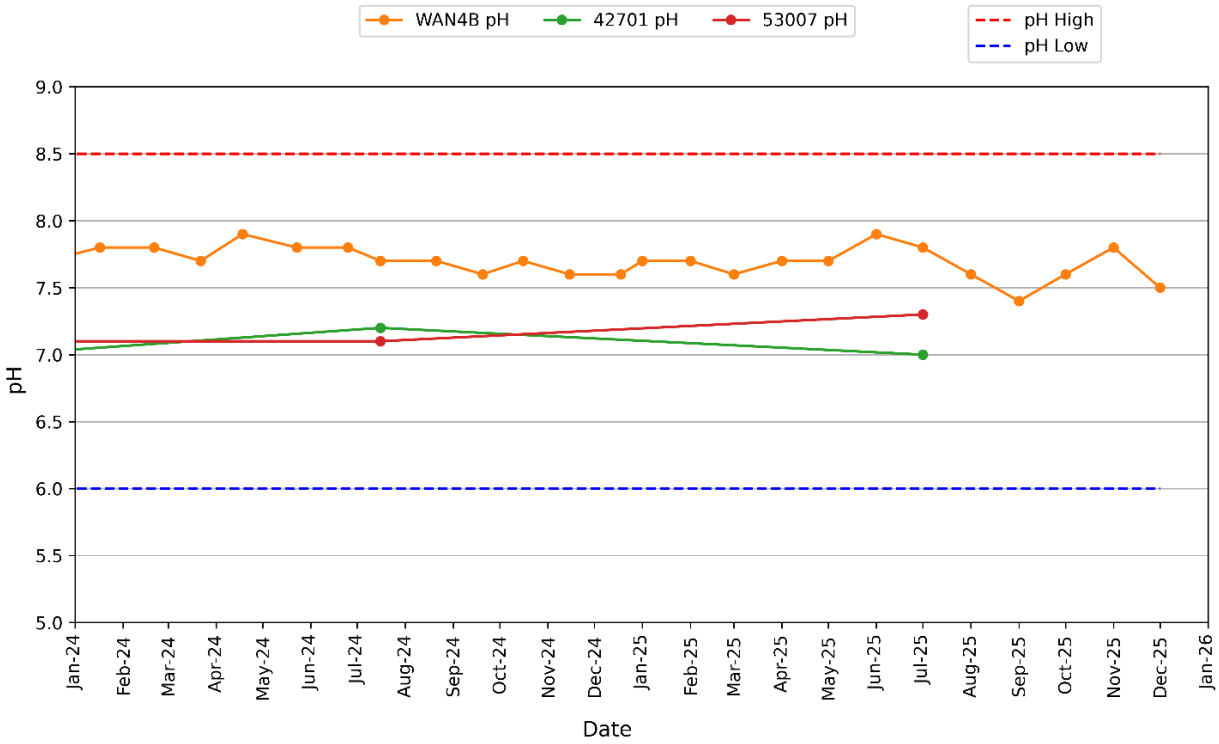


Figure 7.7 pH trends – coal seam aquifers (Wantana Area)

7.3.2 EC

Figure 7.8 and Figure 7.9 show EC trends for coal seam units and interburden bores in the Wantana area and Regional Alluvium Bores, respectively. EC triggers are unique for each site and so are not plotted in the figures to preserve clarity, however, water quality trigger events are described in Section 7.5.

The coal seam and interburden bores can be separated into three general groups by EC:

- Bores with EC measurements generally less than 2,000 µS/cm.
  - WAN1A, WAN1B, WAN2A, WAN6B, and WAN9B.
- Bores with EC measurements between 2,000 µS/cm and 3,500 µS/cm.
  - WAN2B, WAN2C, WAN7B, and WAN8B.
- Bores with EC measurements generally above 4,000 µS/cm.
  - WAN10B and REPI7.
  - these values are within the expected range for coal seam bores.

As discussed in Section 7.2.2, EC in alluvium bores is typically below 2000 µS/cm so Permian bores recording lower EC may reflect seepage from the alluvium.

The deeper Permian bores, WAN4B and WAN5A, recorded EC values around 2500 µS/cm and 5500 µS/cm through 2025 (Figure 7.9). These values are consistent with historic data and below their respective trigger values.

Groundwater EC in three of these bores exceeded their derived triggers in 2025 with REPI7 and WAN10B exceeding Stage 2 triggers and WAN2A exceeding its Stage 1 trigger. These exceedances are further discussed in Section 7.5.

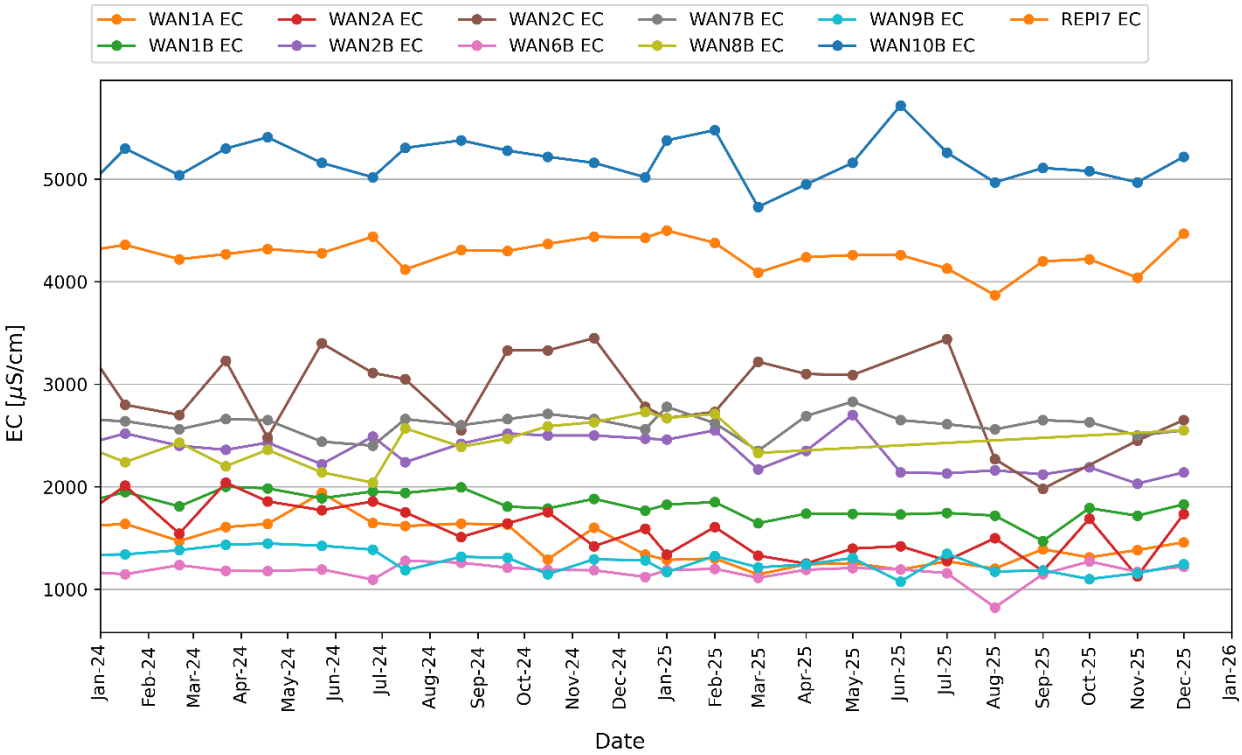


Figure 7.8 Electrical conductivity trends – Coal seam bores (Wantana Area)

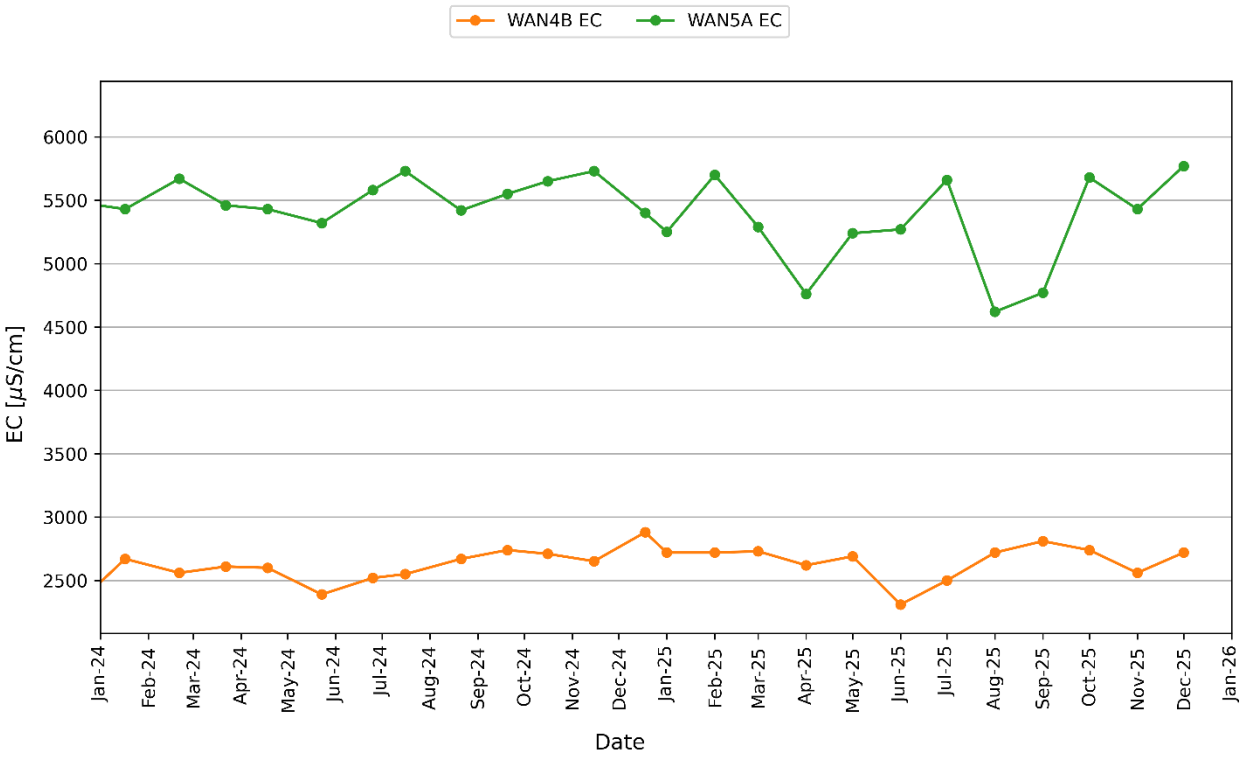


Figure 7.9 Electrical conductivity trends – deep Permian bores

7.4 Permian groundwater quality – northwest of active mining

Figure 7.10 and Figure 7.11 show the pH and EC, respectively, for bores BE1 and BE2 to the northwest of active mining (BE3, BE4, and BE5 have been decommissioned).

Figure 7.10 shows pH recordings at these bores and indicated that pH has remained stable between 7.0 and 7.5 throughout 2025. Groundwater pH values these bores are within historic ranges.

Figure 7.11 shows that both bores record generally stable trends from 2024 through 2025 with BE1 between 7500 µS/cm and 8000 µS/cm and BE2 between 5500µS/cm and 6500 µS/cm. BE1 recorded two (2) Stage 1 exceedances in 2025 (discussed in Section 7.5) and BE2 records a slightly rising trend across 2025 but has remained below its trigger levels.

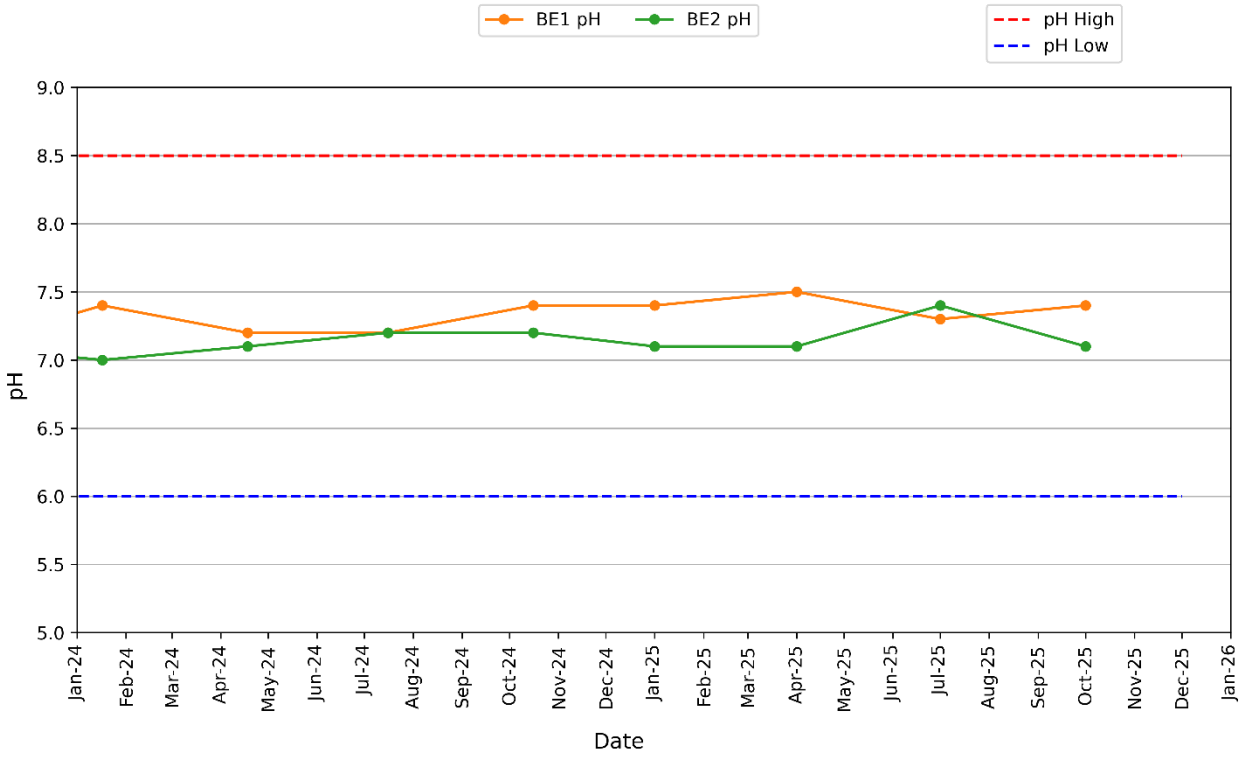


Figure 7.10 pH of Permian bores to the northwest of active mining

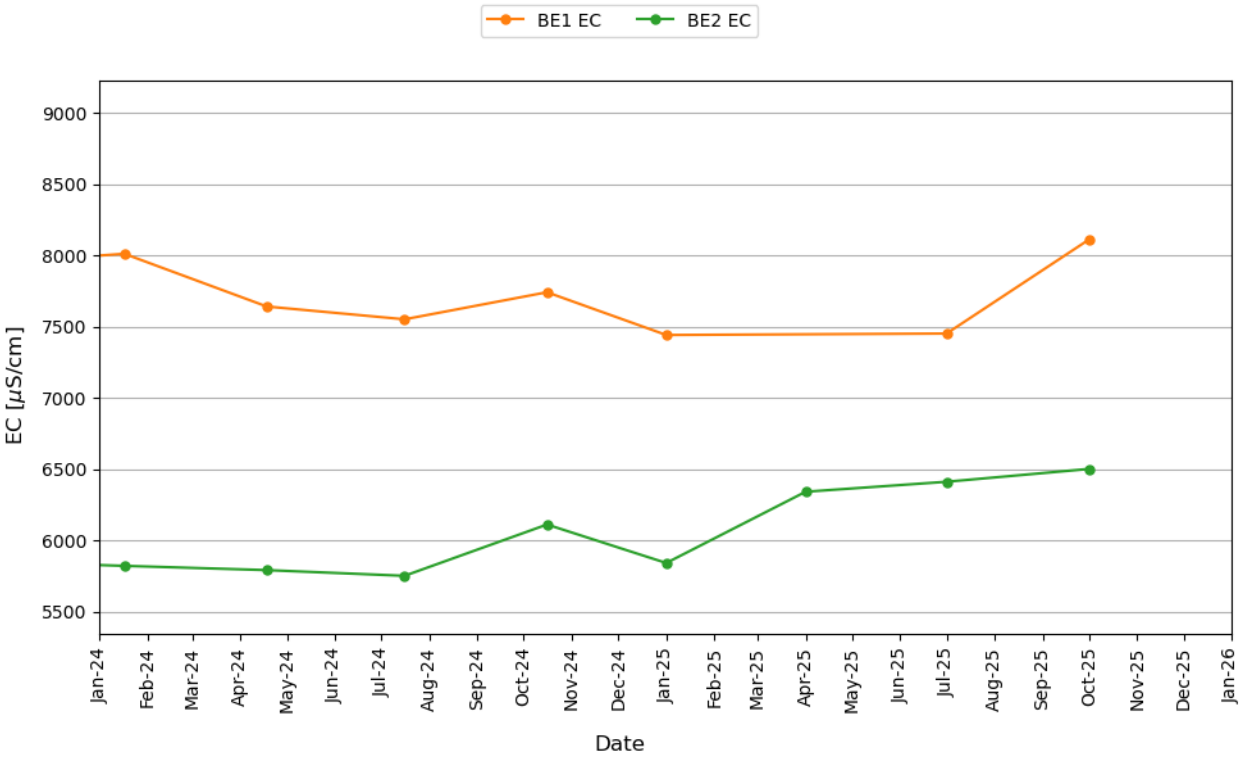


Figure 7.11 Electrical conductivity of Permian bores to the northwest of active mining

7.5 Water quality trigger events

Water quality monitoring data was compared to trigger values in the current WMP (December 2023). Thirteen sites had groundwater quality EC trigger events and one bore (WAN8A) had pH trigger events in 2025.

7.5.1 pH

WAN8A consistently records pH near 12.0 when there was sufficient water for sampling. Elevated pH values for WAN8A were investigated in 2017 and further in monthly groundwater reviews and found to be related to stagnant water in the sump of this bore and not representative of in situ groundwater conditions. Replacement of this bore has been recommended.

No other bores recorded pH exceedances for 2025.

7.5.2 EC

A comparison of monitoring results to EC triggers revealed that thirteen monitoring bores exceeded their respective EC triggers during the monitoring period (Table 7.1). Ten of these exceedances triggered the response protocol as outlined in the WMP (i.e. one Stage 2 exceedance or three consecutive Stage 1 exceedances).

EC exceedances where previously by AGE for alluvium bores (AGE 2024) and addressed throughout 2025 during the respective monthly reviews conducted by AGE with the most thorough analysis presented in the October monthly review (AGE 2025c) addressing WAN9A2 (but the findings were applicable to other EC behaviour and exceedances). Based on a review of current and historic data for WAN9A2, and consideration of previous EC exceedance investigations, the following findings were made in the October report:

- Groundwater levels in WAN9A2 are correlated with Hunter River stage, whereas EC is generally not correlated. Rather, EC is variable, with occasional short-duration spikes (one or two measurements), but shows a generally stable long-term trend.
- There is no clear long-term trend in EC or pH for WAN9A2 and the recent variability (including the Stage 2 exceedance) may simply relate to fluctuations in groundwater level and river stage.
- The EC measurement immediately following the Stage 2 trigger exceedance was below the Stage 1 trigger level and consistent with historic conditions.

As discussed in several places above, groundwater levels in many bores rose significantly in mid to late 2025 contemporaneous with higher river stage in the Hunter River (Figure 2.1). Comparison of these datasets (groundwater level and river stage) provide strong evidence that groundwater levels in the alluvial bores are correlated to river stage. This also implies that there is the potential for mass transport between the river and the aquifer (i.e. river water flowing into the groundwater and vice versa).

Ultimately, the conclusion of AGE 2025c and other investigations within the monthly reports is that higher EC readings in bores is related to mobilisation of salts within the unsaturated zone as the water table rises. When these previously dry soils become saturated, salt minerals that have been deposited within the soils over years of recharge-evaporation cycles, dissolve into the groundwater and results in measurably higher EC in the groundwater bores.

The comparison of groundwater levels in nested bore sites (Section 6.2.2) generally indicate a downward gradient from the alluvium into the underlying Permian strata. Under these conditions groundwater from the Permian strata (which would have higher EC than alluvium – see Section 7) is unable to flow into the alluvium. This provides further evidence that the elevated EC values and trigger events are not related to mining but rather to natural conditions of the alluvium-river relationship.

Given that similar river stage conditions where only observed once before over the period of record in 2022 and otherwise groundwater levels remain fairly stable (see Figure 6.20 as example), the previous trigger values were likely not adequate to capture this level of groundwater level change. At this point it is unclear whether the 2022 and 2025 river stage flooding is part of the normal variability, in which case trigger values should be updated, or if these events are isolated conditions and do not represent long-term future conditions, in which case updating trigger values would not be necessary. At this stage AGE only recommends that the next trigger evaluation consider high river stage conditions.

Table 7.1 Summary of EC trigger exceedances for 2025

Site	28510	42701	47277	53007	BE1	BG5	REPI7	WAN2A	WAN5B	WAN6A	WAN9A2	WAN10A	WAN10B
Lithology	**Deep Permian**	**Deep Permian**	**Alluvium**	**Deep Permian**	**Permian**	**Alluvium**	**Vaux Seam**	**Alluvium**	**Permian**	**Alluvium**	**Alluvium**	**Alluvium**	**Vaux Seam**
Stage 1 EC Trigger (µS/cm)	1041	991	1244	947	7420	1309	4370	1358	1290	1063	959	1367	5290
Stage 2 EC Trigger (µS/cm)	1052	1035	1247	975	8280	1341	4470	1881	1900	1280	1230	1647	5440
Jan-25	-	-	-	-	**7440**	**1429**	**4500**	1338	987	**1217**	926	1040	**5380**
Feb-25	-	-	-	-	-	-	**4380**	**1607**	**1499**	**1254**	945	**1568**	**5480**
Mar-25	-	-	-	-	-	-	4090	1327	826	**1166**	916	1163	4730
Apr-25	-	-	-	-	-	**1377**	4240	1250	814	**1272**	940	1297	4950
May-25	-	-	-	-	-	-	4260	**1396**	823	**1232**	**1035**	**1515**	5160
Jun-25	-	-	-	-	-	-	4260	**1420**	820	**1135**	942	1125	**5720**
Jul-25	**1089**	**1146**	**1289**	**1070**	**7450**	**1350**	4130	1279	771	**1081**	**1002**	950	5260
Aug-25	-	-	-	-	-	-	3870	**1498**	1106	**1116**	**1028**	**1405**	4970
Sep-25	-	-	-	-	-	-	4200	1176	**1331**	1008	**1274**	1268	5110
Oct-25	-	-	-	-	**8110**	**1395**	4220	**1688**	790	1036	922	951	5080
Nov-25	-	-	-	-	-	-	4040	1120	829	993	945	1245	4970
Dec-25	-	-	-	-	-	-	4360	**1734**	904	1063	977	983	5220

Notes: 999 = Stage 1 exceedance.
999 = Stage 2 exceedance.
"-" = no data.

8 Comparison to ANZECC guidelines

Groundwater is used for livestock watering on properties in the region as well as for irrigation purposes. Guidelines exist for the protection of these environmental values and are outlined in the Australian and New Zealand Environment and Conservation Council (ANZECC, 2000) guidelines.

Annual speciation results as required by the WMP have been compared to the ANZECC guidelines and are shown in Table 8.1. Exceedances of guideline values in 2025 were recorded for:

- 12 bores for iron;
- 5 bores for fluoride;
- 4 bores for TDS (1 exceeding pig and poultry guidelines and 3 exceeding sheep and dairy guidelines); and
- 19 bores for sodium (strongly related to EC).

These ANZECC guideline values are not explicit triggers per the WMP and so there is not additional investigation required. However, Bengalla should continue to monitor for these analytes.

Table 8.1 July 2025 water chemistry data and ANZECC guidelines

Site	Long term irrigation	Long term irrigation	Stock water	Stock water pigs and poultry sheep and dairy
Analyte in exceedance	Iron (mg/L)	Sodium (mg/L)	Fluoride (mg/L)	TDS (mg/L)
Exceedance value	0.20 mg/L	115	2.0 mg/L	3000 mg/L 4000 mg/L
18298	<0.05	62	0.2	591
19116	<0.05	84	0.2	562
28510	<0.05	55	0.2	699
37774	<0.05	193	0.2	1210
42701	<0.05	54	0.2	722
42927	<0.05	54	0.2	790
46737	<0.05	868	0.8	4220
53007	-	-	-	-
BE1	0.82	1810	3.4	4240
BE2	2.11	1600	2.8	4170
BE3	-	-	-	-
BG1	<0.05	59	0.2	502
BG3	<0.05	85	0.3	582
BG5	<0.05	82	0.2	950
REPI7	-	-	-	-
SMB1S	<0.05	160	0.3	1140
SMB2N	0.43	233	0.4	1300

Site	Long term irrigation	Long term irrigation	Stock water	Stock water pigs and poultry sheep and dairy
Analyte in exceedance	**Iron (mg/L)**	**Sodium (mg/L)**	**Fluoride (mg/L)**	**TDS (mg/L)**
Exceedance value	**0.20 mg/L**	**115**	**2.0 mg/L**	**3000 mg/L 4000 mg/L**
WAN1A	1.66	158	0.8	796
WAN1B	0.51	267	0.7	1140
WAN2A	1.26	136	0.8	776
WAN2B	0.69	513	3.8	1390
WAN2C	0.32	775	3.0	1990
WAN4A	1.66	120	0.4	694
WAN4B	0.05	432	1.3	1510
WAN5A	2.96	1120	1	3670
WAN5B	0.13	45	0.2	465
WAN6A	1.56	53	0.1	654
WAN6B	0.06	179	0.9	608
WAN7A	<0.05	124	0.3	818
WAN7B	<0.05	597	1.5	1660
WAN8A[1]	-	-	-	-
WAN8B	-	-	-	-
WAN9A2	0.94	57	0.2	584
WAN9B	0.74	320	5.4	780
WAN10A	<0.05	88	0.2	594
WAN10B	0.14	900	1.2	3210

Notes: '-': no data.

[1] insufficient water for sampling.

9 Summary

9.1 Groundwater levels

A review of groundwater level trends indicates the following:

- Groundwater level trends show that alluvium groundwater levels are consistent with external stressors including rainfall patterns and Hunter River stage, with groundwater levels rising during high flow periods in mid to late 2025.
- Water level contours and flow directions are generally unchanged from previous years with groundwater in the alluvium flowing parallel to the Hunter River with some notable heterogeneity identified from the contours.
- Contours for Permian bores show groundwater flow directions generally west to east across the site, consistent with topography.
- Groundwater levels in the regional alluvium bore BG3 dropped below the trigger level in February 2025 but recovered quickly afterwards.
  - The pattern in this bore is similar to other alluvium bores and so the trigger exceedance is very likely due to natural variability.
- Hydraulic gradient from paired deep-shallow bores indicate flow from the alluvium (recharged via the Hunter River) into the underlying Permian strata but, in some places, the Permian strata is still responding to surface stressors (climate and river stage).
- Coal seams and interburden in the Wantana Extension Bores are depressurised from mining, increasing the potential for leakage from the alluvium to the coal seams. A pressure head differential of up to nearly 20 m was observed in WAN2 site and has persisted.
  - This depressurisation is in line with the EIS groundwater model predictions that state "*The water level in the deep aquifer is expected to fall reducing the availability of water in this aquifer*". Bengalla's target coal seams are included in the "*deep aquifer*" layer of the groundwater model.
- Bores northwest of the active mining area (BE1, BE2, 46737) displayed minimal changes in groundwater level during the 2025 monitoring period with only slight steady declines, which are related to depressurisation as the mine progresses westward.
- On a regional scale, groundwater in the alluvium flows south-west, generally parallel to the flow of the Hunter River. However, close to the Wantana Extension, alluvial groundwater flows towards the pit, likely due to the depressurisation of coal seams subcropping beneath the alluvium. This is consistent with the 2013 EIS (AGE, 2013) that states "*The groundwater model predicts that mining associated with the Project will induce flow from the alluvium to the Permian. This is a reversal of the flow direction under pre-mining conditions*", and "*The model predicts mining will continue to depressurise and lower groundwater levels in the Permian sequence, but this will not result in drawdown extending a significant degree into the alluvial aquifer system, with model drawdown calculated to be less than 1 m*."

9.2 Groundwater quality

A review of pH monitoring data indicates the following:

- All monitoring bores recorded groundwater pH values within triggers and near neutral conditions.
  - The exception is WAN8A, which is not representative of in situ aquifer conditions and is recommended to be replaced.

A review of EC monitoring data indicates the following:

- Eight (8) monitoring bores recorded Stage 2 groundwater EC trigger exceedances during 2025 and five (5) additional bores recorded Stage 1 exceedances.

- Nearly all of these bores are located in the Hunter River plain east of the mine where alluvium bores show strong correlation to river stage in the adjacent Hunter River. EC behaviour has been investigated previously by AGE (AGE 2024; AGE 2025c) and has been attributed to mobilisation of salts from the unsaturated zone as water levels rise. This appears consistent with the 2025 exceedances as a number of bores show 1) higher groundwater levels in the second half of 2025 (correlated with river stage), and 2) EC values have been dropping in the last few months of 2025 as groundwater levels are also declining.
- The exception to the alluvium bores is that BE1 (located northwest of the mine) also recorded EC trigger events in 2025 – all of which were Stage 1 exceedances. BE1 would not be influenced by Hunter River stage but still shows behaviour correlative with climate. EC values also rose in late-2022 to early-2023 which is a period to coincides with a rise in water level followed by a decline that is likely due to depressurisation from mining.
  - A more-thorough investigation into BE1 is recommended to determine how much of the groundwater level and EC behaviour is related to mining versus climate.
- Groundwater quality within the bores to the northwest of the active mining area (BE1, BE2) showed differing groundwater EC trends despite the fact they both monitor interburden Permian sandstone units. Groundwater EC in BE1 was consistently above the Stage 1 trigger threshold in 2025 whereas BE2 remained relatively stable below trigger thresholds (approximately 5,800 µS/cm).
  - Further assessment should be included in the analysis of BE1 behaviour.
- EC values in alluvium monitoring bores are generally less than 1,500 µS/cm, whereas EC in Permian bores range from near 1000 µS/cm to over 5000µS/cm.
- When speciation results are compared to the ANZECC guidelines, multiple locations exceed the ANZECC guidelines for iron (long term irrigation), fluoride (stock water), TDS (stock water), and sodium (long term irrigation). However, as discussed in this report, groundwater in the Hunter River plain is strongly correlated to conditions in the Hunter River and groundwater flux (water moving from the river into the aquifer and vice-versa) is likely occurring and thus water quality in the Hunter River is likely influencing water quality in the alluvium.
  - As these are guidelines and not explicit triggers, no additional investigation is required.

10 Recommendations

Recommendations based on the information provided in this (and previous) annual reports include:

- Continue to monitor water levels in bores where access allows and investigate if the water levels drop below the trigger criteria.
- Continue to analyse groundwater level and quality data on a monthly timeframe as this provides near-real-time assessment and review of conditions.
- Replace WAN8A with a similarly constructed, but sufficiently deeper, bore.
- Previous versions of the WMP, BE2 and BE3 site coordinates appear to have been incorrectly assigned. This issue has reoccurred in the newest version of the WMP (*WMP 2023 – BMC*) in table E3, where BE2 is assigned coordinates that conflict with previous maps, tables and figures. The location of these bores should be surveyed and compared to the approved WMP. This may have implications for derived trigger levels in these bores.
- Update groundwater trigger levels with the latest iteration of the groundwater model when predictions become available.
- Investigate groundwater level and water quality behaviour in bores west of Bengalla (BE1, BE2, and 46737) to determine representative impacts from climate and mining.
- Consider effects from the Hunter River when reviewing groundwater quality triggers for updating.

11 References

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AGE (2018). *Bengalla Groundwater Trigger Review*. November 2018 (G1543S).

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AGE (2021). *Bengalla Exceedance Review WAN10B (Draft)*. October 2021 (BEN5003.001).

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AGE (2025b). *Bengalla Bores EC Investigation 2024*. April 2025 (BEN5025.001).

AGE (2025c). *Bengalla Mine – October 2025 Water Exceedance Investigation*. December 2025. (BEN5029.001).

BMC (2023). *Bengalla Mine. Water Management Plan. Version 6*. Bengalla Mining Company. December 2023.

Appendix A

Monitoring bore summary data

Bore ID	Standard WQ/SWL	Installation date	Full suite WQ	Data since	Baseline water level (mAHD)	Baseline measurement date	Max predicted drawdown (mAHD)	Maximum predicted drawdown (m)	WMP bore	Trigger levels (mAHD)	2025 GWL (mAHD)	Measured date	Drawdown (2025 - baseline) (m)	Difference (2025 - Trigger) (m)
11953	Quarterly	Jan-97	Annually	Oct-03	136.46	Feb-00	-	-	No	129.30	-	-	#N/A	#N/A
18298	Quarterly	Jan-97	Annually	Sept-09	123.53	Feb-11	123.19	0.34	Yes	123.20	125.07	Jul-25	-1.54	1.87
19116	Quarterly	Jan-97	Annually	Oct-03	127.46	May-97	123.24	4.22	Yes	123.20	127.16	Jul-25	0.30	3.96
28510	Quarterly	Jan-97	Annually	Aug-09	132.22	Feb-00	128.97	3.25	Yes	129.00	132.36	Jul-25	-0.14	3.36
37774	Quarterly	Jan-97	Annually	Aug-09	134.14	Feb-00	128.74	5.40	Yes	128.70	134.23	Jul-25	-0.09	5.53
42701	Quarterly	Jan-97	Annually	Oct-03	133.18	Feb-00	131.26	1.92	Yes	131.30	133.63	Jul-25	-0.45	2.33
42927	Quarterly	Jan-97	Annually	Oct-03	132.29	Feb-00	131.11	1.18	Yes	131.10	133.75	Jul-25	-1.46	2.65
46737	Quarterly	Jan-97	Annually	Sept-09	186.05	Feb-01	185.31	0.74	Yes	185.30	189.97	Jul-25	-3.92	4.67
47277	Quarterly	Jan-97	Annually	Aug-09	133.65	Aug-02	132.81	0.84	Yes	132.80	133.83	Jul-25	-0.18	1.03
53007	Quarterly	Jan-97	Annually	Aug-09	133.67	Feb-01	131.91	1.76	Yes	131.90	133.59	Jul-25	0.08	1.69
64092	Quarterly	Jan-97	Annually	Oct-03	143.98	Feb-99	-	-	No	#N/A	#N/A	-	#N/A	#N/A
A10	Quarterly	Jan-97	Annually	Oct-03	184.45	Feb-99	-	-	No	#N/A	#N/A	-	#N/A	#N/A
BE1	Quarterly	Jun-12	Annually	Jun-12	172.04	Sept-12	156.83	15.21	Yes	156.80	168.60	Jul-25	3.44	11.80
BE2	Quarterly	Jun-12	Annually	Jun-12	167.67	Sept-12	18.81	148.86	Yes	18.80	153.60	Jul-25	14.07	134.80
BE3	Quarterly	Jun-12	Annually	Jun-12	145.69	Sept-12	113.18	32.51	Yes	#N/A	#N/A	-	#N/A	#N/A
BG1	Quarterly SWL 8hr logger	Jan-97	Annually	Oct-03	128.24	Nov-00	126.84	1.40	Yes	126.80	129.70	Jul-25	-1.46	2.90
BG3	Quarterly SWL 8hr logger	Jan-97	Annually	Oct-03	126.48	Feb-99	126.25	0.23	Yes	126.30	127.20	Jul-25	-0.72	0.90

Bore ID	Standard WQ/SWL	Installation date	Full suite WQ	Data since	Baseline water level (mAHD)	Baseline measurement date	Max predicted drawdown (mAHD)	Maximum predicted drawdown (m)	WMP bore	Trigger levels (mAHD)	2025 GWL (mAHD)	Measured date	Drawdown (2025 - baseline) (m)	Difference (2025 - Trigger) (m)
BG4	Quarterly SWL 8hr logger	Jan-97	Annually	Sept-09	152.74	May-01	149.92	2.82	No	#N/A	#N/A	-	#N/A	#N/A
BG5	Quarterly	Jan-97	Annually	Oct-03	133.35	Feb-99	132.40	0.95	Yes	132.40	132.90	Jul-25	0.45	0.50
E12	Quarterly	Jan-97	Annually	Oct-03	157.40	Feb-99	-	-	No	#N/A	#N/A	-	#N/A	#N/A
REPI7	Quarterly	Jan-97	Annually	Jan-97	102.09	Jun-10	63.07	39.02	Yes	63.10	90.20	Jul-25	11.89	27.10
SMB1	Monthly	Jun-10	Biannually	Aug-10	128.66	Aug-11	127.17	1.49	Yes	127.20	129.30	Jul-25	-0.64	2.10
SMB2	Monthly	Jun-10	Biannually	Aug-10	128.83	Aug-11	127.28	1.55	Yes	127.30	129.40	Jul-25	-0.57	2.10
WAN10A	Monthly	May-09	Biannually	Apr-09	126.74	May-09	122.16	4.58	Yes	122.20	127.30	Jul-25	-0.56	5.10
WAN10B	Monthly	May-09	Biannually	Apr-09	119.20	May-09	98.32	20.88	Yes	98.30	110.60	Jul-25	8.60	12.30
WAN1A	Monthly	Sept-05	Annually	Aug-09	121.72	Sept-05	117.53	4.19	Yes	117.50	125.60	Jul-25	-3.88	8.10
WAN1B	Monthly	Sept-05	Annually	Aug-09	115.87	Sept-05	100.09	15.78	Yes	100.10	122.50	Jul-25	-6.63	22.40
WAN2A	Monthly	Sept-05	Annually	Aug-09	125.23	Feb-07	118.47	6.76	Yes	118.50	126.30	Jul-25	-1.07	7.80
WAN2B	Monthly	Sept-05	Annually	Aug-09	111.80	Feb-07	86.38	25.42	Yes	86.40	105.90	Jul-25	5.90	19.50
WAN2C	Monthly	Sept-05	Annually	Aug-09	100.44	Feb-07	75.02	25.42	Yes	75.00	100.20	Jul-25	0.24	25.20
WAN3	Monthly	Sept-05	Annually	Aug-09	126.64	Sept-05	-	-	Yes	0.00	-	-	#N/A	#N/A
WAN4A	Monthly	Sept-05	Annually	Aug-09	126.64	Sept-05	121.16	5.48	Yes	121.20	126.80	Jul-25	-0.16	5.60
WAN4B	Monthly	Sept-05	Annually	Aug-09	124.51	Sept-05	98.19	26.32	Yes	98.20	114.90	Jul-25	9.61	16.70
WAN5A	Monthly	Sept-05	Annually	Aug-09	126.74	Sept-05	124.31	2.43	Yes	124.30	126.90	Jul-25	-0.16	2.60
WAN5B	Monthly	Sept-05	Annually	Aug-09	126.74	Sept-05	116.03	10.71	Yes	#N/A	#N/A	-	#N/A	#N/A

Bore ID	Standard WQ/SWL	Installation date	Full suite WQ	Data since	Baseline water level (mAHD)	Baseline measurement date	Max predicted drawdown (mAHD)	Maximum predicted drawdown (m)	WMP bore	Trigger levels (mAHD)	2025 GWL (mAHD)	Measured date	Drawdown (2025 - baseline) (m)	Difference (2025 - Trigger) (m)
WAN6A	Monthly	Sept-05	Annually	Aug-09	128.00	Aug-07	126.90	1.10	Yes	126.90	128.70	Jul-25	-0.70	1.80
WAN6B	Monthly	Sept-05	Annually	Aug-09	127.92	Aug-07	123.82	4.10	Yes	123.80	128.90	Jul-25	-0.98	5.10
WAN7A	Monthly	Sept-05	Annually	Aug-09	126.80	Feb-09	125.40	1.40	Yes	125.40	127.10	Jul-25	-0.30	1.70
WAN7B	Monthly	Sept-05	Annually	Aug-09	128.70	Feb-08	126.41	2.29	Yes	126.40	130.70	Jul-25	-2.00	4.30
WAN8A	Monthly	May-09	One off sample	Apr-09	125.64	Sept-09	123.29	2.35	Yes	123.30	125.00	Jul-25	0.64	1.70
WAN8B	Monthly	May-09	One off sample	Apr-09	118.03	Oct-09	108.51	9.52	Yes	108.50	116.40	Jul-25	1.63	7.90
WAN9A2	Monthly	May-09	One off sample	Apr-09	126.25	Sept-09	123.68	2.57	Yes	123.70	127.60	Jul-25	-1.35	3.90
WAN9B	Monthly	May-09	Biannually	Apr-09	119.44	Sept-09	111.39	8.05	Yes	111.40	117.00	Jul-25	2.44	5.60
BE1 (VWP)	Quarterly	Oct-11	NA	2011	-	-	-	-	-	#N/A	#N/A	-	-	#N/A
BE1 (VWP)	Quarterly	Nov-11	NA	2011	-	-	-	-	-	#N/A	#N/A	-	-	#N/A
BE2 (VWP)	Quarterly	Dec-11	NA	2011	-	-	-	-	-	#N/A	#N/A	-	-	#N/A
BE2 (VWP)	Quarterly	Jan-12	NA	2011	-	-	-	-	-	#N/A	#N/A	-	-	#N/A
BE3 (VWP) [a]	Quarterly	Feb-12	NA	2011	-	-	-	-	-	#N/A	#N/A	-	-	#N/A
BE3 (VWP) [a]	Quarterly	Mar-12	NA	2011	-	-	-	-	-	#N/A	#N/A	-	-	#N/A
BE4 (VWP) [a]	Quarterly	Mar-17	NA	2017	-	-	-	-	-	#N/A	#N/A	-	-	#N/A
BE4 (VWP) [a]	Quarterly	Mar-17	NA	2017	-	-	-	-	-	#N/A	#N/A	-	-	#N/A
BE5 (VWP) [a]	Quarterly	Apr-17	NA	2017	-	-	-	-	-	#N/A	#N/A	-	-	#N/A

Bore ID	Standard WQ/SWL	Installation date	Full suite WQ	Data since	Baseline water level (mAHD)	Baseline measurement date	Max predicted drawdown (mAHD)	Maximum predicted drawdown (m)	WMP bore	Trigger levels (mAHD)	2025 GWL (mAHD)	Measured date	Drawdown (2025 - baseline) (m)	Difference (2025 - Trigger) (m)
BE5 (VWP) [a]	Quarterly	Apr-17	NA	2017	-	-	-	-	-	#N/A	#N/A	-	-	#N/A
GW01A	Monthly	Dec-18	Annually	2019	-	-	-	-	No	#N/A	#N/A	-	-	#N/A
GW01B	Monthly	Dec-18	Annually	2019	-	-	-	-	No	#N/A	#N/A	-	-	#N/A
WAN11A	Monthly	Jan-19	Annually	Feb-19	-	-	-	-	No	#N/A	#N/A	-	-	#N/A
WAN11B	Monthly	Jan-19	Annually	Feb-19	-	-	-	-	No	#N/A	#N/A	-	-	#N/A
WAN12	Monthly	Feb-19	Annually	Feb-19	-	-	-	-	No	#N/A	#N/A	-	-	#N/A
211GW001	TBC	Nov-21	-	-	-	-	-	-	No	#N/A	#N/A	-	-	#N/A
211GW002	TBC	Nov-21	-	-	-	-	-	-	No	#N/A	#N/A	-	-	#N/A

Appendix B

Annual surface water review

Australasian Groundwater & Environmental Consultants

Report on

Bengalla 2025 Annual Surface Water Review

Prepared for
Bengalla Mining Company Pty Ltd

Project No. 20250008.BEN5029.001
March 2026

ageconsultants.com.au

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Table of contents

B1 Introduction and scope of work 1

B2 Site water management 2

B2.1 Surface Water Monitoring Program 2

B2.2 Surface Water Triggers 2

B2.3 Response Protocol 2

B3 Surface water exceedance summary 2025 3

B3.1.1 Surface water pH 4

B3.1.2 Surface water EC 4

B3.1.3 Surface water total suspended solids (TSS) 5

B4 Exceedance Investigation 7

B4.1 Climate 7

B4.2 Hunter River 9

B4.2.1 Hunter River average values 9

B4.2.2 River stage and climate 10

B4.2.3 River stage and EC 11

B4.3 Surface water exceedance discussion 14

B4.3.1 Surface water EC 14

B4.3.2 Surface water pH 16

B4.3.3 Surface water TSS 18

B5 Summary and Conclusions 19

B5.1 EC summary 19

B5.2 pH summary 20

B5.3 TSS summary 20

B5.4 General summary 20

B6 Recommendations 21

B7 References 22

Table of contents

List of figures

Figure B 2.1 Bengalla surface water monitoring site along the Hunter River and groundwater monitoring sites 1
Figure B 3.1 Bengalla 2024-2025 pH data and upper trigger level 4
Figure B 3.2 Bengalla 2024-2025 EC data and trigger level 5
Figure B 3.3 Bengalla 2024-2025 TSS data and trigger level 6
Figure B 4.1 Annual rainfall and cumulative rainfall departure (1992 to 2025) for Bengalla weather monitoring station along with Hunter River stage (at Muswellbrook) 8
Figure B 4.2 Daily total rainfall and Hunter River stage (at Muswellbrook) for 2025 8
Figure B 4.3 Hunter River stage at Muswellbrook compared to the CRD 11
Figure B 4.4 Hunter River stage and EC from Muswellbrook station (2007-2025) 12
Figure B 4.5 Hunter River stage and EC from Muswellbrook station (2024-2025) 12
Figure B 4.6 Minimum river stage versus maximum EC for the Hunter River at Muswellbrook by month 13
Figure B 4.7 Box-and-whisker plot for EC where stage less than and greater than 0.6 13
Figure B 4.8 EC readings at Bengalla sites and Hunter River stage at Muswellbrook (2007-2025) 15
Figure B 4.9 EC readings at Bengalla sites and in the Hunter River and Hunter River stage at Muswellbrook (2022-2025) 15
Figure B 4.10 Hunter River EC vs W01 (left pane) and W01 vs W04 (right pane) 16
Figure B 4.11 pH readings at Bengalla (2007-2025) 17
Figure B 4.12 W01 pH vs W04 pH and best-fit line 17
Figure B 4.13 TSS readings at Bengalla (2007-2025) 18
Figure B 4.14 W01 TSS vs W04 TSS and best-fit line 18

List of tables

Table B 2.1 Surface water monitoring sites along the Hunter River 2
Table B 2.2 Bengalla adopted water quality trigger levels for the Hunter River sites 2
Table B 3.1 Water quality data from 2025 collected at Bengalla 3
Table B 4.1 Monthly average rainfall and percent of annual (from Bengalla weather station, 1992-2025) 7
Table B 4.2 Statistical summary of water quality parameters for the Hunter River 10

Bengalla 2025 Annual Surface Water Review

B1 Introduction and scope of work

The Bengalla Mining Company Pty Ltd (BMC) is a joint venture ownership between New Hope Group (80%) and Taipower (20%). BMC operate the Bengalla open cut coal mine (Bengalla), which was officially opened in 1999. Bengalla is located approximately 4 km west of Muswellbrook in the Upper Hunter Valley of New South Wales (NSW). Mining operations target coal from the Warkworth to Edderton seams of the Permian Wittingham Coal Measures.

The approved Bengalla Water Management Plan (WMP) (BMC 2023) sets out the procedures for management of water at Bengalla and includes surface water impact assessment criteria for investigating any potentially adverse impacts to surface water with an emphasis on water quality in the Hunter River (receiving waters).

This report provides a review of surface water quality data against prescribed exceedance triggers at Bengalla for receiving water monitoring sites along the Hunter River. Specifically, this report investigates the source of exceedances in Bengalla surface water monitoring sites by comparing water quality measured at these sites to other water quality monitoring in the Hunter River and identifies the causal pathways for the recent elevated water quality parameters.

As it relates to the WMP, this assessment includes:

- review of meteorological conditions over the relevant period;
- documentation of the timing and location of the exceedance(s);
- investigation into the potential cause of the exceedance, i.e. were there any changes to natural conditions or land use that may have affected surface water over time; and
- discussion on whether the exceedances are attributable to mining at Bengalla and if the results indicate actual or potential harm to the environment.

B2 Site water management

B2.1 Surface Water Monitoring Program

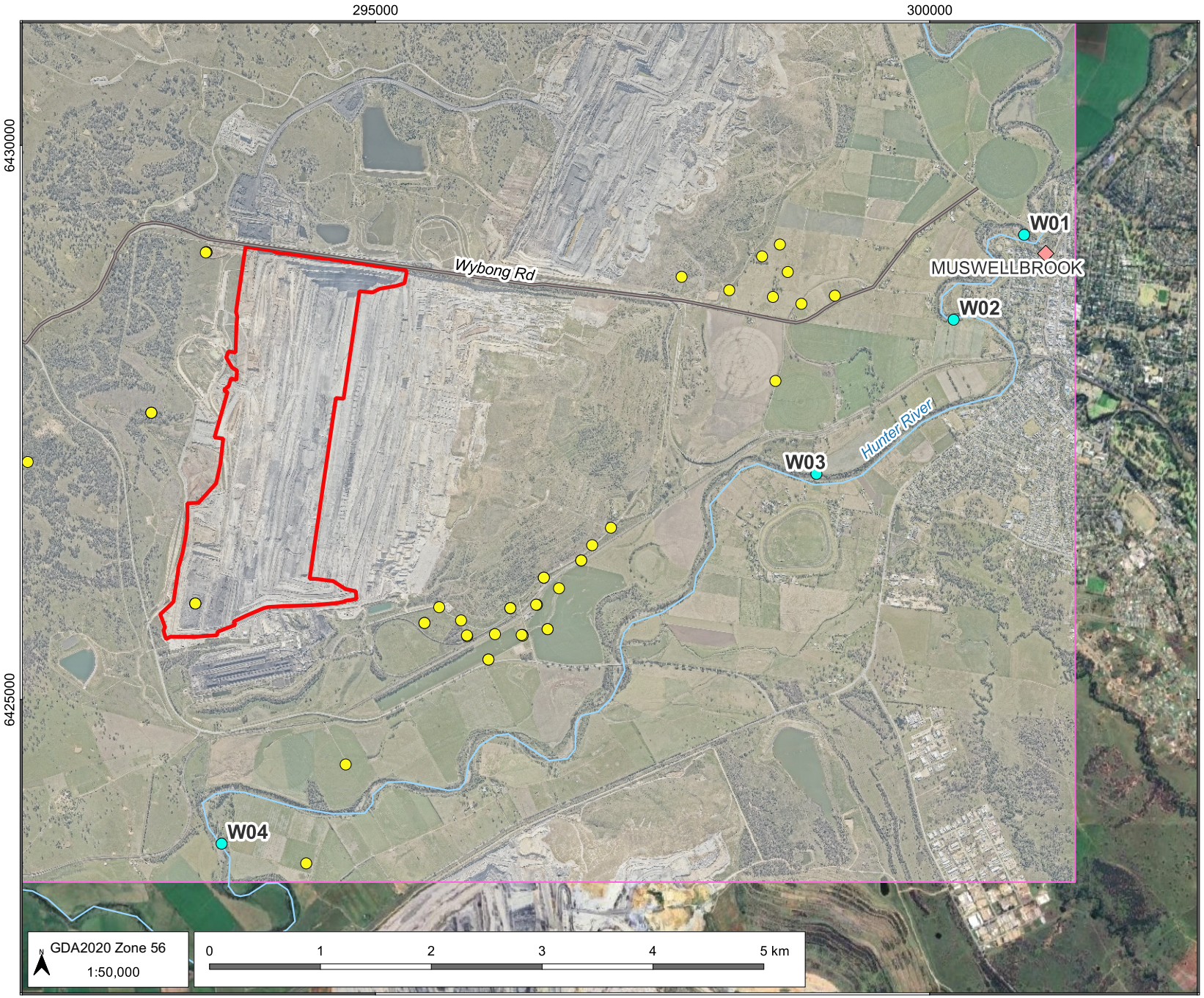
A surface water monitoring program is undertaken at Bengalla to monitor compliance with regulatory requirements and improve the understanding and efficiency of the Bengalla water management system and the effectiveness of surface water management. The monitoring program comprises:

- water quality;
- water quantity;
- water management system key infrastructure; and
- stream and riparian vegetation health.

Water quality monitoring is conducted in accordance with the requirements provided in Approved Methods for Sampling and Analysis of Water Pollutants in New South Wales (Department of Environment and Conservation, 2004) and AS 5667:1:1998 Parts 1, 4 and 6. Surface water quality monitoring is undertaken across the Bengalla site (see WMP) but sites relevant to this investigation are those along the Hunter River, which are provided in Table B 2.1 and shown in Figure B 2.1.

Table B 2.1 Surface water monitoring sites along the Hunter River

Site ID	Easting	Northing	Sampling point description	Type of Analysis	Monitoring frequency
W01	300853	6429192	Hunter River (upstream, near Kayuga Road Bridge)	Basic Surface Water Analysis	Monthly
				Surface Water Speciation	6 Monthly
W02	300217	6428426	Hunter River (upstream, Thornbro Dairy – North)	Basic Surface Water Analysis	Monthly
W03	298979	6427035	Hunter River (upstream, Thornbro Dairy – South)	Basic Surface Water Analysis	Monthly
W04	293612	6423698	Hunter River (downstream, Whites Creeks Vineyards)	Basic Surface Water Analysis	Monthly
				Surface Water Speciation	6 Monthly



LEGEND

- Monitoring Bores
- Surface Water Sites
- Hunter River stations
- Major Drainage
- Void Boundary Aug2025
- Bengalla Imagery Bound

Bengalla Annual Surface Water Review (BEN5029.001)

Monitoring bore network and surface water sites

DATE
10/03/2026

FIGURE No:
B 2.1

©2026 Australasian Groundwater and Environmental Consultants Pty Ltd (AGE) - www.ageconsultants.com.au; Source: 1 second SRTM Derived DEM-S - © Commonwealth of Australia (Geoscience Australia) 2011; GEODATA TOPO 250K Series 3 - © Commonwealth of Australia (Geoscience Australia) 2006
G:\Projects\BEN5029.001 2025 Monthly Monitoring and Reporting\3_GIS\Workspaces\006_Deliverable6_GW Annual Review\Figure 4.1 AR2025 Groundwater Monitoring Network.qgz

B2.2 Surface Water Triggers

The Bengalla Development Consent (SSD-5170) Schedule 3, Condition 25 stipulates that the surface water management plan must include performance criteria and trigger levels for investigating any potentially adverse impacts associated with activities at Bengalla. The surface water quality impact assessment criteria used as trigger values for assessing Bengalla's surface water impacts to the Hunter River are provided in the WMP and those relevant to this assessment are reproduced in Table B 2.2. The trigger levels are to be based on historic data but, where insufficient local reference data is available, Australian and New Zealand Environment and Conservation Council (ANZECC) & Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) (2000) ecosystem trigger values have been adopted. The Development Consent states that trigger values may be refined or rederived if required following monitoring.

Table B 2.2 Bengalla adopted water quality trigger levels for the Hunter River sites

Parameter	Units	Trigger Limit	Comments
pH	pH units	6.5 – 8.1	Lower bound based on ANZECC guideline for ecosystem protection, upper bound based on site Baseline data
EC	µS/cm	650	Site baseline data adopted, rounded to nearest 10
TSS	mg/L	40	Site baseline data adopted, rounded to nearest 10

B2.3 Response Protocol

Should the monitoring program identify the occurrence of a trigger exceedance at Bengalla, BMC will initiate an investigation (where applicable) to:

- identify the cause of the event;
- determine if the event is an incident and/or non-compliance;
- identify any additional monitoring requirements, mitigation, or management strategies required; and
- review follow-up results, where required, to measure the effectiveness of the mitigation or management strategies.

A technical specialist may be engaged, where required, to undertake the investigation and prepare report.

Following exceedances in surface water quality data collected at the Bengalla Hunter River sites throughout 2025, BMC engaged AGE as the technical specialist to conduct a review of the data against surface water and climate conditions.

B3 Surface water exceedance summary 2025

Water quality data is collected by Bengalla and the four Hunter River monitoring sites and assessed for field parameters (pH, EC, TSS) quarterly. AGE have been engaged by BMC to undertake monthly review of groundwater level and quality data collected across the Bengalla groundwater monitoring network. Because of the link between groundwater and surface water, as well as the number of Bengalla bores that target the alluvial aquifer adjacent to the Hunter River, surface water data (pH, EC, and TSS) is included in the monthly reviews.

Throughout 2025, EC data collected at surface water sites (Table B 3.1) fluctuated between 300 µS/cm and 960 µS/cm and were notably elevated (and exceeded trigger values) in January and February and October and November with the Oct-Nov readings over 800 µS/cm at all four monitoring sites. These exceedances triggered Bengalla's response plan which required further investigation.

An investigation into EC exceedances at surface water sites was undertaken in 2024 (AGE 2025a) which compared EC at these sites to EC recorded in the Hunter River at Aberdeen (station ID 210056) and Muswellbrook (station ID: 210002). The main finding of that investigation was that the elevated EC recorded at Bengalla was due to elevated EC in the Hunter River prior to it passing by Bengalla (i.e. in situ conditions). Surface water data are reviewed monthly by AGE in conjunction with groundwater data and in monthly the exceedances in late-2025 were attributed to elevated EC recorded in the Hunter River and Muswellbrook (see further discussion below).

Total suspended solids (TSS) and pH are also measured at these surface water sites and show far less fluctuation than EC, with pH remaining generally and consistently near 8.0 and TSS generally less than 50 mg/L (trigger values are 8.1 and 40 mg/L, respectively). The exceedances in EC do not appear to be coincide with trends in pH or TSS. TSS and pH were generally consistent with historical data with a few notable spikes (which do not appear to be part of any observed trends) and a few exceedances.

Table B 3.1 Water quality data from 2025 collected at Bengalla

Parameter	pH				EC				TSS			
Trigger range	6.5 – 8.1				650 µS/cm				40 mg/L			
Date	W01	W02	W03	W04	W01	W02	W03	W04	W01	W02	W03	W04
Jan-25	7.9	8.0	8.0	8.0	534	575	**665**	**662**	24	**131**	31	26
Feb-25	8.1	7.9	7.4	**8.3**	648	649	**773**	**881**	18	18	31	**54**
Mar-25	7.9	7.8	7.8	7.9	596	590	620	639	20	24	18	24
Apr-25	7.9	7.6	7.9	7.9	355	350	349	344	27	27	29	27
May-25	7.5	7.7	-	8.1	300	385	-	356	**153**	27	-	**84**
Jun-25	8.1	**8.2**	-	**8.3**	572	589	-	**675**	7	9	-	11
Jul-25	**8.3**	**8.4**	**8.2**	**8.3**	468	500	477	466	17	18	24	18
Aug-25	7.9	7.7	-	7.8	384	324	-	306	**94**	**92**	-	**83**
Sept-25	8.0	-	8.0	7.9	597	-	573	554	19	-	18	21
Oct-25	8.0	**8.2**	**8.2**	8.1	**833**	**833**	**859**	**911**	12	10	9	14
Nov-25	7.9	8.0	8.0	8.1	**872**	**879**	**917**	**965**	12	14	16	19
Dec-25	**8.2**	**8.2**	-	**8.3**	620	620	-	**706**	16	17	-	22

Note: 999 indicates exceedance.

B3.1.1 Surface water pH

A total of five months in 2025 saw pH-High trigger exceedances at one or more sites with all measured sites recording exceedances in Jul-25 and Dec-25. Aside from that, all stations remained very near the upper exceedance throughout 2025 with a mean pH value from all sites of 8.0 and a standard deviation of 0.2. All pH data for 2025 monitoring and the associated trigger level can be seen in Figure B 3.1 which shows that pH is consistently near the trigger level of 8.1 with some exceedances but an overall stable trend.

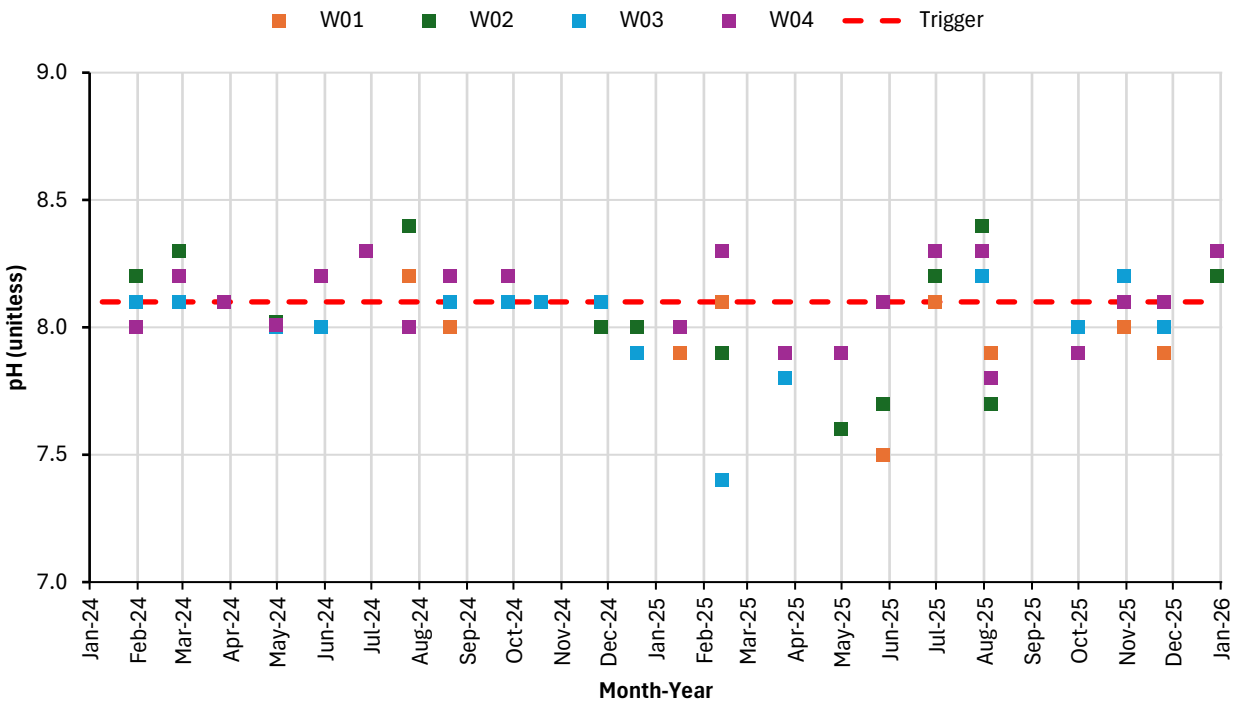


Figure B 3.1 Bengalla 2024-2025 pH data and upper trigger level

B3.1.2 Surface water EC

EC exceedances were recorded at all surface water monitoring during 2025 (Figure B 3.2), with exceedances observed at downstream sites W03 and W04 in January and February and at all measured sites in October and November. These exceedances are reviewed in monthly report conducted by AGE and are compared to EC measured in the Hunter River at the Muswellbrook station. Generally, EC at Bengalla sites fluctuates between less than 300 µS/cm and near 1000 µS/cm with the average 2025 value across all sites equal to 600 µS/cm (standard deviation: 190 µS/cm). EC is at Bengalla is typically consistent with EC measured at the Muswellbrook station (discussion further in Section B4.3).

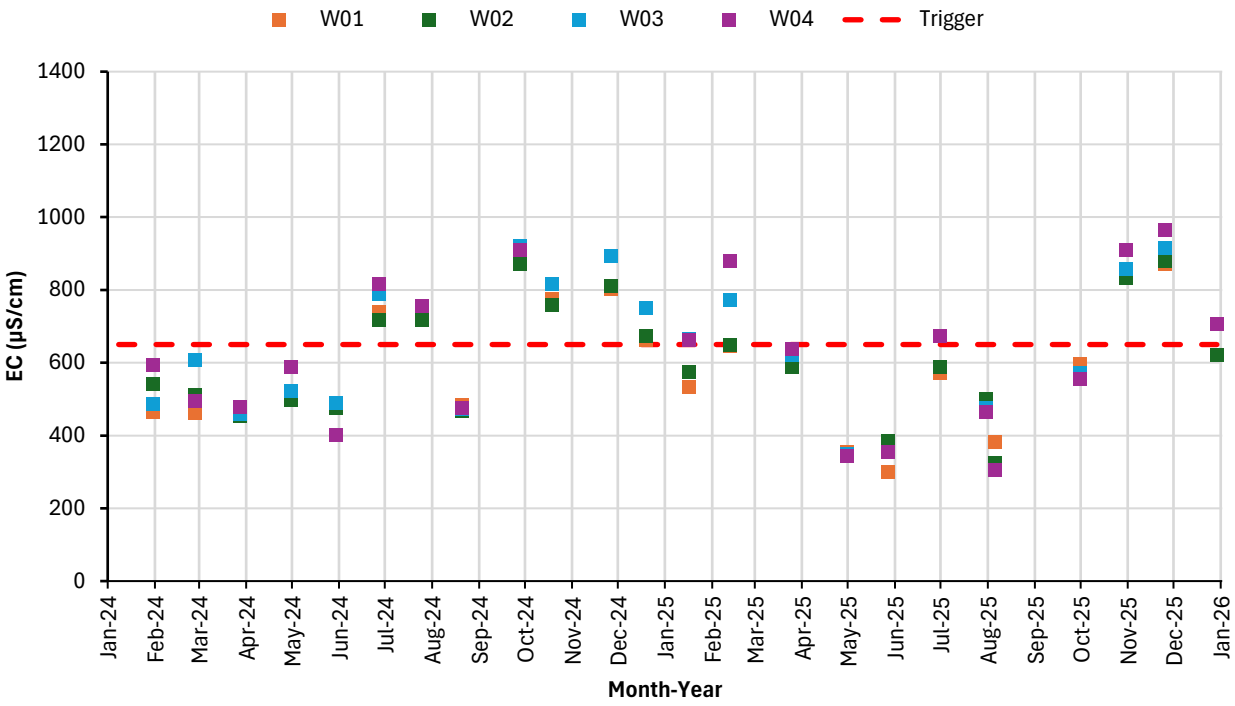


Figure B 3.2 Bengalla 2024-2025 EC data and trigger level

B3.1.3 Surface water total suspended solids (TSS)

TSS exceedances were observed in surface water sites in January, February, May, and August in 2025 with all recorded sites exceeding trigger values in May and August. Site W02 recorded a TSS value of 131 mg/L in January which was approximately five times the values at other sites and is likely either an erroneous value (incorrectly noted) or anomalous (i.e. represents specific conditions at that site at that time rather than conditions of the Hunter River at that time). Similarly, site W01 recorded a TSS value of 153 mg/L in May and all sites recorded values above 80 mg/L in August. Average TSS at all sites in 2025 was 32 mg/L (standard deviation: 33 mg/L).

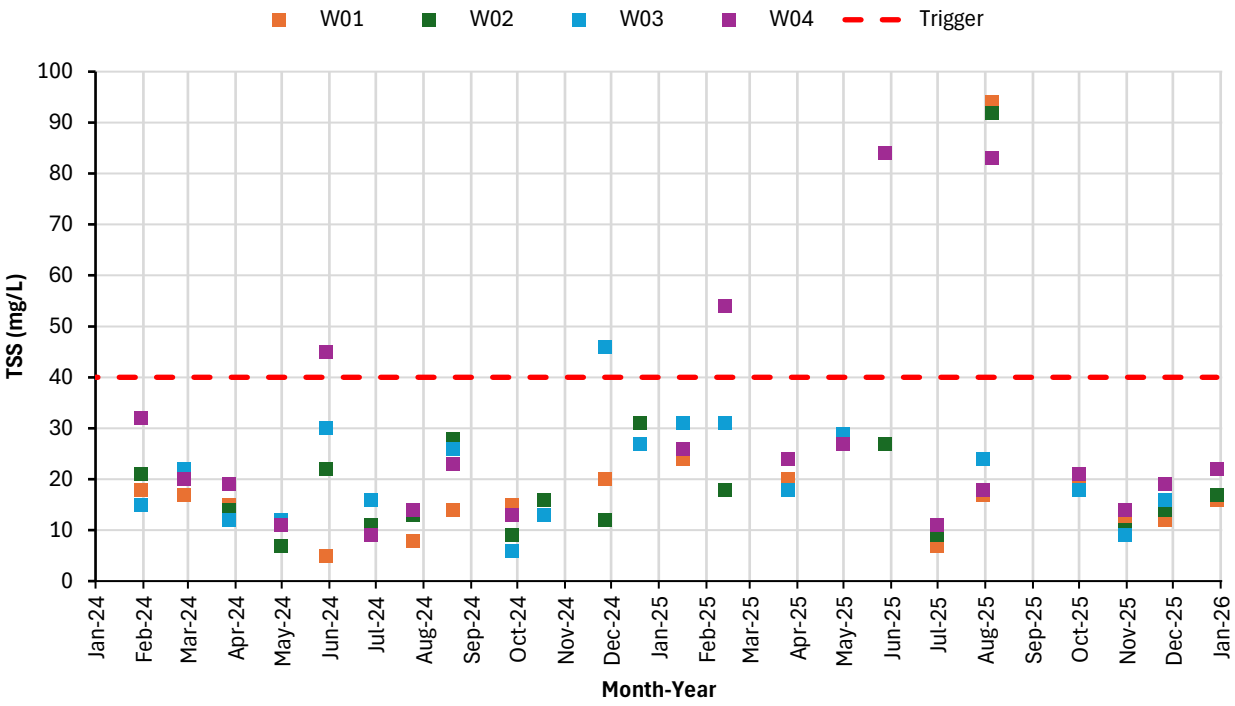


Figure B 3.3 Bengalla 2024-2025 TSS data and trigger level

B4 Exceedance Investigation

The primary goal of this review is to address requirements of the Response Protocol for Bengalla's WMP, namely, to identify the cause of the event and determine if the event is an incident and/or noncompliance. This is achieved by assessing to what degree in situ surface water conditions in the Hunter River are responsible for the observed water quality readings at Bengalla. In this section, water quality data from the Bengalla monitoring sites are compared to climate and river conditions to determine if there is a link between conditions in the Hunter River upstream and readings made at Bengalla.

B4.1 Climate

The climate at Bengalla is described in the main body of the 2025 Annual Groundwater Review but is summarised in this section as it relates to surface water conditions. Temperatures range from an average daily low of approximately 17 °C in winter to an average daily high of approximately 32 °C in summer. Rainfall averages 599 mm per year (based on 1996 to 2025 period of record) and varies seasonally (Table B 4.1), with rainfall in the summer months being slightly higher than during the winter but large rainfall events can skew these patterns. Rainfall events are typically short-duration (1-2 days) but can be high-intensity (over 50 mm/day).

Table B 4.1 Monthly average rainfall and percent of annual (from Bengalla weather station, 1992-2025)

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Monthly total rainfall (mm) 2025	71	50	103	41	134	17	32	123	20	29	34	14	667
Long term monthly average rainfall (mm) 1992 - 2025	55	68	67	38	37	44	35	37	35	46	69	69	599
2025 % of average monthly rainfall	55	68	67	38	37	44	35	37	35	46	69	69	90

Historical rainfall is contextualised using the Cumulative Rainfall Departure (CRD) method (Table B 4.1). This method is a summation of the monthly departure of rainfall from the long-term average monthly rainfall. A rising trend in the CRD plot indicates periods of above average rainfall, whilst a falling slope indicates periods when rainfall is below average.

The CRD for Bengalla since 1996 is shown in Figure B 4.1 and illustrates two significant drought periods (persistent below-average rainfall and a declining trend in CRD) from 2001-2007 and 2017-2019. Since 2022 annual rainfall has been near average (flat trend in CRD).

Figure B 4.2 shows the daily rainfall for Bengalla in 2025 to highlight the specific rainfall events and patterns. Particularly high rainfall was recorded on days in March (46 mm on the 29th), May (over 25 mm on both the19th and 21st), and August (56 mm on the 2nd).

Persistent above-average or below-average rainfall contributes to storage in the Hunter River system by allowing reservoirs to fill up (e.g., Glenbawn Dam, Glennies Creek Dam) which then provides water for release down the Hunter River for irrigation, ecology, and recreation. Figure B 4.2 also shows daily river stage in the Hunter River at Muswellbrook which highlights the correlation between rainfall events and Hunter River stage (further discussed in Section B4.2).

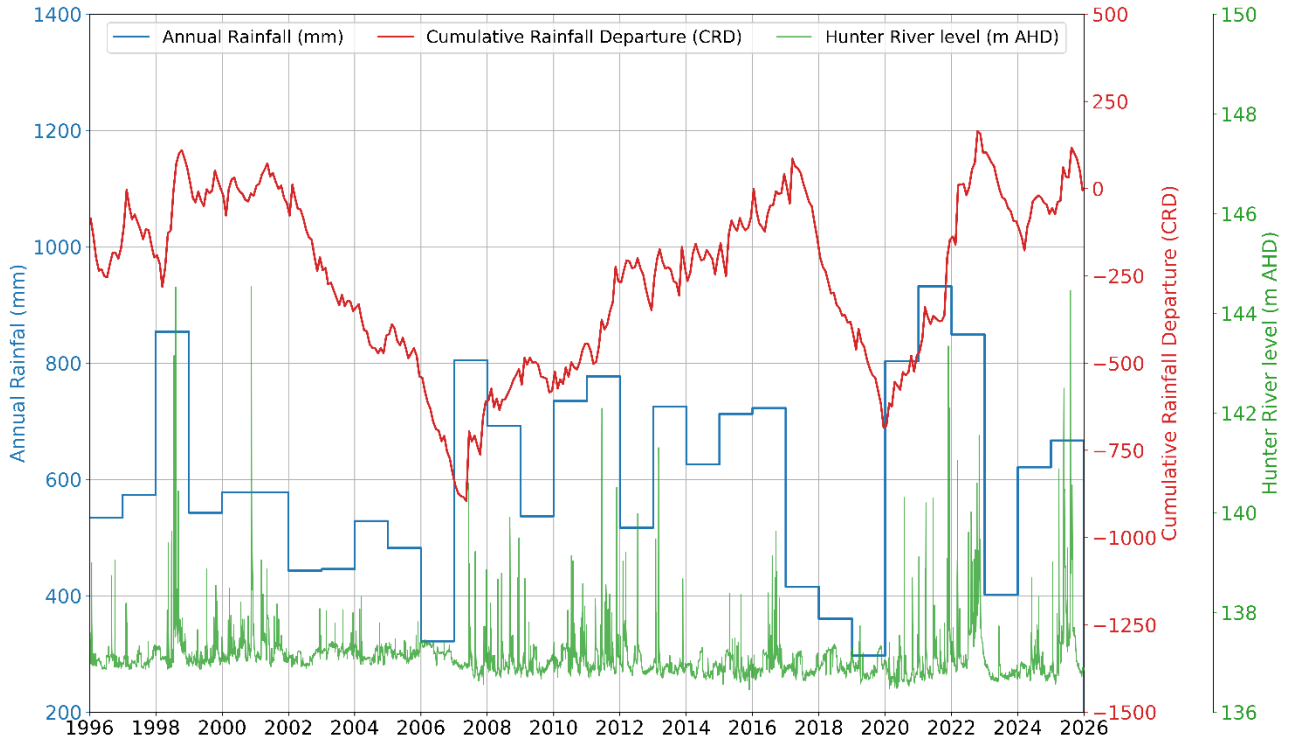


Figure B 4.1 Annual rainfall and cumulative rainfall departure (1992 to 2025) for Bengalla weather monitoring station along with Hunter River stage (at Muswellbrook)

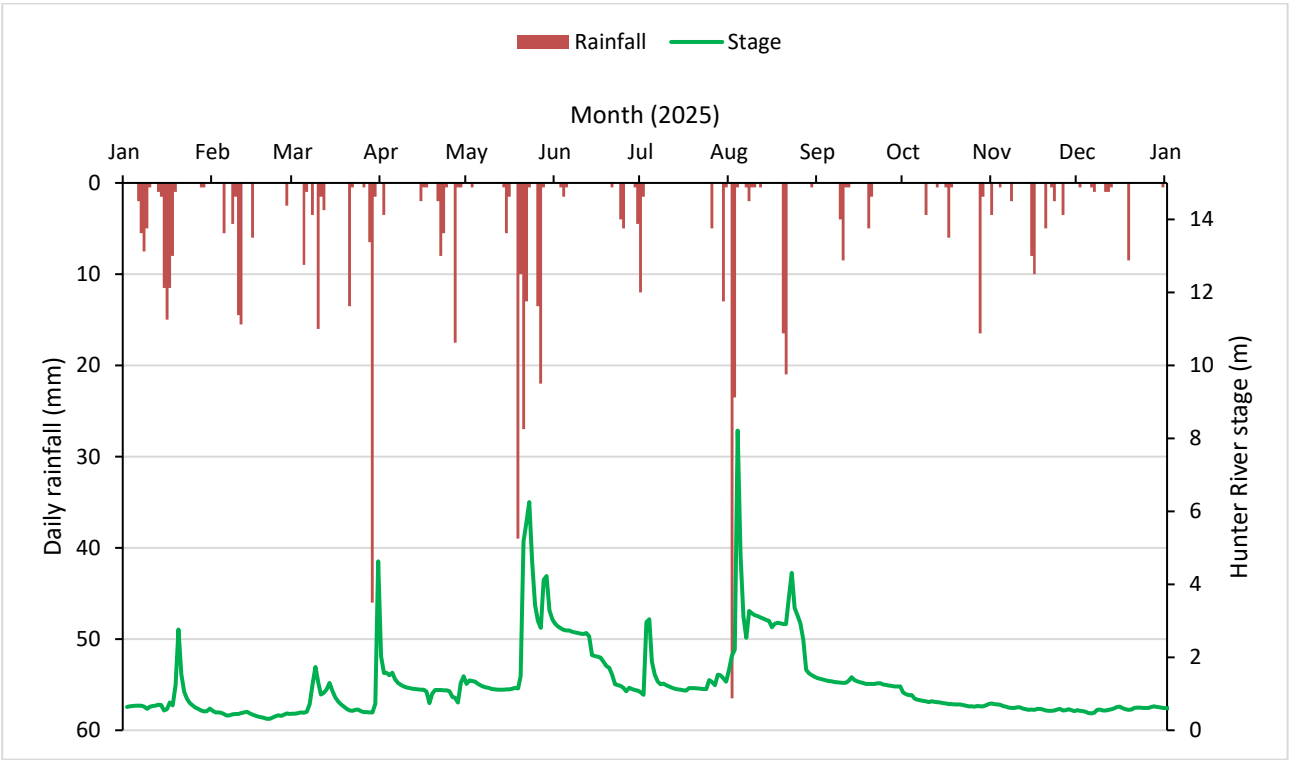


Figure B 4.2 Daily total rainfall and Hunter River stage (at Muswellbrook) for 2025

B4.2 Hunter River

The Hunter River watershed drains water from east of the Great Dividing Range and flows eastward to its outlet at the Pacific Ocean at Newcastle NSW. The Hunter River near Bengalla is controlled by releases from Glenbawn Dam but also fluctuate in response to rainfall (see Figure B 4.2). The water quality of the river oscillates due to persistent low-flow periods and the impacts on water quality. The Hunter region, and particularly the lower Hunter catchment, supports a high level of urban and industrial development which has affected water quality. In the upper catchment, land clearing has resulted in erosion and salinity issues (NSW 2025).

B4.2.1 Hunter River average values

Hunter River water quality data has been collected by Department of Industry – Water (DOI-Water) since the 1970s. The results from monitoring by DoI-Water indicate that the Hunter River is alkaline (pH above 7.0), fresh (low EC), and generally low TSS around 10 mg/L. Water quality reported by Bengalla since 2007 supports these results and average values from Bengalla's surface water monitoring sites are provided in Table B 4.2.

Readings of pH are historically near 8.0 for the monitoring sites and often approach (or exceed) the trigger level of 8.1 (median = 8.0; see Table B 2.1).

TSS is generally fairly low at the site (median = 20 mg/L) but occasional high-value readings have been recorded (over 1000 mg/L). These elevated readings are usually isolated and not part of persistent trends and may not even be consistent across the four monitoring sites.

Flow and quality data is collected for the Hunter River at multiple sites within the watershed. Data from the WaterNSW monitoring site at Muswellbrook (station ID: 210002; located just upstream from Bengalla) provide an average EC of 510 µS/cm (i.e. 'fresh') over the period from 2007-2025 (also reported in Table B 4.2). The Muswellbrook station is used throughout this report to represent in situ Hunter River conditions (i.e. water quality conditions prior to any interaction with Bengalla).

The NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) publishes annual surface water quality reports for the Hunter River which includes statistics at multiple sites along the river (Muswellbrook being the nearest to Bengalla). These reports include statistical summaries (box-and-whisker plots) for water quality parameters including: pH, EC, and TSS. Values from the 2023-2024 report (covering July 2023 through March 2024) are included in Table B 2.1 for Aberdeen (upstream of Bengalla) and Singleton (downstream). (DCCEEW reports are published in January and the 2024-2025 report was not available at the time of this report).

The data provided in Table B 2.1, as well as the DCCEEW report, indicates that pH and TSS appears relatively consistent between the four sites with pH consistently around 7.5 to 8.0 and TSS generally below 40 mg/L. EC generally increases downstream, which is further discussed in the DCCEEW report and attributed to both natural sources such as the marine origin of the Permian sediments that underly the basin and anthropogenic sources, such as mining, power generation, and agriculture. It was noted in the 2023-2024 report that conditions in some of surface water sites sampled by the DCCEEW improved relevant water quality index (WQI) scores.

Table B 4.2 Statistical summary of water quality parameters for the Hunter River

Parameter		Aberdeen[1]	Bengalla[2]	Muswellbrook[1]	Singleton[1]
pH	25th %ile	NA	7.8	7.4	7.6
	Median		8.0	7.7	7.8
	75th %ile		8.1	7.9	8.1
EC (µS/cm)	25th %ile	354	385	500	800
	Median	419	480	510	1100
	75th %ile	517	656	600	1240
TSS (mg/L)	25th %ile	NA	11	7	15
	Median		20	12	22
	75th %ile		37	15	42

Source: [1] DCCEEW Hunter River Annual Surface Water Quality Report 2023-2024.
[2] Bengalla site data (2007 – 2025).

B4.2.2 River stage and climate

River stage and EC data was collected from the WaterNSW Water Information Hub[1] for the monitoring station at Muswellbrook (Station ID: 210002), located just upstream from Bengalla's W01 site. EC data from Muswellbrook station was not available in the AGE's 2024 surface water report, so Aberdeen data was used in that report, however, data is available for 2025 for Muswellbrook so that station's data is used predominantly in this report. River stage for the Muswellbrook site was compared to the CRD developed above and presented in Figure B 4.3 for the period 2007-2025 (corresponds to period of record for Bengalla surface water data).

Figure B 4.3 shows that, while river stage can be highly variable and fluctuate over several metres in response to high-intensity rainfall events, there is an observable relationship between drought conditions (e.g. 2017-2021; 2023-2024) and river stage. Conversely, periods of persistent above-average rainfall (e.g. 2020-2023) correspond to 1) higher peak stage (flooding), 2) repeated high-stage events, and 3) higher "baseline" stage (represented in Figure B 4.3 by 25th percentile flow).

[1] https://realtimedata.waternsw.com.au/water.stm.

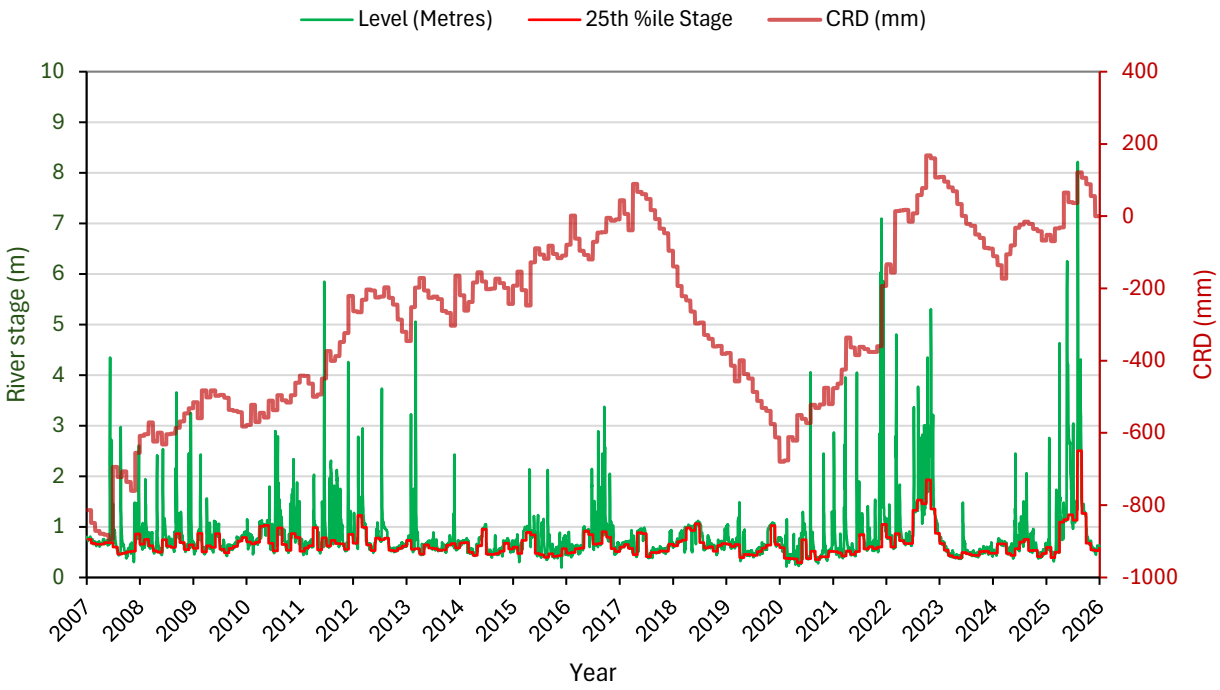


Figure B 4.3 Hunter River stage at Muswellbrook compared to the CRD

B4.2.3 River stage and EC

As discussed above, the Hunter River is susceptible to persistent low-flow conditions and is impacted by salinity from natural and anthropogenic conditions (DCCEEW 2024). Low flow conditions tend to slow the river velocity down which allows for an increase in the evaporation over pools in the river. Evaporation concentrates dissolved minerals in the river water (including salts) which then can lead to a rise in EC. Salinity in the Hunter River is managed by the Hunter River Salinity Trading Scheme (HRSTS; see Section B4.2.3.1).

The Muswellbrook stations record daily EC data for the Hunter River. This data is provided along with the river stage data in Figure B 4.4 for the period 2007-2025. Figure B 4.4 shows that there is higher variability in EC than in river stage but, when focussing on the period from 2017-2020 (drought), there is a clear correlation between long-term stage and EC. EC fluctuates between 120 µS/cm and 1150 µS/cm over the full period of record presented in the figure but rising significantly and remains high following high stage flood events (e.g. in early 2023 and late 2025).

Figure B 4.5 shows the same data as Figure B 4.4 but for the last two years. At this scale it is clear that high stage events correspond to low EC, and EC rises over periods of persistent low river stage due to, as mentioned, concentration of salts in the water due to evaporation.

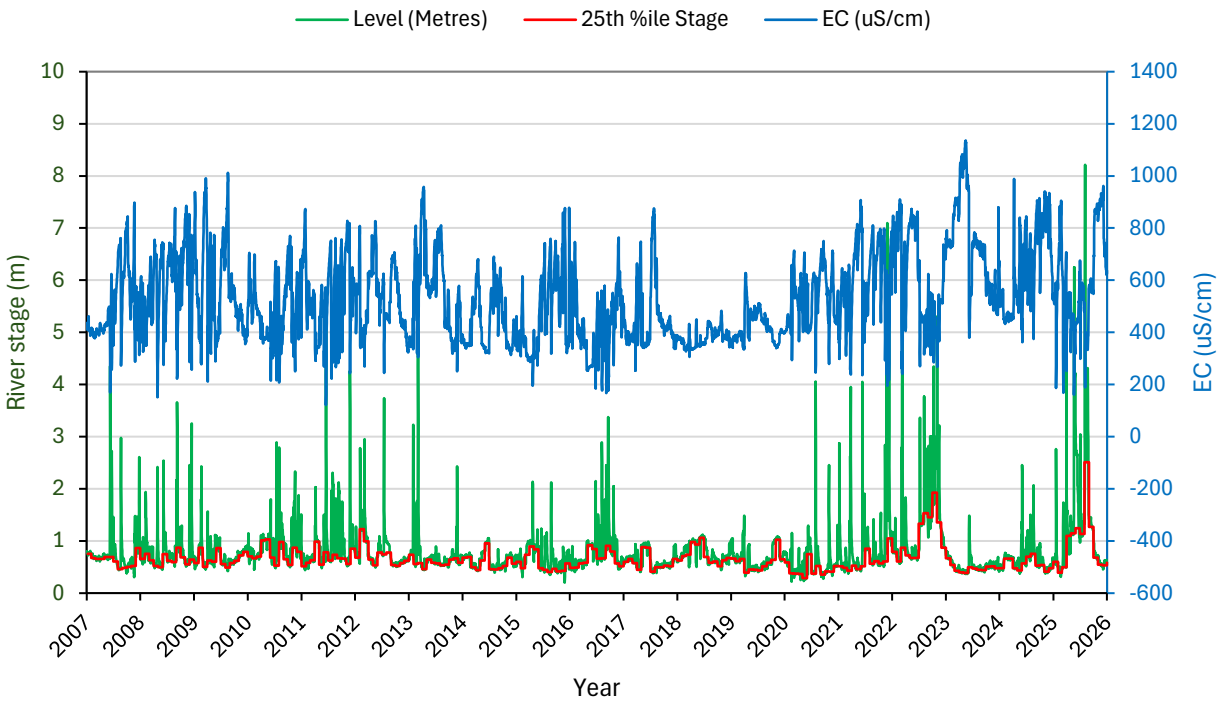


Figure B 4.4 Hunter River stage and EC from Muswellbrook station (2007-2025)

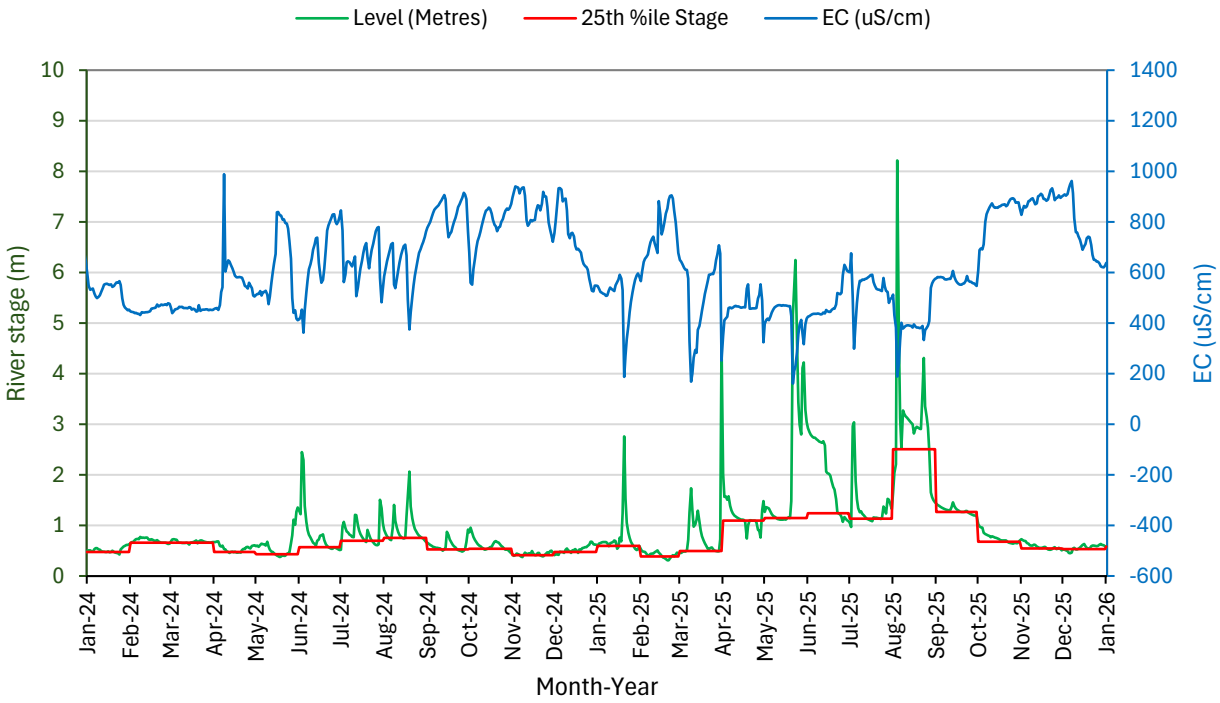


Figure B 4.5 Hunter River stage and EC from Muswellbrook station (2024-2025)

The relationship between river stage and EC is illustrated more succinctly in Figure B 4.6 which shows the minimum monthly river stage versus the maximum monthly EC for the Hunter River at Muswellbrook over the period 2007-2025. River stage typically increases very rapidly and recedes at a slower rate, and EC increases even more slowly as the river stage recedes (see Figure B 4.5), so the data provided in Figure B 4.6 is a bit noisy with a very poor correlation (R^2 = 0.11). However, what this relationship does illustrate is that high EC is more likely to be associated with low river stage. Figure B 4.7 shows that river stage less than 0.6 m corresponds to a median EC of 690 µS/cm whereas stage over 0.6 m corresponds to a median EC of 556µS/cm).

The fact that this relationship relatively flat is due to the fact that there is a minimum river stage (around 0.5 m), which is likely related to the stage where the river is nearly stagnant and exists as a series of connected pools, but evaporation will continue which further drives higher EC values. The lower EC limit (around 300 µS/cm) is likely related to the 'freshest' incoming water to the system.

Further discussion around what is controlling EC in the Hunter River upstream of Bengalla is outside the scope of this assessment and likely much more complicated than what is presented here. Instead, it is sufficient for this assessment to establish that EC conditions in the Hunter River upstream of the Bengalla mine are similar in magnitude to what is recorded by Bengalla. The extent that these in situ conditions are driving water quality conditions recorded at the Bengalla surface water monitoring sites are discussed further in Section B4.3.

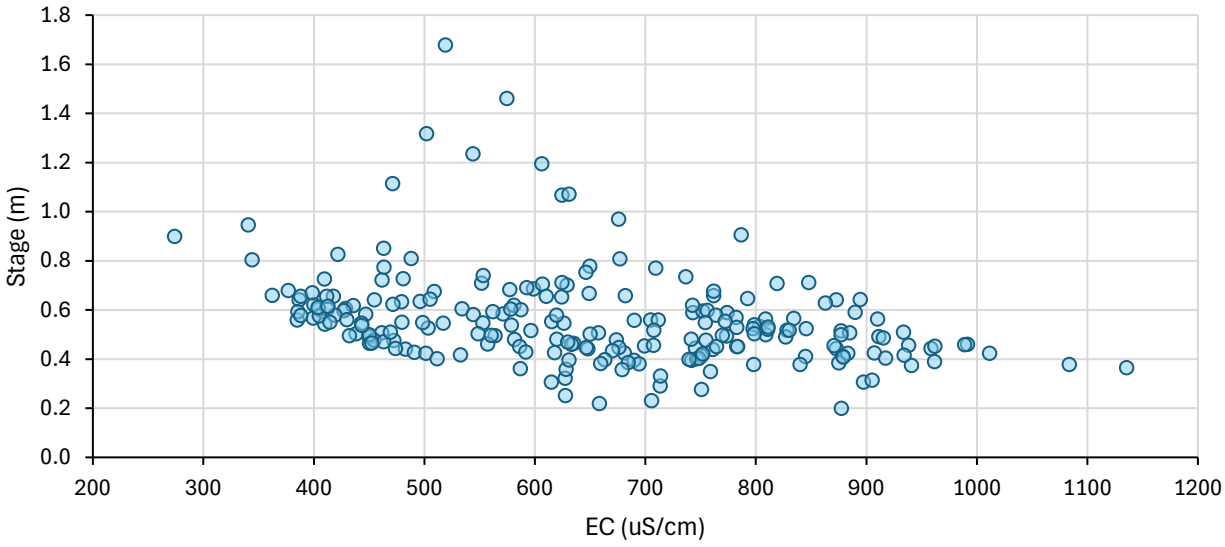


Figure B 4.6 Minimum river stage versus maximum EC for the Hunter River at Muswellbrook by month

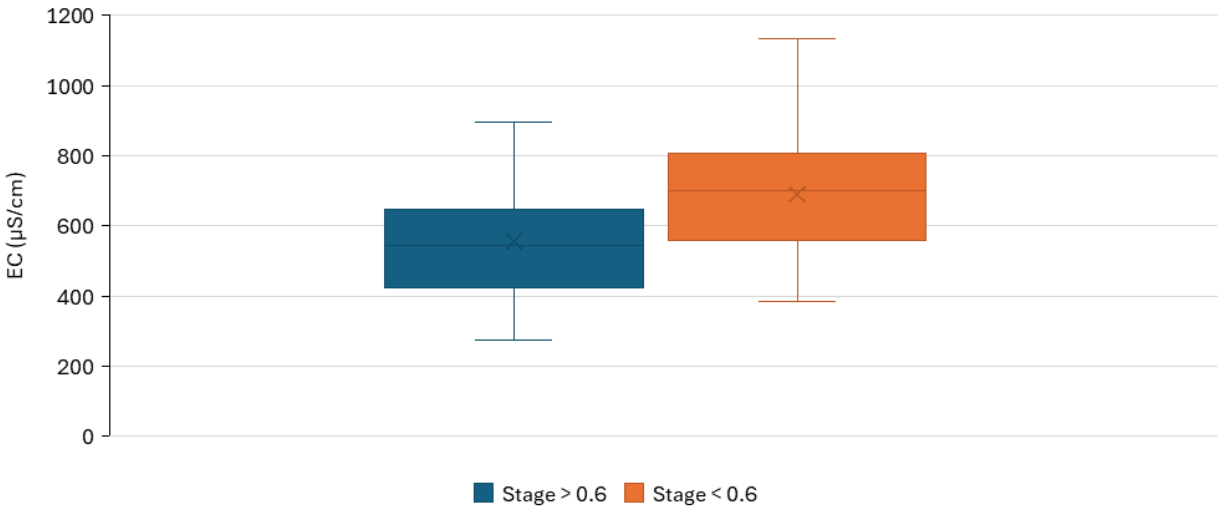


Figure B 4.7 Box-and-whisker plot for EC where stage less than and greater than 0.6

B4.2.3.1 Hunter River Salinity Trading Scheme

It is worth noting that salinity in the Hunter River is of such concern that the NSW Government developed the Hunter River Salinity Trading Scheme (HRSTS) to manage salinity in the river alongside the needs of river users. The HRSTS involves a finite system of salt credits that industries can buy and trade to discharge their salty water into the Hunter River. Discharges are only permitted when the river contains adequate fresh water to dilute the salt and maintain water quality. The scheme therefore balances the amount of salt that industry can directly discharge with the background level of salt in the river. Agriculture benefits from fresh irrigation waters while miners and electricity generators can make controlled discharges of excess waters.

Review of Bengalla's Monthly Water Quality Monitoring Reports for 2025 identify that mine water was discharged from their LDP in May (1.956 ML) and August (122.56 ML). In all other months the reports state: "*During the Reporting Period, Bengalla did not discharge any mine water under the HRSTS*". For comparison, discharge in the Hunter River at Muswellbrook in May and August was over 1500 ML/d.

B4.3 Surface water exceedance discussion

The three field water quality parameters (pH, EC, and TSS) recorded at Bengalla's surface water monitoring sites are discussed in this section as they relate to in situ conditions in the Hunter River. The discussion covers the full period of record (2007-2025) with an emphasis on recent exceedances in 2025. While pH, EC, and TSS are all considered in this assessment, we have chosen to emphasise EC as there is readily available data on EC from the Hunter River. The comparison between EC measured at Muswellbrook and measured at Bengalla is used to establish the relationship between in situ river water quality upstream of Bengalla and water quality measured at Bengalla, which is then applied to pH and TSS.

B4.3.1 Surface water EC

Surface water sites recorded EC values above the prescribed triggers during 2025, with exceedances focused in the Jan-Feb and Oct-Nov (see Table B 3.1). In other months, EC remained generally between 350 µS/cm and 600 µS/cm. TSS and pH appear discordant with EC and values with pH variable around 8.0 and TSS exceedances at only one site in January and February and all measured sites in May and August.

A review of EC data over the full period of record (2007-2025) shows that the exceedances in 2025 are just the latest exceedance events and that several similar exceedance events occurred in the past 18 years (Figure B 4.8). We use the term "exceedance event" to define a period over multiple months were EC exceeded the trigger level but are separated by EC below the trigger level. A previous exceedance event occurred through 2023 where EC rose at all sites to over 1000 µS/cm before returning to lower values, and again in 2024 where EC rose to over 800 µS/cm. By comparison, the EC exceedances in 2025 where minor compared to 2023 and 2024.

These recent events are highlighted in Figure B 4.9 and shown along with Hunter River EC which shows clear correlation with EC measured at Bengalla sites. Comparison between river stage and EC shows that the 2023 and 2024 exceedance events were coincident with a prolonged period of low river stage and that the EC exceedances in late 2025 were also coincident with low stage.

Figure B 4.9 also highlights that the Hunter River EC at Muswellbrook is naturally variable and, along with information in Table B 4.2 above, averages just below Bengalla's trigger level of 650 µS/cm. In fact, the median EC in the Hunter River at Muswellbrook for the period from 2023 through 2025 was 642 µS/cm and there were 532 days over that period where EC was over 650 µS/cm, which is roughly half of the total days.

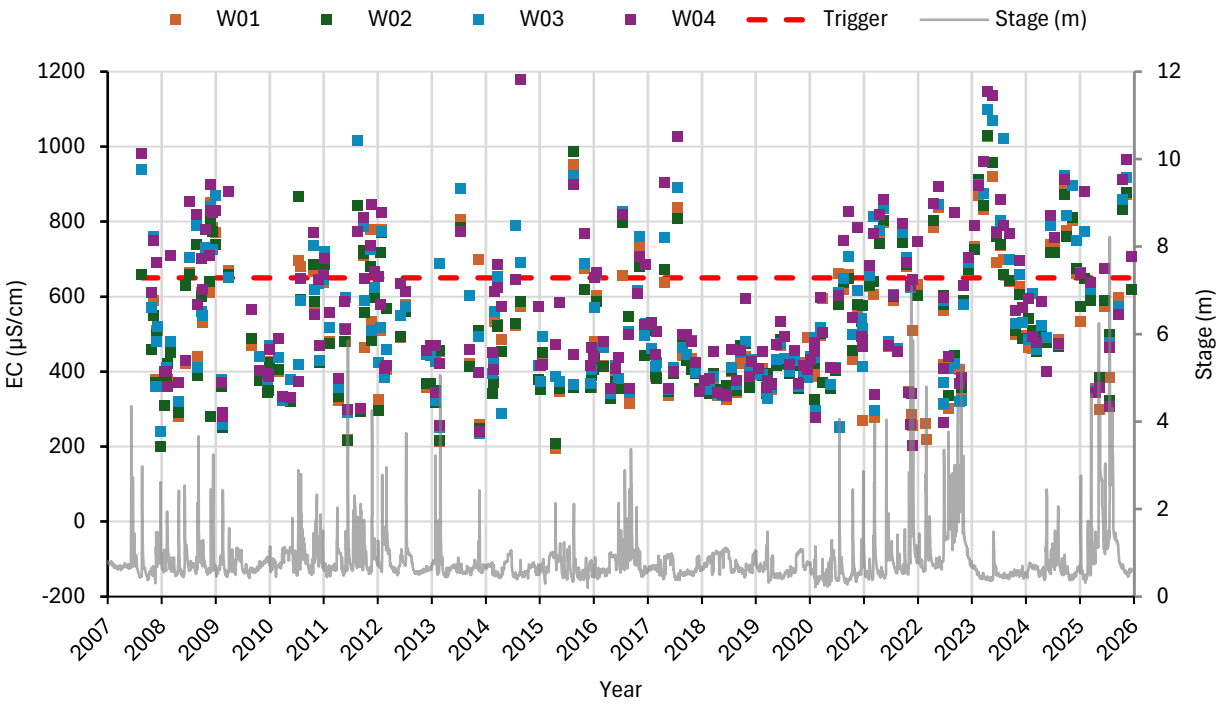


Figure B 4.8 EC readings at Bengalla sites and Hunter River stage at Muswellbrook (2007-2025)

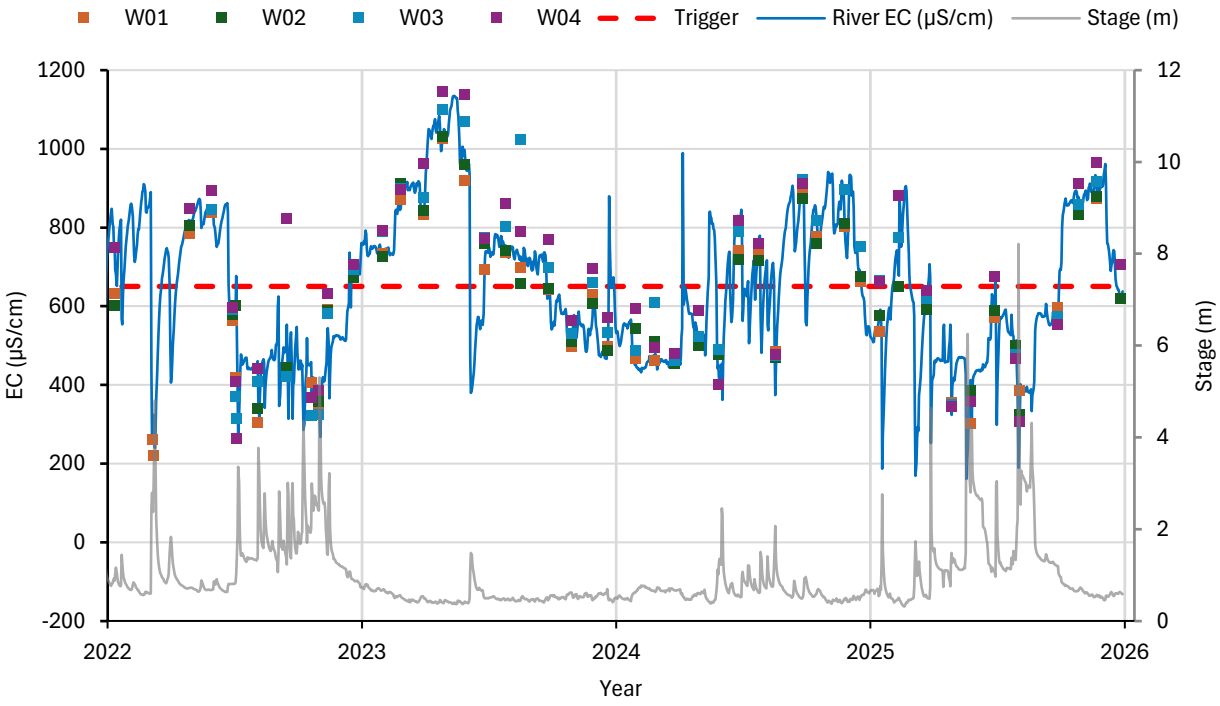


Figure B 4.9 EC readings at Bengalla sites and in the Hunter River and Hunter River stage at Muswellbrook (2022-2025)

The relationship between Hunter River EC and EC measured at Bengalla sites is further illustrated in Figure B 4.10 which compares EC in the Hunter River directly to EC at site W01. The correlation coefficient (R^2) between these two datasets is 0.71, which indicates a moderately strong correlation and, more importantly, the slope of the best-fit line is nearly 1, which indicates that EC at W01 is generally equal (or slightly lower given the slope is 0.9) than EC measured at Muswellbrook. The significance of this figure is that is shows that there is not generally any significant change in EC (and thus change in water quality conditions) between the Muswellbrook site and Bengalla.

Figure B 4.10 (left pane) establishes the relationship between EC in the Hunter River and EC measured at Bengalla's upstream monitoring site but would not account for discharge into the Hunter River at Bengalla, which may be direct discharge of surface water or indirect discharge via groundwater baseflow through the alluvial aquifer adjacent to the river. The effect of discharge from Bengalla would, instead, be evident by a change in water quality between monitoring sites along the river. This was investigated by comparison between EC measured at site W01 (most upstream site) and site W04 (most downstream site), which is shown in Figure B 4.10 (right pane). This comparison produces an R^2 value of 0.76 and a slope of 1.04. While the slope implies EC at W04 is statistically likely to be slightly higher than EC at W01, the R^2 implies there is also considerable variability in the difference and that W04 is occasionally lower than W01. Furthermore, Figure B 4.10 covers from 2007 through 2025 and, under circumstances where Bengalla is authorised to release water into the Hunter River under the HRSTS (as it did in May and August 2025), it would be expected for EC to increase between W01 and W04.

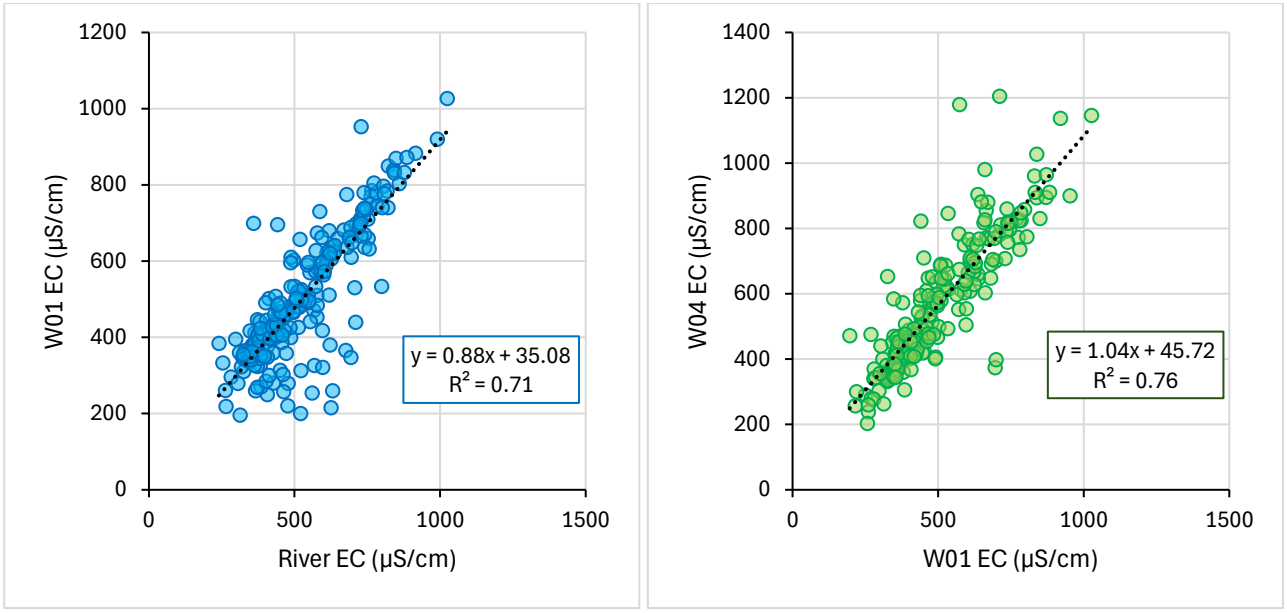


Figure B 4.10 Hunter River EC vs W01 (left pane) and W01 vs W04 (right pane)

B4.3.2 Surface water pH

Measured pH values have been generally near or above 8.0 for 2025 which is consistent with the entire period of record (see Figure B 4.11). With the exception of initial low pH values in 2007 (around 7.0), pH at all sites has been generally consistent between 7.5 and 8.2 with no clear change between sites W01 and W04 (average difference < 0.03). While there appear to be some subtle trends in the dataset (such as a slight dip in average pH below 8.0 between 2014 and 2016), the absence of large changes make comparison to river stage unlikely to produce a meaningful correlation and suggests that pH measured at Bengalla is generally stable. The correlation between W01 and W04 data is provided in Figure B 4.12 and the best-fit line produced a slope of 0.82 (indicating pH in W04 is generally lower than at W01) and an R^2 of 0.55 (indicating only moderate correlation) and indicating, overall, that there is no discernible change in pH in the Hunter River as it flows past Bengalla.

Data on pH is collected from the Hunter River at Muswellbrook and published in annual reports (see Table B 4.2). The 2023-2024 annual report shows that the median pH recorded at Muswellbrook was approximately 7.7 and ranged from approximately 7.0 to 8.3 (DCCEEW 2025). These values are consistent with previous years' reports and also consistent with data collected at Bengalla and implies that pH is consistent with in situ conditions of the Hunter River and that there is no significant change in pH near Bengalla.

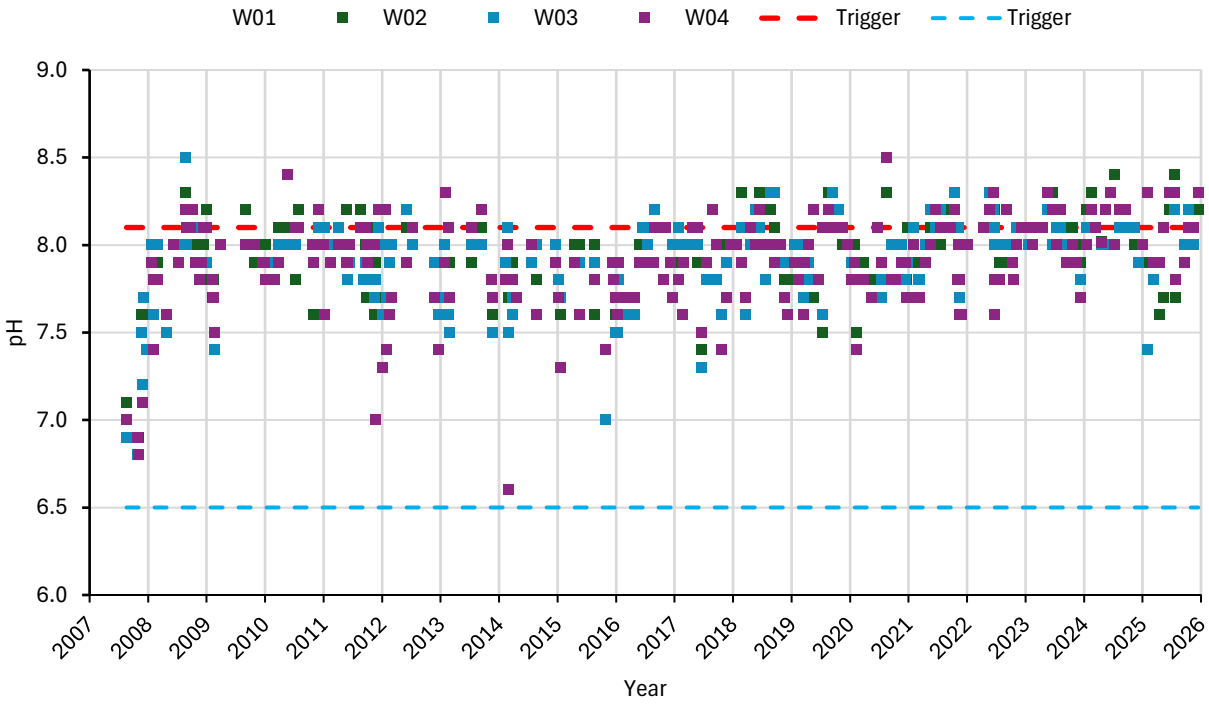


Figure B 4.11 pH readings at Bengalla (2007-2025)

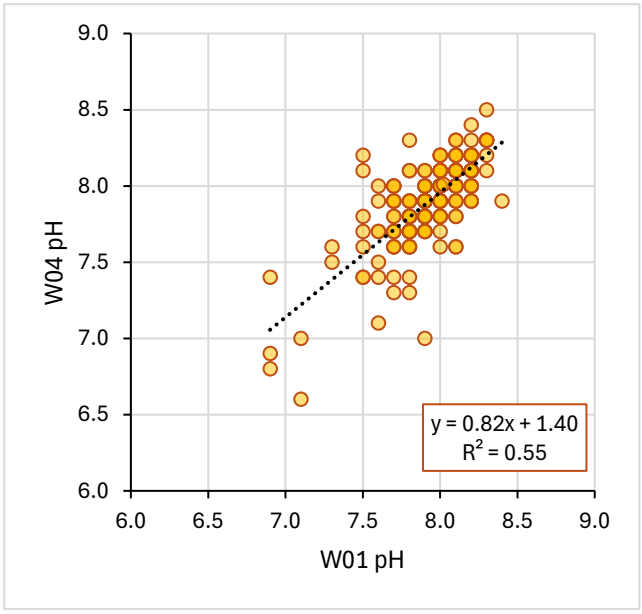


Figure B 4.12 W01 pH vs W04 pH and best-fit line

B4.3.3 Surface water TSS

Total suspended solids (TSS) remained mostly below trigger thresholds in 2025, with only a few sites marginally exceeding the prescribed trigger level of 40 mg/L. This pattern is consistent with historic data (Figure B 4.13) which also shows generally low TSS readings (median: 20 mg/L) with occasional spikes but no clear long-term trends. There is, however, an apparent relationship between low TSS and low river stage from 2017-2020 but no other clear correlation (R^2 between river stage and W01 TSS < 0.01 – not shown). The average difference between W01 and W04 (W04-W01) for 2025 and for the full period of record is 8 mg/L and 1.3 mg/L. Figure B 4.12 shows W01 vs W04 which produces a best-fit line with a slope of 0.64 (R^2 = 0.68) indicating that W04 is generally less than W01 overall but also only moderate correlation (suggesting there is some independence in TSS between W01 and W04). Overall, this provides evidence that TSS is not typically increasing in the Hunter River as it passes by Bengalla.

Data from DCCEEW's surface water quality report shows that TSS at Muswellbrook had a median value of approximately 13 mg/L and a range between 10 and 20 mg/L. This, as with pH, is consistent with data collected by Bengalla and indicates that the measured TSS is consistent with in situ conditions of the Hunter River upstream of Bengalla.

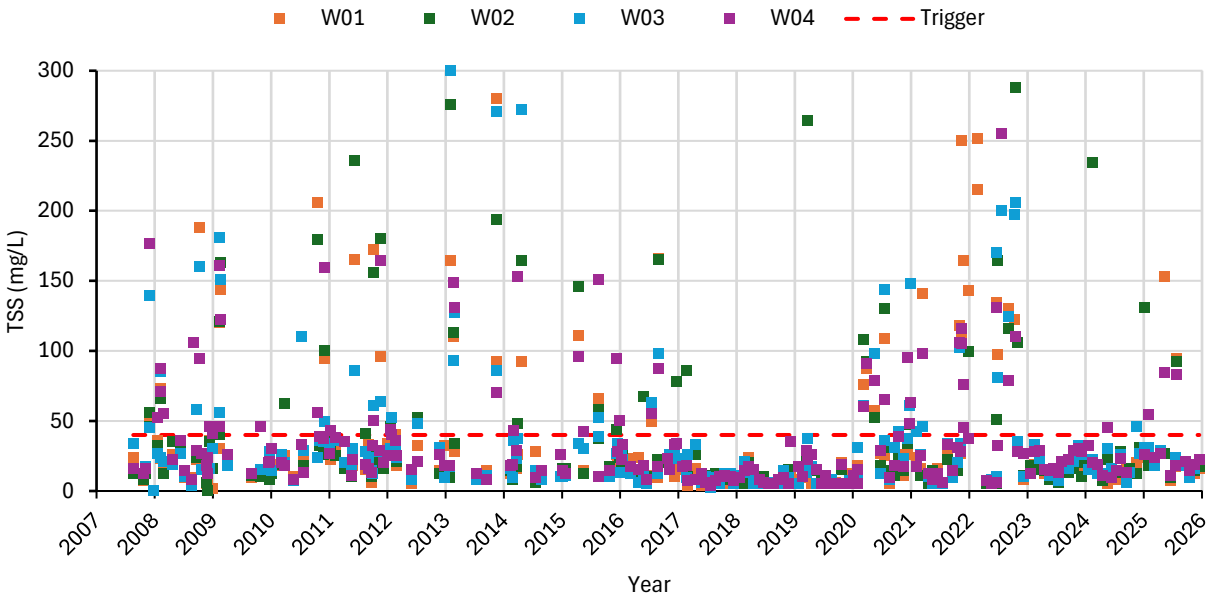


Figure B 4.13 TSS readings at Bengalla (2007-2025)

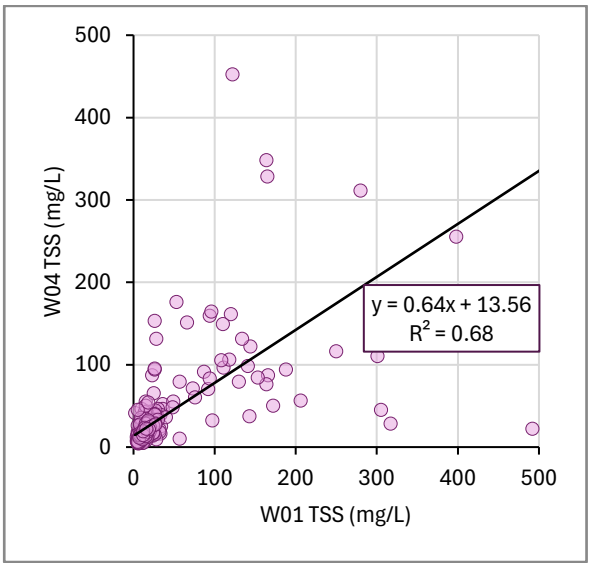


Figure B 4.14 W01 TSS vs W04 TSS and best-fit line

B5 Summary and Conclusions

Benalla operates under Development Consent (SSD-5170) and under their Water Management Plan (WMP), which lays out criteria for monitoring groundwater and surface water to ensure any adverse impacts from mining activities are quickly identified and addressed. Part of the WMP is the Surface Water Monitoring Program which includes monthly monitoring at four sites along the Hunter River, which is the receiving water source for discharge from Bengalla. The WMP also provides trigger values for water quality measured at the Hunter River sites. When measured values exceed trigger levels, the WMP requires investigation.

Average water quality conditions for the Hunter River were summarised in this report based on publicly available data from WaterNSW and from annual surface water quality reports from DCCEEW. These sources provide average conditions for pH, EC, and TSS (and others) in the Hunter River at various sites including at Muswellbrook which is just upstream from Bengalla. Review of these data sources indicate that in situ surface water conditions in the Hunter River are fairly consistent to measured values at Bengalla. Comparison between EC and river stage from the Aberdeen site indicates to strong correlation between river stage and EC, with high EC being correlated to prolonged periods of low river stage and low EC correlated to high stage.

Surface water quality data (pH, EC, and TSS) collected at Bengalla's surface water monitoring sites in 2025 was reviewed for exceedances of the prescribed trigger levels and compared to in situ conditions as well as long-term trends in the data. Comparison was also made between the upstream Bengalla site (W01) and the downstream site (W04) to identify any significant changes in water quality in the Hunter River as it passes by Bengalla. Key findings for pH, EC, and TSS are provided below.

B5.1 EC summary

- EC measurements from all sites ranged from 300 µS/cm to 965 µS/cm in 2025 and all measured sites recorded exceedances in October and November with EC up to 315 µS/cm above the trigger level of 650 µS/cm. Similarly, exceedances were recorded at sites W03 and W04 in January and February. Comparison to rivers stage indicates that these exceedances coincide with an periods of low stage in the Hunter River as well as higher EC values measured in the Hunter River at Muswellbrook.
- The EC behaviour in 2025 is consistent with the long-term behaviour of higher EC recorded at Bengalla following persistent low-stage periods (e.g. end of 2025). Data from the Hunter River monitoring site at Muswellbrook was used to establish this trend between EC and river stage for the full period of record (2007-2025) which confirmed that high EC corresponds to low stage and vice versa.
- A comparison of EC measured at Bengalla at W04 (downstream site) and W01 (upstream site) indicates that there is no clear trend of increasing or decreasing EC in 2025, rather the exceedances are part of natural in situ conditions of the Hunter River. Comparison of the longer record (2007-2025) indicates a very slight bias toward higher EC in W04 than W01 (slope of best-fit line = 1.04, R2 = 0.76), but when considering that release of water into the Hunter River is permitted at certain times under the HRSTS, including May and August 2025, this relationship indicates that, even though discharge is allowed, there is no major increase in EC in the Hunter River as it passes by Bengalla.
- Overall, the review of EC data indicates values measured by Bengalla for 2025 are representative of in situ river conditions, as illustrated by EC data from the Muswellbrook site.

B5.2 pH summary

- pH measurements from all sites in 2025 ranged from 7.5 to 8.4 with most sites regularly exceeding the prescribed upper trigger level of 8.1 or recording values near it.
- The exceedances do not appear to be part of a trend in increasing pH but represent a continuation of average pH levels over the full period or record (2007-2025). These pH values are consistent with in situ water quality conditions in the Hunter River at Aberdeen, Muswellbrook, and Singleton.
- Comparison of pH readings between upstream and downstream sites (W04-W01) does not indicate a preferential bias towards changing pH between the sites in 2025 (average difference = 0.01), which is consistent with the long term data (average difference < 0.03) which produces a best-fit line with a slope of 0.82 (R^2 = 0.55) indicating a slight bias towards lower pH in W04 than W01.
- The pH data indicate that any discharge occurring from Bengalla (either direct or indirect) over the period of record is not causing a change in water quality in the Hunter River with respect to pH.

B5.3 TSS summary

- TSS measurements ranged from less than 10 mg/L to 153 mg/L throughout 2025 and results from surface water sites varied over 2025. Exceedances were observed at single sites in January and February, two of three sites in May, and all measured sites in August. The exceedance in May was unusually high and corresponds to a period of high rainfall in the region, potentially causing localised conditions to have elevated TSS levels.
- The TSS readings show no clear trends throughout 2025 and no clear correlation to river stage, which is consistent across the full period of record (2007-2025). The only exception is a period from 2017-2020 where both low stage and low TSS were recorded, but this is not enough to influence an overall correlation.
- There is also no strong relationship in TSS between W01 and W04 in 2025 or for the full period of record, which has a slope of 0.64 (R^2 = 0.68), indicating a moderate bias toward lower TSS in W04 than W01. This suggests that TSS generally variable across the different monitoring sites but indicates no clear or consistent change in TSS in the Hunter River as it passes by Bengalla.

B5.4 General summary

The overall findings of this report are as follows:

- Only small amounts of discharge were provided to the Hunter River from Bengalla in 2025 but these amounts were less than 1% of flow in the river and therefore would have minimal measurable effect.
- Water quality at the upstream monitoring site (W01) is generally consistent with conditions measured upstream at Muswellbrook and EC is strongly correlated with river stage. This is likely similar for pH and TSS although those data are not available at the Muswellbrook site.
- There is no clear strong relationship between water quality measurements at upstream and downstream sites at Bengalla indicating no change in water quality in the Hunter River as it passes by Bengalla, meaning no evidence of impact.
- There is no change in beneficial use category for the surface water sites although the elevated EC may make the water a risk for irrigation of salt sensitive crops. There is no risk of environmental harm.

B6 Recommendations

After review of the surface water data, AGE are providing the following recommendations:

- Update EC, TSS, and pH trigger levels based on:
  - measurements made at Bengalla sites; and
  - measurements made at other sites along the Hunter River (e.g. using data collected by government agencies).
- No changes to the surface water monitoring network are recommended at this time.

B7 References

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Appendix H

Rehabilitation Monitoring Report

OzEnvironmental Pty Ltd is now proudly part of the Moss Group of companies

Rehabilitation Monitoring and Audit 2025

Bengalla Mining Company Pty Ltd

Locked Mail Bag 5

Muswellbrook, NSW, 2333

Project number: J000210

FEBRUARY 2026

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MOSS ENVIRONMENTAL GENERAL NOTES

Project No: J000210 (Rev01)

Title: Rehabilitation Monitoring and Audit 2025

Client: Bengalla Mining Company Pty Ltd

Date: 26 February 2026

Status: Final

Document Control

Rev	Date	Prepared by	Reviewed by	Approved by	Remarks
00	19 January 2026	Nico Brits	Nicholas Everitt (review of flora data & text related to flora data)		Draft for review
01	25 February 2026	Nico Brits	Samantha O'Sullivan Hayley Frazer		Incorporate client comments on draft report

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DECLARATION

Moss Environmental would like to acknowledge the Aboriginal people who are the traditional custodians of the land in which this project is located. Moss Environmental would also like to pay respect to Elders both past and present.

EXECUTIVE SUMMARY

This report presents the findings of the 2025 rehabilitation monitoring program conducted at Bengalla Mine (Bengalla) by Moss Environmental on behalf of Bengalla Mining Operations Pty Ltd (BMC).

Remediation, rehabilitation and revegetation works were completed in 2025 at Bengalla to establish high density woody vegetation (HDWV) and pasture on the eastern overburden emplacement area (OEA). Works are driven by the Rehabilitation Management Plan (RMP) and the Forward Work Plan (FWP) developed by BMC.

The rehabilitation monitoring program is implemented annually and has evolved in response to the increasing extent and maturity of rehabilitated areas as mining progresses. Historically, all rehabilitation transects were monitored every year; however, as ecological succession slows in more established rehabilitation, annual monitoring of all transects has become less informative. Accordingly, in 2024 a biennial, rotational monitoring approach was adopted, whereby half of the transects are monitored in Year A and the remaining half in Year B, with the cycle repeated thereafter. From 2024 onwards, transects with even numbers are monitored in even years and those with odd numbers in odd years, ensuring a consistent and manageable annual monitoring effort without compromising scientific validity, while achieving full site coverage every two years. The 2025 monitoring campaign (an odd-numbered year) included field data collection at 21 transect sites, focusing on erosion presence and severity, ground cover, species diversity, community structure and function, and soil characteristics, along with a rehabilitation audit of the surrounding management zones.

Field surveys were completed over a one-week period in November 2025, used to represent the 2025 monitoring period. Cumulative rainfall during the two years preceding this 2025 monitoring campaign was respectively ~118% (807.8 mm) and ~122% (833.9 mm) of the long-term (65-year) annual average (683.9 mm).

One area of pasture rehabilitation (Class III) was assessed for the 2025 monitoring round. The Class III pasture rehabilitation continued to display a satisfactory performance in 2025, albeit with lower live ground cover protection, with vegetative cover showing a high biomass and feed quality. Pasture composition recorded at P3 (Class III) in 2025 showed considerable change from the 2023 monitoring period. A total of 16 species were recorded which comprised only one desirable pasture species (one pasture grass), 11 non-invasive exotic species and four priority weeds.

Across all areas of HDWV rehabilitation, consistent with previous years, soil and slope stability were excellent at most monitoring sites with limited active erosion processes recorded. A few instances of minor rill and sheet erosion were recorded and are likely to require ongoing management. However, significant gully and channel erosion were noted as part of the wider walkover audit inspection (see Section 5.2). A total of 7 rills, 12 gully channels and 1 tunnel erosion channel were recorded and that would need remediation.

Protective ground cover increased in 2025 (except for HDWV09) likely due to more favourable climatic conditions (higher rainfall) in the 2023/24 and 2024/25 seasons. Protective cover remained above the 70% minimum cover benchmark at all historic rehabilitation areas[1].

The floristics species richness results indicate native species in the establishing vegetation communities across the rehabilitation zones have decreased slightly in proportion to exotics in 2025. In contrast to 2023, the wetter conditions could have resulted in the increase in exotic ground covers recorded which outcompeted native species.

Areas of historic HDWV rehabilitation are well established and have shown minimal change in condition in the past couple of years. Consistent with previous years and the well-established nature of the rehabilitation across historic areas, shrubs and trees diversity remained constant at all historic monitoring sites in 2025. Canopy tree stems densities have shown minimal change from 2023 results, however, sub-canopy small trees have declined from 2023 results. This is evidence of larger canopy trees continuing to survive whereas smaller sub-canopy trees have not been able to. Reasons for this are not clear at this time. Tree densities in newer rehabilitation areas (a key objective and requirement of the HDWV final land use) remain below acceptable targets.

[1] Historic rehabilitation areas include: HDWV01, HDWV03, HDWV07, HDWV09 and HDWV11.

Particularly, the density of canopy eucalypts remained unsatisfactory and will need to be increased through supplementary infill tree plantings. It should however be noted that over the past 6 years, HDWV trees has been progressively established, and this density will improve significantly as these trees grow and mature.

Establishment success continues to be inconsistent across the newer rehabilitation areas with variances between sites and rehabilitation methods being extremely wide ranging.

Overall and irrespective of their 2025 performance in terms of species composition and tree densities and taking into account the recruitment capability shown in wetter years, it is considered that there is adequate potential for the established communities to be self-sustainable.

Newer HDWV rehabilitation[2] (established since 2020 under the RMP) was highly variable in condition, influenced by the different revegetation techniques and approaches implemented:

- Areas dressed with topsoil and direct seeded showed high protective ground cover levels, high weed cover levels and vastly variable tree stem densities (i.e. limited germination strike rates).
- Areas direct-seeded in a subsoil substrate showed moderate to poor ground cover establishment, moderately low weed cover levels and very low tree stem densities (indicating poor germination strike rates and potential deficiencies in the growth medium).
- Areas seeded directly into overburden showed moderate to poor ground cover establishment, moderately low weed cover levels and variable but on average satisfactory tree stem densities and increasing from 2023 counts.
- Areas planted with tubestock into in situ topsoil showed very high protective ground cover, high weed cover levels and variable but on average satisfactory tree stem densities.

Total species richness recorded in 2025 at the monitoring sites was variable and ranged between 11-26 species for an average of ~19.6 species per site. This is slightly lower than the 2023 average of ~22.3 species per site. The representation of native species (in proportion of total species richness) has decreased to an average of ~16.9% across all sites (compared to an average of ~19.9% in 2023) and ranged between 4.5-26.3%. These results indicate that native species in the establishing vegetation communities across the rehabilitation zones have decreased slightly in proportion to exotics in 2025. In contrast to 2023, the wetter conditions could have resulted in the increase in exotic ground covers recorded which outcompeted native species.

In the older rehabilitated areas, a total of 16 mid and upper storey species were recorded across the historic sites comprising 12 NSW native species (5 shrubs, 3 small trees and 4 canopy trees) and 4 exotic species (2 shrubs and 2 canopy trees). Of the 12 native species, 8 species (or 66.7%) were characteristic of the Central Hunter Grey Box – Ironbark Woodland (CHGBIW) or Central Hunter Spotted Gum – Ironbark – Grey Box Forest (CHSGIGBF) communities. For the newer established rehabilitation areas, the 2025 results showed that a total of 22 mid and upper storey species were recorded, comprising 20 NSW native species (11 shrubs, 3 small trees and 6 canopy trees) and 2 exotic species (all shrubs). Of the 20 native species, 15 species (or 75.0%) were characteristic of the CHGBIW or CHSGIGBF communities. It should be noted that there is no requirement to re-create a specific native vegetation community profile as part of the rehabilitation objectives for Bengalla, however shrub and tree species targeted for reestablishment will generally come from the local Central Hunter Grey Box – Ironbark Woodland (GBIW) and Central Hunter Spotted Gum - Ironbark – Grey Box Forest (SGIGBF) vegetation communities.

Shrub and tree species diversity continue to be, on average, higher in areas planted with tubestock than in all seeded areas (irrespective of the substrate); indicating variable and inconsistent strike rates and germination success where seeding was undertaken.

Tree establishment success continues to be inconsistent across the newer rehabilitation areas with variances between sites and rehabilitation methods being extremely wide ranging.

In total, only 5 of the 20 monitoring sites met the defined tree density benchmark which is an improvement on the previous year's results. Total stem densities recorded in 2025 averaged ~292 stems/ha in the historic rehabilitation sites, which is below the

[2] Newer rehabilitation areas include: HDWV15, HDWV17, HDWV19, HDWV21, HDWV23, HDWV25, HDWV27, HDWV29, HDWV31, HDWV33, HDWV35, HDWV37, HDWV39, HDWV41 and HDWV43.

defined target benchmark of 400 stem/ha. Stem densities averaged ~357 stems/ha in the newer rehabilitation sites which is also below the defined target benchmark.

Soil sampling and analysis was undertaken at all sites monitored in 2025. Testing results generally indicated no key deficiencies in the various growth media, except for pH at the majority of sites and salinity at two sites. The results from the 2025 monitoring are currently outside completion criteria for pH however these are likely to reduce over time. pH could, be assessed for appropriate ameliorants since current levels have the potential to impact on establishment and growth of native vegetation as pH of all sites is trending upwards towards higher alkalinity and should be assessed for appropriate management measures to reduce the pH levels. Organic material analysis returned generally moderate to high levels at most sites.

Additional issues observed during the walkover audit and requiring management inputs included weed infestations (particularly of Galenia, African Boxthorn and the high threat Prickly Pear weed (*Opuntia stricta*)), , insufficient incorporation of artificial habitat features.

CONTENTS

1. INTRODUCTION 1
1.1 Background 1
1.2 Report scope and structure 1
2. LAND REHABILITATION AT BENGALLA 3
2.1 Post-mining landscape and land use goals 3
2.2 Rehabilitation objectives 3
2.3 Existing rehabilitation 4
2.3.1 Background 4
2.3.2 Rehabilitation zones 4
2.4 Rehabilitation monitoring 6
2.4.1 Approach 6
2.4.2 Monitoring schedule 6
2.4.3 2025 Monitoring scope of works 6
3. METHODOLOGY 8
3.1 Transect-based monitoring 8
3.1.1 Monitoring sites 8
3.1.2 Site layout 9
3.1.3 Monitoring metrics and methods 11
3.2 Audit inspection 12
3.3 Works implementation 14
3.3.1 Monitoring dates 14
3.3.2 Weather conditions 14
3.4 Results interpretation 15
3.4.1 Transect-based data 15
3.4.2 Walkover audit observations 16
3.4.3 Compliance assessment 17
4. RESULTS – CLASS III PASTURE REHABILITATION 19
4.1 Transect-based monitoring 19
4.1.1 Photographic monitoring 19
4.1.2 Erosion 19
4.1.3 Ground cover protection 19
4.1.4 Soil properties 20
4.1.5 Pasture composition 24
4.1.6 Pasture productivity 24
4.2 Walkover Audit Inspection 29
4.3 Compliance Assessment 29
5. RESULTS – HDWV 31
5.1 Transect-based Monitoring 31
5.1.1 Photographic Monitoring 31
5.1.2 Erosion 31
5.1.3 Ground Cover Protection 31
5.1.4 Soil Properties 33
5.1.5 Floristics 40
5.1.6 Tree Stems Densities 49

5.1.7 Regeneration 50
5.2 Walkover Audit Inspection 51
5.3 Compliance Assessment 54
6. RECOMMENDATIONS 58
6.1 Erosion Repairs 58
6.2 Weeds 58
6.3 Feral Pests 59
6.4 HDWV Establishment 59
6.5 Habitat Augmentation 59
7. REFERENCES 60

TABLES

Table 3.1: Bengalla rehabilitation monitoring program – 2025 monitoring sites 8
Table 3.2: Monitoring metrics and assessment methods 11
Table 3.3: Rehabilitation performance criteria guidelines 17
Table 3.4: Bengalla rehabilitation objectives and completion criteria 17
Table 4.1: Progress against RMP completion criteria – Class III Pasture 29
Table 5.1: Soil analysis – key findings 33
Table 5.2: Mid and canopy species composition (2025) – HDWV (historic rehabilitation) 43
Table 5.3: Mid and canopy species composition (2025) – HDWV (newer rehabilitation) 45
Table 5.4: Natural regeneration 2025 51
Table 5.5: Walkover audit key findings 2025 – HDWV rehabilitation 51
Table 5.6: Progress against RMP completion criteria (HDWV) 2025 – landform, erosion, habitat and feral pests 54
Table 5.7: Progress against RMP completion criteria (HDWV) – Soils and vegetation 56

FIGURES

Figure 1.1: Site Locality Map 2
Figure 2.1: Rehabilitation Management Zones 5
Figure 3.1: Monitoring site layout 9
Figure 3.2: Monitoring sites 10
Figure 3.3: Rehabilitation audit tracks (*Note: some tracks did not record on the mobile app due to suspected poor network coverage*) 13
Figure 3.4: Local annual rainfall 2019-2025 (cumulative December to November) 15
Figure 3.5: Local monthly rainfall data 2019-2025 (cumulative) 15
Figure 4.1: Soil cracking at P3 19
Figure 4.2: Ground cover protection (2025) – Class III Pasture 20
Figure 4.3: Soil properties monitoring results (2014 – 2025) – Class III Pasture 23
Figure 4.4: Species composition monitoring results (2014-2025) – Class III Pasture 24
Figure 4.5: Pasture biomass monitoring results P3 (2014-2025) 25
Figure 4.6: Dry matter digestibility 26
Figure 4.7: Crude protein content 26
Figure 4.8: Metabolisable energy 27
Figure 4.9: Feed availability 27
Figure 4.10: Potential stocking rate 28
Figure 4.11: Phosphorus 28
Figure 5.1: Ground cover protection (2022-2025) – HDWV (historic rehabilitation) 32

Figure 5.2: Ground cover protection (2022-2025) – HDWV (new rehabilitation) 33
Figure 5.3: Soil properties monitoring results (2021-2025) – HDWV.....39
Figure 5.4: Total species richness (2022-2025) – HDWV (historic rehabilitation) 40
Figure 5.5: Total species richness (2022-2025) – HDWV (newer rehabilitation).....41
Figure 5.6: Contribution of species types to total live ground cover – HDWV (historic rehabilitation) 41
Figure 5.7: Contribution of species types to total live ground cover – HDWV (newer rehabilitation).....42
Figure 5.8: Cumulative weed cover levels 2025 – HDWV (historic rehabilitation) 47
Figure 5.9: Cumulative weed cover levels 2025 – HDWV (newer rehabilitation).....47
Figure 5.10: Tree stem densities (2022-2025) – HDWV (historic rehabilitation) 49
Figure 5.11: Tree stem densities (2022-2025) – HDWV (newer rehabilitation).....50
Figure 5.12: Walkover audit key findings 2025 – HDWV rehabilitation 53

APPENDICES

APPENDIX A 2025 PHOTOGRAPHIC MONITORING RECORD 61
APPENDIX B 2025 WALKOVER AUDIT PHOTOGRAPHS 82
APPENDIX C 2025 SOIL LABORATORY ANALYSES REPORT 87
APPENDIX D 2025 FLORISTICS MONITORING RESULTS.....88
APPENDIX E 2025 PASTURE FEED QUALITY TESTING REPORT 91

1. Introduction

1.1 Background

Bengalla Mine (Bengalla) is located approximately 4 kilometres (km) west of the township of Muswellbrook in the Upper Hunter Valley of New South Wales (NSW). The site location is illustrated in Figure 1.1 below. The mine is managed and operated by Bengalla Mining Company Pty Limited (BMC), a joint venture ownership with New Hope Group and Taipower. BMC is responsible for all facets of the operation including coal extraction, final landform development and rehabilitation works.

BMC presently operates under Development Consent for State Significant Development (SSD) 5170 (as modified) which was granted by the NSW Department of Planning, Housing and Infrastructure (previously the Department of Planning and Environment) on 3rd March 2015 for the continuation of the Bengalla project. The approval allows for the extraction of up to 15 million tonnes per annum of run of mine coal until 2039.

As required by SDD-5170, post-mined land rehabilitation at Bengalla is carried out progressively and as soon as reasonably practicable following disturbance. Once initial rehabilitation works are complete, rehabilitation monitoring and inspections begin to ensure successful progression towards defined goals and objectives. The annual rehabilitation monitoring program at Bengalla commenced in 2009 and has been successively implemented by AECOM (2009-2017), Koru Environmental (2018-2022 and 2024) and Moss Environmental (2023). Monitoring is implemented to satisfy the requirements of:

- Relevant conditions contained in SDD 5170 Consolidated consent;
- Relevant conditions imposed on the mining leases under the Mining Act, 1992; and
- The current Rehabilitation Management Plan (RMP) (BMC, 2023).

1.2 Report scope and structure

This report provides a brief overview of rehabilitation requirements and objectives at Bengalla, outlines the monitoring methods and presents the results of the ensuing 2025 rehabilitation monitoring works conducted in November 2025 by Moss Environmental Pty Ltd on behalf of BMC. The report is structured as follows:

- Section 2 – highlights rehabilitation requirements and objectives for Bengalla, and the monitoring approach adopted to assess and report on performance condition.
- Section 3 – details the rehabilitation monitoring methodology, as defined in the current RMP.
- Section 4 – presents and discusses the 2025 monitoring results for the Class III pasture rehabilitation, including an assessment of rehabilitation progress against the defined completion criteria.
- Section 5 – presents and discusses the 2025 monitoring results for areas of HDWV rehabilitation, including an assessment of rehabilitation progress against the defined completion criteria.
- Section 6 – provides high-level generic recommendations suggested to improve rehabilitation condition, based on the 2025 monitoring results and observations.
- Section 7 – includes the bibliography of references cited throughout this report.

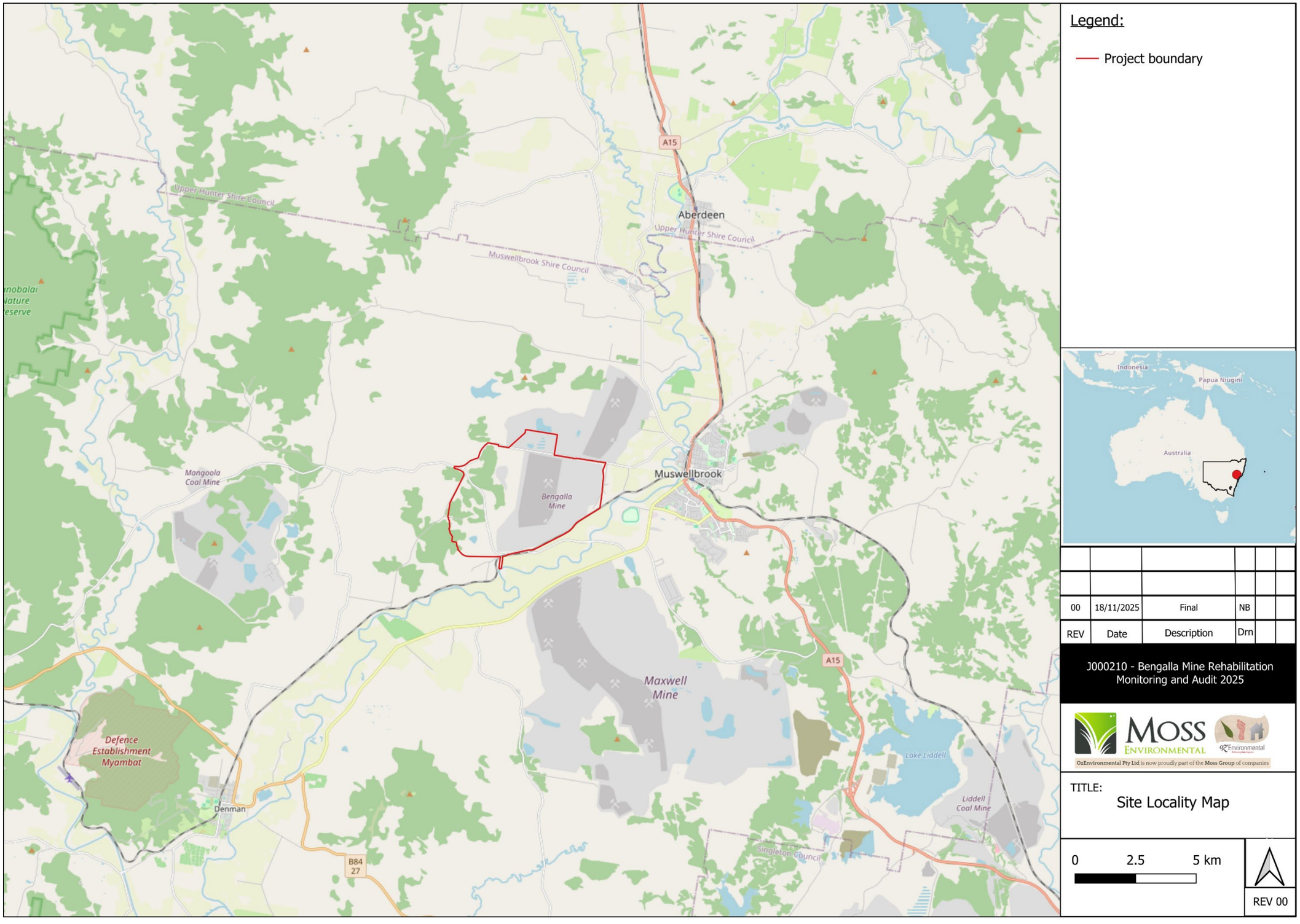


Figure 1.1: Site Locality Map

2. Land rehabilitation at Bengalla

2.1 Post-mining landscape and land use goals

The overarching objective of the Bengalla rehabilitation program is to develop a safe, stable, and non-polluting landscape that is consistent with rehabilitation requirements stated in relevant project approvals and the *Mining Act 1992*. This will be achieved by the development of an undulating, free draining post mining landform (excluding final void) that is consistent with the surrounding environment.

Pasture Class IV and V revegetation areas with a minimum 10% tree coverage will cover the majority of the post-mining landform, however the face of the overburden emplacement area (OEA) that is exposed to Muswellbrook and Denman will be rehabilitated with high density woody vegetation (HDWV) comprising of species commensurate with the surrounding native vegetation.

The ephemeral watercourse known as Dry Creek (which has been diverted to facilitate mining operations at Bengalla) is currently approved to be re-instated after the relevant area has been mined through.

2.2 Rehabilitation objectives

In order to achieve the final land use objectives defined for Bengalla, 'domains' (including 'final land use' domains and 'mining' domains as defined in Section 4 of the Resources Regulator Rehabilitation objectives and rehabilitation completion criteria guideline) have been selected by Bengalla and incorporated in the RMP which are used to divide the site into small, more manageable areas. Domains are usually defined based on the consideration of specific requirements of the mining location and the local environment. Each domain will generally require specific decommissioning and rehabilitation methods to successfully achieve the intended post-mining land use.

A total of five mining domains (i.e. active areas) and seven final land use domains have been defined for the site as per the RMP. Currently relevant to the rehabilitation monitoring program are the final land use domains defined as 'Native Ecosystem (HDWV)-Domain A', 'Agricultural – Grazing'-Domain B, and 'Water Management Areas'-Domain F, which have been re-established on overburden emplacement areas (i.e. mining Domain 4)'.

- Domain A (Native Ecosystem – HDWV) relates to the eastern and southern faces of the OEA which are exposed to Muswellbrook and Denman and will consist of HDWV with pasture. This design will allow for both visual amenity of the landform from external viewing locations and a native vegetation corridor over part of the OEA. The vegetation to be established will consist of high-density woodland vegetation with pasture along the contour banks (swales). There is no requirement to re-create a specific native vegetation community profile, however shrub and tree species targeted for reestablishment will generally come from the local Central Hunter Grey Box – Ironbark Woodland (GBIW) and Central Hunter Spotted Gum - Ironbark – Grey Box Forest (SGIGBF) vegetation communities.
- Domain B (Agricultural – Grazing) will comprise areas of:
    a. Class III pasture: a small sub-domain on the top of the eastern OEA where class III land capability was re-established. This domain has minimal slopes and was created from soils recovered from the Southern OEA (prior to emplacement).
    b. Class IV and V pasture: Class IV and V land capability pastoral lands will cover the majority of the post-mining landform. These pasture areas will be reconstructed using a mix of native grasses and improved pasture species. Throughout the domain, native vegetation will be introduced as scattered tree plots to create windbreaks and wood lots for stock shelter, as well as improve overall landscape connectivity.

2.3 Existing rehabilitation

2.3.1 Background

To date, rehabilitation works have been undertaken on the OEA to the east of the active mine. In accordance with BMC's previous development consent (DA 211/93), areas of pre-2016 rehabilitation across the eastern side of the OEA were revegetated with a mosaic of pasture and woodland rehabilitation (with no specific species selection).

However, the current approval (SSD-5170) was granted under the condition that the entire southern and eastern face of the OEA is to be entirely revegetated using HDWV, i.e. requiring BMC to retrofit historic rehabilitation areas not achieving adequate tree densities (i.e. areas of pasture rehabilitation and areas of low-density woody vegetation) into HDWV.

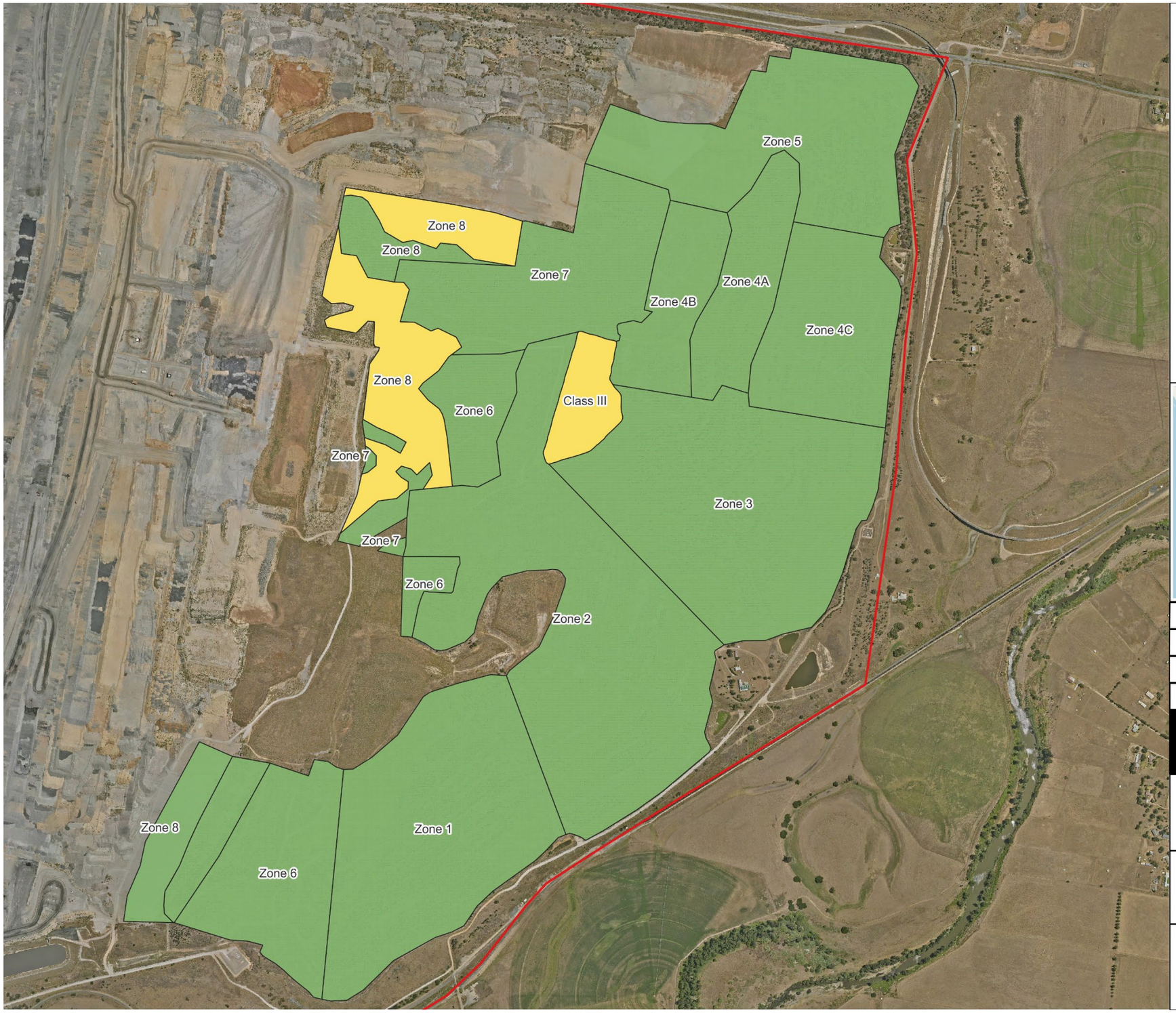
To that effect, a revegetation program to retrofit HDWV is underway which commenced in 2020. The strategy incorporates a combination of approaches including different revegetation techniques (direct seeding using a rear-mounted spreader, aerial seeding using a helicopter or drone, or tubestock plantings) in various substrates / growth medium types (topsoil, subsoil or overburden).

2.3.2 Rehabilitation zones

Rehabilitation works at Bengalla are undertaken in accordance with the Rehabilitation Strategy, the RMP and the Forward Work Program (FWP) developed by Bengalla. The program defines management zones based on existing conditions, revegetation strategy and timing for implementation. Management zones include both historic rehabilitation areas requiring to be converted to HDWV as well as areas of new rehabilitation (i.e. not previously established).

At the time of the 2025 monitoring campaign, a total of approximately 345 hectares (ha) of post-mined rehabilitated lands existed at Bengalla, comprising:

- ~5.5 ha of pasture rehabilitation, comprising Class III land capability.
- ~339.5 ha of native ecosystem (HDWV) rehabilitation on class IV and V land capability. Current rehabilitation areas at the site and the rehabilitation management zones are shown in Figure 2.1.



Legend:

- Project boundary
- Agricultural - Grazing (Pasture)
- Native ecosystems (HDWV)



REV	Date	Description	Drn		
01	24/02/2026	Amend rehab zones	NB		
00	18/11/2025	Final	NB		

J000210 - Bengalla Mine Rehabilitation Monitoring and Audit 2025

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TITLE:
Rehabilitation Management Zones Map

0 200 400 m

REV 01

Figure 2.1: Rehabilitation Management Zones

2.4 Rehabilitation monitoring

2.4.1 Approach

Rehabilitation monitoring at Bengalla is undertaken to satisfy the requirements of the RMP, with the monitoring results being reported in the Annual Review. The objective of the annual monitoring program is to assess rehabilitation progress against relevant performance indicators and completion criteria. The approach adopted to that effect includes a combination of transect-based monitoring and a rehabilitation audit:

- The transect-based monitoring relies on quantitative data that is collected in a consistent and repeatable manner to allow multi-year comparison of data and assessment of changes and trends occurring over time. The results of this monitoring indicate whether the rehabilitation meets the relevant objectives particularly pertaining to vegetation attributes and metrics (e.g. tree densities, floristic assemblages, vegetation structure, etc.), whilst highlighting potential deficiencies requiring improvement and management interventions.
- The rehabilitation audit is intended as a complement to the transect-based monitoring, and consists of a broad-scale, high-level walkthrough inspection of rehabilitated lands across the site with the main objective to identify any potential issues / deficiencies requiring maintenance treatments (e.g. slope stability or drainage issues, weed infestations, etc.).

2.4.2 Monitoring schedule

The rehabilitation monitoring program is implemented annually at the site.

Historically, all monitoring transects established across the rehabilitation were monitored on an annual basis. However, as mining progresses and additional rehabilitation is completed at the site, the density of transects (which is correlated to the area of rehabilitation) increases whereby ongoing annual monitoring of transects becomes less informative as the rehabilitation becomes better established (i.e. more mature) and ecological successional processes start to slow down.

Consequently, a decision was made in 2024 to change the monitoring frequency for each transect to biennial and establish a rotational schedule whereby half of the transects are monitored in Year A and the second half in Year B (and the alternance then repeated); with the exception of:

- Newly established rehabilitation areas;
- Drainage features; and
- Areas identified to have significant weed infestations in the previous monitoring report.

This will assist Bengalla in planning targeted remedial works on a risk-based approached. Starting in 2024, all transects coded with an even number were monitored in even years and those coded with odd numbers in odd years (i.e. this current monitoring campaign). This approach will allow to maintain a relatively consistent and reasonable monitoring effort every year, without compromising on the quality or scientific validity of the collected datasets. Accordingly, the geographical scope for the annual rehabilitation audit will generally be limited to the areas containing the transects for the given monitoring year, i.e. assessing the broader areas surrounding the transects and whilst travelling to and between monitoring transects. This way, comprehensive coverage of the rehabilitation will be achieved every two years.

2.4.3 2025 Monitoring scope of works

The scope of works for the 2025 monitoring campaign included the implementation of the field data collection program followed by processing, analysis and interpretation of monitoring results and associated reporting. The following were undertaken:

1. Step 1 – Field monitoring and assessments, consisting of:
    a. Transect-based monitoring of rehabilitated areas to measure slope stability (i.e. erosion), ground cover protection, species diversity, community structure and function, and soil characteristics – a total of 21 monitoring sites were assessed; and
    b. Rehabilitation audit – with inspection areas focussing on the management zones where monitoring transects are located.
2. Step 2 – Preparation of a rehabilitation monitoring report (this report): covering all aspects of the field work and site assessments, including an assessment of rehabilitation progress against relevant RMP completion criteria, and provision of recommendations for improvement where rehabilitation is underperforming.

3. Methodology

3.1 Transect-based monitoring

3.1.1 Monitoring sites

A total of 21 monitoring sites were monitored in 2025, comprising one Class III pasture site and 20 HDWV sites. Of the 20 HDWV sites:

- Seven sites were established in sections of the OEA where original rehabilitation works have been at least partially successful (i.e. trees/shrubs present), and located within zones 1, 3 and 5. Management zones 3 and 5 subsequently underwent rehabilitation criteria reform with the physical works to reform these sites completed in June 2023. For these sites several years of monitoring data are available to analyse long-term trends in vegetation condition.
- Seven sites were located within management zones 4 and 6 (i.e. Zone 6 rehabilitation works were completed in 2019, Zone 4 revegetation reform works completed in June 2023). These sites were established during the 2021/2022 monitoring campaigns, and this 2025 monitoring event represented the fourth and fifth year of data collection.
- Five sites were located within management zones 2 and 7 (i.e. revegetation works completed between 2021 and 2022). These were monitored for the first time in 2022, i.e. with this year's results representing the second year of comparable data collection.
- One site was located within management zone 8 (i.e. revegetation works completed in 2023). These were monitored for the first time in 2023, i.e. with this year's results representing the first year of comparable data collection.
- No new monitoring transects were established during the 2025 monitoring program. New areas that were rehabilitated in 2025 still had minor ongoing rehabilitation work within these areas, including that areas have not yet been seeded at the time of monitoring. However, new star pickets were installed at monitoring site HDWV21, as these were missing when the site was visited for monitoring. The replacement star pickets were installed at the coordinates specified in the RMP.

Details on the monitoring sites are listed in Table 3.1 and shown in Figure 3.2.

Table 3.1: Bengalla rehabilitation monitoring program – 2025 monitoring sites

Location / PRP zone	Site code	Monitoring started	Revegetation method	Coordinates (GDA94 Zone 56)	
				Easting	Northing
Class III area	P3	2014	Black cracking clay + direct seeded	296710	6427664
Zone 1	HDWV 07	2017	Topsoil + direct seeded	296381	6426121
	HDWV 09	2017	Topsoil + direct seeded	295982	6425838
	HDWV 35	2022	Topsoil + tubestock	296222	6426531
	HDWV 37	2022	Topsoil + tubestock	296047	6426403
Zone 2	HDWV 29	2022	Topsoil + tubestock	296262	6427151
	HDWV 31	2022	Topsoil + direct seeded	296851	6426955
	HDWV 39	2022	Topsoil + tubestock	296723	6426616
	HDWV 41	2022	Topsoil + tubestock	296688	6426462
Zone 3	HDWV 01	2011	Topsoil + direct seeded	297166	6427208
	HDWV 03	2012	Topsoil + direct seeded	296895	6427456

Zone 4	HDWV 15	2020	Topsoil + tubestock	297147	6427905
	HDWV 17	2020	Topsoil + direct seeded	296911	6427633
	HDWV 19	2020	Topsoil + direct seeded	297340	6427767
	HDWV 21	2020	Topsoil + direct seeded	297432	6427611
Zone 5	HDWV 11	2018	Topsoil + direct seeded	297501	6428270
Zone 6	HDWV 23	2021	Topsoil + direct seeded	296352	6427401
	HDWV 25	2021	Topsoil + direct seeded	295883	6426309
	HDWV 27	2021	Topsoil + direct seeded	295859	6425835
Zone 7	HDWV 33	2022	Overburden + aerial seeded	296728	6427867
Zone 8	HDWV 43	2023	Overburden + aerial seeded	296092	6427978

3.1.2 Site layout

Each monitoring site consists of a standardised 50 m long transect, with nested 1 m x 1 m and 2 m x 2 m plots, in the configuration depicted in Figure 3.1. Monitoring transects are established as follows:

- Transects are located along the contour i.e. across the slope (with some exceptions for historical monitoring sites established under previous monitoring methods).
- Transects are permanently established using metal star pickets at the start and end points to facilitate repeated measurements over time. This is essential for long-term monitoring to be meaningful; and
- Transects are located by GPS readings of the start and end points (±3m accuracy).

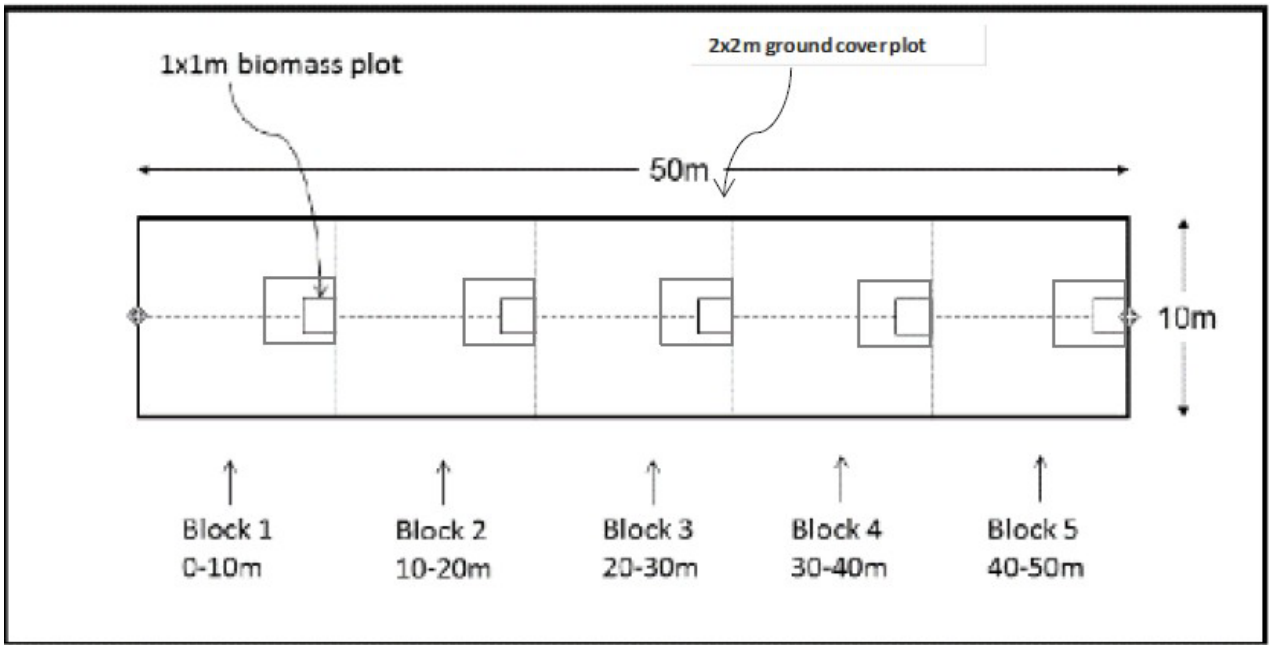


Figure 3.1: Monitoring site layout



Legend:

- Monitoring points
- Project boundary
- Agricultural - Grazing (Pasture)
- Native ecosystems (HDWV)



REV	Date	Description	Drn		
01	24/02/2026	Amend rehab zones	NB		
00	18/11/2025	Final	NB		

J000210 - Bengalla Mine Rehabilitation Monitoring and Audit 2025

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TITLE:
Monitoring Sites Map

0 200 400 m

REV 01

Figure 3.2: Monitoring sites

3.1.3 Monitoring metrics and methods

At each of the monitoring sites, the metrics presented in Table 3.2 were assessed and recorded (differing based on the target final land use).

Table 3.2: Monitoring metrics and assessment methods[3]

Metric	Sampling area	Methods
All monitoring sites		
Slope	50m transect line	• The slope gradient at the transect line is measured using a digital clinometer for accurate results.
Erosion	10m x 50m transect area	• Erosion is assessed in accordance with the guidelines in the Australian Soil and Land Survey Field Handbook (National Committee on Soil and Terrain, 2009) for sheet, rill, gully and tunnel erosion. • Where rills or gully features were present, their location, depth and width are recorded as they intercept the transect line.
Ground cover protection	2m x 2m quadrats	• The percentage cover live vegetation (projected), organic litter, rocks >200mm and bare ground are visually estimated.
Ground cover composition	2m x 2m quadrats	• All ground cover species (grasses, herbs and sub-shrubs) are identified (where possible) and recorded and assigned a foliage percent cover (FPC) score.
Soil properties	10m x 50m transect area	• A composite soil sample (made up of 5-6 x sub-samples) is collected and sent to a NATA-accredited laboratory for analysis of soil chemistry.
Pasture rehabilitation		
Pasture biomass	1m x 1m quadrats	• All standing herbage is cut to ground level using hand shears and the clipped material weighed on site using a digital scale to determine the standing herbage biomass.
Feed quality	10m x 50m transect area	• A sample of available forage material is collected (in accordance with the guidelines provided by NSW DPI (2017) and sent to a NATA-accredited laboratory for feed quality testing including.
HDWV rehabilitation		
Vegetation community composition and structure	10m x 50m transect area	• All trees and shrub species are identified and recorded. • A count is undertaken of all shrubs and trees to determine the overall stem densities. • Each recorded individual is categorised within a height category using the following classes: <1m, 1-3m, 3-5m, 5-8m, 8-12m, >12m.
	50m transect line	• FPC provided by shrub species and by tree species is measured using a line intercept method, with native species and exotic species assessed separately.
Habitat potential	10m x 50m transect area	• The presence and abundance of a litter layer, ground logs/woody debris, large rocks or other artificial habitat features were quantified and recorded.
Ecosystem resilience	10m x 50m transect area	• Results of the woody species height stratification are used to determine the occurrence of second-generation seedlings. • The presence of reproductive material (buds/flowers/fruits) on established shrubs and trees is recorded.

[3] The methodology listed in this table was extracted from the Bengalla Rehabilitation Management Plan, 2024.

3.2 Audit inspection

The audit consisted of a rapid-style assessment of rehabilitation areas whilst walking the site (see Figure 3.3 below), covering an area as comprehensive as possible within the available time allocation. Opportunistic sightings and assessments were made identifying the following where relevant:

- Serious erosion and slumping – including presence and severity of active erosion areas (e.g. rill, gully and tunnel erosion).
- Function and condition of existing erosion and sediment control structures and landform features, including water management structures (e.g. spine drains, contour banks), water ponding areas, etc. (where applicable).
- Visual assessment of ground protection and vegetation cover, vegetation health and growth rates.
- Presence of artificial habitat structures incorporated into the rehabilitation (e.g. nest boxes, logs, rock piles or large boulders, erect habitat trees, etc).
- Areas of significant weed incursion (with a particular focus on high threat exotics and priority weed species).
- Evidence of presence/impact of vertebrate pests; and
- Any other disturbance factors or features, such as presence of mine waste, track disturbance, damaged fences, etc.

GPS points (±3m accuracy) and geo-located photographs were taken of all observations made during the assessment. By collecting geo-located photos, areas can be re-visited in the future and photo-monitoring continued to demonstrate the evolution of the site condition over time.

Note: the audit tracks at monitoring site HDWV23is outside rehabilitated areas and therefore observations made here were not included in the report.



Legend:

- Monitoring points
- Native ecosystems (HDWV)
- Agricultural - Grazing (Pasture)
- Rehabilitation audit tracks
- Project boundary

REV	Date	Description	Drn		
00	18/11/2025	Final	NB		

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TITLE:
Rehabilitation Audit Tracks Map

0 200 400 m

REV 00

Figure 3.3: Rehabilitation audit tracks (*Note: some tracks did not record on the mobile app due to suspected poor network coverage*)

3.3 Works implementation

3.3.1 Monitoring dates

Field data collection took place over one week (10 – 15 November 2025) and was conducted by Nico Brits (Senior Environmental Consultant) and Nicholas Everitt (Principal Ecologist) from Moss Environmental. Monitoring activities were supervised by Samantha O'Sullivan (Environmental Advisor) from BMC.

3.3.2 Weather conditions

Interrogating local rainfall data in the context of an ongoing monitoring program is important as the amount of rain received during the months or even weeks preceding floristic surveys can strongly influence the species diversity observed in the ground layer (especially shorter-lived species of grass, forb, fern, twiner, etc.). Wet conditions tend to favour the emergence and flowering of many species (including weeds), whereas drier periods will often lead to lower recorded species diversity (often compounded by desiccated plants making positive species identification difficult). Consequently, cross-year comparisons of total species richness and abundance of vegetation typically require careful interpretation.

For rehabilitated lands on unconsolidated soil profiles, the amount (and intensity) of rainfall can also have repercussions on landform stability and surface erosion processes, especially in areas of steeper slope gradients and/or where a vegetative cover has not yet fully established (e.g. recent rehabilitation). In particular, heavy rainfall events (i.e. ≥25mm in 24-hour) generate high surface-flow velocities associated with greater erosive forces.

Rainfall data received in the locality over the past 7 years are illustrated in Figure 3.4 (cumulative 12-month rainfall calculated over the December-to-November period) and Figure 3.5 (monthly rainfall) (data from Muswellbrook (Lindisfarne) BoM Station No. 61168) and Muswellbrook (Spring Creek (Castle Vale) BoM Station No. 61192 (-32.2092 °S, 150.7365 ° E). The Spring Creek Met Station data was used during this monitoring due to Station 61168 presenting no data from March 2023.

Following the severe three-year statewide drought which impacted the region between 2016 and 2019 and placed a significant amount of stress on local vegetation and biophysical systems (including rehabilitated lands), conditions significantly eased off starting early 2020 and the locality received well above average annual rainfall between 2019 and 2022. The 2022/23 year shows a marked difference in rainfall, with a significant decrease to below average measurements. As shown in Figure 3.4, cumulative rainfall during the two years preceding this 2025 monitoring campaign was respectively ~118% (807.8 mm) and ~122% (833.9 mm) of the long-term (65-year) annual average (683.9 mm). It should be noted, however, that the majority of this rainfall occurred during the winter months.

Compared to long-term seasonal averages, the four-month period directly preceding the 2025 field survey received slightly below average rainfall, except for August 2025. Total rainfall received during the months of July (31.8mm), September (17 mm) and October (27.4 mm) was below their long-term monthly average. Total rainfall received during August (136.4 mm) was well above the long-term monthly average (Figure 3.5).

Finally, the locality experienced a total of 14 heavy rainfall events (>20mm) during the 12 months preceding the survey, two of which occurring during the four months leading up to the field surveys.

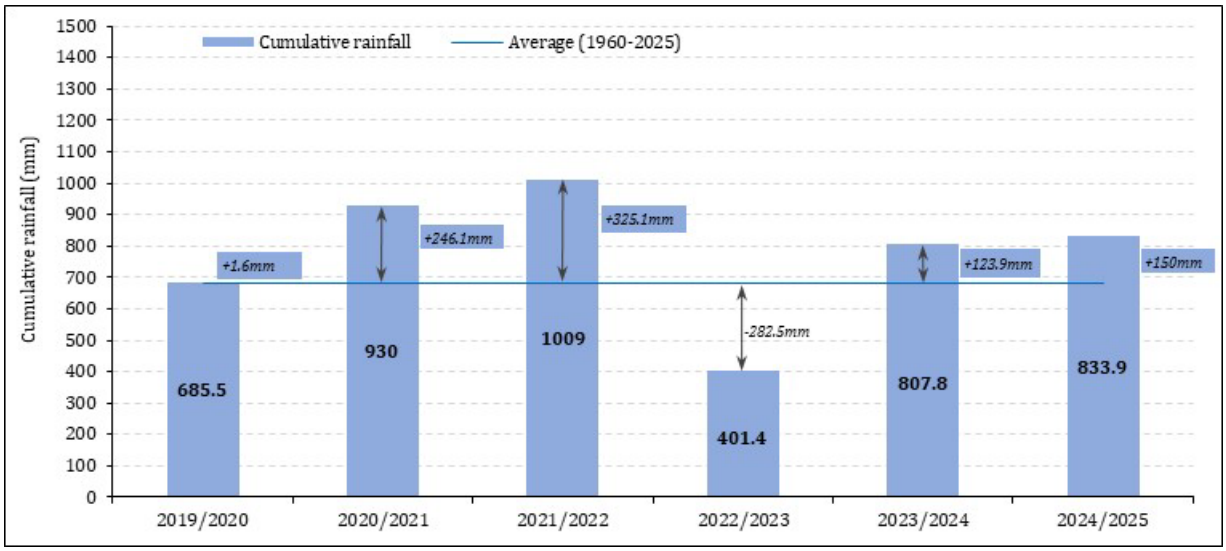


Figure 3.4: Local annual rainfall 2019-2025 (cumulative December to November)

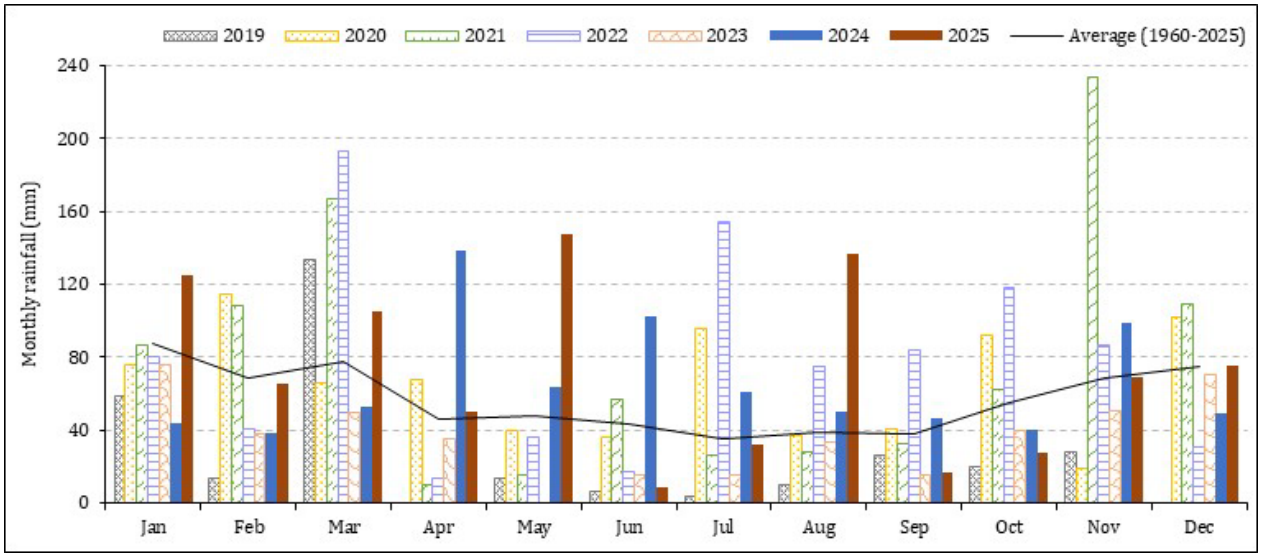


Figure 3.5: Local monthly rainfall data 2019-2025 (cumulative)

3.4 Results interpretation

3.4.1 Transect-based data

Results from the transect-based monitoring were analysed, tabulated, and presented graphically to provide a summary of key monitoring results for each area monitored. Where relevant, data from previous monitoring events were also included for comparison and trend analysis (noting that the monitoring frequency changed in 2024, making 2023 the most recent year suitable for cross-year comparisons for the locations monitored in this event).

The following data analyses and interpretation were undertaken:

- **Soil properties:** soil chemical properties of pH, salinity[4], sodicity and fertility were assessed against values documented in relevant literature (particularly Hazelton and Murphy, 2007) and as pertaining to value ranges known to be suitable and conducive to vegetation growth.

[4] Note that the electrical conductivity (EC) values reported in the laboratory report were converted to account for soil types (as per Hazelton & Murphy, 2007).

- **Ground cover:** ground cover was defined as including live vegetative cover, litter cover and other perennial and immovable ground features (such as logs or rocks >10 cm), and rehabilitation performance assessed against the previous MOP target of 70 % total protective cover.
- **Weed incidence:** data were interrogated for the presence and abundance of weed species[5]. Weeds were categorised as either 'non-invasive exotics' (i.e. low risk and generally requiring no active control except in severe cases) or 'priority weeds'[6] (i.e. problematic species requiring active and ongoing control). Weed cover was assessed as acceptable where ≤10 % cumulative Foliage Projective Cover (FPC).
- **Pasture composition[7]:** data were interrogated for the presence and proportion of suitable pasture species, as per the approved pasture species list in the RMP (Table 10) making up the pasture composition. These were defined to include: palatable and productive grasses, legumes, and other native species.
- **Pasture biomass:** satisfactory performance was defined where herbage biomass was ≥ 1,500 kg DM/ha (dry matter per hectare), which has been reported as the minimum herbage mass required to maintain satisfactory production in a dry cow cattle enterprise in the region (NSW DPI, 2006a).
- **Pasture productivity:** using the herbage biomass and feed testing results, potential carrying capacities and stocking rates of the rehabilitated pastures were calculated in accordance with the NSW DPI's 'Beef stocking rates and farm size – Hunter Region' (NSW DPI, 2006b).
- **Woody vegetation composition:** shrub and tree species establishing in the HDWV rehabilitation domain were assessed against species assemblage's characteristic of the local CHGBIW and CHSGIGBF communities to determine levels of resemblance. Performance was assessed as satisfactory where ≥75% of trees and shrubs were representative of the target communities. Assessment against these communities is a requirement for HDWV, as per Table 4, point A. The species are assessed in groups using the same groupings each monitoring year, as per Appendix C.
- **Woody vegetation density:** stem counts and densities were considered and reported for tree species only (tree species as defined in the BAM), which is believed to be the intent of the relevant RMP completion criteria. As defined in the RMP tree densities were assessed as satisfactory where greater than 400 stems/ha equivalent.
- **Natural regeneration:** in areas of mature woodland rehabilitation, regeneration was assessed as 'active' (i.e. second-generation seedlings present), 'potential' (i.e. no seedlings but reproductive material present on plants) or 'absent' (i.e. no seedlings nor reproductive material present).

3.4.2 Walkover audit observations

All observations made during the walkover audit inspection were assigned a priority ranking based on the categories and guideline defined in Table 3.3.

This approach (including performance categories) was adopted with the view to prioritise current rehabilitation issues impacting the site at the time of the monitoring, thereby providing BMC a record of what issues should be prioritised for maintenance / remedial actions (while also highlighting those areas of acceptable performance / practice).

[5] Having regards to the component of grazing land use defined for most of Bengalla's rehabilitation (including in areas of HDWV), introduced species suitable for grazing (i.e. pasture grasses and legumes) were not considered as weeds for the purpose of this monitoring program.

[6] Priority weeds were defined to include species listed as: priority weeds under the NSW Biosecurity Act 2015 (NSW WeedWise), Weeds of National Significance (WoNS), and/or High Threat Exotics (HTE) under the NSW BAM (NSW OEH, 2017). Additionally, and although not falling in either of these categories, *Acacia saligna* was also defined as a priority weed as the species is a known issue on mine sites locally.

[7] Note Pasture refers to both Class III and unclassified pasture areas. Class III pasture is assessed based on a unique set of criteria approved solely for the purpose of Class III pasture.

Table 3.3: Rehabilitation performance criteria guidelines

Priority	Type	Description
1	Urgent immediate action required	• Issues threatening the fundamental objectives of safe, stable and vegetated landforms (e.g. severe erosion issues compromising land capability, large bare areas, spontaneous combustion impacts, etc). • Unattended issues will prevent successful lease relinquishment. • Repair/remediation costs likely to increase rapidly if issue is left unattended.
2	Major maintenance works required	• Rehabilitation success compromised and does not meet completion criteria. • Issue processes and impacts may deteriorate if left unattended for a long period of time. • Significant management inputs required to address the issue and progress the rehabilitation towards defined objectives and criteria (e.g. repairs of minor/localised erosion, severe widespread weed infestations, large-scale revegetation or tree plantings, etc.)
3	Regular inspections, minor maintenance works, or improvement interventions required	• Does not meet completion criteria but future rehabilitation success unlikely to be compromised. • Localised or routine land management actions required to improve rehabilitation condition (e.g. localised weed control, supplementary infill tree plantings, fertiliser applications, incorporation of artificial habitat features, etc.) • Careful monitoring or regular inspections of area/issue required to confirm area/issue is not degrading further.
4	Observations of good practices or rehabilitation performance.	• Satisfactory rehabilitation performance (relative to the age of the rehabilitation) or example of good practice. • Meets or on trajectory to meet completion criteria (e.g. ecologically young areas). • Routine land management and monitoring should be continued to maintain status until relinquishment process is sought.

3.4.3 Compliance assessment

Using the analysed field monitoring data together with the observations made during the audit, an assessment was undertaken of current rehabilitation performance against associated completion criteria defined in the RMP (2024).

For reference, these criteria have been reproduced in Table 3.4, as relevant to the scope of this rehabilitation monitoring program (some criteria have been reworded, re-organised or grouped to remove duplicates or improve legibility).

Where no clear benchmark values are defined in the RMP for a specific indicator, pre-defined target benchmarks were used to provide an assessment of performance condition. These were based on review of published literature and studies, historical monitoring results, benchmarks in previous MOPs, and other relevant standards and guidelines.

It is further noted that several completion criteria require an assessment of rehabilitation condition against corresponding analogue sites (for both pasture and HDWV final land uses). The Bengalla rehabilitation monitoring program currently does not include relevant analogue sites, therefore progress against those criteria cannot be assessed.

Table 3.4: Bengalla rehabilitation objectives and completion criteria

Rehabilitation objectives	Completion criteria
Domain A (Native Ecosystem – HDWV) and Domain B (Agricultural – Grazing)	
Safe, stable and non-polluting	No uncontrolled access and demarcations present Adoption of standard fire prevention measures including firebreaks and minimising fire hazards, access maintained for fire fighting No visible signs of instability (slumping/cracks) requiring ongoing maintenance

	No erosion rills, gullies or tunnel erosion requiring ongoing maintenance No erosion in water/sediment management structures requiring ongoing maintenance No evidence of contamination Water quality of surface runoff within parameters suitable for relevant land use Surface runoff diverted to neighbouring drainage lines
Slope / macro-relief	Landform compliant with approved final landform
Incorporation of natural drainage lines	Water / sediment management structures installed as per design
Domain A (Native Ecosystem – HDWV)	
Soils suitability	Soil properties are appropriate for native vegetation growth
Sustainable vegetation cover	Species establishing are aligned to those included in the species mix for the domain Species diversity comparable to similar native woodland in the region
HDWV established	Tree stem densities maintained at ≥400 stems/ha
Ecosystem structure and function	Surface organic litter present Weed coverage comparable to similar native woodland in the region Evidence of reproductive material on shrubs/trees and/or presence of second-generation seedlings Recruitment rates are equal to or exceed mortality rates
Habitat augmentation	Habitat features (e.g. nest boxes, boulders, logs, etc) present on rehabilitated areas Presence of native animal activity
Feral pests incidence	No increasing trends in feral pests populations and species diversity
Domain B (Agricultural – Grazing)	
Landform suitable to establish Class III pasture	No surface rocks present that impede the post-mining land use
Soils suitability	Soil properties are appropriate for pasture growth
Vegetation cover suitable for pasture land use	Vegetative cover comparable to similar native woodland in the region Presence of a diversity of grasses and legumes from the species mix Pasture composition comparable to similar pasture areas within the region Weed coverage comparable to similar pasture area within in the region No species with known toxicity to grazing stock Pasture productivity comparable to regional averages Surface organic litter present
Feral pests incidence	No increasing trends in feral pest populations and species diversity

4. Results – Class III Pasture rehabilitation

4.1 Transect-based monitoring

4.1.1 Photographic monitoring

For reference, photographs taken in November 2025 for the 2025 annual monitoring from the permanent photo points at the start and end of the 50m transect line are provided in Appendix A.

The photographs depict the visual condition of the monitoring site at the time of the 2025 monitoring, which can be compared with previous monitoring years (supplied in previous annual monitoring reports) to determine evolution and changes in vegetation establishment and condition over time.

4.1.2 Erosion

No active erosion processes have been recorded, which is due to the very gentle to flat topography established to re-create Class III land capability. Several surface cracking in the soil has been noted throughout the transect area, which is because of the clayey nature of the soil.



Figure 4.1: Soil cracking at P3

4.1.3 Ground cover protection

Total protective cover at the ‘P3’ monitoring site declined relative to the 2023 monitoring period. While no exposed bare ground was recorded in 2023, 3.2% bare ground was recorded in 2025. Although the minimum benchmark of 70% total cover continues to be exceeded (Figure 4.2), live cover has decreased to 55.7%, representing an approximate 22% reduction compared with 2023. Over the same period, litter cover increased from 21.9% in 2023 to 41.1% in 2025. Overall, the data indicate a continued and steady decline in live cover at this monitoring site since 2021.

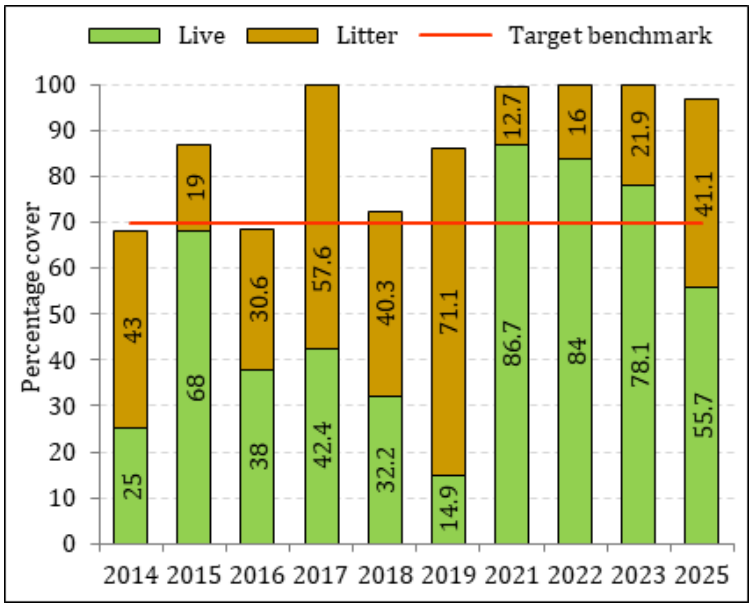


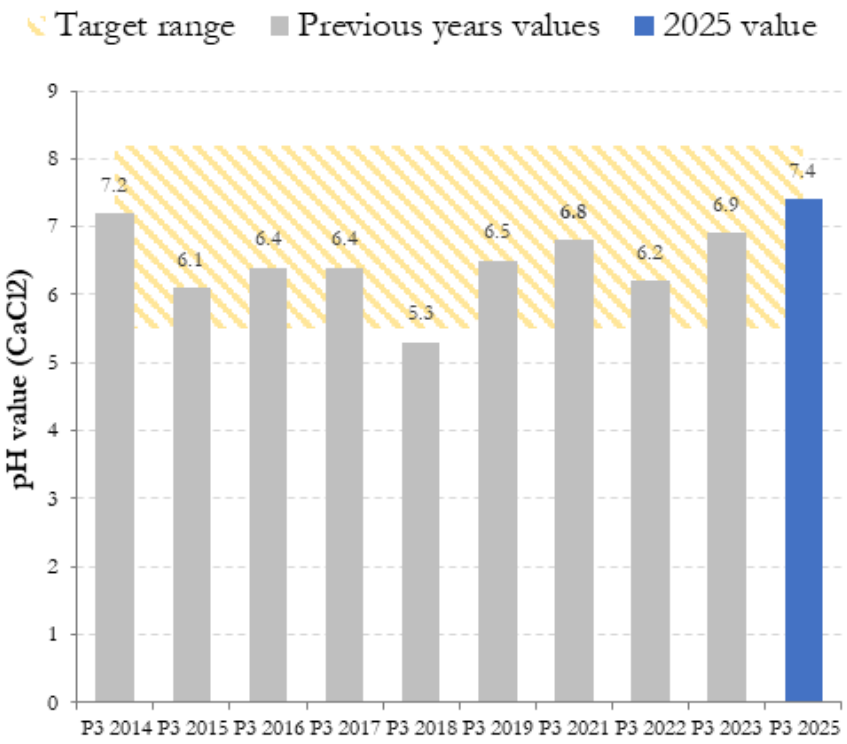
Figure 4.2: Ground cover protection (2025) – Class III Pasture

4.1.4 Soil properties

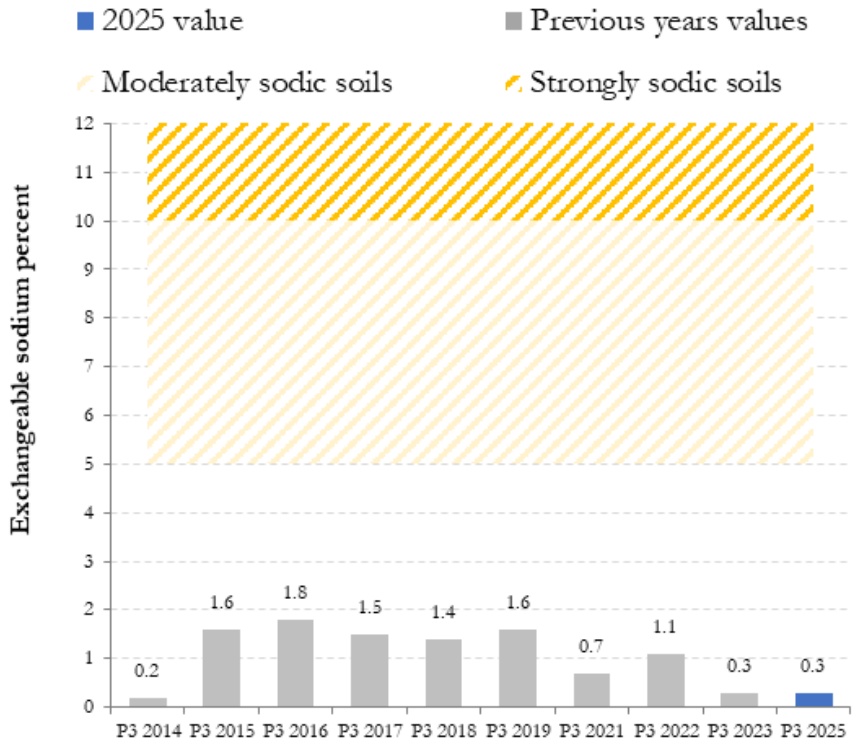
Testing results for key soil chemical properties (i.e. those most influencing and regulating plant establishment and growth) are presented in Figure 4.3; including pH, salinity converted from electrical conductivity (EC), sodicity, cation exchange capacity (CEC) and organic matter content (OM). For further reference, the detailed laboratory analysis report is provided in Appendix C.

The 2025 results for P3 were generally within range of previous years and only displayed minor seasonal variations. The tested soil sample at P3 was slightly alkaline, non-saline and non-sodic, and continued to show high levels of OM and CEC.

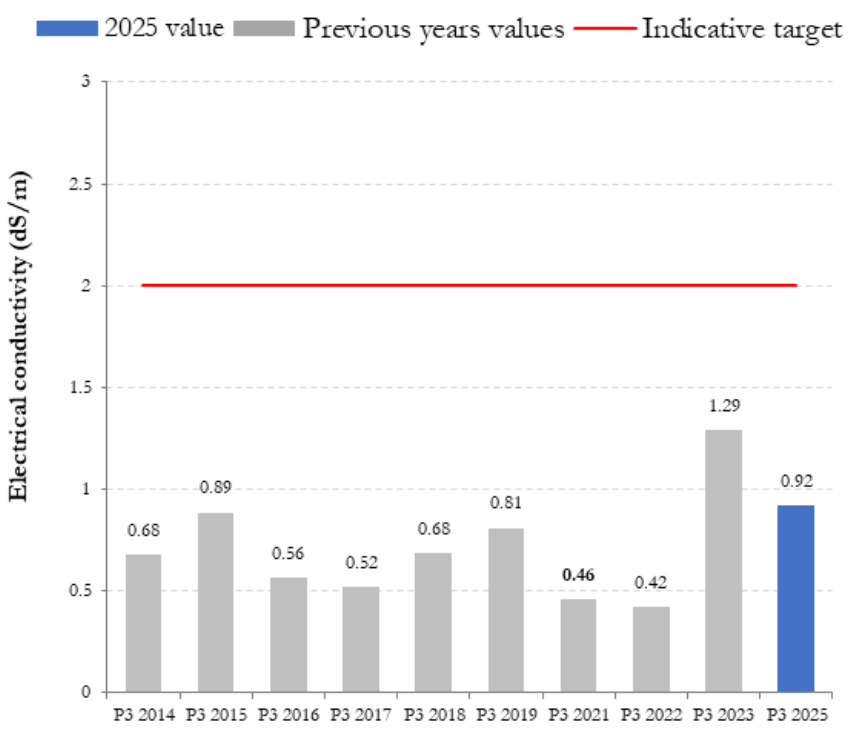
Soil acidity - pH



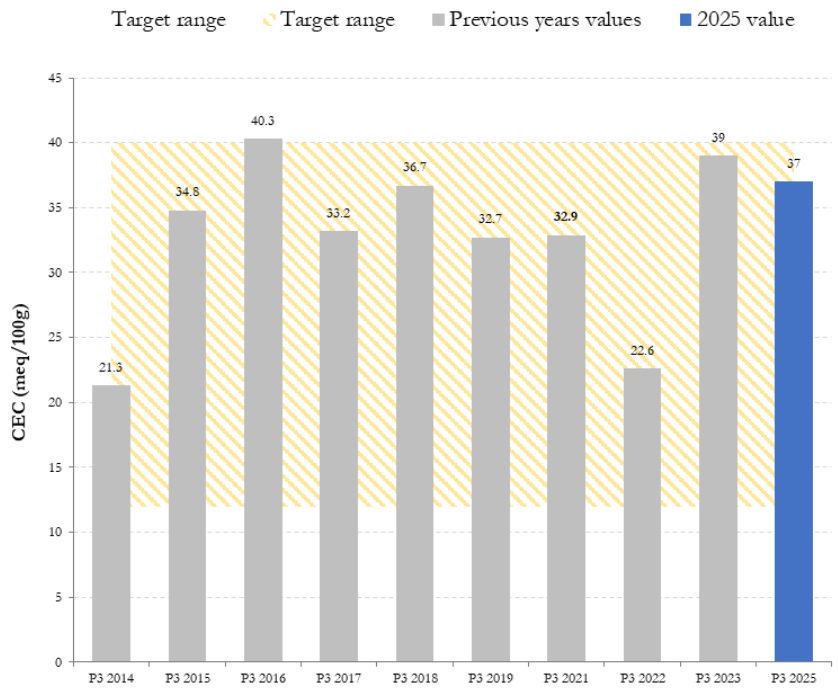
Soil sodicity – Exchangeable Sodium Percent (ESP)



Soil salinity – Electrical Conductivity (EC)[8]



Soil fertility – Cation Exchange Capacity (CEC)



[8] Note that the EC values reported in the laboratory report (Appendix C) were converted to account for soil types (as per Hazelton & Murphy, 2007).

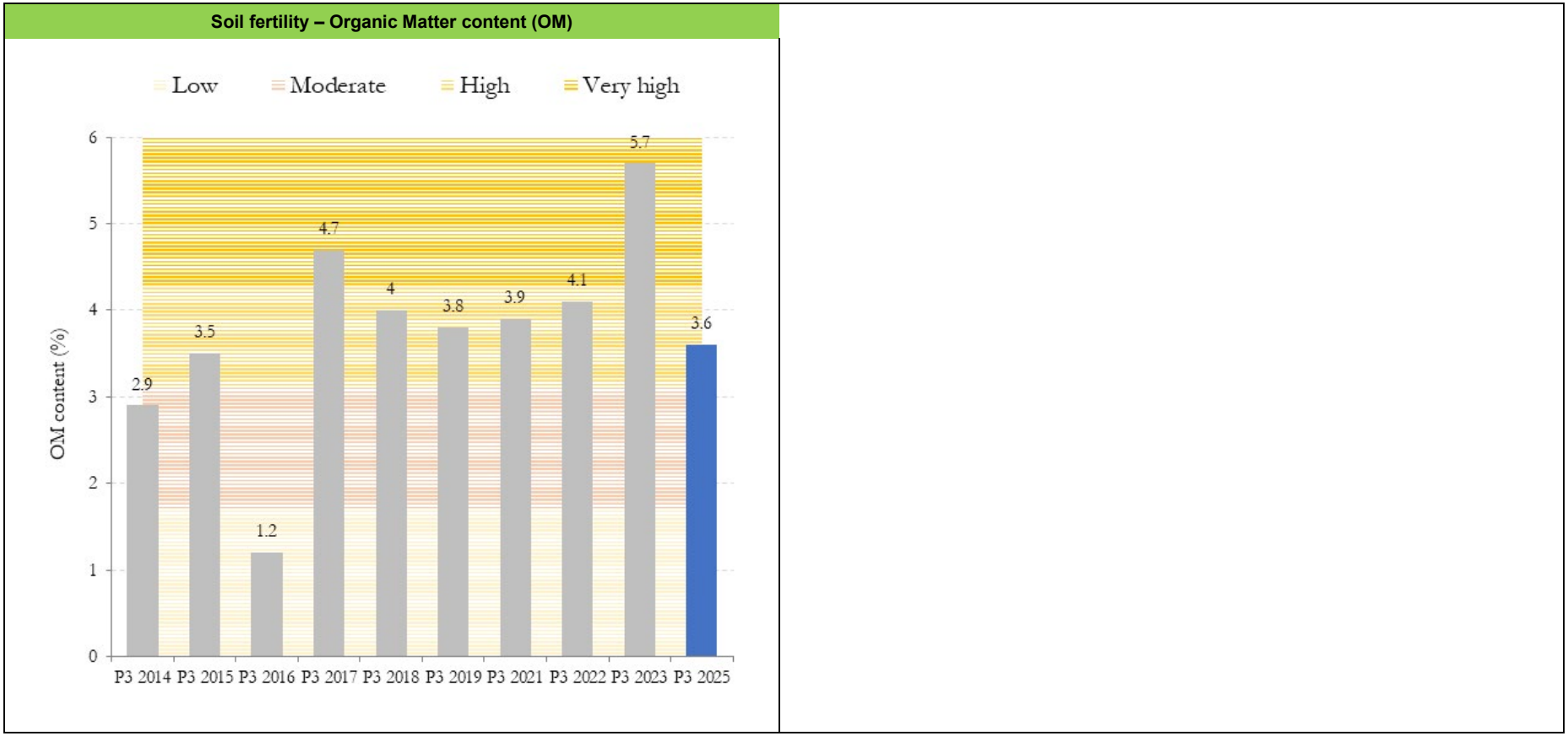


Figure 4.3: Soil properties monitoring results (2014 – 2025) – Class III Pasture

4.1.5 Pasture composition

Trends in pasture composition performance (including weeds) since 2014 are shown in Figure 4.4, with the detailed 2025 floristics monitoring results included in Appendix D for further reference. Note that due to changes in monitoring methods, FPC score were not recorded in 2014 and could not be graphed.

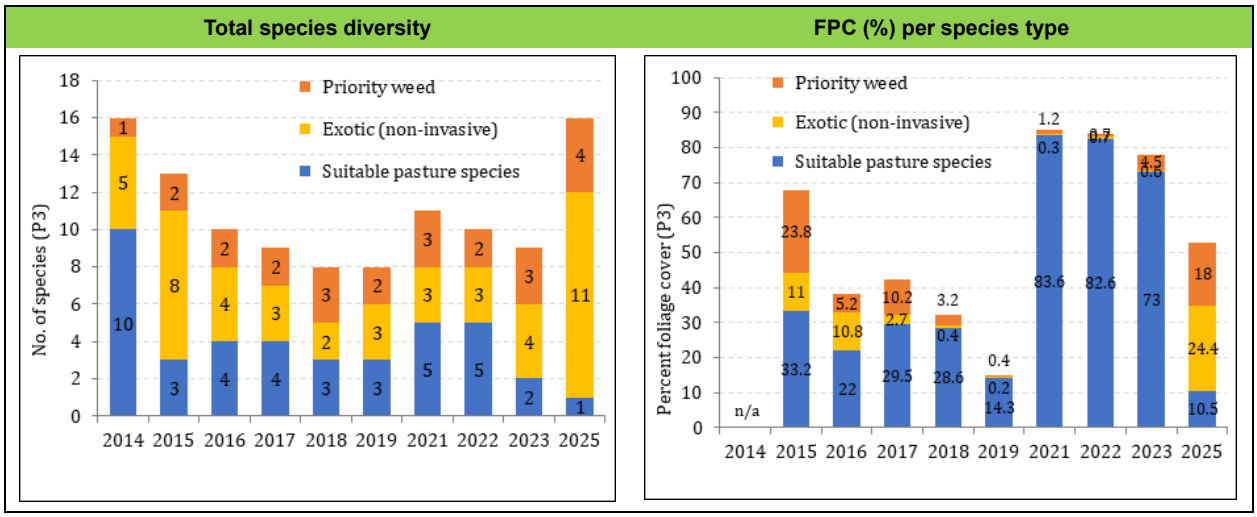


Figure 4.4: Species composition monitoring results (2014-2025) – Class III Pasture.

Pasture composition recorded in P3 in 2025 showed considerable change from the 2023 monitoring period. A total of 16 species were recorded which comprised only one desirable pasture species (one pasture grass), 11 non-invasive exotic species and four priority weeds.

Total live herbage in 2025 is dominated by *Galenia pubescens* and *Plantago lanceolata*, both weed species, and which combinedly represented 33.74% of the total live herbage cover. *Bromus catharticus* (Prairie Grass), which is a productive and palatable pasture grass only represented 10.5% of the total live herbage cover.

In 2023, weed diversity and abundance were considered acceptable, with an estimated cumulative cover of approximately 5.1% (0.6% non-invasive exotics and 4.5% priority weeds). It was noted at the time that, without significant improvement in climatic conditions in the following year, reduced pasture biomass was likely to facilitate an increase in exotic weed abundance and cover. This outcome has been observed in 2025, with weed diversity and abundance increasing substantially to an estimated cumulative cover of approximately 42% (24.4% non-invasive exotics and 18% priority weeds).

As was the case in 2023, one species remained which has a known potential toxicity to stock, being *Sorghum halepense* (Johnson Grass). Johnson's Grass has the potential to cause prussic acid poisoning – severe cases of which can lead to death of the animals (NSW DPI, 2007). Although occurring at very low abundance (~0.4% cover), the species has consistently been recorded over the last few monitoring events, and it is unknown how it will respond to the introduction of stock (e.g. the species could further establish from in situ seed bank as the cover of palatable grasses reduces under grazing pressures). As noted in previous year's reports, the presence of the species will need to be considered (i.e. advice from qualified agronomist sought) before livestock is introduced.

As in 2023, *Urochloa panicoides* (Liverseed grass) was not recorded at P3.

4.1.6 Pasture productivity

4.1.6.1 Herbage biomass

Reflecting the increase in rainfall compared to 2023, herbage biomass at P3 increased in 2025 to approximately ~3,378 kg DM/ha, i.e. maintaining its exceedance of the minimum productivity benchmark of 1,500 kg DM/ha (Figure 4.5).

Although an increase in herbage biomass was noted, its still not at the levels recorded in 2021 and 2022. Consistent with previous monitoring periods, the sampled herbage from P3 in 2025 showed a high moisture content (59.8%), as showed by the difference between the green and dry biomass levels.

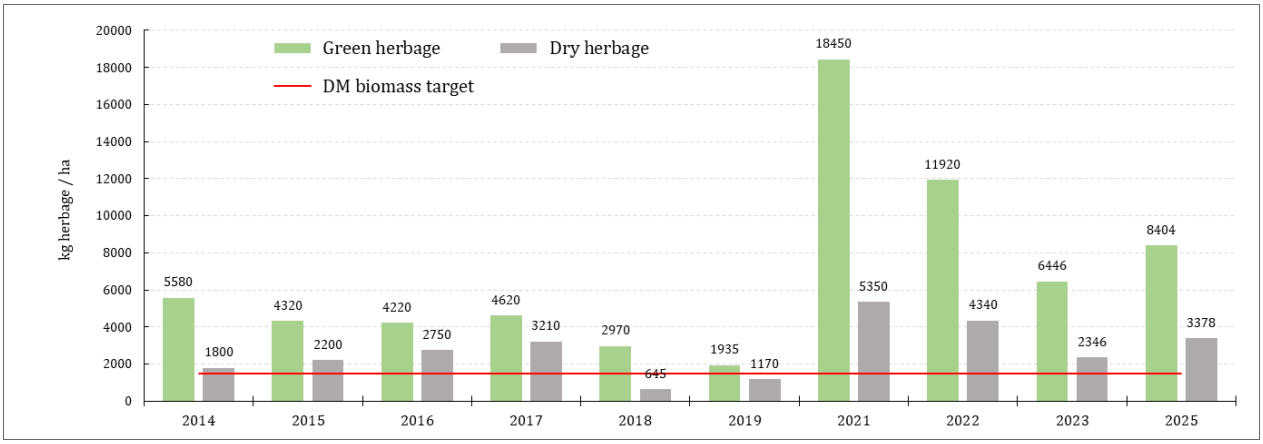


Figure 4.5: Pasture biomass monitoring results P3 (2014-2025)

4.1.6.2 Feed quality and carrying capacity

The feed quality testing results are summarised in Figure 4.6 to Figure 4.11, which also includes calculations of potential carrying capacities for a 450kg dry stock cattle enterprise[9]. For further reference, the detailed laboratory report is provided in Appendix E. (Note that monitoring for feed quality only started in 2018).

[9] NB: the calculations of stocking rates were made with due consideration to the following:

- Stocking rates were calculated using the amount of feed available, the metabolizable energy (ME) content of the feed and the average monthly feed requirement of dry cow livestock.
- In the Hunter Valley, the average energy requirements for dry stock are approximately 54.0 MJ/day (from NSW DPI, 2006b), which equates to 1,620 MJ/month.
- Adjustments were made to the recorded amount of herbage biomass to account for pasture residue (cattle don't graze to ground level) as well as inevitable herbage wastage associated with trampling, animal manure, etc. Wastage of ~25% can reasonably be expected and that amount was therefore deducted from the total available herbage biomass.

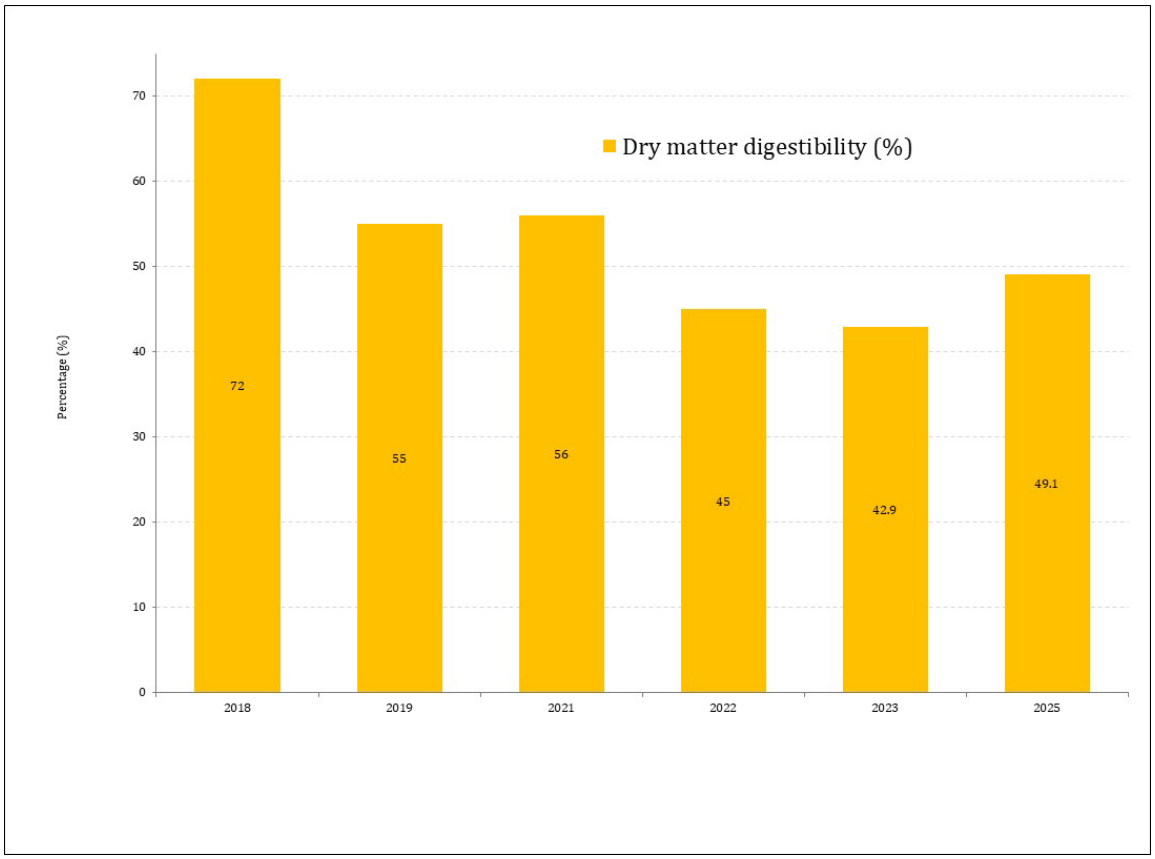


Figure 4.6: Dry matter digestibility

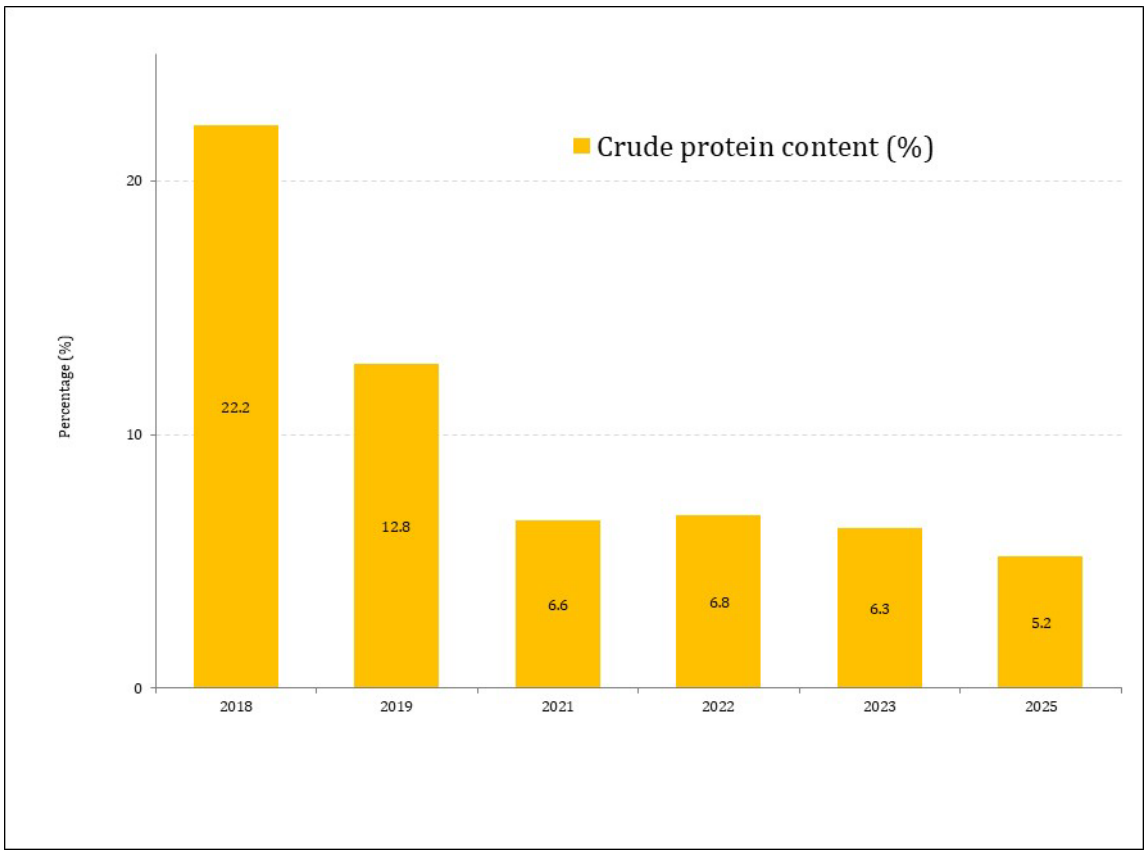


Figure 4.7: Crude protein content

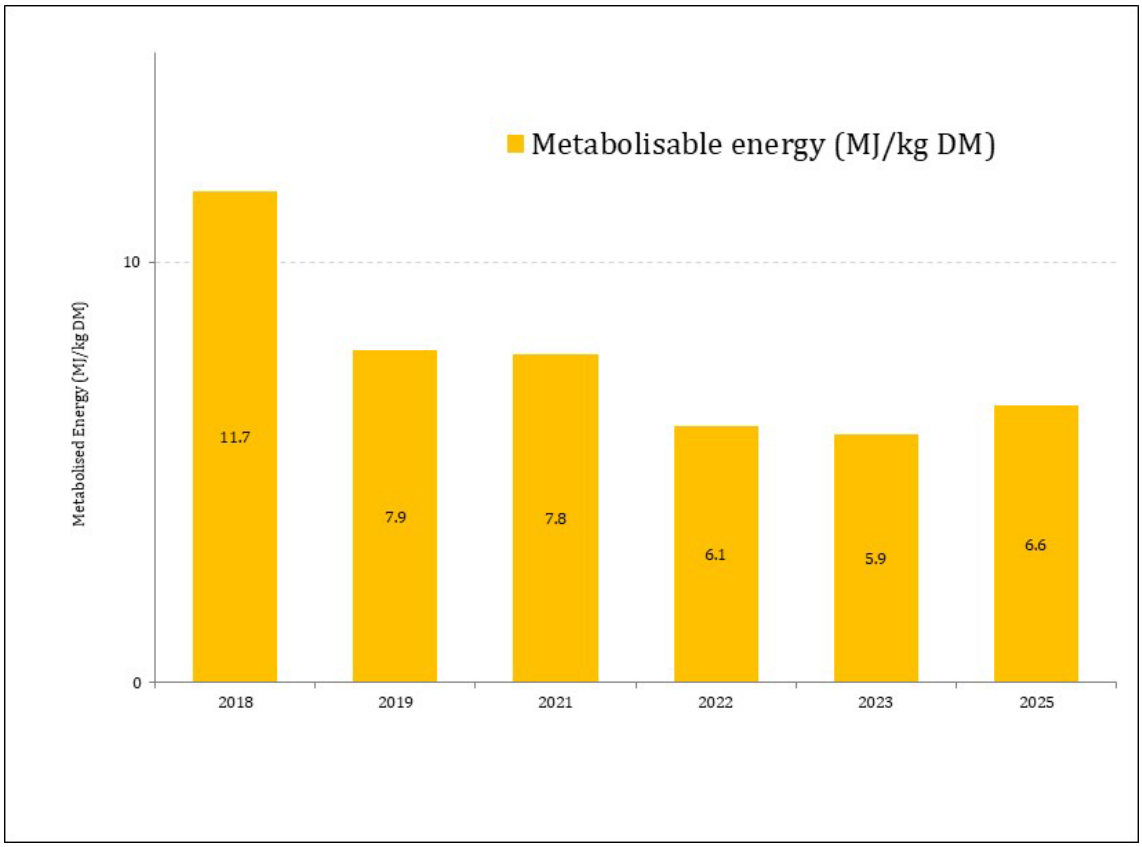


Figure 4.8: Metabolisable energy

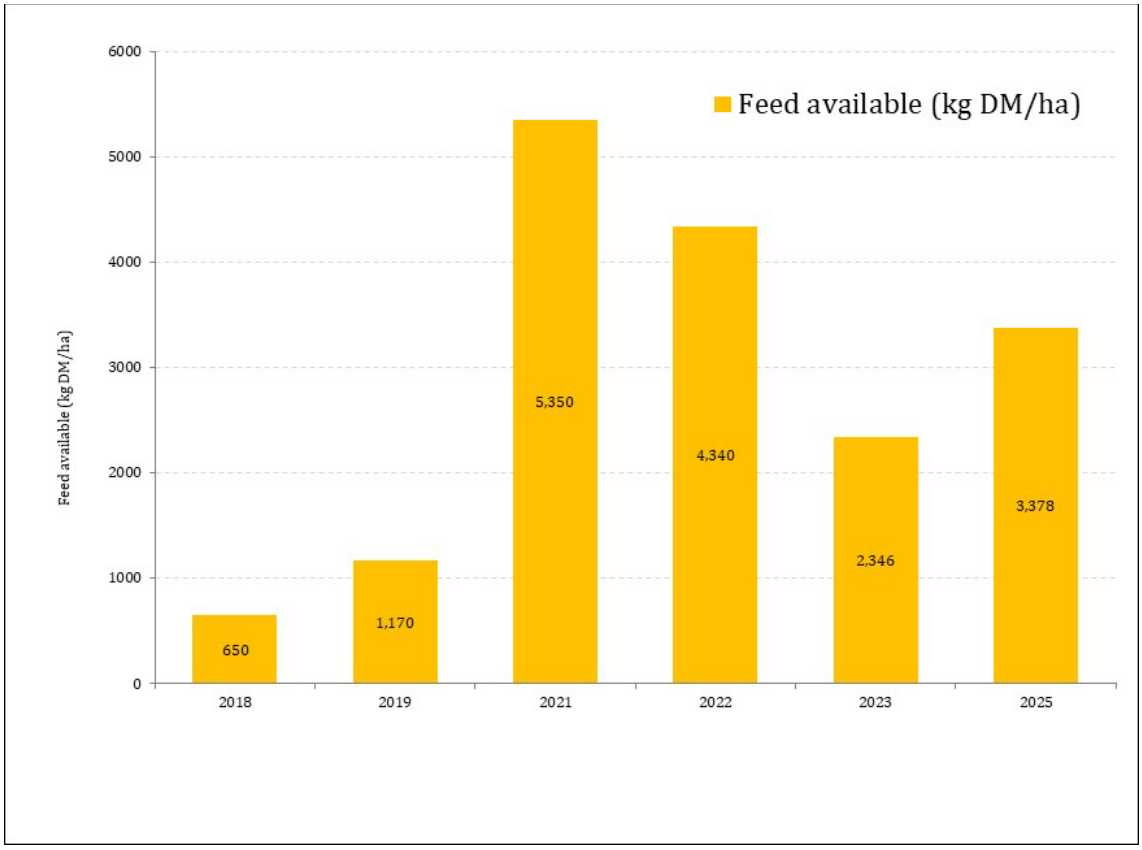


Figure 4.9: Feed availability

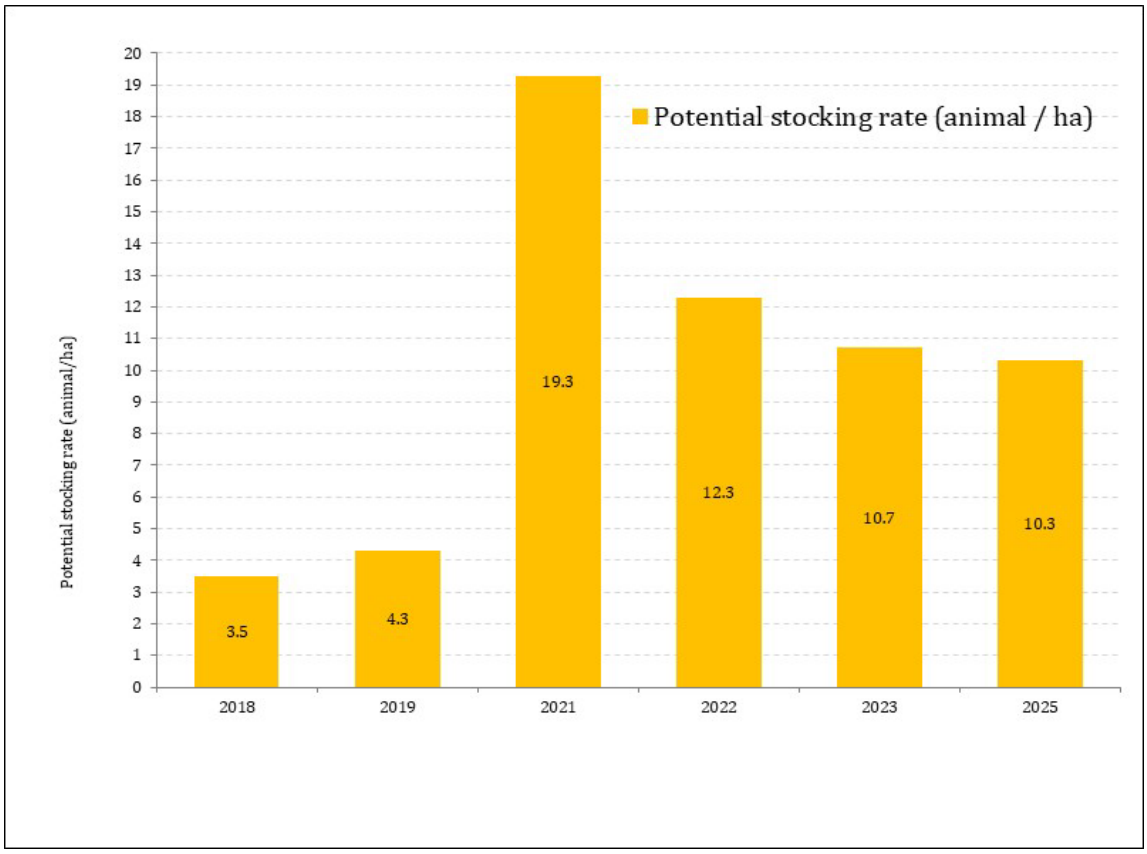


Figure 4.10: Potential stocking rate

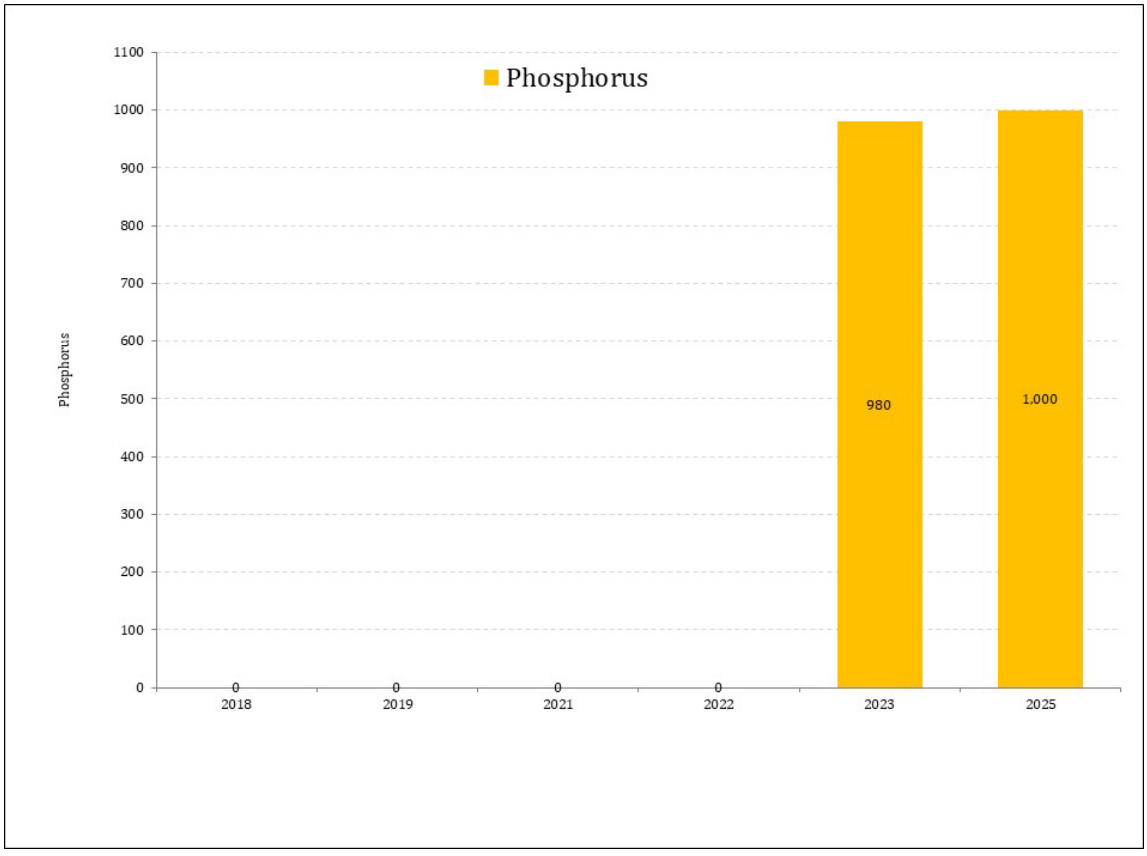


Figure 4.11: Phosphorus

The potential carrying capacity of the P3 Class III pasture in 2025 was calculated at ~10.3 dry cow/ha. This is slightly less than last year (~10.7 dry cow/ha); however, this remains much greater than the average carrying capacity of a similar pasture in the Hunter region (NSW DPI, 2006b).

However, it must be noted that the productivity levels and stocking rates reported here only apply to the pasture under no active grazing regime or pressure. If the pasture was actively grazed, available herbage biomass would rapidly reduce and accordingly so would stocking rates.

4.2 Walkover Audit Inspection

No specific observations were made within the Class III pasture area during the walkover inspection.

No issues of stability, drainage or weed incursions were recorded; and vegetative performance was generally uniform throughout and consistent with the data collected at the monitoring transect.

4.3 Compliance Assessment

Based on the 2025 monitoring results and observations as presented in the previous sections, Table 4.1 provides an assessment of rehabilitation progress against the relevant completion criteria defined in the RMP (2024 for the 'Class III Pasture' domain.

Table 4.1: Progress against RMP completion criteria – Class III Pasture

Completion criteria	Progress as of 2025	Compliant
Weed control focuses on priority species such that weed coverage on rehabilitated land as determined by a suitably qualified expert is comparable to similar pasture areas within the region.	Not assessed - the monitoring program currently does not include corresponding analogue sites against which this criterion can be assessed. Recorded weed cover levels were high in 2025 which represented 33.74% of the total live herbage cover.	n/a
No species with known toxicity to grazing stock.	One species recorded with known potential toxicities to livestock (Johnson grass).	No
Monitoring indicates no increasing trends in population or species diversity of feral pests.	No evidence of feral pest populations noted at P3.	Yes
Presence of grasses and legumes from the species mix relevant to the domain on rehabilitated land as determined by a suitably qualified expert is comparable to similar pasture areas within the region.	Not assessed – the monitoring program currently does not include corresponding analogue sites against which this criterion can be assessed.	n/a
Surface organic litter present across rehabilitated areas.	Yes – organic litter is present across the soil surface in P3 (grass litter and mulch).	Yes
Surface rocks present on land surface do not impede the post- mining land use.	No large surface rocks present	Yes
Vegetation cover on rehabilitated land as determined by a suitably qualified expert is comparable to similar pasture areas within the region.	Not assessed – the monitoring program currently does not include corresponding analogue sites against which this criterion can be assessed. Vegetation live cover decreased substantially from previous monitoring. Although the minimum benchmark of 70% total cover continues to be exceeded (Figure 4.2), live cover has decreased to 55.7%, representing an approximate 22% reduction compared with 2023	n/a
Demarcation present and access restricted.	No uncontrolled access evidenced. The Class III area remains fully fenced and all fences/gates are in good condition	Yes
Pasture productivity comparable to vegetation communities of similar type in the region.	Pasture in its current (un-grazed) condition has a productivity exceeding regional averages.	Yes
Adoption of standard fire prevention measures including firebreaks and minimising fire hazards.	Not assessed – outside the scope of this monitoring program	n/a

Access maintained for firefighting		
No evidence of contamination	No hazardous or problematic materials were observed or recorded during the walkover inspection	Yes
Contaminated land remediated in accordance with relevant procedures and guidelines.	No hazardous or problematic materials were observed or recorded during the walkover inspection	Yes
Land safely accessible to grazing stock.	Land is safe to access by grazing stock.	Yes
No visible signs of instability (slumping/ cracks) that require ongoing management and maintenance works.	Several surface cracking in the soil has been noted throughout the transect area, which is because of the clayey nature of the soil and not because of instability of the landform.	Yes
No evidence of erosion within the water/sediment management structures that requires ongoing management and maintenance.	Not applicable – no water management structure in the Class III domain	n/a
No erosion rills, gullies or tunnel erosion that requires ongoing management and maintenance works.	Area stable with no signs of active erosion	Yes
Landform compliant with approved Final Landform.	Not assessed – outside the scope of this monitoring program	n/a
Landform compliant with approved landform design.	Not assessed – outside the scope of this monitoring program	n/a
Pasture productivity comparable to vegetation communities of similar type in the region.	Pasture in its current (un-grazed) condition has a productivity exceeding regional averages.	Yes
Services disconnected and removed.	Not assessed – outside the scope of this monitoring program	n/a
Infrastructure removed.	Not assessed – outside the scope of this monitoring program	n/a
Required licences and approval documents issued.	Not assessed – outside the scope of this monitoring program	n/a
Water quality meets parameters suitable for land use chosen from Australia and New Zealand Guidelines for Fresh and Marine Water Quality 2000 or its latest version.	Not assessed – outside the scope of this monitoring program	n/a
Surface runoff is diverted to neighbouring drainage lines.	No surface runoff from the Class III pasture area leaves the site, i.e. all surface flows report to adjoining rehabilitation area and water management structures downslope	Yes
Landform compliant with the approved hydrological modelling landform design.	Not assessed – outside the scope of this monitoring program	n/a
Waste storage areas have been constructed as designed. Verification and/or testing confirms integrity of structures and does not pose threat of environmental harm	Not assessed – outside the scope of this monitoring program	n/a

5. Results – HDWV

Wherever possible, a differentiation is made throughout the following section between 'historic' rehabilitation and 'newer' rehabilitation (i.e. areas recently reworked under the RMP).

In addition, and for practicality in reporting and legibility purposes, monitoring results from the past three to four monitoring events only have been included in the graphed results and data.

Where older monitoring data exist for monitoring sites, previous years reports can be referred to for longer-term trends in rehabilitation condition.

5.1 Transect-based Monitoring

5.1.1 Photographic Monitoring

For reference, photographs taken in 2025 from the permanent photo points at the start and end of the 50 m transect line are provided in Appendix A.

The photographs depict the visual condition of the monitoring site at the time of the 2025 monitoring, which can be compared with previous monitoring years (supplied in previous annual monitoring reports) to determine evolution and changes in vegetation establishment and condition over time.

5.1.2 Erosion

Soil and slope stability were excellent at most monitoring sites with limited active erosion processes recorded. A few instances of rill, tunnel, and sheet erosion were recorded and are likely to require ongoing management.

Erosion was recorded at the following locations of the following type.

- HDWV39 – rill, HDWV43 – rill, HDWV33 – rill and HDWV15 – rill.

Superficial rill erosion (channels <30 cm deep) was recorded at four monitoring sites (HDWV15, HDWV33, HDWV39, and HDWV43). All the rill erosion occurrences are classified as stabilised due to the establishment of minor groundcover vegetation. With further establishment this may continue to self-stabilise over time as vegetation in all strata further establishes, which will need to be confirmed during the next monitoring events.

The site audit walkover returns opportunistic findings of gully erosion as presented in Table 5.5.

5.1.3 Ground Cover Protection

Trends in ground cover protection since 2022 are depicted in Figure 5.1 (historic rehabilitation areas) and Figure 5.2 (newer rehabilitation areas).

Protective ground cover increased in 2025 (except for HDWV09) likely due to more favourable climatic conditions (higher rainfall) in the 2023/24 and 2024/25 seasons. Protective cover remained above the 70% minimum cover benchmark at all historic rehabilitation areas. The historic sites ranged between 82-100% with an average across all historic rehabilitation areas of 93.4%, significantly higher than the 2023 average of 83.8%.

Ground cover levels across newer rehabilitation areas were more variable which reflected both the various revegetation techniques and the age since revegetation. In total, the 70% cover benchmark was met at 13 of the 15 monitoring sites at the time of monitoring (as opposed to 8 of 15 sites in 2023). The following variations were observed between the monitoring sites in 2025:

- 'Topsoil + direct seeded' areas: protective cover ranged between 70-100% (average ~87.2% for all sites), with all six sites meeting the target benchmark.

- ‘Subsoil + direct seeded’ areas: protective cover ranged between 53-84% (average ~68.8% for all sites), with one site not meeting the target benchmark.
- ‘Overburden + direct/aerial seeded’ areas: protective cover ranged between 53-97% (average ~75.3% for all sites), with one site not meeting the target benchmark.
- ‘Topsoil + tubestock’ areas: protective cover ranged between 89-97% (average ~93.1% for all sites), with all five sites meeting the target benchmark.

Overall, results continue to show that cover levels appeared more variable and inconsistent in areas seeded in overburden or subsoil substrates, where vegetative ground cover establishment is likely inhibited by the lack of topsoil. These areas will need to be closely monitored in coming years.

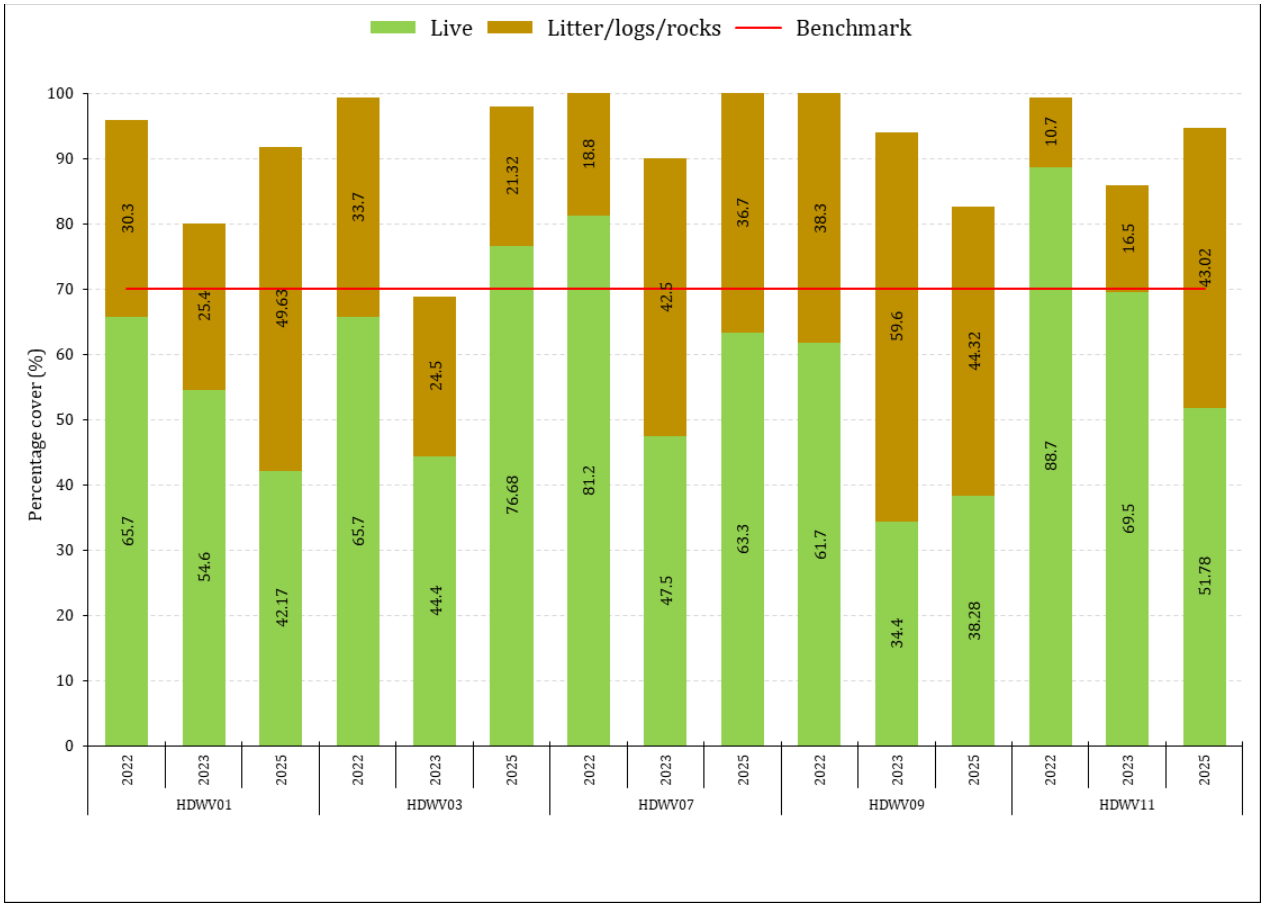


Figure 5.1: Ground cover protection (2022-2025) – HDWV (historic rehabilitation)

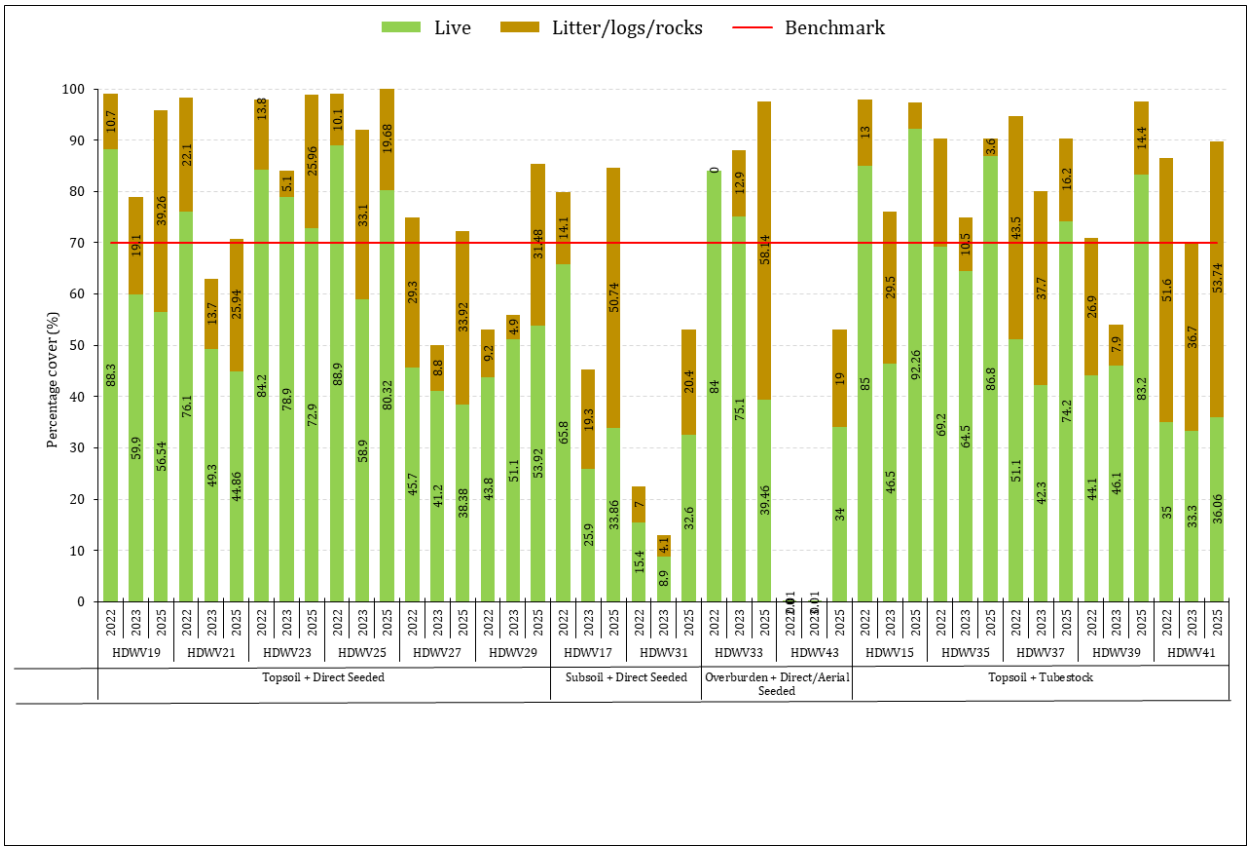


Figure 5.2: Ground cover protection (2022-2025) – HDWV (new rehabilitation)

5.1.4 Soil Properties

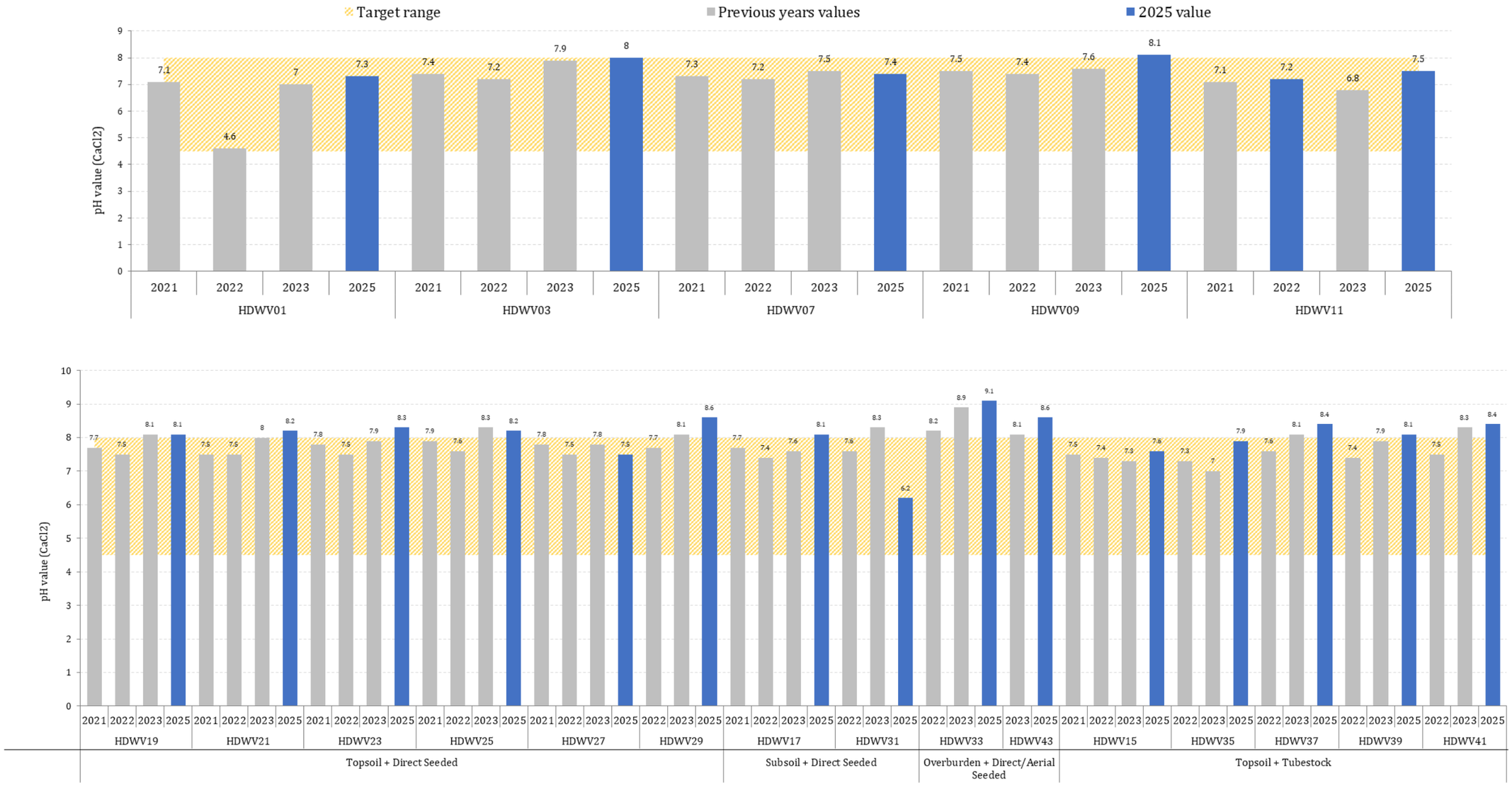
Soil testing results for pH, salinity, sodicity and cation exchange capacity are presented in Figure 5.3 (detailed laboratory analysis report is provided in Appendix C). Key findings from the soil testing program are highlighted in the following table.

Table 5.1: Soil analysis – key findings

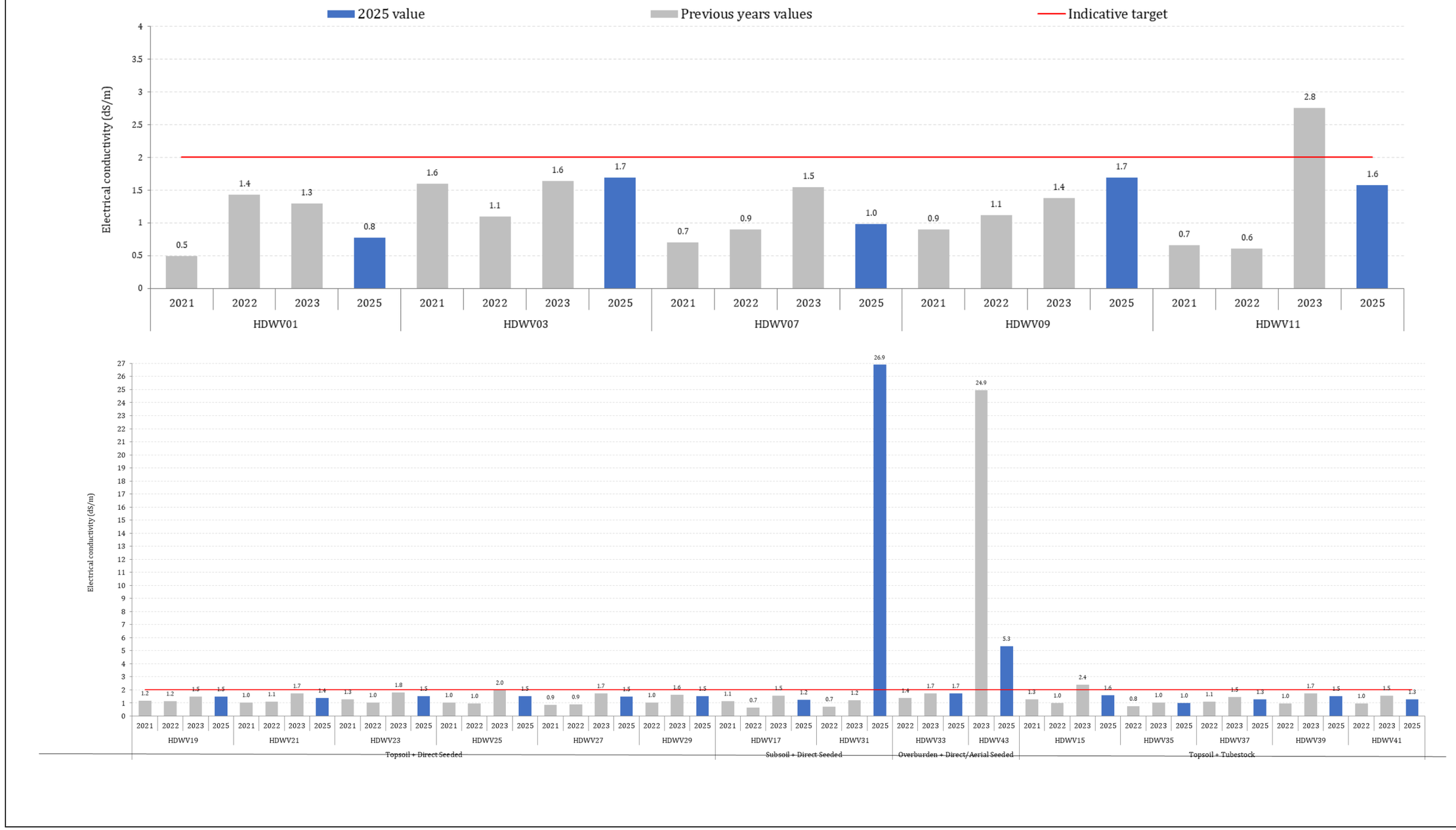
Soil acidity – pH	Soil pH levels recorded in 2025 ranged between 6.2-9.1 (i.e. slightly acidic to moderately alkaline), with 8 of the 20 sites being within acceptable range for native vegetation growth (i.e. 4.5-8.0). Most sites falling marginally outside the upper target range were only just outside this target – however none of the pH levels were highly alkaline to the point that plant growth would be affected with the exception of HDWV33 with a pH of 9.1. Sites HDWV19, HDWV21, HDWV23, HDWV25, HDWV27 and HDWV20 are all seeded in topsoil, and are at or marginally above the upper target limit for pH. None of the pH levels were highly alkaline to the point that plant growth would be expected to be affected. Most previously monitored sites showed only minor seasonal variations since the last monitoring period, except for HDWV31 and HDWV35. HDWV31 shows a sudden decrease in alkalinity in 2025 (from 8.3 in 2023 to 6.2 in 2025). HDWV35 shows a sudden increase in alkalinity in 2025 (from 7 in 2023 to 7.9 in 2025) HDWV31 is now within acceptable range, however, HDWV35 is not within acceptable range. All other sites generally returned a neutral to slightly alkaline pH levels, which is higher than typical soil profiles in the region (which are moderately acidic) but within acceptable range for plant establishment and growth.
Soil salinity – electrical conductivity (EC)	Consistent with the last monitoring period, soil salinity levels in 2025 were low at most locations and comprised between 0.8-1.7 dS/m, i.e. within values considered as non-saline and unlikely to restrict vegetation establishment and growth. However, there were two sites with highly elevated levels above the target criteria of salinity ranging from 5.3 to 26.91 dS/m.

	HDWV43 had a minor exceedance (5.34 dS/m) not considered likely to impact plant establishment or growth. During the 2023 monitoring period, the salinity level at HDWV43 was 24.9 dS/m. A significant decrease in 2025 has therefore been noted. HDWV31 had a very high salinity level of 26.91 dS/m. Previous monitoring results were well below the target levels. It is unclear what the reason for this sudden increase could be and it is therefore recommended that this be monitored in the next monitoring events, and downslope vegetation and surface water monitored for impacts from high levels of salinity.
Soil sodicity – exchangeable sodium percentage (ESP)	All sites were non-sodic and returned very low ESP (exchangeable sodium percentage) levels in 2025 – for a satisfactory performance.
Soil fertility – cation exchange capacity (CEC)	Soils CEC showed natural seasonal variations at most sites in 2025 (CEC levels are influenced by clay content and organic matter levels, and seasonal fluctuations are common) and ranged from slightly high 11 meq/100g to a very high 34 meq/100g. The indicative target of >6 meq/100g (which is deemed adequate for areas being returned to native vegetation where land productivity is not a concern) was achieved by all 20 of the monitoring sites. Of these, 2 sites returned a moderately low CEC (6.0-12 meq/100g) and 5 sites a moderate CEC (12.0-20.0 meq/100g). The remaining 13 sites returned a good CEC (>20 meq/100g). CEC levels on average appeared somewhat lower in areas seeded in overburden and old rehabilitation areas, reflecting the lower fertility of the overburden substrate and declining fertility of older rehabilitation areas, albeit still well within the target range. However, CEC levels in all other locations showed no evident differences based on substrate (topsoil vs subsoil).
Soil fertility – organic matter content (OM)	Soil OM (Organic Matter) levels were highly variable between all samples in 2025, ranging from 1.1% to a high 3.7% and generally reflecting the varying levels of vegetation establishment across locations. Soil OM levels are greatly influenced by the rate of plant material being returned to the ground (i.e. litter) and should progressively increase as vegetation further establishes across the rehabilitation. Of the 20 monitoring sites tested in 2025, 11 returned OM content considered as low (<1.7%), 7 sites as moderate (1.7-3.1%) and 2 sites as high (3.1-4.3%).

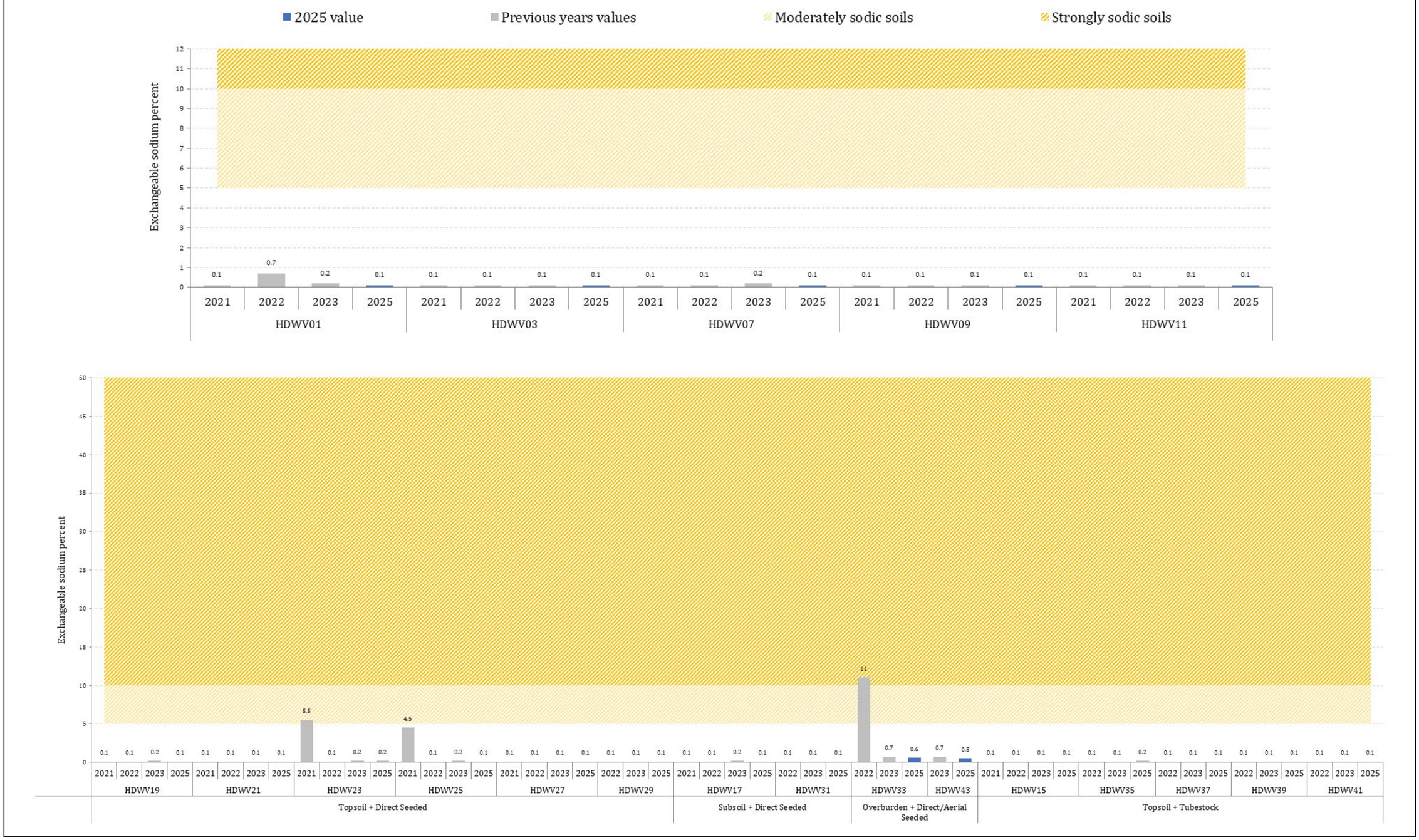
Soil acidity – pH



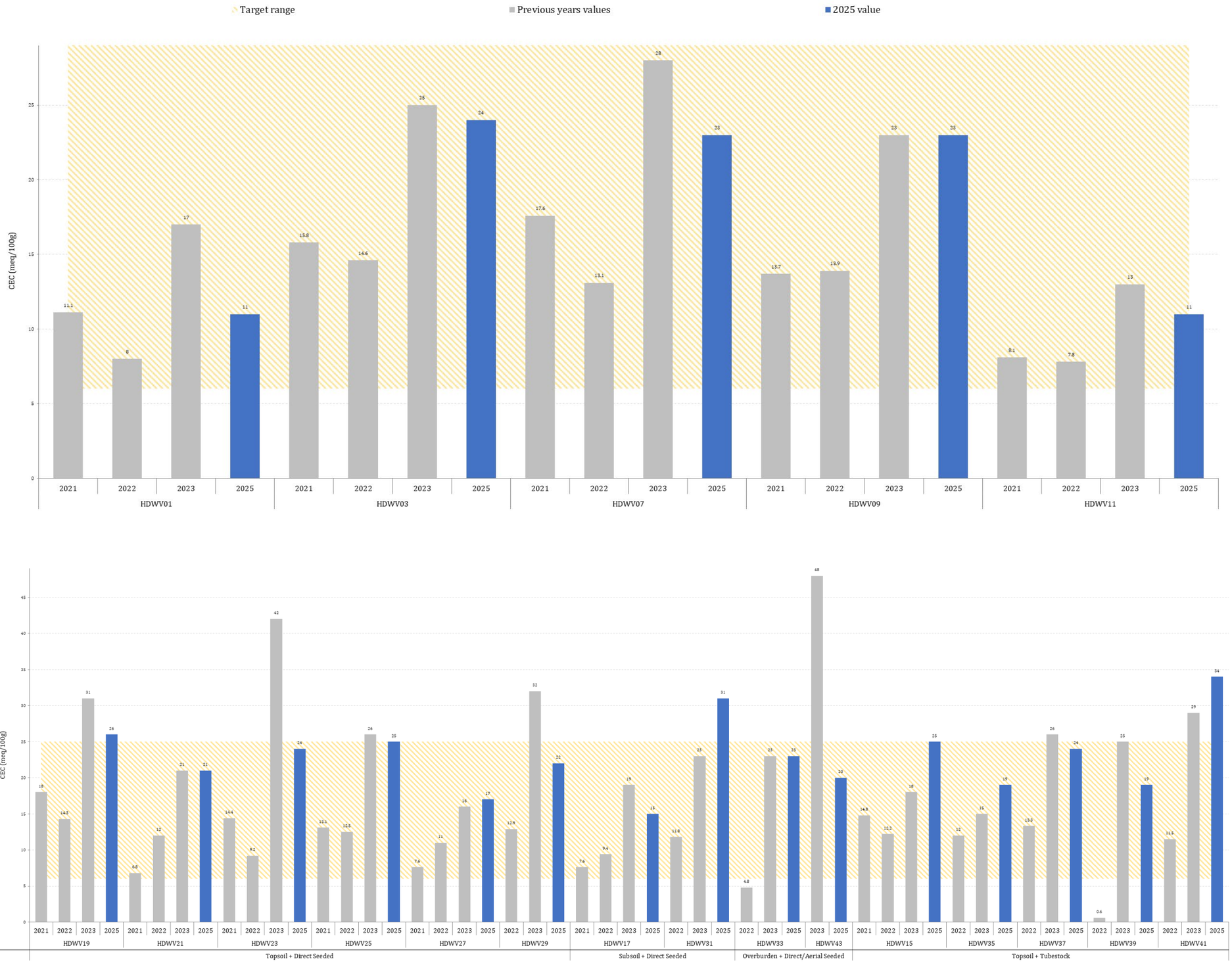
Soil salinity – Electrical conductivity



Soil sodicity – Exchangeable Sodium Percent



Soil fertility – Cation Exchange Capacity



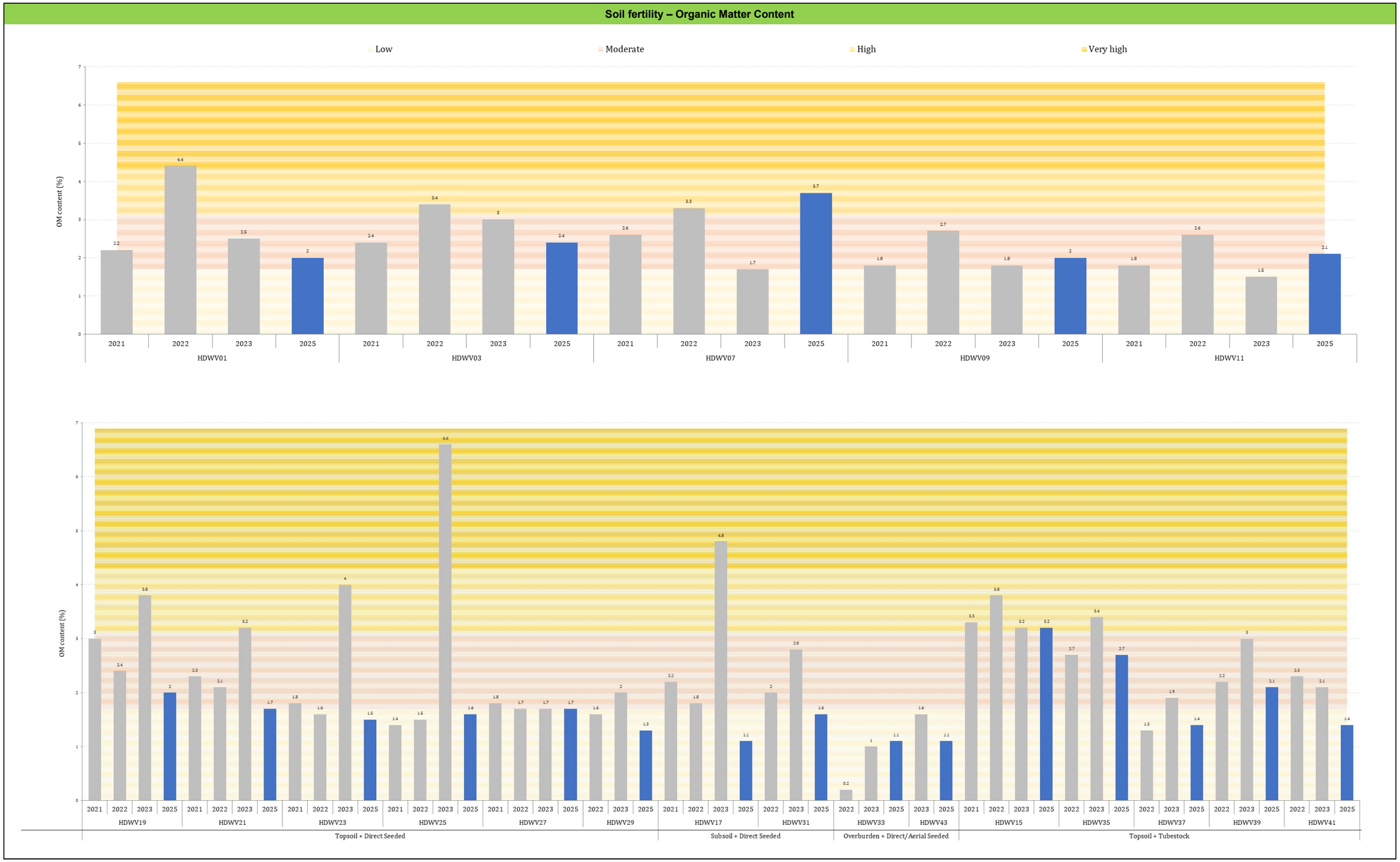


Figure 5.3: Soil properties monitoring results (2021-2025) – HDWV.

5.1.5 Floristics

Trends in total species richness since 2022 are depicted in Figure 5.4 (historic rehabilitation areas) and Figure 5.5 (newer rehabilitation areas), with detailed 2025 floristic monitoring results included in Appendix D for further reference.

Total species richness recorded in 2025 at the monitoring sites was variable and ranged between 11-26 species for an average of ~19.6 species per site. This is slightly lower than the 2023 average of ~22.3 species per site. The representation of native species (in proportion of total species richness) has decreased to an average of ~16.9% across all sites (compared to an average of ~19.9% in 2023) and ranged between 4.5-26.3%. These results indicate that native species in the establishing vegetation communities across the rehabilitation zones have decreased slightly in proportion to exotics in 2025. In contrast to 2023, the wetter conditions could have resulted in the increase in exotic ground covers recorded which outcompeted native species.

The following variations were observed in 2025 based on revegetation techniques and age of rehabilitation:

- 'Topsoil + direct seeded' areas (historic rehabilitation): range 17-20 species (average 18.8 species/site), average proportion native species ~25.2%.
- 'Topsoil + direct seeded' areas (newer rehabilitation): range 20-25 species (average 22.3 species/site), average proportion native species ~15.6%.
- 'Subsoil + direct seeded' areas (newer rehabilitation): range 18-26 species (average 22 species/site), average proportion native species ~13.2%.
- 'Overburden + direct/aerial seeded' areas (newer rehabilitation): range 17-19 species (average 18 species/site), average proportion native species ~8.5%.
- 'Topsoil + tubestock' areas (newer rehabilitation): range 11-22 species (average 17.8 species/site), average proportion native species ~14.6%.

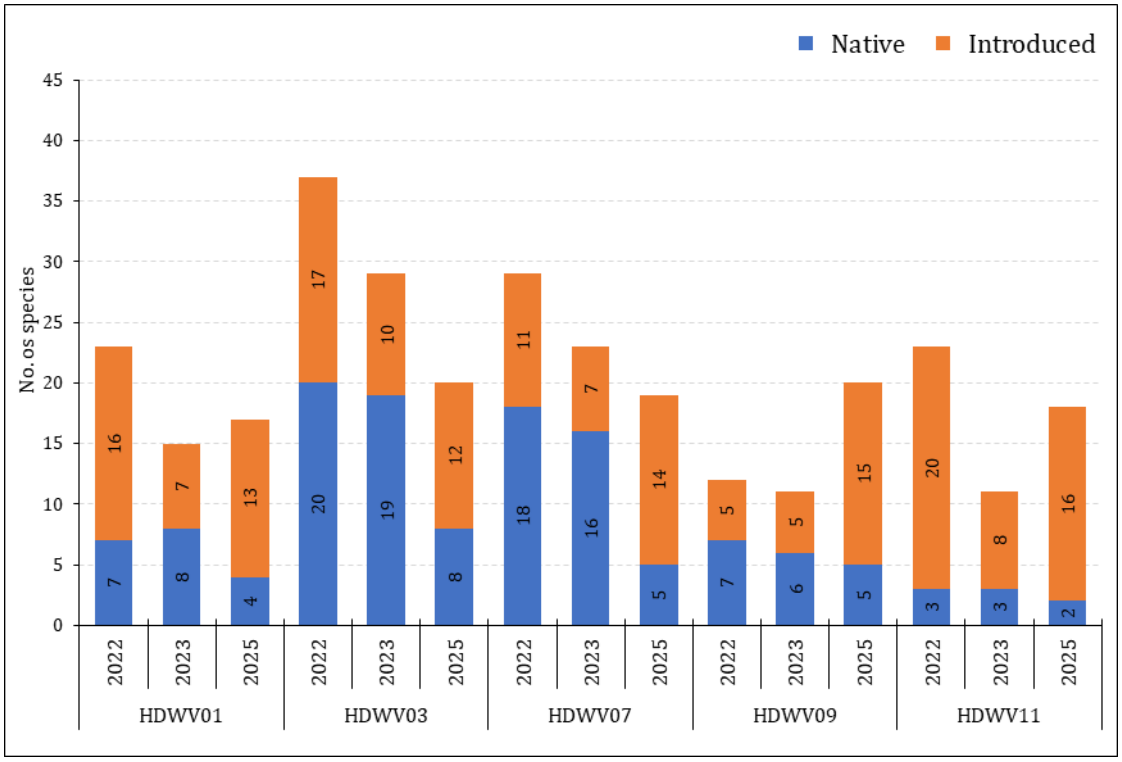


Figure 5.4: Total species richness (2022-2025) – HDWV (historic rehabilitation)

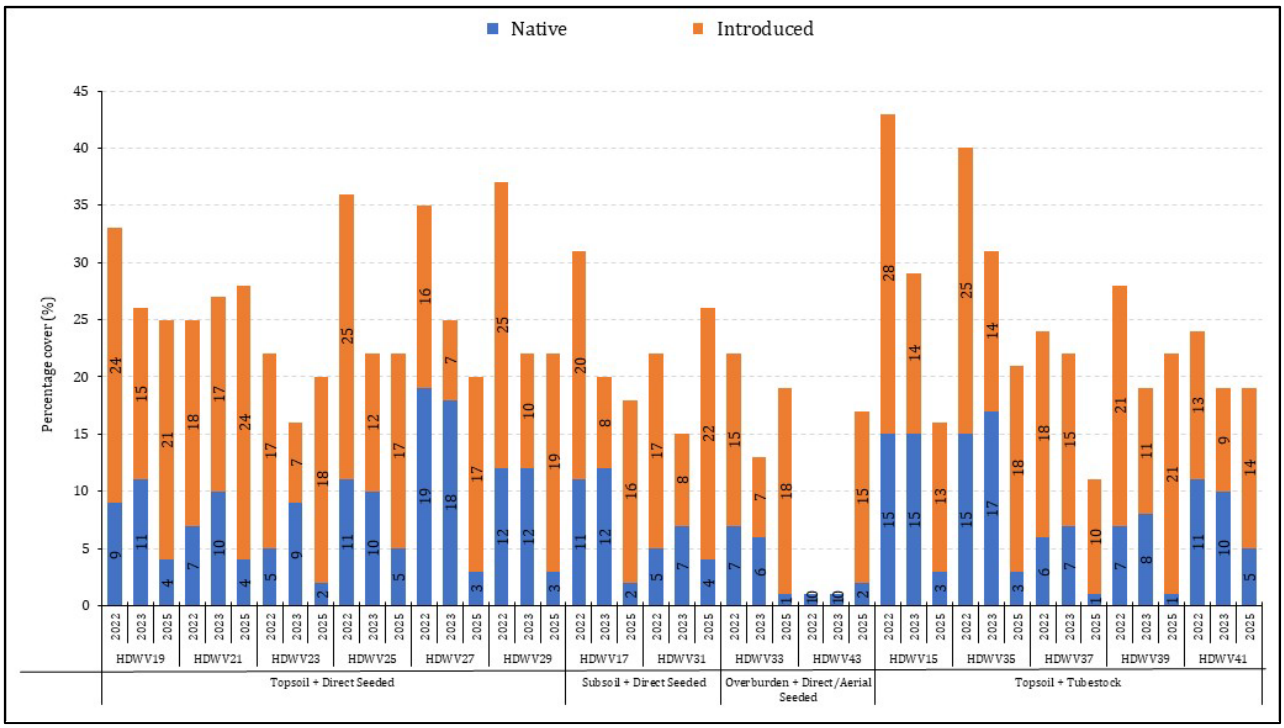


Figure 5.5: Total species richness (2022-2025) – HDWV (newer rehabilitation)

5.1.5.1 *Ground Layer*

A total of 77 ground cover species were recorded in 2025 across the rehabilitation areas, comprising:

- 19 grasses – including 7 native species, 8 introduced pasture grasses and 4 weeds.
- 52 forbs – including 10 native species, 9 introduced legumes and 33 weeds.
- 3 sub-shrubs – including 1 native species and 2 weeds; and
- 3 'other' species (twiners, sedges, ferns, etc) – including 2 native species and 1 weed.

Figure 5.6 (historic rehabilitation) and Figure 5.7 (newer rehabilitation) represent the contribution of native species, introduced pasture species and weeds in proportion of the total live cover in the ground layer, as measured in 2025.

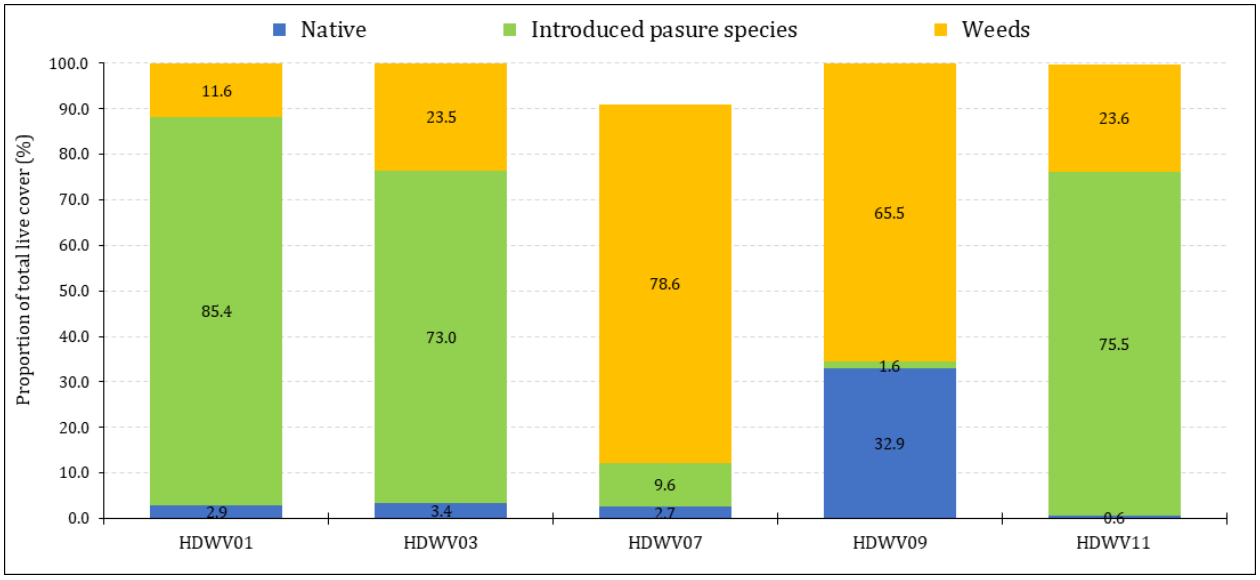


Figure 5.6: Contribution of species types to total live ground cover – HDWV (historic rehabilitation)

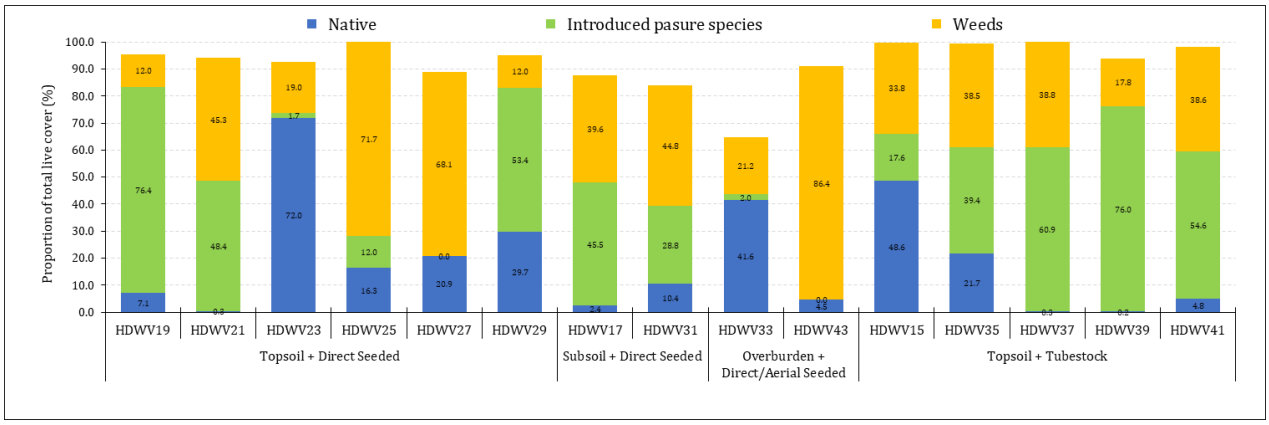


Figure 5.7: Contribution of species types to total live ground cover – HDWV (newer rehabilitation)

Consistent with previous years, the ground layer remained very largely dominated by exotic pasture grasses at most sites, representing much of the total live cover at 11 of the 20 monitoring sites. *Chloris gayana* (Rhodes Grass) and *Megathyrsus maximus* (Guinea grass) are by far the most common and abundant species across the site, with *Bromus catharticus* (Prairie Grass) also being locally dominant.

Six sites had a predominantly weedy ground cover, with a similar composition of common and locally abundant weed species including *Galenia pubescens* (Galenia), *Lysimachia arvensis* (Scarlet Pimpernel), *Plantago lanceolata* (Ribwort Plantain) or *Rapistrum rugosum* (Turnip weed).

Three sites displayed a predominantly native ground layer, typically consisting of *Cynodon dactylon* (Common Couch) though other native grasses *Anthosachne scabra* (Common Weatgrass) and *Panicum effusum* (Hairy Panic) also appear to have increased in coverage.

Finally, it is important to reiterate that there are currently no approval requirements to re-establish a specific native species ground layer throughout the HDWV rehabilitation. The rehabilitation objective for Bengalla is that "*the vegetation composition of the rehabilitation contains species that are commensurate with native communities of high density woody vegetation (HDWV). The HDWV species mix is based on the locally occurring Grey Box – Ironbark Woodland and Ironbark – Spotted Gum – Grey Box Woodland vegetation communities*".

This final land use domain contains a component of grazing and is intended to be accessible to cattle. Productive exotic pasture species suitable for grazing are therefore not regarded as weeds for the purpose of this monitoring program.

5.1.5.2 *Mid and Canopy Layers*

Mid-storey species (shrubs + small trees) and canopy species (trees) recorded at the monitoring sites in 2025 are presented in Table 5.2 (historic rehabilitation) and Table 5.3 (newer rehabilitation), which also indicate which species are representative of (i.e. naturally found in) the CHGBIW and CHSGIGBF local native communities.

Historic Rehabilitation

Consistent with previous years and the well-established nature of the rehabilitation across historic areas, shrubs and trees diversity remained constant at all historic monitoring sites in 2025 and ranged from five to eight species (average 7.2 species per site).

A total of 16 mid and upper storey species were recorded across the historic sites comprising 12 NSW native species (5 shrubs, 3 small trees and 4 canopy trees) and 4 exotic species (2 shrubs and 2 canopy trees). Of the 12 native species, 8 species (or 66.7%) were characteristic of the CHGBIW or CHSGIGBF communities.

Overall, four of the five historic monitoring sites displayed woody species assemblages dominated by species characteristic of CHGBIW and CHSGIGBF (i.e. representing ≥50% of total shrub/tree richness).

As reported in previous years, shrub and tree species assemblages are particularly stochastic across older rehabilitation areas of the OEA, with no evident consistency in established vegetation communities across all areas. This has likely been influenced by different seeding mixes, different topsoil provenance and quality, and different rehabilitation and revegetation methods over time.

Newer Rehabilitation

The 2025 results showed that a total of 22 mid and upper storey species were recorded, comprising 20 NSW native species (11 shrubs, 3 small trees and 6 canopy trees) and 2 exotic species (all shrubs). Of the 20 native species, 15 species (or 75.0%) were characteristic of the CHGBIW or CHSGIGBF communities. All 15 monitoring sites, except HDWV 25, displayed woody species assemblages dominated by species characteristic of CHGBIW and CHSGIGBF (i.e. representing ≥50% of total shrub/tree richness). However, woody species diversity and abundance remained highly variable between the monitoring sites based on revegetation techniques employed, as follows:

- 'Topsoil + direct seeded' areas: range 3-10 species (average 6.8 species/site), average species representativeness ~72.3%.
- 'Subsoil + direct seeded' areas: range 4-6 species (average 5.0 species/site), average species representativeness ~62.5%.
- 'Overburden + direct/aerial seeded' areas: range 6-9 species (average 7.5 species/site), average species representativeness ~66.7%.
- 'Topsoil + tubestock' areas: range 4-10 species (average 6.6 species/site), average species representativeness ~74.8%.

Shrub and tree species representativeness continue to be, on average, higher in areas planted with tubestock than in all seeded areas (irrespective of the substrate); indicating variable and inconsistent strike rates and germination success where seeding was undertaken.

Table 5.2: Mid and canopy species composition (2025) – HDWV (historic rehabilitation)

Species (* introduced, ^ priority weed)	Type	Growth form	GBIW / SGIGBF species?	HDWV01	HDWV03	HDWV07	HDWV09	HDWV11
*Eucalyptus cladocalyx**	Exotic	Canopy Tree	No	X				
Melaleuca sp.	Native	Small tree	No	X				
Eucalyptus melliodora	Native	Canopy Tree	No	X				
*Acacia saligna^*	Priority weed	Shrub	No	X	X	X	X	X
Acacia salicina	Native	Small tree	Yes	X	X	X	X	X
Eucalyptus moluccana	Native	Canopy Tree	Yes	X	X		X	
Corymbia maculata	Native	Canopy Tree	Yes	X	X	X	X	X
Eucalyptus crebra	Native	Canopy Tree	Yes	X	X			
*Lycium ferocissimum^*	Priority weed	Shrub	No		X	X	X	
Acacia implexa	Native	Shrub	Yes		X	X		
Acacia decora	Native	Shrub	Yes			X	X	
Dodonaea viscosa subsp. cuneata	Native	Shrub	Yes			X	X	
Acacia parvipinnula	Native	Shrub	Yes			X		
Corymbia citriodora	Exotic	Canopy Tree	No					X
Acacia linifolia	Native	Shrub	No					X

Acacia decurrens	Native	Small tree	No		X			
Total species			**16**	**8**	**8**	**8**	**7**	**5**
Proportion of characteristic species (%)			**50.0**	**50.0**	**62.5**	**75.0**	**71.4**	**40**

Table 5.3: Mid and canopy species composition (2025) – HDWV (newer rehabilitation)

Species (* introduced, ^ priority weed)	Type	Growth form	GBIW / SGIGBF species?	Topsoil + Direct Seeded						Subsoil + Direct Seeded		Overburden + Aerial/Direct Seeded		Topsoil + Tubestock				
				HDWV19	HDWV21	HDWV23	HDWV25	HDWV27	HDWV29	HDWV17	HDWV31	HDWV33	HDWV43	HDWV15	HDWV35	HDWV37	HDWV39	HDWV41
Acacia saligna^	Priority weed	Shrub	No	X	X		X		X	X	X	X	X					
Acacia salicina	Native	Small tree	Yes	X				X	X						X			
Eucalyptus moluccana	Native	Canopy Tree	Yes	X	X			X						X	X			
Corymbia maculata	Native	Canopy Tree	Yes	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Eucalyptus crebra	Native	Canopy Tree	Yes	X	X			X			X	X	X	X	X			
Lycium ferocissimum^	Priority weed	Shrub	No									X				X		X
Eucalyptus albens	Native	Canopy Tree	Yes	X										X			X	X
Acacia implexa	Native	Shrub	Yes		X		X	X	X			X		X	X		X	
Acacia decora	Native	Shrub	Yes	X	X	X		X		X			X					
Dodonaea viscosa subsp. cuneata	Native	Shrub	Yes		X									X	X	X	X	X
Acacia parvipinnula	Native	Shrub	Yes	X	X			X		X			X					
Acacia linifolia	Native	Shrub	No		X		X	X		X								
Dodonaea viscosa subsp. spatulata	Native	Shrub	Yes					X	X		X				X			
Acacia decurrens	Native	Small tree	No				X							X	X	X	X	X
Eucalyptus tereticornis	Native	Canopy Tree	Yes											X				
Acacia falcata	Native	Shrub	Yes											X				X
Eucalyptus blakelyi	Native	Canopy Tree	Yes		X													
Acacia concurrens	Native	Small tree	No			X							X					
Acacia ligulata	Native	Shrub	No				X											
Acacia sp. (fine bipinnate)	Native	Shrub	No							X			X					
Dodonaea viscosa subsp. augustifolia	Native	Shrub	Yes									X	X	X				
Acacia longissima	Native	Shrub	Yes										X				X	

	Total species	**22**	**8**	**10**	**3**	**6**	**9**	**5**	**6**	**4**	**6**	**9**	**10**	**8**	**4**	**5**	**6**
	Proportion of characteristic species (%)	**68.2**	**87.5**	**80.0**	**66.7**	**33.3**	**88.9**	**80.0**	**50.0**	**75.0**	**66.7**	**66.7**	**90.0**	**87.5**	**50.0**	**80.0**	**66.7**

5.1.5.3 *Weeds*

A total of 66 weed species (i.e. exotic species excluding introduced pasture species) were recorded across all sites in 2025, comprising 56 non-invasive exotics (2 trees, 2 sub-shrubs, 4 grasses, 1 vine and 47 forbs) and 10 priority weeds (2 shrubs, 2 grasses and 6 forbs). Priority weeds include *Lycium ferocissimum* (African Boxthorn), *Acacia saligna* (Golden Wreath Wattle), *Sorghum halepense* (Johnson Grass), *Paspalum dilatatum* (Paspalum), *Bidens pilosa* (Cobblers Peg), *Bidens subalternans* (Greater Beggars Tick), *Carthamus lanatus* (Saffron Thistle), *Galenia pubescens* (Galenia), *Hypericum perforatum* (St John's Wart), and *Senecio madagascariensis* (Fireweed).

Total cumulative weed cover levels recorded in 2025 (i.e. ground + mid + upper storey[10]) are presented in Figure 5.8 (historic rehabilitation) and Figure 5.9 (newer rehabilitation), respectively.

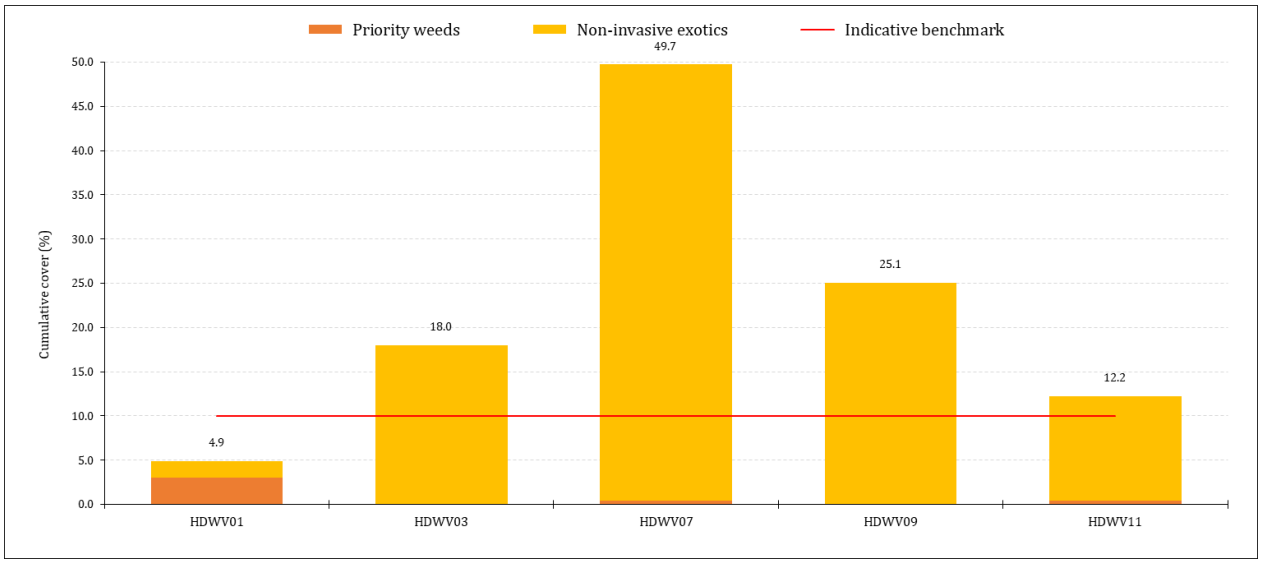


Figure 5.8: Cumulative weed cover levels 2025 – HDWV (historic rehabilitation)

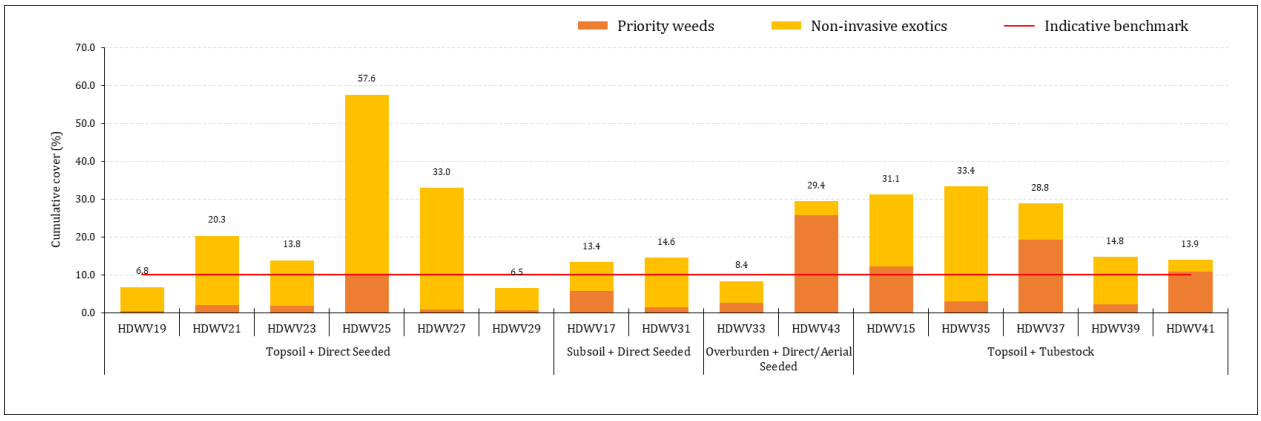


Figure 5.9: Cumulative weed cover levels 2025 – HDWV (newer rehabilitation)

The 2025 weed monitoring results indicate a significant increase in weed population levels with 16 of 20 sites registering weed cover levels between 12.2-57.6% (compared to 7 of 20 sites and range of 11.7-30.7% in 2023) and in exceedance of the 'allowable' 10% cumulative weed cover benchmark. As noted in 2022, areas not dressed with topsoil displayed lower weed abundance, as follows:

- 'Topsoil + direct seeded' areas (historic rehabilitation): weed cover range 4.9-49.7%, average ~22.0%.

[10] Ground layer weeds FPC = average weed cover in the 2 m x 2 m quadrats. Mid and upper storey weeds FPC = assessed through the 50 m line intercept method (refer to monitoring methods in Section 3.1.3).

- 'Topsoil + direct seeded' areas (newer rehabilitation): weed cover range 6.5-57.6%, average ~23.0%.
- 'Subsoil + direct seeded' areas (newer rehabilitation): weed cover range 13.4-14.6%, average ~14.0%.
- 'Overburden + direct/aerial seeded' areas (newer rehabilitation): weed cover range 8.4-29.4%, average ~18.9%.
- 'Topsoil + tubestock' areas (newer rehabilitation): weed cover range 13.9-33.4%, average ~24.4%.

Fourteen monitoring sites had high levels of priority weeds alone (i.e. those most problematic species) exceeding the 10% target, including:

- HDWV03 (18.0% priority weeds cover) – where Ribwort Plantain (*Plantago lanceolata*) and Turnip Weed (*Rapistrum rugosum*) will need to be controlled;
- HDWV07 (49.7% priority weeds cover) – where Ribwort Plantain (*Plantago lanceolata*), Turnip Weed (*Rapistrum rugosum*) and Cleavers (*Galium aparine*) will need to be controlled;
- HDWV09 (25.1% priority weeds cover) – where Ribwort Plantain (*Plantago lanceolata*) and Scarlet Pimpernel (*Lysimachia arvensis*) will need to be controlled;
- HDWV11 (12.2% priority weeds cover) – where Cleavers (*Galium aparine*) will need to be controlled;
- HDWV21 (20.3% priority weeds cover) – where Ribwort Plantain (*Plantago lanceolata*), Fireweed (*Senecio madagascariensis*) and Verbena (*Verbena x brasiliensis*) will need to be controlled;
- HDWV25 (72.0% priority weeds cover) – where Ribwort Plantain (*Plantago lanceolata*), Scarlet Pimpernel (*Lysimachia arvensis*) and Galenia (*Galenia pubescens*) will need to be controlled;
- HDWV27 (33.0% priority weeds cover) – where Paddy's Lucerne (*Sida rhombifolia*), Scarlet Pimpernel (*Lysimachia arvensis*) and Purpltop (*Verbena officinalis*) will need to be controlled;
- HDWV17 (13.4% priority weeds cover) – where Ribwort Plantain (*Plantago lanceolata*), Scarlet Pimpernel (*Lysimachia arvensis*) and Galenia (*Galenia pubescens*) will need to be controlled;
- HDWV31 (14.6% priority weeds cover) – where Wild Aster (*Aster subulatus*) and Scarlet Pimpernel (*Lysimachia arvensis*) will need to be controlled;
- HDWV43 (29.4% priority weeds cover) – where Galenia (*Galenia pubescens*) will need to be controlled;
- HDWV15 (20.2% priority weeds cover) – where Turnip Weed (*Rapistrum rugosum*) and Galenia (*Galenia pubescens*) will need to be controlled;
- HDWV35 (33.4% priority weeds cover) – where Turnip Weed (*Rapistrum rugosum*) will need to be controlled;
- HDWV37 (28.8% priority weeds cover) – where Galenia (*Galenia pubescens*) will need to be controlled;
- HDWV39 (14.8% priority weeds cover) – where Ribwort Plantain (*Plantago lanceolata*), Fireweed (*Senecio madagascariensis*) and Verbena (*Verbena x brasiliensis*) will need to be controlled; and
- HDWV41 (13.9% priority weeds cover) – where Galenia (*Galenia pubescens*) will need to be controlled.

Golden Wreath Wattle and Galenia typically respond well to conventional treatments and can successfully be controlled provided adequate resources and control effort.

The prevalence of African Boxthorn was not adequately captured by the line-intercept scores across the monitoring sites due to their location within the 10 m x 50 m sampling zone and subsequently were not included in the graphs and cumulative weed cover figures. They were captured by stem counts and as such should be targeted in vicinity of HDWV03 in addition to the opportunistic locations mapped in Figure 5.12.

5.1.6 Tree Stems Densities

Trends in recorded tree stems densities are presented in Figure 5.10 (historic rehabilitation) and Figure 5.11 (newer rehabilitation).

5.1.6.1 Historic Rehabilitation

Canopy tree stems densities have shown minimal change from 2023 results, however, sub-canopy small trees have declined from 2023 results. This is evidence of larger canopy trees continuing to survive whereas smaller sub-canopy trees have not been able to. Reasons for this are not clear at this time.

Total stem densities recorded in 2025 ranged from 160 stems/ha at HDWV07 to 420 stems/ha at HDWV01, with an average of ~292 stems/ha which is below the defined target benchmark of 400 stem/ha.

Acacia species continue to dominate the stem count at all but one monitoring site (HDWV01). Total stem counts continue to the be largely comprised of *Acacia salicina* (Cooba) and not preferred long-lived canopy eucalypt species. As mentioned in the 2023 report, this is not a satisfactory outcome as the species is shorter-lived (~50 years) and will unlikely provide adequate vegetation structure and complexity in the long-term. Supplementary infill tree plantings should be undertaken in other locations, particularly HDWV07 to establish eucalypt species commensurate with CHGBIW and CHSGIGBF.

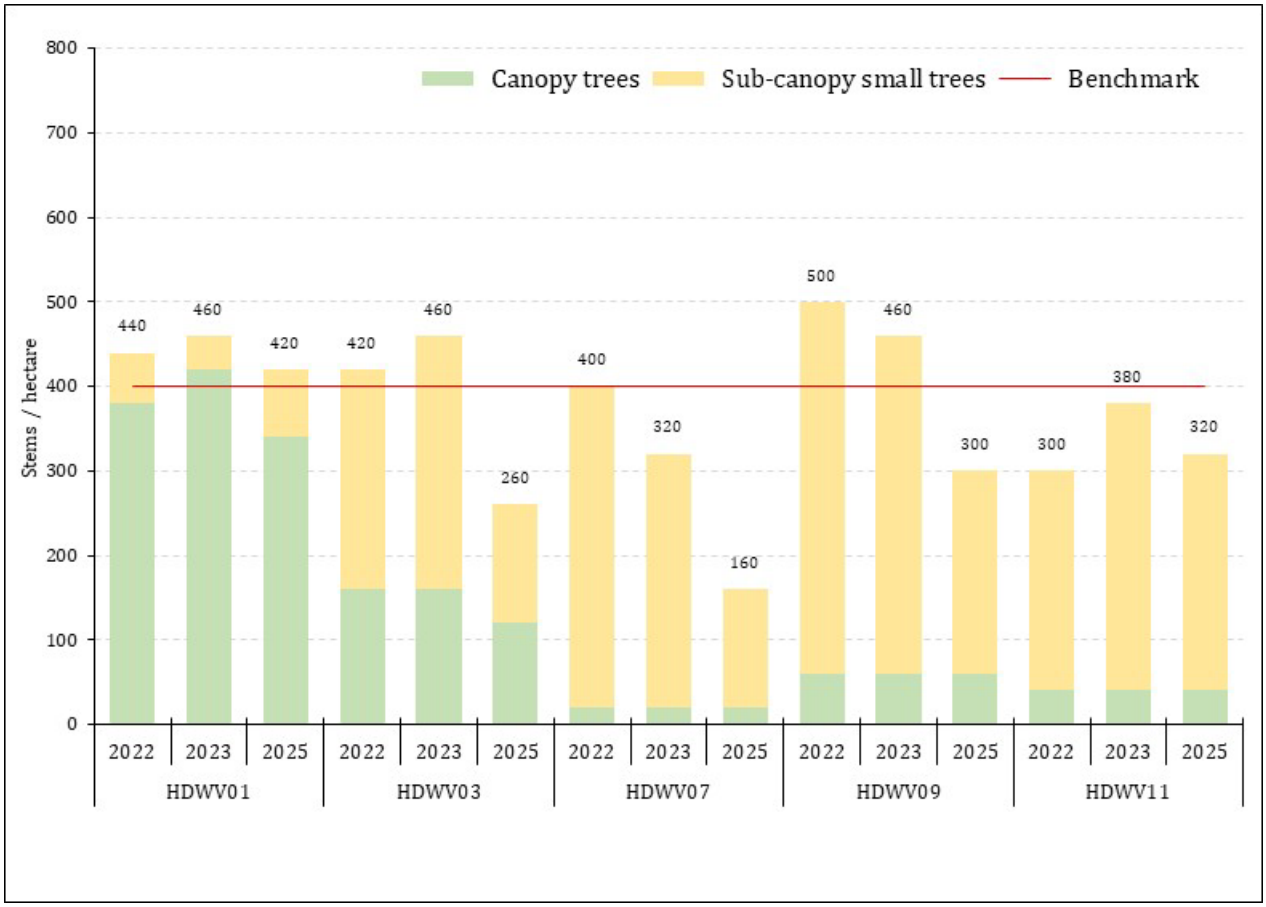


Figure 5.10: Tree stem densities (2022-2025) – HDWV (historic rehabilitation)

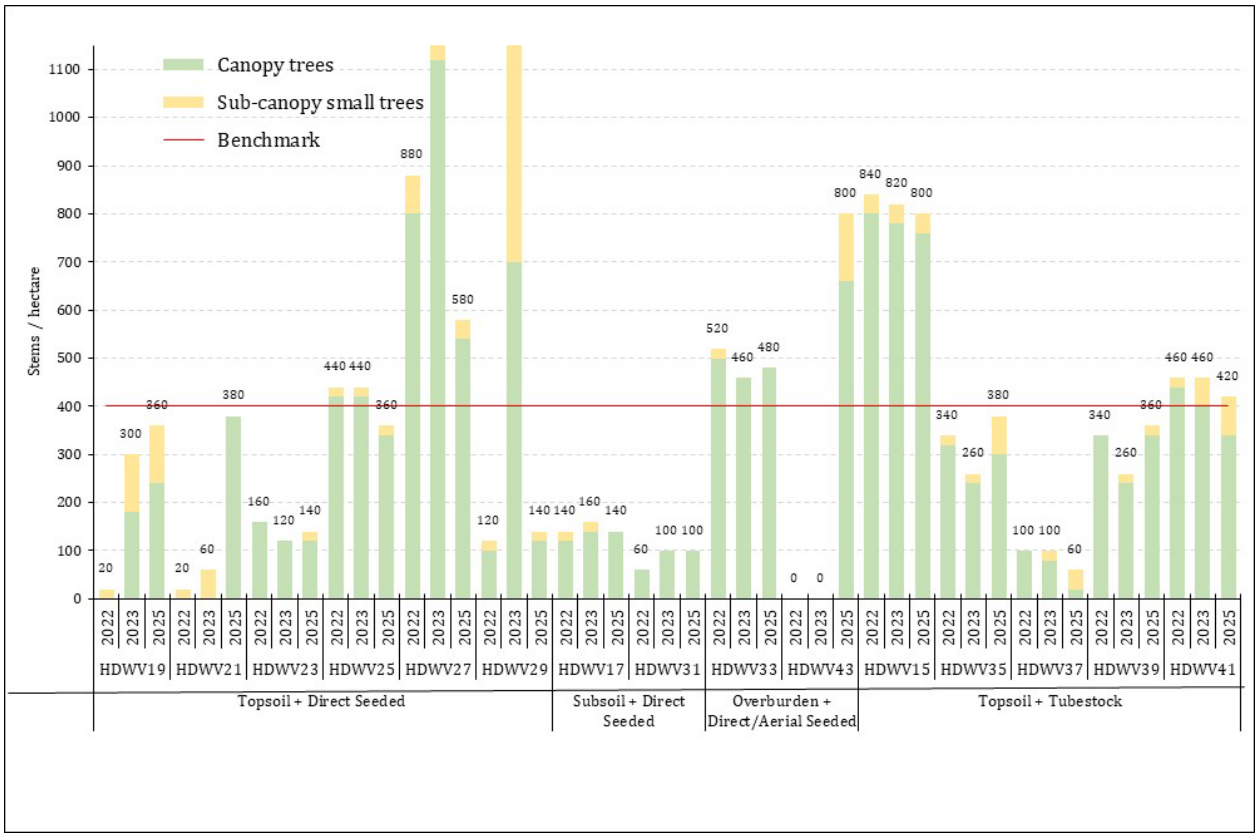


Figure 5.11: Tree stem densities (2022-2025) – HDWV (newer rehabilitation)

'Overburden' (~640 stems/ha) and 'Topsoil + Tubestock' (~404 stems/ha) areas have produced a satisfactory result and are out-performing 'Subsoil + Direct Seeded' (~120 stems/ha) and 'Topsoil + Direct Seeded' (~326 stems/ha) areas.

5.1.7 Regeneration

Active natural tree regeneration (i.e. recruitment of second-generation tree seedlings) was observed at 10 of the 20 monitoring sites. Between 40.0-100.0% of shrub species and between 0-28.6% of tree species were recorded with evidence of flowering/fruiting structures across the monitoring sites in 2025. As noted in the 2023 report, this metric should be taken as indicative only and not representative, as shrubs and trees may be flowering/fruiting at different times of the year, while some individuals of a specific species may only produce flower/fruits in response to conditions and not necessarily on a seasonal or annual basis. Results for 2025 are presented in Table 5.4.

Of note, *Dodonaea viscosa subsp. cuneata* was observed to be fruiting abundantly and considerably more than the two other subspecies present across the entire site.

Overall and irrespective of their 2025 performance in terms of species composition and tree densities and taking into account the recruitment capability shown in wetter years, it is considered that there is adequate potential for the established communities to be self-sustainable.

Table 5.4: Natural regeneration 2025[11]

Metric	HDWV01	HDWV03	HDWV07	HDWV15	HDWV17	HDWV21	HDWV25	HDWV27	HDWV29	HDWV35	HDWV37	HDWV39	HDWV41
% of shrubs with flower/fruit (1)	n/a[2]	100	50.0	50.0	50.0	40.0	66.7	40.0	50.0	66.7	50.0	66.7	50.0
% of trees species with flower/fruit	28.6	0	0	0	0	0	0	0	0	0	0	0	0
No. tree species with seedlings	0	0	0	0	2	3	1	3	0	2	0	1	0

(1) Excludes shrubby weeds i.e. *Acacia saligna* and *Lycium ferocissimum*.

(2) No native shrub species present at these locations

5.2 Walkover Audit Inspection

Key observations made during the 2025 walkover inspection are summarised in Table 5.5 (which includes reference links to example photographs provided in Appendix B), with their locations shown in Figure 5.12.

Table 5.5: Walkover audit key findings 2025 – HDWV rehabilitation

Category	Details	Photo ref.	Priority
Drainage structures – Rock-lined drains	All rock-lined drainage channels across the OEA were assessed as stable and well-functioning, with drain in older historic areas well vegetated.	Photo collection 1	4
Slope erosion – Rilling	A total of 7 rills were recorded ranging in severity from 5-30cm in depth and which may exceed 'allowable' limits for safe and stable landform. These included 2 channels in Zone 1, 2 channels in PRP Zone 2, 1 channel in PRP Zone 5, 1 channel in PRP Zone 7 and 1 channel in PRP Zone 8. All rills were classified as stabilised or partially stabilised except for 1 in Zone 5 close to HDWV11 monitoring point which was classified as active. The rills should be closely monitored and remediation requirements considered on a case-by-case basis (e.g. channels of lower severity which are assessed as fully stabilised and occur in areas of good vegetative performance may not necessarily need to be repaired).	Photo collection 6	3
Slope erosion - Gully	A total of 12 gully channels were recorded with a severity of 40-150cm in depth and which may exceed 'allowable' limits for safe and stable landform. These included 3 channels in Zone 1, 3 channels in PRP Zone 6, 4 channels in PRP Zone 2, 1 channel in PRP Zone 7 and 1 channel in PRP Zone 8. All gully channels were classified as stabilised or partially stabilised except for 2 (1 in Zone 6 close to HDWV25 monitoring point and 1 in Zone 2 close to HDWV31 monitoring point) which was classified as active. The gully should be closely monitored and remediation requirements considered on a case-by-case basis (e.g. channels of lower severity which are assessed as fully stabilised and occur in areas of good vegetative performance may not necessarily need to be repaired).	Photo collection 7	1
Slope erosion - tunnel	Only 1 tunnel erosion channel was recorded with an approximate depth of 100cm in depth and which exceed the 'allowable' limits for safe and stable landform. It was identified in Zone 1 (close to HDWV09). Tunnel erosion is evident in the topsoil layer and may cause slumping if not repaired.	Photo collection 8	1

[11] This table only includes sites that have shown reproductive material. Sites where none were recorded have been omitted from this table.

Weeds – Galenia	Survey results show Galenia remains prevalent and widely distributed across the entire site including severe infestations and localised patches scattered throughout.	Photo collection 9	2
Weeds – African Boxthorn	The species is common across the site and based on previous year's results, appears to be expanding. Some areas are at risk of severe infestations and should be the target of greater control efforts	Photo collection 10	3
Habitat augmentation	Several artificial habitat features (log piles) were noted through the rehabilitated areas. These have been mapped in Figure 5.12. In their current configuration they are more likely to harbour vertebrate pests such as rabbits and foxes and regular monitoring should be undertaken to determine if targeted pest control is required.	Photo collection 2	4
Animal pests	Vertebrate pest animals such as feral pigs were sighted during the 2025 surveys. Pigs are difficult to control as they travel great distances daily unless there is a constant resource and opportunistic observations should be mapped to check if numbers may be increasing. Evidence of rabbits occurred in and around the pasture areas though no warrens were discovered. Nocturnal transect spotlight surveys are recommended to establish a baseline count to better understand rabbit abundance going forward.	Photo collection 5	3
Access tracks	Internal tracks maintenance has been very limited within the rehabilitation, and several tracks were overgrown with vegetation at the time of monitoring, making access to some locations difficult. Internal access tracks should be regularly maintained in serviceable condition to ensure adequate access to all rehabilitation areas.	N/A	3
Threatened species translocation	Several specimens of Tiger Orchid (*Cymbidium canaliculatum*) found in the pre-strip were successfully salvaged and relocated into the rehabilitation on their host stag trees – for an excellent practice. Their survival will need to be monitored to determine the success of the translocation / transfer.	Photo collection 4	4
Bare ground	A localised patch of bare ground (~150 m^2) was noted in Zone 6. It is recommended that this area be inspected regularly to establish whether it will recover. If this area is not recovering, additional improvement interventions such as reseeding could be required.	Photo collection 3	3



Figure 5.12: Walkover audit key findings 2025 – HDWV rehabilitation

5.3 Compliance Assessment

Based on the 2025 monitoring results and observations as presented in the previous sections, this section provides an assessment of rehabilitation progress against the relevant completion criteria defined in the RMP (2024) for areas of HDWV rehabilitation.

Criteria pertaining to landform establishment, landform stability, drainage, habitat augmentation and feral pests have been assessed at the scale of the entire emplacement area (Table 5.6).

For criteria pertaining to vegetative performance and soils, a separate assessment has been undertaken based on rehabilitation age and revegetation method (consistent with the rest of this report) (Table 5.7).

Table 5.6: Progress against RMP completion criteria (HDWV) 2025 – landform, erosion, habitat and feral pests

Completion criteria	Progress as of 2025	Compliant
Land safely accessible.	No uncontrolled access was evidenced, and rehabilitation areas at the site are typically well demarcated. Monitoring site HDWV21 was not demarcated and was re-staked during the 2025 monitoring period.	Yes
No visible signs of instability (slumping/ cracks) that require ongoing management and maintenance works.	Minor slumping and cracking, as shown in Photo Collection 7, was observed which could compromise the integrity and long-term stability of the landform. These areas will need to be assessed for repair requirements.	No
No erosion rills, gullies or tunnel erosion that requires ongoing management and maintenance works.	Several gully channels of moderate to high severity (25-150 cm deep), tunnel erosion of minor severity (10-25cm deep) and rills of minor severity (occur across the slopes, which will need to be assessed for repair requirements.	No
No evidence of erosion within the water/sediment management structures that requires ongoing management and maintenance.	Channel erosion is impacting the main rock-lined drainage channel in the area of natural landform (PRP Zone 6).	No
No evidence of contamination.	No hazardous or problematic materials were observed or recorded during the walkover inspection.	Yes
Surface runoff is diverted to neighbouring drainage lines.	All surface drainage from rehabilitation areas is currently contained internally into sediment basins, with no surface water leaving the site.	n/a
Water quality meets parameters suitable for land use chosen from Australia and New Zealand Guidelines for Fresh and Marine Water Quality 2000 or its latest version.	Not assessed – outside the scope of this monitoring program.	n/a
Landform compliant with approved Final Landform.	Not assessed – outside the scope of this monitoring program.	n/a
Water/sediment management structures installed per design. No evidence of erosion requiring ongoing management and maintenance.	Not assessed – outside the scope of this monitoring program.	n/a
Monitoring indicates no increasing trends in population or species diversity of feral pests.	Foxes, rabbits/hares and pigs utilise the rehabilitation. An ongoing culling program is in place to reduce population levels. Active and regular monitoring focusing on rabbits and pigs should be undertaken to better inform population status. No increase trends of feral pest populations have been noted.	Yes
Presence of habitat features (e.g., boulders and large logs) on rehabilitated areas.	Habitat features (log piles) have been installed have been installed throughout the rehabilitation area (see Photo Collection 2). No nest boxes or rocky areas have been incorporated as yet and present opportunity to improve wild life habitat connectivity across the site.	No / Insufficient
Presence of native animal activity.	Macropods and several species of woodland birds were observed as utilising the rehabilitation areas.	Yes
Adoption of standard fire prevention measures including firebreaks and minimising fire hazards Access maintained for firefighting	Not assessed – outside the scope of this monitoring program	n/a

Services disconnected and removed.	Not assessed – outside the scope of this monitoring program	n/a
Infrastructure removed.	Not assessed – outside the scope of this monitoring program	n/a
Required licences and approval documents issued.	Not assessed – outside the scope of this monitoring program	n/a
Landform compliant with the approved hydrological modelling landform design.	Not assessed – outside the scope of this monitoring program	n/a
Waste storage areas have been constructed as designed. Verification and/or testing confirms integrity of structures and does not pose threat of environmental harm	Not assessed – outside the scope of this monitoring program	n/a

Table 5.7: Progress against RMP completion criteria (HDWV) – Soils and vegetation

Completion criteria	Progress as of 2025	Compliance status				
		Topsoiled + Direct Seeded (historic rehabilitation)	Topsoil + Direct Seeded (newer rehabilitation)	Subsoil + Direct Seeded (newer rehabilitation)	Overburden + Aerial/Direct Seeded (newer rehabilitation)	Topsoil + Tubestock (newer rehabilitation)
Soil/growth medium maintains chemical and physical qualities appropriate to achieve native vegetation growth.	Soil fertility levels are variable but overall deemed within suitable range for native vegetation growth across all areas. Soil salinity levels exceeded the target at two sites. Both the sites (HDWV31 and HDWV43) are newer established sites on overburden / subsoil and returned very high levels. High soil pH levels were recorded for many areas with an increase in pH across all sites. This trend towards more alkaline soils is thought to be a result of the die back of vegetative growth, subsequent decomposing of the organic material in the soil resulting in an increase of pH. All sites were non-sodic and returned very low ESP (exchangeable sodium percentage) levels in 2025.	No	No	No	No	No
Species establishing are aligned to those included in the species mix for the domain and species diversity on rehabilitated land as determined by a suitably qualified expert to be comparable to similar native woodland areas within the region.	Average proportions of shrubs and trees species representative of the local communities CHGBIW and CHSGIGBF measured at the monitoring sites were as follow: • 'Topsoil + direct seeded' (historic rehabilitation): ~66.7% characteristic species. • 'Topsoil + direct seeded' (newer rehabilitation): ~72.3% characteristic species. • 'Subsoil + direct seeded' (newer rehabilitation): ~62.5% characteristic species. • 'Overburden + direct/aerial seeded' (newer rehabilitation.): ~66.7% characteristic species. • 'Topsoil + tubestock' areas (newer rehabilitation): ~74.8% characteristic species.	Yes	Yes	Yes	Yes	Yes
Stem densities maintained at ≥ 400 stems/ha in nominated HDWV areas	Average tree stems densities measured as: • 'Topsoil + direct seeded' (historic rehabilitation): ~292 stems/ha. • 'Topsoil + direct seeded' (newer rehabilitation): ~326 stems/ha. • 'Subsoil + direct seeded' (newer rehabilitation): ~120 stems/ha. • 'Overburden + direct/aerial seeded' (newer rehabilitation.): ~640 stems/ha. • 'Topsoil + tubestock' areas (newer rehabilitation): ~404 stems/ha.	No	No	No	Yes	Yes

	Tree stem counts will increase as tubestock and direct seeded trees which are currently immature continue to grow and become more evident in the rehabilitation areas.					
Surface organic litter present.	Surface organic litter has increased across 13 of the 20 monitoring sites in 2025 which is likely because of reduced live vegetation growth. Additionally, the establishment of any new rehabilitation areas will lower the average scores. As noted in 2023, litter should naturally accumulate with time assuming satisfactory vegetation establishment and growth.	Yes	Yes	Yes	Yes	Yes
Weed control focuses on priority species such that weed coverage on rehabilitated land as determined by a suitably qualified expert to be comparable to similar native woodland areas within the region.	Not assessed - the monitoring program currently includes no relevant analogue/reference sites in areas of native woodland against which rehabilitation performance can be compared. However, native woodland ecosystems in the region typically show very low levels of weed coverage (often <1%). When assessed again the nominal and indicative 10% weed cover target, performance in 2025 was measured was as: • 'Topsoil + direct seeded' (historic rehabilitation): average ~22.0% weed cover. • 'Topsoil + direct seeded' (newer rehabilitation): average ~25.4% weed cover. • 'Subsoil + direct seeded' (newer rehabilitation): average ~14.0% weed cover. • 'Overburden + direct/aerial seeded' (newer rehabilitation.): average ~18.9% weed cover. • 'Topsoil + tubestock' areas (newer rehabilitation): average ~24.4% weed cover.	n/a	n/a	n/a	n/a	n/a
Evidence of reproductive material on mature long lived vegetation and/or presence of second generation seedlings from mature long lived species as determined by a suitably qualified expert.	Active natural tree regeneration (i.e. recruitment of second-generation tree seedlings) was observed at 10 of the 20 monitoring sites. Between 40.0-100.0% of shrub species and between 0-28.6% of tree species were recorded with evidence of flowering/fruiting structures across the monitoring sites in 2025	Yes	Yes	Yes	Yes	Yes
Recruitment rates are equal to or exceed mortality rates.	This criterion is difficult or impractical to accurately measure or assess. However, as in the previous year's report, woody species diversity and counts of tree stem densities have remained generally stable over the evaluation period in areas of historic rehabilitation, with only a minor net reduction in shrub/tree populations largely attributed to acacia dieback.	Yes	Yes	Yes	Yes	Yes

6. Recommendations

6.1 Erosion Repairs

Erosion issues identified during this 2025 round of monitoring and recommended for remediation included:

- Superficial rill erosion (channels <30 cm deep) was recorded at four monitoring sites (HDWV15, HDWV33, HDWV39, and HDWV43).
- A total of 7 rills were recorded ranging in severity from 5-30cm in depth. These included 2 channels in Zone 1, 2 channels in PRP Zone 2, 1 channel in PRP Zone 5, 1 channel in PRP Zone 7 and 1 channel in PRP Zone 8. All rills were classified as stabilised or partially stabilised except for 1 in Zone 5 close to HDWV11 monitoring point which was classified as active.
- A total of 12 gully channels were recorded with a severity of 40-150cm in depth. These included 3 channels in Zone 1, 3 channels in PRP Zone 6, 4 channels in PRP Zone 2, 1 channel in PRP Zone 7 and 1 channel in PRP Zone 8. All gully channels were classified as stabilised or partially stabilised except for 2 (1 in Zone 6 close to HDWV25 monitoring point and 1 in Zone 2 close to HDWV31 monitoring point) which was classified as active.
- Only 1 tunnel erosion channel was recorded with an approximate depth of 100cm in depth. It was identified in Zone 1 (close to HDWV09).

6.2 Weeds

Weed incursion remains one of the main issues inhibiting rehabilitation progress across the site and will require significant, systematic and ongoing management inputs.

Similarly to previous years, of the priority weeds recorded at the site in 2025, the most problematic include Galenia and African Boxthorn – which typically respond well to conventional treatments (i.e. herbicide applications, mulching, etc) and should continue to be systematically targeted for treatment. Treatment should be timed prior to seasonal reproduction (where the species allow) to reduce the presence of seed in the soil.

African Boxthorn particularly should be targeted in vicinity of the following monitoring sites in addition to the opportunistic locations mapped in Figure 5.12:

- HDWV03
- HDWV19
- HDWV31
- HDWV39; and
- HDWV41.

Fireweed was observed commonly during the 2025 monitoring, with it becoming well established in certain areas in conjunction with other weeds. It is recommended that Fireweed be controlled opportunistically during any weed control operations being undertaken going forward.

Other recorded priority weeds (e.g. Cobblers Peg, Saffron Thistle, Prickly Pear (high threat weed), etc) occur more sparsely and generally do not represent an immediate threat to the successful establishment of the targeted land use.

Areas of broadleaf (non-listed) environmental weeds identified at the time of the 2025 monitoring, proliferation of which was a result of high rainfall, have reduced naturally through seasonal and climatic variation. As stated in the previous report, these species are generally not recommended for treatment as they tend to naturally reduce once canopy

foliage establishes. Continued long-term monitoring will confirm that this natural reduction is occurring, and active management may need to be considered otherwise.

Acknowledging the strong component of grazing in the agreed final land use for most of the site (including areas of HDWV), exotic pasture grasses including Guinea grass, Kikuyu and Rhodes Grass have not been regarded as weeds under this monitoring program and thus control is not deemed required. It is however noted that these species are defined as 'high threat exotics' for the purpose of biodiversity conservation under the NSW Biodiversity Conservation Act 2016, and may be problematic and counteract any effort to establish a native component in the ground layer in future monitoring.

6.3 Feral Pests

Feral pig activity was recorded during the 2025 monitoring. Continued monitoring collecting opportunistic observations such as scats, diggings and live animals should be undertaken in conjunction with active monitoring using camera traps placed in areas of higher use.

Fresh Rabbit/Hare signs were observed (albeit outside rehabilitation areas), and these species pose a significant threat to rehabilitation. High Rabbit densities can have severe impacts on live ground cover resulting in large bare patches at risk of erosion and Hare are known to browse shrub and tree seedlings to the extent that survival rates of germinated seedlings and tube stock are severely impacted. As Rabbit and Hare populations are difficult to determine, active nocturnal monitoring using the Transect Spotlight method should be considered to establish a baseline count. Seasonal monitoring would then allow future fluctuations of these pests to be detected and managed before impacts on vegetation rehabilitation occur.

6.4 HDWV Establishment

Future revegetation plantings should continue to ensure a relatively even distribution of the canopy tree species so as not to result in areas being dominated by short lived shrub species. The use of a successional planting principles for infill species selection is recommended. This means selecting plants or shrub and mid-storey canopy species that would naturally regenerate after the structure of the canopy, and more importantly the establishment of topsoil and moisture holding capacity, has been established.

The continued implementation of the HDWV installation over the coming years should be adaptive and take into considerations the findings presented in this and previous reports and subsequent rehabilitation monitoring events (to determine which revegetation methods is generating the best outcomes).

6.5 Habitat Augmentation

Artificial habitat sites created focused on log piles concentrated in rehabilitation areas. These provide native fauna habitat, and whilst thought to favour introduced species such as rabbits and foxes in other landforms, BMC have previously sought and received guidance from an Ecologist, who advised that the site specific recommendation is to provide log piles since they provide higher ecological benefit, especially for closure criteria, when laid in piles rather than spread across the rehabilitation area in isolation. As in previous reports, it continues to be a recommendation that future construction of artificial habitat features include rock piles, large boulders, and nest boxes.

7. References

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APPENDIX A
2025 PHOTOGRAPHIC MONITORING RECORD

Monitoring site: P3

View from start of transect	View from end of transect
	

Monitoring site: HDWV 01

View from start of transect	View from end of transect
	

Monitoring site: HDWV 03

View from start of transect	View from end of transect
	

Monitoring site: HDWV 07

View from start of transect	View from end of transect
	

Monitoring site: HDWV 09

View from start of transect	View from end of transect
	

Monitoring site: HDWV 11

View from start of transect	View from end of transect
	

Monitoring site: HDWV 15

View from start of transect	View from end of transect
	

Monitoring site: HDWV 17

View from start of transect	View from end of transect
	

Monitoring site: HDWV 19

View from start of transect	View from end of transect
	

Monitoring site: HDWV 21

View from start of transect	View from end of transect
	

Monitoring site: HDWV 23

View from start of transect	View from end of transect
	

Monitoring site: HDWV 25

View from start of transect	View from end of transect
	

Monitoring site: HDWV 27

View from start of transect	View from end of transect
	

Monitoring site: HDWV 29

View from start of transect	View from end of transect
	

Monitoring site: HDWV 31

View from start of transect	View from end of transect
	

Monitoring site: HDWV 33

View from start of transect	View from end of transect
	

Monitoring site: HDWV 35

View from start of transect	View from end of transect
	

Monitoring site: HDWV 37

View from start of transect	View from end of transect
	

Monitoring site: HDWV 39

View from start of transect	View from end of transect
	

Monitoring site: HDWV 41

View from start of transect	View from end of transect
	

Monitoring site: HDWV 43

View from start of transect	View from end of transect
	

APPENDIX B
2025 WALKOVER AUDIT PHOTOGRAPHS

Rock-lined drains (Photo collection 1)






Habitat augmentation (Photo collection 2)






Bare ground (Photo collection 3)





Threatened species translocation (Photo collection 4)







Animal pests (Photo collection 5)





Rill erosion (Photo collection 6)







Gully erosion (Photo collection 7)






Tunnel erosion (Photo collection 8)



Weeds – Galenia (Photo collection 9)




Weeds – Boxthorn (Photo collection 10)

Weeds – Turnip weed (Photo collection 11)


APPENDIX C
2025 SOIL LABORATORY ANALYSES REPORT

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CERTIFICATE OF ANALYSIS 395824

Client Details

Client	Moss Environmental
Attention	Nico Brits
Address	1/342 Peel St, TAMWORTH, NSW, 2340

Sample Details

Your Reference	**J210 BMC Rehab Monitoring**
Number of Samples	21 Soil
Date samples received	18/11/2025
Date completed instructions received	18/11/2025

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client unless as indicated below in the method summaries. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	25/11/2025
Date of Issue	12/12/2025

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Diego Bigolin, Inorganics Supervisor
Giovanni Agosti, Group Technical Manager
Jack Wallis, Senior Chemist
Jenny He, Inorganic Team Leader
Larry Ye, Senior Chemist
Priya Samarawickrama, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

Acid Extractable metals in soil						
Our Reference		395824-1	395824-2	395824-3	395824-4	395824-5
Your Reference	UNITS	HDWV 27	HDWV 07	HDWV 09	HDWV 37	HDWV 35
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		10/11/2025	10/11/2025	10/11/2025	11/11/2025	11/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	24/11/2025	24/11/2025	24/11/2025	24/11/2025	24/11/2025
Date analysed	-	24/11/2025	24/11/2025	24/11/2025	24/11/2025	24/11/2025
Phosphorus	mg/kg	160	240	260	290	240

Acid Extractable metals in soil						
Our Reference		395824-6	395824-7	395824-8	395824-9	395824-10
Your Reference	UNITS	HDWV 25	HDWV 31	HDWV 39	HDWV 41	HDWV 43
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		11/11/2025	11/11/2025	11/11/2025	11/11/2025	12/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	24/11/2025	24/11/2025	24/11/2025	24/11/2025	24/11/2025
Date analysed	-	24/11/2025	24/11/2025	24/11/2025	24/11/2025	24/11/2025
Phosphorus	mg/kg	230	90	240	270	330

Acid Extractable metals in soil						
Our Reference		395824-11	395824-12	395824-13	395824-14	395824-15
Your Reference	UNITS	HDWV 33	HDWV 29	HDWV 23	HDWV 17	HDWV 03
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		12/11/2025	12/11/2025	12/11/2025	12/11/2025	12/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/11/2025	21/11/2025	21/11/2025	21/11/2025	21/11/2025
Date analysed	-	24/11/2025	24/11/2025	24/11/2025	24/11/2025	24/11/2025
Phosphorus	mg/kg	370	190	190	220	210

Acid Extractable metals in soil						
Our Reference		395824-16	395824-17	395824-18	395824-19	395824-20
Your Reference	UNITS	HDWV 11	HDWV 15	HDWV 19	HDWV 01	HDWV 21
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		13/11/2025	13/11/2025	13/11/2025	13/11/2025	14/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/11/2025	21/11/2025	21/11/2025	21/11/2025	21/11/2025
Date analysed	-	24/11/2025	24/11/2025	24/11/2025	24/11/2025	24/11/2025
Phosphorus	mg/kg	220	560	200	210	210

Acid Extractable metals in soil		
Our Reference		395824-21
Your Reference	UNITS	p3
Depth		0.1m
Date Sampled		14/11/2025
Type of sample		Soil
Date prepared	-	21/11/2025
Date analysed	-	24/11/2025
Phosphorus	mg/kg	1,000

Moisture						
Our Reference		395824-1	395824-2	395824-3	395824-4	395824-5
Your Reference	UNITS	HDWV 27	HDWV 07	HDWV 09	HDWV 37	HDWV 35
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		10/11/2025	10/11/2025	10/11/2025	11/11/2025	11/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/11/2025	20/11/2025	20/11/2025	20/11/2025	20/11/2025
Date analysed	-	21/11/2025	21/11/2025	21/11/2025	21/11/2025	21/11/2025
Moisture	%	7.0	13	10	8.5	10

Moisture						
Our Reference		395824-6	395824-7	395824-8	395824-9	395824-10
Your Reference	UNITS	HDWV 25	HDWV 31	HDWV 39	HDWV 41	HDWV 43
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		11/11/2025	11/11/2025	11/11/2025	11/11/2025	12/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/11/2025	20/11/2025	20/11/2025	20/11/2025	20/11/2025
Date analysed	-	21/11/2025	21/11/2025	21/11/2025	21/11/2025	21/11/2025
Moisture	%	8.3	5.6	9.2	12	9.0

Moisture						
Our Reference		395824-11	395824-12	395824-13	395824-14	395824-15
Your Reference	UNITS	HDWV 33	HDWV 29	HDWV 23	HDWV 17	HDWV 03
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		12/11/2025	12/11/2025	12/11/2025	12/11/2025	12/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/11/2025	20/11/2025	20/11/2025	20/11/2025	20/11/2025
Date analysed	-	21/11/2025	21/11/2025	21/11/2025	21/11/2025	21/11/2025
Moisture	%	9.5	11	10	7.2	10

Moisture						
Our Reference		395824-16	395824-17	395824-18	395824-19	395824-20
Your Reference	UNITS	HDWV 11	HDWV 15	HDWV 19	HDWV 01	HDWV 21
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		13/11/2025	13/11/2025	13/11/2025	13/11/2025	14/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/11/2025	20/11/2025	20/11/2025	20/11/2025	20/11/2025
Date analysed	-	21/11/2025	21/11/2025	21/11/2025	21/11/2025	21/11/2025
Moisture	%	7.9	11	11	8.1	8.5

Moisture		
Our Reference		395824-21
Your Reference	UNITS	p3
Depth		0.1m
Date Sampled		14/11/2025
Type of sample		Soil
Date prepared	-	20/11/2025
Date analysed	-	21/11/2025
Moisture	%	19

CEC						
Our Reference		395824-1	395824-2	395824-3	395824-4	395824-5
Your Reference	UNITS	HDWV 27	HDWV 07	HDWV 09	HDWV 37	HDWV 35
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		10/11/2025	10/11/2025	10/11/2025	11/11/2025	11/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/11/2025	25/11/2025	25/11/2025	25/11/2025	25/11/2025
Date analysed	-	25/11/2025	25/11/2025	25/11/2025	25/11/2025	25/11/2025
Exchangeable Ca	meq/100g	14	14	15	16	9.8
Exchangeable K	meq/100g	0.5	1.4	0.9	0.6	0.9
Exchangeable Mg	meq/100g	2.5	8.4	7.0	7.8	8.0
Exchangeable Na	meq/100g	<0.1	<0.1	<0.1	0.1	0.2
Cation Exchange Capacity	meq/100g	17	23	23	24	19

CEC						
Our Reference		395824-6	395824-7	395824-8	395824-9	395824-10
Your Reference	UNITS	HDWV 25	HDWV 31	HDWV 39	HDWV 41	HDWV 43
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		11/11/2025	11/11/2025	11/11/2025	11/11/2025	12/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/11/2025	25/11/2025	25/11/2025	25/11/2025	25/11/2025
Date analysed	-	25/11/2025	25/11/2025	25/11/2025	25/11/2025	25/11/2025
Exchangeable Ca	meq/100g	16	27	12	26	10
Exchangeable K	meq/100g	0.8	0.2	0.7	0.7	0.3
Exchangeable Mg	meq/100g	7.5	3.0	5.7	7.2	8.8
Exchangeable Na	meq/100g	<0.1	<0.1	<0.1	<0.1	0.5
Cation Exchange Capacity	meq/100g	25	31	19	34	20

CEC						
Our Reference		395824-11	395824-12	395824-13	395824-14	395824-15
Your Reference	UNITS	HDWV 33	HDWV 29	HDWV 23	HDWV 17	HDWV 03
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		12/11/2025	12/11/2025	12/11/2025	12/11/2025	12/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/11/2025	25/11/2025	25/11/2025	25/11/2025	25/11/2025
Date analysed	-	25/11/2025	25/11/2025	25/11/2025	25/11/2025	25/11/2025
Exchangeable Ca	meq/100g	13	15	16	9.9	17
Exchangeable K	meq/100g	0.5	0.5	0.5	0.4	1.1
Exchangeable Mg	meq/100g	9.2	5.8	7.1	4.8	5.5
Exchangeable Na	meq/100g	0.6	0.1	0.2	<0.1	<0.1
Cation Exchange Capacity	meq/100g	23	22	24	15	24

CEC						
Our Reference		395824-16	395824-17	395824-18	395824-19	395824-20
Your Reference	UNITS	HDWV 11	HDWV 15	HDWV 19	HDWV 01	HDWV 21
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		13/11/2025	13/11/2025	13/11/2025	13/11/2025	14/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/11/2025	25/11/2025	25/11/2025	25/11/2025	25/11/2025
Date analysed	-	25/11/2025	25/11/2025	25/11/2025	25/11/2025	25/11/2025
Exchangeable Ca	meq/100g	8.6	17	18	6.7	15
Exchangeable K	meq/100g	0.7	1.8	0.7	0.6	0.6
Exchangeable Mg	meq/100g	2.2	5.4	7.2	3.3	5.0
Exchangeable Na	meq/100g	<0.1	<0.1	<0.1	<0.1	<0.1
Cation Exchange Capacity	meq/100g	11	25	26	11	21

CEC		
Our Reference		395824-21
Your Reference	UNITS	p3
Depth		0.1m
Date Sampled		14/11/2025
Type of sample		Soil
Date prepared	-	25/11/2025
Date analysed	-	25/11/2025
Exchangeable Ca	meq/100g	22
Exchangeable K	meq/100g	1.7
Exchangeable Mg	meq/100g	14
Exchangeable Na	meq/100g	0.3
Cation Exchange Capacity	meq/100g	37

Misc Inorg - Soil						
Our Reference		395824-1	395824-2	395824-3	395824-4	395824-5
Your Reference	UNITS	HDWV 27	HDWV 07	HDWV 09	HDWV 37	HDWV 35
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		10/11/2025	10/11/2025	10/11/2025	11/11/2025	11/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	19/11/2025	19/11/2025	19/11/2025	19/11/2025	19/11/2025
Date analysed	-	19/11/2025	19/11/2025	19/11/2025	19/11/2025	19/11/2025
pH 1:5 soil:water	pH Units	7.5	7.4	8.1	8.4	7.9
Electrical Conductivity	µS/cm	120	110	140	120	92
Ammonia as N in soil	mg/kg	1.2	2.9	1.6	1.6	1.7
Nitrate as N in soil	mg/kg	2	5.5	2	0.7	<0.5
Nitrite as N in soil	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
NOx as N in soil	mg/kg	1.8	5.6	1.6	0.73	<0.5
Total Nitrogen in soil/solids	mg/kg	1,000	1,600	1,200	930	1,500
Phosphate as P in soil	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Organic Nitrogen as N	mg/kg	1,000	1,600	1,200	920	1,500
Organic Matter (Combustion)	%	1.7	3.7	2.0	1.4	2.7

Misc Inorg - Soil						
Our Reference		395824-6	395824-7	395824-8	395824-9	395824-10
Your Reference	UNITS	HDWV 25	HDWV 31	HDWV 39	HDWV 41	HDWV 43
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		11/11/2025	11/11/2025	11/11/2025	11/11/2025	12/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	19/11/2025	19/11/2025	19/11/2025	19/11/2025	19/11/2025
Date analysed	-	19/11/2025	19/11/2025	19/11/2025	19/11/2025	19/11/2025
pH 1:5 soil:water	pH Units	8.2	6.2	8.1	8.4	8.6
Electrical Conductivity	µS/cm	130	2,300	130	120	600
Ammonia as N in soil	mg/kg	1.6	2.9	1.6	2.1	2.3
Nitrate as N in soil	mg/kg	2	<0.5	<0.5	1	<0.5
Nitrite as N in soil	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
NOx as N in soil	mg/kg	1.7	<0.5	<0.5	1.5	<0.5
Total Nitrogen in soil/solids	mg/kg	980	860	1,200	1,300	890
Phosphate as P in soil	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Organic Nitrogen as N	mg/kg	970	860	1,200	1,300	890
Organic Matter (Combustion)	%	1.6	1.6	2.1	1.4	1.1

Misc Inorg - Soil						
Our Reference		395824-11	395824-12	395824-13	395824-14	395824-15
Your Reference	UNITS	HDWV 33	HDWV 29	HDWV 23	HDWV 17	HDWV 03
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		12/11/2025	12/11/2025	12/11/2025	12/11/2025	12/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	19/11/2025	19/11/2025	19/11/2025	19/11/2025	19/11/2025
Date analysed	-	19/11/2025	19/11/2025	19/11/2025	19/11/2025	19/11/2025
pH 1:5 soil:water	pH Units	9.1	8.6	8.3	8.1	8.0
Electrical Conductivity	µS/cm	140	130	130	100	140
Ammonia as N in soil	mg/kg	1.4	1.5	2.3	1.2	1.5
Nitrate as N in soil	mg/kg	<0.5	0.9	0.8	1	1
Nitrite as N in soil	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
NOx as N in soil	mg/kg	<0.5	1.0	0.83	1.1	1.1
Total Nitrogen in soil/solids	mg/kg	720	830	940	870	1,400
Phosphate as P in soil	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Organic Nitrogen as N	mg/kg	720	820	940	870	1,300
Organic Matter (Combustion)	%	1.1	1.3	1.5	1.1	2.4

Misc Inorg - Soil						
Our Reference		395824-16	395824-17	395824-18	395824-19	395824-20
Your Reference	UNITS	HDWV 11	HDWV 15	HDWV 19	HDWV 01	HDWV 21
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		13/11/2025	13/11/2025	13/11/2025	13/11/2025	14/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	19/11/2025	19/11/2025	19/11/2025	19/11/2025	19/11/2025
Date analysed	-	19/11/2025	19/11/2025	19/11/2025	19/11/2025	19/11/2025
pH 1:5 soil:water	pH Units	7.5	7.6	8.1	7.3	8.2
Electrical Conductivity	µS/cm	130	150	140	66	130
Ammonia as N in soil	mg/kg	1.7	2.1	2.1	1.5	1.5
Nitrate as N in soil	mg/kg	4	3	<0.5	1	<0.5
Nitrite as N in soil	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
NOx as N in soil	mg/kg	4.4	2.8	0.52	1.3	<0.5
Total Nitrogen in soil/solids	mg/kg	1,200	2,100	1,100	1,000	1,100
Phosphate as P in soil	mg/kg	<0.5	2	<0.5	<0.5	<0.5
Organic Nitrogen as N	mg/kg	1,200	2,100	1,100	1,000	1,100
Organic Matter (Combustion)	%	2.1	3.2	2.0	2.0	1.7

Misc Inorg - Soil		
Our Reference		395824-21
Your Reference	UNITS	p3
Depth		0.1m
Date Sampled		14/11/2025
Type of sample		Soil
Date prepared	-	19/11/2025
Date analysed	-	19/11/2025
pH 1:5 soil:water	pH Units	7.4
Electrical Conductivity	µS/cm	86
Ammonia as N in soil	mg/kg	2.8
Nitrate as N in soil	mg/kg	7.3
Nitrite as N in soil	mg/kg	<0.1
NOx as N in soil	mg/kg	7.4
Total Nitrogen in soil/solids	mg/kg	1,700
Phosphate as P in soil	mg/kg	6.5
Organic Nitrogen as N	mg/kg	1,700
Organic Matter (Combustion)	%	3.6

Total Kjeldahl Nitrogen (TKN)						
Our Reference		395824-1	395824-2	395824-3	395824-4	395824-5
Your Reference	UNITS	HDWV 27	HDWV 07	HDWV 09	HDWV 37	HDWV 35
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		10/11/2025	10/11/2025	10/11/2025	11/11/2025	11/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	19/11/2025	19/11/2025	19/11/2025	19/11/2025	19/11/2025
Date analysed	-	19/11/2025	19/11/2025	19/11/2025	19/11/2025	19/11/2025
TKN in soil (by Calculation)	mg/kg	1,000	1,600	1,200	930	1,500

Total Kjeldahl Nitrogen (TKN)						
Our Reference		395824-6	395824-7	395824-8	395824-9	395824-10
Your Reference	UNITS	HDWV 25	HDWV 31	HDWV 39	HDWV 41	HDWV 43
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		11/11/2025	11/11/2025	11/11/2025	11/11/2025	12/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	19/11/2025	19/11/2025	19/11/2025	19/11/2025	19/11/2025
Date analysed	-	19/11/2025	19/11/2025	19/11/2025	19/11/2025	19/11/2025
TKN in soil (by Calculation)	mg/kg	970	860	1,200	1,300	890

Total Kjeldahl Nitrogen (TKN)						
Our Reference		395824-11	395824-12	395824-13	395824-14	395824-15
Your Reference	UNITS	HDWV 33	HDWV 29	HDWV 23	HDWV 17	HDWV 03
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		12/11/2025	12/11/2025	12/11/2025	12/11/2025	12/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	19/11/2025	19/11/2025	19/11/2025	19/11/2025	19/11/2025
Date analysed	-	19/11/2025	19/11/2025	19/11/2025	19/11/2025	19/11/2025
TKN in soil (by Calculation)	mg/kg	720	820	940	870	1,300

Total Kjeldahl Nitrogen (TKN)						
Our Reference		395824-16	395824-17	395824-18	395824-19	395824-20
Your Reference	UNITS	HDWV 11	HDWV 15	HDWV 19	HDWV 01	HDWV 21
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		13/11/2025	13/11/2025	13/11/2025	13/11/2025	14/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	19/11/2025	19/11/2025	19/11/2025	19/11/2025	19/11/2025
Date analysed	-	19/11/2025	19/11/2025	19/11/2025	19/11/2025	19/11/2025
TKN in soil (by Calculation)	mg/kg	1,200	2,100	1,100	1,000	1,100

Total Kjeldahl Nitrogen (TKN)		
Our Reference		395824-21
Your Reference	UNITS	p3
Depth		0.1m
Date Sampled		14/11/2025
Type of sample		Soil
Date prepared	-	19/11/2025
Date analysed	-	19/11/2025
TKN in soil (by Calculation)	mg/kg	1,700

Particle Size Distribution in Soils						
Our Reference		395824-1	395824-2	395824-3	395824-4	395824-5
Your Reference	UNITS	HDWV 27	HDWV 07	HDWV 09	HDWV 37	HDWV 35
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		10/11/2025	10/11/2025	10/11/2025	11/11/2025	11/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/11/2025	20/11/2025	20/11/2025	20/11/2025	20/11/2025
Date analysed	-	21/11/2025	21/11/2025	21/11/2025	21/11/2025	21/11/2025
Cobbles >75mm	%	<1	<1	<1	<1	<1
Cobbles/Coarse Gravel 63-75mm	%	<1	<1	<1	<1	<1
Coarse Gravel 37.5-63mm	%	<1	<1	<1	<1	<1
Coarse Gravel 26.5-37.5mm	%	<1	<1	<1	<1	<1
Coarse Gravel 19-26.5mm	%	<1	<1	<1	<1	<1
Medium Gravel 13.2-19mm	%	9	1	<1	<1	<1
Medium Gravel 9.5-13.2mm	%	1	<1	1	<1	1
Medium Gravel 6.7-9.5mm	%	1	1	2	1	1
Medium Gravel 4.75-6.7mm	%	1	1	4	<1	3
Fine Gravel 2.36-4.75mm	%	7	10	19	20	20
Very Coarse Sand 1.18-2.36mm	%	6	1	14	10	9
Coarse Sand 0.6-1.18mm	%	5	2	2	4	2
Medium Sand 0.425-0.6mm	%	6	6	3	6	2
Medium Sand 0.3-0.425mm	%	9	12	4	6	2
Fine Sand 0.15-0.3mm	%	19	13	14	14	9
Very Fine Sand 0.075-0.15mm	%	22	10	23	12	13
Coarse Silt 0.020-0.075mm	%	8	10	6	11	14
Fine Silt 0.002-0.020mm	%	2	12	3	4	10
Clay <0.002mm	%	4	22	6	11	14

Particle Size Distribution in Soils						
Our Reference		395824-6	395824-7	395824-8	395824-9	395824-10
Your Reference	UNITS	HDWV 25	HDWV 31	HDWV 39	HDWV 41	HDWV 43
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		11/11/2025	11/11/2025	11/11/2025	11/11/2025	12/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/11/2025	20/11/2025	20/11/2025	20/11/2025	20/11/2025
Date analysed	-	21/11/2025	21/11/2025	21/11/2025	21/11/2025	21/11/2025
Cobbles >75mm	%	<1	<1	<1	<1	<1
Cobbles/Coarse Gravel 63-75mm	%	<1	<1	<1	<1	<1
Coarse Gravel 37.5-63mm	%	<1	<1	<1	<1	<1
Coarse Gravel 26.5-37.5mm	%	<1	<1	<1	<1	<1
Coarse Gravel 19-26.5mm	%	<1	<1	<1	<1	<1
Medium Gravel 13.2-19mm	%	3	<1	4	<1	2
Medium Gravel 9.5-13.2mm	%	2	1	<1	<1	1
Medium Gravel 6.7-9.5mm	%	2	1	3	<1	1
Medium Gravel 4.75-6.7mm	%	3	2	3	2	2
Fine Gravel 2.36-4.75mm	%	10	9	16	14	12
Very Coarse Sand 1.18-2.36mm	%	8	11	7	12	6
Coarse Sand 0.6-1.18mm	%	6	8	5	1	3
Medium Sand 0.425-0.6mm	%	5	3	7	1	2
Medium Sand 0.3-0.425mm	%	8	4	9	3	3
Fine Sand 0.15-0.3mm	%	13	21	17	10	9
Very Fine Sand 0.075-0.15mm	%	14	15	11	14	5
Coarse Silt 0.020-0.075mm	%	13	13	8	16	20
Fine Silt 0.002-0.020mm	%	3	4	4	9	14
Clay <0.002mm	%	9	8	7	17	20

Particle Size Distribution in Soils						
Our Reference		395824-11	395824-12	395824-13	395824-14	395824-15
Your Reference	UNITS	HDWV 33	HDWV 29	HDWV 23	HDWV 17	HDWV 03
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		12/11/2025	12/11/2025	12/11/2025	12/11/2025	12/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/11/2025	20/11/2025	20/11/2025	20/11/2025	20/11/2025
Date analysed	-	21/11/2025	21/11/2025	21/11/2025	21/11/2025	21/11/2025
Cobbles >75mm	%	<1	<1	<1	<1	<1
Cobbles/Coarse Gravel 63-75mm	%	<1	<1	<1	<1	<1
Coarse Gravel 37.5-63mm	%	<1	<1	<1	<1	<1
Coarse Gravel 26.5-37.5mm	%	<1	<1	<1	<1	<1
Coarse Gravel 19-26.5mm	%	3	<1	<1	<1	<1
Medium Gravel 13.2-19mm	%	<1	2	<1	6	<1
Medium Gravel 9.5-13.2mm	%	5	1	<1	4	<1
Medium Gravel 6.7-9.5mm	%	3	2	1	4	<1
Medium Gravel 4.75-6.7mm	%	6	5	2	3	3
Fine Gravel 2.36-4.75mm	%	19	15	13	11	18
Very Coarse Sand 1.18-2.36mm	%	19	6	9	10	8
Coarse Sand 0.6-1.18mm	%	5	5	2	5	7
Medium Sand 0.425-0.6mm	%	6	6	5	4	6
Medium Sand 0.3-0.425mm	%	7	8	8	8	11
Fine Sand 0.15-0.3mm	%	8	17	22	22	18
Very Fine Sand 0.075-0.15mm	%	6	11	12	15	15
Coarse Silt 0.020-0.075mm	%	6	12	14	5	7
Fine Silt 0.002-0.020mm	%	3	1	2	1	1
Clay <0.002mm	%	5	9	10	3	6

Particle Size Distribution in Soils						
Our Reference		395824-16	395824-17	395824-18	395824-19	395824-20
Your Reference	UNITS	HDWV 11	HDWV 15	HDWV 19	HDWV 01	HDWV 21
Depth		0.1m	0.1m	0.1m	0.1m	0.1m
Date Sampled		13/11/2025	13/11/2025	13/11/2025	13/11/2025	14/11/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/11/2025	20/11/2025	20/11/2025	20/11/2025	20/11/2025
Date analysed	-	21/11/2025	21/11/2025	21/11/2025	21/11/2025	21/11/2025
Cobbles >75mm	%	<1	<1	<1	<1	<1
Cobbles/Coarse Gravel 63-75mm	%	<1	<1	<1	<1	<1
Coarse Gravel 37.5-63mm	%	<1	<1	<1	<1	<1
Coarse Gravel 26.5-37.5mm	%	<1	<1	<1	<1	<1
Coarse Gravel 19-26.5mm	%	<1	<1	<1	<1	<1
Medium Gravel 13.2-19mm	%	<1	5	2	<1	3
Medium Gravel 9.5-13.2mm	%	1	2	2	2	<1
Medium Gravel 6.7-9.5mm	%	<1	4	3	1	1
Medium Gravel 4.75-6.7mm	%	2	2	1	2	1
Fine Gravel 2.36-4.75mm	%	7	4	8	11	6
Very Coarse Sand 1.18-2.36mm	%	5	5	6	11	5
Coarse Sand 0.6-1.18mm	%	4	7	9	3	2
Medium Sand 0.425-0.6mm	%	6	4	13	3	5
Medium Sand 0.3-0.425mm	%	10	4	5	7	8
Fine Sand 0.15-0.3mm	%	26	15	11	17	16
Very Fine Sand 0.075-0.15mm	%	18	10	14	13	14
Coarse Silt 0.020-0.075mm	%	15	16	12	17	22
Fine Silt 0.002-0.020mm	%	1	6	2	3	4
Clay <0.002mm	%	6	16	13	9	13

Particle Size Distribution in Soils		
Our Reference		395824-21
Your Reference	UNITS	p3
Depth		0.1m
Date Sampled		14/11/2025
Type of sample		Soil
Date prepared	-	20/11/2025
Date analysed	-	21/11/2025
Cobbles >75mm	%	<1
Cobbles/Coarse Gravel 63-75mm	%	<1
Coarse Gravel 37.5-63mm	%	<1
Coarse Gravel 26.5-37.5mm	%	<1
Coarse Gravel 19-26.5mm	%	<1
Medium Gravel 13.2-19mm	%	<1
Medium Gravel 9.5-13.2mm	%	<1
Medium Gravel 6.7-9.5mm	%	<1
Medium Gravel 4.75-6.7mm	%	3
Fine Gravel 2.36-4.75mm	%	30
Very Coarse Sand 1.18-2.36mm	%	10
Coarse Sand 0.6-1.18mm	%	1
Medium Sand 0.425-0.6mm	%	2
Medium Sand 0.3-0.425mm	%	3
Fine Sand 0.15-0.3mm	%	16
Very Fine Sand 0.075-0.15mm	%	6
Coarse Silt 0.020-0.075mm	%	9
Fine Silt 0.002-0.020mm	%	8
Clay <0.002mm	%	14

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055	Nitrite - determined colourimetrically based on APHA latest edition NO2- B. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-060	Phosphate determined colourimetrically based on EPA365.1 and APHA latest edition 4500 P E. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-062	TKN - determined colourimetrically based on APHA latest edition 4500 Norg. Alternatively, TKN can be derived from calculation (Total N - NOx).
Inorg-107	Particle Size Distribution using in house method INORG-107 by way of sieving and/or hydrometer sedimentation testing.
Inorg-128	Dissolved or Total Carbon or Dissolved or Total Organic/Inorganic Carbon using the combustion method, high temperature catalytic combustion with NDIR.
INORG-137	Total Carbon Nitrogen Sulfur by high temperature catalytic combustion with IR detection. Total Nitrogen may also be determine from TKN+NOx by calculation.
Metals-020	Determination of various metals/elements by ICP-AES. Total Phosphate determined stochiometrically from Phosphorus (assumed to be present as Phosphate). Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation. Submission of low masses of sample e.g. for dust samples, may result in raised PQLs. Where molecular anion forms are calculated from an element (e.g. SO4 from S or PO4 from P stoichiometrically), the assumption is that the element is only present in that molecular anion form.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	395824-2
Date prepared	-			21/11/2025	1	24/11/2025	24/11/2025		21/11/2025	21/11/2025
Date analysed	-			24/11/2025	1	24/11/2025	24/11/2025		24/11/2025	24/11/2025
Phosphorus	mg/kg	10	Metals-020	<10	1	160	170	6	99	104

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	395824-21
Date prepared	-			[NT]	11	21/11/2025	24/11/2025		[NT]	21/11/2025
Date analysed	-			[NT]	11	24/11/2025	24/11/2025		[NT]	24/11/2025
Phosphorus	mg/kg	10	Metals-020	[NT]	11	370	400	8	[NT]	96

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	20	21/11/2025	24/11/2025		[NT]	[NT]
Date analysed	-			[NT]	20	24/11/2025	24/11/2025		[NT]	[NT]
Phosphorus	mg/kg	10	Metals-020	[NT]	20	210	210	0	[NT]	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	395824-2
Date prepared	-			25/11/2025	1	25/11/2025	25/11/2025		25/11/2025	25/11/2025
Date analysed	-			25/11/2025	1	25/11/2025	25/11/2025		25/11/2025	25/11/2025
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	1	14	14	0	100	127
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	1	0.5	0.6	18	101	84
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	1	2.5	2.9	15	96	96
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	1	<0.1	<0.1	0	108	97

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	395824-15
Date prepared	-			[NT]	12	25/11/2025	25/11/2025		25/11/2025	25/11/2025
Date analysed	-			[NT]	12	25/11/2025	25/11/2025		25/11/2025	25/11/2025
Exchangeable Ca	meq/100g	0.1	Metals-020	[NT]	12	15	16	6	108	#
Exchangeable K	meq/100g	0.1	Metals-020	[NT]	12	0.5	0.5	0	104	95
Exchangeable Mg	meq/100g	0.1	Metals-020	[NT]	12	5.8	6.1	5	97	121
Exchangeable Na	meq/100g	0.1	Metals-020	[NT]	12	0.1	0.2	67	108	106

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	16	25/11/2025	25/11/2025		[NT]	[NT]
Date analysed	-			[NT]	16	25/11/2025	25/11/2025		[NT]	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	[NT]	16	8.6	9.4	9	[NT]	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	[NT]	16	0.7	0.7	0	[NT]	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	[NT]	16	2.2	2.3	4	[NT]	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	[NT]	16	<0.1	<0.1	0	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	395824-2
Date prepared	-			19/11/2025	1	19/11/2025	19/11/2025		19/11/2025	19/11/2025
Date analysed	-			19/11/2025	1	19/11/2025	19/11/2025		19/11/2025	19/11/2025
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	1	7.5	8.0	6	99	[NT]
Electrical Conductivity	µS/cm	2	Inorg-002	<2	1	120	130	8	99	[NT]
Ammonia as N in soil	mg/kg	0.5	Inorg-057	<0.5	1	1.2	1.2	0	95	118
Nitrate as N in soil	mg/kg	0.5	Inorg-055	<0.5	1	2	2	0	97	88
Nitrite as N in soil	mg/kg	0.1	Inorg-055	<0.1	1	<0.1	<0.1	0	94	92
NOx as N in soil	mg/kg	0.5	Inorg-055	<0.5	1	1.8	1.8	0	97	88
Total Nitrogen in soil/solids	mg/kg	10	INORG-137	<10	1	1000	1200	18	97	[NT]
Phosphate as P in soil	mg/kg	0.5	Inorg-060	<0.5	1	<0.5	<0.5	0	117	86
Organic Nitrogen as N	mg/kg	10		<10	1	1000	1200	18	[NT]	[NT]
Organic Matter (Combustion)	%	0.1	Inorg-128	<0.1	1	1.7	1.7	0	87	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			[NT]	11	19/11/2025	19/11/2025		19/11/2025	[NT]
Date analysed	-			[NT]	11	19/11/2025	19/11/2025		19/11/2025	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	11	9.1	9.2	1	99	[NT]
Electrical Conductivity	µS/cm	2	Inorg-002	[NT]	11	140	140	0	99	[NT]
Ammonia as N in soil	mg/kg	0.5	Inorg-057	[NT]	11	1.4	1.4	0	95	[NT]
Nitrate as N in soil	mg/kg	0.5	Inorg-055	[NT]	11	<0.5	<0.5	0	97	[NT]
Nitrite as N in soil	mg/kg	0.1	Inorg-055	[NT]	11	<0.1	<0.1	0	94	[NT]
NOx as N in soil	mg/kg	0.5	Inorg-055	[NT]	11	<0.5	<0.5	0	97	[NT]
Total Nitrogen in soil/solids	mg/kg	10	INORG-137	[NT]	11	720	540	29	96	[NT]
Phosphate as P in soil	mg/kg	0.5	Inorg-060	[NT]	11	<0.5	<0.5	0	103	[NT]
Organic Nitrogen as N	mg/kg	10		[NT]	11	720	540	29	[NT]	[NT]
Organic Matter (Combustion)	%	0.1	Inorg-128	[NT]	11	1.1	1	10	84	[NT]

QUALITY CONTROL: Misc Inorg - Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	20	19/11/2025	19/11/2025		[NT]	[NT]
Date analysed	-			[NT]	20	19/11/2025	19/11/2025		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	20	8.2	8.2	0	[NT]	[NT]
Electrical Conductivity	µS/cm	2	Inorg-002	[NT]	20	130	130	0	[NT]	[NT]
Ammonia as N in soil	mg/kg	0.5	Inorg-057	[NT]	20	1.5	[NT]		[NT]	[NT]
Nitrate as N in soil	mg/kg	0.5	Inorg-055	[NT]	20	<0.5	[NT]		[NT]	[NT]
Nitrite as N in soil	mg/kg	0.1	Inorg-055	[NT]	20	<0.1	[NT]		[NT]	[NT]
NOx as N in soil	mg/kg	0.5	Inorg-055	[NT]	20	<0.5	[NT]		[NT]	[NT]
Total Nitrogen in soil/solids	mg/kg	10	INORG-137	[NT]	20	1100	[NT]		[NT]	[NT]
Phosphate as P in soil	mg/kg	0.5	Inorg-060	[NT]	20	<0.5	[NT]		[NT]	[NT]
Organic Nitrogen as N	mg/kg	10		[NT]	20	1100	[NT]		[NT]	[NT]
Organic Matter (Combustion)	%	0.1	Inorg-128	[NT]	20	1.7	[NT]		[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	19/11/2025	19/11/2025		[NT]	[NT]
Date analysed	-			[NT]	21	19/11/2025	19/11/2025		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	21	7.4	[NT]		[NT]	[NT]
Electrical Conductivity	µS/cm	2	Inorg-002	[NT]	21	86	[NT]		[NT]	[NT]
Ammonia as N in soil	mg/kg	0.5	Inorg-057	[NT]	21	2.8	2.8	0	[NT]	[NT]
Nitrate as N in soil	mg/kg	0.5	Inorg-055	[NT]	21	7.3	7.7	5	[NT]	[NT]
Nitrite as N in soil	mg/kg	0.1	Inorg-055	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
NOx as N in soil	mg/kg	0.5	Inorg-055	[NT]	21	7.4	7.7	4	[NT]	[NT]
Total Nitrogen in soil/solids	mg/kg	10	INORG-137	[NT]	21	1700	2000	16	[NT]	[NT]
Phosphate as P in soil	mg/kg	0.5	Inorg-060	[NT]	21	6.5	6.6	2	[NT]	[NT]
Organic Nitrogen as N	mg/kg	10		[NT]	21	1700	2000	16	[NT]	[NT]
Organic Matter (Combustion)	%	0.1	Inorg-128	[NT]	21	3.6	4.0	11	[NT]	[NT]

QUALITY CONTROL: Total Kjeldahl Nitrogen (TKN)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	395824-2
Date prepared	-			19/11/2025	1	19/11/2025	19/11/2025		19/11/2025	19/11/2025
Date analysed	-			19/11/2025	1	19/11/2025	19/11/2025		19/11/2025	19/11/2025
TKN in soil (by Calculation)	mg/kg	10	Inorg-062	<10	1	1000	1200	18	[NT]	[NT]

QUALITY CONTROL: Total Kjeldahl Nitrogen (TKN)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			[NT]	11	19/11/2025	19/11/2025		19/11/2025	[NT]
Date analysed	-			[NT]	11	19/11/2025	19/11/2025		19/11/2025	[NT]
TKN in soil (by Calculation)	mg/kg	10	Inorg-062	[NT]	11	720	540	29	[NT]	[NT]

QUALITY CONTROL: Total Kjeldahl Nitrogen (TKN)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	19/11/2025	19/11/2025		[NT]	[NT]
Date analysed	-			[NT]	21	19/11/2025	19/11/2025		[NT]	[NT]
TKN in soil (by Calculation)	mg/kg	10	Inorg-062	[NT]	21	1700	2000	16	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volumes) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates can be downloaded from the Envirolab Resources website or obtained directly by contacting the laboratory.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

For Dust Deposit Gauge (DDG) analysis the sampling, sampling period and funnel exposure area do not fall under Envirolab's NATA accreditation (unless the Newcastle laboratory where responsible for the sampling), hence the annotation on the DDG units of reporting.

Urine Analysis - The BEI values listed are taken from the 2022 edition of "TLVs and BEIs Threshold Limits" by ACGIH.

Report Comments

CEC - #Poor spike recovery was obtained for this sample. The sample was re-digested and re-spiked and the poor recovery was confirmed. This is due to matrix interferences. However, an acceptable recovery was obtained for the LCS.

APPENDIX D
2025 FLORISTICS MONITORING RESULTS

Species	Common name	Life form	Type	02-2025	MWV01-2025	MWV03-2025	MWV07-2025	MWV09-2025	MWV11-2025	MWV15-2025	MWV17-2025	MWV19-2025	MWV21-2025	MWV23-2025	MWV25-2025	MWV27-2025	MWV29-2025	MWV31-2025	MWV33-2025	MWV35-2025	MWV37-2025	MWV39-2025	MWV41-2025	HDWV43-2025
Anthosachne scabra	Common Weatgrass	Grass	Native			0.7														16				
Atriplex semibaccata	Creeping Saltbush	Sub-shrub	Native																					
Austrostipa scabra	Speargrass	Grass	Native																					
Austrostipe verticillata	Slender Bamboo Grass	Grass	Native			0.5																		
Bothriochloa decipiens	Red Grass	Grass	Native													0.02								
Calotis hispidula	Bogan Flea	Forb	Native			0.02																		
Calotis lappulacea	Yellow Burr-daisy	Forb	Native										0.04											
Carex inversa	Knob Sedge	Sedge	Native		0.45		0.02	0.02							0.4									
Cheilanthes sieberi	Poison Rock Fern	Fern	Native																					
Chloris divaricata	Slender Chloris	Grass	Native																					
Chloris truncata	Windmill Grass	Grass	Native																					
Convolvulus augustissimus	-	Forb	Native									0.02	0.04				0.02			0.4	0.2			
Convolvulus erubescens	Blushing Bindweed	Vine	Native																					
Cullen tenax	Emu-foot	Forb	Native (legume)																					
Cynodon dactylon	Common Couch	Grass	Native				0.24			43		3.9		52	9.6	10	16	2.4	16.4	2.4			0.2	1.34
Daucus glochidiatus	Native Carrot	Forb	Native						0.02															
Dichanthium sericeum	Queensland Bluegrass	Grass	Native																					
Dichondra repens	Kidney Weed	Forb	Native																					
Dichondra sp. Inglewood	-	Forb	Native			0.36			0.3		0.76			0.5	0.2			0.4				0.2	1.2	
Einadia hastata	Berry Saltbush	Forb	Native		0.34		0.4	0.04																
Einadia nutans subsp. linifolia	Climbing Saltbush	Forb	Native			0.5				1.66														
Enchylaena tomentosa	Ruby Saltbush	Sub-shrub	Native																					
Eriochloa pseudoacrotricha	Early Spring Grass	Grass	Native																					
Erodium crinitum	Blue Storksbill	Forb	Native																					
Euchiton sphaericus	Star Cudweed	Forb	Native																					
Euphorbia dallachyana	Mat Spurge	Forb	Native													0.1		0.4					0.02	
Geranium solanderi	Native Geranium	Forb	Native																				0.12	
Glycine tabacina	Variable Glycine	Vine	Native (legume)			0.02							0.02				0.02							
Lachnagrostis filiformis	Blown Grass	Grass	Native		0.4		1								6								0.2	
Neptunia gracilis	Sensitive Plant	Forb	Native																					
Oxalis perennans	Grassland Wood-sorrel	Forb	Native	2.14	0.04	0.02	0.02	0.02		0.14	0.06	0.06	0.04		0.2			0.2						
Panicum effusum	Hairy Panic	Grass	Native					12.4																
Panicum queenslandicum	Coolibah Grass	Grass	Native																					
Paspalidium distans	Shotgrass	Grass	Native																					
Poaceae sp.	Unknown	Grass	Native																					0.2
Salsola australis	Rolypoly	Shrub	Native																					
Sclerolaena muricata	Black Roly Poly	Shrub	Native																					
Rhynchosia minima	Rhynchosia	Vine	Native (legume)																					
Senecio quadridentatus	Cotton Fireweed	Forb	Native																					
Sida corrugata	Corrugated Sida	Sub-shrub	Native			0.52		0.1				0.02												
Sida hackettiana	Golden Rod	Sub-shrub	Native																					
Sporobolus creber	Slender Rat's Tail Grass	Grass	Native																					
Wahlenbergia gracilis	Australian Bluebell	Forb	Native																					
Asphodelus fistulosus	Onion Weed	Forb	Exotic (non-invasive)			0.02						0.24			3.4			0.8				0.6	0.2	
Aster subulatus	Wild Aster	Forb	Exotic (non-invasive)	0.04	0.2		0.2	2.8	0.38	0.04	0.86	0.1	0.16			2.06	0.2	1.8	0.06	0.4		0.2		0.04
Avena barbata	Bearded Oats	Grass	Exotic (non-invasive)												0.4					1.4	0.2			
Briza minor	Shivery Grass	Grass	Exotic (non-invasive)																	0.4				
Centaurea melitensis	Maltese Cockspur	Forb	Exotic (non-invasive)																					
Centaurium tenuiflorum	Slender Centaury	Forb	Exotic (non-invasive)		0.1			0.06				0.02	0.04			0.26	0.02	1.4	0.2			0.6		
Chenopodium album	Fat Hen	Forb	Exotic (non-invasive)																					
Cirsium vulgare	Spear Thistle	Forb	Exotic (non-invasive)	0.86		0.04			0.1		0.2								0.1			0.4		
Conyza bonariensis	Flaxleaf Fleabane	Forb	Exotic (non-invasive)				0.28	0.54							0.8	2.2	0.06	1.3	1.5	2.4			0.2	0.02
Conyza sumatrensis	Tall Fleabane	Forb	Exotic (non-invasive)	0.04	0.42	0.04			0.04		0.2	0.36	0.44	0.62	0.4			0.5	1.5			0.6	0.2	
Cyclospermum leptophyllum	Slender Celery	Forb	Exotic (non-invasive)					0.02	0.02			0.04	0.46	0.06		0.04		0.2	1.22					0.24
Facelis retusa	Annual Trampweed	Forb	Exotic (non-invasive)																					
Galium aparine	Cleavers	Vine	Exotic (non-invasive)	0.02	0.2		6.2	1	10.24															
Gamochaeta americana	Cudweed	Forb	Exotic (non-invasive)																					
Gamochaeta calviceps	Cudweed	Forb	Exotic (non-invasive)		0.16			0.04								0.12			0.02					
Gomphocarpus fruticosus	Narrow-leaved Cotton Bush	Forb	Exotic (non-invasive)						0.04			0.02	0.04			0.04		0.6				0.2	0.24	0.02
Hirschfeldia incana	Buchan Weed	Forb	Exotic (non-invasive)																					
Hypochaeris albiflora	White Flatweed	Forb	Exotic (non-invasive)																					
Hypochaeris glabra	Smooth Catsear	Forb	Exotic (non-invasive)	0.04														0.2	0.12					
Hypochaeris radicata	Flatweed	Forb	Exotic (non-invasive)																					
Lactuca saligna	Willow-leaved Lettuce	Forb	Exotic (non-invasive)										0.04	0.04										
Lactuca serriola	Prickly Lettuce	Forb	Exotic (non-invasive)				0.02												0.02					
Lepidium bonariense	Argentine Peppercress	Forb	Exotic (non-invasive)																					
Linum trigynum	French Flax	Forb	Exotic (non-invasive)															0.4				0.2		
Lysimachia arvensis	Scarlet Pimpernel	Forb	Exotic (non-invasive)	0.7	0.48	1.3		12	0.66	0.04	2.4	1.22	1.26	8.8	17	9.02	3.1	2.2	0.62			4.6	0.44	
Malva parviflora	Small-flowered Mallow	Forb	Exotic (non-invasive)														0.14							
Modiola caroliniana	Red-flowered Mallow	Forb	Exotic (non-invasive)				1		0.04		0.36	0.34	0.02	0.56	1.2	0.02		0.2		0.4	1.8		0.04	0.4
Petrorhagia dubia	-	Forb	Exotic (non-invasive)										0.06											
Plantago lanceolata	Ribwort Plantain	Forb	Exotic (non-invasive)	16.74		9.5	31	4.22		1.32	2.4	3.72	3.48	0.2	21.6			0.2	0.22	6.8	2.2	3.6	1.3	1.3
Polygonum aviculare	Wireweed	Forb	Exotic (non-invasive)																					
Rapistrum rugosum	Turnip Weed	Forb	Exotic (non-invasive)	5.2		6.2	9.6	0.14	0.02	17.44				0.7	2.2	3				15.4		0.4	0.2	1.2
Rumex crispus	Curled Dock	Forb	Exotic (non-invasive)												0.4				0.02					
Salvia reflexa	Mintweed	Forb	Exotic (non-invasive)																					
Setaria parviflora	Slender Pigeon Grass	Grass	Exotic (non-invasive)												1.6									0.2
Sida rhombifolia	Paddy's Lucerne	Sub-shrub	Exotic (non-invasive)				0.04			0.02	0.84	0.06	0.08	0.62	1.4	6.24	0.6	1		0.6	4	0.4		
Sida spinosa	Arrow-leaf Sida	Sub-shrub	Exotic (non-invasive)		0.02	0.3				0.02		0.04		0.02						0.2				
Sisyrinchium rosulatum	Scourweed	Forb	Exotic (non-invasive)																					
Solanum americanum	Glossy Nightshade	Forb	Exotic (non-invasive)																					
Solanum chenopodioides	Whitetip Nightshade	Forb	Exotic (non-invasive)	0.4																				
Solanum nigrum	Black-berry Nightshade	Forb	Exotic (non-invasive)	0.1										0.2										
Soliva sessilis	Bindyi	Forb	Exotic (non-invasive)																					
Sonchus asper	Prickly Sowthistle	Forb	Exotic (non-invasive)						0.06						0.2									
Sonchus oleraceus	Common Sowthistle	Forb	Exotic (non-invasive)		0.28	0.42			0.02			0.14	0.14	0.12				0.4			0.2	0.6	0.3	0.06
Spergularia rubra	Sandspurry	Forb	Exotic (non-invasive)																					
Stachys arvensis	Stagger Weed	Forb	Exotic (non-invasive)					0.22				0.02	0.04		6		0.04					0.2		
Urochloa panicoides	Liverseed Grass	Grass	Exotic (non-invasive)																					
Verbascum virgatum	Twiggy Mullein	Forb	Exotic (non-invasive)																					
Verbena bonariensis	Purpltop	Forb	Exotic (non-invasive)	0.3		0.2	1	4	0.2	0.02	0.46				2.6		1.6			2.4	1.2			0.06
Verbena incompta	Purpltop	Forb	Exotic (non-invasive)									0.02												
Verbena officinalis	Purpletop	Forb	Exotic (non-invasive)													9.2	0.02	2	0.16					
Verbena quadrangularis	A Verbena	Forb	Exotic (non-invasive)																					
Verbena rigida	Veined Verbena	Forb	Exotic (non-invasive)																					
Verbena x brasiliensis	A Verbena	Forb	Exotic (non-invasive)										12.02				0.02							
Veronica persica	Creeping Speedwell	Forb	Exotic (non-invasive)																					
Bidens pilosa	Cobblers Peg	Forb	Exotic (priority weed)														0.2	0.2						
Bidens subalternans	Greater Beggars Tick	Forb	Exotic (priority weed)	0.16																				
Bromus catharticus	Prairie Grass	Grass	Introduced (pasture grass)	10.5						2.62										13.4	0.2		0.1	
Bromus hordeaceus	Soft Brome	Grass	Introduced (pasture grass)		0.4																			
Bromus molliformis	Soft Brome	Grass	Introduced (pasture grass)				0.04		0.1				0.04							2.2		1.2		
Cenchrus clandestinus	Kikuyu	Grass	Introduced (pasture grass)					0.6			2.6													
Chloris gayana	Rhodes Grass	Grass	Introduced (pasture grass)		18.8	30					2.8	43.2	21.66	1.2			11.4	9.4	0.8	9.6		62		
Echinochloa esculenta	Japanese Millet	Grass	Introduced (pasture grass)																					
Lolium multiflorum	Italian Ryegrass	Grass	Introduced (pasture grass)											0.06										
Lolium perenne	Perennial Ryegrass	Grass	Introduced (pasture grass)				0.04			0.6										9				
Lolium rigidum	Wimmera Ryegrass	Grass	Introduced (pasture grass)																					
Megathyrsus maximus	Guinea Grass	Grass	Introduced (pasture grass)		16.8	26	6		39	13	10				12		17.4				45		19.6	
Panicum coloratum	Coolah Grass	Grass	Introduced (pasture grass)																					
Medicago minima	Woolly Burr Medic	Forb	Introduced (legume)															0.6	2.46			2.2		
Medicago orbicularis	Button Medic	Forb	Introduced (legume)																					
Medicago polymorpha	Burr Medic	Forb	Introduced (legume)									1						0.4				0.8	0.2	
Medicago spp.	A Medic	Forb	Introduced (legume)								2	1.4												
Medicago truncatula	Barrel Medic	Forb	Introduced (legume)	0.4	0.04	0.02	5.8		0.14	0.1			0.6	1.8			0.4		0.3			1.2	0.5	0.4
Melilotus indicus	Hexham Scent	Forb	Introduced (legume)	0.06				0.02			0.86	0.06	0.2	1.3		0.1	1.02		11.14					2.08
Trifolium arvense	Haresfoot Clover	Forb	Introduced (legume)													0.62								
Trifolium campestre	Hop Clover	Forb	Introduced (legume)					0.02			1.36	0.1	1.88	1.6		1.44	1.2	4.2		0.4		0.8		
Trifolium dubium	Yellow Suckling Clover	Forb	Introduced (legume)																					
Trifolium glomeratum	Clustered Clover	Forb	Introduced (legume)											0.6		3.2								
Trifolium pratense	Red Clover	Forb	Introduced (legume)																					
Trifolium repens	White Clover	Forb	Introduced (legume)																					0.6
Trifolium vesiculosum	Arrowleaf Clover	Forb	Introduced (legume)																					
Carthamus lanatus	Saffron Thistle	Forb	Exotic (priority weed)									0.02												
Galenia pubescens	Galenia	Forb	Exotic (priority weed)	17	3.04		0.4			11.96	4.42		0.04		12.6		0.3	0.6		1.6	11.2	0.6	10.8	25
Hypericum perforatum	St John's Wart	Forb	Exotic (priority weed)													0.42				0.6				
Paspalum dilatatum	Paspalum	Grass	Exotic (priority weed)														0.1				8			
Senecio madagascariensis	Fireweed	Forb	Exotic (priority weed)	0.6				0.02	0.4	0.28	1.28	0.42	2.02	1.9	0.2	0.4	0.06	0.6	2.6	0.8		1.6		0.84
Sorghum halepense	Johnson Grass	Grass	Exotic (priority weed)	0.4																				

Site Code	Species	Type	Growth form	Height Class (m)						Reproductive material preser	Average repro. scor
				< 1	1-3	3-5	5-8	8-1	>1		
HDWV11-2025	Acacia saligna	Priority weed	Shrub		2		1			No	n/a
HDWV11-2025	Acacia salicina	Native	Small tree		3	3	5	3		No	n/a
HDWV11-2025	Corymbia maculata	Native	Tree					1		No	n/a
HDWV11-2025	Acacia linifolia	Native	Shrub	3	15					No	n/a
HDWV11-2025	Corymbia citriodora	Exotic	Tree					1		No	n/a
HDWV1-2025	Acacia saligna	Priority weed	Shrub			5	2			No	n/a
HDWV1-2025	Melaleuca sp.	Native	Small tree				2			Yes	5
HDWV1-2025	Eucalyptus melliodora	Native	Tree				2	2	1	No	n/a
HDWV1-2025	Acacia salicina	Native	Small tree				2			No	n/a
HDWV1-2025	Eucalyptus moluccana	Native	Tree					1	1	No	n/a
HDWV1-2025	Corymbia maculata	Native	Tree					1	2	No	n/a
HDWV1-2025	Eucalyptus crebra	Native	Tree				1		3	No	n/a
HDWV1-2025	Eucalyptus cladocalyx	Exotic	Tree			1		2	1	Yes	3
HDWV15-2025	Eucalyptus crebra	Native	Tree		4	3	4			No	n/a
HDWV15-2025	Eucalyptus tereticornis	Native	Tree		2	3	7			No	n/a
HDWV15-2025	Eucalyptus moluccana	Native	Tree		2	9				No	n/a
HDWV15-2025	Acacia decurrens	Native	Small tree			1	1			No	n/a
HDWV15-2025	Eucalyptus albens	Native	Tree		1	1				No	n/a
HDWV15-2025	Dodonaea viscosa subsp. augustifolia	Native	Shrub			1				No	n/a
HDWV15-2025	Dodonaea viscosa subsp. cuneata	Native	Shrub		5	5				Yes	3
HDWV15-2025	Acacia falcata	Native	Shrub		1	1				No	n/a
HDWV15-2025	Acacia implexa	Native	Shrub		1	2	1			Yes	5
HDWV15-2025	Corymbia maculata	Native	Tree			2				No	n/a
HDWV17-2025	Acacia saligna	Priority weed	Shrub			2				No	n/a
HDWV17-2025	Acacia parvipinnula	Native	Shrub		1	4	5			Yes	4
HDWV17-2025	Corymbia maculata	Native	Tree	4		2	1			No	n/a
HDWV17-2025	Acacia linifolia	Native	Shrub		1	10				Yes	3
HDWV17-2025	Acacia decora	Native	Shrub	2	2					No	n/a
HDWV17-2025	Acacia sp. (fine bipinnate)	Native	Shrub		1					No	n/a
HDWV19-2025	Acacia saligna	Priority weed	Shrub	1						No	n/a
HDWV19-2025	Corymbia maculata	Native	Tree	2						No	n/a
HDWV19-2025	Eucalyptus albens	Native	Tree	5	1					No	n/a
HDWV19-2025	Eucalyptus crebra	Native	Tree	2	1					No	n/a
HDWV19-2025	Eucalyptus moluccana	Native	Tree	1						No	n/a
HDWV19-2025	Acacia decora	Native	Shrub	1						No	n/a
HDWV19-2025	Acacia parvipinnula	Native	Shrub		6					No	n/a
HDWV19-2025	Acacia salicina	Native	Small tree		6					No	n/a
HDWV21-2025	Acacia saligna	Priority weed	Shrub	3	3	2				No	n/a
HDWV21-2025	Corymbia maculata	Native	Tree	5	3					No	n/a
HDWV21-2025	Dodonaea viscosa subsp. cuneata	Native	Shrub	1	2					No	n/a
HDWV21-2025	Eucalyptus blakelyi	Native	Tree		1					No	n/a
HDWV21-2025	Eucalyptus crebra	Native	Tree	2	1					No	n/a
HDWV21-2025	Eucalyptus moluccana	Native	Tree	2	5					No	n/a
HDWV21-2025	Acacia decora	Native	Shrub	1	1					Yes	5
HDWV21-2025	Acacia parvipinnula	Native	Shrub		1					No	n/a
HDWV21-2025	Acacia implexa	Native	Shrub			1				Yes	4
HDWV21-2025	Acacia linifolia	Native	Shrub		3	1				Yes	3
HDWV23-2025	Acacia concurrens	Native	Small tree		1					No	n/a
HDWV23-2025	Acacia decora	Native	Shrub	1						No	n/a
HDWV23-2025	Corymbia maculata	Native	Tree		4	1	1			No	n/a
HDWV25-2025	Acacia saligna	Priority weed	Shrub			1				No	n/a
HDWV25-2025	Corymbia maculata	Native	Tree	1	5	10	1			No	n/a
HDWV25-2025	Acacia decurrens	Native	Small tree		1					No	n/a
HDWV25-2025	Acacia implexa	Native	Shrub		1					No	n/a
HDWV25-2025	Acacia linifolia	Native	Shrub		6	3				Yes	2
HDWV25-2025	Acacia ligulata	Native	Shrub		1					Yes	3
HDWV27-2025	Acacia parvipinnula	Native	Shrub		2	1				No	n/a
HDWV27-2025	Acacia linifolia	Native	Shrub		20	23				Yes	4
HDWV27-2025	Dodonaea viscosa subsp. spatulata	Native	Shrub	1						n/a	n/a
HDWV27-2025	Corymbia maculata	Native	Tree							n/a	n/a
HDWV27-2025	Eucalyptus crebra	Native	Tree	5	8					n/a	n/a
HDWV27-2025	Acacia implexa	Native	Shrub		1	1				Yes	3
HDWV27-2025	Acacia decora	Native	Shrub		3					n/a	n/a
HDWV27-2025	Acacia salicina	Native	Small tree		2					n/a	n/a
HDWV27-2025	Eucalyptus moluccana	Native	Tree	2	3					n/a	n/a
HDWV27-2025	Corymbia maculata	Native	Tree	2	4	2	1			n/a	n/a
HDWV29-2025	Acacia saligna	Priority weed	Shrub		1	5				No	n/a
HDWV29-2025	Corymbia maculata	Native	Tree		4	2				No	n/a
HDWV29-2025	Acacia implexa	Native	Shrub		3	2				Yes	3
HDWV29-2025	Dodonaea viscosa subsp. spatulata	Native	Shrub		2					No	n/a
HDWV29-2025	Acacia salicina	Native	Small tree		1					No	n/a
HDWV31-2025	Acacia saligna	Priority weed	Shrub	2	4					No	n/a
HDWV31-2025	Corymbia maculata	Native	Tree	1	3					No	n/a
HDWV31-2025	Eucalyptus crebra	Native	Tree		1					No	n/a
HDWV31-2025	Dodonaea viscosa subsp. spatulata	Native	Shrub		1					No	n/a
HDWV3-2025	Acacia saligna	Priority weed	Shrub	5	7					Yes	4
HDWV3-2025	Eucalyptus moluccana	Native	Tree					2		No	n/a
HDWV3-2025	Corymbia maculata	Native	Tree					2		No	n/a
HDWV3-2025	Acacia salicina	Native	Small tree				5			No	n/a
HDWV3-2025	Acacia decurrens	Native	Small tree		1	1				No	n/a
HDWV3-2025	Eucalyptus crebra	Native	Tree			1	1			No	n/a
HDWV3-2025	Acacia implexa	Native	Shrub				1			Yes	4
HDWV3-2025	Lycium ferocissimum	Priority weed	Shrub	7	20					No	n/a
HDWV33-2025	Acacia saligna	Priority weed	Shrub	3						No	n/a
HDWV33-2025	Corymbia maculata	Native	Tree	10	6	4	1			No	n/a
HDWV33-2025	Eucalyptus crebra	Native	Tree	1	2					No	n/a
HDWV33-2025	Dodonaea viscosa subsp. augustifolia	Native	Shrub	9						No	n/a
HDWV33-2025	Acacia implexa	Native	Shrub	1						No	n/a
HDWV33-2025	Lycium ferocissimum	Priority weed	Shrub		1					No	n/a
HDWV35-2025	Corymbia maculata	Native	Tree	2	8	1				No	n/a
HDWV35-2025	Eucalyptus moluccana	Native	Tree	1	2					No	n/a
HDWV35-2025	Eucalyptus crebra	Native	Tree		1					No	n/a
HDWV35-2025	Dodonaea viscosa subsp. cuneata	Native	Shrub	2	5					No	n/a
HDWV35-2025	Dodonaea viscosa subsp. Spatulata	Native	Shrub		1					Yes	4
HDWV35-2025	Acacia salicina	Native	Small tree		1					No	n/a
HDWV35-2025	Acacia implexa	Native	Shrub			1				No	n/a
HDWV35-2025	Acacia decurrens	Native	Small tree			3				No	n/a
HDWV37-2025	Dodonaea viscosa subsp. cuneata	Native	Shrub	2	4					No	n/a
HDWV37-2025	Acacia decurrens	Native	Small tree		2					No	n/a
HDWV37-2025	Corymbia maculata	Native	Tree		1					No	n/a
HDWV37-2025	Lycium ferocissimum	Priority weed	Shrub		4					Yes	4
HDWV39-2025	Eucalyptus moluccana x albens	Native	Tree	8	9					No	n/a
HDWV39-2025	Dodonaea viscosa subsp. cuneata	Native	Shrub		43	1				Yes	4
HDWV39-2025	Acacia implexa	Native	Shrub	1						No	n/a
HDWV39-2025	Acacia decurrens	Native	Small tree		1					No	n/a
HDWV39-2025	Dodonaea viscosa subsp. augustifolia	Native	Shrub		2					Yes	5
HDWV41-2025	Dodonaea viscosa subsp. cuneata	Native	Shrub		23	2				Yes	3
HDWV41-2025	Eucalyptus moluccana x albens	Native	Tree		9	3				No	n/a
HDWV41-2025	Acacia falcata	Native	Shrub		1					No	n/a
HDWV41-2025	Acacia decurrens	Native	Small tree		4					No	n/a
HDWV41-2025	Corymbia maculata	Native	Tree		2	3				No	n/a
HDWV41-2025	Lycium ferocissimum	Priority weed	Shrub		3					No	n/a
HDWV43-2025	Acacia saligna	Priority weed	Shrub	12	7					No	n/a
HDWV43-2025	Corymbia maculata	Native	Tree	27	5					No	n/a
HDWV43-2025	Acacia concurrens	Native	Small tree	2	5					No	n/a
HDWV43-2025	Acacia parvipinnula	Native	Shrub	4						No	n/a
HDWV43-2025	Dodonaea viscosa subsp. augustifolia	Native	Shrub	22	1					No	n/a
HDWV43-2025	Acacia decora	Native	Shrub	9	1					No	n/a
HDWV43-2025	Acacia sp. (fine bipinnate)	Native	Shrub	2						No	n/a
HDWV43-2025	Acacia longissima	Native	Shrub	2						No	n/a
HDWV43-2025	Eucalyptus sp. (crebra)	Native	Tree	1						No	n/a
HDWV7-2025	Acacia saligna	Priority weed	Shrub			8	4			No	n/a
HDWV7-2025	Acacia decora	Native	Shrub		25	21				Yes	1
HDWV7-2025	Acacia salicina	Native	Small tree		2	5				No	n/a
HDWV7-2025	Dodonaea viscosa subsp. cuneata	Native	Shrub		2					Yes	5
HDWV7-2025	Acacia implexa	Native	Shrub		1	2	1			No	n/a
HDWV7-2025	Corymbia maculata	Native	Tree					1		No	n/a
HDWV7-2025	Acacia parvipinnula	Native	Shrub			2	1			No	n/a
HDWV7-2025	Lycium ferocissimum	Priority weed	Shrub	1	25					Yes	2
HDWV9-2025	Acacia saligna	Priority weed	Shrub			2	5			No	n/a
HDWV9-2025	Acacia salicina	Native	Small tree		1	8	3			No	n/a
HDWV9-2025	Acacia decora	Native	Shrub	1	3	2				No	n/a
HDWV9-2025	Corymbia maculata	Native	Tree					1		No	n/a
HDWV9-2025	Dodonaea viscosa subsp. cuneata	Native	Shrub		1					No	n/a
HDWV9-2025	Eucalyptus moluccana	Native	Tree				2			No	n/a
HDWV9-2025	Lycium ferocissimum	Priority weed	Shrub		1					No	n/a

APPENDIX E
2025 PASTURE FEED QUALITY TESTING REPORT

Department of Primary Industries and Regional Development

LABORATORY REPORT

AgEnviro Labs - South

DATE OF ISSUE:	**24/11/25**	**REPORT NO:**	**R25-02108-[R00]**
DATE RECEIVED:	21/11/2025	**SAMPLES RECEIVED:**	1X PASTURE
LABORATORY:	**FEED QUALITY SERVICE**	**LABORATORY REF:**	R25-02108
JOB MANAGER:	RICHARD MEYER	**PURCHASE ORDER:**	

SUBMITTER:	**NICO BRITES**	**COMPANY:**	**MOSS ENVIROMENTAL**
ADDRESS:	1/342 PEEL STREET	NSW , 2340	
	TAMWORTH	AUSTRALIA	
PIC:			
SUBMITTED ON BEHALF OF:			

METHOD ID	ANALYSIS METHOD
Reuter & Robinson 2.E.3; 2.E.4	Dry & Grind inc Dry Matter & Moisture
LMOP_2-1129	Forage Quality Parameters by NIR
LMOP_2-1124	Calculation of Metabolisable Energy
AFIA GRADING	*AFIA Hay & Silage Grade

***NATA Accreditation does not cover the performances of this service**

Results Finalised By:

Richard Meyer

Richard Meyer
Feed Chemist
Feed Quality Service

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DATE OF ISSUE: 24/11/25 **REPORT NO:** R25-02108-[R00]

ANALYSIS RESULTS

Dry & Grind inc Dry Matter & Moisture	LOR	UNITS	1 P3 (BMC-Rehab Monitoring)
Dry Matter (DM)	0.5	%	40.2
Moisture	0.5	%	59.8

Approved by:

Richard Meyer
Richard Meyer
Feed Chemist
Feed Quality Service

Standard Forage Package - NIR	LOR	UNITS	1 P3 (BMC-Rehab Monitoring)
Neutral Detergent Fibre (NDF) - NIR	10	%	68.2
Acid Detergent Fibre (ADF) - NIR	4.0	%	37.8
Crude Protein (CP) - NIR	2	%	5.2
Inorganic Ash - NIR	3.0	%	7.4
Organic Matter (OM) - NIR		%	92.6
Dry Matter Digestibility (DMD) - NIR	39	%	49.1
DOMD - NIR	38	%	47.5
Calculation of Ruminant ME - NIR	4.3	MJ/kg DM	6.6
Water Soluble Carbohydrates (WSC) - NIR	4	%	5.9

DATE OF ISSUE: 24/11/25 **REPORT NO:** R25-02108-[R00]

Standard Forage Package - NIR	LOR	UNITS	1 P3 (BMC-Rehab Monitoring)
AFIA Hay and Silage Grade			NO GRADE

Approved by:

Richard Meyer

Richard Meyer
Feed Chemist
Feed Quality Service

ATTACHMENTS

INITIAL_SUBMISSION_FORM_2025-11-21_091423.pdf,
AUTHORISED_SUBMISSION_FORM_2025-11-21_100921.pdf, 1_FQS_Information_Attachment.pdf

LABORATORY COMMENTS

All analyses were conducted in a period between 21/11/2025 and 24/11/25.

This report R25-02108-[R00] is version 00, 24/11/25 and replaces any previous report related to R25-02108.

NOTE

I. AFIA Grading is calculated using the 95% coverage probability for the expanded uncertainty of the measurement of results for crude protein (CP) and metabolisable energy (ME). Where there is sufficient doubt that a test sample has complied with a particular grade, then a range of grades are quoted to ensure sufficient accuracy in the reporting.
II. All results are reported on a dry matter basis unless otherwise stated. All units of % are g/100g equivalent.
III. The results apply to the samples as provided to the laboratory.
IV. LOR = Limit of Reporting, the minimum quantity that can be reported with confidence.
V. Information supplied by the submitter may be transcribed from the Submission Form attached to this report. Validity of results is dependent on supplied information being correct.
VI. The laboratory report shall not be reproduced except in full without approval of the laboratory

Appendix I

Summary of Cumulative Elevated PM_{10} Monitoring Results and Bengalla Increment

Appendix I

Summary of Cumulative Elevated PM10 Monitoring Results and Bengalla Increment

APPENDIX I

Summary of Cumulative Elevated Dust Monitoring Results

and Bengalla Increment 2025

Date of elevated result	Result (µg/m^3)	Monitor	Description
24 HOUR EXCEENDANCES			
06 January 2025	62.2	PM10-1	BMC engaged Todoroski Air Sciences (TAS) to investigate the elevated PM_{10} levels recorded at PM10-1. Based on the prevailing wind directions it was estimated that BMC's operations contributed 10.2µg/m3 to the elevated reading at PM10-1. BMC provided DPHI with the investigation report and a summary of operations undertaken at BMC on the day.
23 February 2025	97.3	PM10-3	BMC engaged TAS to investigate the elevated PM_{10} levels recorded at PM10-3. Based on the prevailing wind directions it is estimated that BMC's operations contributed 24.2µg/m3 to the elevated reading at PM10-3. BMC provided DPHI with the investigation report and a summary of operations undertaken at BMC on the day.
01 March 2025	53.3	PM10-3	BMC engaged TAS to investigate the elevated PM_{10} levels recorded at PM10-3. Based on the prevailing wind directions it is estimated that BMC's operations contributed 7.8µg/m3 to the elevated reading at PM10-3. BMC provided DPHI with the investigation report and a summary of operations undertaken at BMC on the day.
28 August 2025	54.2	PM10-1	BMC engaged TAS to investigate the elevated PM_{10} levels recorded at PM10-1. Based on the prevailing wind directions it is estimated that BMC's operations contributed 48.6µg/m3 to the elevated reading at PM10-1. BMC provided DPHI with the investigation report and a summary of operations undertaken at BMC on the day.
09 September 2025	50.1	PM10-1	BMC engaged TAS to investigate the elevated PM_{10} levels recorded at PM10-1. Based on the prevailing wind directions it is estimated that BMC's operations contributed 11.6µg/m3 to the elevated reading at PM10-1. BMC provided DPHI with the investigation report and a summary of operations undertaken at BMC on the day.

27 September 2025	62.0	PM10-1	BMC engaged TAS to investigate the elevated PM_{10} levels recorded at PM10-1. Based on the prevailing wind directions it is estimated that BMC's operations contributed 11.3µg/m3 to the elevated reading at PM10-1. BMC provided DPHI with the investigation report and a summary of operations undertaken at BMC on the day.
21 October 2025	57.1	PM10-3	BMC engaged TAS to investigate the elevated PM_{10} levels recorded at PM10-3. Based on the prevailing wind directions it is estimated that BMC's operations contributed 4.8µg/m3 to the elevated reading at PM10-3. BMC provided DPHI with the investigation report and a summary of operations undertaken at BMC on the day.
08 November 2025	53.9	PM10-1	BMC engaged TAS to investigate the elevated PM_{10}levels recorded at PM10-1. Based on the prevailing wind directions it is estimated that Bengalla's operations contributed 15.9µg/m3 to the elevated reading at PM10-1. BMC provided DPHI with the investigation report and a summary of operations undertaken at BMC on the day.
14 December 2025	54.5	PM10-1	BMC engaged TAS to investigate the elevated PM_{10} levels recorded at PM10-1. Based on the prevailing wind directions it is estimated that Bengalla's operations contributed 6.5µg/m3 to the elevated reading at PM10-1. BMC provided DPHI with the investigation report and a summary of operations undertaken at BMC on the day.
ANNUAL AVERAGE CRITERIA (PM_{10})			
31 December 2025	25.7	PM10-1	BMC engaged TAS to investigate a potential exceedance of the Annual Average PM_{10} level criteria recorded by BMC monitors in 2025. Based on the prevailing wind directions it is estimated that BMC's operations contributed an annual average PM_{10} level of 5.5µg/m3 recorded at the PM10-1 HVAS monitor. BMC provided DPHI with the investigation report and a summary of operations undertaken at BMC on the day.
ANNUAL AVERAGE CRITERIA (Deposited Dust)			
31 December 2025	4.3	D27	BMC engaged TAS to investigate a potential exceedance of the Annual Average Deposited Dust level criteria recorded by BMC monitors in 2025. It is estimated that BMC's operations contributed an annual average deposited dust level of 1.9 g/m^2/month recorded at the D27 monitor. BMC provided DPHI with the investigation report and a summary of operations undertaken at BMC on the day.

Appendix J

Non- Aboriginal Heritage Sites

Bengalla Mining Company Non-Aboriginal Heritage Sites

Keys Family Cemetery





Stockyards


10 Dec 2025 1:52:36 pm
Bengalla Road
Castle Rock
Muswellbrook Shire Council
New South Wales


10 Dec 2025 1:52:27 pm
Old Bengalla Road
Bengalla
Muswellbrook Shire Council
New South Wales

Old Bengalla





House Site 1


Network: 19 Dec 2025 at 9:53:12 am AEDT
Local: 19 Dec 2025 at 9:53:12 am AEDT
S 32° 16' 55.793", E 150° 47' 27.128"
Castle Rock NSW 2333
Australia
Bengalla Mining Company
HERITAGE SITE
HOUSE SITE 1
DO NOT DISTURB


Network: 19 Dec 2025 at 9:52:58 am AEDT
Local: 19 Dec 2025 at 9:52:58 am AEDT
S 32° 16' 55.944", E 150° 47' 27.015"
Castle Rock NSW 2333
Australia

House Site 2


DO NOT DISTURB
10 Dec 2025 12:58:59 pm
Bengalla Road
Bengalla
Muswellbrook Shire Council
New South Wales

Blunts Butter Factory





Bengalla Homestead









External Views





Internal views of fire places



Example of repairs needed



Garden Shed



Out building



Bookkeeper's Cottage



Bookkeepers' cottage, renovated living room.

Overdene Homestead



External view



External view of exposed verandah area







Internal views of Overdene Cottage