YANCOAL
兖煤澳大利亚有限公司
MT THORLEY WARKWORTH



Mount Thorley Warkworth

2025 Annual Review

Name of Operations	Mount Thorley Warkworth
Name of Operator	Coal & Allied (NSW) Pty Ltd (wholly owned subsidiary of Yancoal Australia Ltd)
Development consent /project approval	SSD-6464 & SSD-6465
Name of holder of development consent/project approval	Warkworth Mining Ltd Mt Thorley Operations Pty Ltd
Mining Lease #	Contained within Section 3.1 of this report
Name of holder of mining lease	Warkworth Mining Ltd Mount Thorley Operations Pty Ltd
Water Licence #	Contained within Section 3.1 of this report
Name of holder of water licence	Contained within Section 3.1 of this report
Annual Review Start Date	01/01/2025
Annual Review End Date	31/12/2025

I, Gary Mulhearn, certify that this audit report is a true and accurate record of the compliance status of Mount Thorley Warkworth for the period 1 January 2025 to 31 December 2025 and that I am authorised to make this statement on behalf of Coal & Allied (NSW) Pty Ltd.

Note.

a) The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows 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 the 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	Mr Gary Mulhearn
Title of Authorised Reporting Officer	Environment and Community Manager
Signature of Authorised Reporting Officer	
Date	31 March 2026

Executive Summary

Mount Thorley Warkworth (MTW) is an integrated operation of two open cut coal mines, Warkworth Mining Limited (WML) and Mount Thorley Operations (MTO). This Annual Review reports on the environmental performance of MTW for the period 1 January 2025 to 31 December 2025.

This report has been prepared in accordance with conditions of the development consents held by MTW which require a report of the operation's environmental performance to be provided on an annual basis. The structure of the 2025 Annual Review aligns with the NSW Department of Planning Housing and Infrastructure (DPHI) *Post-approval requirements for State significant mining developments – Annual Review Guideline* (October 2015).

MTW produced 17.71 million tonnes of run-of-mine (ROM) coal during 2025, and 11.76 million tonnes of saleable coal. ROM coal from WML and MTO was produced at less than the approved ROM coal production rates for WML (18 Mtpa) and MTO (10 Mtpa).

Noise

There was a single non-compliance recorded against MTW's consented noise limits in relation to WML on 12 August 2025 (1dB) at the Wambo Road monitoring location which was caused after application of a low-frequency modifying factor of +2dB. MTW's active noise monitoring and management actions were able to identify and manage noise levels at the Wambo Road monitoring location. Implementation of MTW's noise management and mitigation measures meant that only a short time (1hr 21min) elapsed between the independent noise consultant identifying the potential noise exceedance, and MTW confirming that noise levels were compliant with noise limits at the Wambo Road location. DPHI assessed the noise exceedances, and measures to prevent reoccurrence, and elected to issue a Warning Letter in response. There was a decrease (from 149 to 41) in the number of supplementary attended noise measurements which exceeded the internal trigger levels for corrective action compared to 2024. A total of up to 2,951 hours of mine equipment stoppages were recorded as a result of proactive and reactive measures to minimise noise and ensure compliance with noise criteria.

Blasting

During the reporting period 243 blast events were initiated at MTW and all blasts returned results below the relevant ground vibration criteria for all monitoring locations. One (1) blast event on 26 May 2025 recorded an air blast overpressure result of 122.6 dB(L) at the Bulga Village monitoring location which was an exceedance of the 120 dB(L) threshold for air blast overpressure at this monitoring location. This exceedance was reported to DPHI on 26 May 2025 and a written report was provided. After review of the written report, DPHI elected to record the breach with no further regulatory action proposed on 12 August 2025.

Air Quality

During 2025, MTW complied with all short term and annual average air quality criteria. A total of up to 2,696 hours of mine equipment stoppages were recorded as a result of proactive and reactive measures to minimise dust and ensure compliance with air quality criteria.

Heritage

Aboriginal and Historic heritage matters continued to be managed in accordance with the Aboriginal Heritage Management Plan (AHMP) and Historic Heritage Management Plan (HHMP). Chance Find of an isolated artefact occurred and the site was added to AHIMS and MTW databases. No salvage of Aboriginal objects was undertaken during the period. Access upgrades to two historic heritage buildings were undertaken to provide reliable access for conservation management works. Annual compliance inspections were completed and no heritage incident or unauthorised site disturbance was identified.

Surface Water

2025 was a wetter than average year with a total of 702 mm of rainfall recorded at MTW's Charlton Ridge Meteorological station. The average annual rainfall at Charlton Ridge is 677mm, as calculated from 2007 to 2024 annual totals.

Groundwater

Groundwater monitoring activities were undertaken in 2025 in accordance with the MTW Water Management Plan and groundwater monitoring programme. The monitoring results are used to establish and monitor trends in physical and geochemical parameters of surrounding groundwater potentially influenced by mining.

Groundwater monitoring data is reviewed on a quarterly basis and is included in the March, June, September and December Monthly Environmental Monitoring Reports, available at https://www.yancoal.com.au/our-sites/mount-thorley-documents/#mon-docs

Visual Amenity

Slashing works were undertaken in 2025 along Putty Road, improving visual amenity. The visual bund that was constructed along the Putty Road and WML West Pit area during 2024 has continued to establish vegetation. Existing shade cloth has remained in place on chainmesh boundary fencing along Putty Road, whilst planted native vegetation is establishing to permanent visual screening between areas of established vegetation adjacent to the Warkworth open cut mining activities.

Rehabilitation and Land Management

A total of 100.1ha of new rehabilitation (rehabilitation progressed to Ecosystem and Land Use Establishment phase) was completed during 2025 which was 11.0ha more than the Forward Program 2025 target of 89.1ha. Total disturbance undertaken in 2025 was 60.2ha against a Forward Program target of 52.0ha. The increased amount of disturbance was due to the following: disturbance for infrastructure areas in Mount Thorley and North Out of Pit Dam; and disturbance of rehabilitation to remediate spontaneous combustion and to recover topsoil from a stockpile.

Biodiversity and Offset Management

Restoration of the Warkworth Sands Woodland vegetation community continued with 9,800 tube stock planted in the Northern Biodiversity Area (BA) and 960 planted in the Southern BA. Rapid Condition Assessments, and property inspections were undertaken across all BA's in 2025.

Weed control, vertebrate pest management activities, fence replacement and erosion area repairs were conducted during 2025 in accordance with the Offset Management Plans.

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1 STATEMENT OF COMPLIANCE

A Statement of Compliance against the relevant approvals is provided in **Table 1.1**. **Table 1.2** provides a brief summary of the non-compliances and a reference to where these are addressed within this Annual Review.

TABLE 1.1 STATEMENT OF COMPLIANCE

Approval	Were all conditions complied with?
DA SSD-6465 (MTO)	Yes
DA SSD-6464 (WML)	No

TABLE 1.2 NON COMPLIANCES

Relevant approval	Condition number	Condition description (summary)	Compliance status	Section in this Annual Review it is addressed.
SSD-6464 (WML)	Schedule 3 Condition 7	Water Discharge	Non-compliant	10
SSD-6464 (WML)	Schedule 3 Condition 7	Compliance with noise criteria	Non-compliant	10
SSD-6464 (WML)	Schedule 3 Condition 8	Blast overpressure	Non-compliant	10

TABLE 1.3 COMPLIANCE STATUS KEY FOR TABLE 1.2

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

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

2 INTRODUCTION

Mount Thorley Warkworth Coal Mine (MTW), is an integrated operation consisting of Warkworth Mining Limited (WML) and Mount Thorley Operations (MTO) situated 14 km southwest of Singleton, in the Upper Hunter Valley region of NSW **(Figure 1 & Figure 2)**. MTW is managed and operated by Coal & Allied (NSW) Pty Ltd, a wholly owned subsidiary of Yancoal Australia Limited (YAL). A summary of MTW tenements is shown in **Figure 3.**

2.1 Scope

This Annual Review (AR) covers the twelve-month reporting period from **1 January 2025 to 31 December 2025.**

This report summarises the environmental performance of MTW in accordance with conditions of the development consents held by site. The structure of this 2025 Annual Review aligns with the *DPHI Post-approval requirements for State significant mining developments – Annual Review Guideline* (October 2015).

This AR includes reference to the mining tenement of the Mount Thorley Coal Loader (MTCL), which is included in the Rehabilitation Management Plan. The MTCL operates under a Singleton Council development consent, and annual environmental reporting for the MTCL is not included within the scope of this AR.

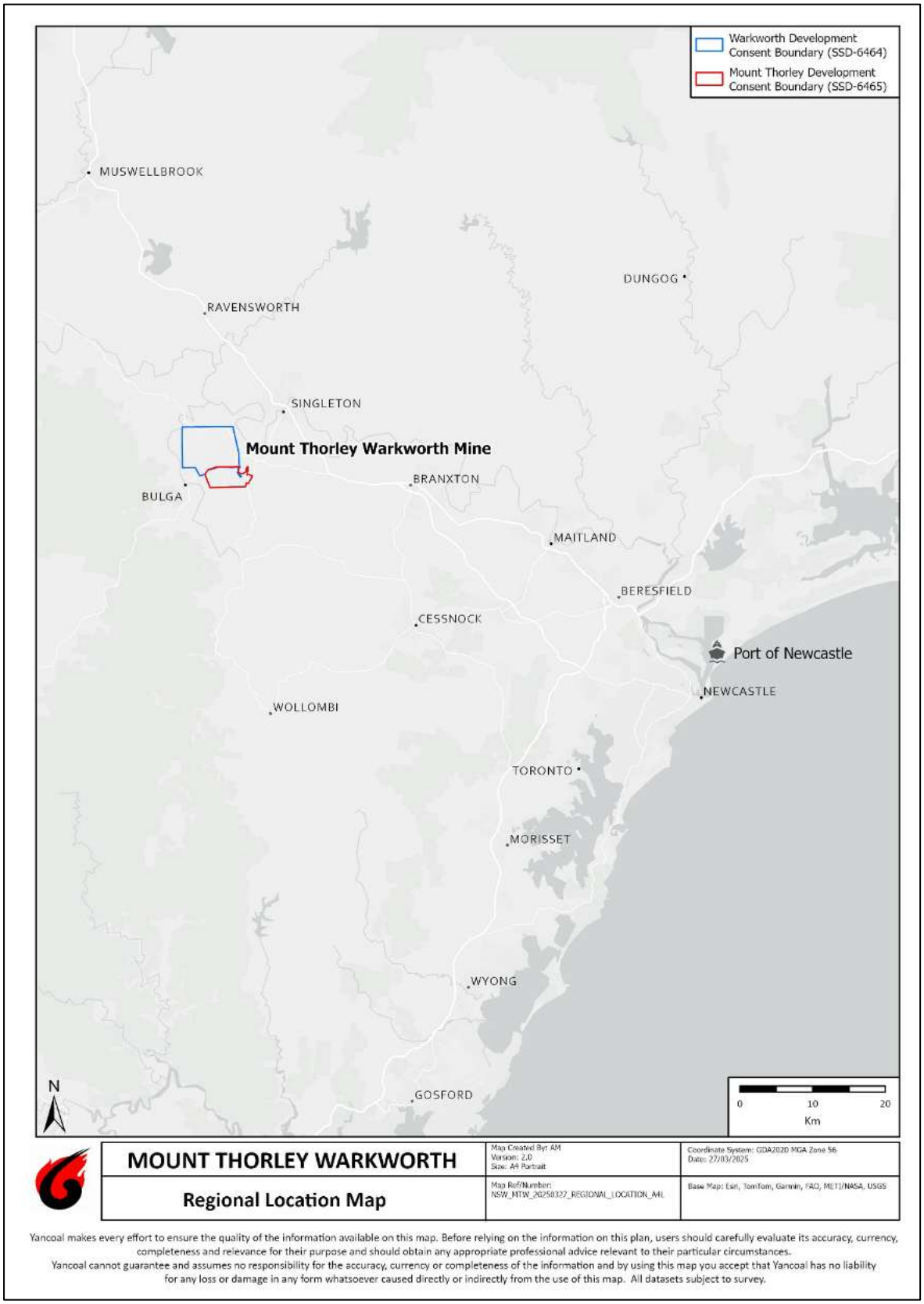


FIGURE 1: MTW REGIONAL CONTEXT

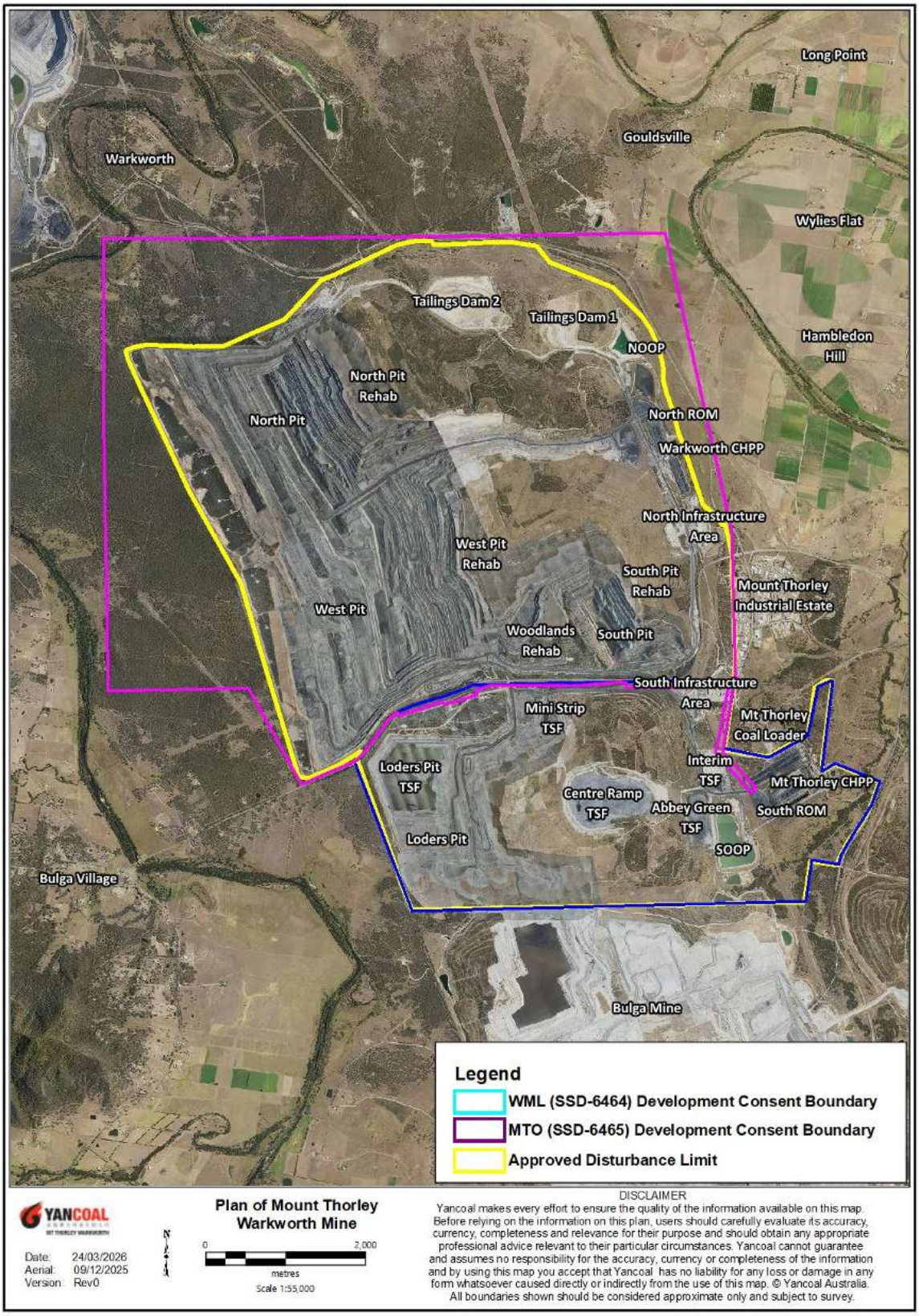


FIGURE 2: MTW SITE LAYOUT AND LOCALITY PLAN

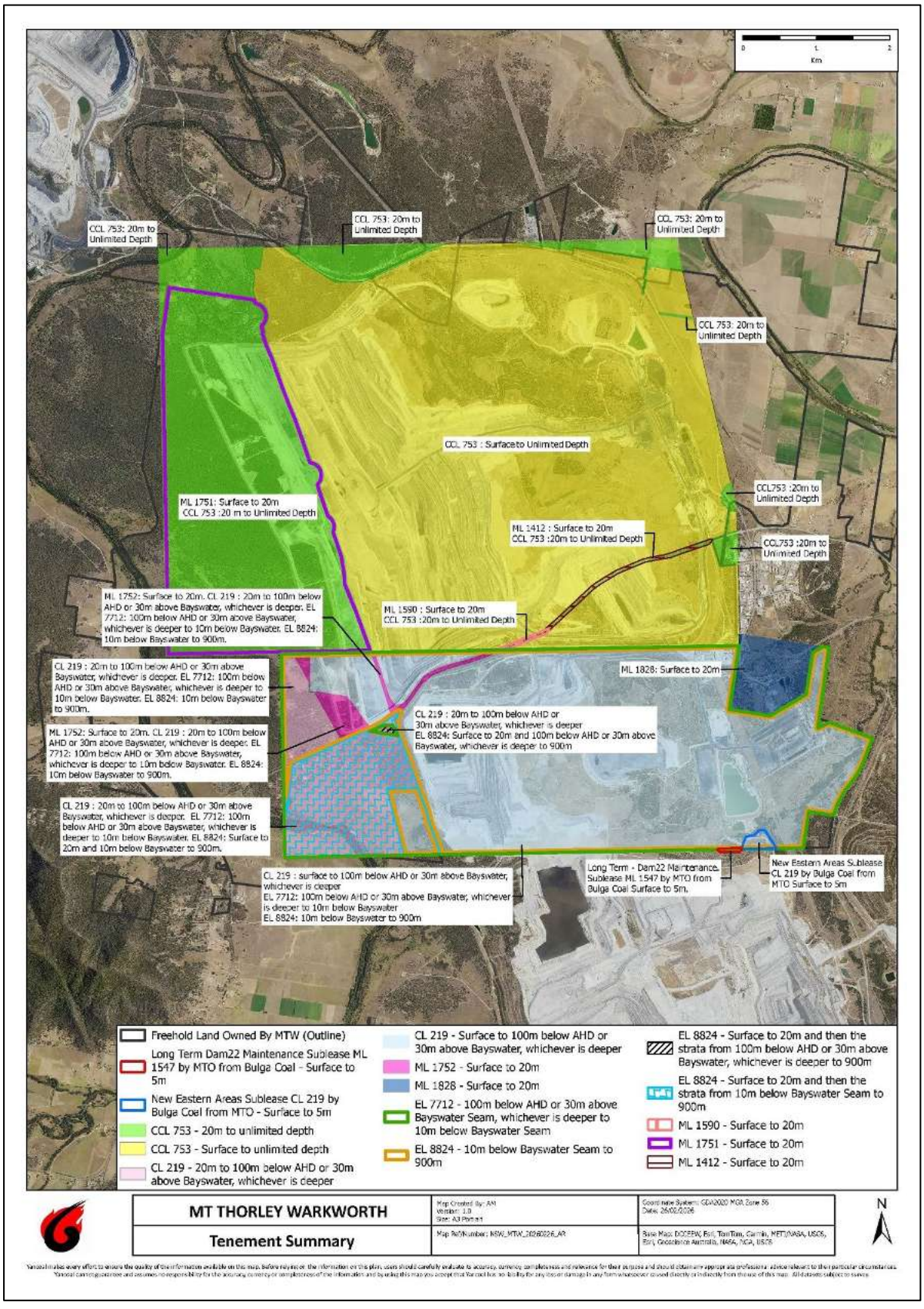


FIGURE 3: MTW TENEMENT SUMMARY

2.2 Mine Contacts

Table 2.1 outlines the contact details for site personnel responsible at Mount Thorley Warkworth.

TABLE 2.1 SITE PERSONNEL

Position	Name	Contact Number
General Manager – MTW	Cris Shadbolt	(02) 6570 1500
Environment & Community Manager - MTW	Gary Mulhearn	(02) 6570 1734

3 APPROVALS

3.1 Approvals, Leases and Licences

3.1.1 Current Approvals

The status of MTO and WML development consents, licenses and relevant approvals at 31 December 2025 are summarised in **Table 3.1** to **Table 3.6**.

TABLE 3.1 OPERATIONS APPROVALS- WARKWORTH

Approval Number	Description	Authority	Date of Approval / Variations
SSD-6464	Warkworth Continuation Project development consent.	DPHI	26/11/2015
SSD-6464 MOD 2	Modification the Warkworth Continuation Project to use the Lemington Underground as a water storage for Warkworth (and HVO); and authorise construction of the Ultra-Class truck workshop.	DPHI	27/05/2022
EPBC 2009/5081	Approval under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) to extend the existing Warkworth Coal Mine over an additional 705 hectares of land at Warkworth NSW including associated modifications to existing mine infrastructure.	Department of Climate Change, Energy, the Environment and Water (DCCEEW)	9/8/2012 – 31/3/2033 (varied on 14/10/2018)
EPBC 2002/629	Approval under the EPBC Act to construct and operate an open cut coal mine extension at the Warkworth Coal Mine.	DCCEEW	18/2/2004 – 25/02/2039 (varied on 6/4/2004, 24/5/2004, 19/11/2004, 13/7/2012, 14/10/2018)

TABLE 3.2 OPERATIONS APPROVALS - MOUNT THORLEY

Approval Number	Description	Authority	Date of Approval / Variations
SSD-6465	Mount Thorley Continuation Project development consent	DPHI	26/11/2015

TABLE 3.3 LICENCES AND PERMITS

Licence No	Description	Authority	Date of Approval / Variations
Warkworth			
EPL 1376	Environment Protection Licence	EPA	08/07/2025
5061122	Radiation Licence	EPA	02/05/2025
XSTR200105	Licence to Store – Explosives Act	SafeWork NSW	19/08/2019
Mount Thorley			
EPL 1976	Environment Protection Licence	EPA	12/09/2025
5061110	Radiation Licence	EPA	31/07/2025

Note: Environment Protection Licences remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

TABLE 3.4 MINING TENEMENTS

Mining tenement	Type	Purpose	Status	Grant Date	Expiry Date
Warkworth Mining Ltd					
CCL 753	Consolidated Coal Lease	Mining	Granted	23/05/1990	17/02/2034
ML 1412	Mining Lease	Mining	Granted	11/01/1997	11/01/2038
ML 1590	Mining Lease	Mining	Granted	27/02/2007	26/02/2028
ML 1751	Mining Lease	Mining	Granted	17/03/2017	17/03/2038
Mount Thorley Operations Pty Ltd					
CL 219	Coal Lease	Mining	Granted	23/09/1981	23/09/2044
(Part) ML 1547	Sub-Lease	Mining	Registered	The part sublease area known as the "Dam 22 Long Term Mining Sublease". Sublease is agreed between parties, currently pending	04/04/2046

Mining tenement	Type	Purpose	Status	Grant Date	Expiry Date
				approval and re-registration	
ML 1752	Mining Lease	Mining	Granted	17/03/2017	17/03/2038
EL 7712	Exploration Licence	Prospecting	Granted Ren. Pen.	23/2/2011	23/02/2026
EL 8824	Exploration Licence	Prospecting	Granted Ren. Pen.	15/02/2019	15/02/2025
Mount Thorley Coal Loading Ltd					
ML 1828	Mining Lease	Mining Purposes	Granted	25/02/2022	25/02/2043

TABLE 3.5 WATER LICENCES (WATER ACT 1912)

Licence Number	Type	Purpose	Legislation	Description	Renewal Date
20BL168821	Bore	Monitoring Bore	Part 5 Water Act 1912	Bores: MTAGP1, MTAGP2, ABGOH07, ABGOH43, ABGOH44, ABGOH45	Perpetuity
20BL171729	Bore	Monitoring Bore	Part 5 Water Act 1912	G3	Perpetuity
20BL171841	Bore	Monitoring Bore	Part 5 Water Act 1912	OH1126	Perpetuity
20BL171842	Bore	Monitoring Bore	Part 5 Water Act 1912	OH944	Perpetuity
20BL171843	Bore	Monitoring Bore	Part 5 Water Act 1912	OH1137	Perpetuity
20BL171844	Bore	Monitoring Bore	Part 5 Water Act 1912	Bores: OH1123 (E), OH1123 (W)	Perpetuity
20BL171845	Bore	Monitoring Bore	Part 5 Water Act 1912	OH1124	Perpetuity
20BL171846	Bore	Monitoring Bore	Part 5 Water Act 1912	Bores: OH786, OH942	Perpetuity
20BL171847	Bore	Monitoring Bore	Part 5 Water Act 1912	Bores: OH1127, OH787	Perpetuity
20BL171848	Bore	Monitoring Bore	Part 5 Water Act 1912	OH1125	Perpetuity
20BL171849	Bore	Monitoring Bore	Part 5 Water Act 1912	OH1122	Perpetuity
20BL171850	Bore	Monitoring Bore	Part 5 Water Act 1912	OH1138	Perpetuity
20BL171891	Bore	Monitoring Bore	Part 5 Water Act 1912	Bores: OH1121, OH788, OH943	Perpetuity

Licence Number	Type	Purpose	Legislation	Description	Renewal Date
20BL171892	Bore	Monitoring Bore	Part 5 Water Act 1914	Bores: WOH2153 (PZ2), WOH2154 (PZ1), WOH2155 (PZ4), WOH2156 (PZ3)	Perpetuity
20BL171893	Bore	Monitoring Bore	Part 5 Water Act 1918	Bores: WOH2141 (PZ6), Ground Water Alluvial Modelling	Perpetuity
20BL171894	Bore	Monitoring Bore	Part 5 Water Act 1913	WOH2139 (PZ5)	Perpetuity
20BL172272	Bore	Monitoring Bore	Part 5 Water Act 1912	PZ9S, PZ9D	Perpetuity
20BL172273	Bore	Monitoring Bore	Part 5 Water Act 1912	PZ8S, PZ8D	Perpetuity
20BL172439	Bore	Monitoring Bore	Part 5 Water Act 1912	Windermere	Perpetuity
20BL172518	Bore	Monitoring Bore	Part 5 Water Act 1912	Windermere: MBW01, MBW02, MBW03, MBW04	Perpetuity
20BL173276	Bore	Monitoring Bore	Part 5 Water Act 1912	Windermere	Perpetuity
20BL173065	Bore	Monitoring Bore	Part 5 Water Act 1912	SR012	Perpetuity

TABLE 3.6 WATER ACCESS LICENCES (WATER MANAGEMENT ACT 2000)

Licence Number	Description	Water Source	Water Sharing Plan	Water Source – Management Zone	Licence Allocation (ML)*	2025 Take (ML) Total
WAL963	Warkworth Mining Limited Hunter River Pump (General Security)	Hunter River	Hunter Regulated River WSP	Zone 2b (Hunter River from Wollombi Brook Junction to Oakhampton Rail Bridge)	243	0
WAL10543	Mount Thorley Joint Venture (MTJV) water supply scheme, held by Singleton Shire Council	Hunter River	Hunter Regulated River WSP	Zone 2b (Hunter River from Wollombi Brook Junction to Oakhampton Rail Bridge)	1,907 (MTW share is 1,009)	430

Licence Number	Description	Water Source	Water Sharing Plan	Water Source – Management Zone	Licence Allocation (ML)*	2025 Take (ML) Total
WAL43056	Warkworth Mining Limited (High Security)	Hunter River	Hunter Regulated River WSP	Zone 2b (Hunter River from Wollombi Brook Junction to Oakhampton Rail Bridge)	2,000	0
WAL43057	Warkworth Mining Limited (High Security)	Hunter River	Hunter Regulated River WSP	Zone 2b (Hunter River from Wollombi Brook Junction to Oakhampton Rail Bridge)	1,400	0
WAL18233	Old Farm	Hunter River Alluvium	Hunter Unregulated and Alluvial Water Sources WSP	Hunter Regulated River Alluvial Water Source – Downstream Glennies Creek Management Zone	5	0
WAL18558	Hawkes	Wollombi Brook	Hunter Unregulated and Alluvial Water Sources WSP	Lower Wollombi Brook Water Source	50	0
WAL19022	Sandy Hollow Creek	Unregulated River	Hunter Unregulated and Alluvial Water Sources WSP	Singleton Water Source	60	0
WAL40464 / WAL40465	Mt Thorley and Warkworth Pit Excavations	Permian Coal Seams	North Coast Fractured and Porous Rock Groundwater Sources WSP	Sydney Basin – North Coast Groundwater Source	180 / 750	428
WAL39798	Bore Extraction (Lemington underground)	Permian Coal Seams	North Coast Fractured and Porous Rock Groundwater Sources WSP	Sydney Basin – North Coast Groundwater Source	1,800	283

** Licence allocations are for 1 July to 30 June reporting year. Actual usage can exceed licence allocation in the table above if carryover provisions are available and have been applied during the water year.*

3.1.2 Management Plans, Programmes and Strategies

Table 3.7 details the management plans and strategies which are required under the Warkworth (SSD-6464) and Mount Thorley (SSD-6465) Development Consent instruments.

TABLE 3.7 STATUS OF MANAGEMENT PLANS REQUIRED UNDER WARKWORTH CONTINUATION (SSD-6464) AND MOUNT THORLEY OPERATIONS (SSD-6465) DEVELOPMENT CONSENTS

Plan / Program / Strategy	Status at end of 2025 (approval date)
Air Quality Management Plan	3/11/2025
Noise Management Plan	25/08/2025
Blast Management Plan	13/10/2025
Water Management Plan	15/11/2021
WML Biodiversity Management Plan	20/09/2018
Rehabilitation Management Plan (RMP)	Prepared 23/01/2026 Components of RMP approved by Resources Regulator: Final Landform and Rehabilitation Plan (FLRP) and Rehabilitation Objectives (ROBJ) approved 8/12/2023.
Environmental Management Strategy	5/08/2022
MTW Historic Heritage Management Plan	12/08/2022
MTW Aboriginal Heritage Management Plan	12/08/2022
Wollombi Brook Aboriginal Cultural Heritage Conservation Area Plan of Management	16/06/2022
Loder Creek Aboriginal Cultural Heritage Conservation Area Plan of Management	19/03/2019
Management Plan for Goulburn River Biodiversity Area	12/08/2022
Management Plan for Bowditch Biodiversity Area	12/08/2022
Management Plan for Southern Biodiversity Area	12/08/2022
Management Plan for Northern Biodiversity Area	12/08/2022
Management Plan for North Rothbury Biodiversity Area	12/08/2022
Warkworth Sands Woodland Integrated Management Plan	Pending (Submitted to OEH 15/02/2017)
Warkworth Sands Woodland Performance Criteria	Pending (Submitted to OEH 15/02/2017)

4 OPERATIONS DURING THE REPORTING PERIOD

4.1 Summary of Mining Activities

Areas to be mined are geologically modelled, a mine plan is formed and the relevant mining locations are surveyed prior to mining. **Figure 4** illustrates the mining process.



FIGURE 4: MINING PROCESS

Within Warkworth, mining activities continued to advance in a westerly direction in both North and West Pits; and the North Out of Pit (NOOP) Dam completed mechanical/electrical water infrastructure construction and commissioning. North, West and South Pit voids were used for dumping overburden & coarse rejects from the North & South CHPP. Mount Thorley Operations continues to be utilised for fine tailings and overburden emplacement. Exploration drilling was conducted within the relevant mining leases ahead of mining and within the pit to gain further information on the resource. All mining related activity is in line with the current development consents.

4.2 Mineral Processing

All processing and rejects/tailings disposal activities undertaken in 2025 were consistent with the approved development consents and no changes were made to the processing and rejects/tailings disposal methods.

The Loders Pit Tailings Storage Facility commenced operating in 2021 and continued throughout 2025. Waste capping of Tailings Dam 2 continued throughout 2025 in limited quantities.

4.3 Production Statistics

MTW is permitted to extract up to 18 million tonnes of ROM coal from the Warkworth Mine and 10 million tonnes from the Mount Thorley Mine. MTW Production Statistics for the previous, current and future reporting period are summarised in **Table 4.1**.

TABLE 4.1 SUMMARY OF PRODUCTION AT MTW IN 2025

Material	Approved Limits	Reporting Period 2024	Reporting Period 2025	Forecast for 2026
Prime Overburden Waste (kbcm)	N/A	93,870	98,079	99,234
MTO ROM Coal (Mtpa)	10 (SSD-6465)	0.93	0.75	0.64
WML ROM Coal (Mtpa)	18 (SSD-6464)	16.31	16.96	16.76
Combined MTW ROM Coal (Mtpa)	28 (Combined)	17.24	17.71	17.40
Coarse Reject (kt)	N/A	4,865	5,285	4,939
Fine Reject – Tailings (kt)	N/A	540.5	587.2	548.8
Product (kt)	N/A	11,224	11,755	11,847

All product coal was transported by rail. MTW transported 11,739 kt of product coal via rail during the 2025 reporting period.

4.4 Summary of Changes (Developments and Equipment Upgrades)

- The North Out of Pit (NOOP) Dam excavation by heavy mining equipment was completed Q2 2024. Construction of mechanical/electrical water infrastructure construction completed Q4 2025.
- Construction completed Q2 2025 of the final sediment water management structures and dams for the western advancing pre-strip at Warkworth. These structures were designed in accordance with the NSW Blue Book, Managing Urban Stormwater: Soils and Construction, Volume 2E Mines and Quarries.
- Construction completed for the designed increased discharge rate infrastructure for the MTO discharge point under the Hunter River Salinity Trade Scheme. The increased discharge rate is per the MTO development consent SSD-6465.
- The following new heavy mining equipment was commissioned in 2025:
    - Ten Haul Trucks
    - Three Water Trucks
    - One Small Motor Grader
- The following heavy mining equipment was decommissioned in 2025:
    - One Haul Truck
    - One Drills

5 ACTION(S) REQUIRED FROM PREVIOUS ENVIRONMENTAL MANAGEMENT REVIEW

There were no actions required by DPHI to be addressed in the 2025 AR from the 2024 AR.

6 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

6.1 Meteorological Data

Meteorological data is collected to assist in day to day operational decisions, planning, and environmental management and to meet development consent requirements. MTW operates a meteorological (weather) station located on Charlton Ridge. The meteorological station measures wind speed, wind direction, temperature, humidity, solar radiation, rainfall, and sigma theta. Instruments are installed, calibrated, and maintained according to the relevant Australian Standard AS 3580.14 (2014). Meteorological data is available to site personnel and provides mining operations with trend assessment details to inform operational decisions aimed at minimising impacts. Daily Meteorological data summaries are presented in the Monthly Environmental Monitoring reports, available via the MTW website: https://www.yancoal.com.au/our-sites/mount-thorley-documents/#mon-docs.

6.2 Noise

6.2.1 Noise Management

MTW manages noise with the aim to ensure compliance with permissible noise limits at nearby private residences. A combination of both proactive and reactive control mechanisms is employed on a continuous basis to ensure effective management of noise emissions is maintained. Noise management strategies and processes employed at MTW are detailed in the MTW Noise Management Plan available via the MTW website: https://www.yancoal.com.au/our-sites/mount-thorley-documents/#mon-docs.

MTW's 2025 noise performance metrics are shown below:

- There was a single non-compliance recorded against MTW's consented noise limits in relation to WML on 12 August 2025 (1dB) at the Wambo Road monitoring location which was caused after application of a low-frequency modifying factor of +2dB. MTW's active noise monitoring and management actions were able to identify and manage noise levels at the Wambo Road monitoring location. Implementation of MTW's noise management and mitigation measures meant that only a short time (1hr 21min) elapsed between the independent noise consultant identifying the potential noise exceedance, and MTW confirming that noise levels were compliant with noise limits at the Wambo Road location. DPHI assessed the noise exceedances, and measures to prevent reoccurrence, and elected to issue a Warning Letter in response.
- There was a single $L_{A1.1\ minute}$ exceedance recorded during the February attended monitoring. During the initial measurement at Bulga RFS starting on 27 February 2025, a mining continuum from WML was audible throughout the measurement, generating a site-only LAeq of 35 dB. A low-frequency modifying factor was applicable to the measured LAeq result in accordance with the NPfI and a +2 dB penalty was applied for an adjusted site-only LAeq of 37 dB which is compliant with the noise criterion at the Bulga RFS location. Impact noise generated the

site-only LA1,1minute of 52 dB, which exceeded the relevant limit by 5 dB. MTW was operating in accordance with the NMP completing routine supplementary noise monitoring and implemented operational controls as required to manage noise. In accordance with the NMP, five remeasures were completed approximately five minutes after the LA1,1minute potential exceedance was recorded. Remeasures are typically 1 minute each, being the most efficient way to collect five LA1,1minute samples. However, remeasures were 15 minutes each on this occasion due to the noise operator's decision. WML noise levels complied with noise limits during all five remeasures. In accordance with the NMP, a follow-up measurement was scheduled to occur within one week of the potential exceedance from WML. Adverse weather conditions related to Cyclone Alfred delayed the follow-up measurement until 12 March 2025, when meteorological conditions were suitable for monitoring to occur. During the follow up measurement at Bulga RFS on the 12 March 2025, a mining continuum from WML was audible throughout the measurement, generating a site-only LAeq of 30 dB. Surges in the continuum generated the site-only LA1,1minute of 33 dB, which complies with the criterion. Track noise was also noted.

- Community noise complaints received – decreased from 45 in 2024 to 40 in 2025.
- Number of Community Response Officer (CRO) (supplementary) noise measurements which exceed the internal trigger level for action decreased from 160 in 2024 to 157 in 2025.
- Number of equipment downtime hours logged in response to noise management triggers – decreased from 3,835 hours in 2024 to 2,951 hours in 2025.

A range of noise management processes were undertaken during 2025. These are described herein.

6.2.2 Sound Power Control

During the reporting period, 43 sound power level assessments were undertaken by an external consultant across 30 trucks, 2 excavator and 11 track dozers. Of the assessments undertaken, 15 pieces of equipment exceeded MTW In-Service targets and as such are subject to further maintenance inspections/defect management to address sound power and to be retested as required.

6.2.2.1 Real Time Noise Management

MTW's Real-Time noise management framework provides an effective tool for managing instances of elevated noise, ensuring compliance is maintained, and responding to community concerns.

MTW utilise CROs to provide an interface between the mine and community. They are effective in implementing the management framework, validating real-time alerts through supplementary handheld noise measurements and audible observations, driving operational change as required and responding to community complaints. A summary of supplementary handheld noise measurements conducted by the CROs in 2025 is presented in **Table 6.1**.

MTW's Insite website allows members of the general public to access noise, meteorological, air quality data as well as any operational changes made during shift via MTW's interactive website. Insite viewer access: http://insite.yancoal.com.au

TABLE 6.1 SUMMARY OF SUPPLEMENTARY ATTENDED NOISE MONITORING CONDUCTED BY COMMUNITY RESPONSE OFFICERS 2025

Monitoring Location	Number of Assessments	Number of measurements >WML trigger^	Number of measurements > MTO trigger^	Average WML noise level ($L_{Aeq\ 5min}$ dB(A))*	Average MTO noise level ($L_{Aeq\ 5min}$ dB(A))*
Wollemi Peak Road (Bulga RFS)	1723	74	16	33.4	32.5
Bulga Village	575	8	0	33.2	31.2
Inlet Road	457	21	0	33.4	31.3
Inlet Road West	405	4	0	30.5	27.7
Long Point	531	0	0	30.3	Inaudible[1]
South Bulga	-	-	-	-	-
Wambo Road	783	34	0	33.9	31.9
Total	4474	141	16	-	-

^Triggers are internally set thresholds for operational response and are specified in the MTW Noise Management Plan. The number of measurements greater than the trigger cannot be used as an assessment or interpretation of compliance. A compliance assessment is provided in Sections 1 and 6.2.3.1.

**Average noise levels do not take account of measurements taken where the noise source of interest was recorded as inaudible.*

[1] noise measurement taken where inaudible for MTO and noise level not assigned.

In response to the events listed in **Table 6.1** which were greater than the trigger, up to 2,951 hours of equipment downtime were recorded to manage noise during 2025.

6.2.3 Noise Performance

A total of 103 compliance measurements were undertaken by an independent acoustic specialist in accordance with the MTW Noise Monitoring Programme during the reporting period. Each measurement involves an assessment of mine noise against the various LAeq, 15 minute and LA1, 1min noise criteria. Noise monitoring results are shown in **Appendix 1** and are also presented in the Monthly Environmental Monitoring Reports, available via the MTW website https://www.yancoal.com.au/our-sites/mount-thorley-documents/#mon-docs

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfI), the applicability of the low frequency modification penalty has been assessed. There were four noise measurements taken during the reporting period which required the modifying factor penalty to be applied. Of those, there was one noise measurements taken during the reporting period which exceeded consent conditions following application of NPfI low frequency modifying factor, as listed in **TABLE 6.2**.

TABLE 6.2 ATTENDED NOISE MEASUREMENTS EXCEEDING CONSENT CONDITIONS FOLLOWING APPLICATION OF NPFI LOW FREQUENCY MODIFYING FACTOR

Location	Date/Time	Relevant Criteria	Criterion (dB)*	L_{Aeq}(dB)	Revised L_{Aeq} (dB)	Exceeds by (dB)
Wambo Road	12/08/2025 21:29	WML LAeq impact assessment criteria	37	36	38	1

The non-compliance recorded against WML's consented noise limit (12 August 2025 (1dB)), occurred after application of a low-frequency modifying factor of +2dB. MTW's active noise monitoring and management actions were able to identify and manage noise levels at the Wambo Road monitoring location. Implementation of MTW's noise management and mitigation measures meant that only a short time (1hr 21min) elapsed between the independent noise consultant identifying the potential noise exceedance, and MTW confirming that noise levels were compliant with noise limits at the Wambo Road location. The noise exceedance was reported to DPHI as an incident. Further detail on this reportable incident is provided in **Section 10**.

6.2.3.1 Comparison against Last Years' Results

A comparison of non-compliances and exceedances between years is used as a measure of the effectiveness of noise management measures employed on site.

Details of this comparison are provided in **Table 6.3** which includes the low frequency modifying factor related noise exceedance recorded in 2025, compared to performance since 2014.

TABLE 6.3 COMPARISON OF 2025 NOISE MONITORING RESULTS AGAINST PREVIOUS YEARS'

Year	Number of assessments	Number of exceedances	Number of non-compliances
2025	618	1	1
2024	600	3	3
2023	576	0	0
2022	612	7	6
2021	576	0	0
2020	576	0	0
2019	588	1	0
2018	594	1	0
2017	576	0	0
2016	576	0	0
2015	665	0	0
2014	700	0	0
2013	456	11	7
2012	562	13	3
2011	572	11	4
2010	561	3	3
2009	569	10	4

A comparison of supplementary noise measurements undertaken during the previous and current reporting period is provided in **Table 6.4**. This data shows the considerable effort in undertaking supplementary noise measurements has continued in 2025, and average noise readings have been comparable.

TABLE 6.4 COMPARISON OF CRO (SUPPLEMENTARY) NOISE MEASUREMENT PERFORMANCE

Monitoring Location	Number of Assessments		Number of Measurements >WML Trigger^		Number of Measurements > MTO Trigger^		Average WML Noise Level ($L_{Aeq\ 5min}$ dB(A))*		Average MTO Noise Level ($L_{Aeq\ 5min}$ dB(A))*	
	2024	2025	2024	2025	2024	2025	2024	2025	2024	2025
Wollemi Peak Road (Bulga RFS)	1371	1723	68	74	11	16	33.9	33.4	33.0	32.5
Bulga Village	547	575	8	8	0	0	33.3	33.2	31.8	31.2
Inlet Road	489	457	31	21	0	0	33.9	33.4	32.0	31.3
Inlet Road West	388	405	8	4	0	0	31.2	30.5	29.5	27.7
Long Point	545	531	1	0	0	0	30.6	30.3	28.5	Inaudible[1]
South Bulga	-	-	-	-	-	-	-	-	-	-
Wambo Road	718	783	33	34	0	0	34.2	33.9	32.4	31.9
Total	4058	4474	149	141	11	16	-	-	-	-

^Triggers are internally set thresholds for operational response and are specified in the MTW Noise Management Plan. The number of measurements greater than the trigger cannot be used an assessment or interpretation of compliance. Compliance assessment is provided in 6.2.3 and 6.2.4.

**Average noise levels do not take account of measurements taken where the noise source of interest was recorded as inaudible.*

[1] noise measurement taken were inaudible for MTO and noise level not assigned.

6.2.3.2 Validation of Real Time Monitoring Results

A comparison of real time and independent attended noise monitoring results was undertaken for 2025. The comparison identified that the majority of attended noise monitoring results were aligned or lower than the corresponding real time noise monitoring results i.e. real time noise monitor trigger is largely conservative for the most closely located real time noise monitors and for the mostly closely aligned 15-minute monitoring periods. There were exceptions to this, including;

- WML $L_{Aeq\ 15\ minute}$ attended monitoring measured noise levels were higher than the real time monitoring measured noise levels for four of eight monitoring locations in February, June, September, and December; for three of eight monitoring locations in April and August; for two of eight monitoring locations in May and October; and for one of eight monitoring locations in January, March, and July.
- MTO $L_{Aeq,\ 15\ minute}$ attended monitoring measured noise levels were higher than the real time monitoring measured noise levels for three of eight attended monitoring locations in January; and for one of eight monitoring locations in February, April, May, August, and September.

On the occasions where the WML and MTO attended monitoring measured noise levels were higher, the recorded noise levels were generally well below noise limits specified in MTW's Noise Management Plan.

The real time noise monitors can have difficulty assigning WML and MTO directional noise levels at times, such as where there is more than one noise source and where MTW is not the primary noise source. MTW's noise management process is that routine supplementary noise monitoring is also undertaken by the Community Response Officer each night and provides additional assessment of directional noise levels, allowing for swift targeted operational modifications where noise levels from MTW present a risk of exceeding the specified noise limit(s).

6.2.3.3 Comparison against EIS Predictions

Table 6.5 provides a comparison of 2025 attended monitoring data and the predicted noise levels modelled in the 2014 Warkworth Continuation EIS. Comparison has been made against the modelled worst-case noise levels for Year 9 of the development (nominally 2023). The comparison data has been sourced from the modelled noise levels at the nearest residential receivers to the current monitoring locations. Reported 2025 data is the calculated quarterly average of WML contribution to measured $L_{Aeq,\ 15\ minute}$ results and the maximum monthly measured noise level obtained through compliance assessment (irrespective of applicability of noise criteria due to meteorological conditions).

Where a monitoring event has been assessed as being "inaudible" or "not measurable", a conservative value of 25dB has been used to calculate the $L_{Aeq,\ 15\ minute}$ average for the quarter. The comparison shows that average measured $L_{Aeq,\ 15\ minute}$ noise is within the predicted EIS noise level range. Maximum measured $L_{Aeq,\ 15\ minute}$ noise was also within the predicted EIS noise level.

TABLE 6.5 PREDICTED NIGHT TIME WML (EIS 2014) LAEQ (15 MINUTE) NOISE LEVELS AND AVERAGED AND MAXIMUM 2025 MONITORING RESULTS

Monitoring Location	Year 9 Modelled Noise	Quarter 1 2025 average & maximum		Quarter 2 2025 average & maximum		Quarter 3 2025 average & maximum		Quarter 4 2025 average & maximum	
	$L_{Aeq\ (15\ minute)}$ (dB)	$L_{Aeq\ (15\ minute)}$ (dB)		$L_{Aeq\ (15\ minute)}$ (dB)		$L_{Aeq\ (15\ minute)}$ (dB)		$L_{Aeq\ (15\ minute)}$ (dB)	
		Avg	Max	Avg	Max	Avg	Max	Avg	Max
Wollemi Peak Road*/Bulga RFS	≤38	32.3	37	21.7	25	31.3	35	24.0	26
Bulga Village	≤38	25.3	31	29.0	30	36.7	38	27.0	31
Gouldsville Road	≤35	23.3	25	29.0	33	25.0	25	25.0	25
Inlet Road	≤37	27.7	32	27.3	37	31.3	34	25.7	31
Inlet Road West*	≤35	23.3	25	26.3	29	24.7	29	27.3	32
Long Point*	≤35	25.0	25	23.3	25	25.0	30	23.3	25
South Bulga	≤38	23.3	25	23.3	29	25.7	27	21.7	25
Wambo Road	≤38	27.0	30	28.7	31	28.0	29	25.7	29

**Denotes – No nearby receiver location modelled*

6.3 Blasting

6.3.1 Blast Management

During the reporting period, the MTW blast monitoring network operated in accordance with AS2187.2-2006 to measure ground vibration and air blast overpressure of each event at a high sampling frequency. Monitors function as regulatory compliance instruments in accordance with the MTW Blast Monitoring Programme (appended to Blast Management Plan) and are located on (or in locations representative of) privately owned land. During 2025 monitors were located at:

- Abbey Green (Abbey Green Station, Putty Road, Glenridding);
- Bulga Village (Wambo Road, Bulga);
- Putty Road, Mount Thorley (known as MTIE)
- Wambo Road (Wambo Road, Bulga);
- Warkworth Village (former Warkworth Public School, Warkworth); and
- Wollemi Peak Road (intersection of Putty & Wollemi Peak Roads, Bulga).

These locations are shown in **Figure 5** below.

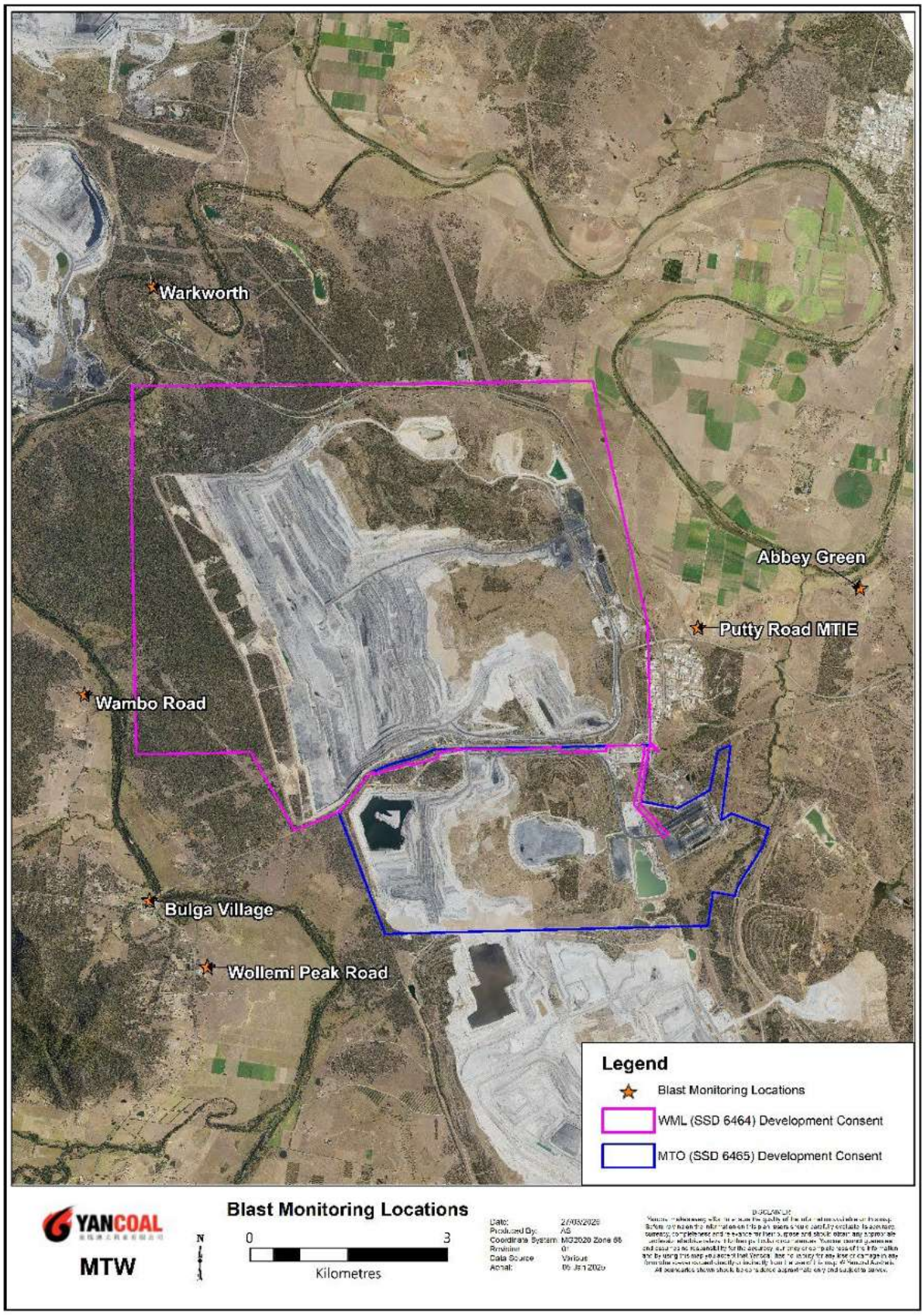


FIGURE 5: BLAST MONITORING LOCATIONS

6.3.2 Blast Performance

During the reporting period 243 blast events were initiated at MTW. Results of ground vibration and airblast overpressure recorded during 2025 are presented in **Figure 6** to **Figure 11**. All blasts returned results below the relevant ground vibration criteria for all monitoring locations. One (1) blast event on 26 May 2025 recorded an air blast overpressure result of 122.6 dB(L) at the Bulga Village monitoring location which was an exceedance of the 120 dB(L) threshold for air blast overpressure at this monitoring location.

A preliminary notification of the suspected airblast overpressure exceedance was reported to the DPHI and to the EPA on 26 May 2025. An investigation into this event was completed and a written report was provided to the DPHI and to the EPA on 2 June 2025. The investigation was unable to determine a definitive cause for this event, however, meteorological conditions and the monitoring unit were unable to be ruled out. The DPHI elected to record the breach with no further regulatory action proposed on 12 August 2025 and an Official Caution was issued by the EPA in relation to this matter on 1 September 2025. MTW conducted further investigation regarding the instrumentation by installing a second monitor at the Bulga Village location so that results from the 2 monitors could be compared. This investigation found that the blast monitor was operating in accordance with the airblast overpressure tolerances specified by the manufacturer. Although, interference from wind and equipment issues did occur. Further details on this incident and the actions taken by MTW are provided in **Section 10.**

Road closures occurred for all blasts within 500 metres of a public road. Public roads were also closed on occasions to mitigate potential impact upon road users from post blast emissions.

Following a complaint from a community member regarding post blast emissions during an MTW road closure, MTW was contacted by the DPHI to provide details of this event. An investigation by MTW indicated the blast had a zero fume rating, and the Watch and Act road closure in the Blast Management Plan was followed, however some vehicles may have driven through post blast dust emissions. Upon review, DPHI determined that no non-compliance occurred. To reduce risk of a similar community complaint in future, MTW elected to develop a guide to inform post blast emissions travel time based on blast distance from roads and wind speed, with this improvement implemented since 5 February 2026.

In accordance with Schedule 3, Conditions 9 and 10 of SSD-6464, Warkworth Mining Limited carried out blasting on site between 7am and 5pm Monday to Saturday inclusive. No blasts occurred on Sundays or on public holidays. Warkworth Mining Limited carried out not more than 3 blasts per day and not more than 12 blasts per week (averaged over a calendar year).

No blasts were carried out at Mt Thorley Operations Limited in 2025.

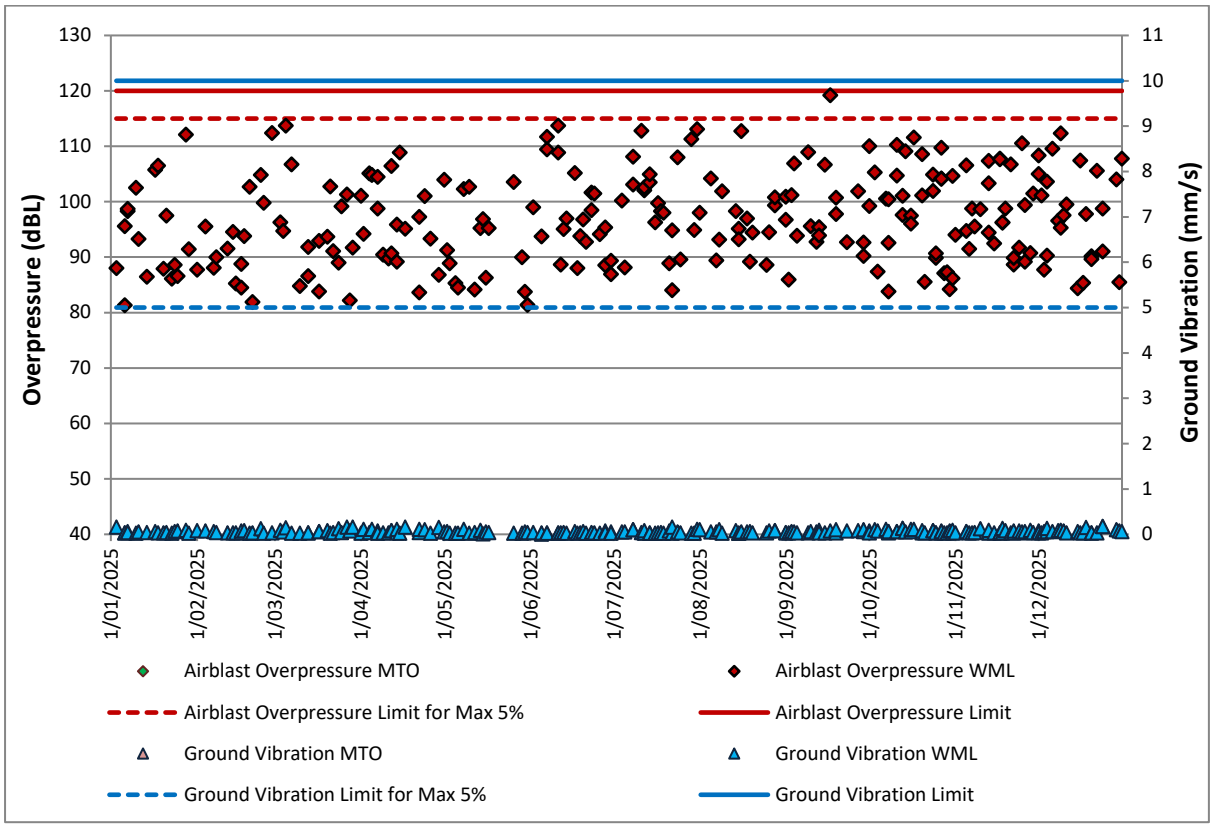


FIGURE 6: ABBEY GREEN BLAST RESULTS

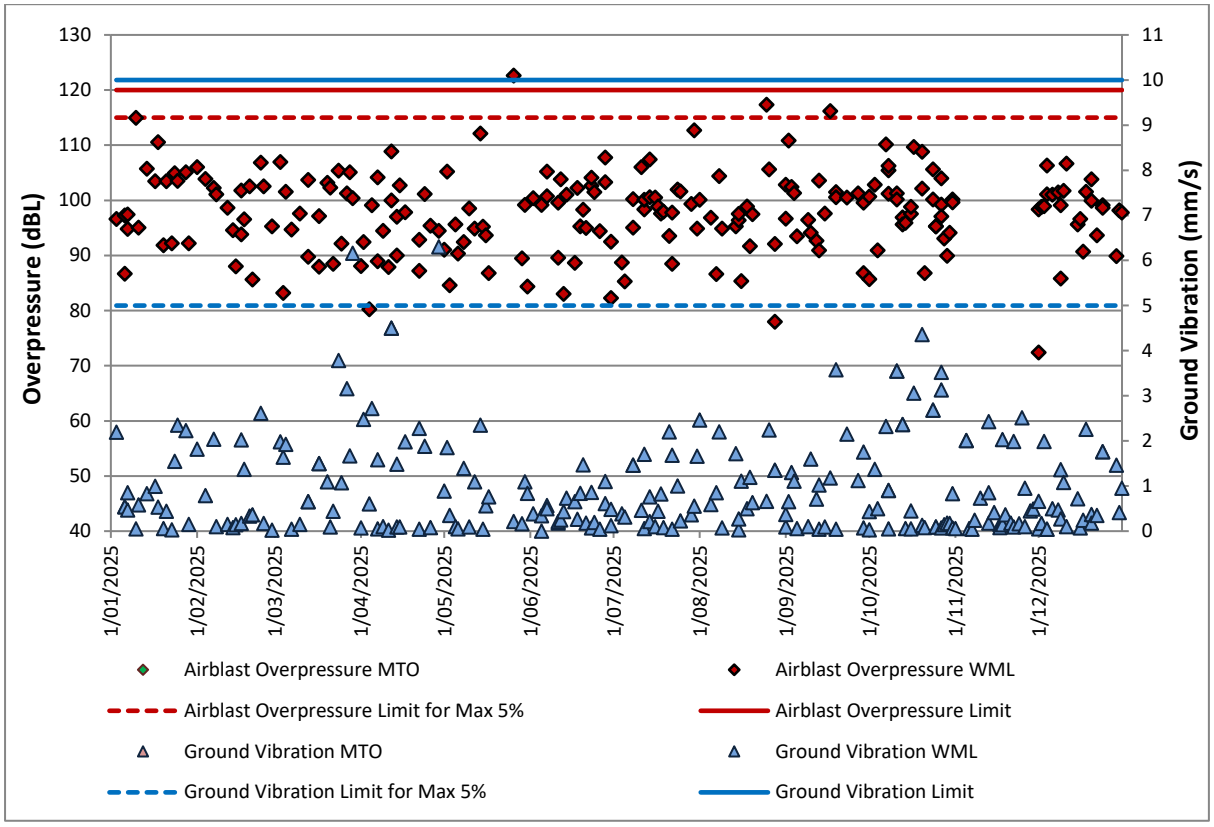


FIGURE 7: BULGA VILLAGE BLAST RESULTS

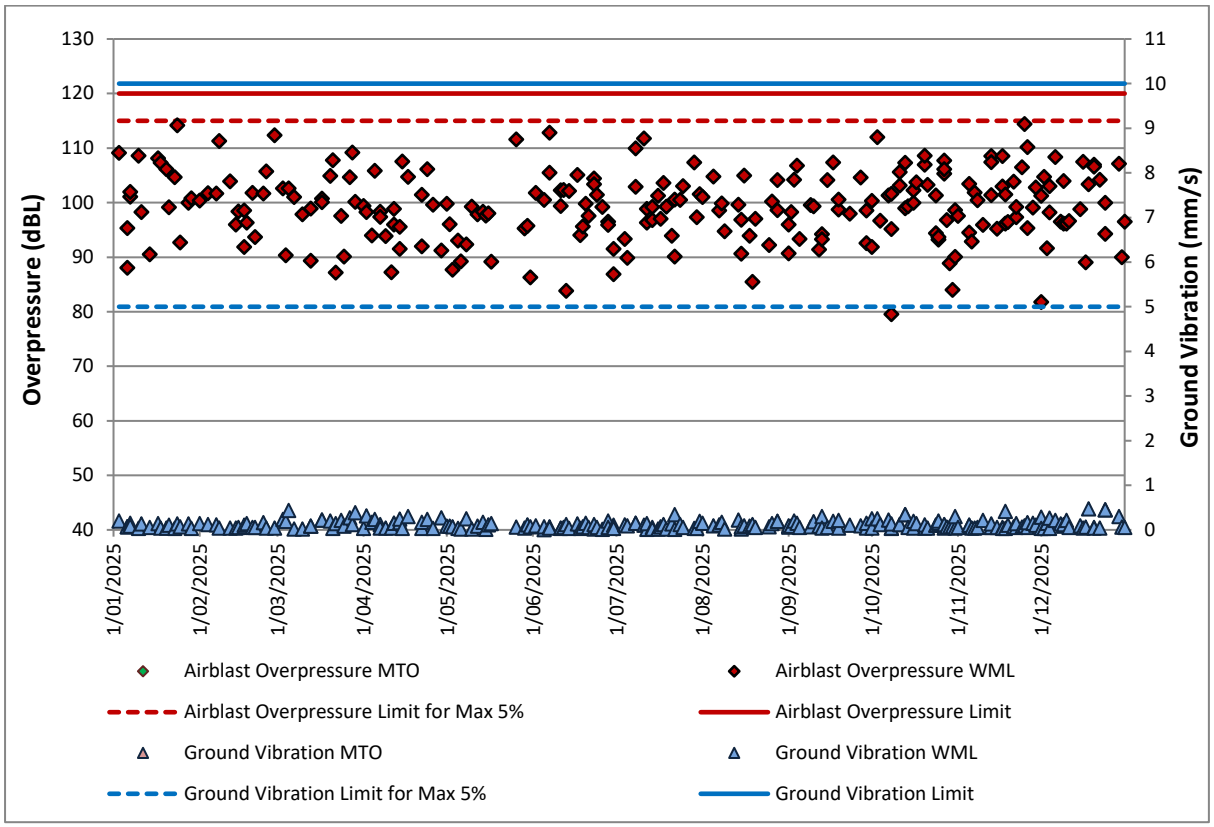


FIGURE 8: MTIE BLAST RESULTS

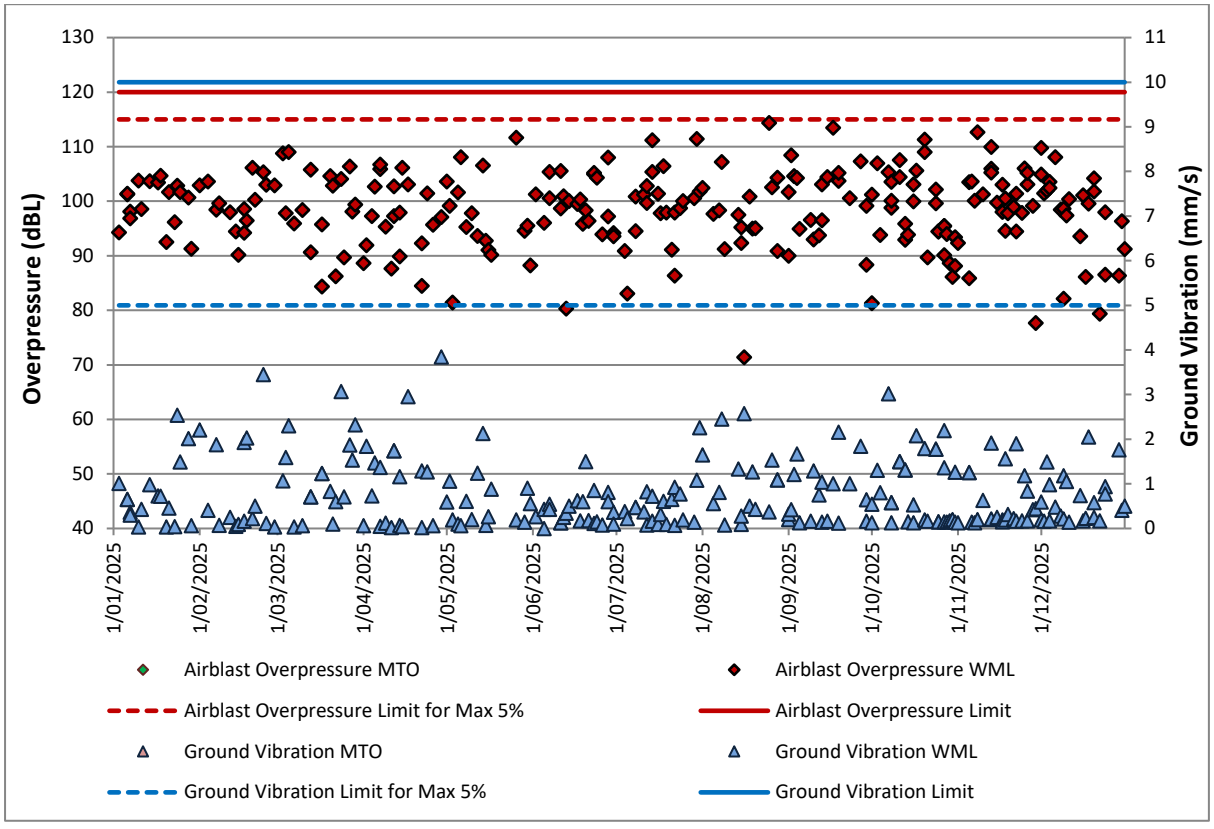


FIGURE 9: WOLLEMI PEAK ROAD BLAST RESULTS

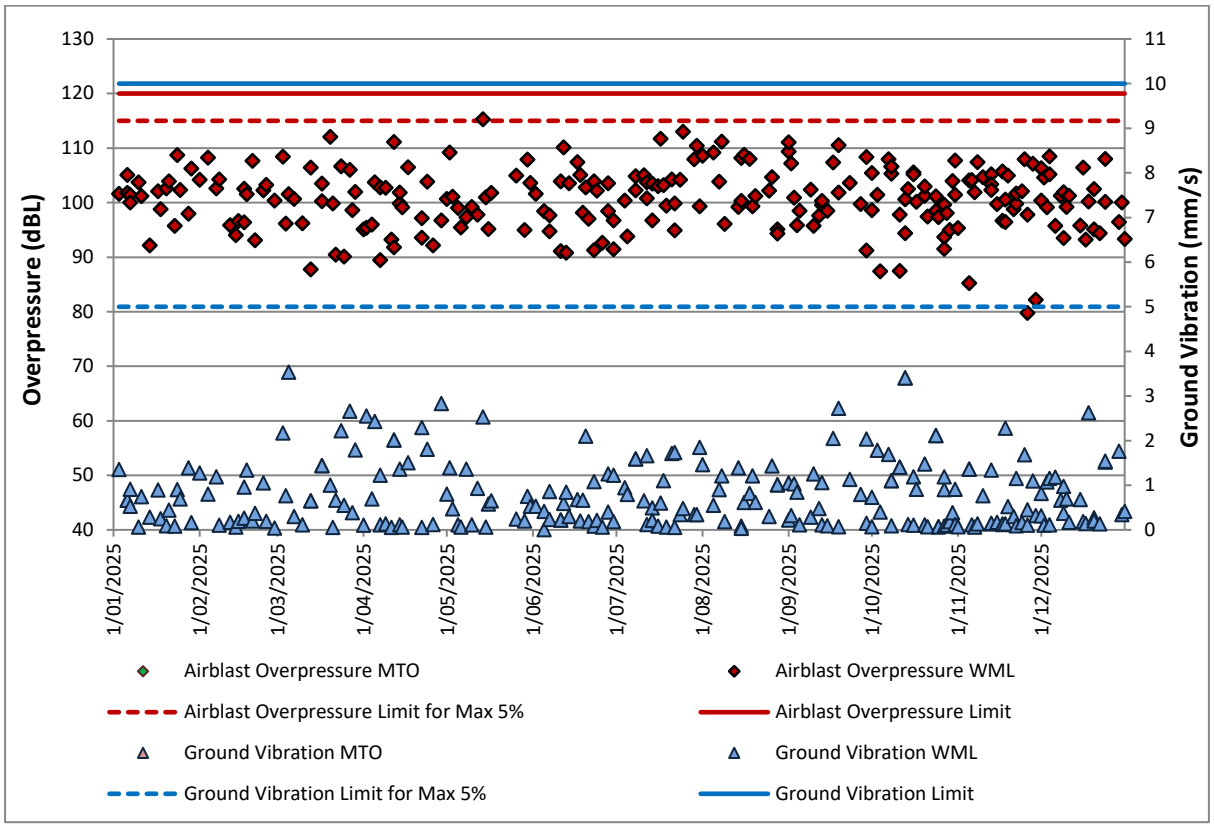


FIGURE 10: WAMBO ROAD BLAST RESULTS

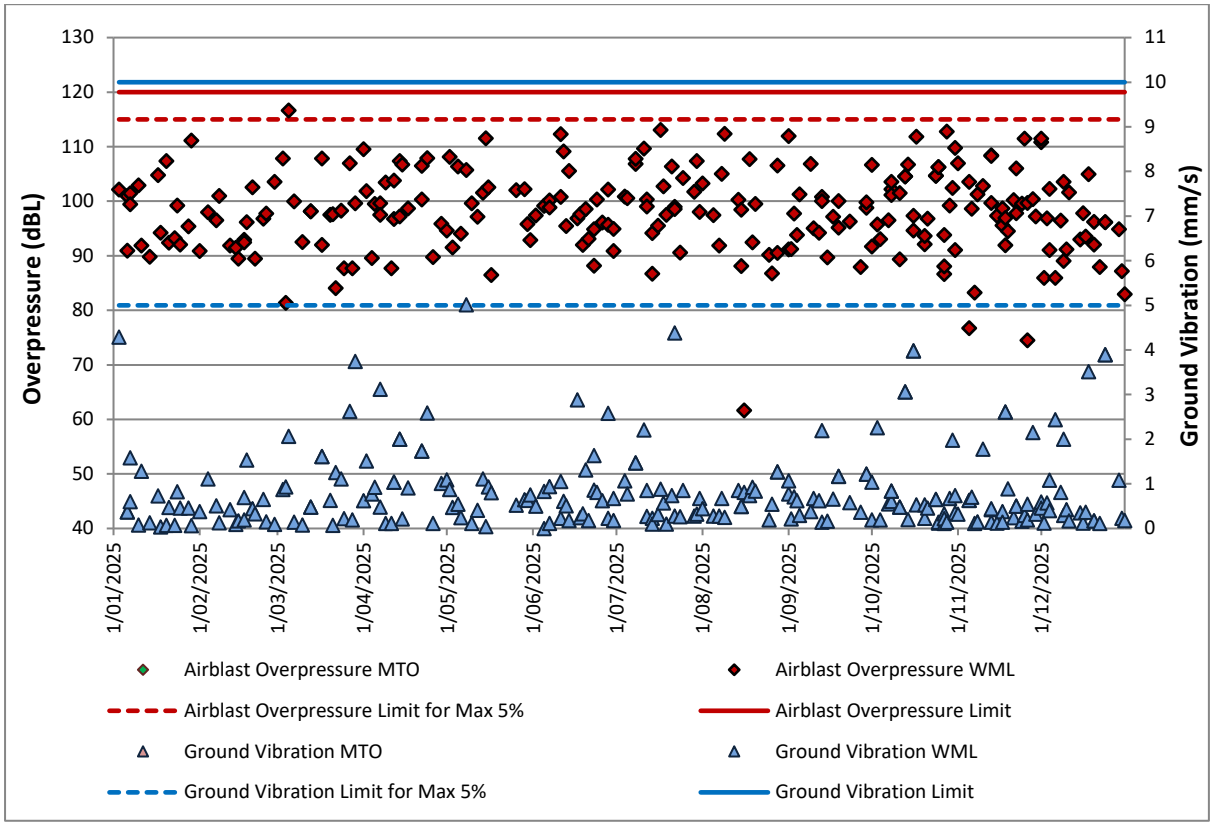


FIGURE 11: WARKWORTH BLAST RESULTS

6.3.2.1 Blast Fume Management

MTW operates a Post Blast Fume Generation Mitigation and Management Plan. This document outlines the practices to be utilised to reduce generation of post blast fume and reduce potential offsite impact from any fume which may be produced. This includes risk assessment of the likelihood of fume production, specialised blasting design, appropriate product selection, on-bench water management, implementation of fume management zones and use of blasting permissions to identify likely path of any fume which may be produced.

All blasts are observed for fume and any fume produced is ranked according to the Australian Explosive Industry & Safety Group (AEISG) Scale. During 2025, no blasts produced visible post-blast fume with a post-blast ranking Level 4 or higher according to the AEISG Scale.

Rankings for visible blast fume according to the AEISG scale for shots fired during 2025 and comparison to rankings distribution during previous years is provided in **Table 6.6.**

TABLE 6.6 VISIBLE BLAST FUME RANKINGS ACCORDING TO THE AEISG COLOUR SCALE

AEISG Ranking	2025	2024	2023
0	255	246	272
1	13	21	9
2	5	12	5
3	3	5	7
4	0	0	0
5	0	0	0
Total*	276	284	293

** Where a number of individual blasts were fired as a blast event, fume was assessed for each individual blast pattern rather than for the event as a whole.*

6.3.2.2 Comparison of Monitoring Results Against Previous Years' Performance and EA Predictions

Blasting results recorded in 2025 are similar to results recorded in previous years and are generally consistent with EA predictions.

6.4 Air Quality

6.4.1 Air Quality Management

Air quality management at MTW is prescribed by the Air Quality Management Plan (available at https://www.yancoal.com.au/our-sites/mount-thorley-documents/#mgt-docs). The management plan:

- Describes procedures required to ensure compliance with the approval conditions relating to air quality including the measures that MTW will use to manage air quality;
- Details the management framework and mitigation actions to be taken while operating; and
- Provides a mechanism for assessing air quality monitoring results against the relevant impact assessment criteria.

6.4.1.1 Real-Time Air Quality Management

MTW's real-time air quality monitoring stations continuously log information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger limits. Following an alarm, an inspection is undertaken, and operations and equipment usage are modified as required to manage air quality in accordance with MTW's Air Quality Management Plan.

1,099 real-time alarms for air quality and wind conditions were received and acknowledged during 2025 from the real-time monitors which are shown on the map in **Figure 14**. In response, up to 2,696 hours of mining equipment downtime was recorded due to air quality management. A detailed breakdown of air quality related equipment stoppages (per month, per equipment type) is presented in **Figure 12**.

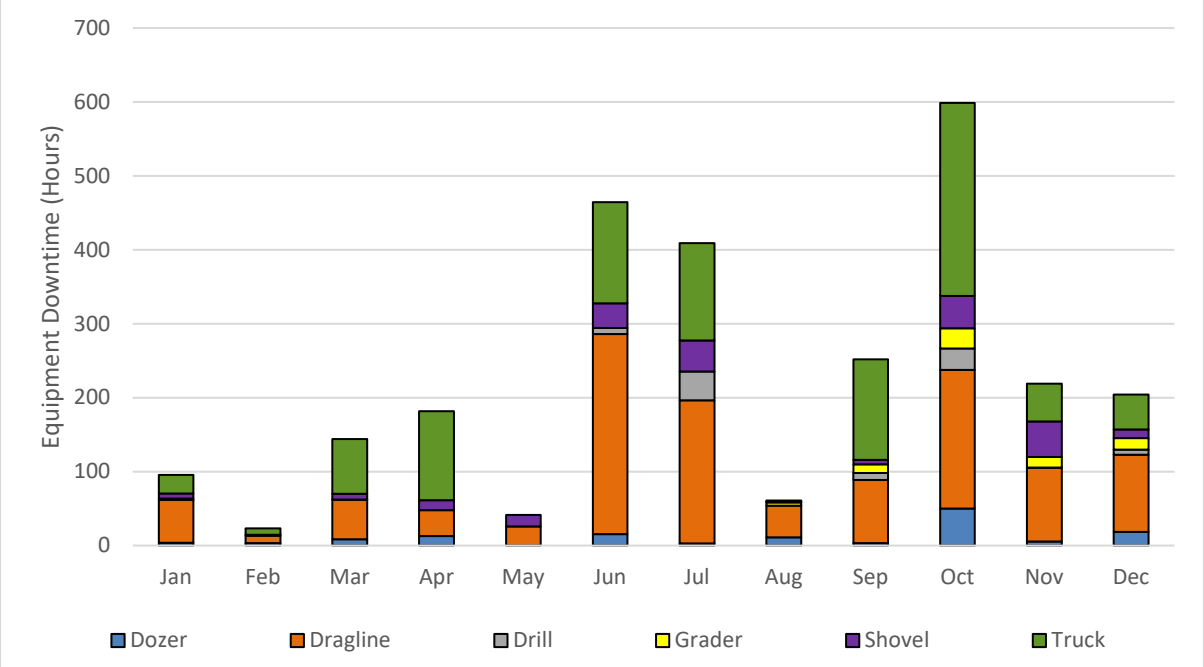


FIGURE 12: EQUIPMENT DOWNTIME FOR DUST MANAGEMENT BY MONTH (2025)

6.4.1.2 Temporary Stabilisation

An aerial seeding programme was undertaken in 2025, which aimed to reduce airborne dust from inactive waste dumps and ahead of mining areas. 86 hectares of area was seeded (see **Figure 13**) using an exotic pasture grass and legume mix suitable for summer sowing. Fertiliser was mixed with the seed prior to loading to provide sufficient nutrients for plant growth.

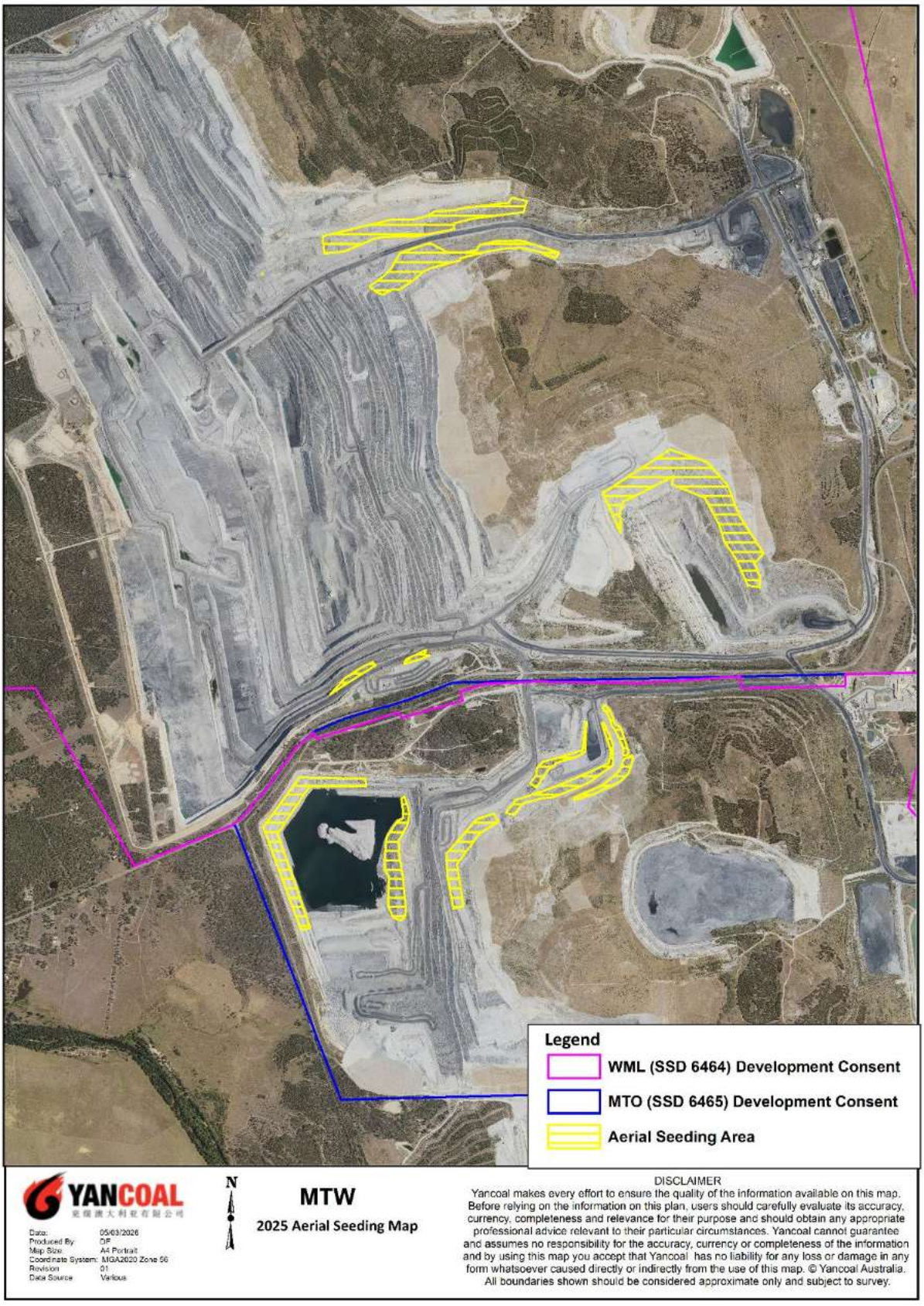


FIGURE 13: AERIAL SEEDING AREAS

6.4.2 Air Quality Performance

6.4.2.1 Air Quality Monitoring

Air quality monitoring at MTW is undertaken in accordance with the MTW Air Quality Monitoring Programme and protocol for evaluating non-compliances. The monitoring network comprises an extensive array of monitoring equipment which is utilised to assess performance against the relevant conditions of MTW's approvals and EPL's. Air quality monitoring locations are shown in **Figure 14.** During 2025, MTW complied with all short term and annual average air quality criteria.

Air quality compliance criteria are shown in **Table 6.7**, along with a summary of MTW's performance against the criteria. Whilst MTW operates under two separate planning approvals the following compliance assessment has been undertaken on a 'whole of MTW site' basis, rather than individually assessing the contribution of each approval area to the measured results.

Air quality monitoring data is made publicly available through the MTW Monthly Environmental Monitoring Reports available on the MTW website at: https://www.yancoal.com.au/our-sites/mount-thorley-documents/#mon-docs and daily data can be accessed on the MTW Insite website at: https://insite.yancoal.com.au/mount-thorley-warkworth/data

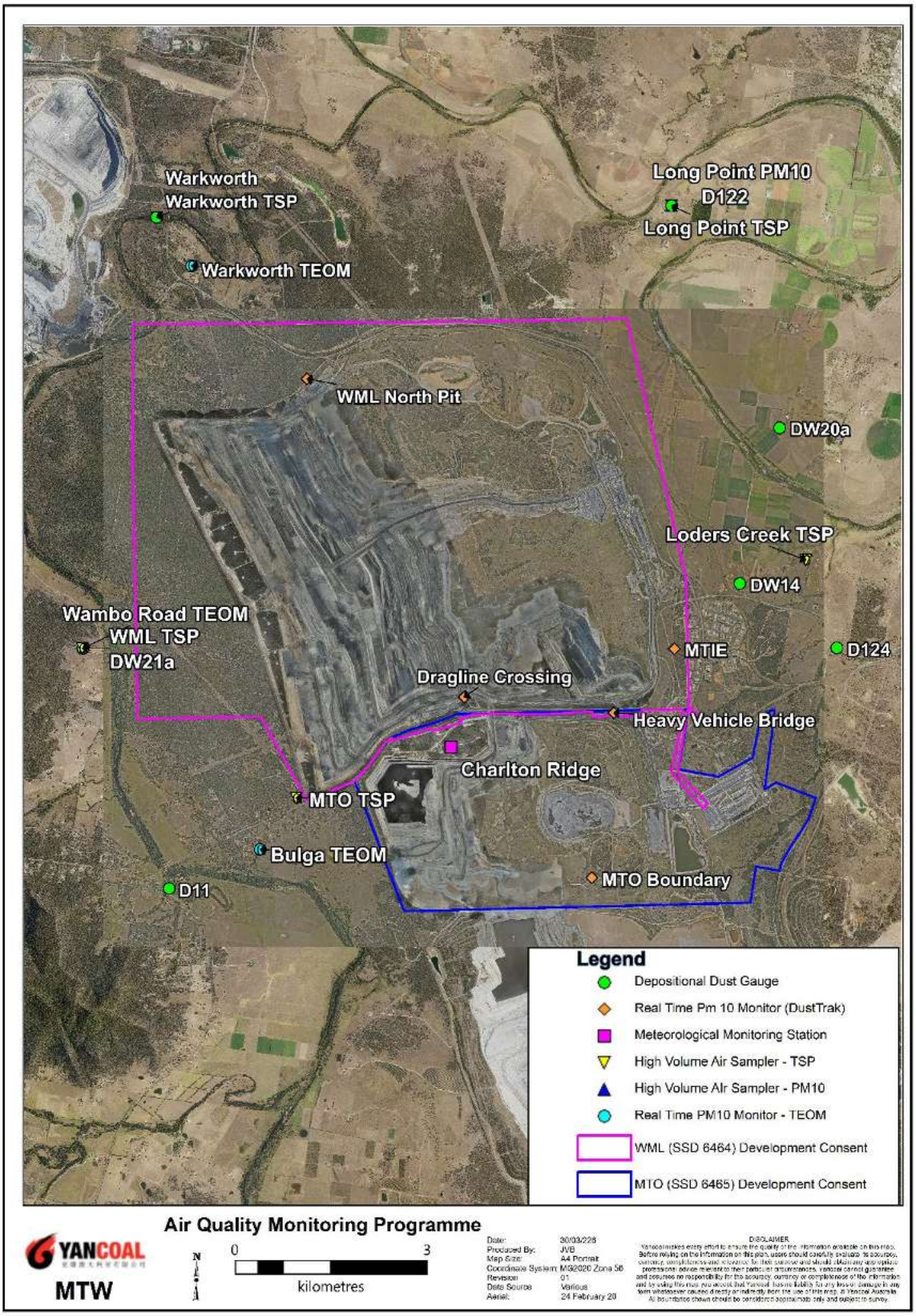


FIGURE 14: AIR AND METEOROLOGICAL MONITORING LOCATIONS MTW 2025

TABLE 6.7 AIR QUALITY IMPACT ASSESSMENT CRITERIA AND 2025 COMPLIANCE ASSESSMENT

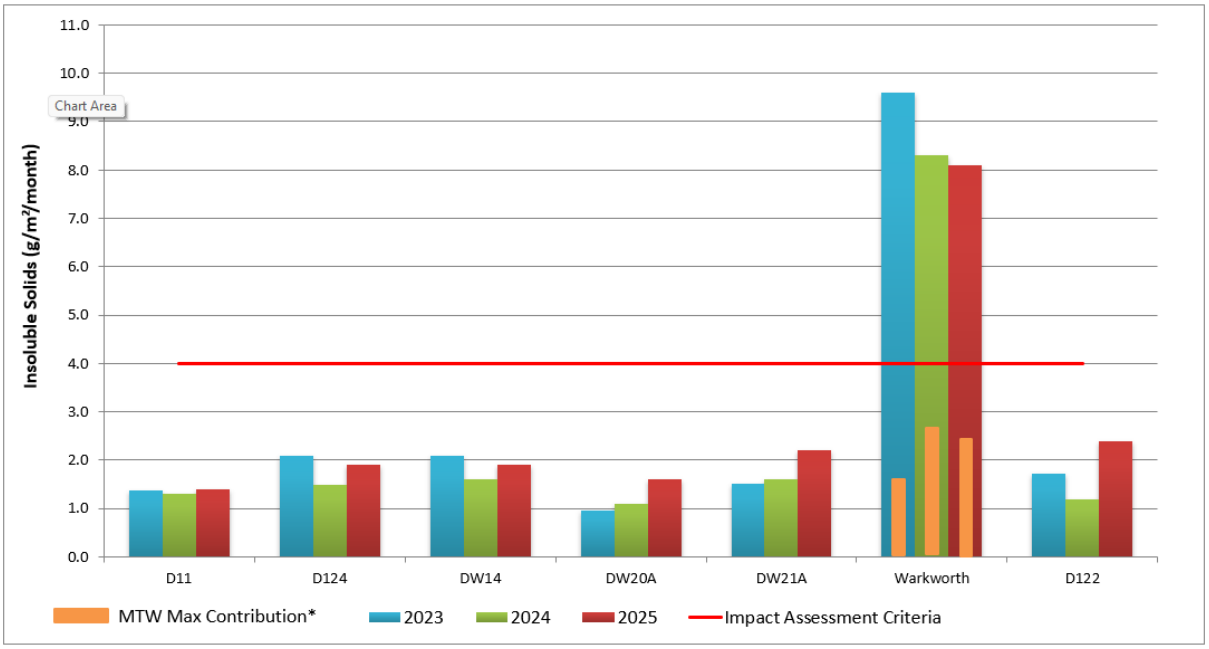
Pollutant	Criterion	Averaging Period	Compliance
Deposited Dust	4 g/m^2/month	Maximum total deposited dust level	100%
	2 g/m^2/month	Maximum increase in deposited dust level	100%
Total Suspended Particulate matter (TSP)	90 µg/m^3	Long Term (Annual)	100%
Particulate matter <10µm (PM_{10})	30 µg/m^3	Long Term (Annual)	100%
	50 µg/m^3	Short Term (24 hour)	100%

6.4.2.2 Deposited Dust

Deposited dust is monitored generally in accordance with AS3580.10.1(2016) at six (6) locations situated on, or representative of residences on privately-owned land and also at a 7th location (Warkworth). The annual average insoluble matter deposition rates in 2025 compared with the impact assessment criterion and previous year's data is shown in **Figure 15.**

There was one exceedance of the 4 g/m^2/month long-term impact assessment criteria, for maximum total deposited dust level, recorded at the Warkworth monitoring location. An external consultant was engaged to conduct an investigation which determined maximum MTW contribution to be less than or equal to 2.3g/m2/month, or ~28% of the total level of 8.1g/m2/month at Warkworth. Whilst the result exceeds the 2 g/m^2/month maximum allowable increase in deposited dust criterion, there are no residences on privately-owned land in Warkworth and as such, this does not constitute non-compliance, as per Schedule 3, Condition 17 of WML Development Consent (SSD-6464) and Schedule 3, Condition 15 of MTO Development Consent (SSD-6465).

Excepting the Warkworth monitoring location for reasons above, all annual average insoluble matter deposition rates recorded on or representing privately owned land were compliant with the long-term impact assessment criteria of 4g/m2/month. On 3 November 2025, an updated Air Quality Management Plan was approved by DPHI. The update included a change to the monitoring program which removed depositional dust monitoring for the Warkworth monitoring location (as there are no residences on privately owned land in Warkworth). Accordingly, the Warkworth depositional dust monitoring location ceased being monitored from November 2025.



** MTW's estimated maximum contribution to annual average deposited dust level (determined by external air quality consultant).*

FIGURE 15: 2025 DEPOSITIONAL DUST RESULTS COMPARED AGAINST THE IMPACT ASSESSMENT CRITERIA AND PREVIOUS YEARS' RESULTS

6.4.2.3 Total Suspended Particulates (TSP)

Total Suspended Particulates (TSP) are measured at four (4) locations situated on or representative of privately-owned land in accordance with AS3580.9.3 (2015) and also at a 5th location (Warkworth HVAS). Annual average TSP concentrations recorded in 2025 compared against the long-term impact assessment criterion and previous years' data, are shown in **Figure 16**.

One high volume air sampler exceeded the annual TSP impact assessment criteria during the 2025 reporting period. This was investigated to determine the level of contribution from MTW activities in accordance with the compliance protocol outlined in the approved MTW Air Quality Management Plan. The recorded exceedance was determined to be compliant with the relevant criteria, as the measured result was not primarily attributable to MTW. On 3 November 2025, an updated Air Quality Management Plan was approved by DPHI. The update included a change to the monitoring program which removed depositional dust monitoring for the Warkworth monitoring location (as there are no residences on privately owned land in Warkworth). Accordingly, the Warkworth TSP monitoring location will no longer be reported in the TSP results.

After analysis of the single exceedance, all annual average results were compliant with the impact assessment and land acquisition criteria.

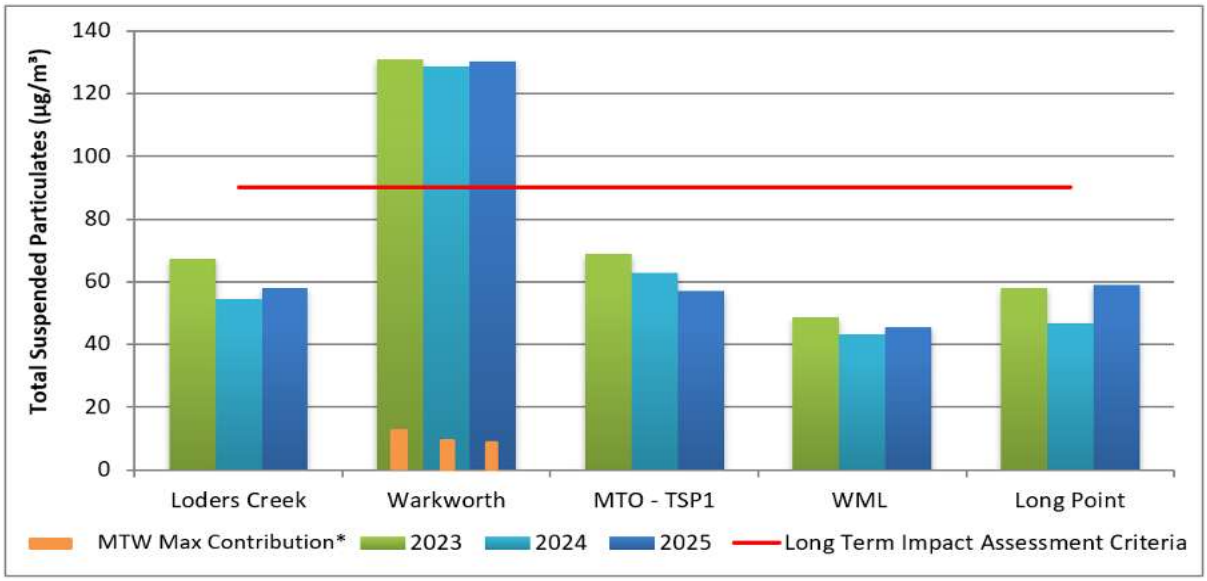
A summary of the investigation undertaken for the annual TSP exceedance is provided in **Table 6.8**

TABLE 6.8 ANNUAL TSP INVESTIGATION - 2025

Date	Site	Annual Average PM_{10} result ($\mu g/m^3$)	Calculated Annual TSP ($\mu g/m3$)	Discussion
2025	Warkworth HVAS TSP	130.3	11.0*	An external consultant was engaged to investigate the exceedance. The investigation determined that the maximum potential contribution from MTW at the Warkworth monitor during the review period was 11.0 µg/m3. This was based on an analysis of meteorological data, estimated background particulate levels and position of the site in relation to MTW. As the measured result is not primarily attributable to MTW, it does not constitute non-compliance, as per MTW's approved Air Quality Management Plan. No further action is required.

* *MTW's estimated contribution to annual average TSP level ($\mu g/m^3$).*

During the reporting period, seven (7) out of the 300 TSP measurements were not able to be fully collected on the scheduled sampling date (based on a sampling frequency of every six days) due to an equipment issue and a contaminated sample. The annual average TSP concentrations recorded in 2025 were similar to that of the previous two years.



** MTW's estimated maximum contribution to annual average TSP level (determined by external air quality consultant).*

FIGURE 16: 2025 TSP ANNUAL AVERAGE COMPARED AGAINST THE IMPACT ASSESSMENT CRITERIA AND PREVIOUS YEARS' RESULTS

6.4.2.4 Particulate Matter <10µm (PM10)

Compliance assessment for Particulate Matter <10µm (PM_{10}) is measured at four (4) locations on privately owned land in accordance with AS3580.9.6 (2015). During 2025, all short term and annual average results were compliant with the impact assessment criteria, as per MTW's approved Air Quality Management Plan.

6.4.2.5 Short term PM10 impact assessment criteria

Monitoring results for PM_{10} (24 hour) collected through High-Volume Air Sampler monitoring are compared against the short-term impact assessment criteria (**Figure 17**). All 24hr average results recorded by MTW's surrounding network of TEOM monitors are presented on a quarterly basis in **Figure 18** to **Figure 21.**

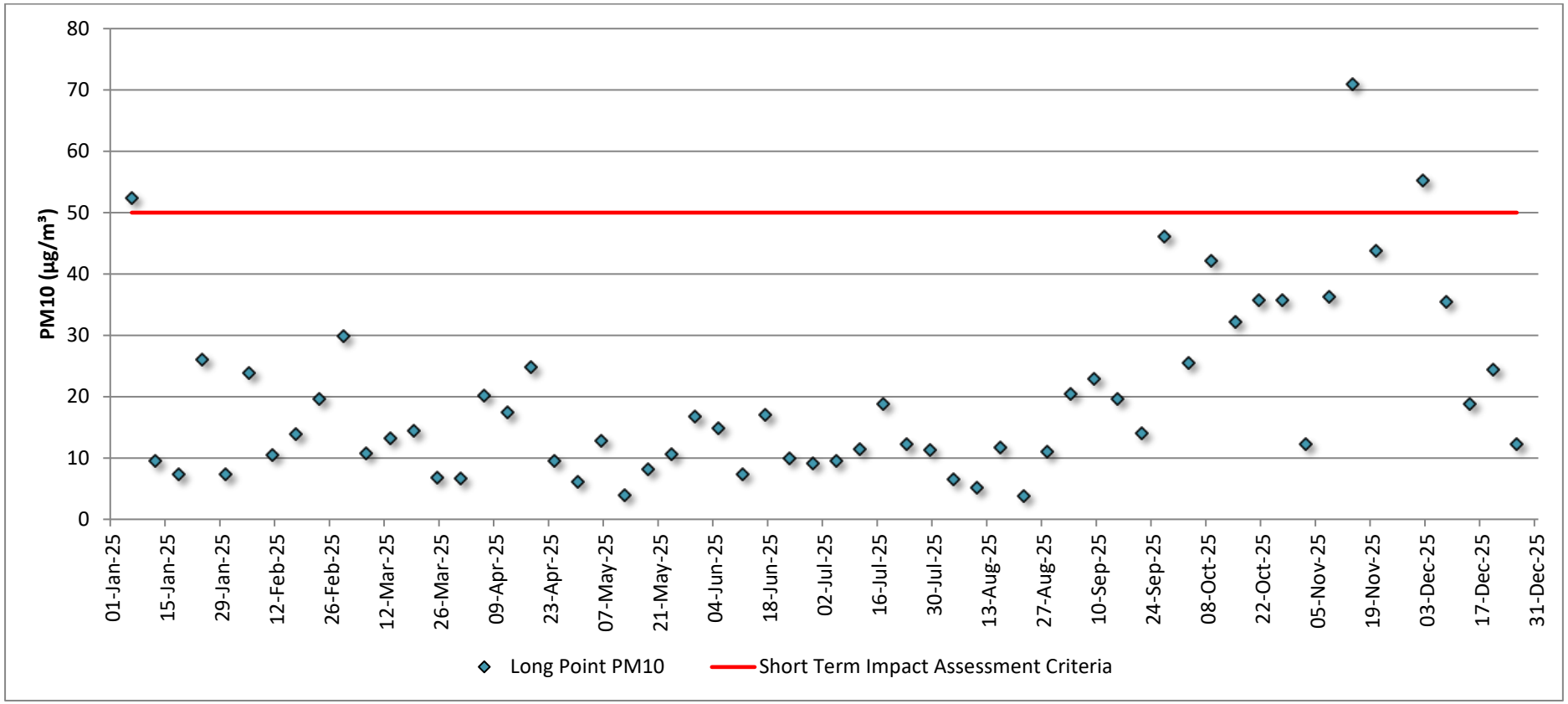


FIGURE 17: PM10 24HR MONITORING RESULTS (MEASURED BY MTW PM10 HVAS MONITOR)

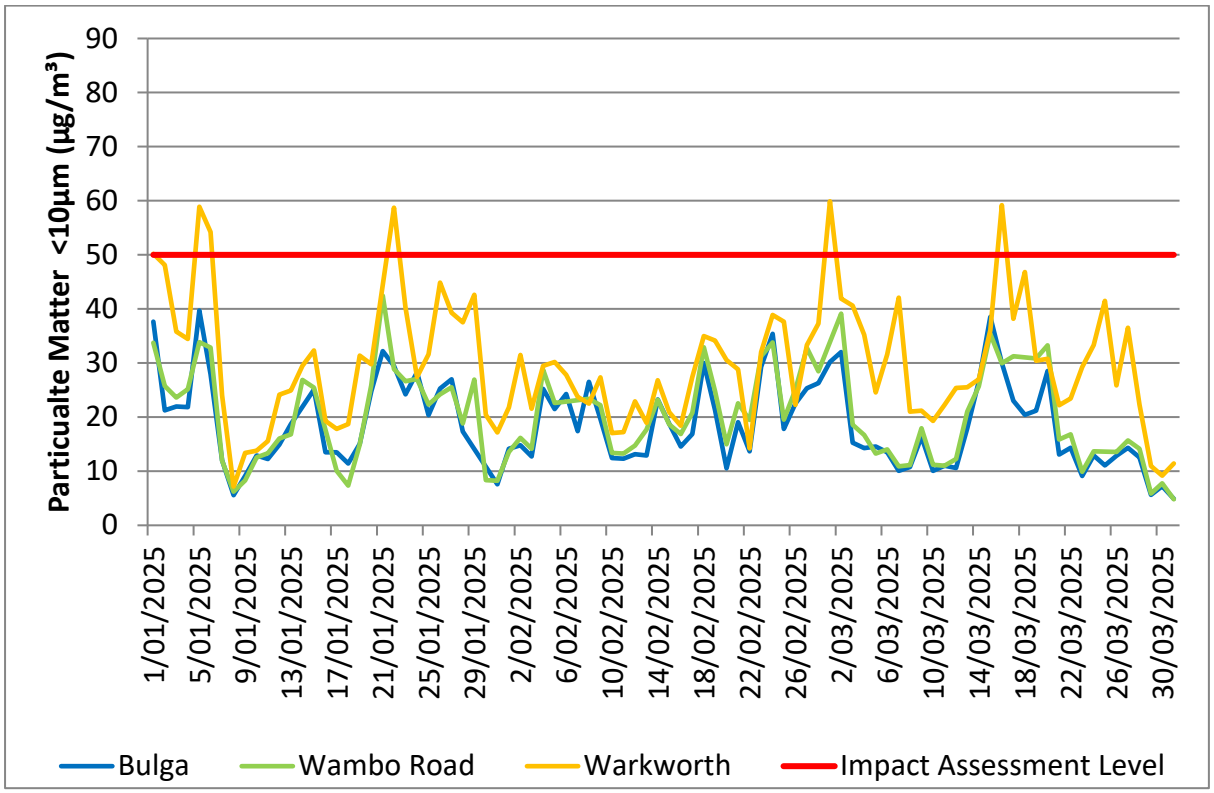


FIGURE 18: 24HR AVERAGE PM10 MEASURED AT TEOM MONITORS SURROUNDING MTW - QUARTER ONE 2025

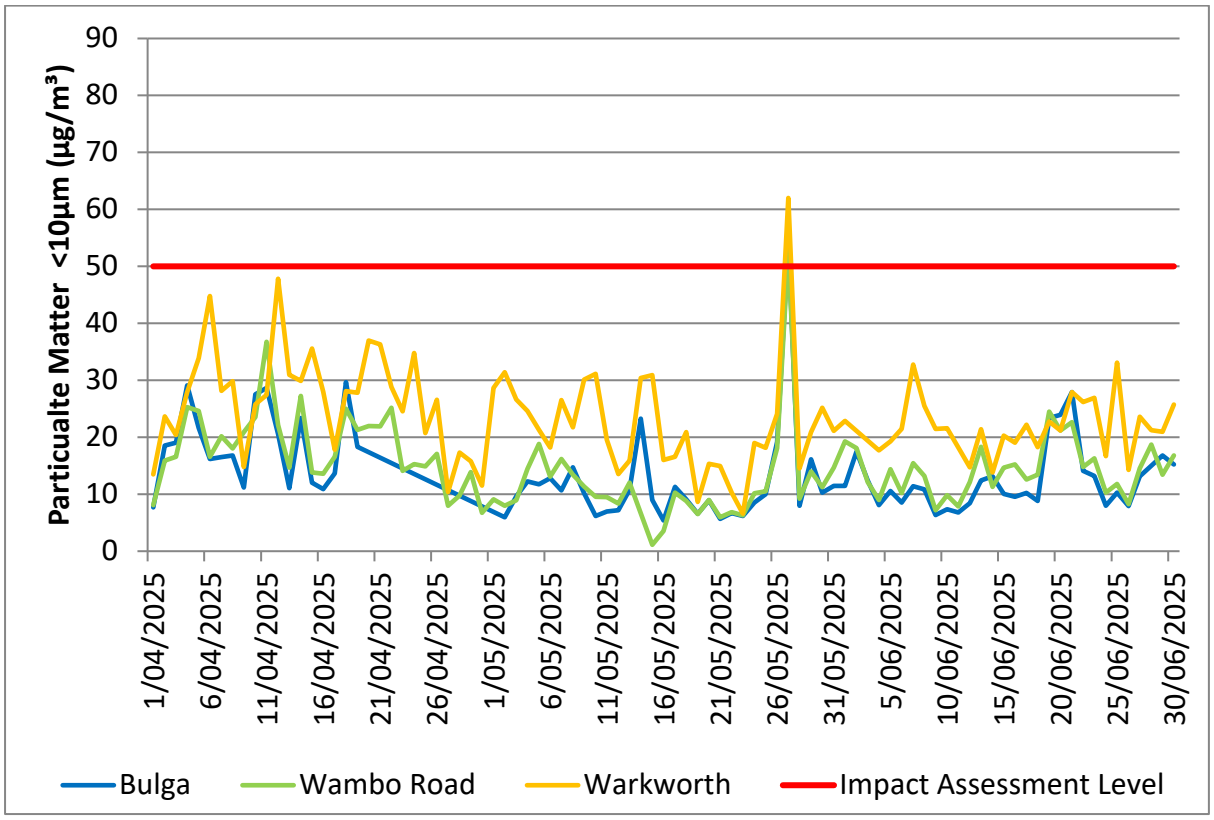


FIGURE 19: 24HR AVERAGE PM10 MEASURED AT TEOM MONITORS SURROUNDING MTW - QUARTER TWO 2025

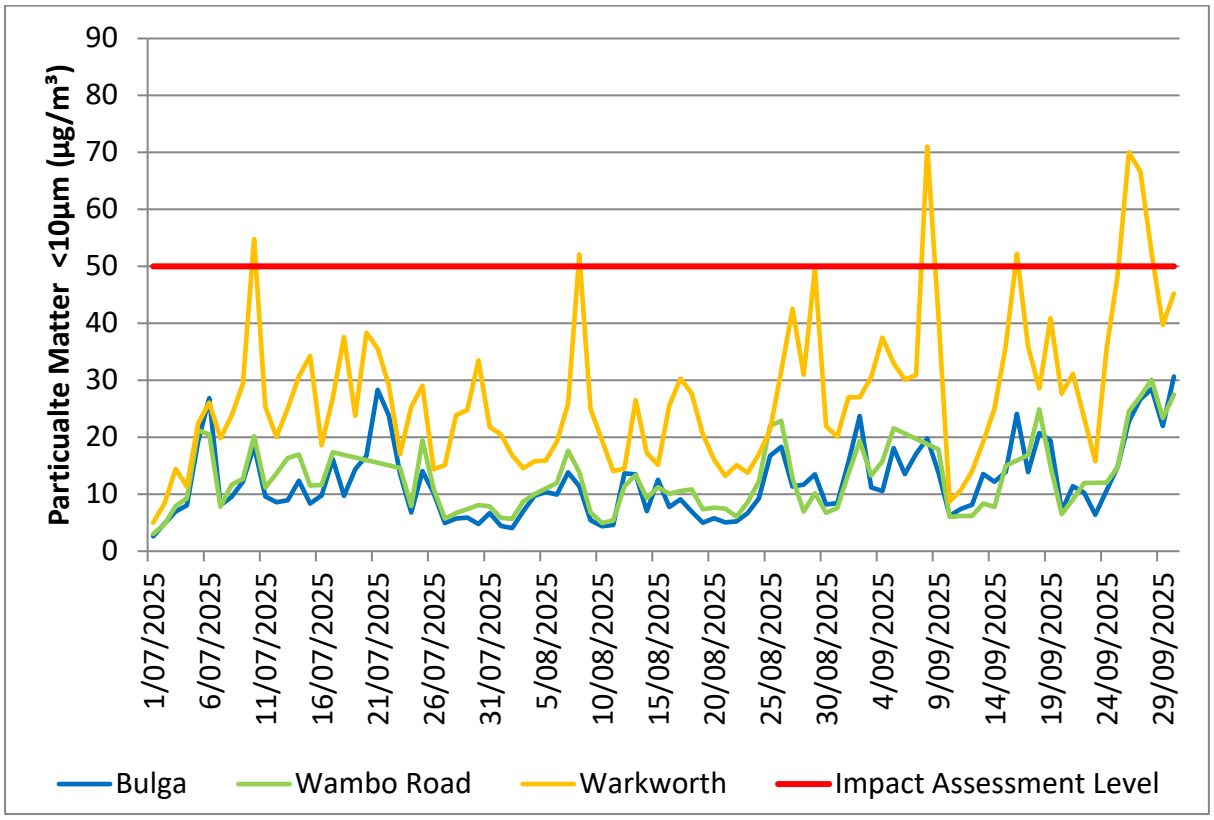


FIGURE 20: 24HR AVERAGE PM10 MEASURED AT TEOM MONITORS SURROUNDING MTW - QUARTER THREE 2025

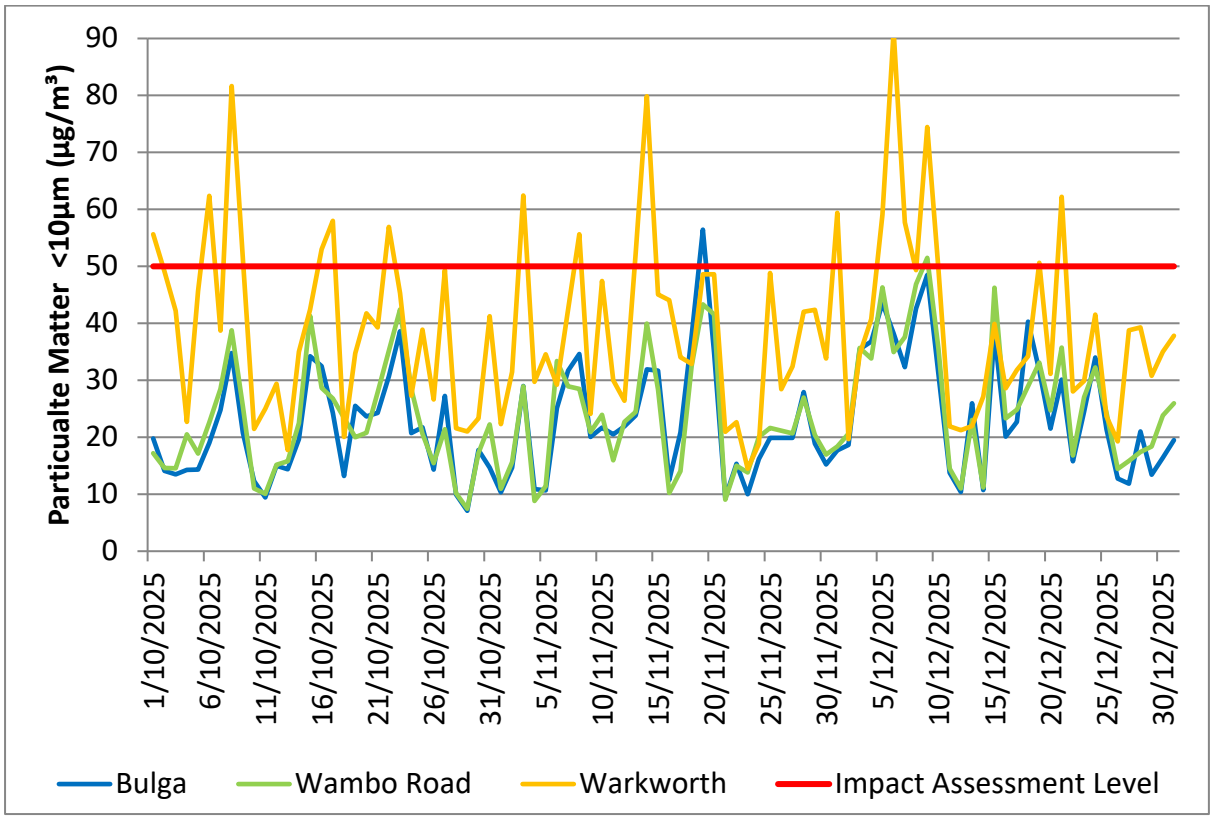


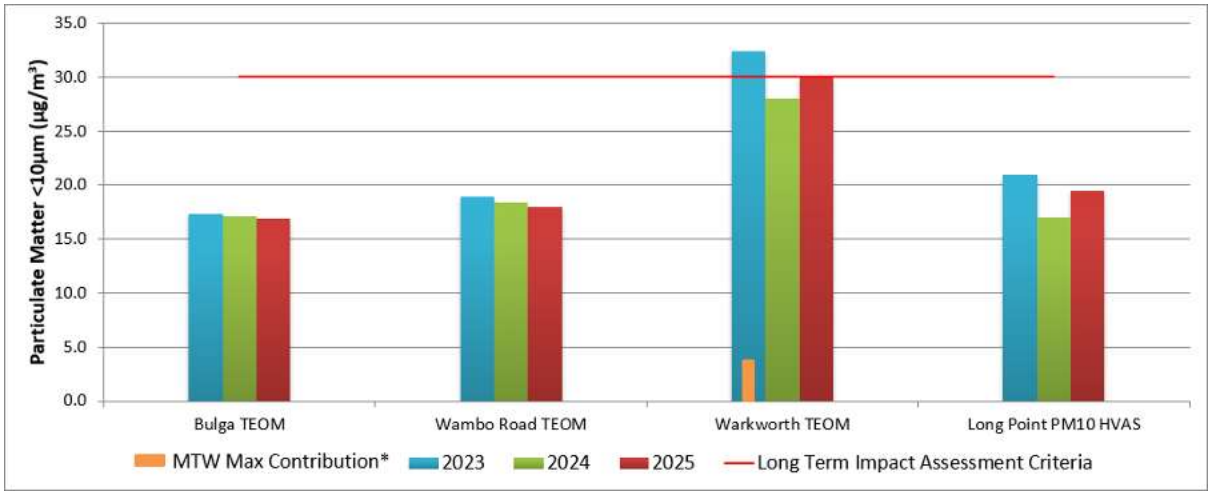
FIGURE 21: 24HR AVERAGE PM_{10} MEASURED AT TEOM MONITORS SURROUNDING MTW - QUARTER FOUR 2025

Thirty-six (36) TEOM PM_{10} raw measurement results and three (3) HVAS PM_{10} raw measurement results (all sources) exceeded the 24 hour short term impact assessment criteria during the reporting period. The exceedances were investigated to determine the level of contribution from MTW activities in accordance with the compliance protocol outlined in the MTW Air Quality Management Plan. This protocol considers wind direction to infer the source of particulate matter. A summary of the investigations undertaken for the short term PM10 exceedances is provided in **Appendix 2**. The investigations found that MTW was not a significant contributor to any of the 36 TEOM PM_{10} result exceedances or the three (3) HVAS PM_{10} result exceedances and therefore, no non-compliances were recorded.

6.4.2.6 Long term PM_{10} impact assessment criteria

Annual average PM_{10} concentrations have been compared with the long term PM_{10} impact assessment criterion and previous years' data in **Figure 22**. All annual average PM_{10} concentrations recorded on privately owned land (or representative of the nearest privately-owned property) were compliant with the assessment criterion.

The annual average PM_{10} concentrations recorded in 2025 and 2024 were all lower than in 2023 for all monitoring units. This is likely related to higher rainfall totals being recorded in 2025 and 2024 than were recorded in 2023.



Note: MTW Max Contribution only calculated/displayed when annual measured value is greater than the criteria.

FIGURE 22: ANNUAL AVERAGE PM10 RESULTS 2023 TO 2025

6.4.2.7 Comparison of 2025 Air Quality data against EA predictions

Annual average PM_{10} results at two of four monitoring locations were above the modelled range for Year 9 of the development (nominally 2023). Refer to **Table 6.9**.

TSP annual averages at all monitoring locations were higher than modelled predictions for the Year 9 scenario. Refer to **Table 6.10**.

The difference between modelled predictions and the measured results can be explained as a function of model inputs which do not account for PM10 or TSP contribution from regional particulate events such as bushfires, stock movement, dust from local roads and driveways and agricultural activity. The annual average TSP and PM_{10} concentrations recorded in 2025 and 2024 are lower than those recorded in 2023 for all sites except for the Long Point TSP HVAS, which recorded a slightly higher result during 2025 than 2023. The generally lower TSP and PM_{10} concentrations in 2025 and 2024 are likely related to higher rainfall totals in 2025 and 2024 compared to 2023. Please refer to **Figure 16** and **Figure 22** for further details regarding annual average TSP and PM_{10} concentrations from 2023 to 2025.

TABLE 6.9 2025 PM10 ANNUAL AVERAGE RESULTS COMPARED AGAINST CUMULATIVE PREDICTIONS FOR YEAR 9 - WARKWORTH CONTINUATION EIS (2014).

Monitoring Location	Long Term (annual average) PM_{10} criteria	
	Year 9 EIS Prediction (µg/m^3)	2025 Annual Average (µg/m^3)
Bulga OEH TEOM	22	16.9
Wambo Road TEOM	14	18.0
Warkworth OEH TEOM	32	29.9
Long Point PM_{10}	16	19.4

TABLE 6.10 2025 TSP ANNUAL AVERAGE RESULTS COMPARED AGAINST CUMULATIVE PREDICTIONS FOR YEAR 9 – WARKWORTH CONTINUATION EIS (2014)

Monitoring Location	Long Term (annual average) TSP criteria	
	Year 9 EIS Prediction (µg/m^3)	2025 Annual Average (µg/m^3)
MTO TSP	50	57.1
Loders Creek TSP	41	58.0
WML TSP	35	45.6
Warkworth TSP	68	130.3
Long Point TSP	38	58.9

6.4.2.8 Greenhouse Gas

Yancoal's operations report under the National Greenhouse and Energy Reporting (NGER) Scheme for the 2024-2025 financial year. Whilst Mount Thorley and Warkworth are separate facilities for the purpose of NGER reporting, the combined MTW Scope 1 and Scope 2 emissions calculated for the 2024-2025 financial year was 1,195,496t CO2-e. MTW Scope 1 and Scope 2 emissions calculated for the 2023-2024 financial year was 1,088,300t CO2-e. The approximate 9.8% increase in emissions can be largely attributable to an increase in fugitive emissions from total overburden removed and ROM coal mined between the reporting years. Scope 1 and Scope 2 emissions attributable to MTW are generally consistent with Environmental Assessment predictions except for the fugitive emissions component of Scope 1 emissions which has increased significantly, largely due to modelling and estimation changes * [See note in this Section].

MTW implemented the following in 2025 to improve fuel use efficiency and reduce emissions:

- Lighting plants continued to be upgraded from light globes to LEDs
- Optimisation of prestrip travel routes and haulage routes to waste dumps to reduce haul cycle, idle, and queuing times.

- Strategic use of mobile crib huts and mobile fuel farms to reduce HME travel times for breaks and refuelling.
- Larger trucks used for more efficient topsoil haulage to dumps rather than smaller articulated trucks when available.
- New water fill point at the Flyover Road used to increase road watering efficiency by utilising water carts more efficiently.

Note: * - The most recent environmental impact statement (EIS) for the facility was prepared in 2014 to support the NSW development application for SSD-6464. This EIS included an assessment of greenhouse gas impacts in Appendix G – Air Quality and Greenhouse Gas Assessment, Warkworth Continuation 2014 which was prepared by Todoroski Air Sciences in June 2014. The greenhouse gas assessment included a relevant earlier estimate of scope 1 emissions. It estimated that based on producing a maximum of 18 Mt of ROM coal per calendar year, Warkworth would emit an average of 882,056 t CO2e scope 1 emissions.

Regarding the fugitive emissions estimates which form part of our total scope 1 emissions, these are not directly comparable due to a change in reporting methodology. The relevant earlier estimate used the default fugitive emissions factor of 0.045 t CO2e/t ROM coal for open cut mines in NSW as set out in the 2013 Australian National Greenhouse Gas Accounts – National Greenhouse Accounts Factors. Since this time under the Commonwealth NGER Act, the method 1 default factor for open cut coal mines in NSW has increased. Further, Warkworth has refined its gas understanding and changed to method 2 reporting under the NGER Act. As such, a direct comparison of current emissions reported under the NGER Act to those presented in the EIS is not considered practicable or informative. The NGER data is subject to the rigour required under the NGER Act which includes third party assurance.

6.5 Heritage Summary

6.5.1 Heritage Management

During the reporting period, Aboriginal Cultural Heritage and Historic Heritage was managed in accordance with the site's approved Aboriginal Heritage and Historic Heritage Management Plans. A summary of the performance in each of these areas is outlined below.

6.5.2 Heritage Performance

6.5.2.1 Aboriginal Heritage

6.5.2.1.1 Aboriginal Heritage Activities

Aboriginal cultural heritage was managed in accordance with the MTW Aboriginal Heritage Management Plan (AHMP) and the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (the Due Diligence Code).

The MTW Aboriginal Cultural Heritage Working Group (CHWG) is the primary forum for Aboriginal community consultation on matters pertaining to cultural heritage. The CHWG is comprised of

representatives from MTW and Registered Aboriginal Parties (RAPs) from Upper Hunter Valley Aboriginal community groups, corporations and individuals.

MTW was issued Care Agreement C0003708 on 26 April 2019 by the Office of Environment and Heritage (now Heritage NSW), which approved the transfer and safekeeping of Aboriginal objects and was a replacement of Care Agreement C0001841. On 19 October 2020, the Aboriginal objects specified in Care Agreement C003708 were transferred to the updated location for safekeeping. Heritage NSW was advised of the transfer on 29 October 2020.

There was no salvage of Aboriginal objects undertaken from the AHMP area during 2025.

A suspected new Aboriginal object (a "chance find") was identified on 28 February 2025 as part of an ecological pre-clearance inspection. The site was barricaded in accordance with the AHMP and inspection by a consulting archaeologist undertaken on 8 March 2025 verified the find as an Aboriginal object. Details of the site were submitted to the Heritage NSW Aboriginal Heritage Information Management System (AHIMS) and site records updated. Inspection of the site was undertaken by representatives of the MTW Cultural Heritage Working Group on 11 March 2025 to confirm the site extent, assess the site significance, and discuss management measures for the site. No additional Aboriginal objects or areas of Potential Archaeological Deposit (PAD) were identified during this inspection and the site was determined to be an isolated artefact (**Figure 23**). The site remains *in-situ* and will continue to be managed in accordance with the requirements of the AHMP until salvage works are undertaken prior to the progression of approved mining works.



FIGURE 23: ABORIGINAL CULTURAL HERITAGE CHANCE FIND

Conservation Agreements for the Wollombi Brook Aboriginal Cultural Heritage Conservation Area (WBACHCA) and Loders Creek Aboriginal Cultural Heritage Conservation Area (LCACHCA) were signed on 3 November 2022 under delegation of the Minister administering the *National Parks and Wildlife*

Act 1974. During the reporting period work continued to register the Agreements on title for the lands of the Conservation Areas – in 2024 the NPWS Deputy Secretary signed the registration documents, and progressed to NPWS legal team ahead of lodgement with Land Registry Service. Follow up with NPWS has occurred in Feb, Mar, May, June, Oct, Nov, Dec 2025. Work to finalise the registrations is ongoing at the end of the reporting period and will continue into the next Annual Review period.

Consultation with the CHWG and formation of the Plan of Management Implementation Group (PMIG) for the Wollombi Brook Aboriginal Cultural Heritage Conservation Area (WBACHCA) and Loders Creek Aboriginal Cultural Heritage Conservation Area (LCACHCA) occurred at a meeting of the CHWG on 9 May 2025. Meeting of the PMIG and review and progression of the implementation plans for the Conservation Areas is planned to occur during the next reporting period. Planned works to prepare for relocation of the Site M grinding grooves from the storage area remain to be considered and guided by the PMIG.

6.5.2.1.2 Audits and Incidents

During the reporting period there were 27 Ground Disturbance Permits (GDPs) assessed for cultural heritage management considerations at MTW. Ground disturbance works were conducted based on an Aboriginal cultural heritage sites avoidance policy so that no un-salvaged sites were impacted by these activities. There were no known incidents, nor any unauthorised disturbance caused to Aboriginal cultural heritage sites at MTW during 2025.

An AHMP compliance inspection covering the 2025 reporting period was undertaken on 21 November and 24 November 2025. This inspection was conducted by representatives of the Aboriginal community, internal MTW personnel, and a consultant archaeologist with 72 Aboriginal cultural heritage sites reviewed during this program. No unauthorised site disturbances or AHMP non-compliances were identified during the inspection. The Aboriginal Heritage Management Plan Inspection report is provided in **Appendix 3**.

6.5.2.2 Historic Heritage

6.5.2.2.1 Historic Heritage Activities

Historic heritage was managed in accordance with the MTW Historic Heritage Management Plan (HHMP). In 2012 the MTW Cultural Heritage Advisory Group (CHAG) was established as a community consultation forum for matters pertaining to management of historic (non-Indigenous) heritage located on MTW lands. The CHAG is comprised of community representatives with knowledge and interests in the historic heritage of the region such as historical groups, individuals and local government. The CHAG met twice during the reporting period on 9 April and 25 November 2025.

The MTW Historic Heritage Conservation Fund (HHCF) was launched by Singleton Council in December 2018, in accordance with Schedule 17 of the HHMP. MTW has made all of the agreed contributions to the fund with the final contribution made in the 2022 reporting period. The availability of the fund is advertised on the Singleton Council and MTW websites, and directly to landowners with registered heritage items, and continued to be available during the 2025 reporting period. Applications for funding under the HHCF are considered by Singleton Council's Singleton Heritage Advisory Committee

(SHAC) and recommendations made to Council. There was one successful application to the HHCF in the reporting period however no funding was expended from the Fund as the application was approved at the December meeting of the Singleton Council and funds will not be paid to the applicant until the next (2026) reporting period. The balance of the HHCF at end of 2025 was $437,652.50.

The MTW Great North Road Conservation Fund (GNRCF) was established by MTW in May 2017, in compliance with Condition 45 of the Warkworth development consent SSD-6464. MTW has made all of the agreed contributions to the fund with the final contribution made in the 2019 reporting period. The purpose of the fund is to provide resources to promote positive heritage outcomes for the convict built Great North Road. At commencement of the partnership with the Convict Trail Project (CTP) in relation to the GNRCF, a list of seven projects to be funded was developed. In 2022, CTP provided an updated projects listing including one additional project. A status update report from CTP was received November 2025 which identified that work on a number of the projects had occurred during the reporting period. Works included clearing of invasive species from the Bedlam Point road cutting (Project 2) and negotiations with Cessnock City Council on placement of signage at the Monkey Place Creek (Project 6). Funds expended to date on GNRCF projects to end November 2025 is $40,211.30 with outgoings during the reporting period of approximately $18,850.35.

During the reporting period routine area maintenance works were undertaken at Springwood Homestead, the Red Brick House, and the RAAF Cook House. Inspection by a heritage builder was undertaken at Springwood and the Red Brick House and at Springwood Homestead an area of temporary roofing extension to shed roof runoff away from the building was subsequently constructed (**Figure 24**). Roofing repairs were undertaken at the Red Brick House following damage by a severe storm in late November in addition to minor repairs on several occasions to re-attach hoarding boards following break-ins by persons unknown. Works planned for the period at Springwood Homestead and the RAAF Cook House were again disrupted by access constraints due to periods of wet weather however at the end of the period construction of alternate all weather access to Springwood Homestead had been completed and upgrade completed of the initial track sections to the RAAF Cook House, including mulching to realign track sections and replacement of a washed out culvert.



FIGURE 24: TEMPORARY ROOFING EXTENSION AND SUPPORTING FRAMEWORK AT REAR OF SPRINGWOOD HOMESTEAD

An Historic Heritage Management Plan (HHMP) compliance inspection covering the 2025 reporting period was conducted between 25 November 2025. This inspection was conducted by a consultant archaeologist escorted by MTW personnel. Three historic heritage sites were inspected during this program. No incidents or any unauthorised disturbance was identified at historic heritage sites at MTW during 2025. The Historic Heritage Management Plan Inspection Report is shown in **Appendix 4**. Actions arising from the inspection will inform works to be undertaken during the upcoming reporting period.

6.6 Visual Amenity and Lighting

6.6.1 Visual Amenity and Lighting Management

MTW aims to minimise visual amenity impacts from its operations. Two of the main controls used are lighting management and visual screening.

6.6.2 Visual Amenity and Lighting Performance

6.6.2.1 Lighting

MTW aims to provide sufficient lighting for work to be undertaken safely, whilst minimising disturbance to neighbouring residents and public road users, particularly nearby residents in Bulga Village, Mount Thorley, Warkworth Village, Long Point, Milbrodale and motorists on the Putty Road and Golden Highway.

Actions undertaken in 2025 to manage lighting impacts at MTW included:

- Routine night shift inspections conducted by Community Response Officers to observe operating practices and to ensure lights are not shining towards nearby residential areas or affecting public roads;
- Yellow lights are used in preference to white lights in areas based on risk and external exposure;
- Alternate sheltered dumps are operated, or work areas are shut down if lighting or visual amenity issues arise and cannot be sufficiently managed.

6.6.2.2 Visual Screening

Visual screening of MTW's operations incorporates various methods to best suit the terrain and infrastructure constraints around the boundary of the mine.

Visual bunding has an immediate screening effect, providing complete screening in areas where vegetation would be inadequate to filter views or where additional height is required. Bunds may be vegetated where practicable and feasible for visual amenity and to mitigate erosion. The visual bund that was constructed along the Putty Road and WML West Pit area during 2024 has continued to establish vegetation improving visual screening. The Putty Road visual bund will be extended in the 2026 Annual Review period.

Built screens (i.e. solid fences or walls), may be used as an alternative when bunds and tree screens are not practicable. Temporary screens (i.e. fencing and shade mesh) may also be used as required for interim screening.

Existing shade cloth has remained in place on chainmesh boundary fencing along Putty Road, whilst planted native vegetation is establishing to permanent visual screening between areas of established vegetation adjacent to the Warkworth open cut mining activities. Vegetation plantings were undertaken in 2020 to infill between existing trees/shrubs. Slashing works were also undertaken in 2025 along Putty Road, improving visual amenity.

6.7 Water

6.7.1 Water Management

An adaptive management approach is implemented at MTW to achieve the following objectives for water management:

- Fresh water usage is minimised;
- Impacts on the environment and MTW neighbours are minimised; and
- Interference to mining production is minimal.

This is achieved by:

- Preferentially using mine water for coal preparation and dust suppression where feasible;

- An emphasis on control of water quality and quantity at the source;
- Segregating waters of different quality where practical;
- Recycling on-site water;
- Ongoing maintenance and review of the water management system; and
- Releasing water to the environment in accordance with statutory requirements.

Plans showing the layout of key water management structures and key pipelines are shown in **Figure 25**. The MTW Water Management Plan contains further detail on management practices and is available on the MTW website https://www.yancoal.com.au/our-sites/mount-thorley-documents/#mgt-docs.

Improvements to water management in 2025 included:

- The North Out of Pit (NOOP) Dam excavation by heavy mining equipment was completed Q2 2024. Construction of mechanical/electrical water infrastructure construction was completed Q4 2025.
- Construction completed Q2 2025 of the final sediment water management structures and dams for the western advancing pre-strip at Warkworth. These structures were designed in accordance with the NSW Blue Book, Managing Urban Stormwater: Soils and Construction, Volume 2E Mines and Quarries.
- Construction completed for the designed increased discharge rate infrastructure for the MTO discharge point under the Hunter River Salinity Trade Scheme. The increased discharge rate is per the MTO development consent SSD-6465.
- Operation of the Bulga Coal water share project which transfers mine water for use in Bulga Coal operations.
- Desilting of Dams 2AS, 3S, 22N and 26N.
- Installation of additional internal water transfer pipeline.

There were two reportable water related incidents during the reporting period that occurred on 29 March 2025 and 3 August 2025 per below summary. Further details on these incidents and the actions taken by MTW are provided in **section 10.**

- The incident on 29 March 2025 involved the discharge from one boundary sediment dam (Dam 56N) as a result of a greater than design rainfall event. (60.4 mm). MTW received notification on 1 May 2025 from DPHI stating no comments on the incident report. There has been no response from the EPA.
- The incident on 3 August 2025 involved the discharge from two boundary sediment dams (Dam 56N and 557N) as a result of a greater than design rainfall event. (96.2 mm). MTW received notification on 12 August 2025 from DPHI stating no comments on the incident reports. There has been no response from the EPA.

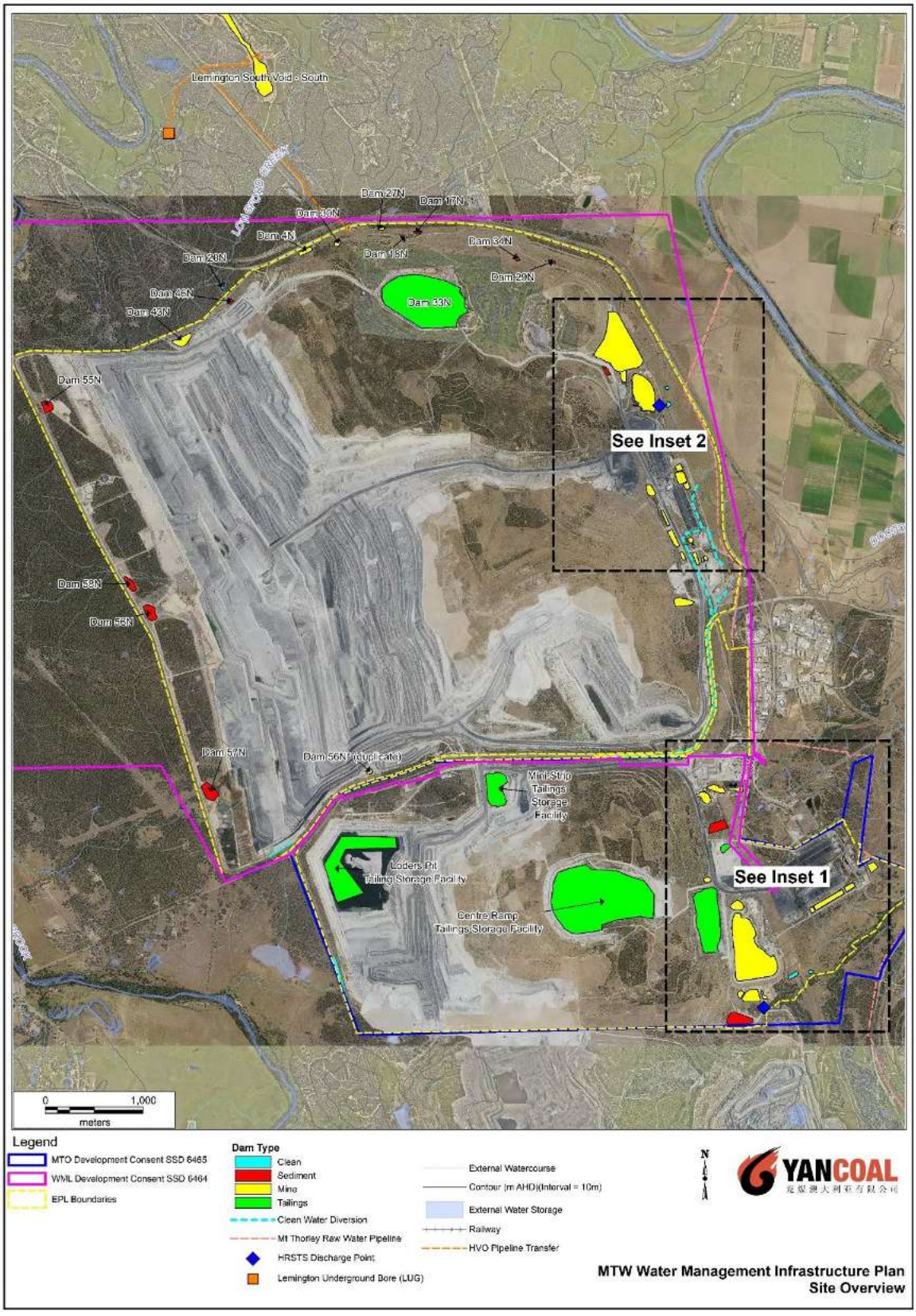


FIGURE 25: WATER MANAGEMENT INFRASTRUCTURE PLAN – SITE OVERVIEW

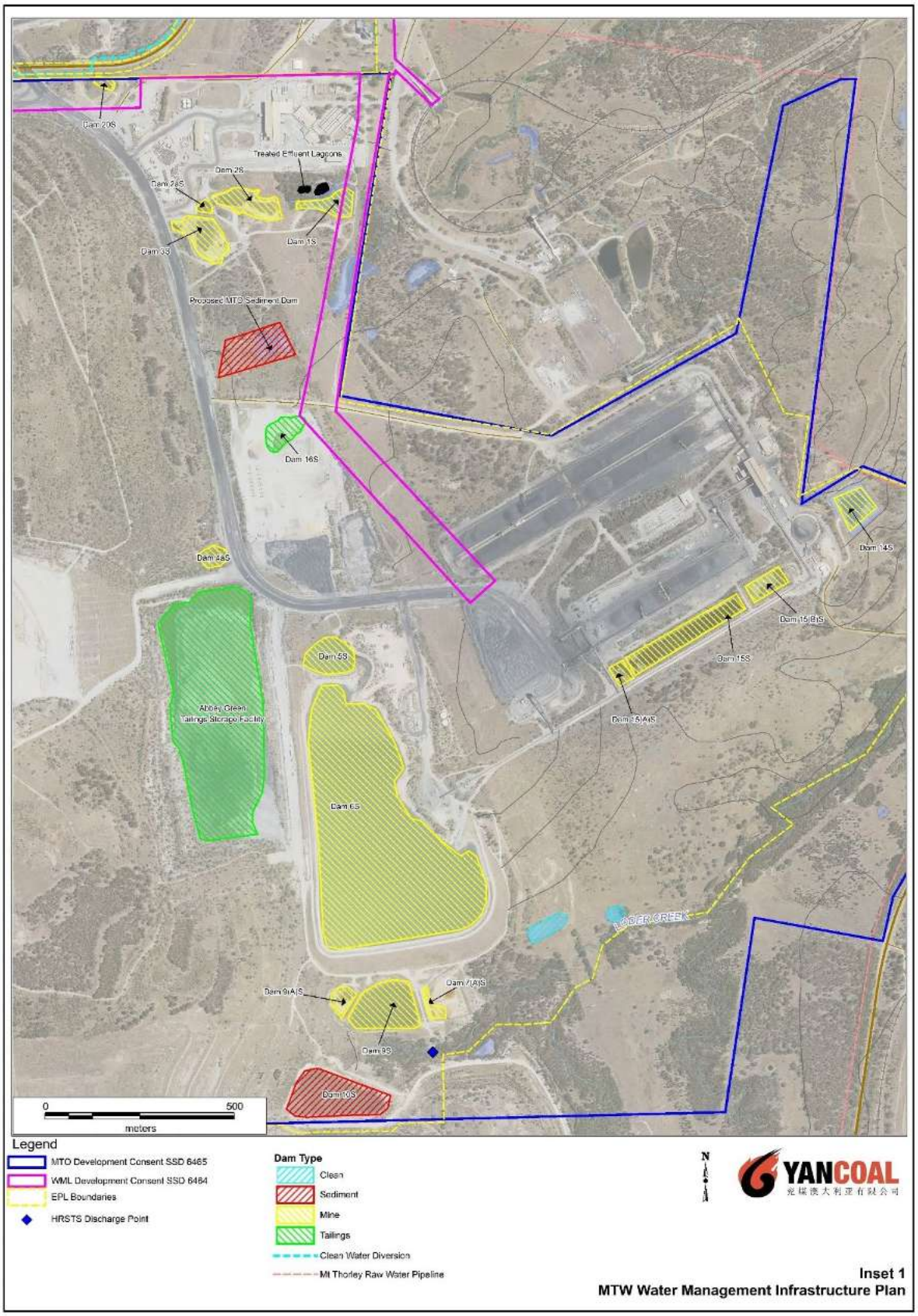


FIGURE 25A – MTW WATER MANAGEMENT INFRASTRUCTURE PLAN – INSET 1 (MTO DETAIL)



FIGURE 25B – MTW WATER MANAGEMENT INFRASTRUCTURE PLAN - INSET 2 (WML DETAIL)

6.7.2 Water Balance Performance

MTW uses a water balance to record and assess water flux, but also to forecast and plan water management needs. These annual site water balances are then compared to previous results. A 2025 static water balance for MTW is presented in **Table 6.11** and a simplified schematic of this balance is included in **Figure 26**. A salt flux schematic is shown in **Figure 27**.

TABLE 6.11 STATIC MODEL RESULTS, ANNUAL WATER BALANCE

Water Stream	Volume (ML) (% Total)
Inputs	
Rainfall Runoff	8,999 (76%)
Hunter River (MTJV supply scheme)	430 (4%)
Potable (Singleton Shire Council / trucked)	49 (<1%)
Groundwater	428 (4%)
Recycled to CHPP from tailings (not included in total)	4,244
Imported (LUG bore)	283 (2%)
Imported (Hunter Valley Operations)	0 (0%)
Water from ROM Coal	1,599 (14%)
Total Inputs	**11,788**
Outputs	
Dust Suppression	1,707 (16%)
Evaporation – mine water dams	1,979 (19%)
Entrained in process waste	1,979 (27%)
Sharing with other mines	1,194 (11%)
Discharged (HRSTS)	1,239 (12%)
Water in coarse reject	617 (6%)
Water in product coal	757 (7%)
Miscellaneous use (wash-down etc.)	103 (1%)
Total Outputs	**10,466**
Change in storage	**1,322**

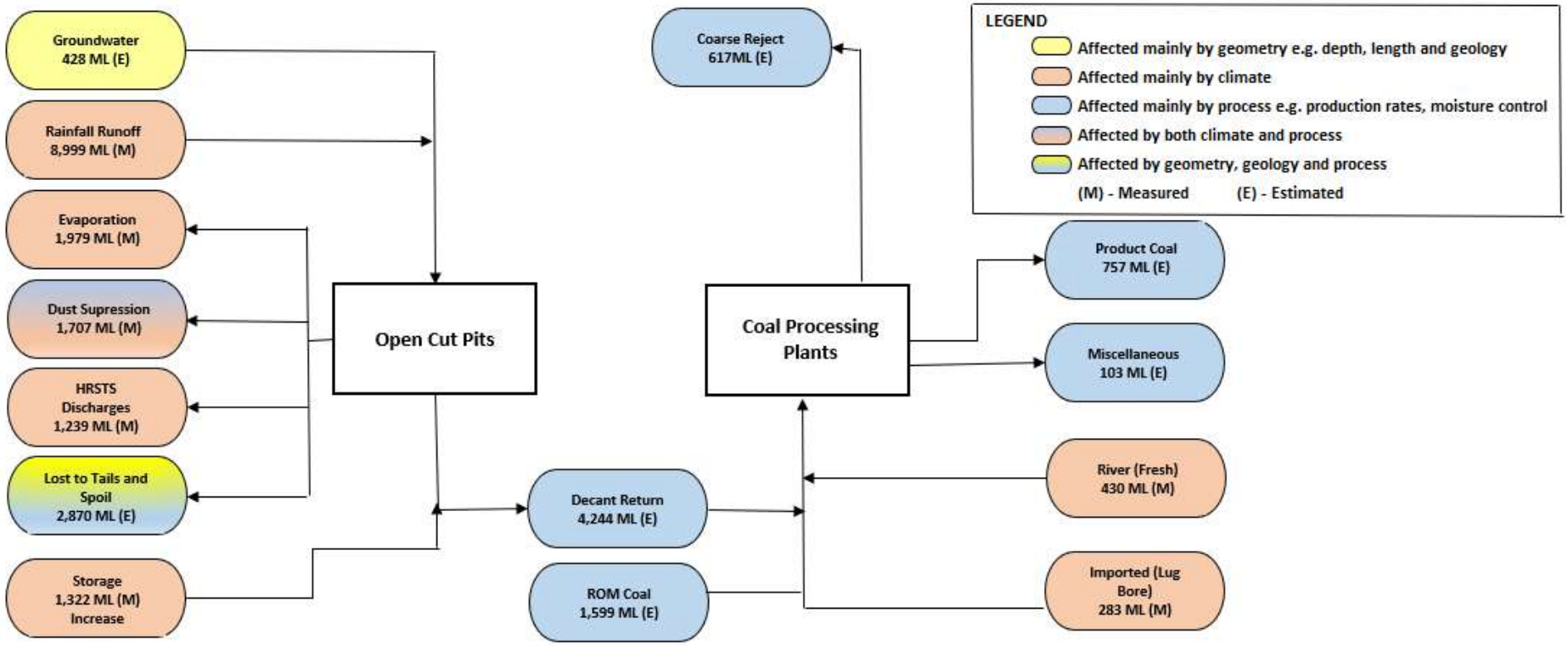


FIGURE 26: SCHEMATIC DIAGRAM MTW WATER FLUX

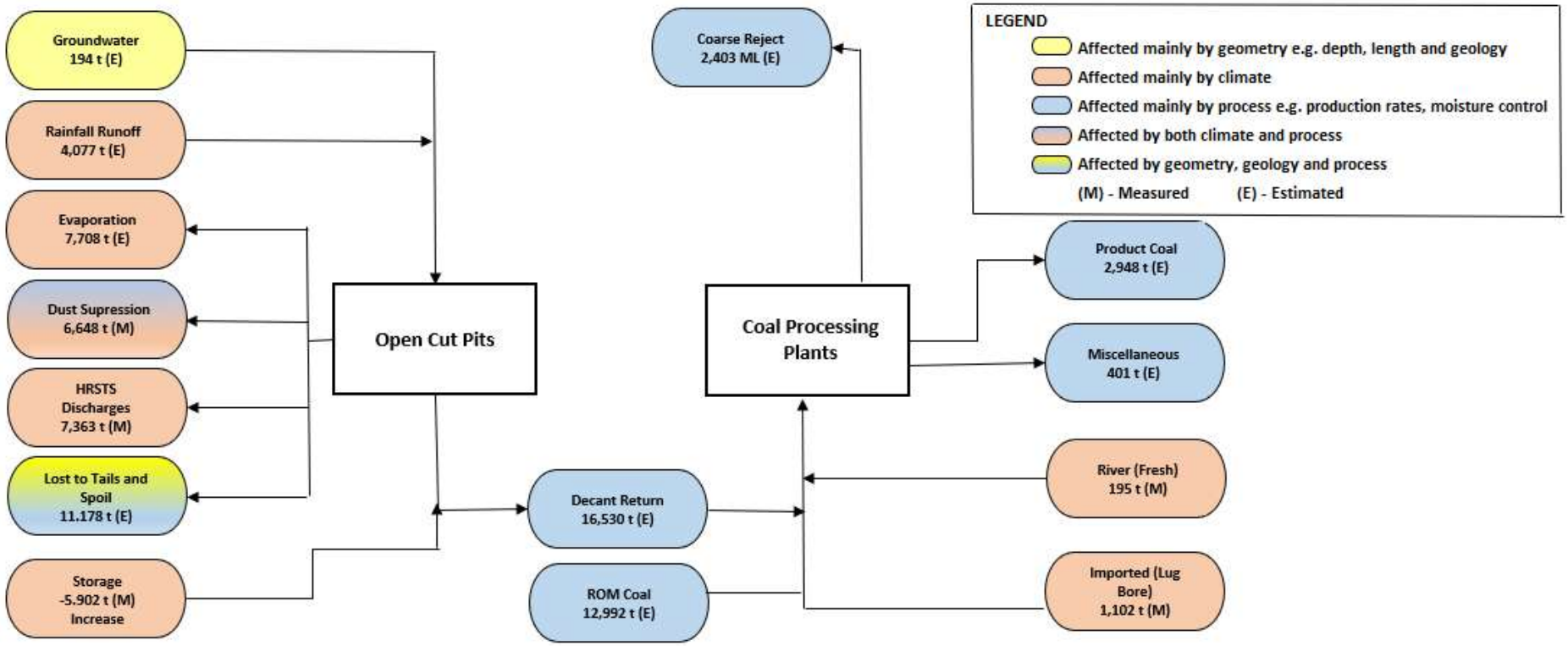


FIGURE 27: SCHEMATIC DIAGRAM MTW SALT FLUX

6.7.2.1 Water Inputs

A total of 702mm of rainfall was recorded at MTW in 2025 producing a calculated 8,999ML of runoff from developed, disturbed and mining catchments. Water falling on clean water catchments is diverted off site into natural systems where possible. Rainfall runoff was the largest input to the site mine water balance in 2025.

Water was required to be imported to meet site demand during 2025. During the reporting period 286 ML was imported from the LUG bore by MTW, compared to the previous reporting period (305 ML extracted in 2024).

MTW also sources water from the Hunter River via the Mount Thorley Joint Venture (MTJV) water supply scheme. Singleton Shire Council holds the high security water licence on behalf of the scheme members. Singleton Shire Council maintains and operates the scheme to supply raw water to MTW, Glencore's Bulga Coal complex, and to meet Council's own needs. MTW's share of the MTJV allocation is 1,009 ML per water reporting year.

A total of 430 ML of water was abstracted from the Hunter River during the reporting period for MTW operations which was slightly less than the volume of water extracted in the previous reporting period. (692 ML extracted in 2024).

Groundwater Licences are held for each mining excavation area. Passive take via seepage inflows into the mining excavations is accounted for against relevant water source Water Access licences. Water Licences and access entitlements held by MTW are detailed in **Table 3.5** and **Table 3.6.**

Licence conditions require the volume and quality of water taken by the works to be measured and reported on an annual water calendar year basis (i.e. financial year). Groundwater inflows via pit wall seepage are at low rates, with a significant proportion evaporating at the coal face. The remainder reports to the pit floor, where it may accumulate along with direct rainfall, rainfall runoff and leakage from spoils. As a result, it is not possible to physically measure the volume of water taken by these groundwater licences, nor the quality of waters extracted via seepage to the pits. Ground water inflows volumes are estimated based on modelling from Australasian Groundwater and Environmental Consultants Pty Ltd (2015), *Mount Thorley and Warkworth Mines Long Term Approvals Model Update* (Project No G1468G, February 2015).

6.7.2.1 Water Outputs

Significant water uses at MTW in 2025 were evaporation from Dams (1,979 ML), water entrained in process waste (1,979 ML) and dust suppression on haul roads, mining areas and coal stockpiles (1,707 ML). Water sharing to Bulga Coal from MTO was utilised in 2025 (1,194 ML).

MTW participates in the Hunter River Salinity Trading Scheme (HRSTS), allowing discharge from licensed discharge points during declared discharge events associated with increased flow in the Hunter River. During high flows, each HRSTS participant is entitled to discharge a share of the total

allowable discharge into a block of water passing down the Hunter River according to the number of HRSTS salt credits that they hold. Credits may be traded between participants to ensure that saline water is being managed in the most cost-effective way.

There are 1000 credits, each entitling the holder to discharge 1/1000 of each high flow day's total allowable discharge. The credits may be traded between participants so that those holders who do not need to discharge can trade their entitlement to others with the greatest need HRSTS discharge opportunity. HRSTS discharges are undertaken in accordance with HRSTS regulations (including the need to hold HRSTS credits for the discharges undertaken), and the licence conditions of EPL 1376 and EPL 1976.

MTW maintains two licensed HRSTS discharge monitoring locations:

- Dam 1N, located at WML North, which discharges to Doctor's Creek; and
- Dam 9S, located at MTO South, which discharges to Loders Creek.

During the reporting period, no discharge occurred from Dam 1N (WML) under the HRSTS. A total of 1,239 ML was discharged from Dam 9S (MTO) during the reporting period. Construction was completed of an additional discharge point from Dam 6S (MTO) during the 2025 Annual Review period which will permit an increased rate of discharge, as is approved by development consent SSD-6465. It is anticipated that the new discharge point will be added to the MTO Environment Protection Licence 1976 in the 2026 reporting period to permit use during a HRSTS discharge event.

6.8 Surface Water Management

Surface water monitoring activities continued in 2025 in accordance with the MTW Water Management Plan and MTW Surface Water Monitoring Programme. MTW maintains a network of surface water monitoring sites located at selected site dams and surrounding natural watercourses as shown in **Figure 28**. Water quality monitoring is undertaken to verify the effectiveness of the water management system onsite, and to identify the emergence of potentially adverse effects on surrounding watercourses. Primary water storage dams are monitored routinely to verify the quality of mine water, used in coal processing, dust suppression, and other day to day activities around the mine.

Surface water monitoring data review involves a comparison of measured pH, Electrical Conductivity (EC) and Total Suspended Solids (TSS) results against internal trigger values which have been derived from the historical data set. The response to measured samples outside the trigger limits is detailed in the MTW Water Management Plan.

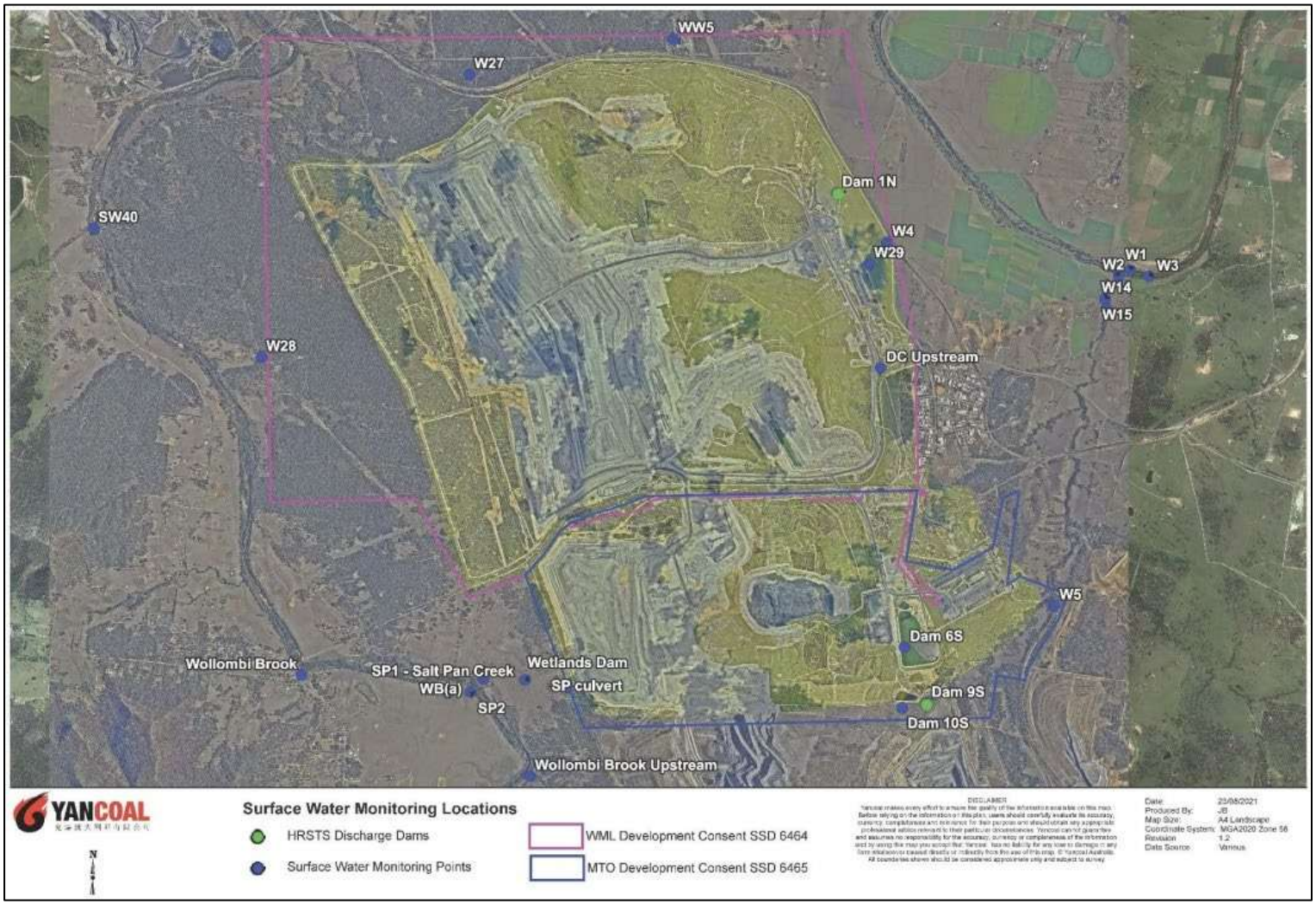


FIGURE 28: SURFACE WATER MONITORING POINTS

6.8.1 Surface Water Performance

Routine surface water monitoring was undertaken from twelve (12) sites and rain event sampling was undertaken from thirteen (13) sites. Sampling of surface waters was carried out in accordance with AS/NZS 5667.6 (1998). Analysis of surface water was carried out in accordance with approved methods by a NATA accredited laboratory.

Water quality is evaluated through the assessment of pH, EC and TSS. All surface water sites were also sampled for comprehensive analysis annually. The sampling frequency for ephemeral water sites was modified in 2016, from quarterly to a rain-event trigger system in an effort to ensure samples taken were more representative of typical water quality for those streams (up to eight sampling events per annum can now be taken under the revised sampling protocol). During the reporting period, there were two rain event sampling runs completed. All required sampling and analysis was undertaken, except as detailed in **Table 6.12**. Trigger tracking results are described in **Table 6.13**.

TABLE 6.12 MTW WATER MONITORING DATA RECOVERY FOR 2025 (BY EXCEPTION)

Location	Data Recovery (%)	Comment
W1	100%	Nil.
W2	100%	Nil.
W3	100%	Nil.
W27	100%	Nil.
W28	0%	No safe access to site in March, April, August and September.
WW5	0%	Insufficient water to take a sample in March, April, August and September.
SW40	100%	Nil
SP Culvert	25%	Insufficient water to take a sample in March, April and August.
SP2	100%	Nil.
Wetlands Dam	50%	Insufficient water to take a sample in March.

Note: Missing data indicates that there was insufficient water to take a sample, or that there was no safe access.

A summary of all surface water monitoring results is provided in the MTW Monthly Environmental Monitoring Reports and can be viewed via MTW's website (https://www.yancoal.com.au/our-sites/mount-thorley-documents/#mgt-docs).

Figure 29 to **Figure 34** show long term water quality trends for the Hunter River, Wollombi Brook, other surrounding tributaries and site dams.

Measurements of EC were generally stable during the reporting period across the majority of sites and consistent with historical seasonal trends. Elevated EC level compared to the 95th percentile trigger value were

recorded during the reporting period at the W2 and W3 monitoring site located on the Hunter River. The sites with elevated levels will continue to be monitored for future elevated levels and investigated as required.

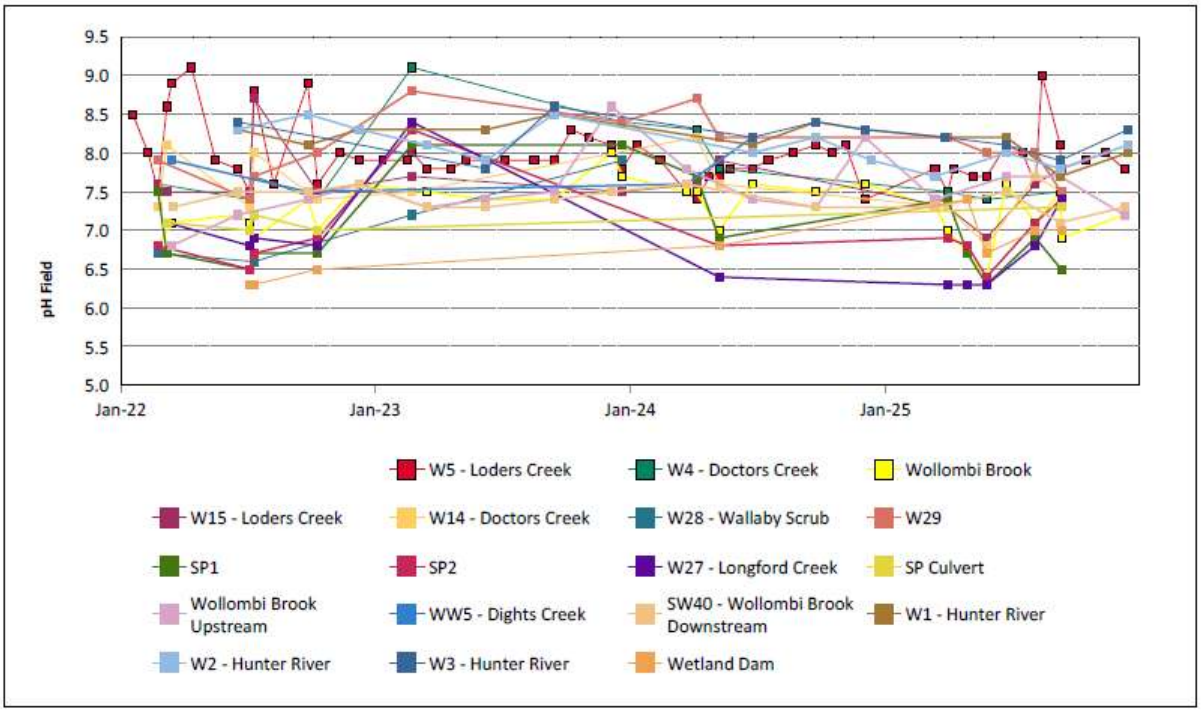
Measurements of pH were generally stable during the reporting period across the majority of sites and consistent with historical seasonal trends. One rain event sample recorded pH below the 5th percentile trigger and will continue to be monitored in future sampling events and investigated if required. No sites recorded pH above the 95th percentile trigger during the reporting period.

A number of TSS limits were triggered in the reporting period, which were generally associated with rainfall events or sampling from pooled section of watercourses; these are outlined below in **Table 6.13**. Monitoring results will continue to be monitored for future elevated levels and investigated as required. These results are also provided in the Monthly reports provided on the MTW Insite website (https://www.yancoal.com.au/our-sites/mount-thorley-documents/#mgt-docs).

TABLE 6.13 SURFACE WATER MONITORING - TRIGGER TRACKING RESULTS

Site	Date	Trigger Limit Breached	Action Taken in Response
W4	10/09/2025	TSS – 50mg/L (ANZECC criteria)	No MTW site sources of sediment identified. Sampling completed in response to rain event greater than 30mm. Elevated TSS likely related to rainfall event.
W5	8/01/2025 10/09/2025	TSS – 50mg/L (ANZECC criteria)	Unlikely to be associated with MTW mining related impacts. Elevated TSS results most likely attributable to sampling from water with no flow (pool of water) and not considered to be a valid representation given that there was no flow at the time of sampling. TSS returned to within trigger level for 12 x subsequent routine and rain event sampling completed including September annual analysis on 8/09/2025. Sample 10/09/2025 above trigger level, All subsequent sampling below trigger level 15/10/2025, 12/11/20255 and 9/12/2025.
W2	13/03/2025 15/12/2025	TSS – 50mg/L (ANZECC criteria)	No MTW site sources of sediment identified. TSS returned to within trigger level for subsequent sampling on 23/06/25. Sampling 15/12/2025 above trigger level, Watching Brief*
W14	31/03/2025, 28/04/2025 4/08/2025 10/09/2025	TSS – 50mg/L (ANZECC criteria)	No MTW site sources of sediment identified. TSS returned to within trigger level for subsequent sampling on 26/05/25. Sampling 4/08/2025 and 10/09/2025 above trigger level, Watching Brief*
W27	10/09/2025	TSS – 50mg/L (ANZECC criteria)	No MTW site sources of sediment identified. Sampling completed in response to rain event greater than 30mm. Elevated TSS likely related to rainfall event.
W29	10/09/2025	TSS – 50mg/L (ANZECC criteria)	No MTW site sources of sediment identified. Sampling completed in response to rain event greater than 30mm. Elevated TSS likely related to rainfall event.
SP1	28/04/2025	TSS – 50mg/L (ANZECC criteria)	No MTW site sources of sediment identified. TSS returned to within trigger level for subsequent sampling on 26/05/25.
Wetlands Dam	28/04/2025	TSS – 50mg/L (ANZECC criteria)	No MTW site sources of sediment identified. TSS returned to within trigger level for subsequent sampling on 26/05/25.
W29	10/09/2025	pH – 5th Percentile	Sampling completed in response to rain event greater than 30mm. Slightly lower pH likely related to rainfall event.
W2	15/12/2025	EC - 95th Percentile	Watching Brief*
W3	15/12/2025	EC - 95th Percentile	Watching Brief*

* = Watching brief established pending outcomes of subsequent monitoring events.



Note: Missing data indicates that there was insufficient water to take a sample, or that there was no safe access.

FIGURE 29: WATERCOURSE PH TRENDS 2022 TO 2025

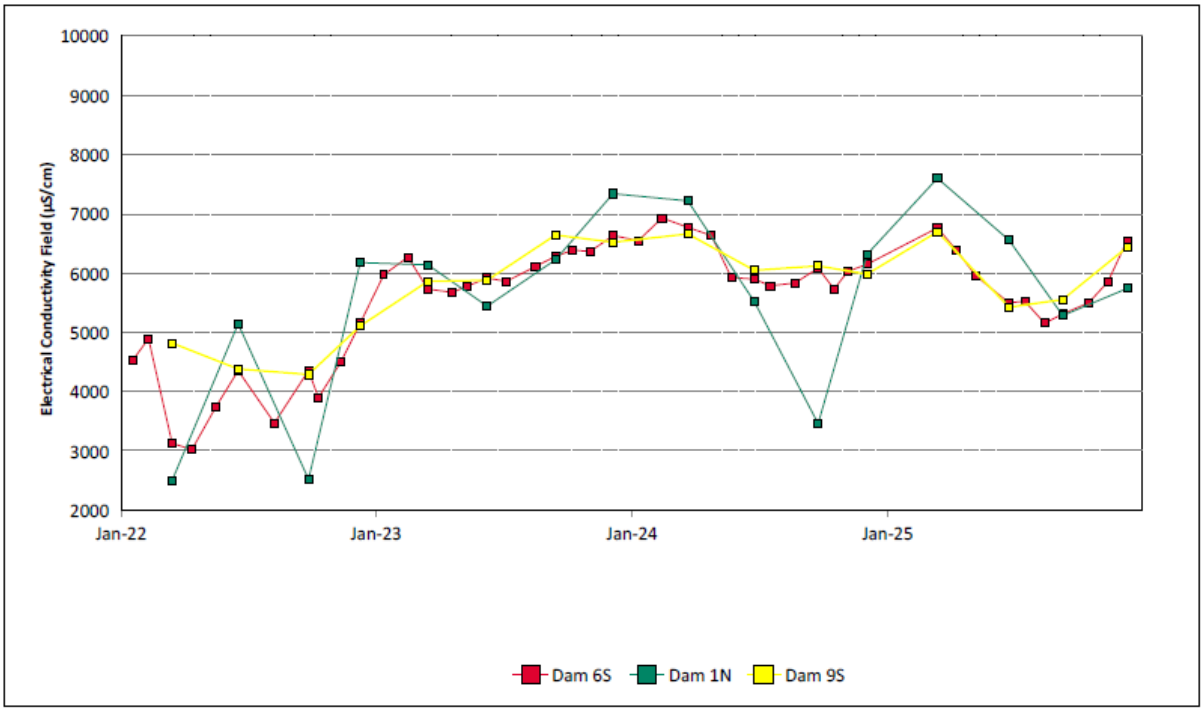


FIGURE 30: WATERCOURSE EC TRENDS 2022 TO 2025

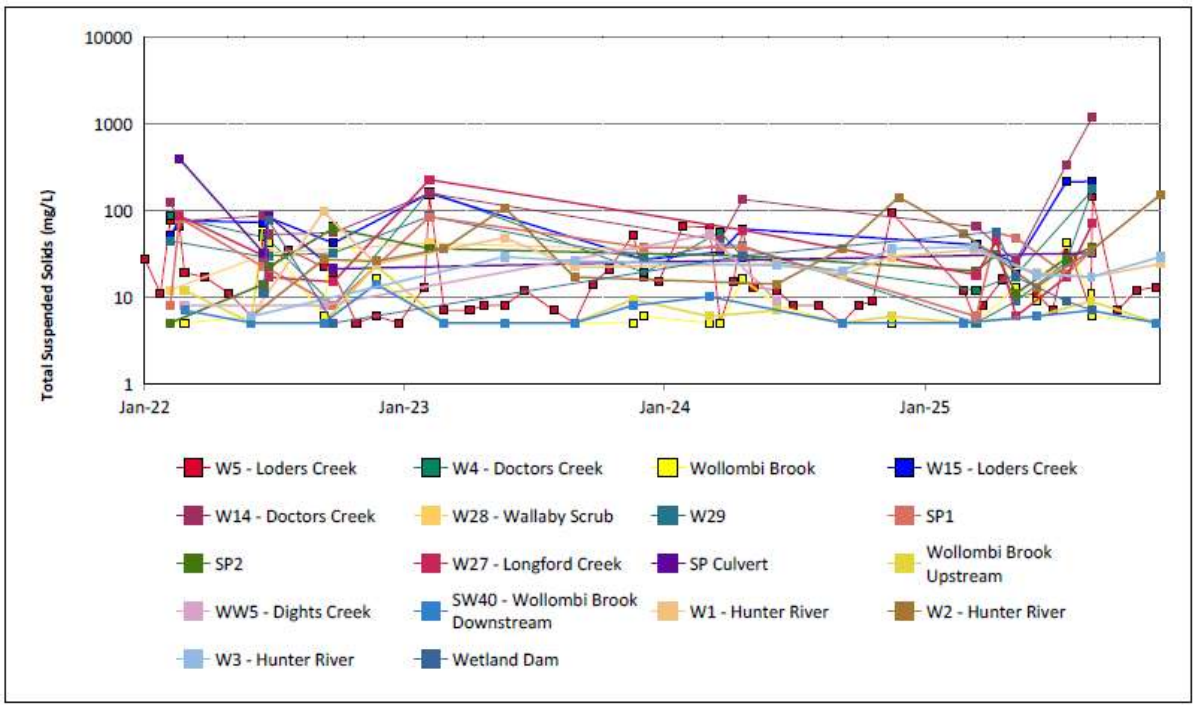


FIGURE 31: WATERCOURSE TSS TRENDS 2022 TO 2025

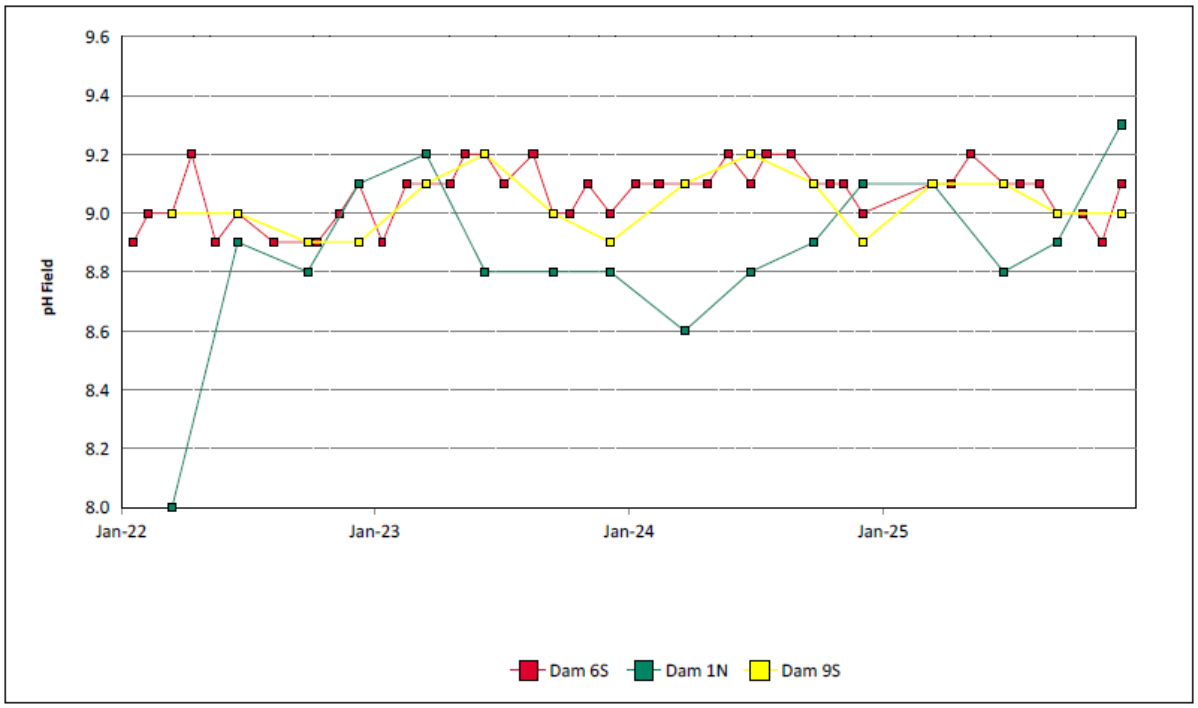


FIGURE 32: SITE DAMS PH TRENDS 2022 TO 2025

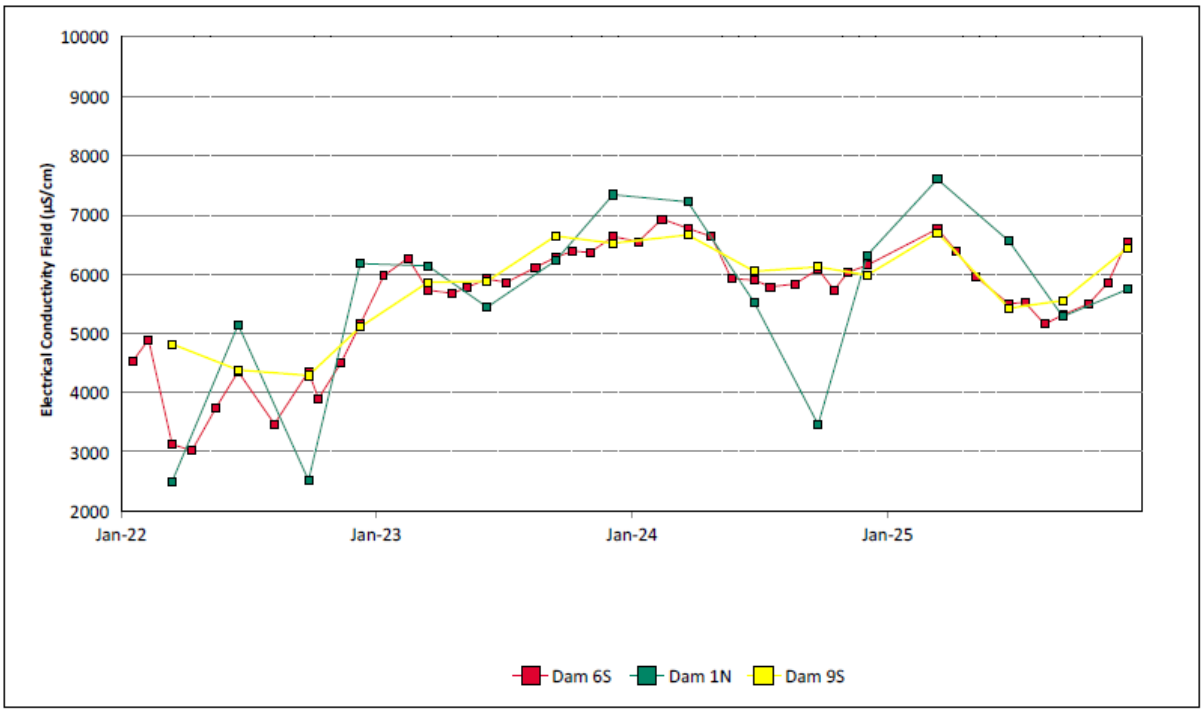


FIGURE 33: SITE DAMS EC TRENDS 2022 TO 2025

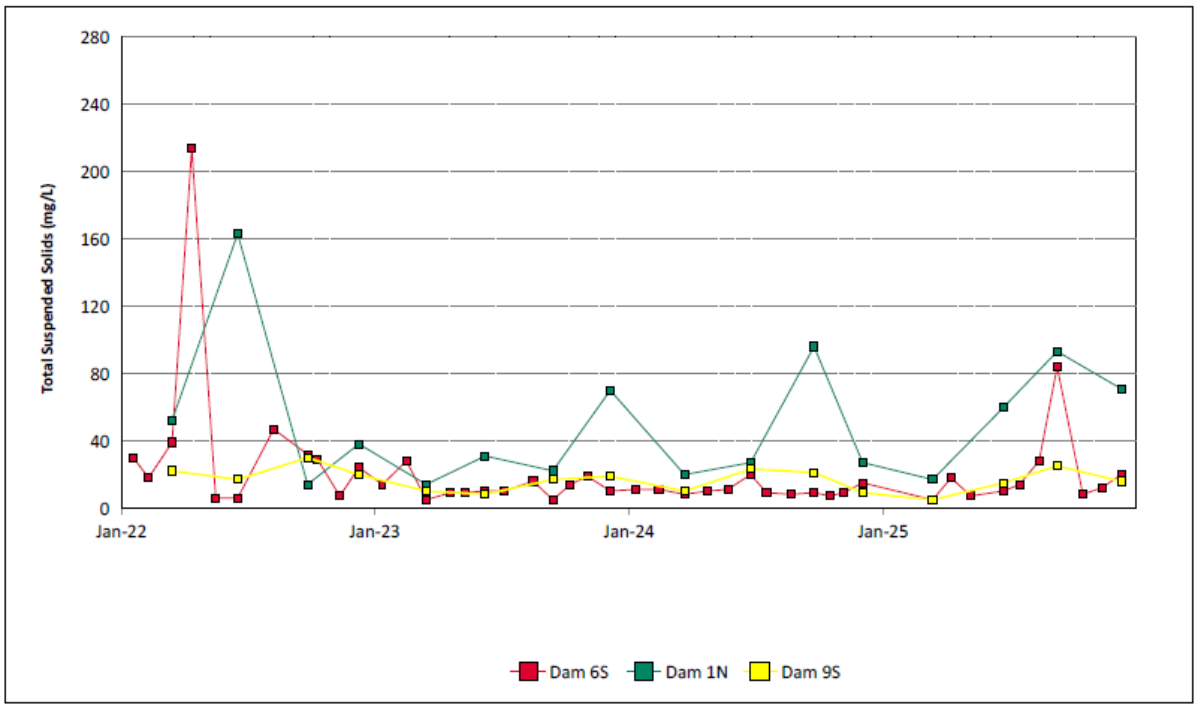


FIGURE 34: SITE DAMS TSS TRENDS 2022 TO 2025

6.8.1.1 Stream Health and Channel Stability

A programme to monitor and report on the stream and riparian vegetation health in Loders Creek and Wollombi Brook which may be potentially affected by the development commenced in 2016. The monitoring programme at times has been conducted in conjunction with a similar programme managed by Bulga Surface Operations.

The annual monitoring program includes the following:

- Documenting locations and dimensions of significant erosive or depositional features;
- Photographs upstream, downstream, at both the left and right banks;
- Rating the site with the Ephemeral Stream Assessment protocol developed by the CSIRO to assess the erosional state of the creek at the monitoring location (a measure of channel stability);
- Rating the site with the Rapid Appraisal of Riparian Condition (RARC) protocol developed by Land & Water Australia. This assesses the ecological condition of riparian habitats using indicators that reflect functional aspects of the physical, community and landscape features of the riparian zone (a measure of stream health); and
- Taking measurements of the channel cross-sections (transects) for comparison purposes for any future monitoring.

A copy of the annual stream health and channel stability monitoring report (Annual SHCS report) is provided as **Appendix 5**. The 2025 stream health and channel stability monitoring survey followed a year of highly variable climatic conditions, with periods of elevated rainfall and associated high flow events earlier in the year, followed by a return to relatively dry and stable conditions leading into the survey period. Evidence of these earlier flows was apparent at a number of monitoring sites, including elevated debris lines, detrital accumulations and indicators of high flow events over the previous year. At the time of monitoring, however, stream conditions were generally characterised by low flows, isolated pooled water or slow-moving water within the drainage networks.

Across the monitoring network, CSIRO Ephemeral Stream Assessment (ESA) results indicated a high degree of consistency in channel condition between 2024 and 2025 with most sites retaining their previous classification ratings. Although several sites continue to exhibit active erosion features, including exposed banks, slumped sections and animal access tracks, these features were generally persistent, spatially limited and consistent with those recorded during previous monitoring periods. In many instances, erosion features showed evidence of partial stabilisation through grass colonisation, swamp-oak sapling establishment and weed growth, particularly where colluvial sediments had accumulated. Where changes in scores were recorded, these were typically minor and associated with localised changes in vegetation cover rather than any widespread changes in channel and riparian bank geomorphology.

Two sites recorded changes to their overall CSIRO ESA classification during the 2025 assessment. At location LC3, improved ground cover and increased regulation of lateral flow contributed to a reduction in activity rating from *Very Active* to *Active*, indicating a modest improvement in channel

condition relative to 2024. In contrast, location LC12 recorded a decline in vegetation cover across the drainage line floor, resulting in a downgrade from *Potentially Stabilising* to *Active* and returning the site to a condition consistent with that recorded in 2022 and 2023.

Stream Health Monitoring using the Rapid Appraisal of Riparian Condition (RARC) method showed that overall riparian condition at the four primary monitoring sites (MTW LDP2, BM34, BM35 and BM37) remained stable in 2025. RARC classifications continued to range from *Average* to *Good*, with no changes to overall ratings. These outcomes reflect the ongoing influence of relatively intact riparian canopies dominated by mature swamp-oak and river-oak species, which provide structural stability, detrital inputs and shading, despite generally limited native understorey complexity and varying levels of weed presence.

Across the broader Loder Creek network, riparian condition and channel stability remained strongly influenced by site specific factors, including livestock access, weed pressure, canopy continuity and historical erosion. Sites characterised by narrow or fragmented riparian corridors and ongoing livestock access (e.g. LC6, LC7, LC12, LC15 and LC16) continued to display a higher susceptibility to disturbance and erosion, whereas sites supporting more continuous canopy cover and well-established groundcover exhibited greater resilience to flow events.

In summary, the 2025 MTW Stream Health and Channel Stability monitoring program indicates that the assessed creek systems remain generally stable, with no evidence of widespread degradation attributable to MTW mine operations. While localised erosion and vegetation fluctuations persist at several sites, these are consistent with historical conditions and are often counterbalanced by natural recovery processes. Continued management measures, including targeted weed control, stock exclusion where practicable and ongoing annual monitoring, are recommended to support incremental improvements in riparian condition and to ensure early detection of any future changes in channel stability.

6.8.2 Groundwater Management

Groundwater monitoring activities were undertaken in 2025 in accordance with the MTW Water Management Plan and groundwater monitoring program. The monitoring results are used to establish and monitor trends in physical and geochemical parameters of surrounding groundwater potentially influenced by mining.

The groundwater monitoring program at MTW measures the quality of groundwater against background data, EIS predictions and historical trends. Groundwater quality is evaluated through the parameters of pH, EC, and standing water level. A comprehensive suite of analytes are measured on an annual basis, including major anions, cations and metals.

Groundwater monitoring data is reviewed on a quarterly basis. The review involves a comparison of measured pH and EC results against internal trigger values (5th and 95th percentile) which have been derived from the historical data set. The response to results outside the trigger limits is detailed in the MTW Water Management Plan.

The monitoring locations are shown in **Figure 35** and the annual Ground Water Review report can be found in **Appendix 6.**

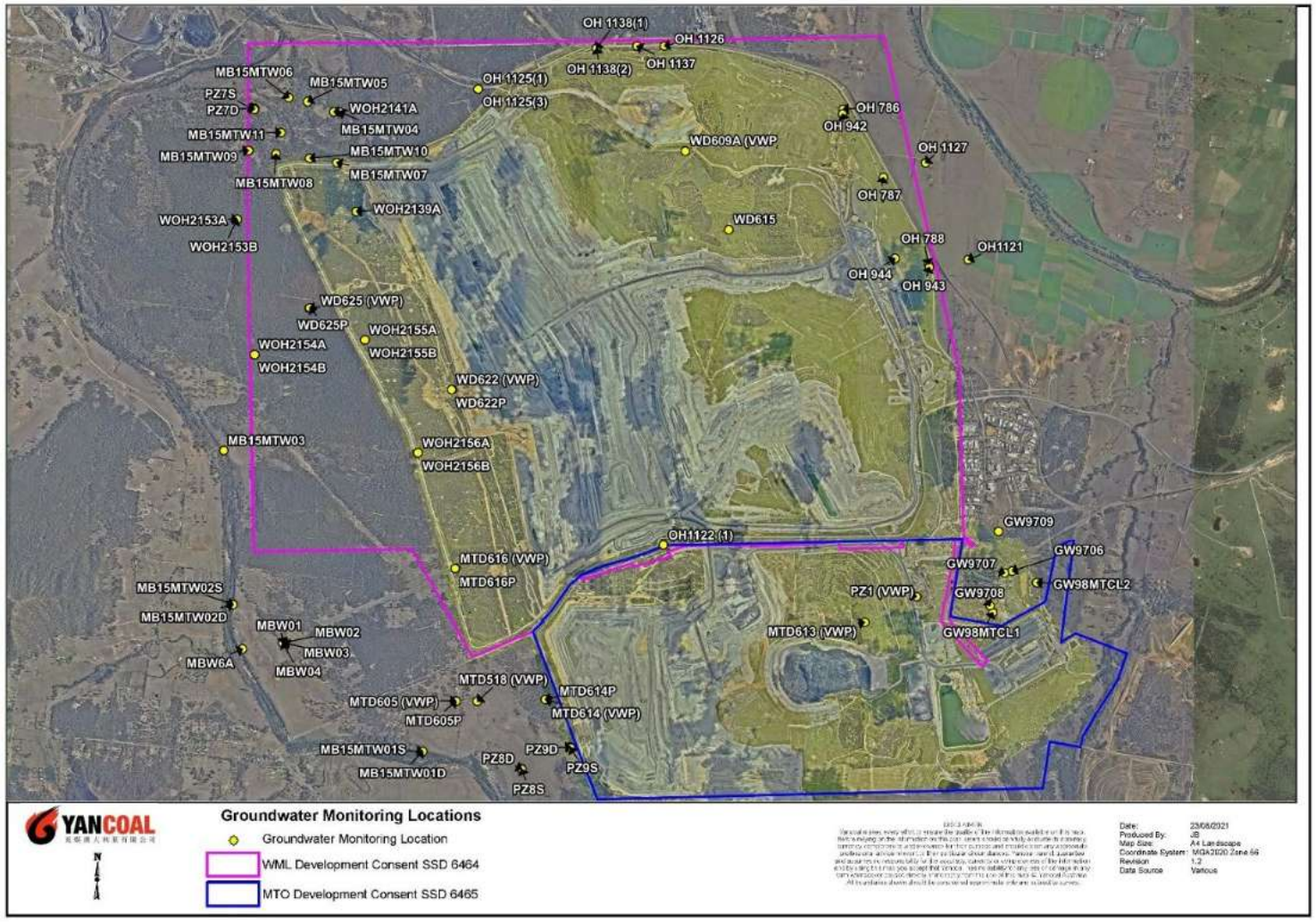


FIGURE 35: GROUNDWATER MONITORING NETWORK AT MTW IN 2025

6.8.3 Groundwater Performance

Sampling of ground waters was carried out on 254 occasions from 60 bores across MTW in accordance with AS/NZS 5667.6 (1998). Where laboratory analysis was undertaken, this was performed by a NATA accredited laboratory. Groundwater sampling and analysis was undertaken as required with the following exceptions detailed in **Table 6.14**.

TABLE 6.14 MTW WATER MONITORING DATA RECOVERY FOR 2025 (BY EXCEPTION)

Location	Data Recovery (%)	Comment
OH787	50%	No safe access in June and September.
OH943	0%	Obstruction in bore unable to sample in 2025.
OH1122 (1)	0%	Insufficient water for sampling in 2025.
OH1125 (3)	50%	Insufficient water for sampling in January and June.
OH1127	0%	Obstruction in bore unable to sample in 2025.
GW9708	75%	Obstruction in bore unable to sample in 25/09/2025.
WOH2139A	0%	Decommissioned due to mine progression.
MTD616P	0%	Decommissioned due to mine progression.
WD616P	0%	Decommissioned due to mine progression.
WD622P	0%	Decommissioned due to mine progression.

6.8.4 Annual Ground Water Review

Groundwater monitoring results are reviewed against the trigger limits within MTW's approved Water Management Plan on a quarterly basis by MTW. A comparison of the water quality information across MTW's monitoring bore network is provided graphically in **Appendix 6.** The approved trigger limits are based on the historical water quality data as shown in the relevant site Environmental Impact Assessments. These trigger limits are updated annually based on collected site data as described in the MTW Water Management Plan. A summary of the management actions taken in response to any exceedances of the trigger limits during the period is provided in the Monthly Environmental Monitoring Reports, available via MTW's website (https://www.yancoal.com.au/our-sites/mount-thorley-documents/#mgt-docs).

An annual groundwater review was undertaken by an independent groundwater consultant (Australasian Groundwater and Environmental Consultants Pty Ltd). The scope of the review included an assessment of the water quality and groundwater levels recorded during the 2025 reporting period as well as a review of the historical results against the predictions in the site groundwater model. A copy of the full report is included in **Appendix 6.**

Key findings from the independent groundwater consultant's report were:

- Groundwater level in coal seams in the Western down-dip depressurised zone generally declined or remained stable during the 2025 monitoring period.

- Groundwater levels in shallow overburden monitoring bores underlying the Wollombi Brook alluvium and Warkworth Sands typically declined or remained stable during the 2025 monitoring period. Minimal interaction between the Wollombi Brook alluvium and the shallow overburden is evident.
- Groundwater level in coal seams eastward and up-dip of mining recorded variable results during 2025. Bayswater monitoring bores were typically stable, whilst groundwater levels in Warkworth coal seam bores decreased, and Vaux monitoring bores either remained stable or slightly declined during the monitoring period.
- Groundwater level in Hunter River alluvial bores were stable or slightly decreased during 2025. OH786 continues to fluctuate heavily compared to other Hunter River alluvium bores.
- Groundwater level in Wollombi Brook alluvium monitoring bores correlate strongly with the CRD, indicating no mining related impacts.
- Groundwater level in Warkworth Sands monitoring bore PZ7S steadily declined during the 2025 monitoring period and shows a correlation with CRD trends.
- Trigger level exceedances were recorded in two shallow overburden monitoring bores underlying the Wollombi Brook alluvium. MB15MTW01D exceeded its prescribed lower trigger threshold for groundwater pH for all monitoring periods during 2025. This is consistent with all recent data taken at this bore. Previous exceedances for pH in MB15MTW01D were investigated (AGE, 2022 and 2025) and concluded that inappropriate trigger values were the likely cause of the exceedances. Three groundwater EC readings at MTD605P were recorded above the trigger level (17516 µS/cm) in 2025 during Q1, Q2 and Q3, thus registering a trigger level exceedance for this bore. Historically this bore consistently remains close to the prescribed trigger level so these marginal exceedances are likely attributable to natural variation.
- Trigger level exceedances for pH were recorded in WOH2156B monitoring the Wambo seam. Trigger values below the lower trigger threshold of 6.9 were observed during all four monitoring periods of 2025 (in February, May, August and November). This is consistent with readings taken in 2024 which were investigated by AGE. Previous exceedances in WOH2156B for groundwater pH in were investigated (AGE 2025) and concluded that mining related impacts were responsible for the sudden drop in water level observed in this bore at the beginning of 2024 and was likely the cause of the abnormal pH levels. As part of this investigation AGE also recommended a review into the bore records of the WOH series bores which, show discrepancies between GWMP records and field readings.
- Two trigger level exceedance for pH were recorded during 2025 at boreholes OH1121 and OH1126 (monitoring the Vaux seam). OH1121 recorded 3 consecutive readings above the upper pH trigger threshold (7.2) during Q2, Q3 and Q4. Conversely, OH1126 recorded three consecutive readings below the lower trigger threshold (6.7) during Q1, Q2, and Q3. The remaining Vaux monitoring bore OH1137 recorded a single reading above the upper trigger level in Q2 (7.3) with all other 2025 readings remaining within trigger limits.
- Three consecutive exceedance level readings for groundwater pH were recorded in borehole PZ9S (monitoring the Wollombi Brook Alluvium) during Q3 and Q4 monitoring (September

and December) and also during the extra Q3 sampling round (October) that was requested by MTW. Groundwater pH readings for Q2 (March) was equal to the upper trigger level of 7.0.

- 2025 groundwater pH measurements in PZ7S were below the lower trigger threshold during Q1 and Q4 with readings in Q2 and Q3 commensurate with the lower trigger level (6.7). Despite groundwater pH readings being at or below the lower trigger during 2025, this did not constitute a trigger level exceedance.
- Hunter River Monitoring bore OH786 recorded a single reading above the trigger threshold for groundwater EC during Q1 (March) with a reading of 2270 µS/cm, above the trigger threshold of 1551 µS/cm. OH786 also displayed highly variable groundwater pH data, recording readings commensurate with the lower (6.9) and upper (7.7) trigger levels during Q2 and Q4 respectively. No trigger level exceedances were recorded in Hunter River alluvium bores during 2025.
- Warkworth seam monitoring bore OH1138(1) recorded one groundwater pH reading in September (7.2) that was significantly above the upper trigger threshold (6.9). All previous readings at this bore were between 6.1 and 6.4 making the reading in September a significant outlier. This abnormal reading can possibly be attributed to transcription error a change in sampling technique. No trigger level exceedances were recorded in Warkworth Seam monitoring bores in 2025.
- Overall sensors in WD625, MTD613, MTD518 and MTD605 recorded mostly declining pressure heads throughout the year to varying degrees. MTD614 showed stable trends in sensors 1 and 2 with the remaining sensors showing data faults. No pressure head data was available for the 2025 period from VWPs MTD616 and WD622 (both bores were decommissioned in 2022).
- VWP sensors installed into the Bayswater coal seam recorded overall declining pressure heads during the 2025 monitoring period.
- VWP pressure head in sensors installed into the Mt Arthur coal seam remained stable or declined slightly during the 2025 monitoring period. The sensor in WD625 (sensor 2) recorded a significant decline between the beginning of 2023 and 2025 but stabilized during the remainder of 2025.
- VWP sensors installed into Woodlands Hill coal seam recorded stable pressure heads during 2025. The sensor in WD625 (sensor 1) recorded a steady decline from the date of its installation in 2013 but recorded a significant uptick in pressure head during the 2025 monitoring period.
- There were no VWP data available from sensors in the Wambo coal seam for 2025. Data from the sensor installed into the Wambo coal seam at VWP MTD518 indicates the sensor has likely failed.
- Pressure head varied in VWP sensors in the Vaux coal seam for 2025. The sensor in the Vaux seam in bore WD625 recorded a continuing steady decrease in pressure head, whereas the sensor in MTD605 (sensor 6) recorded a relatively steady trend.
- Whybrow coal seam VWP sensor pressure head in MTD614 (sensor 1) recorded an overall increase in 2025.
- VWP pressure heads in the Glen Munro seam at MTD614 (sensor 2) began to record invalid data during October 2024.

- VWP pressure head in the Blakefield seam at MTD605 (sensor 4) were stable during 2025.
- VWP pressure head in the Piercefield seam at WD615 (sensor 1) were stable during 2025.
- PZ1 calibration factors weren't available. AGE recommended that calibration factors should be located so that PZ1 can be reviewed in future reports.
- Observed groundwater levels generally align with model predictions, except for OH1122(1) in Blakefield seam where observed levels are over 35 m higher, weak correlations in Bowfield seam bores, and GW98MTCL2 which shows discrepancies exceeding 10 m. WOH2156B has remained relatively stable but has shown increased variability and marked decline since late 2023. Overall, VWP pressure heads do not closely match modelled data, and no model predictions exist for bores installed after 2015.

Key recommendations from the independent groundwater consultant's report include:

- An investigation should be undertaken to determine the cause of pH exceedances in OH1121, OH1126, PZ9S. Bores WOH2156B and MB15MTW01D exceedances were previously investigated (AGE, 2025). An investigation should be undertaken to determine the cause of EC exceedances in MTDP605P.
- Calibration factors for VWP PZ1 should be determined so that pressure head trends can be discussed in future annual reviews.
- Mount Arthur, Bowfield and Vaux seam VWP sensor cables should be inspected in MTD614 for damage to determine if erroneous data is due to a poor connection to the logger and can be rectified.
- The MTD605 Interburden sensors (sensor 3), Vaux seam (sensor 6), Bayswater (sensor 7) should be inspected for poor connections to the logger unit to confirm weather erroneous data from these sensors can be rectified.
- The sensor targeting Glen Munro (sensor 2) in MTD614 should be inspected for its connection to the logger unit to confirm if sensor errors can be rectified.
- Investigate/remediate at: OH1127 (blocked by pump), MB15MTW11 (confirm bore is blocked), SPO2 (sampling tool consistently becoming stuck in bore). OH786 was indicated as having a perforation in the bore wall at 1.4 m. OH944 was noted as having a 'detached standpipe' in field notes. This should be investigated to make sure it has not been compromised as this can affect groundwater parameters.
- Survey data (coordinates and top of PVC mAHD) should be confirmed for bores MB15MTW01 through MB15MTW10, as well as MBW06A, OH1137 and MB15MTW11 which historically have inconsistent RL data.
- Consider installing a new monitoring bore to monitor the Bowfield seam. The last remaining monitoring bore for this seam OH1125(3) went dry during 2022. An investigation should be undertaken into the depth discrepancies between field observations and GWMP records in the WOH series boreholes (WOH2153A and B, WOH2154A and B, WOH2155A and B, WOH2156A and B). Field sheets suggest that the deeper of the pairs of these bores are the 'A-series' whereas the GWMP indicates that the 'B-series' target the deeper of the two target coal seams (Wambo). Installation records should be compared with field measurements of

depth to the base of the bore, the borehole logs and any other relevant installation notes to confirm the target units of these monitoring bores.

- Consider updating the groundwater model to incorporate newly constructed monitoring installations. There are no modelled data for bores constructed after 2015.

MTW will assess and progress the recommendations of the groundwater consultant for the 2025 reporting period including completion of investigation into instances of trigger exceedances, as per MTW's Water Management Plan.

6.8.5 Compensatory Water Supply

Under the *Water Management Act 2000*, there are three types of basic landholder rights in NSW:

- **Domestic and stock rights** - Owners or occupiers of land overlaying an aquifer or with river, estuary or lake frontage can take water without a licence for domestic (household) purposes or for stock watering.
- **Harvestable rights** - Harvestable rights allows landholders to capture and store a proportion of the rainfall runoff from their landholding in one or more harvestable rights dams without requiring a water access licence, water supply work approval, or water use approval.
- **Native title** - Anyone who holds native title with respect to water, as determined under the Commonwealth Native Title Act 1993, can take and use water for a range of personal, domestic and non-commercial purposes.

MTW is required by development consent conditions to provide compensatory water supply to the owner of any privately owned land whose basic landholder water rights (as defined in the *Water Management Act 2000*) are adversely and directly impacted as a result of the development.

During the 2025 reporting period there was no need for compensatory water supply to be provided to others as a result of the developments.

6.9 Waste

6.9.1 Management

The management of waste generated on the MTW site is undertaken in accordance with the site MTW non-mineral waste management strategy which is designed to;

- track and record all wastes leaving the site to meet all regulatory requirements; and
- implement appropriate segregation, collection, handling, transport and disposal of waste in a way which minimises the impacts on the environment.

All waste not suitable for reuse on site is removed by a licensed waste contractor and disposed of or recycled accordingly at licensed waste management facilities within the local Hunter region. Appropriate segregation is implemented across various waste streams at MTW to maximise diversion from landfill and minimise the impact to the environment by recycling or reuse. Some waste categories are processed and disposed of on the MTW site, as per NSW EPA exemption approvals, set out in the MTW Environment Protection Licenses. The effluent treatment and disposal facilities at MTW consist of sewage treatment plants which treat, disinfect and dispose, or re-use the treated effluent on site. All waste management contractors engaged for waste collection, handling and transportation at MTW are licensed by the NSW EPA.

6.9.2 Performance

During the reporting period MTW continued to undertake regular inspections of areas where wastes are generated and stored, to reinforce the principles of a considerate waste management approach including waste stream segregation to increase material recycling and promote diversion from landfill. In 2025, 79% of all non-mineral waste generated and removed from MTW was diverted from landfill and processed at licensed recycling and secondary use facilities. The remaining 21% was disposed of as end-of-life waste at a local licensed landfill facility. There were no community complaints or regulatory non-compliance notices receiving in 2025, in relation to waste management during the reporting period.

7 LAND MANAGEMENT

7.1 Summary of Rehabilitation

A total of 100.1ha of new rehabilitation (rehabilitation progressed to Ecosystem and Land Use Establishment phase) was completed during 2025 which was 11.0ha more than the Forward Program 2025 target of 89.1ha. Total disturbance undertaken in 2025 was 60.2ha against a Forward Program target of 52.0ha. The increased amount of disturbance was due to the following: disturbance for infrastructure areas in Mount Thorley and North Out of Pit Dam; and disturbance of rehabilitation to remediate spontaneous combustion and to recover topsoil from a stockpile.

The 2014 Environmental Impact Statements for the Warkworth Continuation Project and the Mt Thorley Continuation Project modelled MTW's progress with mining and rehabilitation in indicative mine plans at different stages over the course of MTW executing it's operations. These documents modelled a total of 1,607.8 ha of rehabilitation completion by the end of 2023. At the end of the 2025 reporting period there had been 1,564.8 hectares of rehabilitation completed across Warkworth and Mount Thorley, which is 43ha less than predicted in the indicative EIS forecast for the end of 2023.

An Annual Rehabilitation Report has been prepared to meet the requirements of the Standard Conditions for Mining Leases. The Annual Rehabilitation report has been provided in **Appendix 7** of this report.

7.2 Weed Control

7.2.1 Weed Treatment

The weeds identified at MTW occur primarily in areas that have been disturbed such as post mining rehabilitation areas, previous civil works areas, soil stockpiles, water management structure surrounds, and general areas of minor ground disturbance. The weed control associated with rehabilitation maintenance is detailed in the Annual Rehabilitation Report (**Appendix 7**). In addition to the rehabilitation maintenance, a total of 78 days of weed management work was undertaken on site at MTW during 2025, with 195 ha of land treated, including maintenance of access tracks and environmental monitoring points. The weeds targeted during the 2025 weed management programme were based on the results of the 2024 weed survey. **Figure 36** illustrates the target species and weed treatment areas across MTW. Weed treatment areas are assessed following the completion of periods of work to determine the effectiveness of control works.

The species focussed on during treatment included:

- African Boxthorn *(Lycium ferocissimum)*
- African Olive *(Olea europaea)*
- Balloon Vine *(Cardiospermum grandiflorum)*

- Blue Heliotrope *(Heliotropium amplexicaule)*
- Castor Oil Plant *(Ricinus communis)*
- Creeping Pear *(Opuntia humifusa)*
- Galenia *(Galenia pubescens)*
- Lantana *(Lantana camara)*
- Mother of Millions *(Bryophyllum delagoense)*
- Paddy Melon *(Cucumis myriocarpus)*
- Prickly Pear species *(Opuntia spp)*
- Rhodes Grass *(Chloris gayana kunth)*
- St Johns Wort *(Hypericum perforatum))*
- Telegraph Weed *(Heterotheca grandiflora)*
- Tiger Pear *(Opuntia aurantiaca)*

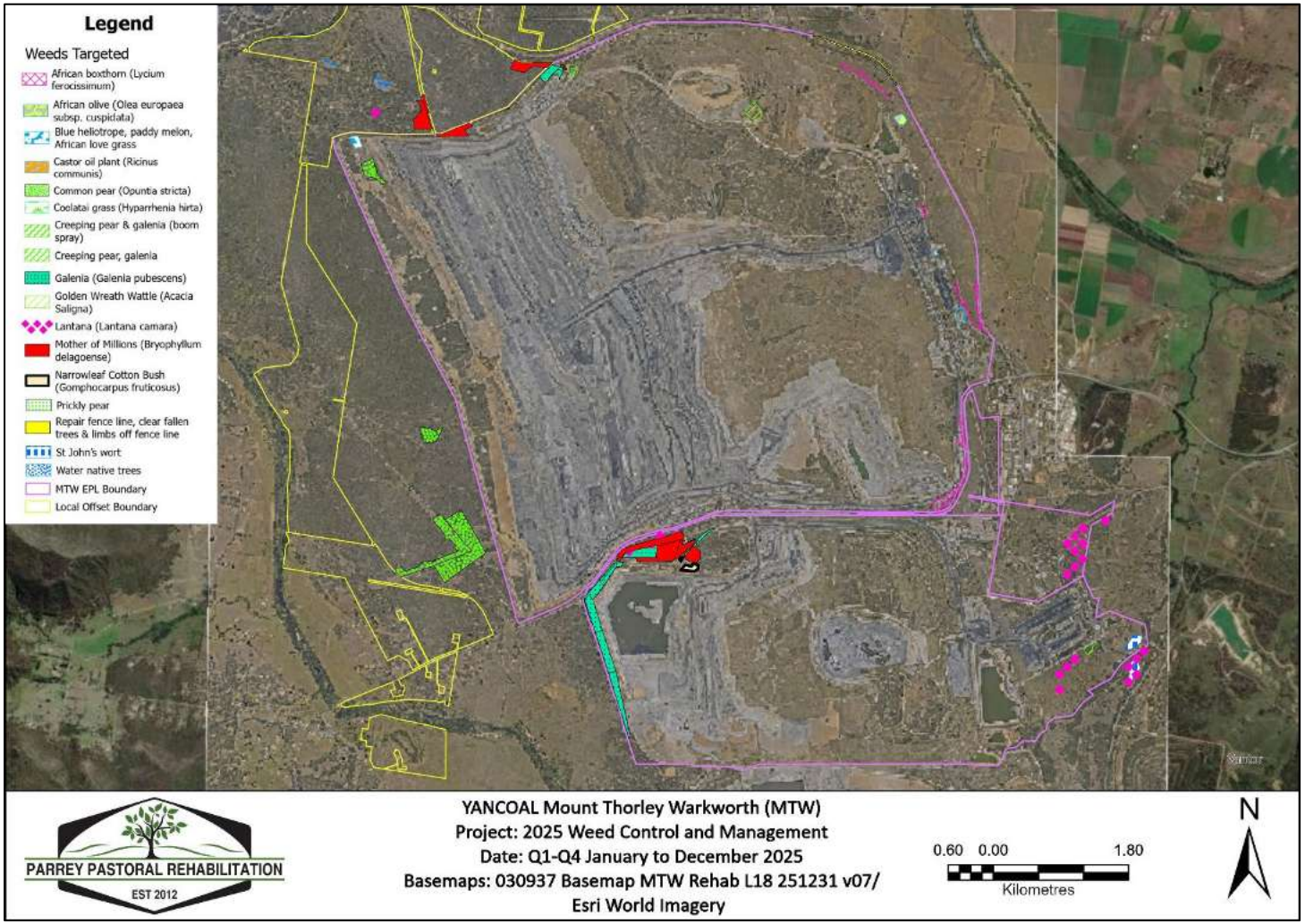


FIGURE 36: ANNUAL WEED CONTROL OVERVIEW FOR 2025

7.2.2 Annual Weed Survey

The management and control of weeds at MTW is governed by the Annual Weed Survey (AWS). The AWS lists Weeds of National Significance (WONS), noxious, environmental and other non-declared weed species identified across MTW and provides a framework to allow for structured weed management and control across operational and non-operational areas of MTW.

The following summarises the results of the weed survey undertaken during December 2025 and is based upon the NSW Biosecurity Act 2015 which came into force from 1 July 2017 and repealed 14 Acts including the Noxious Weeds Act 1993. The new legislation has resulted in the development of the Hunter Regional Strategic Weed Management Plan (2017-2022 and subsequently 2023-2027), which covers the area occupied by MTW.

Five WONS were identified during the survey, including:

- African Boxthorn *(Lycium ferocissimum)*
- Bitou Bush *(Chrysanthemoides monilifera subsp rotundata)*
- Fireweed *(Scenecio madagascariensis)*
- Lantana *(Lantana camara)*
- Pear Species (*Opuntioid Cacti, Opuntia humifusa, Opuntia stricta, Optunia aurantiaca)*

Fourteen other priority weeds were identified at MTW during the survey, including:

- African Lovegrass *(Eragrostis curvula).* Regional – Asset protection
- African Olive (*Olea europaea). Regional – Containment*
- Blue Heliotrope *(Heliotropium amplexicaule).* Regional – Asset protection
- Castor Oil Plant *(Ricinus communis).* General biosecurity duty
- Coolatai Grass (*Hyparrhenia hirta*). Regional - Asset protection
- Fleabane *(Conyza bonariensis).* General biosecurity duty
- Galenia *(Galenia pubescens).* Regional – Containment
- Golden Dodder (*Cuscuta campestris*). General biosecurity duty
- Green Cestrum *(Cestrum parqui).* Regional - Asset protection
- Mother of Millions *(Bryophyllum delagonese).* Regional - Asset protection
- Scotch Thistle *(Onopordum acanthium).* General biosecurity duty
- Spiny Rush *(Juncas acutus)*. General biosecurity duty
- St John's Wort *(Hypericum perforatum).* Regional – Containment
- Telegraph Weed (*Heterotheca grandiflora*). Regional – Asset protection

Twelve weeds that are not officially declared or listed were also recorded at MTW including:

- Blackberry Nightshade *(Solanum nigram)*
- Golden Wreath Wattle *(Acacia saligna)*
- Inkweed *(Phytolacca octandra)*
- Mustard Weed *(Sisymbrium sp.)*
- Narrow Leaved Cotton Bush *(Gomphocarpus fructicosus)*

- Noogoora Burr *(Xanthium occidentale)*
- Paddy's Lucerne *(Sida rhombifolia)*
- Paddy Melon *(Cucumis myriocarpus)*
- Purpletop *(Verbena bonariensis)*
- Rhodes Grass *(Chloris gayana kunth)*
- Stinking Roger *(Tangetes minuta)*
- Tree Tobacco *(Nicotiana glauca)*

Species identified during the 2025 survey will form the basis of ongoing weed management works during 2026.

7.3 Vertebrate Pest Management

As part of MTW's vertebrate pest management activities a baiting programme is carried out on a seasonal basis. Two 1080 ground baiting programmes consisting of approximately 55 bait sites utilising meat baits were undertaken during autumn and spring to target wild dogs and foxes. Baits were checked over a three-week period and replaced each week when taken. The programmes were undertaken in conjunction with neighbouring landholders where possible.

Table 7.1 summarises the results from the programmes carried out at MTW during 2025 with baiting locations and results for the programmes are illustrated in **Figure 37** and **Figure 38**.

TABLE 7.1 VERTEBRATE PEST CONTROL SUMMARY

Season	1080 Baiting			
	Total Takes	Takes by Wild Dog	Takes by Fox	Takes by Feral Pigs
Autumn	58	25	31	0
Spring	53	4	49	0
Total	**111**	**29**	**80**	**0**

Additional pest management programmes included a feral pig trapping and baiting programme carried out across MTW and the local offsets in January and February that resulted in 67 feral pigs controlled (which includes an estimate of 11 pigs from the baiting programme) and in winter that resulted in 41 feral pigs controlled (which includes an estimate of 8 pigs controlled from the baiting programme). MTW will continue to carry out vertebrate pest control programmes during 2026 to limit feral pest impacts on landholdings and surrounding neighbours.

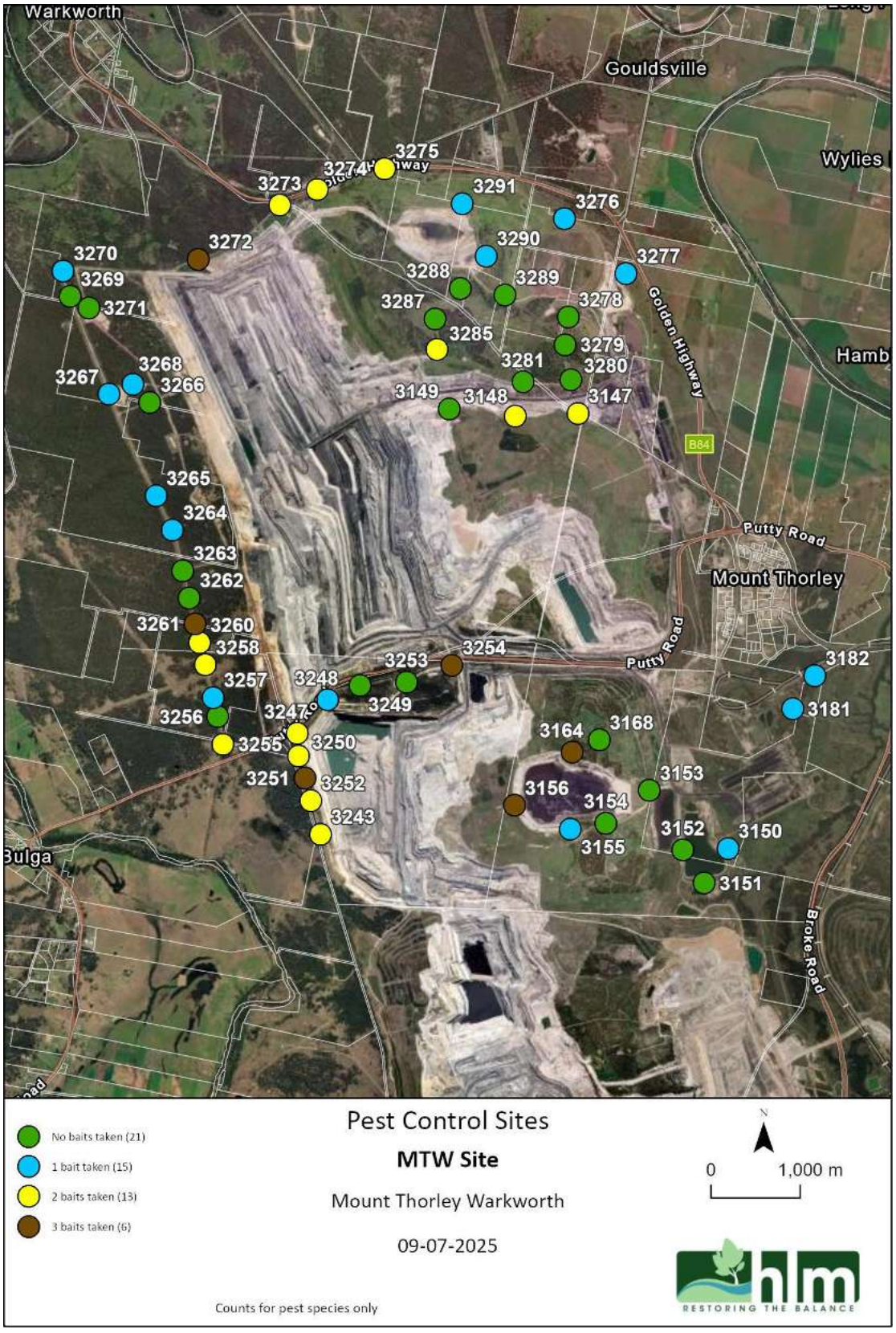


FIGURE 37: BAITING STATION LOCATIONS AND RESULTS AT MTW DURING AUTUMN 2025 VERTEBRATE PEST MANAGEMENT PROGRAMME

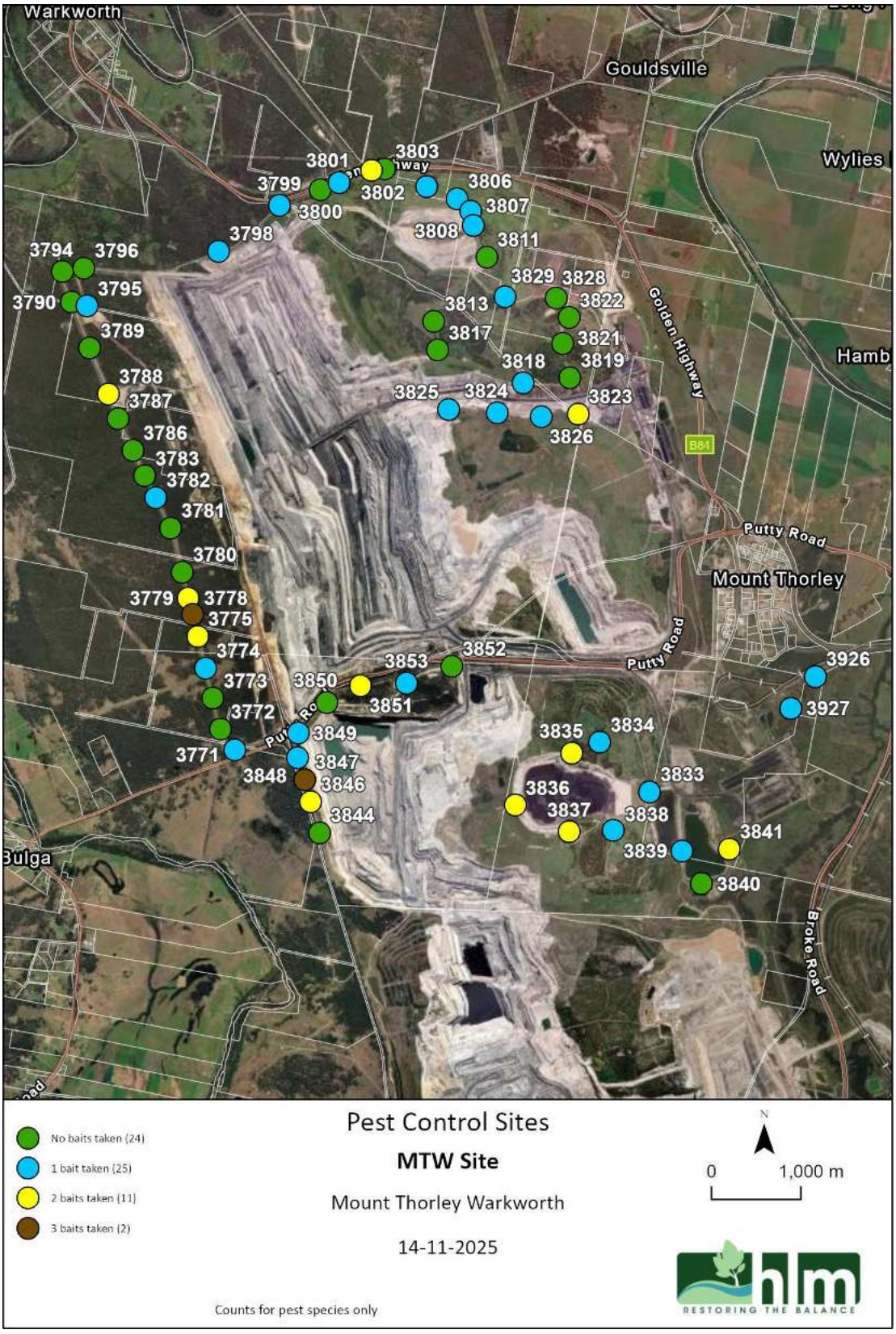


FIGURE 38: BAITING STATION LOCATIONS AND RESULTS AT MTW DURING SPRING 2025 VERTEBRATE PEST MANAGEMENT PROGRAMME

7.4 Biodiversity Offsets

7.4.1 Management

MTW's impacts on biodiversity values are offset through the protection and management of Biodiversity Areas (BAs). The BA's that are related to MTW illustrated in **Figure 39** and also listed in **Table 7.2**.

TABLE 7.2 MTW BIODIVERSITY AREAS

Biodiversity Areas	Area (ha)	Environmental Approvals				Offset Feature/s
		State		Federal		
		NSW 2003	NSW 2015	EPBC 2002/629	EPBC 2009/5081	
Southern	986	211	775		94	Warkworth Sands Woodland; Central Hunter Grey Box – Ironbark Woodland; Habitat for Swift Parrot, Regent Honeyeater, Southern Myotis and Large-eared Pied Bat.
Northern	341	39	302		341	Warkworth Sands Woodland; Central Hunter Grey Box – Ironbark Woodland; Habitat for Swift Parrot, Regent Honeyeater, Southern Myotis and Large-eared Pied Bat.
North Rothbury	41		41		41	North Rothbury Persoonia
Goulburn River (MTW Portion)	1,066		1,066	1,066		Central Hunter Valley Eucalypt Forest (CHVEF); Ironbark/Stringybark Communities; Box shrubby/grassy Woodlands; Habitat for Swift Parrot and Regent Honeyeater
Bowditch	602		602	520	82	CHVEF; Ironbark/Stringybark Communities; Habitat for Swift Parrot and Regent Honeyeater
Putty	383				383	CHVEF; Habitat for Swift Parrot and Regent Honeyeater
Seven oaks	519				519	CHVEF; Habitat for Swift Parrot and Regent Honeyeater
Condon View (MTW Portion)	345				345	CHVEF; Habitat for Swift Parrot and Regent Honeyeater

The MTW BA's are managed in accordance with site specific Offset Management Plans (OMPs). All of the OMPs are available on MTW's website.

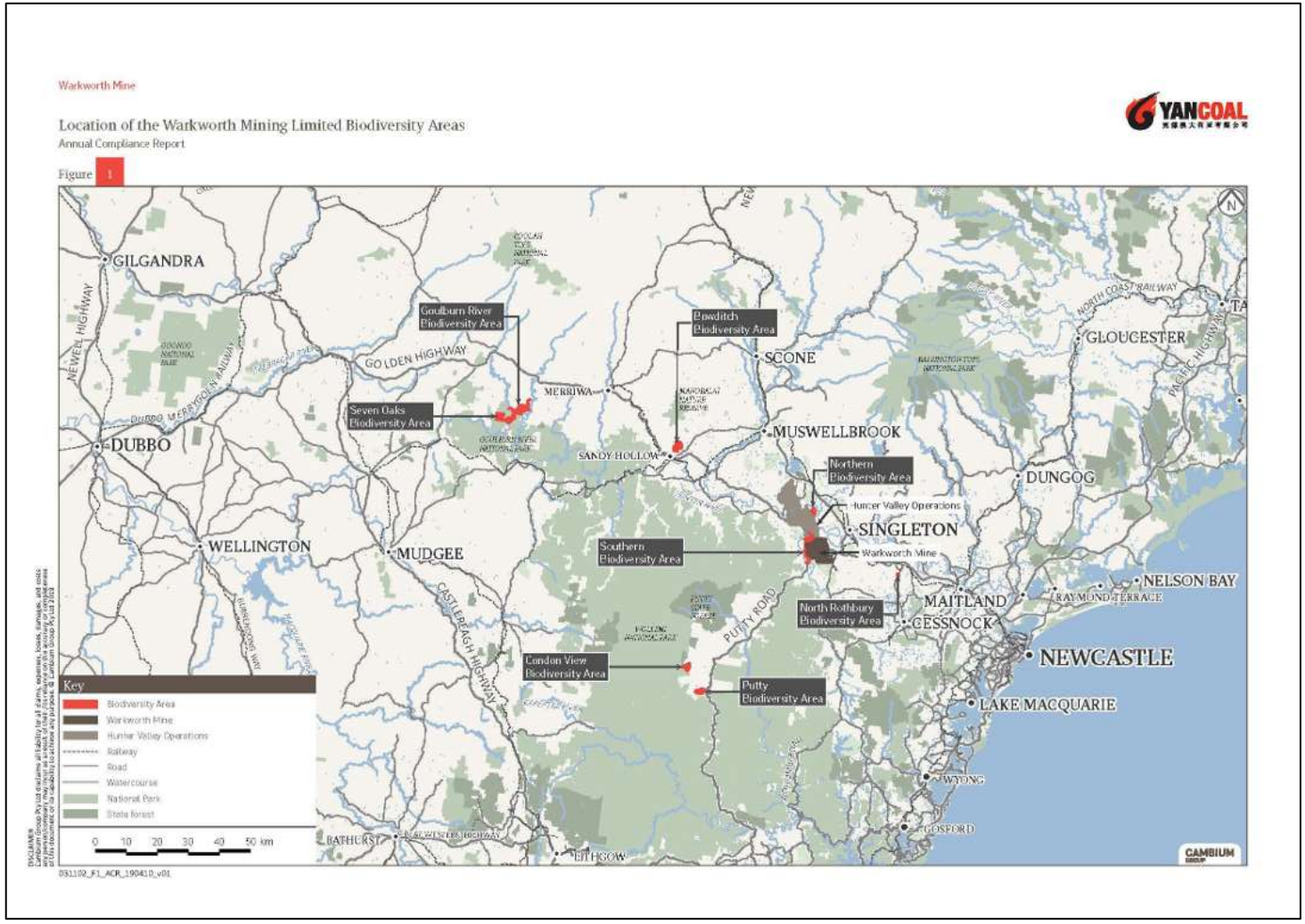


FIGURE 39: MTW BIODIVERSITY OFFSET LOCALITY MAP

7.4.2 Permanent Protection

MTW submitted an administrative modification to NSW development consent SSD-6464 on 29 April 2021 (MOD1) to clarify biodiversity offset requirements for the Warkworth Continuation Project and to facilitate in-perpetuity conservation of biodiversity offset land. Department of Planning, Housing and Infrastructure (DPHI) in consultation with Biodiversity, Conservation and Science (BCS) advised that a Biodiversity Stewardship Agreement (BSA) is the only mechanism acceptable to the NSW Government for in-perpetuity security of biodiversity offset land. The establishment of a BSA requires biodiversity offset credits to be retired. Biodiversity offset credits for the MTW offset land were determined under prior mechanisms and are not equivalent to the current Biodiversity Assessment Method (BAM) credits required for a BSA. During the 2025 Annual Review period, MTW continued working with Conservation Programs, Heritage and Regulation (CPHR) (formerly BCS) and DPHI to progress BSAs for the offset land areas. The administrative modification to NSW development consent SSD-6464 is intended to be withdrawn upon completion of the BSAs.

7.4.3 Biodiversity Area Management Activities

The OMPs describe the Conservation Management Strategies. The following are the key actions completed throughout 2025 across all the BAs:

7.4.3.1 Weed Control

Weed control at the Local BAs targeted the following species:

- African Boxthorn (*Lycium ferocissimum)*
- African Lovegrass *(Eragrostis curvulva)*
- African Olive (*Olea europaea)*
- Ashwagandha *(Withania somnifera)*
- Balloon Vine *(Cardiospermum grandiflorum)*
- Bidens (*Bidens pilosa)*
- Blue Heliotrope *(Heliotropium amplexicaule)*
- Brazilian Nightshade (*Solanum seaforthianum)*
- Bridal Creeper *(Asparagus asparagoides)*
- Carrion Flower *(Orbea variegata)*
- Castor Oil Plant *(Ricinus communis)*
- Cats Claw Creeper *(Dolichandra unguis-cati)*
- Common Pear *(Opuntia stricta)*
- Coolatai Grass (*Hyparrhenia hirta)*
- Creeping Pear *(Opuntia humifusa)*
- Fireweed *(Senecio madagascariensis)*
- Fleabane *(Erigeron bonariensis)*
- Galenia (*Galenia pubescens)*
- Golden Wreath Wattle (*Acacia saligna)*
- Green Cestrum (*Cestrum parqui)*
- Guinea Grass *(Megathyrsus maximus)*
- Inkweed (*Phytolacca octandra)*
- Khaki Weed *(Alternanthera pungens)*
- Kikuyu *(Cenchrus clandestinus)*

- Lantana *(Lantana camara)*
- Mother of Millions (*Bryophyllum delagoense)*
- Moth Vine (*Araujia sericifera)*
- Mullein *(Verbascum sp.)*
- Narrow Leaf Cotton Bush *(Gomphocarpus fruticosus)*
- Paterson's Curse (*Echium plantagineum)*
- Peppercorn Tree *(Schinus molle)*
- Potato Vine *(Solanum seaforthianum)*
- Prickly Pear (*Opuntia stricta)*
- Rhodes Grass *(Chloris gayana)*
- Scotch Thistle *(Onopordum acanthium)*
- Sowthistle *(Sonchus olearius)*
- Spear Thistle *(Cirsium vulgare)*
- Stinking Roger (*Tagetes minuta)*
- Telegraph Weed *(Heterotheca grandiflora)*
- Tiger Pear *(Opuntia aurantiaca)*
- Toadflax *(Linaria vulgaris)*
- Twiggy Mullein *(Verbascum virgatum)*
- Tree of Heaven *(Ailanthus altissima)*
- Turkey Rhubarb *(Rumex sagittatus)*
- Whiskey Grass *(Andropogon virginicus)*
- White Cedar *(Melia azedarach)*

Weed control at the Regional BAs targeted the following species:

- African Lovegrass *(Eragrostis curvulva)*
- African Olive *(Olea europaea)*
- Blackberry *(Rubus armeniacus and Rubus anglocandicans)*
- Blue Heliotrope *(Heliotropium amplexicaule)*
- Blue Passionflower *(Passiflora Caerulea)*
- Brazilian Nightshade *(Solanum seaforthianum)*
- Bridal Creeper *(Asparagus asparagoides)*
- Cadaghi *(Corymbia torelliana)*
- Castor Oil *(Ricinus communis)*
- Cats Claw Creeper *(Dolichandra unguis-cati)*
- Creeping Pear *(Opuntia humifusa)*
- Duranta *(Duranta erecta)*
- Fireweed *(Scenecio madagascariensis)*
- Galenia (*Galenia pubescens)*
- Green Cestrum *(Cestrum parqui)*
- Jacaranda *(Jacaranda mimosifolia)*
- Lantana *(Lantana camara)*
- Mother of Millions (*Bryophyllum delagoense)*
- Moth Vine *(Araujia sericifera)*
- Mullein *(Verbascum sp.)*

- Narrow-leaf Cotton Bush *(Gomphocarpus fruticosus)*
- Ochna *(Ochna serrulata)*
- Peppercorn Tree *(Schinus molle)*
- Prickly Pear *(Opuntia stricta)*
- Queensland Wattle *(Acacia podalyriifolia)*
- Ragwort *(Senecio jacobaea*)
- Robinia *(Robinia pseudoacacia)*
- Silky Oak (Grevillea robusta)
- Sticky Nightshade *(Solanum sisymbrifolium)*
- St John's Wort *(Hypericum perforatum)*
- Sweet Briar *(Rosa rubiginosa)*
- Thistle *(Cirsium sp.)*
- Trad *(Tradescantia fluminensis)*
- Tree of Heaven *(Ailanthus altissima)*
- Whiskey Grass *(Andropogon virginicus)*
- Wild Tobacco *(Solanum mauritianum)*
- Willows *(Salix sp.)*
- Yucca *(Yucca aloifolia)*

7.4.3.2 Infrastructure Management and Improvement

In 2025 fence repair and replacement was undertaken at the Southern, Northern, North Rothbury, Goulburn River and Condon View BAs. Tracks were maintained to reduce encroaching vegetation and improve access. Regular property inspections were undertaken on all BAs.

7.4.3.3 Fire Management

Slashing of fire breaks was undertaken on the Southern, Northern, North Rothbury and Goulburn River BA's. A Hazard Reduction Burn for North Rothbury BA was approved however conditions were outside the prescribed conditions, so the burn was rescheduled for 2026.

Overall fuel load assessments were undertaken on all offsets.

7.4.3.4 Strategic Grazing

No strategic grazing was undertaken in the BAs in 2025.

7.4.3.5 Vertebrate Pest Management

Two 1080 ground baiting programmes targeting wild dogs and foxes were undertaken across the Local and Regional Biodiversity Areas. Baits were checked over a three-week period and replaced each week when taken. Baiting was carried out in autumn and spring and was undertaken in conjunction with neighbouring landholders where possible. **Table 7.3** summarises the results from the programmes during 2025.

TABLE 7.3 SUMMARY OF VERTEBRATE PEST MANAGEMENT 2025

Season	1080 Baiting				
	Total Lethal Baits Laid	Takes by Wild Dog	Takes by Fox	Takes by Feral Pigs	Takes by other/unknown
Autumn (Local BAs)	92	33	18	0	0
Spring (Local BAs)	94	10	43	0	7
Autumn (Regional BAs)	194	36	79	5	16
Spring (Regional BAs)	196	24	70	0	68
Total	**576**	**103**	**210**	**5**	**91**

Additional pest management programmes included:

- A pig trapping and baiting program undertaken in January at MTW and the local Biodiversity Areas controlled up to 67 feral pigs.
- A ground shooting programme at the Goulburn River BA in March controlled five feral pigs and one fox.
- A ground shooting programme at the Bowditch Biodiversity Area in March controlled nine feral deer and one fox.
- A pig trapping and baiting program undertaken in July and August at MTW and the local Biodiversity Areas controlled up to 41 feral pigs.
- Aerial shoot conducted by National Parks and Wildlife Service at the Goulburn River and Seven Oaks BAs in June and August controlled 29 and 14 feral pigs respectively.
- A Noisy Miner ground shoot was undertaken at the Goulburn River BA in August under a Licence to Harm Protected Animals (Biodiversity Conservation Act 2016). The programme aims to assist the survivability of the Regent Honeyeater. The Goulburn River BA programme, which is its ninth consecutive year, resulted in the control of 252 Noisy Miners over seven days.

Vertebrate pest management programmes will continue to be carried out during 2026 to limit feral pest impacts on landholdings and surrounding neighbours.

7.4.3.6 Seed Collection

Seed collection was not undertaken within MTW's Biodiversity Area's in 2025.

7.4.3.7 Revegetation

MTW has committed to restoring the Endangered Ecological Communities of Warkworth Sands Woodland and Central Hunter Grey Box – Ironbark Woodland in the Southern and Northern

Biodiversity Areas. Work commenced in 2014 and overall there is more than 500 hectares of grassland area to be planted and managed over 15 years to restore these Endangered Ecological Communities.

The Warkworth Sands Woodland planting of 9,800 tube stock at the Northern BA was undertaken in October 2025. This included the relocation and spreading of ~11,000m3 of WSW topsoil sand from mining disturbance areas of the Warkworth Continuation project prior to planting. In 2025, restoration work also included planting ~960 Warkworth Sands Woodland tube stock at Southern Biodiversity Area 3 in October 2025.



FIGURE 40: WSW INFILL PLANTING IN THE SOUTHERN BIODIVERSITY AREA 3



FIGURE 41: WSW PLANTING IN THE NORTHERN BIODIVERSITY AREA

7.5 Monitoring Activities

The Local and Regional Biodiversity Areas Annual Compliance Reports respectively (provided in **Appendix 8**) provide a summary of the monitoring activities undertaken, which are consistent with the requirements of the relevant Biodiversity Management Plans. The sections below provide a summary.

7.5.1.1 Rapid Condition Assessments

The Rapid Condition Assessment technique is used as a preliminary assessment of woodland condition within the BA. Each year the sites in mature and regrowth vegetation are revisited to record the presence or absence of key habitat components and threatening processes. The results of the Rapid Condition Assessment, together with property inspection and plot reference points will be used to monitor woodland condition and identify emerging threats. The 2025 monitoring results showed general maintenance of woodland conditions across all BAs and supports the continued implementation of the conservation management strategies.

8 COMMUNITY

8.1 Complaints

A total of 138 complaints were recorded during the reporting period, representing a decrease of approximately ~7% compared to 2024. The 138 complaints were registered by approximately 22 complainants (some complainants remained anonymous), with over 72% of complaints received from 3 individuals. Most complaints were received from residents in the Bulga area. A breakdown of complaints by type is shown in **Table 8.1**.

Blasting, noise and dust remained key concerns for near neighbours during the 2025 reporting period. There has a decrease in complaints regarding noise by ~12% in comparison to 2024. Complaints regarding blasting remained consistent with 2024. There has a decrease in complaints regarding Dust by ~7% in comparison to 2024. Lighting has also remained a key concern for the community with complaint numbers decreasing 6% compared to 2024.

TABLE 8.1 SUMMARY OF COMPLAINTS BY TYPE FOR 2023 TO 2025

Complaint type	2025	2024	2023
Noise	40	45	35
Blasting	37	37	35
Dust	41	44	104
Lighting	16	17	17
Water	0	0	0
Other	4	4	2
Total	**138**	**147**	**193**

8.2 Review of Community Engagement

8.2.1 Communication

Members of the community are encouraged to contact MTW and engage in a way that suits them. Communication avenues in place to support MTW include:

- MTW free call Community Information Line (1800 727 745), which is advertised regularly in local newspapers and community newsletters;
- Online, via MTW's website (https://www.yancoal.com.au/our-sites/mount-thorley-warkworth/) with information about MTW including approvals documents, public reports, environmental monitoring results, blasting and road closures, and information about the MTW Community Consultative Committee (CCC) including the minutes of CCC meetings;

- MTW maintains a 24 hour freecall environmental hotline (1800 656 892), which allows community members to register a concern or complaint at any time of the day or night, 365 days a year. The hotline is advertised in telephone directories, on the MTW website, regularly in local newspapers, and in MTW publications;
- MTW maintains a Blast Information Line (1800 099 669) which provides information on blasts and road closures, and offers an SMS subscription for road closure information;
- Near neighbour engagement, including proactive visits to neighbours surrounding MTW; and
- MTW also issues correspondence to specific community members who may be affected by certain changes, to inform of upcoming consultation activities and as a feedback mechanism.

A range of consultation and engagement activities have continued in 2025, which included:

- The MTW Social Impact Management Plan was implemented. This plan collates together all commitments that were part of the Environmental Assessment for MTW's Continuation Project process and identifies where the company will undertake actions to mitigate some of the potential impacts in the area. The main topics include:-
    - Voluntary Planning Agreement;
    - Property Agreements Strategy, around acquisition and mitigation rights in the area.
    - Management of properties in and around Bulga that MTW has had to acquire.
    - Conservation funds and how MTW operate these.
    - Support for local Schools
    - Scholarships and Apprenticeships;
    - Acquisition of Commercial Facilities, for example the Bulga Tavern where MTW worked to upgrade this facility to support the business sustainability, and the Bulga Service Station which has continued to operate after acquisition;
    - Ongoing Community Support Program; and
    - the MTW CCC, which is identified as one of the primary communication areas where the company reports back through the CCC on how their business is performing.
- Engagement and consultation with near neighbours to provide project updates at key project milestones and activities, and in response to concerns/queries raised by individual near neighbours;
- MTW are supportive of the Upper Hunter Mining Dialogue School Tours program.

8.2.2 Community Consultation Committee

The MTW CCC met on a quarterly basis to discuss MTW's operations. The Committee is comprised of MTW representatives, community members and other key external stakeholders, including Singleton Council. The MTW CCC minutes were made available on the MTW website (https://www.yancoal.com.au/our-sites/mount-thorley-warkworth/). The community is invited to

visit the MTW website to learn more about the MTW CCC, as well as other aspects of MTW operations and projects.

During the reporting period the CCC members were:

- Dr Col Gellatly - Independent Chair
- Cr Hollee Jenkins - Singleton Council Representative
- Mr Ian Hedley – Community Representative
- Mr Stewart Mitchell – Community Representative
- Mrs Barb Brown – Community Representative
- Mrs Myree Russell – Community Representative (appointed 5 March 2025)
- Mr Kevin Waldock - Community Representative (appointed 5 March 2025)
- Mr Neville Hodkinson – Stakeholder Representative - Singleton Shire Healthy Environment Group
- Mr Graeme O'Brien – Community Representative (Alternate)

Company representatives attending the CCC included:

- Mr Cris Shadbolt - MTW General Manager
- Mr Gary Mulhearn – MTW Environment & Community Manager
- Mr Joshua van Bezouwen – MTW Environment & Community Advisor

During December 2024, as requested by the Chair after the resignation of a CCC member in October 2024, MTW commenced an advertising campaign seeking nominations for additional CCC members. The advertising campaign comprised newspaper advertisements, and direct letters to near neighbours to MTW. The nomination closing date was 17 January 2025. After closing date, the Chair submitted applicants to DPHI, and subsequently two new community members were appointed to the MTW CCC by a nominee of the Planning Secretary on 5 March 2025 (as listed above).

8.2.3 Community Support and Development

In 2025, MTW continued its focus on ensuring the long-term sustainability of the communities in which it operates, through the facilitation of community development programmes such as:

- Voluntary Planning Agreement
- Mount Thorley Warkworth Community Support Program

8.2.3.1 Voluntary Planning Agreement

In 2025, MTW continued contributions to the voluntary planning agreement funds required by development consents SSD-6464 and SSD-6465, and as agreed with Singleton Council. During 2025, MTW contributed a further $550,000 excluding GST, bringing total VPA contributions at end of 2025 to $9.05M of the total commitment value of $11M.

Singleton Council operates the Mount Thorley Warkworth VPA Community Committee which discusses the Bulga Community Project Fund component ($6.6M) of the total VPA commitment value

($11M). During 2025, the committee was chaired by Mayor Sue Moore and includes senior staff from Council, community representatives, and a Yancoal representative. In 2025, the Bulga Community Project Funds provided from the VPA increased to $5.15M of the $6.6M fund total, and there has been $3.46M of funds committed to projects in the Bulga / Milbrodale area from the Bulga Community Project Fund. A summary of approved and completed projects is provided in **Table 8.2.**

TABLE 8.2 MTW VPA BULGA COMMUNITY FUND APPROVED AND COMPLETED PROJECTS

Approved Project	Project Lead	Allocated Funding
Recreation area improvements and exercise equipment project	Singleton Council	$80,000.00
Bulga Stock Reserve Plan of Management & Masterplan	Singleton Council	$60,000.00
Lockable noticeboard	Singleton Council	$2,000.00
Old Bulga School restoration	Bulga Milbrodale Progress Association	$430,000.00
Wollombi Brook Walking Trail Masterplan and land purchase exploration	Singleton Council	$20,000.00
Electronic message board	Singleton Council	$27,014.00
Milbrodale Public School - Welsh's Road sealing 600m	Singleton Council	$517,259.68
Bulga Stock Reserve Stage 1 maintenance works	Singleton Council	$46,811.82
Bulga Stock Reserve Stage 2 detailed survey	Singleton Council	$15,000.00
Bulga Stock Reserve Stage 3 Aboriginal cultural study	Singleton Council	$10,000.00
Bulga Stock Reserve – Detailed landscape design	Singleton Council	$20,000
Bulga Milbrodale Equestrian Centre Feasibility Study	Bulga Milbrodale Equestrian Centre	$80,000
Bulga Stock Reserve – Ecological Restoration Plan	Singleton Council	$34,800
Bulga Stock Reserve Stage 4 detailed design plans	Singleton Council	$25,000
Bulga Tennis Court Refurbishment	Singleton Council	$526,004.76
Bulga Stock Reserve - Strategic Restoration Plan	Singleton Council	$500,000
Bulga Community Centre Improvements	Bulga Hall Committee	$115,016
Bulga War Memorial Gates Refurbishment	Singleton Council	$56,047.90
Resurfacing of the Cricket Pitch at Bulga Recreation Ground	Singleton Council	$31,200
Bulga Recreation Ground RV dump point	Singleton Council	$60,000.00
Bulga Community Centre (Hall)	Bulga Hall Committee	$242,480.64
Mount Thorley Warkworth VPA - Bulga and Milbrodale Community Events Fund	Bulga Hall Committee	$20,000

Approved Project	Project Lead	Allocated Funding
Mount Thorley Warkworth VPA - Equipping Bulga Hall for Emergencies	Bulga Hall Committee	$28,000
Project Officer resource – 3 year contract	Singleton Council	$390,000.00
Project management incidentals	Singleton Council	$24,000.00
Completed Projects		
Milbrodale Public School Yarning Circle	Milbrodale Public School	$3,000.00
Milbrodale Public School storage room renovations	Milbrodale Public School	$22,000.00
Friends of St Mark's Cemetery - replacement fence	Friends of St Marks Cemetery	$17,590.44
Baiame Caves Access Road	Singleton Council	$36,677.96
Gravel bus U-turn Bay off Welsh's Road	Singleton Council	$17,920
	TOTAL ALLOCATED FUNDING	**$ 3,457,823.20**

8.2.3.2 MTW Community Support Program

In 2025 MTW continued implementation of the Yancoal Community Support Program (CSP). The CSP intends to make a genuine positive difference to the communities in which Yancoal operates. Applications for CSP partnerships are formally received once per funding year. MTW considers and supports applications for local donations and sponsorships that have a clear community benefit and are aligned with the CSP guidelines.

The 2025 round of applications were advertised in August-September 2024 and closed 27 Sep 2024. There were 33 applications received, and one additional after closing date. The following organisations / projects supported in 2025 through the CSP are listed in **Table 8.3**.

TABLE 8.3 MTW COMMUNITY SUPPORT PROGRAM PROJECTS

Organisation	Project
Business Singleton	2025 Events Program – Business Awards / International Women's Day / 1 x Chamber Breakfast / October Business Luncheon
Family History Society Singleton Inc	The Beginning of Singleton Fire Station 444 (1878) – Book printing
Hunter Valley Amateur Bee Keeping Association	Varroa Controller Biosecurity Protection Equipment
Maitland Saints AFL Club	Boundary Protection Netting
Northern Agriculture Association	Singleton Show and Campdraft 2025
Rotary Club of Singleton on Hunter	Singleton Art Prize 2025
Rural Fire Service Bowthorne/Hinton	Portable Lighting and tools

Organisation	Project
Samaritans Foundation	Christmas Lunch in Singleton 2025
Singleton Clay Target Club Inc	2025 Champion Season – Trophies /prizes
Singleton Council	Christmas on John Street 2025
Singleton Council - Library	Digital Support for Library Outreach
Singleton Council	Seniors High Tea & Expo
Singleton Dressage Club	Dressage Championship Prizes
Singleton Fire Brigade Social Club	Santa Lolly Run 2025
Singleton Golf Club – Lady Members	Ladies Golf Club Open Day 2025
Singleton Heights Pre School	Weatherproofing the Soft Fall Area
Singleton Mountain Bike Club	Picnic Tables and Shade Shelters
Singleton Neighbourhood Centre	Volunteer Training – Senior First Aid
Singleton Rugby Club Ltd	Improve Car Park at the Club
Singleton Strikers Football Club	Senior Goals
Singleton Theatrical Society	2025 Productions
Towns With Heart Inc	Kurri Kurri Nostalgia Festival 2025
United Hospital Auxiliary - Singleton	Hospital Bed Upgrade
YWCA Hunter Region Inc	YWCA Encore
University of Newcastle	Science & Engineering Challenge (Year 3 of 3 year agreement)
University of Newcastle	SMART Science School Tour (Year 3 of 3 year agreement)
Singleton Roosters AFL Club	IT equipment (laptop and printer)
Westpac Rescue Helicopter	Charity Golf Day 2025 Sponsorship

Advertising for the 2026 Community Support Program occurred over August-September 2025 with applications closing 26 September 2025. A report on the 2026 CSP will be provided in the next reporting period.

For information on the Yancoal Community Support Program please visit our website at https://www.yancoal.com.au/our-sites/mount-thorley-documents/#mgt-docs or email mtw.csp@yancoal.com.au.

9 INDEPENDENT ENVIRONMENTAL AUDIT

An Independent Environmental Audit was completed during the 2023 reporting period. An update of progress against the Action Plan developed in response to the 2023 Independent Environmental Audit is included in **Appendix 9**. The next MTW Independent Environmental Audit is due in 2026.

The environmental audit report and MTW's response to recommendations are available in full on the company website (https://www.yancoal.com.au/our-sites/mount-thorley-documents/#mgt-docs).

10 INCIDENTS AND NON-COMPLIANCE

A summary of the environmental incidents reported during 2025 are provided in **Table 10.1**.

TABLE 10.1 ENVIRONMENTAL INCIDENT SUMMARY 2025

Date	Incident Details	Follow up Actions
29/03/2025	Discharge from three boundary sediment dam 56N as a result of a greater than design rainfall event. Rainfall started at approximately 8:06pm on Friday 28 March 2025 and continued until approximately 5:20pm on Saturday 29 March 2025. A total of 60.4mm of rainfall was recorded during the period.	Notifications to the relevant regulatory authorities was undertaken by the MTW Environment and Community Manager (Acting) in accordance with the sites Pollution Incident Response Management Plan. Dewatering of Dam 56N continued throughout and post the rainfall event to the site's mine water management system to dewater these dams to their lowest operating levels. Water samples were collected from monitoring sites during the event and analysis results obtained. Sample results indicated no environmental harm.
26/05/2025	A WML North Pit blast (n43-haircut-bfb-ptg1) which was fired at approximately 2:35pm on 26 May 2025 recorded an airblast overpressure measurement of 122.6 dB(L) at the Bulga Village monitoring location which is an exceedance of the 120 dB(L) threshold for airblast overpressure.	A preliminary notification of the suspected airblast overpressure exceedance was reported to the DPHI and to the EPA on 26 May 2025. An investigation into this event was completed and a written report was provided to the DPHI and to the EPA on 2 June 2025. The investigation was unable to determine a definitive cause for this event, however, meteorological conditions and the monitoring unit were unable to be ruled out. The DPHI elected to record the breach with no further regulatory action proposed on 12 August 2025 and an Official Caution was issued by the EPA in relation to this matter on 1 September 2025. MTW conducted further investigation regarding the instrumentation by installing a second monitor at the Bulga Village location so that results from the 2 monitors could be compared. This investigation found that the blast monitor was operating in accordance with the airblast overpressure tolerances specified by the manufacturer. Although, interference from wind and equipment issues did occur.

Date	Incident Details	Follow up Actions
		MTW notified affected landowners in writing of this exceedance.
3/08/2025	Discharge from two boundary sediment dams (Dam 56N and 57N) as a result of a greater than design rainfall event. Rainfall started at approximately 1:52am on Saturday 2 August 2025 and continued until approximately 8:41pm on Sunday 3 August 2025. A total of 70mm of rainfall was recorded during the period.	Notifications to the relevant regulatory authorities was undertaken by the MTW Environment and Community Manager (Acting) in accordance with the sites Pollution Incident Response Management Plan. Dewatering of Dam 56N and 57N continued throughout and post the rainfall event to the site's mine water management system to dewater these dams to their lowest operating levels. Water samples were collected from monitoring sites during the event and analysis results obtained. Sample results indicated no environmental harm.
12/08/2025	An exceedance of the WML Noise Impact Assessment criteria was recorded at the Wambo Road monitoring location on 12 of August 2025 starting at 9:29pm. A mining continuum from WML was audible throughout the measurement, generating a site only LAeq of 37dB. A low-frequency modifying factor of +2dB was applicable to the Wambo Road measurement, in accordance with the Noise Policy for Industry (NPfI), resulting in an adjusted site-only LAeq of 39 dB, which exceeded the relevant criterion by 1 dB.	In accordance with the approved Noise Management Plan process, after the conclusion of the entire noise monitoring survey's on 12 August 2025 at 01:03am, the noise consultant advised MTW of the potential noise exceedances at the Wambo Road location. MTW's active noise monitoring and management actions were able to identify and manage noise levels at the Wambo Road monitoring location. Implementation of MTW's noise management and mitigation measures meant that only a short time (1hr 21min) elapsed between the independent noise consultant identifying the potential noise exceedance, and MTW confirming that noise levels were compliant with noise limits at the Wambo Road location DPHI was notified in writing of the exceedance measurement on 13 August 2025. A written report was provided to DPHI on 20 August 2025.

11 ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

MTW will endeavour to carry out the following activities during the 2026 reporting period at Mount Thorley Warkworth, as outlined in **Table 11.1**.

TABLE 11.1 PROPOSED ACTIVITIES FOR 2026 REPORTING PERIOD

ID	Performance Area	Activities Proposed
1	Noise	• Maintain and continue sound power level testing of attenuated fleet. • Continue undertaking noise management and monitoring actions in accordance with the MTW Noise Management Plan, including use of the noise monitoring instrument and post processing tool to identify low frequency modifying factor with supplementary noise readings by MTW personnel.
2	Blasting	• Testing and verification of a real time model, which will use real time meteorological data from weather stations throughout the Hunter Valley to better determine the effect of possible overpressure enhancement (real time model in development).
3	Air Quality	• Upgrade of MTW DustTrak units. • Upgrade of Charlton Ridge meteorological station. • Continue undertaking air quality management and monitoring actions in accordance with the MTW Air Quality Management Plan.

ID	Performance Area	Activities Proposed
4	Aboriginal Cultural Heritage	• Ongoing Aboriginal Cultural Heritage management in accordance with the AHMP plans. • Implementation of actions identified by the 2025 AHMP Compliance Inspection. • Inspection of the MTW-70 site (scarred tree) by CHWG representatives to verify cultural significance. • Salvage of the February 2025 chance find from the ahead of mine area. • Progression of registration of the respective Wollombi Brook and Loders Creek Aboriginal Cultural Heritage Conservation Agreements on title during the period. • Cultural Heritage Working Group (CHWG) and Conservation Area Plan of Management Implementation Group (PMIG) meetings are planned to occur. Progression of the Implementation Plans for the Conservation Areas.
5	Historic Heritage	• Ongoing Historic Heritage management in accordance with the HHMP. • Routine inspection and area maintenance works at Springwood Homestead, Red Brick House, and the RAAF Cook House. • Removal of trees around Springwood Homestead removal of trees around the building and supplementary stabilisation works (as needed). Scope development for subsequent preservation works. • Complete RAAF Mess Hall track re-establishment and upgrade. Staged removal of asbestos containing materials, removal of hazardous tree-fall and surrounding vegetation, and initial structural stabilisation works. • Establishment of curtilage fencing around immediate surrounds of Red Brick House. Scope development for future works. • Meetings of the Cultural Heritage Advisory Group (CHAG).
6	Water	• Dam desilting program to maintain dam capacity. • Implementation of actions/recommendations from the annual groundwater review. • Continue to monitor Rehabilitation runoff water quality. • Addition of the new HRSTS discharge point at MTO Dam 6S to the Environmental Protection Licence 1976 and final commissioning of the infrastructure to achieve increased discharge rates as approved under the Mount Thorley Operations Consent (SSD-6465).

ID	Performance Area	Activities Proposed
7	Rehabilitation	• Completion criteria will be drafted and submitted to Resources Regulator for approval. • The rehabilitation monitoring programme will continue in 2026 for native vegetation and agriculture (grazing) rehabilitation areas. The monitoring program will be varied to align with changes to completion criteria in the Rehabilitation Management Plan as required. • Management activities outlined in the MTW Rehabilitation Enhancement Strategy will be implemented to progress rehabilitation areas to the final land use. • LOM growth medium study to identify suitable subsoils/spoils for use as growth medium in native vegetation rehabilitation areas. • Weed spraying (boom and spot spraying), cut and paint and weed wiping will be conducted in establishing rehabilitation areas as required to control both noxious and environmental weeds that are likely to impact on successful rehabilitation being achieved. It is planned that 89ha of new rehabilitation will be undertaken at MTW during 2026. • Habitat augmentation measures, such as the construction of habitat ponds and the placement of salvaged logs in rehabilitation areas. • Surface water will be managed on Tailings Dam 2 with the aim to increase the strength of the tailings surface. Capping activities will continue on areas of the Tailings Dam 2 surface that allow for the safe placement of material, following ongoing geotechnical investigations. • Access tracks in rehabilitation areas will be upgraded to provide better access for maintenance and monitoring activities. • Conduct an analysis of the final landform stability using a landform evolution model. • Review seed mixes used to ensure that appropriate species and rates are being applied to new rehabilitation areas.

ID	Performance Area	Activities Proposed
8	Biodiversity Management	• Planting works will continue to restore Warkworth Sands Woodland in the Northern BA. • Conservation management actions will be undertaken across the BAs in 2026 in accordance with the Offset Management Plans, these will include; weed management, vertebrate pest management including 1080 ground baiting programmes to target wild dogs and foxes scheduled for autumn and spring and a Noisy miner control program in the Regent honeyeater breeding area at the Goulburn River and Bowditch BA's, thermal ground shooting programmes at Bowditch and Goulburn River, rapid condition assessments, overall fuel load assessments and property inspections will be undertaken across all BAs, habitat restoration monitoring and bird assemblage monitoring will be undertaken.. • A hazard reduction burn for North Rothbury BA will be undertaken if conditions are within prescribed criteria. • Infrastructure improvement including fence repairs and replacement, erosion repairs, track maintenance and river crossing installations will be undertaken as required. • Review and Revise Biodiversity Area Management Plans • Progress the securing of biodiversity offset areas, after determination of credit equivalence by Conservation Programs, Heritage and Regulation (CPHR) (formerly BCS) through Biodiversity Stewardship Agreements for each offset area.
9	Community Engagement	• Continued operation of the Community Consultation Committee. • Implementation of the MTW Social Impact Management Plan (which outlines specific and general stakeholder engagement and consultation requirements).
10	Community Development	• Implementation of the Yancoal Community Support Program (CSP) during 2026. The CSP program provides an opportunity for multiple site or group-wide investment in larger, long-term, capacity building projects that make a positive difference. Focus areas include health, social and community, environment, education and training. • Continued funding and participation as a committee representative for the MTW Voluntary Planning Agreement to progress sustainable community projects in the local area.

Appendix 1:

Compliance Noise Monitoring Data



Compliance Noise Monitoring Data

Yancoal Mt Thorley Warkworth

2025

1.0 Noise

Routine attended noise monitoring is carried out in accordance with the MTW Noise Management Plan (NMP). The purpose of the noise surveys is to quantify and describe the acoustic environment around the site and compare results with specified limits. Attended noise monitoring locations are displayed in **Figure 1**.

1.1 Attended Noise Monitoring Results

Monthly attended monitoring was conducted at receiver locations surrounding MTW in 2025. There was one noise measurement taken during the reporting period which exceeded consent conditions following application of NPfI low frequency modifying factor. There was a single $L_{A1.1\ minute}$ exceedance recorded during the February attended monitoring, however follow up monitoring was completed in accordance with the NMP and recorded $L_{A1.1\ minute}$ below criterion. Results are detailed in **Table 1** to **Table 4.**

1.1.1 WML Noise Assessment

Compliance assessments undertaken against the WML noise criteria are presented in **Tables 1** and **2**.

Table 1: $L_{Aeq,\ 15\ minute}$ Warkworth Impact Assessment Criteria – 2025

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB(A)	Criterion Applies?[1]	WML L_{Aeq} dB[2,3,4,7]	Exceedance[3,4,6]
Bulga RFS	14/01/2025 23:51	1.8	F	37	Yes	35	Nil
Bulga Village	14/01/2025 22:20	3.4	E	38	No	IA	N/A
Gouldsville	14/01/2025 21:20	3.4	D	38	No	IA	N/A
Inlet Rd	14/01/2025 21:23	4.1	D	37	No	31	N/A
Inlet Rd West	14/01/2025 21:00	3.1	D	35	No	<25	N/A
Long Point	14/01/2025 21:00	3.1	D	35	No	IA	N/A
South Bulga	14/01/2025 23:00	1.4	F	35	Yes	IA	Nil
Wambo Road	14/01/2025 21:49	3.7	D	38	No	30	N/A
Bulga RFS	27/02/2025 22:49	2.0	F	37	Yes	37	Nil
Bulga RFS[5]	27/02/2025 23:13	2.2	F	37	No	31	N/A
Bulga RFS[5]	27/02/2025 23:30	1.9	F	37	Yes	<30	Nil
Bulga RFS[5]	27/02/2025 23:47	1.6	F	37	Yes	<30	Nil
Bulga RFS[5]	28/02/2025 00:04	1.9	F	37	Yes	IA	Nil
Bulga RFS[5]	28/02/2025 00:22	1.8	F	37	Yes	IA	Nil
Bulga RFS[6]	12/03/2025 22:53	2.0	F	37	Yes	30	Nil
Bulga Village	27/02/2025 22:07	1.2	F	38	Yes	31	Nil
Gouldsville	27/02/2025 21:22	1.9	F	38	Yes	IA	Nil
Inlet Road	27/02/2025 21:21	1.9	F	37	Yes	32	Nil
Inlet Road West	27/02/2025 21:00	2.3	F	35	No	<25	N/A
Long Point	27/02/2025 21:00	2.3	F	35	No	IA	N/A
South Bulga	28/02/2025 01:06	1.2	F	35	Yes	<20	Nil
Wambo Road	27/02/2025 21:45	2.2	F	38	No	26	N/A
Bulga RFS	17/03/2025 23:04	3.4	D	37	No	IA	N/A
Bulga Village	17/03/2025 22:19	3.4	D	38	No	<20	N/A
Gouldsville	17/03/2025 21:21	2.6	D	38	Yes	<20	Nil
Inlet Rd	17/03/2025 21:26	2.7	D	37	Yes	<20	Nil

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB(A)	Criterion Applies?[1]	WML L_{Aeq} dB[2,3,4,7]	Exceedance[3,4,6]
Inlet Rd West	17/03/2025 21:00	3.0	D	35	Yes	<20	Nil
Long Point	17/03/2025 21:00	3.0	D	35	Yes	IA	Nil
South Bulga	17/03/2025 23:55	3.5	D	35	No	IA	N/A
Wambo Road	17/03/2025 21:53	3.2	D	38	No	<25	N/A
Bulga RFS	8/04/2025 23:44	1.5	D	37	Yes	IA	Nil
Bulga Village	8/04/2025 22:53	1.8	D	38	Yes	30	Nil
Gouldsville	8/04/2025 21:21	2.2	F	38	No	IA	N/A
Inlet Road	8/04/2025 21:24	1.9	F	37	Yes	37	Nil
Inlet Road West	8/04/2025 21:00	2.1	F	35	No	29	N/A
Long Point	8/04/2025 21:00	2.1	F	35	No	IA	N/A
South Bulga	9/04/2025 00:37	2.3	D	35	Yes	<25	Nil
Wambo Road	8/04/2025 22:25	1.6	D	38	Yes	31	Nil
Bulga RFS	29/05/2025 23:41	1.6	F	37	Yes	<20	Nil
Bulga Village	29/05/2025 22:16	2.3	E	38	Yes	27	Nil
Gouldsville	29/05/2025 21:21	1.3	D	38	Yes	33	Nil
Inlet Road	29/05/2025 21:29	1.6	D	37	Yes	<20	Nil
Inlet Road West	29/05/2025 21:09	1.3	D	35	Yes	IA	Nil
Long Point	29/05/2025 21:00	1.7	D	35	Yes	IA	Nil
South Bulga	29/05/2025 23:20	1.9	E	36	Yes	<20	Nil
Wambo Road	29/05/2025 21:55	2.2	D	38	Yes	26	Nil
Bulga RFS	17/06/2025 23:35	2.7	E	37	Yes	<20	Nil
Bulga Village	17/06/2025 22:07	2.2	F	38	No	30	N/A
Gouldsville	17/06/2025 21:22	2.2	E	38	Yes	29	Nil
Inlet Road	17/06/2025 21:22	2.4	D	37	Yes	<25	Nil
Inlet Road West	17/06/2025 21:00	3.3	D	35	No	<25	N/A
Long Point	17/06/2025 21:00	3.3	D	35	No	<20	N/A
South Bulga	17/06/2025 22:50	1.7	F	35	Yes	IA	Nil
Wambo Road	17/06/2025 21:46	2.2	F	38	No	29	N/A
Bulga RFS	17/07/2025 23:50	2.2	F	37	No	IA	N/A
Bulga Village	17/07/2025 22:16	2.5	D	38	Yes	37	Nil
Gouldsville	17/07/2025 21:24	1.5	F	38	Yes	25	Nil
Inlet Road	17/07/2025 21:20	1.3	F	37	Yes	29	Nil
Inlet Road West	17/07/2025 21:00	1.2	D	35	Yes	<25	Nil
Long Point	17/07/2025 21:00	1.2	D	35	Yes	<20	Nil
South Bulga	17/07/2025 23:08	1.8	E	35	Yes	IA	Nil
Wambo Road	17/07/2025 21:55	1.5	F	38	Yes	29	Nil
Bulga RFS	12/08/2025 23:20	2.6	D	37	Yes	34	Nil
Bulga Village	12/08/2025 21:58	2.4	D	38	Yes	35	Nil
Gouldsville	12/08/2025 21:21	2.1	E	38	Yes	IA	Nil
Inlet Road	12/08/2025 22:29	2.5	D	37	Yes	34	Nil
Inlet Road West	12/08/2025 21:00	1.7	D	35	Yes	29	Nil
Long Point	12/08/2025 21:00	1.7	D	35	Yes	IA	Nil
South Bulga	13/08/2025 00:09	2.7	D	35	Yes	IA	Nil

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB(A)	Criterion Applies?[1]	WML L_{Aeq} dB[2,3,4,7]	Exceedance[3,4,6]
Wambo Road	12/08/2025 21:29	2.0	E	38	Yes	**39**	**1**
Wambo Road[6]	18/08/2025 22:43	3.6	D	38	No	26	N/A
Bulga RFS	3/09/2025 23:42	1.9	E	37	Yes	35	Nil
Bulga Village	3/09/2025 22:05	1.3	F	38	Yes	38	Nil
Gouldsville	3/09/2025 21:23	1.2	F	38	Yes	<25	Nil
Inlet Road	3/09/2025 21:20	2.0	E	37	Yes	31	Nil
Inlet Road West	3/09/2025 21:00	2.1	D	35	Yes	<20	Nil
Long Point	3/09/2025 21:00	2.1	D	35	Yes	<30	Nil
South Bulga	3/09/2025 23:20	2.3	E	35	Yes	27	Nil
Wambo Road	3/09/2025 21:43	1.3	F	38	Yes	29	Nil
Bulga RFS	20/10/2025 22:48	1.4	F	37	Yes	26	Nil
Bulga Village	20/10/2025 22:08	2.0	E	38	Yes	<25	Nil
Gouldsville	20/10/2025 21:20	1.2	F	38	Yes	IA	Nil
Inlet Road	20/10/2025 21:21	1.2	F	37	Yes	26	Nil
Inlet Road West	20/10/2025 21:00	1.7	E	35	Yes	<25	Nil
Long Point	20/10/2025 21:00	1.7	E	35	Yes	<20	Nil
South Bulga	20/10/2025 23:12	1.0	F	35	Yes	<20	Nil
Wambo Road	20/10/2025 21:46	1.5	E	38	Yes	28	Nil
Bulga RFS	4/11/2025 22:48	2.5	D	37	Yes	<20	Nil
Bulga Village	4/11/2025 22:08	2.7	D	38	Yes	<25	Nil
Gouldsville	4/11/2025 21:23	3.1	D	38	No	<25	N/A
Inlet Road	4/11/2025 21:23	3.1	D	37	No	<20	N/A
Inlet Road West	4/11/2025 21:02	3.1	D	35	No	IA	N/A
Long Point	4/11/2025 21:00	3.1	D	35	No	IA	N/A
South Bulga	4/11/2025 23:09	1.9	F	35	Yes	IA	Nil
Wambo Road	4/11/2025 21:46	3.4	D	38	No	<20	N/A
Bulga RFS	17/12/2025 23:41	2.1	F	37	No	26	N/A
Bulga Village	17/12/2025 22:59	3.5	D	38	No	31	N/A
Gouldsville	17/12/2025 21:30	1.8	F	38	Yes	IA	Nil
Inlet Road	17/12/2025 22:07	1.9	F	37	Yes	31	Nil
Inlet Road West	17/12/2025 21:44	2.0	F	35	Yes	32	Nil
Long Point	17/12/2025 21:00	1.8	F	35	Yes	IA	Nil
South Bulga	18/12/2025 00:22	2.4	F	35	No	<20	N/A
Wambo Road	17/12/2025 22:36	3.2	D	38	No	29	N/A

Notes:

1. Noise limits are applicable if weather conditions were within parameters specified in Section 2.3. Criterion may or may not apply due to rounding of meteorological data values.

2. Site-only LAeq, 15 minute attributed to MTO, including modifying factors if applicable.

3. IA denotes 'Inaudible'.

4. NA in exceedance column means atmospheric conditions outside conditions specified in consent, therefore criterion was not applicable.

5. Remeasure after initial measured exceedance. Five 15-minute measurements were taken instead of five 1-minute measurements.

6. Follow up measurement within one week of measured exceedance.

7. Bold results in red indicate exceedance of relevant criterion.

Table 2: $L_{A1,\ 1\ minute}$ Warkworth - Impact Assessment Criteria – 2025

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB(A)	Criterion Applies?[1]	WML $L_{A1,\ 1min}$ dB[2,3,4,7]	Exceedance[3,4,6]
Bulga RFS	14/01/2025 23:51	1.8	F	47	Yes	40	Nil
Bulga Village	14/01/2025 22:20	3.4	E	48	No	IA	N/A
Gouldsville	14/01/2025 21:20	3.4	D	48	No	IA	N/A
Inlet Rd	14/01/2025 21:23	4.1	D	47	No	39	N/A
Inlet Rd West	14/01/2025 21:00	3.1	D	45	No	<25	N/A
Long Point	14/01/2025 21:00	3.1	D	45	No	IA	N/A
South Bulga	14/01/2025 23:00	1.4	F	45	Yes	IA	Nil
Wambo Road	14/01/2025 21:49	3.7	D	48	No	37	N/A
Bulga RFS	27/02/2025 22:49	2.0	F	47	Yes	52	5
Bulga RFS[5]	27/02/2025 23:13	2.2	F	47	No	33	N/A
Bulga RFS[5]	27/02/2025 23:30	1.9	F	47	Yes	38	Nil
Bulga RFS[5]	27/02/2025 23:47	1.6	F	47	Yes	<30	Nil
Bulga RFS[5]	28/02/2025 00:04	1.9	F	47	Yes	IA	Nil
Bulga RFS[5]	28/02/2025 00:22	1.8	F	47	Yes	IA	Nil
Bulga RFS[6]	12/03/2025 22:53	2.0	F	47	Yes	33	Nil
Bulga Village	27/02/2025 22:07	1.2	F	48	Yes	35	Nil
Gouldsville	27/02/2025 21:22	1.9	F	48	Yes	IA	Nil
Inlet Road	27/02/2025 21:21	1.9	F	47	Yes	45	Nil
Inlet Road West	27/02/2025 21:00	2.3	F	45	No	30	N/A
Long Point	27/02/2025 21:00	2.3	F	45	No	IA	N/A
South Bulga	28/02/2025 01:06	1.2	F	45	Yes	<20	Nil
Wambo Road	27/02/2025 21:45	2.2	F	48	No	31	N/A
Bulga RFS	17/03/2025 23:04	3.4	D	47	No	IA	N/A
Bulga Village	17/03/2025 22:19	3.4	D	48	No	<20	N/A
Gouldsville	17/03/2025 21:21	2.6	D	48	Yes	<25	Nil
Inlet Rd	17/03/2025 21:26	2.7	D	47	Yes	32	Nil
Inlet Rd West	17/03/2025 21:00	3.0	D	45	Yes	<20	Nil
Long Point	17/03/2025 21:00	3.0	D	45	Yes	IA	Nil
South Bulga	17/03/2025 23:55	3.5	D	45	No	IA	N/A
Wambo Road	17/03/2025 21:53	3.2	D	48	No	<25	N/A
Bulga RFS	8/04/2025 23:44	1.5	D	47	Yes	IA	Nil
Bulga Village	8/04/2025 22:53	1.8	D	48	Yes	36	Nil
Gouldsville	8/04/2025 21:21	2.2	F	48	No	IA	N/A
Inlet Road	8/04/2025 21:24	1.9	F	47	Yes	44	Nil
Inlet Road West	8/04/2025 21:00	2.1	F	45	No	33	N/A
Long Point	8/04/2025 21:00	2.1	F	45	No	IA	N/A
South Bulga	9/04/2025 00:37	2.3	D	45	Yes	<25	Nil
Wambo Road	8/04/2025 22:25	1.6	D	48	Yes	34	Nil

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB(A)	Criterion Applies?[1]	WML $L_{A1, 1min}$ dB[2,3,4,7]	Exceedance[3,4,6]
Bulga RFS	29/05/2025 23:41	1.6	F	47	Yes	<25	Nil
Bulga Village	29/05/2025 22:16	2.3	E	48	Yes	<30	Nil
Gouldsville	29/05/2025 21:21	1.3	D	48	Yes	39	Nil
Inlet Road	29/05/2025 21:29	1.6	D	47	Yes	<20	Nil
Inlet Road West	29/05/2025 21:09	1.3	D	45	Yes	IA	Nil
Long Point	29/05/2025 21:00	1.7	D	45	Yes	IA	Nil
South Bulga	29/05/2025 23:20	1.9	E	45	Yes	<30	Nil
Wambo Road	29/05/2025 21:55	2.2	D	48	Yes	<30	Nil
Bulga RFS	17/06/2025 23:35	2.7	E	47	Yes	<20	Nil
Bulga Village	17/06/2025 22:07	2.2	F	48	No	33	N/A
Gouldsville	17/06/2025 21:22	2.2	E	48	Yes	47	Nil
Inlet Road	17/06/2025 21:22	2.4	D	47	Yes	<25	Nil
Inlet Road West	17/06/2025 21:00	3.3	D	45	No	<25	N/A
Long Point	17/06/2025 21:00	3.3	D	45	No	<20	N/A
South Bulga	17/06/2025 22:50	1.7	F	45	Yes	IA	Nil
Wambo Road	17/06/2025 21:46	2.2	F	48	No	29	N/A
Bulga RFS	17/07/2025 23:50	2.2	F	47	No	IA	N/A
Bulga Village	17/07/2025 22:16	2.5	D	48	Yes	39	Nil
Gouldsville	17/07/2025 21:24	1.5	F	48	Yes	30	Nil
Inlet Road	17/07/2025 21:20	1.3	F	47	Yes	30	Nil
Inlet Road West	17/07/2025 21:00	1.2	D	45	Yes	28	Nil
Long Point	17/07/2025 21:00	1.2	D	45	Yes	<20	Nil
South Bulga	17/07/2025 23:08	1.8	E	45	Yes	IA	Nil
Wambo Road	17/07/2025 21:55	1.5	F	48	Yes	35	Nil
Bulga RFS	12/08/2025 23:20	2.6	D	47	Yes	40	Nil
Bulga Village	12/08/2025 21:58	2.4	D	48	Yes	44	Nil
Gouldsville	12/08/2025 21:21	2.1	E	48	Yes	IA	Nil
Inlet Road	12/08/2025 22:29	2.5	D	47	Yes	45	Nil
Inlet Road West	12/08/2025 21:00	1.7	D	45	Yes	34	Nil
Long Point	12/08/2025 21:00	1.7	D	45	Yes	IA	Nil
South Bulga	13/08/2025 00:09	2.7	D	45	Yes	IA	Nil
Wambo Road	12/08/2025 21:29	2.0	E	48	Yes	43	Nil
Wambo Road[6]	18/08/2025 22:43	3.6	D	48	No	30	N/A
Bulga RFS	3/09/2025 23:42	1.9	E	47	Yes	46	Nil
Bulga Village	3/09/2025 22:05	1.3	F	48	Yes	46	Nil
Gouldsville	3/09/2025 21:23	1.2	F	48	Yes	29	Nil
Inlet Road	3/09/2025 21:20	2.0	E	47	Yes	39	Nil
Inlet Road West	3/09/2025 21:00	2.1	D	45	Yes	<20	Nil
Long Point	3/09/2025 21:00	2.1	D	45	Yes	<30	Nil
South Bulga	3/09/2025 23:20	2.3	E	45	Yes	32	Nil

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB(A)	Criterion Applies?[1]	WML $L_{A1, 1min}$ dB[2,3,4,7]	Exceedance[3,4,6]
Wambo Road	3/09/2025 21:43	1.3	F	48	Yes	32	Nil
Bulga RFS	20/10/2025 22:48	1.4	F	47	Yes	32	Nil
Bulga Village	20/10/2025 22:08	2.0	E	48	Yes	28	Nil
Gouldsville	20/10/2025 21:20	1.2	F	48	Yes	IA	Nil
Inlet Road	20/10/2025 21:21	1.2	F	47	Yes	29	Nil
Inlet Road West	20/10/2025 21:00	1.7	E	45	Yes	<25	Nil
Long Point	20/10/2025 21:00	1.7	E	45	Yes	<20	Nil
South Bulga	20/10/2025 23:12	1.0	F	45	Yes	27	Nil
Wambo Road	20/10/2025 21:46	1.5	E	48	Yes	34	Nil
Bulga RFS	4/11/2025 22:48	2.5	D	47	Yes	<20	Nil
Bulga Village	4/11/2025 22:08	2.7	D	48	Yes	33	Nil
Gouldsville	4/11/2025 21:23	3.1	D	48	No	27	N/A
Inlet Road	4/11/2025 21:23	3.1	D	47	No	<25	N/A
Inlet Road West	4/11/2025 21:02	3.1	D	45	No	IA	N/A
Long Point	4/11/2025 21:00	3.1	D	45	No	IA	N/A
South Bulga	4/11/2025 23:09	1.9	F	45	Yes	IA	Nil
Wambo Road	4/11/2025 21:46	3.4	D	48	No	<20	N/A
Bulga RFS	17/12/2025 23:41	2.1	F	47	No	31	N/A
Bulga Village	17/12/2025 22:59	3.5	D	48	No	33	N/A
Gouldsville	17/12/2025 21:30	1.8	F	48	Yes	IA	Nil
Inlet Road	17/12/2025 22:07	1.9	F	47	Yes	34	Nil
Inlet Road West	17/12/2025 21:44	2.0	F	45	Yes	37	Nil
Long Point	17/12/2025 21:00	1.8	F	45	Yes	IA	Nil
South Bulga	18/12/2025 00:22	2.4	F	45	No	<25	N/A
Wambo Road	17/12/2025 22:36	3.2	D	48	No	31	N/A

Notes

1. Noise limits are applicable if weather conditions were within parameters specified in Section 2.3. Criterion may or may not apply due to rounding of meteorological data values.

2. Site-only LA1, 1 minute attributed to MTO, including modifying factors if applicable.

3. IA denotes 'Inaudible'.

4. NA in exceedance column means atmospheric conditions outside conditions specified in consent, therefore criterion was not applicable.

5. Remeasure after initial measured exceedance. Five 15-minute measurements were taken instead of five 1-minute measurements.

6. Follow up measurement within one week of measured exceedance.

7. Bold results in red indicate exceedance of relevant criterion

1.1.2 MTO Noise Assessment

Compliance assessments undertaken against the MTO noise criteria are presented in **Table 3** and **Table 4**.

Table 3: $L_{Aeq,\ 15minute}$ Mount Thorley - Impact Assessment Criteria – 2025

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB	Criterion Applies?[1]	MTO L_{Aeq} dB[2,3,4,7]	Exceedance[3,4,6]
Bulga RFS	14/01/2025 23:51	1.8	F	37	Yes	31	Nil
Bulga Village	14/01/2025 22:20	3.4	E	38	No	<25	N/A
Gouldsville	14/01/2025 21:20	3.4	D	35	No	IA	N/A
Inlet Rd	14/01/2025 21:23	4.1	D	37	No	<30	N/A
Inlet Rd West	14/01/2025 21:00	3.1	D	35	No	27	N/A
Long Point	14/01/2025 21:00	3.1	D	35	No	IA	N/A
South Bulga	14/01/2025 23:00	1.4	F	36	Yes	31	Nil
Wambo Road	14/01/2025 21:49	3.7	D	38	No	<25	N/A
Bulga RFS	27/02/2025 22:49	2.0	F	37	Yes	32	Nil
Bulga RFS[5]	27/02/2025 23:13	2.2	F	37	No	<30	N/A
Bulga RFS[5]	27/02/2025 23:30	1.9	F	37	Yes	<30	Nil
Bulga RFS[5]	27/02/2025 23:47	1.6	F	37	Yes	<25	Nil
Bulga RFS[5]	28/02/2025 00:04	1.9	F	37	Yes	<25	Nil
Bulga RFS[5]	28/02/2025 00:22	1.8	F	37	Yes	<20	Nil
Bulga RFS[6]	12/03/2025 22:53	2.0	F	37	Yes	27	Nil
Bulga Village	27/02/2025 22:07	1.2	F	38	Yes	<25	Nil
Gouldsville	27/02/2025 21:22	1.9	F	35	Yes	IA	Nil
Inlet Road	27/02/2025 21:21	1.9	F	37	Yes	<20	Nil
Inlet Road West	27/02/2025 21:00	2.3	F	35	No	<20	N/A
Long Point	27/02/2025 21:00	2.3	F	35	No	IA	N/A
South Bulga	28/02/2025 01:06	1.2	F	36	Yes	<20	Nil
Wambo Road	27/02/2025 21:45	2.2	F	38	No	31	N/A
Bulga RFS	17/03/2025 23:04	3.4	D	37	No	IA	N/A
Bulga Village	17/03/2025 22:19	3.4	D	38	No	<20	N/A
Gouldsville	17/03/2025 21:21	2.6	D	35	Yes	IA	Nil
Inlet Road	17/03/2025 21:26	2.7	D	37	Yes	<20	Nil
Inlet Road West	17/03/2025 21:00	3.0	D	35	Yes	<20	Nil
Long Point	17/03/2025 21:00	3.0	D	35	Yes	IA	Nil
South Bulga	17/03/2025 23:55	3.5	D	36	No	IA	N/A
Wambo Road	17/03/2025 21:53	3.2	D	38	No	<25	N/A
Bulga RFS	8/04/2025 23:44	1.5	D	37	Yes	32	Nil
Bulga Village	8/04/2025 22:53	1.8	D	38	Yes	<25	Nil
Gouldsville	8/04/2025 21:21	2.2	F	35	No	IA	N/A
Inlet Road	8/04/2025 21:24	1.9	F	37	Yes	<30	Nil
Inlet Road West	8/04/2025 21:00	2.1	F	35	No	<25	N/A

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB	Criterion Applies?[1]	MTO L_{Aeq} dB[2,3,4,7]	Exceedance[3,4,6]
Long Point	8/04/2025 21:00	2.1	F	35	No	IA	N/A
South Bulga	9/04/2025 00:37	2.3	D	36	Yes	29	Nil
Wambo Road	8/04/2025 22:25	1.6	D	38	Yes	<25	Nil
Bulga RFS	29/05/2025 23:41	1.6	F	37	Yes	<20	Nil
Bulga Village	29/05/2025 22:16	2.3	E	38	Yes	<25	Nil
Gouldsville	29/05/2025 21:21	1.3	D	35	Yes	IA	Nil
Inlet Road	29/05/2025 21:29	1.6	D	37	Yes	<20	Nil
Inlet Road West	29/05/2025 21:09	1.3	D	35	Yes	IA	Nil
Long Point	29/05/2025 21:00	1.7	D	35	Yes	IA	Nil
South Bulga	29/05/2025 23:20	1.9	E	36	Yes	<20	Nil
Wambo Road	29/05/2025 21:55	2.2	D	38	Yes	26	Nil
Bulga RFS	17/06/2025 23:35	2.7	E	37	Yes	<20	Nil
Bulga Village	17/06/2025 22:07	2.2	F	38	No	<20	N/A
Gouldsville	17/06/2025 21:22	2.2	E	35	Yes	IA	Nil
Inlet Road	17/06/2025 21:22	2.4	D	37	Yes	<20	Nil
Inlet Road West	17/06/2025 21:00	3.3	D	35	No	IA	N/A
Long Point	17/06/2025 21:00	3.3	D	35	No	IA	N/A
South Bulga	17/06/2025 22:50	1.7	F	36	Yes	<20	Nil
Wambo Road	17/06/2025 21:46	2.2	F	38	No	<25	N/A
Bulga RFS	17/07/2025 23:50	2.2	F	37	No	30	N/A
Bulga Village	17/07/2025 22:16	2.5	D	38	Yes	IA	Nil
Gouldsville	17/07/2025 21:24	1.5	F	35	Yes	IA	Nil
Inlet Road	17/07/2025 21:20	1.3	F	37	Yes	<25	Nil
Inlet Road West	17/07/2025 21:00	1.2	D	35	Yes	IA	Nil
Long Point	17/07/2025 21:00	1.2	D	35	Yes	<20	Nil
South Bulga	17/07/2025 23:08	1.8	E	36	Yes	<20	Nil
Wambo Road	17/07/2025 21:55	1.5	F	38	Yes	<25	Nil
Bulga RFS	12/08/2025 23:20	2.6	D	37	Yes	29	Nil
Bulga Village	12/08/2025 21:58	2.4	D	38	Yes	<25	Nil
Gouldsville	12/08/2025 21:21	2.1	E	35	Yes	IA	Nil
Inlet Road	12/08/2025 22:29	2.5	D	37	Yes	<20	Nil
Inlet Road West	12/08/2025 21:00	1.7	D	35	Yes	26	Nil
Long Point	12/08/2025 21:00	1.7	D	35	Yes	IA	Nil
South Bulga	13/08/2025 00:09	2.7	D	36	Yes	27	Nil
Wambo Road	12/08/2025 21:29	2.0	E	38	Yes	<25	Nil
Wambo Road[6]	18/08/2025 22:43	3.6	D	38	No	26	N/A
Bulga RFS	3/09/2025 23:42	1.9	E	37	Yes	<25	Nil
Bulga Village	3/09/2025 22:05	1.3	F	38	Yes	IA	Nil
Gouldsville	3/09/2025 21:23	1.2	F	35	Yes	IA	Nil

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB	Criterion Applies?[1]	MTO L_{Aeq} dB[2,3,4,7]	Exceedance[3,4,6]
Inlet Road	3/09/2025 21:20	2.0	E	37	Yes	IA	Nil
Inlet Road West	3/09/2025 21:00	2.1	D	35	Yes	<20	Nil
Long Point	3/09/2025 21:00	2.1	D	35	Yes	IA	Nil
South Bulga	3/09/2025 23:20	2.3	E	36	Yes	<20	Nil
Wambo Road	3/09/2025 21:43	1.3	F	38	Yes	<20	Nil
Bulga RFS	20/10/2025 22:48	1.4	F	37	Yes	31	Nil
Bulga Village	20/10/2025 22:08	2.0	E	38	Yes	IA	Nil
Gouldsville	20/10/2025 21:20	1.2	F	35	Yes	IA	Nil
Inlet Road	20/10/2025 21:21	1.2	F	37	Yes	<20	Nil
Inlet Road West	20/10/2025 21:00	1.7	E	35	Yes	IA	Nil
Long Point	20/10/2025 21:00	1.7	E	35	Yes	IA	Nil
South Bulga	20/10/2025 23:12	1.0	F	36	Yes	28	Nil
Wambo Road	20/10/2025 21:46	1.5	E	38	Yes	IA	Nil
Bulga RFS	4/11/2025 22:48	2.5	D	37	Yes	<20	Nil
Bulga Village	4/11/2025 22:08	2.7	D	38	Yes	IA	Nil
Gouldsville	4/11/2025 21:23	3.1	D	35	No	IA	N/A
Inlet Road	4/11/2025 21:23	3.1	D	37	No	IA	N/A
Inlet Road West	4/11/2025 21:02	3.1	D	35	No	IA	N/A
Long Point	4/11/2025 21:00	3.1	D	35	No	IA	N/A
South Bulga	4/11/2025 23:09	1.9	F	36	Yes	<20	Nil
Wambo Road	4/11/2025 21:46	3.4	D	38	No	IA	N/A
Bulga RFS	17/12/2025 23:41	2.1	F	37	No	31	N/A
Bulga Village	17/12/2025 22:59	3.5	D	38	No	<20	N/A
Gouldsville	17/12/2025 21:30	1.8	F	35	Yes	IA	Nil
Inlet Road	17/12/2025 22:07	1.9	F	37	Yes	<25	Nil
Inlet Road West	17/12/2025 21:44	2.0	F	35	Yes	IA	Nil
Long Point	17/12/2025 21:00	1.8	F	35	Yes	IA	Nil
South Bulga	18/12/2025 00:22	2.4	F	36	No	<25	N/A
Wambo Road	17/12/2025 22:36	3.2	D	38	No	<20	N/A

Notes:

1. Noise limits are applicable if weather conditions were within parameters specified in Section 2.3. Criterion may or may not apply due to rounding of meteorological data values.

2. Site-only LAeq, 15 minute attributed to MTO, including modifying factors if applicable.

3. IA denotes 'Inaudible'.

4. NA in exceedance column means atmospheric conditions outside conditions specified in consent, therefore criterion was not applicable.

5. Remeasure after initial measured exceedance. Five 15-minute measurements were taken instead of five 1-minute measurements.

6. Follow up measurement within one week of measured exceedance.

7. Bold results in red indicate exceedance of relevant criterion.

Table 4: $L_{A1, 1Minute}$ Mount Thorley - Impact Assessment Criteria – 2025

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB	Criterion Applies?[1]	MTO $L_{A1, 1min}$ dB[2,3,4, 7]	Exceedance[3,4]
Bulga RFS	14/01/2025 23:51	1.8	F	47	Yes	33	Nil
Bulga Village	14/01/2025 22:20	3.4	E	48	No	30	N/A
Gouldsville	14/01/2025 21:20	3.4	D	45	No	IA	N/A
Inlet Rd	14/01/2025 21:23	4.1	D	47	No	35	N/A
Inlet Rd West	14/01/2025 21:00	3.1	D	45	No	31	N/A
Long Point	14/01/2025 21:00	3.1	D	45	No	IA	N/A
South Bulga	14/01/2025 23:00	1.4	F	46	Yes	36	Nil
Wambo Road	14/01/2025 21:49	3.7	D	48	No	<25	N/A
Bulga RFS	27/02/2025 22:49	2.0	F	47	Yes	35	Nil
Bulga RFS[5]	27/02/2025 23:13	2.2	F	47	No	31	N/A
Bulga RFS[5]	27/02/2025 23:30	1.9	F	47	Yes	<30	Nil
Bulga RFS[5]	27/02/2025 23:47	1.6	F	47	Yes	<25	Nil
Bulga RFS[5]	28/02/2025 00:04	1.9	F	47	Yes	34	Nil
Bulga RFS[5]	28/02/2025 00:22	1.8	F	47	Yes	<25	Nil
Bulga RFS[6]	12/03/2025 22:53	2.0	F	47	Yes	32	Nil
Bulga Village	27/02/2025 22:07	1.2	F	48	Yes	30	Nil
Gouldsville	27/02/2025 21:22	1.9	F	45	Yes	IA	Nil
Inlet Road	27/02/2025 21:21	1.9	F	47	Yes	<25	Nil
Inlet Road West	27/02/2025 21:00	2.3	F	45	No	<20	N/A
Long Point	27/02/2025 21:00	2.3	F	45	No	IA	N/A
South Bulga	28/02/2025 01:06	1.2	F	46	Yes	<20	Nil
Wambo Road	27/02/2025 21:45	2.2	F	48	No	35	N/A
Bulga RFS	17/03/2025 23:04	3.4	D	47	No	IA	N/A
Bulga Village	17/03/2025 22:19	3.4	D	48	No	27	N/A
Gouldsville	17/03/2025 21:21	2.6	D	45	Yes	IA	Nil
Inlet Road	17/03/2025 21:26	2.7	D	47	Yes	<20	Nil
Inlet Road West	17/03/2025 21:00	3.0	D	45	Yes	<20	Nil
Long Point	17/03/2025 21:00	3.0	D	45	Yes	IA	Nil
South Bulga	17/03/2025 23:55	3.5	D	46	No	IA	N/A
Wambo Road	17/03/2025 21:53	3.2	D	48	No	<25	N/A
Bulga RFS	8/04/2025 23:44	1.5	D	47	Yes	38	Nil
Bulga Village	8/04/2025 22:53	1.8	D	48	Yes	<25	Nil
Gouldsville	8/04/2025 21:21	2.2	F	45	No	IA	N/A
Inlet Road	8/04/2025 21:24	1.9	F	47	Yes	<30	Nil
Inlet Road West	8/04/2025 21:00	2.1	F	45	No	<25	N/A

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB	Criterion Applies?[1]	MTO $L_{A1, 1min}$ dB[2,3,4,7]	Exceedance[3,4]
Long Point	8/04/2025 21:00	2.1	F	45	No	IA	N/A
South Bulga	9/04/2025 00:37	2.3	D	46	Yes	32	Nil
Wambo Road	8/04/2025 22:25	1.6	D	48	Yes	<25	Nil
Bulga RFS	29/05/2025 23:41	1.6	F	47	Yes	<20	Nil
Bulga Village	29/05/2025 22:16	2.3	E	48	Yes	<25	Nil
Gouldsville	29/05/2025 21:21	1.3	D	45	Yes	IA	Nil
Inlet Road	29/05/2025 21:29	1.6	D	47	Yes	<20	Nil
Inlet Road West	29/05/2025 21:09	1.3	D	45	Yes	IA	Nil
Long Point	29/05/2025 21:00	1.7	D	45	Yes	IA	Nil
South Bulga	29/05/2025 23:20	1.9	E	46	Yes	<20	Nil
Wambo Road	29/05/2025 21:55	2.2	D	48	Yes	<30	Nil
Bulga RFS	17/06/2025 23:35	2.7	E	47	Yes	<20	Nil
Bulga Village	17/06/2025 22:07	2.2	F	48	No	<20	N/A
Gouldsville	17/06/2025 21:22	2.2	E	45	Yes	IA	Nil
Inlet Road	17/06/2025 21:22	2.4	D	47	Yes	<20	Nil
Inlet Road West	17/06/2025 21:00	3.3	D	45	No	IA	N/A
Long Point	17/06/2025 21:00	3.3	D	45	No	IA	N/A
South Bulga	17/06/2025 22:50	1.7	F	46	Yes	<20	Nil
Wambo Road	17/06/2025 21:46	2.2	F	48	No	25	N/A
Bulga RFS	17/07/2025 23:50	2.2	F	47	No	32	N/A
Bulga Village	17/07/2025 22:16	2.5	D	48	Yes	IA	Nil
Gouldsville	17/07/2025 21:24	1.5	F	45	Yes	IA	Nil
Inlet Road	17/07/2025 21:20	1.3	F	47	Yes	<25	Nil
Inlet Road West	17/07/2025 21:00	1.2	D	45	Yes	IA	Nil
Long Point	17/07/2025 21:00	1.2	D	45	Yes	<20	Nil
South Bulga	17/07/2025 23:08	1.8	E	46	Yes	<20	Nil
Wambo Road	17/07/2025 21:55	1.5	F	48	Yes	<25	Nil
Bulga RFS	12/08/2025 23:20	2.6	D	47	Yes	38	Nil
Bulga Village	12/08/2025 21:58	2.4	D	48	Yes	30	Nil
Gouldsville	12/08/2025 21:21	2.1	E	45	Yes	IA	Nil
Inlet Road	12/08/2025 22:29	2.5	D	47	Yes	<20	Nil
Inlet Road West	12/08/2025 21:00	1.7	D	45	Yes	33	Nil
Long Point	12/08/2025 21:00	1.7	D	45	Yes	IA	Nil
South Bulga	13/08/2025 00:09	2.7	D	46	Yes	33	Nil
Wambo Road	12/08/2025 21:29	2.0	E	48	Yes	<25	Nil
Wambo Road[6]	18/08/2025 22:43	3.6	D	48	No	30	N/A

Location	Date and Time	Wind Speed (m/s)	Stability Class	Criterion dB	Criterion Applies?[1]	MTO $L_{A1, 1min}$ dB[2,3,4, 7]	Exceedance[3,4]
Bulga RFS	3/09/2025 23:42	1.9	E	47	Yes	28	Nil
Bulga Village	3/09/2025 22:05	1.3	F	48	Yes	IA	Nil
Gouldsville	3/09/2025 21:23	1.2	F	45	Yes	IA	Nil
Inlet Road	3/09/2025 21:20	2.0	E	47	Yes	IA	Nil
Inlet Road West	3/09/2025 21:00	2.1	D	45	Yes	<20	Nil
Long Point	3/09/2025 21:00	2.1	D	45	Yes	IA	Nil
South Bulga	3/09/2025 23:20	2.3	E	46	Yes	<25	Nil
Wambo Road	3/09/2025 21:43	1.3	F	48	Yes	<20	Nil
Bulga RFS	20/10/2025 22:48	1.4	F	47	Yes	40	Nil
Bulga Village	20/10/2025 22:08	2.0	E	48	Yes	IA	Nil
Gouldsville	20/10/2025 21:20	1.2	F	45	Yes	IA	Nil
Inlet Road	20/10/2025 21:21	1.2	F	47	Yes	<20	Nil
Inlet Road West	20/10/2025 21:00	1.7	E	45	Yes	IA	Nil
Long Point	20/10/2025 21:00	1.7	E	45	Yes	IA	Nil
South Bulga	20/10/2025 23:12	1.0	F	46	Yes	37	Nil
Wambo Road	20/10/2025 21:46	1.5	E	48	Yes	IA	Nil
Bulga RFS	4/11/2025 22:48	2.5	D	47	Yes	<20	Nil
Bulga Village	4/11/2025 22:08	2.7	D	48	Yes	IA	Nil
Gouldsville	4/11/2025 21:23	3.1	D	45	No	IA	N/A
Inlet Road	4/11/2025 21:23	3.1	D	47	No	IA	N/A
Inlet Road West	4/11/2025 21:02	3.1	D	45	No	IA	N/A
Long Point	4/11/2025 21:00	3.1	D	45	No	IA	N/A
South Bulga	4/11/2025 23:09	1.9	F	46	Yes	<20	Nil
Wambo Road	4/11/2025 21:46	3.4	D	48	No	IA	N/A
Bulga RFS	17/12/2025 23:41	2.1	F	47	No	40	N/A
Bulga Village	17/12/2025 22:59	3.5	D	48	No	<25	N/A
Gouldsville	17/12/2025 21:30	1.8	F	45	Yes	IA	Nil
Inlet Road	17/12/2025 22:07	1.9	F	47	Yes	28	Nil
Inlet Road West	17/12/2025 21:44	2.0	F	45	Yes	IA	Nil
Long Point	17/12/2025 21:00	1.8	F	45	Yes	IA	Nil
South Bulga	18/12/2025 00:22	2.4	F	46	No	29	N/A
Wambo Road	17/12/2025 22:36	3.2	D	48	No	<25	N/A

Notes

1. Noise limits are applicable if weather conditions were within parameters specified in Section 2.3. Criterion may or may not apply due to rounding of meteorological data values.

2. Site-only LA1, 1 minute attributed to MTO, including modifying factors if applicable.

3. IA denotes 'Inaudible'.

4. NA in exceedance column means atmospheric conditions outside conditions specified in consent, therefore criterion was not applicable.

5. Remeasure after initial measured exceedance. Five 15-minute measurements were taken instead of five 1-minute measurements.

6. Follow up measurement within one week of measured exceedance.

7. Bold results in red indicate exceedance of relevant criterion.

1.1.3 Low Frequency Assessment

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfI), the applicability of the low frequency modification factor corrections has been assessed. There were six noise measurements taken during the reporting period which required the penalty to be applied. The WML assessment for low frequency noise is shown in **Table 5** and the MTO assessment for low frequency noise is shown in **Table 6.**

Table 5: Warkworth Low Frequency Noise Assessment – 2025

Location	Date and Time	Measured WML LAeq dB[2]	Criterion Applies?	Intermittency Modifying Factor?[1]	Tonality Modifying Factor?[1]	Frequency of Tonality[1]	Low-frequency Modifying Factor?[1]	Maximum Exceedance of Reference Spectrum [1]	Penalty dB[1]	Exceedance[3,6]
Bulga RFS	14/01/2025 23:51	34	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga Village	14/01/2025 22:20	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gouldsville	14/01/2025 21:20	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inlet Rd	14/01/2025 21:23	31	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inlet Rd West	14/01/2025 21:00	<25	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Long Point	14/01/2025 21:00	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
South Bulga	14/01/2025 23:00	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Wambo Road	14/01/2025 21:49	30	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga RFS	27/02/2025 22:49	35	Yes	No	No	N/A	**Yes**	**1 dB at 80 Hz**	**2**	Nil
Bulga RFS[4]	27/02/2025 23:13	31	No	N/A	N/A	N/A	N/A	N/A	N/A	NA
Bulga RFS[4]	27/02/2025 23:30	<30	Yes	No	No	N/A	No	N/A	N/A	Nil
Bulga RFS[4]	27/02/2025 23:47	<30	Yes	No	No	N/A	No	N/A	N/A	Nil
Bulga RFS[4]	28/02/2025 00:04	IA	Yes	No	No	N/A	No	N/A	N/A	Nil
Bulga RFS[4]	28/02/2025 00:22	IA	Yes	No	No	N/A	No	N/A	N/A	Nil
Bulga RFS[5]	12/03/2025 22:53	31	Yes	No	No	N/A	No	N/A	N/A	Nil
Bulga Village	27/02/2025 22:07	<30	Yes	No	No	N/A	No	N/A	N/A	Nil
Gouldsville	27/02/2025 21:22	IA	Yes	No	No	N/A	No	N/A	N/A	Nil
Inlet Road	27/02/2025 21:21	<30	Yes	No	No	N/A	No	N/A	N/A	Nil

Location	Date and Time	Measured WML LAeq dB[2]	Criterion Applies?	Intermittency Modifying Factor?[1]	Tonality Modifying Factor?[1]	Frequency of Tonality[1]	Low-frequency Modifying Factor?[1]	Maximum Exceedance of Reference Spectrum [1]	Penalty dB[1]	Exceedance[3,6]
Inlet Road West	27/02/2025 21:00	<25	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Long Point	27/02/2025 21:00	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
South Bulga	28/02/2025 01:06	<20	Yes	No	No	N/A	No	N/A	N/A	Nil
Wambo Road	27/02/2025 21:45	<25	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga RFS	17/03/2025 23:04	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga Village	17/03/2025 22:19	<20	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gouldsville	17/03/2025 21:21	<20	Yes	No	N/A	No	No	N/A	Nil	Nil
Inlet Road	17/03/2025 21:26	<20	Yes	No	N/A	No	No	N/A	Nil	Nil
Inlet Road West	17/03/2025 21:00	<20	Yes	No	N/A	No	No	N/A	Nil	Nil
Long Point	17/03/2025 21:00	IA	Yes	No	N/A	No	No	N/A	Nil	Nil
South Bulga	17/03/2025 23:55	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wambo Road	17/03/2025 21:53	<25	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga RFS	8/04/2025 23:44	IA	Yes	No	N/A	No	No	NA	Nil	Nil
Bulga Village	8/04/2025 22:53	30	Yes	No	N/A	No	No	NA	Nil	Nil
Gouldsville	8/04/2025 21:21	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inlet Road	8/04/2025 21:24	35	Yes	No	N/A	No	**Yes**	**2 dB at 80 Hz**	**2**	Nil
Inlet Road West	8/04/2025 21:00	29	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Long Point	8/04/2025 21:00	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
South Bulga	9/04/2025 00:37	<25	Yes	No	N/A	No	No	N/A	Nil	Nil
Wambo Road	8/04/2025 22:25	31	Yes	No	N/A	No	No	N/A	Nil	Nil
Bulga RFS	29/05/2025 23:41	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga Village	29/05/2025 22:16	27	Yes	No	No	N/A	No	N/A	Nil	Nil
Gouldsville	29/05/2025 21:21	33	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road	29/05/2025 21:29	<20	Yes	No	No	N/A	No	N/A	Nil	Nil

Location	Date and Time	Measured WML LAeq dB[2]	Criterion Applies?	Intermittency Modifying Factor?[1]	Tonality Modifying Factor?[1]	Frequency of Tonality[1]	Low-frequency Modifying Factor?[1]	Maximum Exceedance of Reference Spectrum [1]	Penalty dB[1]	Exceedance[3,6]
Inlet Road West	29/05/2025 21:09	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Long Point	29/05/2025 21:00	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
South Bulga	29/05/2025 23:20	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Wambo Road	29/05/2025 21:55	26	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga RFS	17/06/2025 23:35	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga Village	17/06/2025 22:07	30	No	No	No	N/A	NA	N/A	Nil	N/A
Gouldsville	17/06/2025 21:22	29	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road	17/06/2025 21:22	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road West	17/06/2025 21:00	<25	No	No	No	N/A	NA	N/A	Nil	N/A
Long Point	17/06/2025 21:00	<20	No	No	No	N/A	NA	N/A	Nil	N/A
South Bulga	17/06/2025 22:50	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Wambo Road	17/06/2025 21:46	29	No	No	No	N/A	N/A	N/A	Nil	N/A
Bulga RFS	17/07/2025 23:50	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga Village	17/07/2025 22:16	37	Yes	No	No	N/A	No	N/A	Nil	Nil
Gouldsville	17/07/2025 21:24	25	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road	17/07/2025 21:20	29	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road West	17/07/2025 21:00	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Long Point	17/07/2025 21:00	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
South Bulga	17/07/2025 23:08	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Wambo Road	17/07/2025 21:55	29	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga RFS	12/08/2025 23:20	34	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga Village	12/08/2025 21:58	35	Yes	No	No	N/A	No	N/A	Nil	Nil
Gouldsville	12/08/2025 21:21	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road	12/08/2025 22:29	34	Yes	No	No	N/A	No	N/A	Nil	Nil

Location	Date and Time	Measured WML LAeq dB[2]	Criterion Applies?	Intermittency Modifying Factor?[1]	Tonality Modifying Factor?[1]	Frequency of Tonality[1]	Low-frequency Modifying Factor?[1]	Maximum Exceedance of Reference Spectrum [1]	Penalty dB[1]	Exceedance[3,6]
Inlet Road West	12/08/2025 21:00	29	Yes	No	No	N/A	No	N/A	Nil	Nil
Long Point	12/08/2025 21:00	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
South Bulga	13/08/2025 00:09	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Wambo Road	12/08/2025 21:29	37	Yes	No	No	N/A	Yes	1 dB at 80 Hz	2	Nil
Wambo Road[5]	18/08/2025 22:43	26	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga RFS	3/09/2025 23:42	35	Yes	No	No	N/A	No	NA	Nil	Nil
Bulga Village	3/09/2025 22:05	36	Yes	No	No	N/A	Yes	2 dB at 80 Hz	2	Nil
Gouldsville	3/09/2025 21:23	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road	3/09/2025 21:20	31	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road West	3/09/2025 21:00	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Long Point	3/09/2025 21:00	<30	Yes	No	No	N/A	No	N/A	Nil	Nil
South Bulga	3/09/2025 23:20	29	Yes	No	No	N/A	No	N/A	Nil	Nil
Wambo Road	3/09/2025 21:43	29	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga RFS	20/10/2025 22:48	26	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga Village	20/10/2025 22:08	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Gouldsville	20/10/2025 21:20	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road	20/10/2025 21:21	26	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road West	20/10/2025 21:00	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Long Point	20/10/2025 21:00	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
South Bulga	20/10/2025 23:12	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Wambo Road	20/10/2025 21:46	28	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga RFS	4/11/2025 22:48	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga Village	4/11/2025 22:08	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Gouldsville	4/11/2025 21:23	<25	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Location	Date and Time	Measured WML LAeq dB[2]	Criterion Applies?	Intermittency Modifying Factor?[1]	Tonality Modifying Factor?[1]	Frequency of Tonality[1]	Low-frequency Modifying Factor?[1]	Maximum Exceedance of Reference Spectrum [1]	Penalty dB[1]	Exceedance[3,6]
Inlet Road	4/11/2025 21:23	<20	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inlet Road West	4/11/2025 21:02	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Long Point	4/11/2025 21:00	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
South Bulga	4/11/2025 23:09	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Wambo Road	4/11/2025 21:46	<20	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga RFS	17/12/2025 23:41	26	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga Village	17/12/2025 22:59	31	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gouldsville	17/12/2025 21:30	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road	17/12/2025 22:07	31	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road West	17/12/2025 21:44	32	Yes	No	No	N/A	No	N/A	Nil	Nil
Long Point	17/12/2025 21:00	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
South Bulga	18/12/2025 00:22	<20	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wambo Road	17/12/2025 22:36	29	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

1. Yes/No denote modifying factor was not applied. N/A denotes assessment was 'not applicable' due to meteorological conditions or further assessment was not required.

2. IA denotes 'inaudible'.

3. Bold results in red indicate that application of NPfI modifying factor(s) is required.

4. Remeasure after initial measured exceedance. Five 15-minute measurements were taken instead of five 1-minute measurements.

5. Follow up measurement.

6. NA in exceedance column means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable.

Table 6: Mount Thorley Operations Low Frequency Noise Assessment – 2025

Location	Date and Time	Measured MTO LAeq dB[2]	Criterion Applies?	Intermittency Modifying Factor?	Tonality Modifying Factor?[1]	Frequency of Tonality[1]	Low-frequency Modifying Factor?[1]	Maximum Exceedance of Reference Spectrum [1]	Penalty dB[1]	Exceedance[3,6]
Bulga RFS	14/01/2025 23:51	<30	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga Village	14/01/2025 22:20	<25	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gouldsville	14/01/2025 21:20	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inlet Rd	14/01/2025 21:23	<30	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inlet Rd West	14/01/2025 21:00	27	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Long Point	14/01/2025 21:00	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
South Bulga	14/01/2025 23:00	31	Yes	No	No	NA	No	NA	Nil	Nil
Wambo Road	14/01/2025 21:49	<25	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga RFS	27/02/2025 22:49	30	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga RFS[4]	27/02/2025 23:13	<30	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga RFS[4]	27/02/2025 23:30	<30	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga RFS[4]	27/02/2025 23:47	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga RFS[4]	28/02/2025 00:04	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga RFS[4]	28/02/2025 00:22	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga RFS[5]	12/03/2025 22:53	30	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga Village	27/02/2025 22:07	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Gouldsville	27/02/2025 21:22	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road	27/02/2025 21:21	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road West	27/02/2025 21:00	<20	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Long Point	27/02/2025 21:00	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
South Bulga	28/02/2025 01:06	<20	Yes	No	No	N/A	No	N/A	Nil	Nil

Location	Date and Time	Measured MTO LAeq dB[2]	Criterion Applies?	Intermittency Modifying Factor?	Tonality Modifying Factor?[1]	Frequency of Tonality[1]	Low-frequency Modifying Factor?[1]	Maximum Exceedance of Reference Spectrum [1]	Penalty dB[1]	Exceedance[3,6]
Wambo Road	27/02/2025 21:45	<30	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga RFS	17/03/2025 23:04	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga Village	17/03/2025 22:19	<20	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gouldsville	17/03/2025 21:21	IA	Yes	No	No	No	No	N/A	Nil	Nil
Inlet Road	17/03/2025 21:26	<20	Yes	No	No	No	No	N/A	Nil	Nil
Inlet Road West	17/03/2025 21:00	<20	Yes	No	No	No	No	N/A	Nil	Nil
Long Point	17/03/2025 21:00	IA	Yes	No	No	No	No	N/A	Nil	Nil
South Bulga	17/03/2025 23:55	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wambo Road	17/03/2025 21:53	<25	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga RFS	8/04/2025 23:44	32	Yes	No	N/A	No	No	N/A	Nil	Nil
Bulga Village	8/04/2025 22:53	<25	Yes	No	N/A	No	No	N/A	Nil	Nil
Gouldsville	8/04/2025 21:21	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inlet Road	8/04/2025 21:24	<30	Yes	No	N/A	No	No	N/A	Nil	Nil
Inlet Road West	8/04/2025 21:00	<25	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Long Point	8/04/2025 21:00	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
South Bulga	9/04/2025 00:37	29	Yes	No	N/A	No	No	N/A	Nil	Nil
Wambo Road	8/04/2025 22:25	<25	Yes	No	N/A	No	No	N/A	Nil	Nil
Bulga RFS	29/05/2025 23:41	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga Village	29/05/2025 22:16	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Gouldsville	29/05/2025 21:21	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road	29/05/2025 21:29	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road West	29/05/2025 21:09	IA	Yes	No	No	N/A	No	N/A	Nil	Nil

Location	Date and Time	Measured MTO LAeq dB[2]	Criterion Applies?	Intermittency Modifying Factor?	Tonality Modifying Factor?[1]	Frequency of Tonality[1]	Low-frequency Modifying Factor?[1]	Maximum Exceedance of Reference Spectrum [1]	Penalty dB[1]	Exceedance[3,6]
Long Point	29/05/2025 21:00	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
South Bulga	29/05/2025 23:20	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Wambo Road	29/05/2025 21:55	26	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga RFS	17/06/2025 23:35	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga Village	17/06/2025 22:07	<20	No	No	No	N/A	N/A	N/A	Nil	N/A
Gouldsville	17/06/2025 21:22	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road	17/06/2025 21:22	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road West	17/06/2025 21:00	IA	No	No	No	N/A	N/A	N/A	Nil	N/A
Long Point	17/06/2025 21:00	IA	No	No	No	N/A	N/A	N/A	Nil	N/A
South Bulga	17/06/2025 22:50	<20	Yes	No	No	N/A	N/A	N/A	Nil	Nil
Wambo Road	17/06/2025 21:46	<25	No	No	No	N/A	N/A	N/A	Nil	N/A
Bulga RFS	17/07/2025 23:50	30	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga Village	17/07/2025 22:16	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Gouldsville	17/07/2025 21:24	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road	17/07/2025 21:20	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road West	17/07/2025 21:00	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Long Point	17/07/2025 21:00	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
South Bulga	17/07/2025 23:08	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Wambo Road	17/07/2025 21:55	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga RFS	12/08/2025 23:20	29	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga Village	12/08/2025 21:58	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Gouldsville	12/08/2025 21:21	IA	Yes	No	No	N/A	No	N/A	Nil	Nil

Location	Date and Time	Measured MTO LAeq dB[2]	Criterion Applies?	Intermittency Modifying Factor?	Tonality Modifying Factor?[1]	Frequency of Tonality[1]	Low-frequency Modifying Factor?[1]	Maximum Exceedance of Reference Spectrum [1]	Penalty dB[1]	Exceedance[3,6]
Inlet Road	12/08/2025 22:29	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road West	12/08/2025 21:00	26	Yes	No	No	N/A	No	N/A	Nil	Nil
Long Point	12/08/2025 21:00	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
South Bulga	13/08/2025 00:09	27	Yes	No	No	N/A	No	N/A	Nil	Nil
Wambo Road	12/08/2025 21:29	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Wambo Road[5]	18/08/2025 22:43	26	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga RFS	3/09/2025 23:42	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga Village	3/09/2025 22:05	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Gouldsville	3/09/2025 21:23	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road	3/09/2025 21:20	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road West	3/09/2025 21:00	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Long Point	3/09/2025 21:00	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
South Bulga	3/09/2025 23:20	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Wambo Road	3/09/2025 21:43	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga RFS	20/10/2025 22:48	31	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga Village	20/10/2025 22:08	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Gouldsville	20/10/2025 21:20	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road	20/10/2025 21:21	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road West	20/10/2025 21:00	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Long Point	20/10/2025 21:00	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
South Bulga	20/10/2025 23:12	28	Yes	No	No	N/A	No	N/A	Nil	Nil
Wambo Road	20/10/2025 21:46	IA	Yes	No	No	N/A	No	N/A	Nil	Nil

Location	Date and Time	Measured MTO LAeq dB[2]	Criterion Applies?	Intermittency Modifying Factor?	Tonality Modifying Factor?[1]	Frequency of Tonality[1]	Low-frequency Modifying Factor?[1]	Maximum Exceedance of Reference Spectrum [1]	Penalty dB[1]	Exceedance[3,6]
Bulga RFS	4/11/2025 22:48	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Bulga Village	4/11/2025 22:08	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Gouldsville	4/11/2025 21:23	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inlet Road	4/11/2025 21:23	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inlet Road West	4/11/2025 21:02	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Long Point	4/11/2025 21:00	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
South Bulga	4/11/2025 23:09	<20	Yes	No	No	N/A	No	N/A	Nil	Nil
Wambo Road	4/11/2025 21:46	IA	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga RFS	17/12/2025 23:41	31	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bulga Village	17/12/2025 22:59	<20	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gouldsville	17/12/2025 21:30	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road	17/12/2025 22:07	<25	Yes	No	No	N/A	No	N/A	Nil	Nil
Inlet Road West	17/12/2025 21:44	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
Long Point	17/12/2025 21:00	IA	Yes	No	No	N/A	No	N/A	Nil	Nil
South Bulga	18/12/2025 00:22	<25	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wambo Road	17/12/2025 22:36	<20	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

1. Yes/No denote modifying factor was not applied. N/A denotes assessment was 'not applicable' due to meteorological conditions or further assessment was not required.

2. IA denotes 'inaudible'.

3. Bold results in red indicate that application of NPfI modifying factor(s) is required.

4. Remeasure after initial measured exceedance. Five 15-minute measurements were taken instead of five 1-minute measurements.

5. Follow up measurement.

6. NA in exceedance column means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable.

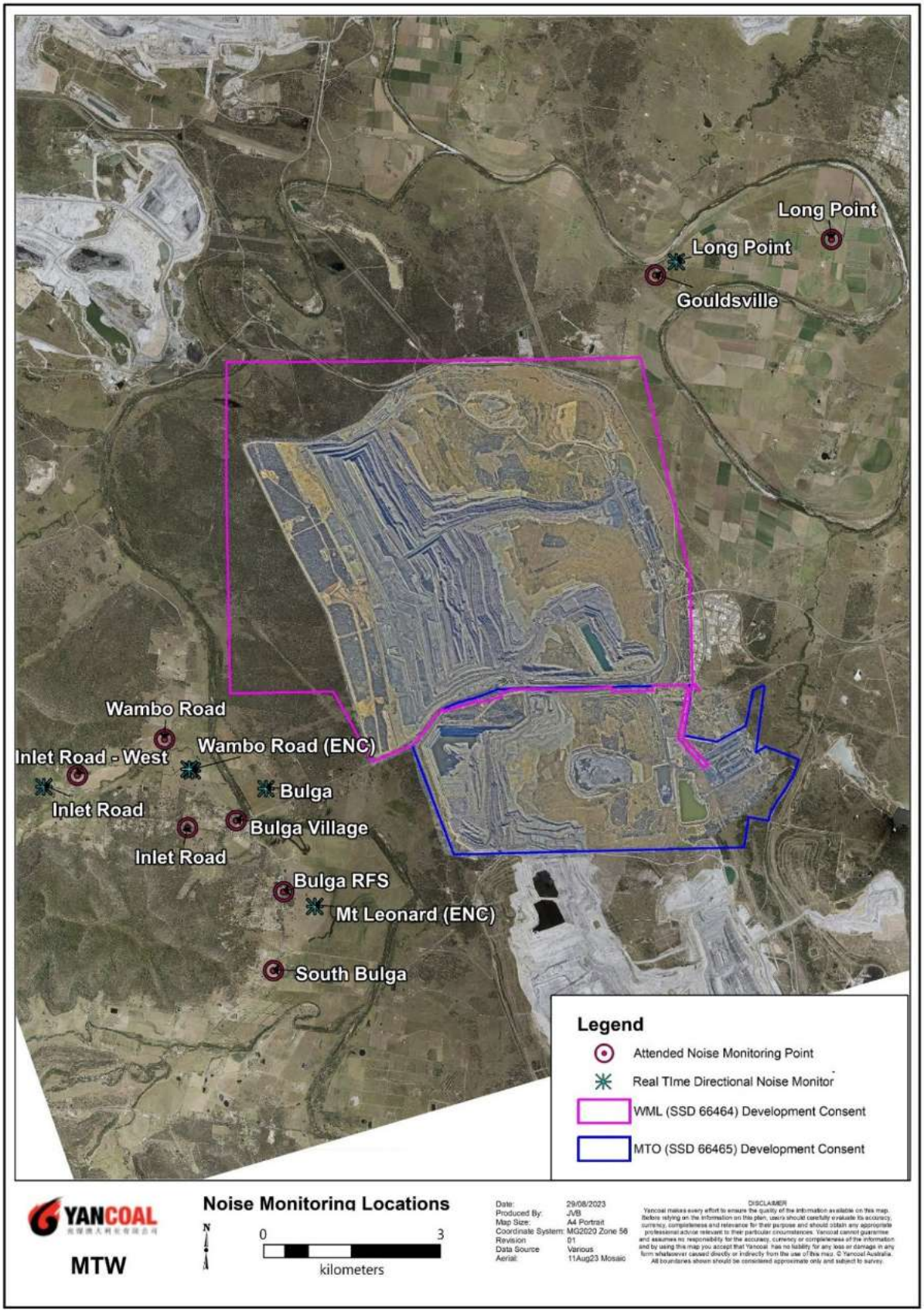


Figure 1: Noise Monitoring Location Plan.

Appendix 2:

Summary of 24 Hour PM10 Exceedance Investigations



Summary of 24 Hour PM_{10} Exceedance Investigations

Yancoal Mt Thorley Warkworth

2025

TABLE 1 24 HOUR PM_{10} INVESTIGATIONS - 2025

Date	Site	24hr PM_{10} result ($\mu g/m^3$)	Maximum Estimated contribution from MTW ($\mu g/m^3$)	Discussion
01/01/2025	Warkworth TEOM	50.2	18.9	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 18.9µg/m3 or ~38% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
05/01/2025	Warkworth TEOM	58.9	26.5	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 26.5µg/m3 or ~51% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
06/01/2025	Long Point HVAS	52.4	22.9	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 22.9µg/m3 or ~44% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
06/01/2025	Warkworth TEOM	54.2	20.7	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 20.7µg/m3 or ~39% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
22/01/2025	Warkworth TEOM	58.7	28.0	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 28.0µg/m3 or ~49% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
01/03/2025	Warkworth TEOM	59.9	27.2	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 27.2µg/m3 or ~45% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.

Date	Site	24hr PM_{10} result ($\mu g/m^3$)	Maximum Estimated contribution from MTW ($\mu g/m^3$)	Discussion
16/03/2025	Warkworth TEOM	59.2	3.2	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 3.2µg/m3 or ~6% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
27/05/2025	Bulga TEOM	54.6	5.9	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 5.9µg/m3 or ~12% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
27/05/2025	Wambo Road TEOM	52.9	0.7	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 0.7µg/m3 or ~2% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
27/05/2025	Warkworth TEOM	62.0	5.7	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 5.7µg/m3 or ~10% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
10/07/2025	Warkworth TEOM	54.8	0.2	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 0.2µg/m3 or ~1% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
08/08/2025	Warkworth TEOM	52.1	38.3	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 38.3µg/m3 or ~74% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
08/09/2025	Warkworth TEOM	71.0	0.0	An analysis of meteorological data has determined that the wind direction was not from MTW's angle of influence and as such, MTW was not a contributor to the result.

Date	Site	24hr PM_{10} result ($\mu g/m^3$)	Maximum Estimated contribution from MTW ($\mu g/m^3$)	Discussion
16/09/2025	Warkworth TEOM	52.2	0.0	An analysis of meteorological data has determined that the wind direction was not from MTW's angle of influence and as such, MTW was not a contributor to the result.
26/09/2025	Warkworth TEOM	70.0	0.0	An analysis of meteorological data has determined that the wind direction was not from MTW's angle of influence and as such, MTW was not a contributor to the result.
27/09/2025	Warkworth TEOM	66.6	0.0	An analysis of meteorological data has determined that the wind direction was not from MTW's angle of influence and as such, MTW was not a contributor to the result.
28/09/2025	Warkworth TEOM	52.3	12.6	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 12.6µg/m3 or ~25% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
01/10/2025	Warkworth TEOM	55.6	0.4	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 0.4µg/m3 or ~1% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
06/10/2025	Warkworth TEOM	62.4	6.2	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 6.2µg/m3 or ~10% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
08/10/2025	Warkworth TEOM	81.7	4.3	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 4.3µg/m3 or ~6% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
09/10/2025	Warkworth TEOM	51.3	9.0	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 9.0µg/m3 or ~18% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.

Date	Site	24hr PM_{10} result ($\mu g/m^3$)	Maximum Estimated contribution from MTW ($\mu g/m^3$)	Discussion
16/10/2025	Warkworth TEOM	53.0	8.2	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 8.2µg/m3 or ~15% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
17/10/2025	Warkworth TEOM	58.0	1.3	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 1.3µg/m3 or ~3% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
22/10/2025	Warkworth TEOM	56.9	2.9	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 2.9µg/m3 or ~6% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
03/11/2025	Warkworth TEOM	62.5	35.4	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 35.4µg/m3 or ~57% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
08/11/2025	Warkworth TEOM	55.6	0.0	An analysis of meteorological data has determined that the wind direction was not from MTW's angle of influence and as such, MTW was not a contributor to the result.
13/11/2025	Warkworth TEOM	52.2	5.9	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 5.9µg/m3 or ~12% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
14/11/2025	Long Point HVAS	71.0	31.7	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 31.7µg/m3 or ~45% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.

Date	Site	24hr PM_{10} result ($\mu g/m^3$)	Maximum Estimated contribution from MTW ($\mu g/m^3$)	Discussion
14/11/2025	Warkworth TEOM	79.9	41.2	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 41.2µg/m3 or ~52% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
19/11/2025	Bulga TEOM	56.4	14.9	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 14.9µg/m3 or ~27% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
01/12/2025	Warkworth TEOM	59.4	0.1	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 0.1µg/m3 or ~1% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
02/12/2025	Long Point HVAS	55.2	37.7	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 37.7µg/m3 or ~69% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
05/12/2025	Warkworth TEOM	59.1	4.8	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 4.8µg/m3 or ~9% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
06/12/2025	Warkworth TEOM	91.3	9.7	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 9.7µg/m3 or ~11% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.

Date	Site	24hr PM_{10} result ($\mu g/m^3$)	Maximum Estimated contribution from MTW ($\mu g/m^3$)	Discussion
07/12/2025	Warkworth TEOM	57.7	16.0	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 16.0µg/m3 or ~28% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
09/12/2025	Wambo Road TEOM	51.5	17.7	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 17.7µg/m3 or ~35% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
09/12/2025	Warkworth TEOM	74.5	25.9	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 25.9µg/m3 or ~35% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
19/12/2025	Warkworth TEOM	50.7	2.4	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 2.4µg/m3 or ~5% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.
21/12/2025	Warkworth TEOM	62.2	10.2	An analysis of meteorological data and background PM10 levels has determined the maximum potential MTW contribution to the result to be in the order of 10.2µg/m3 or ~17% of the measured result. As the calculated contribution was less than 75% of the measured result, MTW is not considered to be a significant contributor to the result, as described in the MTW Air Quality Management Plan.

Appendix 3:

Aboriginal Heritage Management Plan Compliance Inspection Report

Mount Thorley Warkworth
Aboriginal Heritage Management Plan 2025
Compliance Audit Inspection

Report prepared for

Yancoal Australia, Mount Thorley Warkworth



February 2026

Joel Deacon

ARROW
HERITAGE SOLUTIONS

Introduction

Yancoal Australia (Yancoal) manage the Mount Thorley Warkworth (MTW) mining complex located in the Hunter Valley, approximately 8km south-west of Singleton. Approval for the continuation and expansion of the mine was granted on 26 November 2015 under two separate project approvals: the Warkworth Continuation Project Approval (SSD-6464) and the Mount Thorley Operations Project Approval (SSD-6465).

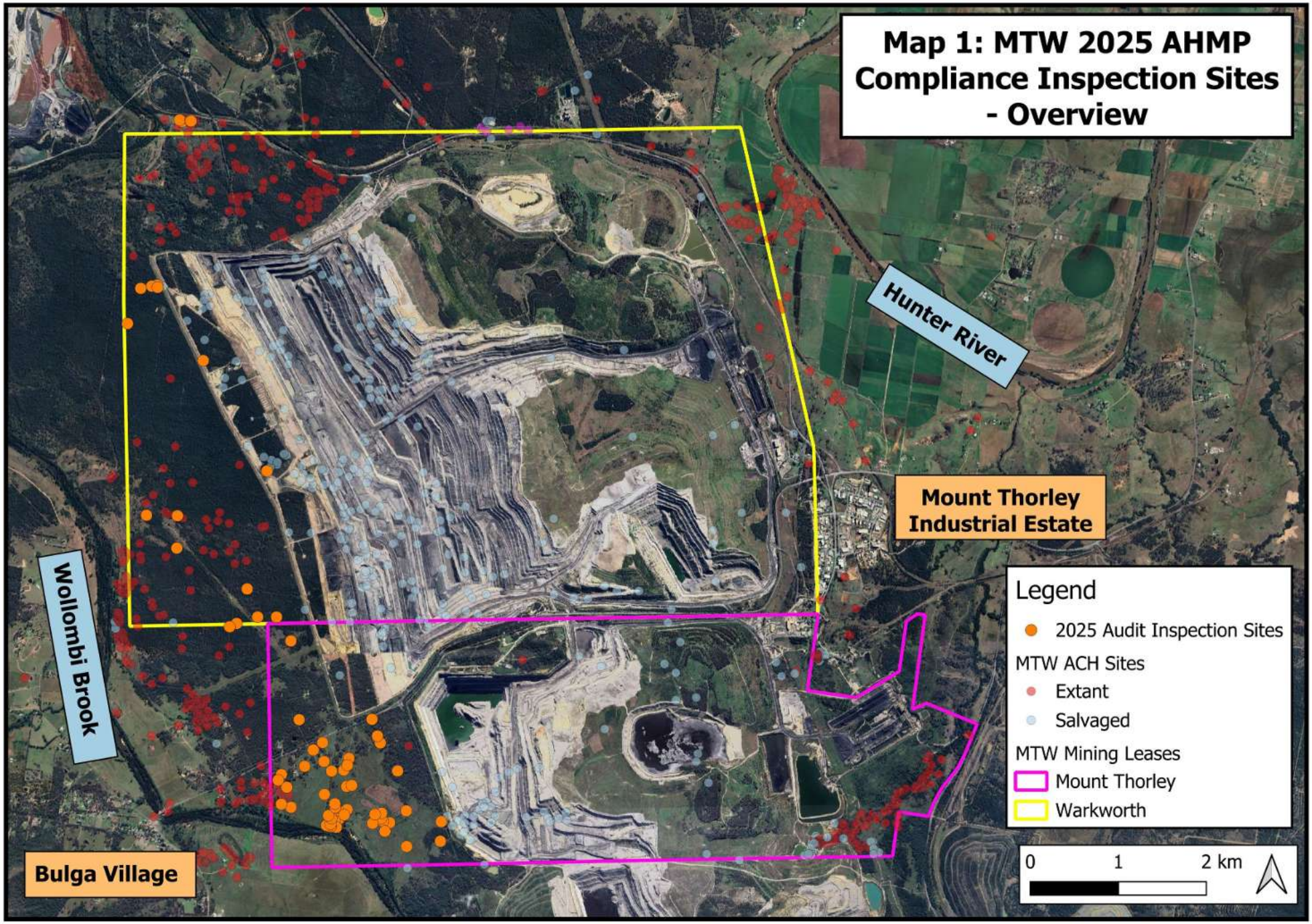
Pursuant to Condition 43 of the Warkworth Continuation Project Approval and Condition 28 of the Mount Thorley Operations Project Approval, Yancoal developed an Aboriginal Heritage Management Plan (AHMP) to cover both mining operations, which was first approved by the Department of Planning and Environment on 29 May 2017 and, most recently, on 12 August 2022 (Version 4.0). This AHMP sets out the principles, processes and measures through which Aboriginal cultural heritage (ACH) will be managed within the AHMP Area. This includes a commitment (Provision 25) to conduct annual AHMP compliance inspections with members of the Aboriginal community, through the auspices of the MTW Aboriginal Cultural Heritage Working Group (CHWG), throughout the life of operations. The purpose of the compliance inspections is to afford the Aboriginal stakeholders and MTW:

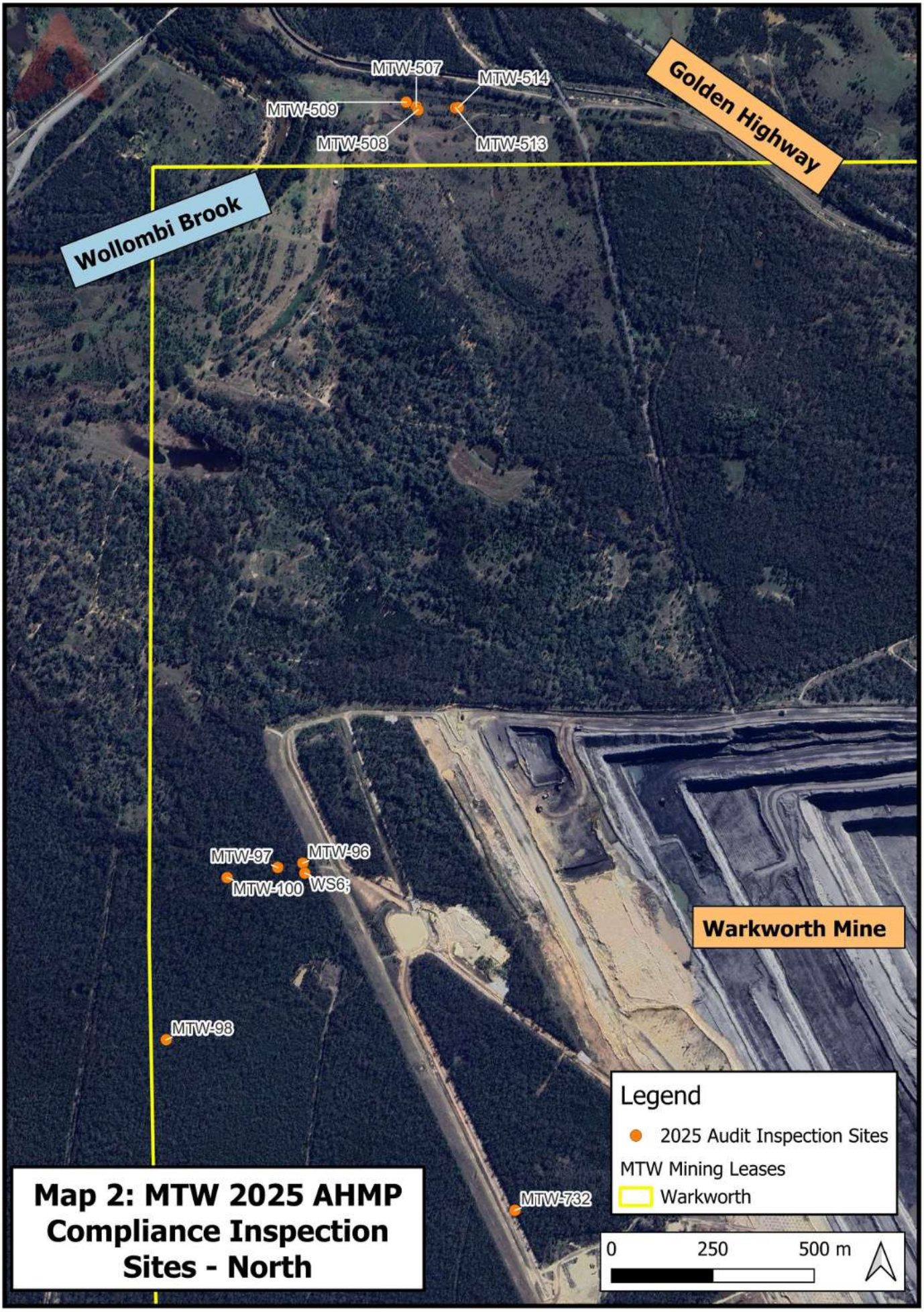
- the opportunity to visit mine operations and mine areas to inspect the operational compliance with AHMP provisions and Ground Disturbance Permit procedures;
- to inspect and monitor the condition and management of various sites over time; and
- to review the effectiveness and performance of AHMP provisions in the management of cultural heritage at the mine.

These compliance inspections are conducted at least annually. Due to the number of ACH sites located at MTW and the time required to inspect all sites, it is not feasible to inspect every site during the same field trip. Therefore, an annual, rolling program of compliance inspections has been implemented that will visit all sites progressively over a number of years. A record will be kept of each compliance inspection so that it can be ensured each site is inspected regularly.

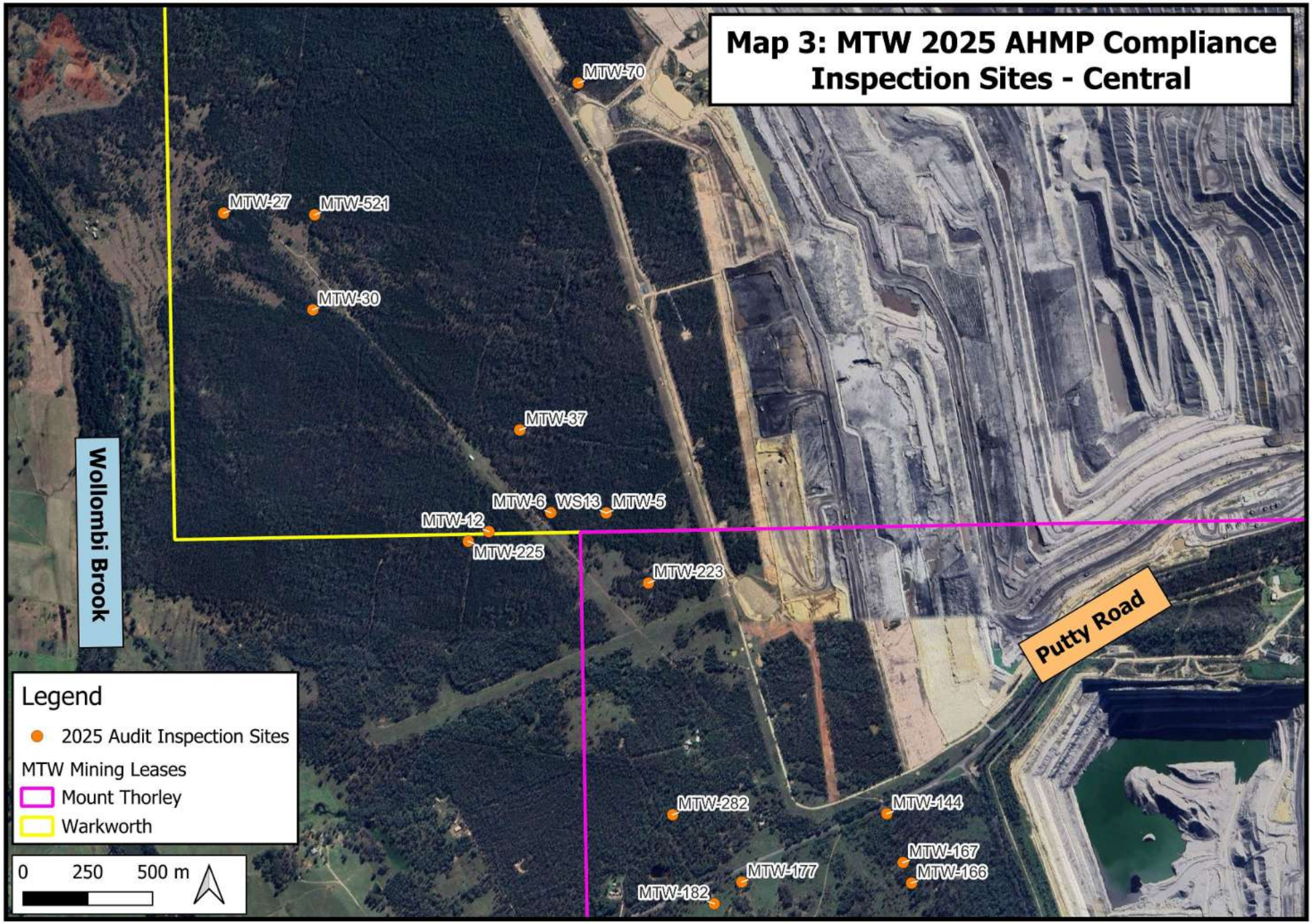
Proposed Activity and Project Brief

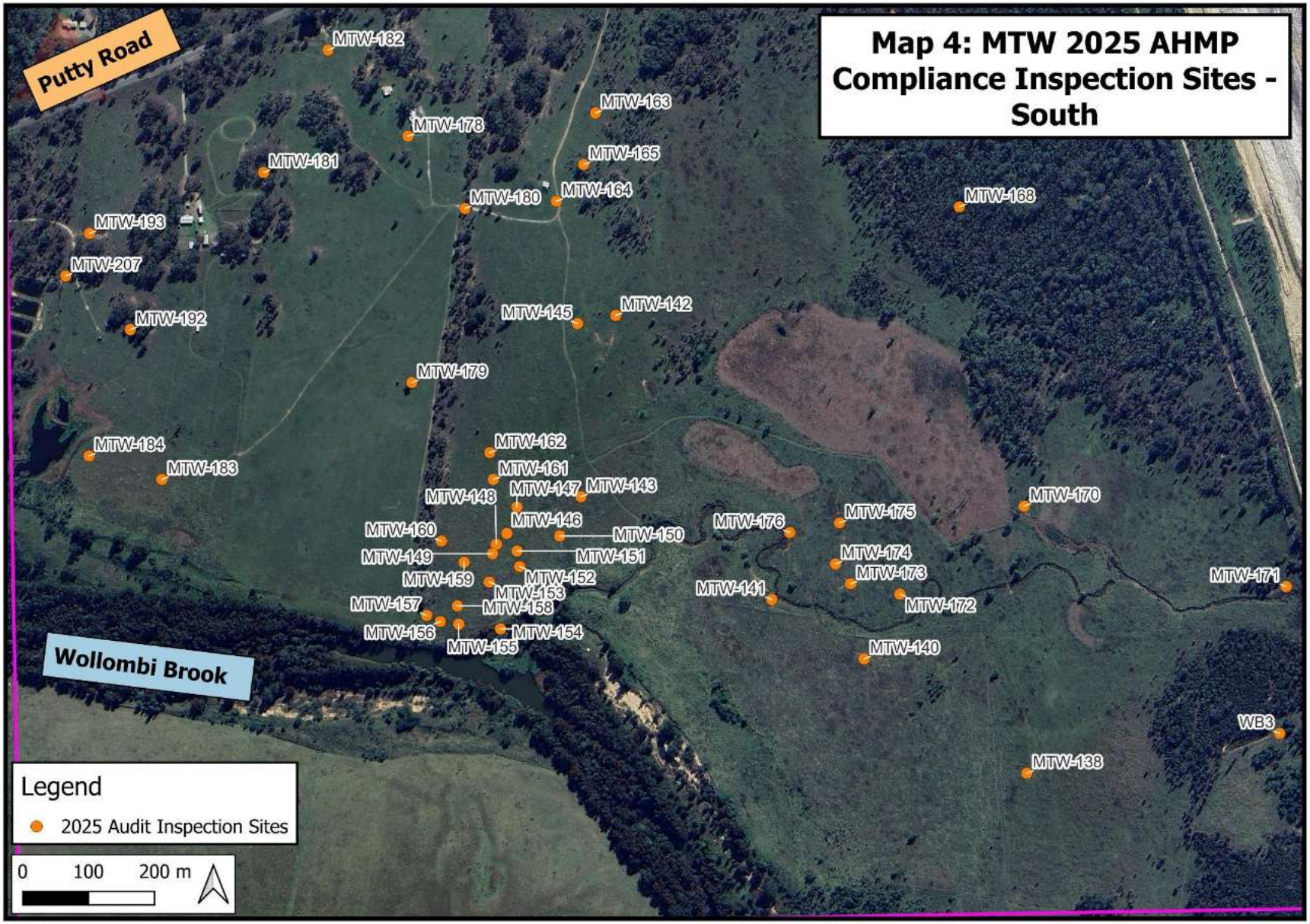
The 2025 compliance audit involved the inspection of 72 extant ACH sites located across MTW lands (see Maps 1-4). At each site an AHMP compliance inspection proforma was completed noting evidence of compliance or non-compliance with AHMP provisions, recommendations on modifications and improvements to management provisions, and recommendations on corrective actions. A photographic record was also completed for the inspected ACH sites.


Map 1: MTW 2025 AHMP Compliance Inspection Sites - Overview
Hunter River
Mount Thorley Industrial Estate
Wollombi Brook
Bulga Village
Legend
2025 Audit Inspection Sites
MTW ACH Sites
Extant
Salvaged
MTW Mining Leases
Mount Thorley
Warkworth
0
1
2 km



Map 2: MTW 2025 AHMP Compliance Inspection Sites - North


Map 3: MTW 2025 AHMP Compliance Inspection Sites - Central
MTW-70
MTW-27
MTW-521
MTW-30
MTW-37
MTW-6
WS13
MTW-5
MTW-12
MTW-225
MTW-223
Wollombi Brook
Putty Road
MTW-282
MTW-144
MTW-167
MTW-166
MTW-177
MTW-182
Legend
2025 Audit Inspection Sites
MTW Mining Leases
Mount Thorley
Warkworth
0
250
500 m


Map 4: MTW 2025 AHMP Compliance Inspection Sites - South
Putty Road
Wollombi Brook
MTW-182
MTW-163
MTW-178
MTW-165
MTW-181
MTW-180
MTW-164
MTW-168
MTW-193
MTW-207
MTW-192
MTW-145
MTW-142
MTW-179
MTW-184
MTW-183
MTW-162
MTW-161
MTW-147
MTW-143
MTW-148
MTW-146
MTW-150
MTW-160
MTW-149
MTW-151
MTW-159
MTW-152
MTW-153
MTW-157
MTW-158
MTW-156
MTW-154
MTW-155
MTW-176
MTW-175
MTW-170
MTW-174
MTW-173
MTW-171
MTW-141
MTW-172
MTW-140
WB3
MTW-138
Legend
2025 Audit Inspection Sites
0
100
200 m

Timing & Personnel

The 2025 MTW AHMP compliance inspection program was conducted on Friday 21 and Monday 24 November 2025. The personnel involved in these inspections were:

Name	Position/Organisation
Joel Deacon	Archaeologist, Arrow Heritage Solutions
Patrick Kirkwood	MTW Environment and Community Advisor
Derrick Vale	CHWG representative
Steven Hickey	CHWG representative
David Horton	CHWG representative
Andrew Horton	CHWG representative

Arrow Heritage Solutions were engaged as independent heritage consultants to conduct the AHMP compliance inspections, and Joel Deacon acted as technical advisor and author of this report. MTW Environment and Community Advisor Patrick Kirkwood arranged the compliance inspection programs and escorted the field team. CHWG representatives participated fully in the field work program.

MTW AHMP Compliance Inspection

A total of 72 extant ACH sites were inspected at both Mount Thorley and Warkworth Operations (see maps above). The inspection areas were selected as they either included ACH sites that had not recently been subject to inspection, or that were close to recent authorised ground disturbing activities. The latter area also gave the CHWG representatives an opportunity to assess operational compliance with AHMP provisions and Ground Disturbance Permit procedures

Methodology & Results

Table 1 shows the results of the 2025 MTW compliance inspection and summarises the information recorded on the individual proforma inspection sheets. Using a mobile mapping device pre-loaded with the GIS co-ordinates for each ACH site, the field team travelled to each location and attempted to re-locate each site. Sometimes this was not possible due to poor ground surface visibility (GSV), a result which, in itself, was not overly significant as long as it was determined that the vicinity had not been disturbed. The presence and condition of barricading or fencing was noted, as well as the presence and nature of various potential site disturbing factors (e.g. erosion, animal, human). Pertinent observations of each site were made and, based on information provided for all the above factors, management recommendations were discussed and agreed by the field team for each site if necessary.

Site Name	AHIMS ID	Date	Site re-identified?	Site intact?	Site fenced/ barricaded?	Fencing/ barricading intact?	Natural erosion	Livestock damage	Human disturbance	Animal disturbance	Pests & weeds	General observations	Management recommendations
MTW-5	37-6-2304	24/11/2025	No	Yes	Yes	Yes	No	No	No	No	No		
MTW-6	37-6-2305	24/11/2025	Yes	Yes	Yes	Yes	No	No	No	No	No		
MTW-12	37-6-2311	24/11/2025	No	Yes	Yes	No	No	No	No	No	No		
MTW-27	37-6-2326	24/11/2025	No	Yes	No	/	No	No	No	No	No		
MTW-30	37-6-2329	24/11/2025	No	Yes	Yes	Yes	No	No	No	No	No		
MTW-37	37-6-2336	24/11/2025	No	Yes	Yes	Yes	No	No	No	No	No		
MTW-70	37-6-2369	24/11/2025	Yes	Yes	Yes	Yes	No	No	No	No	Termites	Tree is dead and burnt; Group not convinced scar is cultural	Continue to monitor/barricade until definitive assessment of cultural origin obtained
MTW-96	37-6-2395	24/11/2025	No	Yes	Yes	Yes	No	No	No	No	No		
MTW-97	37-6-2396	24/11/2025	No	Yes	Yes	Yes	No	No	No	No	No		
MTW-98	37-6-2397	24/11/2025	No	Yes	Yes	No	No	No	No	No	No		
MTW-100	37-6-2399	24/11/2025	No	Yes	Yes	Yes	No	No	No	No	No		
MTW-138	37-6-2437	21/11/2025	Yes	Yes	Yes	No	No	No	No	No	No		
MTW-140	37-6-2438	21/11/2025	Yes	Yes	Yes	No	No	No	No	No	No	very poor GSV	
MTW-141	37-6-2439	21/11/2025	Yes	Yes	Yes	No	No	No	No	No	No	old rubbish dump outside of southern boundary	Remove rubbish
MTW-142	37-6-2440	21/11/2025	Yes	Yes	Yes	No	No	No	Old house remains + track	No	No		
MTW-143	37-6-2441	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-144	37-6-2442	21/11/2025	Yes	Yes	Yes	Yes	No	No	No	No	No		
MTW-145	37-6-2443	21/11/2025	Yes	Yes	Yes	No	No	No	Old house remains + track	No	No		
MTW-146	37-6-2444	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-147	37-6-2445	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-148	37-6-2446	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-149	37-6-2447	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	

Site Name	AHIMS ID	Date	Site re-identified?	Site intact?	Site fenced/ barricaded?	Fencing/ barricading intact?	Natural erosion	Livestock damage	Human disturbance	Animal disturbance	Pests & weeds	General observations	Management recommendations
MTW-150	37-6-2448	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-151	37-6-2449	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-152	37-6-2450	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-153	37-6-2451	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-154	37-6-2452	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-155	37-6-2453	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-156	37-6-2454	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-157	37-6-2455	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-158	37-6-2456	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-159	37-6-2457	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-160	37-6-2458	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-161	37-6-2459	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-162	37-6-2460	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	Multi site complex - not inspected individually but no disturbance noted. Poor GSV	
MTW-163	37-6-2461	21/11/2025	No	Yes	Yes	Yes	No	No	No	No	No		
MTW-164	37-6-2462	21/11/2025	No	Yes	Yes	Yes	No	No	No	No	No		
MTW-165	37-6-2463	21/11/2025	Yes	Yes	Yes	Yes	No	No	No	No	No	dubious cultural origin	
MTW-166	37-6-2464	21/11/2025	No	Yes	Yes	Yes	No	No	No	No	No		
MTW-167	37-6-2465	21/11/2025	Yes	Yes	Yes	No	No	No	No	No	No		
MTW-168	37-6-2466	21/11/2025	Yes	Yes	Yes	Yes	No	No	No	No	No		
MTW-170	37-6-2468	21/11/2025	No	Yes	Yes	No	No	No	No	No	No	has been recently inundated	
MTW-171	37-6-2469	21/11/2025	Yes	Yes	Yes	No	No	No	No	No	No		
MTW-172	37-6-2470	21/11/2025	No	Yes	No	/	No	No	No	No	No	very poor GSV	

Site Name	AHIMS ID	Date	Site re-identified?	Site intact?	Site fenced/ barricaded?	Fencing/ barricading intact?	Natural erosion	Livestock damage	Human disturbance	Animal disturbance	Pests & weeds	General observations	Management recommendations
MTW-173	37-6-2471	21/11/2025	No	Yes	No	/	No	No	No	No	No		
MTW-174	37-6-2472	21/11/2025	No	Yes	No	/	No	No	No	No	No	very poor GSV	
MTW-175	37-6-2473	21/11/2025	No	Yes	No	/	No	No	No	No	No		
MTW-176	37-6-2474	21/11/2025	Yes	Yes	No	/	slight	No	No	No	No		remove old water tank
MTW-177	37-6-2475	21/11/2025	No	Yes	Yes	No	No	No	on old driveway	No	No		
MTW-178	37-6-2476	21/11/2025	No	Yes	Yes	Yes	No	No	some rubbish	No	No		
MTW-179	37-6-2477	21/11/2025	Yes	Yes	Yes	No	No	No	No	No	No		
MTW-180	37-6-2478	21/11/2025	No	Yes	Yes	Yes	No	No	No	No	No		
MTW-181	37-6-2479	21/11/2025	Yes	Yes	No	/	No	No	No	No	No	dubious, very small	
MTW-182	37-6-2480	21/11/2025	No	Yes	Yes	Yes	No	No	No	No	No		
MTW-183	37-6-2481	21/11/2025	Yes	Yes	Yes	No	No	No	No	No	No		
MTW-184	37-6-2482	21/11/2025	No	Yes	No	/	No	No	No	No	No		
MTW-192	37-6-2490	21/11/2025	Yes	Yes	Yes	No	No	No	No	No	No		
MTW-193	37-6-2491	21/11/2025	Yes	Yes	Yes	No	No	No	No	No	No		
MTW-207	37-6-2505	21/11/2025	No	Yes	No	/	No	No	No	kangaroo pad	No		
MTW-223	37-6-2521	24/11/2025	Yes	Yes	No	/	No	No	No	No	No		
MTW-225	37-6-2523	24/11/2025	No	Yes	Yes	No	No	No	No	No	No		
MTW-282	37-6-2577	24/11/2025	No	Yes	Yes	No	No	No	No	No	No		
WS13	37-6-2709	24/11/2025	No	Yes	Yes	Yes	No	No	No	No	No		
WS6;	37-6-2712	24/11/2025	No	Yes	Yes	Yes	No	No	No	No	No		
WB3	37-6-2883	21/11/2025	No	Yes	No	/	No	No	No	No	No		
MTW-507	37-6-2925	24/11/2025	Yes	Yes	Yes	Yes	No	No	Old track	No	No	additional artefacts found on old track	barricade old track to prevent inadvertent access; add new finds to existing site records
MTW-508	37-6-2926	24/11/2025	No	Yes	Yes	Yes	No	No	Old track	No	No	additional artefacts found on old track	barricade old track to prevent inadvertent access; add new finds to existing site records
MTW-509	37-6-2927	24/11/2025	Yes	Yes	Yes	Yes	No	No	Old track	No	No	additional artefacts found on old track	barricade old track to prevent inadvertent access; add new finds to existing site records

Site Name	AHIMS ID	Date	Site re-identified?	Site intact?	Site fenced/ barricaded?	Fencing/ barricading intact?	Natural erosion	Livestock damage	Human disturbance	Animal disturbance	Pests & weeds	General observations	Management recommendations
MTW-513	37-6-2931	24/11/2025	No	Yes	Yes	Yes	No	No	Old track	No	No	additional artefacts found on old track	barricade old track to prevent inadvertent access; add new finds to existing site records
MTW-514	37-6-2936	24/11/2025	No	Yes	Yes	Yes	No	No	Old track	No	No	additional artefacts found on old track	barricade old track to prevent inadvertent access; add new finds to existing site records
MTW-521	37-6-2942	24/11/2025	No	Yes	No	/	some	No	Old track	No	No		
MTW-732	37-6-4475	24/11/2025	Yes	Yes	Yes	Yes	No	No	In mulched area	No	No	recent chance find	

Table 1: Results of 2025 MTW AHMP Compliance Inspection

Aboriginal Site Management Recommendations

All ACH site locations visited during the AHMP compliance inspection were found to be intact with no recent damage or unauthorised disturbance noted. Not all ACH sites were able to be re-identified, but this was due to poor GSV or leaf litter obscuring the ground surface rather than due to inadvertent destruction. Management recommendations were provided for some of the ACH sites visited, however, as the majority of sites faced a very low risk of future disturbance, the field team were satisfied with the current passive management regime. Several sites had been previously barricaded, however that barricading was generally dilapidated. If activity in the vicinity of these sites increases then this barricading should be re-instated, as this is an effective control against inadvertent ground disturbance. The nature of the recommendations that were forthcoming are described below.

Remove rubbish from site vicinity

Site: MTW-141, MTW-176

The presence of historic, farming related debris and scrap was noted in the immediate vicinity of two ACH sites inspected. It should be noted that this rubbish was not located within the site boundaries, nor had it disturbed any recorded ACH material. The majority of the material consisted of scrap metal – a likely deliberate dump at MTW-141 and an individual water tank ring at MTW-176. Access to these areas and the removal of the rubbish would be able to be accomplished while also avoiding all ACH sites in the area.



Scrap metal dump near MTW-141



Old water tank near MTW-176

Continue to barricade and monitor annually ahead of mining

Sites: MTW-70

Site MTW-70 is a dead scarred tree located on the edge of the final mining boundary at Warkworth Mine. The tree is standing but is in a fragile state due to having been burnt, and is currently infested with termites. The site has been previously discussed with the MTW CHWG many times and is currently intended to be salvaged or re-assessed ahead of future mining disturbance. The current audit field team concurred with opinions offered by previous CHWG representatives that the scar did not appear to be of cultural origin. Until any reassessment occurs, the tree should be effectively barricaded and sign-posted for its protection as mining works continue to increase in the area.

The tree should be inspected annually until an ultimate decision is made as to its ability to be salvaged. Due to its fragile nature, a successful removal program is unlikely. Ongoing annual inspections will provide status information to the MTW CHWG and allow that group to make informed decisions on the tree's ongoing management. It should be noted that there were no obvious signs of deterioration evident compared to the 2024 compliance inspection.



Barricade ends of redundant track

Site: MTW-507, 508, 509, 513, 514,

In order to avoid inadvertent disturbance to several ACH sites, the access track to Springwood Homestead has been re-routed. These sites are located immediately adjacent to, and occasionally intersecting with, the existing access track (white dashed line in image below) and it was recommended to re-route this track during the 2024 compliance audit, which has since occurred. It is further recommended that this redundant track be barricaded or bunded to prevent inadvertent access and site disturbance. Logical positions for this bunding would be to the west of site MTW-509 and at the track intersection to the east of MTW-514.



Ground Disturbance Audit Check

Aside from affording CHWG representatives with an opportunity to visit mining operations and monitor the condition of ACH sites, another intention of the compliance inspections is to provide the opportunity to inspect the operational compliance with AHMP provisions and GDP procedures. To this end an inspection was made of the re-routed Springwood Homestead access track. This new track is shown below, with the sites mentioned above in the vicinity of the now redundant track located within the scrub to the right of the picture.



The audit team confirmed that the construction of the new track had not disturbed any ACH sites or objects, and that it was an appropriate solution to prevent the disturbance of any sites adjacent to the now redundant track. This was reinforced by the identification of several stone artefacts on and adjacent to the redundant track, and outside of previously recorded site extents. These site extents will be modified to include these new finds, and the barricading/bunding recommended above will help ensure they are not further disturbed.

Conclusions and Recommendations

The 2025 AHMP compliance inspection has been conducted as per the procedures outlined in the AHMP. No unauthorised site disturbances or AHMP non-compliances were observed during the inspection, and no issues were raised by the CHWG representatives present. A number of recommendations have been made to enhance or assist with the management of ACH at MTW, which are summarised below:

1. **Remove old farm rubbish and scrap metal from the vicinity of sites MTW-141 and 176;**
2. **Continue to monitor and avoid MTW-70 annually ahead of mining and/or further assessment;**
3. **Barricade or bund the ends of the redundant Springwood Homestead access track to avoid disturbance of trackside sites; and**
4. **Update the site details and extents of sites in the MTW ACH GIS along redundant Springwood Homestead access track.**

Appendix 4:

Historic Heritage Management Plan Compliance Inspection Report

Mount Thorley Warkworth Historic Heritage Management Plan 2025 Compliance Audit Inspection

Report prepared for

Yancoal Australia, Mount Thorley Warkworth



February 2026

Joel Deacon

ARROW
HERITAGE SOLUTIONS

Introduction

Yancoal Australia (Yancoal) manage the Mount Thorley Warkworth (MTW) mining complex located in the Hunter Valley, approximately 8km south-west of Singleton. Approval for the continuation and expansion of the mine was granted on 26 November 2015 under two separate project approvals: the Warkworth Continuation Project Approval (SSD-6464) and the Mount Thorley Operations Project Approval (SSD-6465).

Pursuant to Condition 46 of the Warkworth Continuation Project Approval, Yancoal have developed an MTW Historic Heritage Management Plan (HHMP) that covers the MTW mining complex. The MTW HHMP was approved by the Department of Planning and Environment on 11 October 2017 and sets out the principles, processes and measures through which historic heritage will be managed within the HHMP Area. This includes the commitment (Provision 19) to conduct an annual HHMP compliance inspection. The purposes of the HHMP compliance inspections are to:

a. inspect areas and sites to assess compliance with the provisions of the HHMP and site-specific Conservation Management Plans (CMPs);
b. inspect and monitor the condition and management of various sites; and
c. review the effectiveness and performance of the HHMP provisions in the management of historic heritage at MTW.

Proposed Activity and Project Brief

The following historic sites within the MTW HHMP area (shown on the map below) were inspected to assess compliance with actions listed in the HHMP and specific CMPs. A detailed photographic record for each site was also collated to add to the previous photographic data:

- Former RAAF Base Bulga Mess Hall
- Springwood Homestead
- Mount Thorley Brick Farm House

Timing & Personnel

The 2025 MTW HHMP compliance inspection was conducted on 25 November. Arrow Heritage Solutions were engaged as independent heritage consultants to conduct the HHMP compliance inspection, with Joel Deacon acting as technical advisor and author of this report. Patrick Kirkwood, MTW Environment and Community Advisor, arranged the compliance inspection program and arranged access to each site. Darrell Rigby, MTW Community Heritage Advisory Group (CHAG) member and Singleton Council Heritage Advisor also attended.

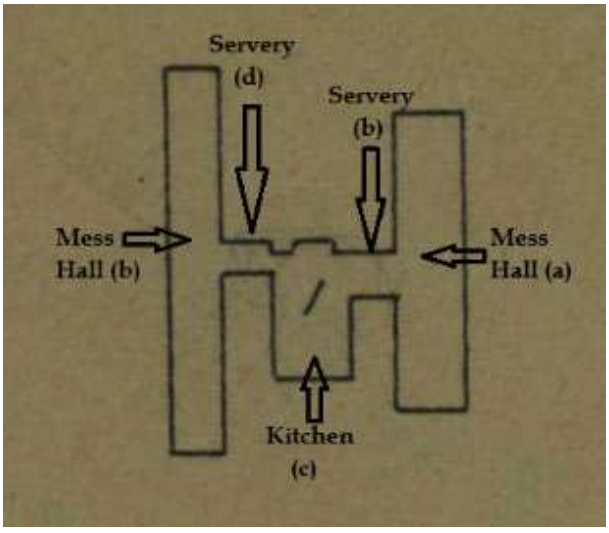

Historic Heritage Sites Inspected
2025 MTW HHMP Compliance Audit
Springwood Homestead
Mount Thorley Red Brick House
Former RAAF Base Bulga Mess Hall
Legend
HHMP Audit Sites
Warkworth Continuation DC Boundary
MTW Mining Leases
1 0 1 2 3 4 km

Former RAAF Base Bulga Mess Hall

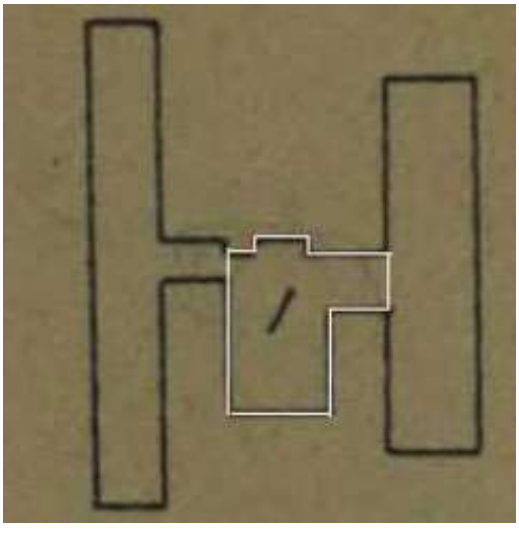
Following the Japanese attack on Pearl Harbour in December 1941, plans were approved to expand existing RAAF bases and establish new ones, including a number of sites in the Hunter Valley. Bulga was identified as a potential site for an operational base and the area was officially taken over by the RAAF on 12 June 1942 for use as a relief landing strip. By July 1943 the site was completed, including the kitchen and mess hall, however, by January 1944 the use of the site was limited due to the decreasing threat of attack. A 1946 condition report noted this building as deteriorating. In January 1953, the building was noted as missing a few sheets of iron and windows.

The building sits in the former camp area west of the north-south runway. It was originally irregular in plan comprising a central kitchen area measuring 13.4 x 8.8m, with long rectangular mess halls to the east and west, connected by a servery on either side. The remnant structure today comprises the kitchen building and the foundation of one of the serveries (see below).

The remnant building is "L" shaped in plan with brick and concrete footings. During the original assessment conducted by ERM in November 2012 (which informed the CMP) the building was noted as being in poor condition with trees physically impacting on the building fabric, and some minor settlement issues resulting in cracking and failing brickwork. The western section of the building was the most intact part, retaining the original timber frame, corrugated asbestos cement roof sheeting and walls clad with corrugated iron sheeting.



Original layout of building



Remaining structure

The building is currently structurally unsound, with a number of timber elements either missing or in a deteriorated state. Corrugated asbestos roof sheeting is also missing in some places, and damaged and in poor condition where it remains. Much of the corrugated iron sheeting

is corroded. Brickwork is also cracking in a number of locations resulting in movement outward, loss of mortar and loss of bricks along the southern and eastern elevations.



View to mess from south-east (2012)



Remnant kitchen area (2012)

As a result, a number of structural recommendations were outlined by ERM in the CMP developed for the site in 2012. These recommendations were not intended to return the building to a serviceable state, rather they sought to do the minimum required to allow safe access to the building to prevent significant damage, and also allow safe access for asbestos removal and internal inspection of the building in the short to medium term.

CMP Requirements

Short to medium term structural recommendations included:

a) **Remove fallen tree branch.** The tree branch impacting on the roof of the building should be removed, using an external mobile elevated platform or boom lift;
b) **Temporary propping.** The building should be temporarily propped and supported as per Bligh Tanner plans SK 1.0 A and SK 2.0 A (contained within the CMP) to allow for safe access into the building and more detailed inspection of the structure.
c) **Asbestos Removal.** Asbestos removal should be completed by a licensed asbestos removal specialist, include the roof sheeting, all asbestos dust and fibres, and loose fragments that are known to exist in the remaining area.
d) **Stabilise framework and replace roof.** Any structural roof members that are destabilized once the roof sheeting is removed are to be secured as required. Side walls which lose stiffness once the roof sheeting has been removed are to be propped temporarily until the new roof has been replaced.
e) **Archaeological clean-up.** Asbestos removal and clean-up should be supervised by a historical archaeologist to ensure any identified items of significance are retained.

f) **Further building inspection.** A structural engineer should complete a building inspection to identify structural repairs and stability requirements within four weeks of the building being cleaned up and decontaminated from asbestos.

Following the internal inspection of the building noted in (f) above, further advice may be provided regarding further recommendations, which, due to the lack of integrity of the building, are unlikely to be directed at restoration, but more towards retaining the remnant structure in a safe environment and reducing further deterioration. Repair drawings have been provided in the CMP to remedy any major cracking in the brickwork or where sections of brickwork have either partially collapsed or broken away from the wall.

Photographic Comparison 2012 through 2025

During the inspection of the Former RAAF Base Bulga Mess Hall for this report, a number of photographs were taken from the same angles and of the same features as were taken during the original ERM 2012 assessment and archival recording as well as during subsequent annual HHMP compliance inspections. These photographs provide a visual baseline condition assessment of the building and also allow a comparative analysis of the building's condition over the last 13 years. The photographs set out below show the condition of the site today in comparison to the 2024 audit, the original 2012 assessment and other selected years where major changes in the site's condition were observed. Comments pertinent to management recommendations for the site are also provided. Where defects have been noted and/or actions have been recommended and remain outstanding, these have been presented in blue text. Where stabilisation or improvement measures have been implemented, these are noted in green text. Previous compliance audit inspection reports can be reviewed for a full photographic archive of the site.

2012	2018
	
2024	**2025**
	

East elevation

2012-18: no discernible change – note fallen branch from tree on western side.

2018-20 (Mar): no discernible change – fallen branch has moved.

Mar 2020 – Dec 2020: no discernible change.

Dec 2020 – 2021: no discernible change.

2021-2022: no discernible change.

2022-2023: no discernible change.

2023-2024: no discernible change.

2024-2025: no discernible change.

2012	2020 (Mar)
	
2024	**2025**
	

South-east elevation

2012-18: evidence of increased bow to southern wall.

2018-20 (Mar): bow in wall appears to have increased.

Mar 2020 – Dec 2020: bow in wall continues to increase.

Dec 2020 – 2021: gap in bowing has increased.

2021-2022: no discernible change.

2022-2023: bow in wall continues to increase

2023-2024: bow in wall increasing, with some collapse and slumping at near bottom corner

2024-2025: no discernible change.

2012	2022
	
2024	**2025**
	

South elevation

2012-18: evidence of increased bow to southern wall and missing panel above entry.

2018-20 (Mar): increased bow to southern wall.

Mar 2020 – Dec 2020: increased bowing on southern wall.

Dec 2020-2021: gap in bowing has increased.

2021-2022: potential subsidence bottom right corner.

2022-2023: increased bowing on southern wall.

2023-2024: missing timbers right hand side of roof, slumping brickwork at bottom right corner

2024-2025: no discernible change.

2012	2020 (Mar)
	
2024	**2025**
	

West elevation

2012-18: shows deterioration of roofing members above open kitchen area and leaning north wall, and further collapse of asbestos roof due to fallen dead tree.

2018-20 (Mar): top of north wall now collapsed, further damage to roof with branch now fallen to ground.

Mar 2020 – Dec 2020: no discernible change.

Dec 2020-2021: northern wall on near side of chimney has detached from exposed western beam.

2021-2022: no discernible change

2022-2023: no discernible change

2023-2024: increased animal activity at bottom left corner

2024-2025: some movement of fallen interior timbers; apparent further separation of northern wall.

2012	2020 (Mar)
	
2024	**2025**
	

North elevation

2012-18: no discernible change.

2018-20 (Mar): top of north wall now collapsed.

Mar 2020 – Dec 2020: no discernible change.

Dec 2020-2021: no discernible change.

2021-2022: no discernible change

2022-2023: no discernible change

2023-2024: no discernible change

2024-2025: some fallen corrugated iron at bottom north-eastern corner.

2012	2018
	
2024	**2025**
	

Concrete and brick foundation at east side of building

2012-18: difficult to discern change.

2018-20 (Mar): no discernible change.

Mar 2020 – Dec 2020: no discernible change.

Dec 2020-2021: difficult to discern change.

2021-2022: no discernible change

2022-2023: some collapse of internal timber members

2023-2024: snapped timber on right hand side of foundation; motorcycle tracks on foundation surface

2024-2025: some fallen corrugated iron in north-eastern corner; cactus growing inside unroofed section.

2012	2022
	
2024	**2025**
	

Grease trap at south end of building

2012-18: shows bow to south wall.

2018-20 (Mar): shows increased bow to south wall.

Mar 2020 – Dec 2020: shows increasing bowing of south wall, and example of new termite monitoring system in bottom right of picture.

Dec 2020-2021: shows increasing bowing of south wall.

2021-2022: potential subsidence at broken brick corner.

2022-2023: some increased movement at cracked corner

2023-2024: slumping brickwork at cracked corner.

2024-2025: no discernible change.

2012	2018
	
2024	**2025**
	

Storage area at south end of building

2012-18: further slight collapse of storage area.

2018-20 (Mar): shows loosening of corrugated iron wall sheeting due to bowing in wall.

Mar 2020 – Dec 2020: no discernible change.

Dec 2020-2021: no discernible change.

2021-2022: no discernible change

2022-2023: further separation of corrugated iron wall sheeting due to bowing in wall.

2023-2024: some movement of loose metal items on ground.

2024-2025: some movement of loose metal items on ground.

2012	2018
	
2024	**2025**
	

Windows and entry at west elevation

2012-18: shows large trunk/branch portions of tree collapsed on roof, which has destroyed roof ventilator.

2018-20 (Mar): shows majority of branches fallen from roof, leaving increased damage to sheeting.

Mar 2020 – Dec 2020: no discernible change.

Dec 2020-2021: no discernible change.

2021-2022: no discernible change.

2022-2023: no discernible change.

2023-2024: no discernible change.

2024-2025: no discernible change.

2012	2018
	
2024	**2025**
	

Timber window detail, west elevation

2012-18: no discernible change.

2018-20 (Mar): no discernible change.

Mar 2020 – Dec 2020: no discernible change.

Dec 2020-2021: no discernible change.

2021-2022: no discernible change.

2022-2023: no discernible change.

2023-2024: no discernible change.

2024-2025: no discernible change.

2012	2020 (Mar)
	
2024	**2025**
	

Detail of north-west elevation

2012-18: shows increased collapse over open kitchen area, as well as new damage to brick foundation at north-west corner.

2018-20 (Mar): shows fallen top of north wall plus increased (animal?) damage to brick foundation at north-western corner.

Mar 2020 – Dec 2020: no discernible change.

Dec 2020 – 2021: detachment of north wall from western beam.

2021-2022: no discernible change

2022-2023: some internal timbers have fallen further.

2023-2024: no discernible change.

2024-2025: further collapse of interior members; northern wall slumping out.

2012	2020 (Mar)
	
2024	**2025**
	

Showing interior damage at kitchen at north end of building

2012-18: shows increased collapse over and accumulation of debris within open kitchen area. Note also severe lean to north wall. Stove doors have become unhinged.

2018-20 (Mar): shows collapsed top of north wall and collapse of remaining full crossbeam. Stove now obscured by collapsed north wall.

Mar 2020 – Dec 2020/Dec 2020 – 2021/2021-2022: no discernible change.

2022-2023: some movement of fallen timbers.

2023-2024: some movement of fallen timbers.

2024-2025: some movement of fallen timbers and iron.

2012	2018
	
2024	**2025**
	

View to interior of south end of building, view from east

2012-18: shows increased collapse over open kitchen area.

2018-20 (Mar): shows further minor deterioration of asbestos panelling.

Mar 2020 – Dec 2020/Dec 2020 – 2021/2021-2022: no discernible change.

2022-2023: some movement of fallen timbers.

2023-2024: breakage to some asbestos panelling, some fallen frame timber.

2024-2025: some movement of fallen timbers, easternmost vertical wall strut fallen.

2012	2018
	
2024	**2025**
	

Showing west interior space

2012-18: no discernible change.

2018-20 (Mar): no discernible change.

Mar 2020 – Dec 2020: no discernible change.

Dec 2020 – 2021: no discernible change.

2021-2022: no discernible change.

2022-2023: no discernible change.

2023-2024: some fallen interior sheeting.

2024-2025: no discernible change.

2012	2018
	
2024	**2025**
	

Damaged brick foundation at south-east corner (south view)

2012-18: no discernible increase to cracked brick foundation.

2018-20 (Mar): further cracking of foundation (to left of shot) and some slumping of corner bricks.

Mar 2020 – Dec 2020: some slight potential further movement in cracked section (also note termite management system in bottom right-hand corner of photograph.

Dec 2020 – 2021: no discernible change.

2021-2022: subsidence noted with buckling beginning between 3rd and 4th course of bricks.

2022-2023: potential further slumping to corner.

2023-2024: increased bowing to brickwork.

2024-2025: no discernible change.

2012	2018
	
2024	**2025**
	

Detail of damaged brick foundation (east view)

2012-18: some further collapse of concrete/cement above brick foundation.

2018-20 (Mar): some slumping outwards of corner brick foundation.

Mar 2020 – Dec 2020: no discernible change.

Dec 2020 – 2021: movement and setting of internal concrete piece.

2021-2022: increased cracking along mortar lines.

2022-2023: no discernible change.

2023-2024: no discernible change.

2024-2025: some minor additional cracking along mortar lines.

2012	2020 (Mar)
	
2024	**2025**
	

View to interior of building, looking north from south entry

2012-18: no discernible change.

2018-20 (Mar): no discernible interior change but shows collapsed north wall.

Mar 2020 – Dec 2020: no discernible change.

Dec 2020 – 2021: no discernible change.

2021-2022: some movement of timbers at front of shot may suggest human interference.

2022-2023: movement of prone drum may suggest human or animal interference.

2023-2024: movement of several items (drums and plasterboard).

2024-2025: no discernible change.

2012	2018
	
2024	**2025**
	

Showing interior of building, viewed from north-west corner

2012-18: shows collapsed roofing members above open kitchen area and accumulation of debris.

2018-20 (Mar): shows additional collapsed roofing member.

Mar 2020 – Dec 2020: no discernible change.

Dec 2020 – 2021: no discernible change.

2021-2022: no discernible change.

2022-2023: some movement of fallen timbers.

2023-2024: no discernible change.

2024-2025: no discernible change.

The comparative photographs above show the changes at the building over the past 13 years. Although no substantial changes were noted between the current and the last inspection, no structural maintenance has occurred either. Of new concern is the evidence that the northern wall is largely unsupported and has begun to detach and collapse outwards.

It can be expected that over the years, the underlying causes of deterioration, such as the degeneration of wooden framework and metal panelling, and animal burrowing underneath the structure, has continued. Therefore, the more significant changes and priority actions identified during previous inspections remain of importance and, if anything, their need of remediation has increased in urgency. Previous recommendations remain valid and the key issues remain:

- Damaged roof sheeting and roofing members, as well as increasing structural instability of bowing southern wall;
- Due to the complete collapse of roofing members over the open kitchen area the top portion of the northern wall has now failed and fallen inside the building footprint. This northern wall has now detached from remnant roofing and west wall members;
- Deterioration of window paneling; and
- Increased damage to brick foundation in north-west corner, and new slumping of south-east foundation corner.

A termite management regime was implemented around the site prior to the 2020 annual inspection and has remained ongoing on a quarterly basis.

A condition inspection of the Former RAAF Base Bulga Mess Hall was conducted in April 2024 (Bill Jordan & Associates), which confirmed that the original Bligh Tanner structural recommendations remain fit for purpose. This recent inspection also provided interim guidance to support building stability while undertaking the asbestos removal, which has been added to the high priority actions below.

Recommendations

High Priority Actions

1. Engage an asbestos expert to assess and develop a clean-up and disposal plan to deal with both the broken fragments and intact asbestos sheeting, with internal scaffolding to be installed to support the roof structure prior to any works in that area;
2. Remove any remaining tree branches from the roof, with internal scaffolding to be installed to support the roof structure prior to any works in that area. In addition, to prevent similar damage in the future, serious consideration should be given to

removing or lopping those trees that are located close enough to the building that they may cause damage if they fall or drop large branches.

High Priority Actions to Follow Actions 1 & 2

3. Pending the results of the asbestos assessment, the building and surrounds should be thoroughly cleaned of asbestos and other rubbish material. An archaeologist should be present to collect any items of historic importance or that relate to the original fabric of the building. This should also include the removal, repair and curation of items such as window frames and panels before their total deterioration. All such items can be stored inside the building and potentially re-used during further stabilization programs;
4. Pending the results of the asbestos assessment, susceptible parts of the building framework, such as roofing members and walls should be stabilized and propped, using the CMP Bligh Tanner plans as a guide;
5. Depending on the time elapsed between now and the completion of the actions above, a structural engineer should again inspect the building before any further works are commenced to ensure recommendations on stability requirements and structural repairs remain current. These further works should aim to reduce the likelihood and extent of any further deterioration at the site rather than seek to rebuild or renovate as it is unlikely that there would be any valid or appropriate option to re-use the site.

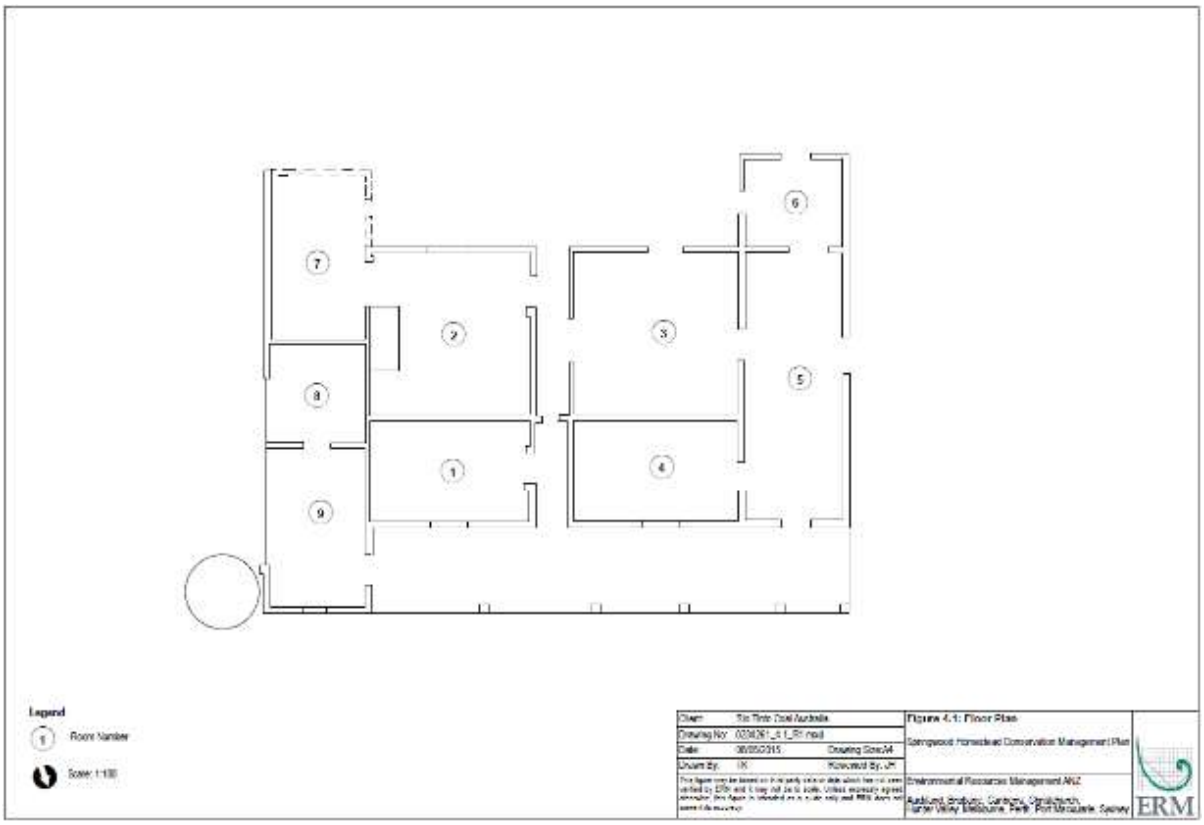
Ongoing

6. Continue with the termite monitoring regime, including an assessment of the integrity of the existing termite inspection pits.

Springwood Homestead

Based on historical research, Springwood Homestead is likely to have been constructed c.1860 and displays many characteristics of late Old Colonial Georgian and Victorian Georgian architecture, including an original shingle broken-backed roof, fanlights or transom lights, panelled doors and under-roof verandas. The homestead is low set, constructed in vertical timber slabs and built around a four room square core, as shown in the plan below.

Given that Springwood Homestead is timber framed and in direct contact with the ground, it is remarkable that it is still standing and in a generally stable condition, with most roof rafters appearing to be still in place. Although the building fabric is generally intact there are a number of areas where the level of structural damage to the roof, wall and flooring members is high. The majority of the damage has occurred from termites and fungal decay, resulting in localised collapse of outer external walls and roof structures. Vandalism has also been an issue, with many vertical timber slabs having been pilfered. Within the CMP developed for the site by ERM in 2015, a number of stabilisation measures have been recommended that will assist to reduce the extent of damage, however a return to a habitable state is not planned.



Springwood Homestead plan (taken from 2015 ERM CMP)



Springwood Homestead in 2012

CMP Recommendations

Although many recommendations are made within the CMP, the more important management measures have been incorporated within a conservation works schedule that covers the following issues:

- Drainage and weatherproofing;
- Vegetation;
- Termites and vermin;
- Building fabric; and
- Structural capacity and wind loads.

The works schedule prioritises the required conservation works and are presented with technical specifications from a structural engineer. Those measures that attend to the building's structural integrity are the focus of the schedule.

High Priority

a) Remove debris from roof using a cherry picker or similar;
b) Remove tree from eastern elevation and stabilize building in this location;
c) Remove vine from eastern wall using combination of pruning and herbicide;
d) Remove tree from south-west corner and stabilize building in this location;
e) Prune all overhanging branches and maintain regular maintenance program; and
f) Reinstate southern veranda and roof to match northern elevation.

Moderate to Low Priority

g) Place treated plywood sheeting over door openings;
h) Prune trees, spray weeds and slash grass;
i) Clean up of site surrounds, overseen by archaeologist;
j) Clean up of building interior, overseen by archaeologist;
k) Refix loose ceiling boards, retaining evidence of fabric if unable to fix;
l) Refix loose and dislodged slabs and plates; and
m) Place treated plywood sheeting over openings and undertake repairs to windows.

Photographic Comparison 2014 through 2025

During the inspection of Springwood Homestead for this report, a number of photographs were taken from the same angles and of the same features as were taken during the original ERM 2014 assessment that informed the CMP as well as during subsequent annual HHMP compliance inspections. These photographs provide a visual baseline condition assessment of the building, and also allow a comparative analysis of the deterioration, or maintenance, levels over the last 11 years. The photographs set out below show the condition of the site today in comparison to the 2024 audit, the original 2014 assessment and other years where major changes in the site's condition were witnessed. Comments pertinent to management recommendations for the site are also provided. Where defects have been noted and/or actions have been recommended and remain outstanding, these have been presented in blue text. Where stabilisation or improvement measures have been implemented, these are noted in green text. Previous compliance audit inspection reports can be reviewed for a full photographic archive of the site.

2014	2018
	
2024	**2025**
	

Eastern elevation

2014-8: no discernible change.

2018-20 (Mar): roof slumping appears to have increased.

Mar 2020-Dec 2020: heavy leaf litter on roof persists. Positively, vegetation clearing surrounding the house is occurring regularly.

Dec 2020–2021: tree growth and associated leaf litter/structural impacts increasing.

2021-2022: tree growth increasing with associated deterioration of roof integrity.

2022-2023: tree growth continues and southern section of timber wall/skillion has collapsed.

2023-2024: tree has been pruned, fallen timbers and roof sheets have been cleared and stacked, broken edge beam strapped and propped, internal roof rafters propped.

2024-2025: no discernible change.

2014	2018
	
2024	**2025**
	

Southern elevation

2014-8: vertical timber slabs have been removed from southern wall.

2018-20 (Mar): possible deterioration of shingles at roof edge, and missing panels from above back door.

Mar 2020-Dec 2020/Dec 2020 – 2021: no discernible change.

2021-2022: uprights from chimney room wall fallen or vandalised, along with remaining wall elements. Associated roof line slumping. Chimney slumping to the east. Movement of remnant furniture/timbers evident through doorway in western room.

2022-2023: part of door has broken off.

2023-2024: some separation of left hand back wall from corner, fallen timbers and roof sheets have been cleared and stacked, edge beam propped, internal roof rafters propped, chimney has been clad and propped.

2024-2025: extensive new framing support installed; loose building materials and fabric stacked neatly inside; plywood sheeting installed to protect exposed shingles and direct roof runoff away from building.

2014	2020 (Mar)
	
2024	**2025**
	

Southern elevation doorway

2014-8: door has been removed.

2018-20 (Mar): no discernible change.

Mar 2020-Dec 2020: no discernible change.

Dec 2020 – 2021: no discernible change.

2021-2022: fallen timber to right of door jamb.

2022-2023: door timber fallen across hallway.

2023-2024: fallen timbers cleared and stacked.

2024-2025: new supportive framing installed.

2014	2018
	
2024	**2025**
	

Eastern side

2014-8: debris has been cleaned and stored and a weed removal program conducted. The house area has also been fenced.

2018-20 (Mar): further deterioration of eastern wall and regrowth of weeds.

Mar 2020-Dec 2020/Dec 2020 – 2021: no discernible change.

2021-2022: apparent increased deformation of eastern roof line.

2022-2023: south-east wall and skillion roof collapsed.

2023-2024: tree has been pruned, fallen timbers and roof sheets have been cleared and stacked, fallen side wall and roof propped, chimney clad and propped.

2024-2025: some roof sheeting has detached and fallen.

2014	2022
	
2024	**2025**
	

Room 2 interior

2014-8: increased debris caused by removal of southern wall.

2018-20 (Mar): no discernible change.

Mar 2020-Dec 2020: no discernible change.

Dec 2020 – 2021: no discernible change.

2021-2022: fallen timber upright; increased decay of chimney blocks.

2022-2023: south-east wall and skillion roof collapsed, continued erosion of chimney sandstone blocks, movement of fallen timbers on floor suggests human or animal visitors.

2023-2024: floor debris cleared and stacked, fallen far roof propped and material cleared, chimney clad and propped.

2024-2025: timbers and fabric stacked neatly within room.

2014	2018
	
2024	**2025**
	

South-west corner

2014-8: shows removal of vertical slabs from southern wall.

2018-20 (Mar): no discernible change.

Mar 2020-Dec 2020: no discernible change.

Dec 2020 – 2021: furniture in far room collapsed.

2021-2022: wall/ceiling separation within white room, furniture/timber disturbance in western room.

2022-2023: no discernible change.

2023-2024: separation of wall at far left corner (up to 13cm), floor debris cleared and stacked, external missing wall propped.

2024-2025: loose wall timbers stacked inside building; new supporting framework installed.

2014	2018
	
2024	**2025**
	

Northern elevation

2014-8: further deterioration of weatherboard panelling.

2018-20 (Mar): no discernible change, though termite activity present.

Mar 2020-Dec 2020: grass/weed growth encroaching over veranda floor.

Dec 2020 – 2021: increased grass encroachment.

2021-2022: increased grass growth.

2022-2023: no discernible change.

2023-2024: ground debris cleared and stacked, veranda beam propped.

2024-2025: no discernible change.

2014	2018
	
2024	**2025**
	

South-east corner

2014-8: shows removal of vertical slabs from southern wall, and some from eastern wall, and further collapse of roof.

2018-20 (Mar): further roof slumping and deterioration of eastern wall.

Mar 2020-Dec 2020: no discernible change.

Dec 2020 – 2021: further deterioration of eastern wall.

2021-2022: movement of roofing timbers, subsidence in chimney blocks, bottom left corner.

2022-2023: total collapse of side wall and roof.

2023-2024: tree has been pruned, fallen timbers and roof sheets have been cleared and stacked, fallen side wall and roof propped, chimney clad and propped.

2024-2025: some roof sheeting has detached and fallen; increased stabilising propping installed.

2014	2020 (Mar)
	
2024	**2025**
	

Eastern elevation

2014-8: possible further collapse of crossbeam and guttering.

2018-20 (Mar): tree continues to impact eastern roof line.

Mar 2020-Dec 2020: increased impact on roofline by tree branches.

Dec 2020 – 2021: tree continues to impact eastern side.

2021-2022: veranda roof now considerably buckled in middle, with separation of timber members occurring.

2022-2023: tree continues to impact eastern side, with wall collapse shown at near left.

2023-2024: tree has been pruned, broken edge beam strapped and propped.

2024-2025: no discernible change.

2014	2020 (Dec)
	
2024	**2025**
	

Northern elevation

2014-8: slumping of veranda along edge beam.

2018-20 (Mar): no discernible change.

Mar 2020-Dec 2020: grass/weed growth encroaching over veranda floor.

Dec 2020 – 2021: no discernible change.

2021-2022: peppercorn has been pruned; termite damage is increased within veranda uprights.

2022-2023: increased splitting to fourth veranda post from right.

2023-2024: deterioration of third veranda post from right, props installed at centre of veranda and near corner, floor debris cleared and stacked.

2024-2025: strapping at corner loose; some cladding on western wall fallen.

2014	2022
	
2024	**2025**
	

View of south-west corner from south

2014-8: shows removal of vertical slabs from southern wall as well as some increase in vegetation growth.

2018-20 (Mar): no discernible change but continuing vegetation impacts.

Mar 2020-Dec 2020: apparent increased vine growth.

Dec 2020 – 2021: continued impacts on south-west corner.

2021-2022: vine has been chopped near ground and killed, some resultant movement of timbers.

2022-2023: no discernible change but continuing vegetation impacts.

2023-2024: bowing of western wall, clean up of fallen timbers.

2024-2025: no discernible change.

The comparative photographs above show the changes at the building over the past 11 years. Over the last year there have been several positive measures implemented across the site to help stabilise the building and protect vulnerable items of historic fabric, with actions such as the propping and stabilisation informed by an April 2024 condition inspection (Bill Jordan and Associates). These positive measures include:

- Pruning of the tree impacting the eastern elevation
- Clearing and stacking of all historic items of building fabric that have previously collapsed, fallen or have otherwise been arrayed across the site
- Strapping and propping of eastern edge beam as well as propping of internal roofing rafters along this section
- Installation of supporting framework under the southern elevation roof line
- Cladding and propping of sandstone chimney
- Northern veranda edge beam propped
- Temporary roof extension installed at southern elevation. Extension is diverting roof runoff away from rear of building and protecting exposed shingles.



Recent temporary roof extension and supporting framework installed along southern elevation within the last 12 months

These are positive management measures that will serve to stabilise the building in anticipation of further remedial structural actions being implemented. Some minor detrimental

changes were also noted during this inspection, largely relating to the localised collapse of some non-structural building elements.

Despite the positive management measures implemented, it can also be expected that the underlying causes of deterioration, such as the degeneration of wooden framework, impacts caused by adjacent trees and the effects of weather entering the unsealed building has continued. Therefore, the priority CMP actions originally identified remain of importance, with recognition that work has begun in this regard.

It remains noted that the collapse of the south-eastern section of wall identified during the 2023 audit exposed some portions of old newspaper that had been adhered to one pieces of wood that once served as shelving in this room. These newspaper fragments are 115 years old and recommendations on their care and conservation are outlined below.

Recommendations

Management recommendations have been prioritised as high or moderate importance, with high priority recommendations to be actioned as soon as possible. The conservation works schedule within the CMP has been re-assessed by Bill Jordan and Associates, and deemed adequate and fit for purpose in light of the building's current structural status. The propping and framing measures recently applied are acknowledged as a positive step towards stabilising the building.

High Priority

1. Remove the trees and vines currently impacting the building at the eastern elevation and south-west corner and treat to prevent regrowth (acknowledgment that work has begun in this regard). Coincident with this removal, acrow props should be installed where appropriate, i.e. where the trees themselves have been supporting the building structure, and as per current structural engineer's instructions at Annex B of the CMP;
2. Once vegetation has been removed, clean all debris from the roof and prune (or consider the removal of) all other trees in close vicinity of the building with potential to drop leaf/branch litter on roof;
3. Engage an archaeologist to ensure any items of historical relevance recently cleared and stored within the building are salvaged and dealt with appropriately. It is noted that all loose building items and other associated material has been collected from the vicinity and stacked neatly within the building; and
4. The wooden piece containing the remnant newspaper fragments should be removed from the site as soon as possible in order to preserve the remaining fabric. The piece

should be stored inside and in constant temperature conditions at low humidity and in dark conditions. It should be stored so as to be protected from vermin and pests, and personnel involved should avoid touching the fragments, especially with bare hands. Prior to removal, in situ photographs should be taken of the piece and its relationship to the other fallen timbers in order to record its contextual provenance. These measures should be undertaken immediately and do not require the structural engineering report in order to commence.

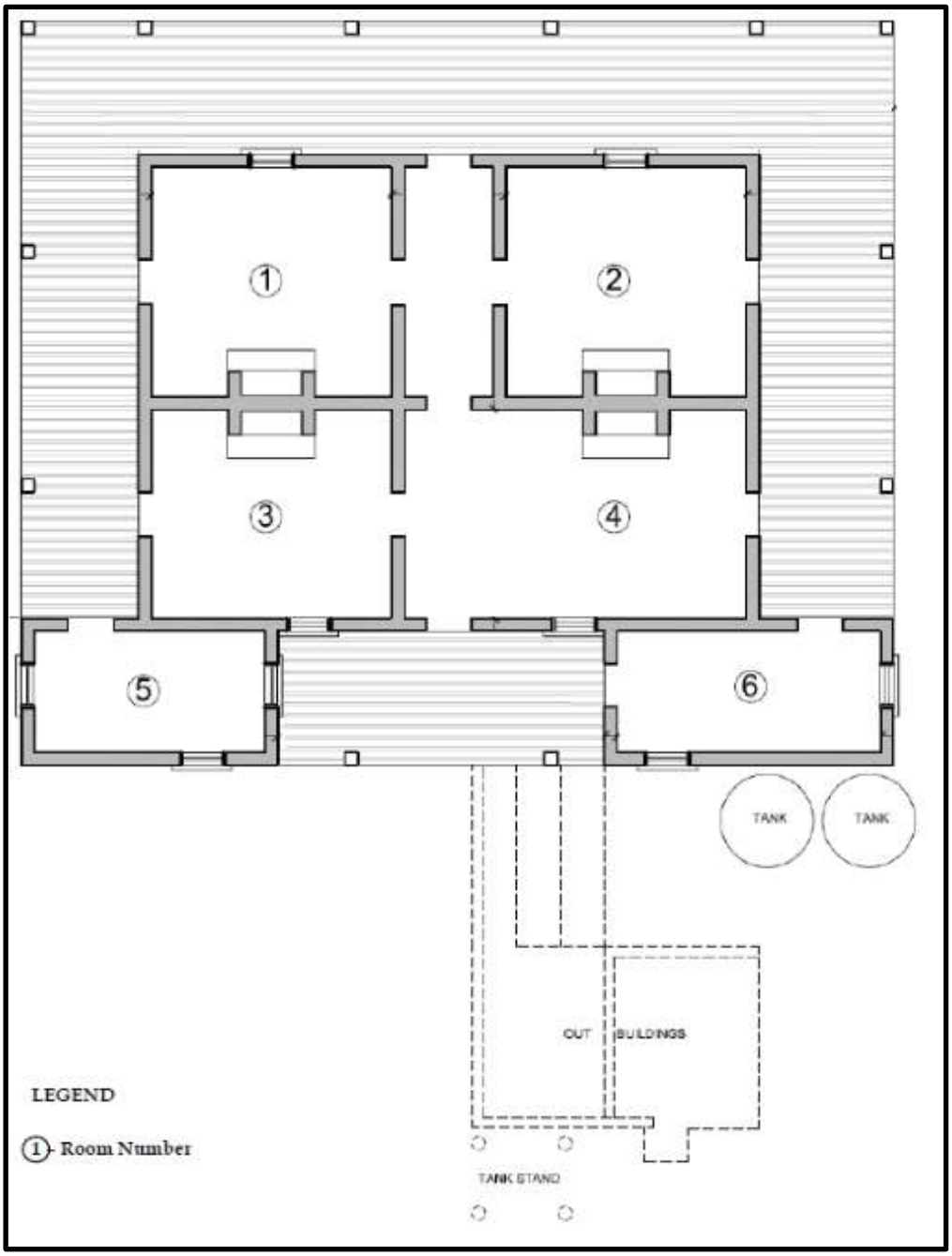
Moderate Priority

Once the high priority recommendations have been attended to, the structural engineer may recommend different or additional measures than originally put forward. Pending this report, the following moderate priority measures are recommended to attain compliance with the CMP and enhance the condition of the homestead:

1. Due to their propensity to harbour termites and transfer infestation to the building, remove all peppercorn trees from around the building, a process which has begun;
2. Maintain the regular vegetation maintenance program;
3. Pending structural engineer's advice, reinstate western, eastern and southern walls, veranda and roof to match northern elevation.
4. Pending reconstruction of southern wall, place treated plywood sheeting over door and window openings;
5. Detailed clean up of building interior, overseen by archaeologist;
6. Pending structural engineer's advice, refix loose ceiling boards and loose and dislodged wall slabs and plates, retaining evidence of fabric if unable to fix;
7. Ensure the minor recommendations and 'policies' listed throughout Section 7 of the CMP are considered in the future management of the homestead;
8. Give consideration to an archaeological excavation and research program at the site, with possible community involvement, to explore the areas of archaeological potential identified in the CMP; and
9. Maintain the termite and pest control regime at the building.

Mount Thorley Brick Farm House

The Mount Thorley Brick Farm House is located off the Golden Highway opposite the MTW coal handling and preparation plant, c.10km south-west of Singleton. The portion of land on which the house sits was purchased by Eliza Glass in 1870 and the physical attributes of the house, which display characteristics of Victorian Georgian architecture, suggest that it was constructed during the following decade. The building is roughly square in plan, with four principal rooms flanking a central hallway.



Floor plan of Mount Thorley Brick Farm House, north up (from ERM 2015 CMP)



Mount Thorley Brick Farm House (2012)

The masonry structure of the building is sound, however, it was noted as being in poor physical condition in 2015 (when a CMP was developed for the site by ERM), with a collapsed veranda roof, missing or loose roof sheeting, missing or collapsed veranda posts, and floorboards and areas affected by termites. The conservation works schedule within the CMP considered the following issues at Mount Thorley Brick Farm House:

- Drainage and weather-proofing;
- Asbestos;
- Vegetation;
- Termites and vermin;
- Building fabric; and
- Structural capacity and wind loads.

Recommendations were made within the CMP's conservation works schedule to address the elements above, a number of which have completed by the proponent. These works included:

- Removal and safe storage of veranda;
- Initial vegetation clearing;
- Sheeting and sealing of all window and door openings;
- Clean up of scattered debris surrounding building; and

- Repair of loose roof sheeting and patching of holes.

Monitoring and maintenance of these repaired items is an ongoing requirement to ensure they provide continual protection to the building.

Photographic Comparison 2015 through 2025

During the inspection of the Mount Thorley Brick Farm House for this report, a number of photographs were taken from the same angles and of the same features as were taken during the original ERM 2015 assessment that informed the CMP as well as during subsequent annual HHMP compliance inspections. These photographs provide a visual baseline condition assessment of the building, and also allow a comparative analysis of the deterioration, or maintenance, levels over the last ten years. The photographs set out below show the condition of the site today in comparison to the 2024 audit, the original 2015 assessment and other years where major changes in the site's condition were witnessed. Comments pertinent to management recommendations for the site are also provided. Where defects have been noted and/or actions have been recommended and remain outstanding, these have been presented in blue text. Where stabilisation or improvement measures have been implemented, these are noted in green text. Previous compliance audit inspection reports can be reviewed for a full photographic archive of the site.

2015	2018
	
2024	**2025**
	

View of north-west side

2015-8: veranda removed and stored inside building, vegetation has been managed.

2018-20 (Mar): vegetation has regrown around building**.**

Mar 2020-Dec 2020: vegetation again under control, panel above boarded door requires refixing.

Dec 2020 – 2021: vegetation requires management and loose boards re-affixing.

2021-2022: panelling fixed or reinstalled on all openings; ruinous electricity board fallen; increased vandal activity at left-most door opening; grass recently mowed.

2022-2023: recently mowed and left door barricading bolstered. Guttering deterioration and lifting of roof tin at near corner.

2023-2024: Damaged leftmost door opening repaired, guttering deterioration and lifting of roof tin at near corner

2024-2025: remnant guttering, fascia and soffit has collapsed along northern half; veranda boards have deteriorated noticeably. New board across door opening.

2015	2020 (Dec)
	
2024	**2025**
	

View of north-west roof corner (focus on damaged roof)

2015-8: roofing sheets have been replaced and holes patched.

2018-20 (Mar): some minor roof holes and lifted sheeting noted.

Mar 2020-Dec 2020: some veranda flashing fallen, panel above door requires refixing.

Dec 2020 – 2021: panel above door requires re-affixing and guttering remains in disrepair.

2021-2022: panel above door fixed, guttering in disrepair.

2022-2023: Deterioration of guttering and roof edge.

2023-2024: Deterioration of guttering and roof edge.

2024-2025: remnant guttering, fascia and soffit has collapsed along northern half.

2015	2018
	
2024	**2025**
	

View of door and window panelling

2015-8: sheeting installed on all openings, however some repair required.

2018-20 (Mar): no discernible change.

Mar 2020-Dec 2020: Front door panel requires reinstallation.

Dec 2020 – 2021: front door panel remains broken.

2021-2022: front door panel reaffixed; veranda grass poisoned.

2022-2023: new panelling installed on front door.

2023-2024: no discernible change

2024-2025: new board across door; loose veranda dwarf wall bricks stacked on landing.

2018	2022
	
2024	**2025**
	

View of door and window panelling

2015-8: sheeting installed on all openings, however some repair required.

2018-20 (Mar): some repair of panelling required.

Mar 2020-Dec 2020: Broken panel remains unrepaired.

Dec 2020 – 2021: broken panel remains unrepaired.

2021-2022: door panel fixed; uprights fixed and propped to support roof.

2022-2023: weeds sprayed, however water appears to be settling under back veranda, which may require attention.

2023-2024: no discernible change.

2024-2025: roof sheet lifting. Back door board strengthened.

2015	2018
	
2024	**2025**
	

View of rear of building (view south)

2015-8: debris has been cleared and stacked.

2018-20 (Mar): vegetation has regrown around building and stacked debris.

Mar 2020-Dec 2020: vegetation cleared and debris restacked.

Dec 2020 – 2021: vegetation management required.

2021-2022: vegetation managed; collapsed roofing members tidied and stacked inside building; broken fascia removed but not repaired.

2022-2023: no discernible change.

2023-2024: no discernible change.

2024-2025: no discernible change.

2018	2020 (Dec)
	
2024	**2025**
	

View of rear of building (view north)

2015-8: debris has been cleared and stacked.

2018-20 (Mar): vegetation has regrown around building and stacked debris.

Mar 2020-Dec 2020: vegetation cleared and debris restacked.

Dec 2020 – 2021: vegetation regrown.

2021-2022: rear of building has been tidied and vegetation managed; building openings repanelled.

2022-2023: guttering has fallen with lifting of roof sheeting behind.

2023-2024: broken guttering has fallen to ground.

2024-2025: fallen gutter and down pipe moved to cistern.

2015	2018
	
2024	**2025**
	

View of eastern veranda (focus on veranda floor)

2015-8: posts and sheeting removed, damaged boards remain exposed.

2018-20 (Mar): damaged boards remain and vegetation growth throughout.

Mar 2020-Dec 2020: damaged boards remain and vegetation growth throughout.

Dec 2020 – 2021: veranda floor remains dilapidated and grass growth throughout.

2021-2022: door panel fixed, vegetation managed but veranda floor remains dilapidated.

2022-2023: no discernible change.

2023-2024: no discernible change.

2024-2025: deterioration and movement of veranda boards.

2015	2020 (Dec)
	
2024	**2025**
	

View of rear of building (focus on roof)

2015-8: skillion roof, guttering and rafters have collapsed; main roof holes repaired.

2018-20 (Mar): no discernible change.

Mar 2020-Dec 2020: some minor holes in roofing require repair.

Dec 2020 – 2021: minor roofing holes remain.

2021-2022: veranda uprights propped, loose members tidied; roofing appears patched.

2022-2023: shows fallen guttering with lifting of roof sheeting behind.

2023-2024: no discernible change.

2024-2025: lifted roofing sheets. Prop installed under skillion roof edge.

2015	2020 (Dec)
	
2024	**2025**
	

View of north-east of building

2015-8: wall element has collapsed (bricks stacked under window); roof framing, sheeting and guttering has collapsed.

2018-20 (Mar): no discernible change.

Mar 2020-Dec 2020: no discernible change.

Dec 2020 – 2021: rafter collapse from above window.

2021-2022: redundant electrical box fallen; increased vandal activity at doorway; roof capping repaired; redundant panel can be removed.

2022-2023: window opening cover replaced and door panel repaired.

2023-2024: graffiti on new door panel, fallen upper lintel plaster.

2024-2025: lintel bricks collapsed and fallen.

2015	2020 (Dec)
	
2024	**2025**
	

View of north-east corner of building (focus wall below window)

2015-8: bricks from roof above stacked in front of required repointing, window sheeting removed.

2018-20 (Mar): no discernible change.

Mar 2020-Dec 2020: repointing requirements remain.

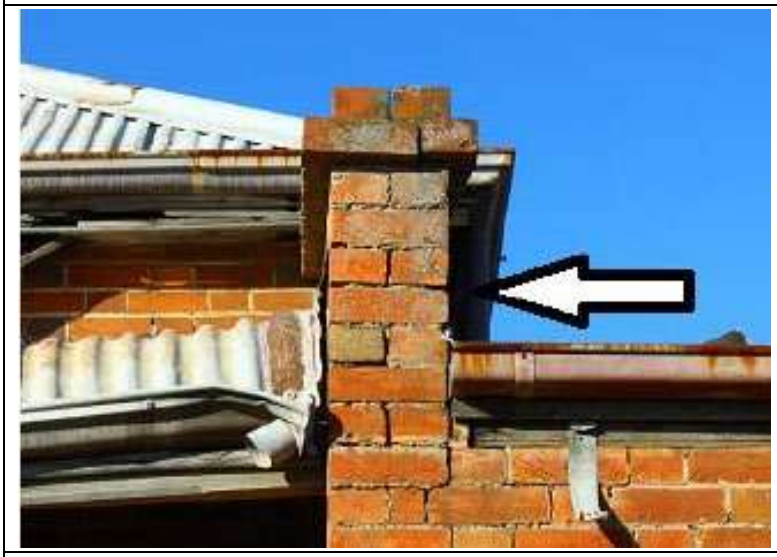
Dec 2020 – 2021: repointing requirements remain.

2021-2022: collapsed roofing members stacked inside; far door panel reaffixed; redundant panel can be removed; repointing requirements remain.

2022-2023: window panel replaced, repointing requirements remain.

2023-2024: repointing requirements remain, fallen lintel plaster and bricks.

2024-2025: repointing requirements remain, lintel bricks have fallen.

2015	2021
	
2024	**2025**
	

View of south-east of building (focus on top of wall)

2015-8: repointing requirements remain.

2018-20 (Mar): repointing requirements remain.

Mar 2020-Dec 2020: repointing requirements remain.

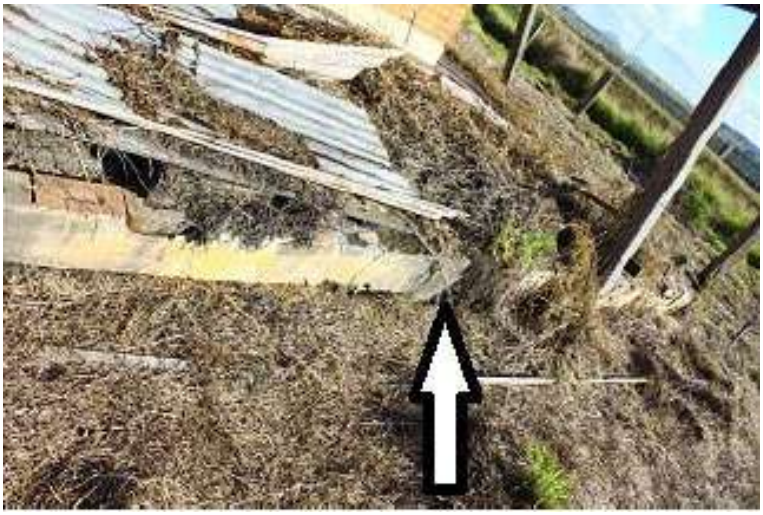
Dec 2020 – 2021: repointing requirements remain.

2021-2022: repointing and fascia repair requirements remain; white paint or similar has been daubed on wall.

2022-2023: brick fallen from chimney, some bowing to top of wall at veranda's end, repointing and fascia repair requirements remain.

2023-2024: brick fallen from chimney, bowing to top of wall at veranda's end with brick missing also, repointing and fascia repair requirements remain.

2024-2025: repointing and fascia/soffit repair requirements remain.

2015	2020 (Dec)
	
2024	**2025**
	

View of eastern veranda (focus on dwarf wall wall)

2015-8: debris cleared from veranda, no change to dwarf wall.

2018-20 (Mar): no discernible change.

Mar 2020-Dec 2020: cracking to wall evident.

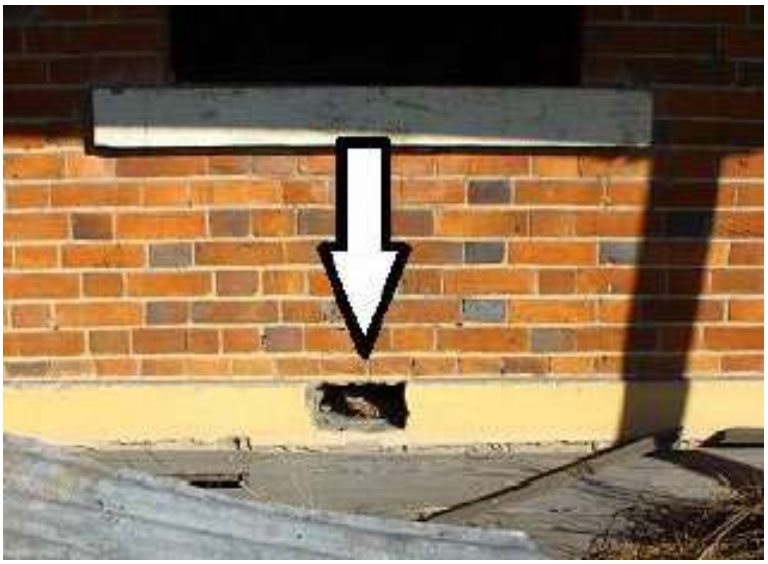
Dec 2020 – 2021: remains in disrepair.

2021-2022: vegetation managed but remains in disrepair.

2022-2023: vegetation managed but remains in disrepair.

2023-2024: remains in disrepair.

2024-2025: veranda boards and dwarf wall noticeably deteriorated.

2015	2018
	
2024	**2025**
	

View of ventilation grilles

2015-8: grilles not replaced.

2018-20 (Mar): grilles remain missing.

Mar 2020-Dec 2020: grilles remain missing.

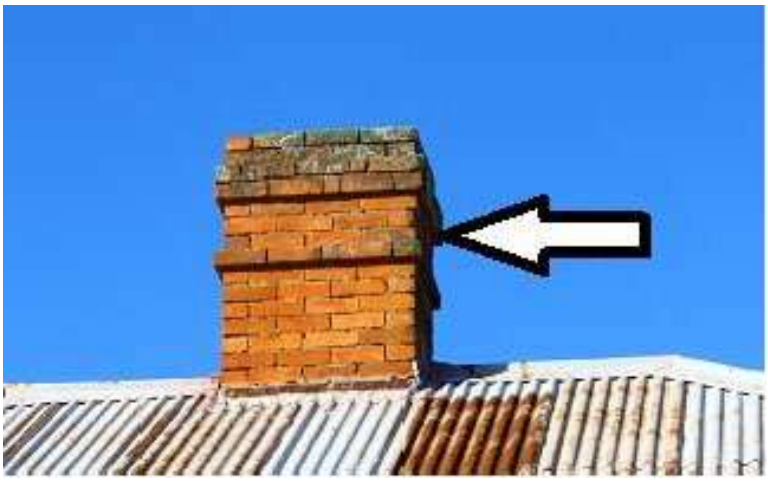
Dec 2020 – 2021: grilles remain missing.

2021-2022: grilles remain missing.

2022-2023: grilles remain missing.

2023-2024: grilles remain missing.

2024-2025: grilles remain missing.

2015	2020 (Mar)
	
2024	**2025**
	

View of southern chimney

2015-8: repointing requirements remain.

2018-20 (Mar): repointing requirements remain.

Mar 2020-Dec 2020: repointing requirements remain.

Dec 2020 – 2021: repointing requirements remain.

2021-2022: repointing requirements remain.

2022-2023: brick missing and repointing requirements remain.

2023-2024: brick missing and repointing requirements remain.

2024-2025: brick missing and repointing requirements remain.

The comparative photographs above show the changes at the building over the past ten years. Some minor repairs to door opening panels have occurred between the current and the last inspection, with vegetation levels being well managed also. It was noted that the termite bait stations had been removed, which should be replaced and a monitoring regime reimplemented as soon as possible. Although these ongoing maintenance measures are beneficial, some priority actions identified within the CMP and during previous inspections remain of importance and, if anything, their need of remediation has increased in urgency. The key issues are currently:

- Considerable damage and exposure to the rear of the building;
- Veranda boards in need of repair;
- Veranda dwarf wall deteriorating;
- Holes in sections of fascia and soffits;
- Gutters remaining in a state of disrepair;
- Brickwork repointing requirements at a number of locations; and
- Termite monitoring and response program to be reimplemented.

It should be noted that the vegetation management regime has been maintained around the site, as have numerous smaller repairs, including propping, which are positive actions and will assist in the arrest of the deterioration of the building. If recommended by a termite control specialist, nearby peppercorns should be removed due to their propensity to harbour termites. The orange tree to the west of the building should be retained due to its connection with habitation of the house.

Recommendations

While many of the high and moderate priority recommended actions within the CMP conservation works schedule have been completed in the past, the recommendations outlined below are required as part of the ongoing maintenance of the building and to minimise the risk of further deterioration in the building structure.

High Priority

1. If any asbestos or fibrous cement sheeting remains at the property, engage an asbestos removalist to remove as required;

Moderate Priority

2. Check that all debris surrounding the house has been removed. If this has not occurred, remove all debris, ensuring an archaeologist is on hand to identify and

catalogue any early architectural fittings or rare pieces of joinery that should be retained for future restoration purposes;

3. Reinstall veranda, including veranda decking and brick dwarf wall, re-using original material where possible, as per recommendations M5, M6 and L1 in the CMP conservation works schedule;
4. As the roof above Room 6 has collapsed, salvage any reusable masonry or timber and set aside within room. Engage a structural engineer to advise on feasibility of reconstructing the masonry and the roof. (NB. Recommendation M9 in the CMP conservation works schedule erroneously refers to this room as Room 5 rather than Room 6 as shown in the floor plan);
5. Repair fascias and soffits, and replace gutters around the house to match existing materials and ogee profile. Install new down-pipes and ensure they are discharging away from the building – particularly away from eastern back veranda;
6. Repoint mortar joints with lime-based mortar on brickwork below Room 6 eastern elevation window sill, on northern and western walls of room 5 and all chimneys;
7. Install new ventilation grilles to existing ground level openings; and
8. Maintain the vegetation management and reinstate termite and pest control regimes at the building.

Conclusion

Up to thirteen years has now elapsed since the preparation of the CMPs began for the three historic heritage buildings reviewed during this inspection. Although some important conservation measures have been implemented over the last decade, other recommended management actions remain incomplete, with the urgency surrounding their attention only increasing year on year. The following actions are considered imperative to prevent irreparable damage to the buildings and, once complete, will provide a solid foundation from which to tackle the remaining issues.

Former RAAF Base Bulga Mess Hall

- Engage an asbestos expert to assess and develop a clean-up and disposal plan to deal with both the broken fragments and intact asbestos sheeting;
- Remove any remaining tree branches from the roof. In addition, to prevent similar damage in the future, serious consideration should be given to removing or lopping those trees that are located close enough to the building that they may cause damage if they fall or drop large branches;
- Pending the results of the asbestos assessment, the building and surrounds should be thoroughly cleaned of asbestos and other rubbish material. An archaeologist should be present to collect any items of historic importance or that relate to the original fabric of the building. This should also include the removal, repair and curation of items such as window frames and panels before their total deterioration. All such items can be stored inside the building and potentially re-used during further stabilization programs;
- Pending the results of the asbestos assessment, susceptible parts of the building framework, such as roofing members and walls should be stabilized and propped, using the CMP Bligh Tanner plans as a guide; and
- Depending on the time elapsed between now and the completion of the actions above, a structural engineer should again inspect the building before any further works are commenced to ensure recommendations on stability requirements and structural repairs remain current. These further works should aim to reduce the likelihood and extent of any further deterioration at the site rather than seek to rebuild or renovate as it is unlikely that there would be any valid or appropriate option to re-use the site

Springwood Homestead

- Remove the trees and vines currently impacting the building at the eastern elevation and south-west corner and treat to prevent regrowth (acknowledgment that work has begun in this regard). Coincident with this removal, acrow props should be installed

where appropriate, i.e. where the trees themselves have been supporting the building structure, and as per current structural engineer's instructions at Annex B of the CMP;

- Once vegetation has been removed, clean all debris from the roof and prune (or consider the removal of) all other trees in close vicinity of the building with potential to drop leaf/branch litter on roof;
- Engage an archaeologist to ensure any items of historical relevance recently cleared and stored within the building are salvaged and dealt with appropriately; and
- The wooden piece containing the remnant newspaper fragments should be removed from the site as soon as possible in order to preserve the remaining fabric. The piece should be stored inside and in constant temperature conditions at low humidity and in dark conditions. It should be stored so as to be protected from vermin and pests, and personnel involved should avoid touching the fragments, especially with bare hands. Prior to removal, in situ photographs should be taken of the piece and its relationship to the other fallen timbers in order to record its contextual provenance. These measures should be undertaken immediately and do not require the structural engineering report in order to commence.

Mount Thorley Brick Farm House

- If any asbestos or fibrous cement sheeting remains at the property, engage an asbestos removalist to remove as required.

Appendix 5:

Annual Stream Health and Stability Report

MOUNT THORLEY WARKWORTH

ANNUAL STREAM HEALTH AND CHANNEL STABILITY MONITORING REPORT 2025



Looking upstream in Loder creek site LC8.

DATA REPORT PREPARED FOR MOUNT THORLEY WARKWORTH PTY LTD

MARINE POLLUTION RESEARCH PTY LTD
FEBRUARY 2025

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1 INTRODUCTION

Marine Pollution Research (MPR) has been commissioned by Mount Thorley Warkworth (MTW) to undertake stream health and channel stability monitoring of creekline drainages downstream of the MTW discharge point and adjacent to the MTW open cut mining operations in the upper Hunter Valley, NSW, to meet the requirements outlined in Section 7.4 of the approved Water Management Plan (WMP) (Version 5.1, November 2021). This data report provides the results of the Annual Stream Health and Channel Stability monitoring undertaken by MPR in October 2025, with former survey reports provided by SLR between 2017 and 2022 and MPR in 2023 and 2024 (see **Section 5**).

2 MONITORING PROGRAM METHODOLOGY

The objective of the MTW Channel Stability and Stream Health Monitoring program is to monitor the channel stability and health of the riparian vegetation in the waterways downstream of the MTW discharge point and adjacent to the mine footprint, to ensure they are not affected by the existing approved MTW mine operations. Excess mine water contained in Dam 9s is released via the MTW discharge point in the upper limits of Loder Creek, an activity which is regulated under the Hunter River Salinity Trading Scheme (HRSTS). In accordance with the monitoring requirements outlined in the MTW WMP, annual Channel Stability and Stream Health monitoring is undertaken in Loder Creek and Wollombi Brook (see **Figure 1** and **Table 1** below).

Table 1 MTW Channel Stability and Stream Health Monitoring Site Program 2025

Creek	Site	E	N	Transect	Photos	RARC	CSIRO
Nine Mile Ck	MTW LDP2	322016	6385376	x	x	x	x
Loders Creek	BM35	322746	6385819	x	x	x	x
Loders Creek	BM34	323779	6388119	x	x	x	x
Wollombi Brook	BM37	313709	6388933		x	x	x
Loder Creek	LC1	321974	6385382		x		x
Loder Creek	LC2	322019	6385367		x		x
Loder Creek	LC3	322087	6385446		x		x
Loder Creek	LC4	322367	6385647		x		x
Loder Creek	LC5	322484	6385655		x		x
Loder Creek	LC6	322670	6385697		x		x
Loder Creek	LC7	322759	6385778		x		x
Loder Creek	LC8	323948	6389351		x		x
Loder Creek	LC9	323996	6389540		x		x
Loder Creek	LC10	324131	6390142		x		x
Loder Creek	LC11	322881	6386043		x		x
Loder Creek	LC12	323802	6388650		x		x
Loder Creek	LC13	324160	6390408		x		x
Loder Creek	LC14	323800	6389222		x		x
Loder Creek	LC15	324150	6390239		x		x
Loder Creek	LC16	324329	6390543		x		x

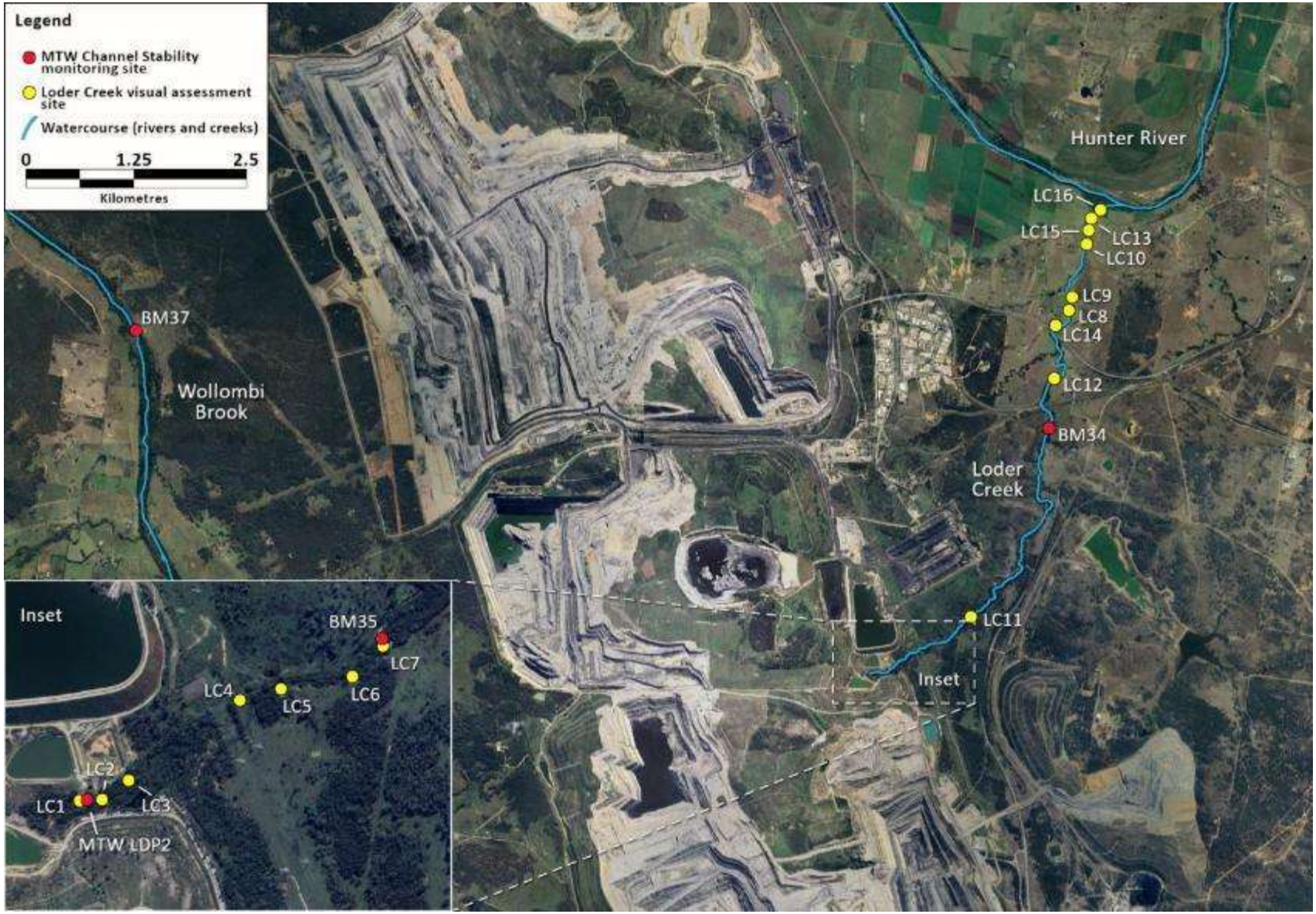


Figure 1: MTW 2025 Channel Stability Monitoring Sites

Assessment of geomorphic condition in stream health assessment is undertaken using a subjective, rapid, visual assessment methodology, with the trajectory of change assessed by comparing scores from surveys made over time. The MTW Channel Stability and Stream Health monitoring program includes the following features:

- Channel Stability rating using the CSIRO *Ephemeral Stream Assessment* (CSIRO ESA) guidelines protocol to assess the erosional state of the creek channel banks and bed,
- Stream Health rating using the Land & Water Australia Rapid Appraisal of Riparian Condition protocol (RARC), to assess the ecological condition of riparian habitats using indicators that reflect functional aspects of the physical, community and landscape features of the riparian zone,
- Cross sectional channel depth transect measurements for a comparative assessment of channel shape over time,
- Photographic monitoring points to facilitate a comparative assessment of channel stability over time,
- Documenting locations and dimensions of significant erosive or depositional features from which any subsequent changes can be evaluated.

2.1 CSIRO Ephemeral Stream Assessment

The CSIRO Ephemeral Stream Assessment method (Tongway and Ludwig 2011) was used to evaluate the condition of drainage channel features in Nine Mile Creek, Loder Creek and Wollombi Brook. There are four main classes of indicators assessed:

A. The type and condition of the vegetation present, if any,
B. The shape and profile of the drainage line and type and condition of materials on the drainage line floor.
C. The nature of the drainage line wall materials.
D. The nature of the stream bank bordering flats and/or slopes and regulation of lateral flow into drainage line.

The indicators produce an activity rating which, when converted to a percentage, ranks each location from *Very Active* through to *Very Stable* (**Table 2**). Annual monitoring results are reviewed and compared with previous surveys to assess whether stream channel degradation has occurred as a result of mine operations.

An investigation is triggered when there is a decrease in the CSIRO ESA classification over two consecutive monitoring rounds at any of the four prescribed monitoring sites (see **Table 9.3** from the MTW WMP), and **Section 9.2** of the MTW WMP outlines the response procedure in the event of a performance trigger breach.

Table 2 CSIRO ESA Activity Ratings & Classifications		
Activity Rating (%)	**Classification**	**Classification definitions**
80 +	Very Stable	Drainage line is very stable and likely to be in original form. It is able to withstand all flow velocities that have previously occurred in this area and only minimal monitoring is required, predominantly after high flow events, to ensure condition does not deteriorate.
70-80	Stable	Drainage line is stable. It is important to assess this zone in relation to the other classifications and define whether this zone is moving from potentially stabilising to a more stable form, or if it is deteriorating from a very stable form. The nature of this relationship will identify the type of monitoring required.
60-69	Potentially Stabilising	Drainage line is potentially stabilising. Ongoing monitoring is required while rehabilitation works are not needed in the immediate future.
50-59	Active	Drainage line is actively eroding and remedial actions are required. It is important to classify if erosion is caused primarily by upstream flows, lateral flows or unstable wall materials so that appropriate rehabilitation can be carried out.

2.2 Rapid Appraisal of Riparian Condition (RARC)

The Rapid Appraisal of Riparian Condition assesses the ecological condition of riparian habitats using indicators that reflect functional aspects of the physical, community and landscape features of the riparian zone (Jansen et al 2005). The RARC method includes score ratings for the following categories:

- Longitudinal continuity and width of riparian canopy vegetation and proximity to nearest patch of native vegetation,
- Vegetation cover for canopy, understorey and ground layers,
- Vegetation cover for canopy, understorey and ground layers for natives,
- Cover of standing dead trees, leaf litter, and fallen logs, and
- Presence of native vegetation regeneration, native tussock, grasses and reeds.

The scores for these five categories are tallied to provide an overall score indicating riparian health:

Table 3 RARC Classification Ratings	
RARC Score	**RARC Classification**
<25	Very Poor
25 - 30	Poor
30 - 35	Average
35 - 40	Good
>40	Excellent

Annual monitoring results are reviewed and compared with previous surveys to assess whether stream channel degradation has occurred as a result of mine operations. An investigation is triggered when there is a decrease in the RARC Stream Health Assessment classification over two consecutive monitoring rounds at any of the four prescribed monitoring sites (see **Table 9.3** from the MTW WMP), and **Section 9.2** of the MTW WMP outlines the response procedure in the event of a performance trigger breach.

2.3 Channel Profile Measurements

Stream channel depth profiles are undertaken along a fixed transect to assess temporal changes to the channel shape by fluvial processes (i.e., bank erosion or sediment deposition). MPR measured the creek channel profile using a dumpy level where the site channel depth measurements were recorded at 0.5m intervals relative to the fixed peg on the left-hand bank (looking downstream), and at significant channel structures or irregular forms (such as incised channel banks, steep sections, rocky outcrops), finishing at the right-hand bank peg. The 2025 dumpy Channel Transect Profile results are shown in **Appendix Figures A-1** to **A-3** and include any water level measurements encountered during the 2025 survey (represented as blue lines).

2.4 Site Channel Visual Assessment

Additionally, visual assessments were undertaken throughout all study sites which included documenting the locations of any significant erosion or depositional sedimentary features and photographing monitoring points at representative locations. Annual monitoring results will be compared with previous monitoring events with the overall aim of detecting temporal changes in drainage channel condition.

3 MTW CHANNEL STABILITY & STREAM HEALTH RESULTS

The MTW Channel Stability and Stream Health monitoring survey was undertaken between the 27th of October and 30th October 2025. **Section 3.1** below summarises the study area weather conditions recorded over the year to date, **Section 3.2** provides the Stream Health and Channel Stability site results and **Section 3.3** provides the Loder Creek Site Visual Assessment results. Channel transect cross sections are provided in **Appendix Figures A-1** to **A-3**, full RARC data sheets are in **Appendix B** and CSIRO ESA data sheets are in **Appendix Table C**.

3.1 Weather Leading Up to the Annual Survey

Rainfall records are recorded at Bureau of Meteorology (BOM) Bulga Down Town gauge (61143) located near BM37 and MTW mine site at Charlton Ridge. The 2025 monthly gauge totals are compared to the long-term mean monthly rainfall totals acquired from BOM Bulga Down Town gauge since 1963, shown in **Figure 2** below.

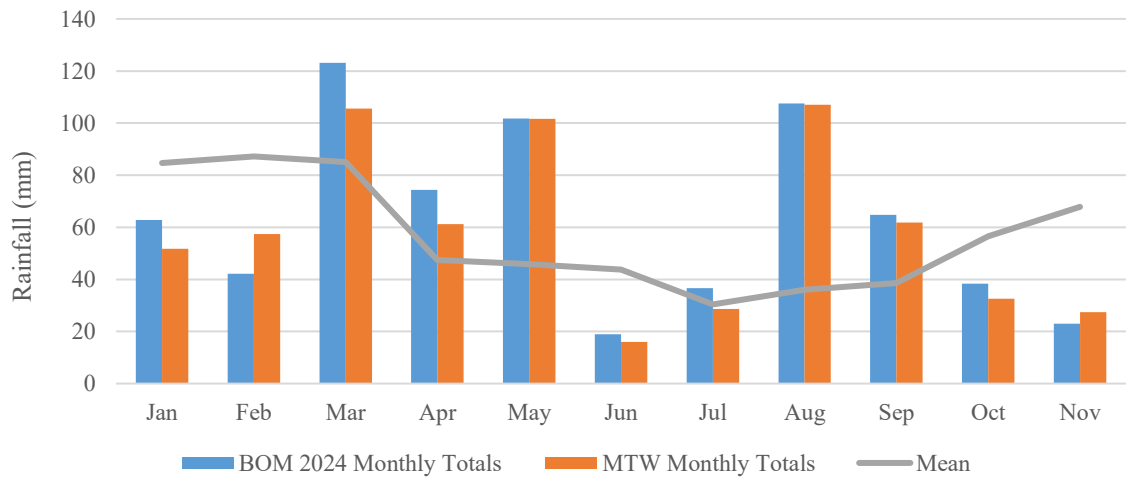


Figure 2 Combined Gauge Rainfall 2025

Following on from 2024 which concluded with a period of prevailing dry weather, 2025 saw dry conditions early in the year followed by wet conditions in autumn. The study area experienced periods of sporadic wet weather over the historically drier, cooler parts of the year with periodic consistent rainfall in August and declining monthly totals leading into the 2025 survey in October:

- Rainfall over January and February 2025 was characterised by regular light shower events, with a combined monthly total of 105mm recorded over 25 rainfall days.

- The autumn period (March-May) saw wetter conditions with 300mm recorded over 41 rainfall days, much higher than the combined mean monthly total (178mm).
- Winter 2025 (June-August) recorded fluctuating rainfall with dry conditions in June to July and episodic, high-intensity events in August. Most of the June rainfall occurred on the 25th (16mm), and July recorded near average totals (38mm) across only six rainfall days. August was very wet with 108mm falling over 15 rainfall days, with most of the total delivered by two three-day storm events (101mm) on the 2nd and 20th August.
- September saw a continuation of above average rainfall (65mm) however it was restricted mostly to a single three-day event producing 63mm in the middle of the month. The following six-week period leading into the spring 2025 survey was mostly dry with only 23mm rainfall spread over 6 rainfall days, including 15mm falling nine days prior to sampling.

3.2 Channel Stability & Stream Health Site Monitoring Results 2025

3.2.1 Loder Creek site MTW LDP2

Site: MTW LDP2		28/10/2025	
Coordinates (MGA56):		E	N
		322016	6385376
Method	Year	Score	Rating
RARC	2024	32	Average
	2025	30	Average
CSIRO	2024	69	Potentially Stabilising
	2025	69	Potentially Stabilising

Following the adoption of recommendations made in MPR (2024), the Stream Health and Channel Stability site downstream of Mount Thorley Warkworth mine Licensed Discharge Point (LDP) was moved from its former location among the boulder lined channel adjacent to the LDP, to a short distance downstream in a section of natural channel.

New monitoring site MTW LDP2 is located in the upper reaches of Loder creek, contained within a narrow section of drainage channel with mostly shallow sloped banks and a localised incision of the channel basin (**Figures 3** and **4**). There was very little surface water present with pooled water observed and with no surface flow through the site.

Site conditions were broadly consistent with those recorded in 2024. Within the channel basin, macrophyte diversity remained low, with spiny rush (*Juncus acutus*) continuing as the sole species and occurring at moderate to high density throughout the channel length.

The riparian corridor continued to comprise a largely continuous swamp-oak (*Casuarina glauca*) canopy, with eucalypts occurring in generally low numbers. As observed previously, swamp-oak density remained slightly higher along the southern bank. While some localised areas of exposed soil occurred beneath the swamp-oak canopy, a thick layer of swamp-oak needles and smaller quantities of eucalyptus leaf litter smothered most of the ground surface, particularly along the southern bank slopes, restricting the establishment of other species. Weed diversity had increased slightly, with scattered occurrences of lantana (*Lantana camara*), cactus (*Cactaceae spp*.), sow thistle (*Sonchus oleraceus*), thistle (*Cirsium vulgare*) and purple top (*Verbena bonariensis*). Swamp-oak saplings were still present but at lower abundance, and native understorey cover had declined slightly since 2024, including a marginal reduction in large native tussock grasses.

Most historical erosion features and potential sediment sources remained unchanged and appeared to be in a stabilising state. The most prominent feature, a large fallen eucalypt with an exposed root ball, continued to represent a potential sediment source; however, no new erosion, undercutting or destabilisation was evident, and accumulated canopy detritus covered sediments around the exposed roots. Minor localised erosion features were present within the Loder Creek channel bed which were generally less than 30-40 cm in height, and while stable at the time of survey, may deteriorate under sustained higher flow conditions. Exposed soils on the gently sloping northern bank continued to represent a potential sediment source, although the low gradient limits the likelihood of substantial sediment contribution to the channel.

A slight reduction in native understorey cover, regeneration, ground cover and leaf litter resulted in a marginal decrease in the RARC score from 32 in 2024 to 30 in 2025. Despite this decline, the overall RARC rating remained *Average*, albeit closer to the lower category threshold. Site conditions were otherwise largely unchanged, and the CSIRO ESA classification remained *Potentially Stabilising* in 2025.



Figure 3: Looking upstream (left) and downstream (right) at Loder Creek site MTW LDP2.



Figure 4: Site MTW LDP2 left bank (left) and right bank (right).

3.2.2 Loder Creek site BM35

Site: BM35		28/10/2025	
Coordinates (MGA56):		E	N
		322746	6385819
Method	Year	Score	Rating
RARC	2024	34	Average
	2025	34	Average
CSIRO	2024	59	Active
	2025	59	Active

Site BM35 is located just downstream of the confluence of Loder Creek and Nine Mile Creek. The channel shape is V-shaped with shallow sloping banks, supporting a shallow (0.3m to 1m deep) and meandering box shaped stream flow channel in the middle. Scattered shallow pools held small volumes of standing water throughout the site, with no evidence of any surface flow at the time of survey.

Macrophyte assemblages, including spiny rush and common reed (*Phragmites australis*) remained consistent in both density and distribution, while arrowgrass (*Triglochin striata*) was present within the creek channel.

Riparian conditions along Loder Creek remained broadly consistent with the previous survey, although some subtle changes were evident. The swamp-oak canopy density had increased slightly with fuller foliage, a response considered consistent with above average rainfall earlier in the year and leading into the 2025 survey period. Despite these changes, the overall integrity and function of the riparian corridor remained stable.

Groundcover within the channel and along the lower banks was dominated by couch grass, which has continued to spread and now forms a largely continuous cover across the channel base and lower wall margins. Where couch grass was absent, the substrate was dominated by dense accumulations of swamp-oak needles, particularly within the channel basin and along the sloping banks. Weed composition was comparable to earlier observations, including purple top (*Verbena bonariensis)*, curled dock (*Rumex crispus)* and a single small African boxthorn (*Lycium ferocissimum*) plant. Regrowth of lantana was evident from previously dead material, consistent with recovery following historical weed control.

The exposed erosion scar along the upper southern (right hand) bank (**Figure 7**) is unchanged but continues to act as a source of active erosion. Along with animal tracks dissecting the site, this feature contributes fine sediment inputs to the creek line. The extent of settled colluvial sediments at the base of the channel valley walls and colonisation by couch grass noted in previous reports remained unchanged in 2025.



Figure 5: Loder Creek site BM35 looking upstream (left) and downstream (right).



Figure 6: Site BM35 left bank (left) and right bank (right).



Figure 7: Erosion scar along the upper right-hand bank.

The CSIRO ESA classification for the site remained unchanged in 2025, continuing to classify as *Active*. Assessment of the RARC metrics identified only minor shifts across individual components, with small improvements recorded for the 'Native Canopy', reflecting ongoing regrowth of wattle and eucalypts, while increased accumulation of swamp-oak needles contributed to a modest improvement in 'Ground Cover'. Collectively, these changes resulted in an increase in the overall 'Vegetation Cover' score.

Riparian condition assessments indicated a reduction in the number of standing dead trees across the site, offset by an increase in hollow-bearing trees and coarse woody debris within the channel and riparian zone. This redistribution of structural habitat elements resulted in a marginal improvement to the 'Debris' score. While native understory regeneration declined and common reed increased in extent, these changes were not sufficient to influence the overall 'Features' category, which remained consistent with the previous survey.

Overall, the cumulative effect of these minor adjustments produced a small increase in the RARC score from 33.5 in 2024 to 33.8 in 2025; however, the site rating continued to be classified as *Average*.

3.2.3 Loder Creek site BM34

Site: BM34		30/10/2025	
Coordinates (MGA56):		E	N
		323779	6388119
Method	Year	Score	Rating
RARC	2024	37	Good
	2025	37	Good
CSIRO	2024	78	Stable
	2025	78	Stable

Downstream Loder Creek monitoring site BM34 is located around 3km downstream from the junction of Loder Creek and Nine Mile Creek. The site consists of a straight drainage channel with minimal sinuosity, with V-shaped profile formed from moderately sloped banks. Surface water was present and continuous throughout the site length in 2025 with a low surface flow.

Macrophyte composition was consistent with previous observations, comprising isolated patches of the submerged macrophyte sago pondweed (*Stuckenia pectinata*), and arrowgrass. The channel basin remained heavily vegetated with only small areas of exposed soil or active erosion features, with dense emergent stands of the common reed and spiny rush effectively infilling the channel, particularly at the channel transect location. The channel margins were similarly lined with macrophytes at comparable densities to those within the basin.

Riparian condition at BM34 is characterised by a narrow and continuous swamp-oak corridor, with a mixed understory of native shrubs and grasses plus invasive weed species occurring in variable abundance throughout and the channel (**Figures 9** and **10**). There were only slight changes in the composition of weed species since the previous monitoring round, with blue heliotrope (*Heliotrope amplexicaule*) having not re-established among adjoining cleared pastures since its high abundance recorded in 2023 (prior to weed spraying).and there were no farmers friend (*Bidens pilosa*) observed. Other weed species with generally lower representation included fireweed (*Senecio madagascariensis*), sow thistle (*Sonchus oleraceus*), cleavers (*Galium aparine*) African boxthorn and isolated pockets of lantana.

African boxthorn shrubs had been sprayed and were dead and lantana density had stabilised, maintaining similar abundances to the previous survey. The adjoining cleared pastures remained unchanged, with Paddys lucerne (*Sida rhombifolia*) occurring in reduced quantities along the riparian margins but not extending into open pasture areas. Ground cover was dominated by a mix of native and introduced grass species, including couch and prairie grass (*Bromus catharticus*) with scattered native tussock grasses.

The RARC assessment noted a shift in the distribution of lantana along the site however the overall abundance remained consistent across the site as a whole. There were no other notable vegetation changes observed or nor were there changes to the 'Vegetation Cover' category score. Similarly, 'A reduction in large native tussock grasses within one transect contributed to a slight decrease in the 'Features' score.

Minor variations across several categories resulted in a slight decrease in the overall RARC score from 37.3 (2024) to 36.8 (2025); however, the final RARC condition rating remained as *Good*. The CSIRO ESA classification for BM34 also remained unchanged in 2025, continuing to be rated as *Stable*.



Figure 8: Loder Creek site BM34 looking upstream (left) and downstream (right) in 2024.



Figure 9: Looking upstream in site BM34 (left) and downstream (right) in 2025.



Figure 10: Site BM34 left bank (left) and right bank (right) in 2025.

3.2.4 Wollombi Brook site BM37

Site: BM37		29/10/2025	
Coordinates (MGA56):		E	N
		313709	6388933
Method	Year	Score	Rating
RARC	2024	35	Average
	2025	35	Average
CSIRO	2024	72	Stable
	2025	72	Stable

Site BM37 is the only site located on Wollombi Brook, on the western side of MTW mining operations (**Figure 1**). The drainage basin comprises a broad channel (20 to 35m width) with steep, high banks along the eastern edge and flat floodplain banks along the western edge (**Figures 11** and **12**). Water levels were noticeably higher than the former survey with slightly turbid water moving through the site with a low flow rate.

Favourable rainfall conditions leading into the 2025 survey supported a noticeable increase in macrophyte abundance with common reed stands being widespread and abundant throughout the channel, accompanied by river bulrush (*Bolboschoenus fluviatilis*) along channel margins where it had begun to occupy broader areas. Native common rushes (*Juncus sp*.) and knotweed (*Persicaria decipens*) occurred at lower densities, while a new species (*Alisma sp*.) was recorded for the first time at the site as a single plant.

The site contains a dense but narrow river-oak (*Casuarina cunninghamiana*) woodland, with eucalypts occurring in the downstream site reach. A well-developed layer of river-oak needles blanketed the ground surface in areas with higher canopy coverage, (mostly closer to the channel edge), with eucalypt leaf litter more evident downstream.

The riparian understorey vegetation showed signs of proliferation, particularly grasses, with couch and panic veldt grass (*Ehrharta erecta*) forming continuous cover across the upper bank walls and extending downslope from the upper riparian zone. Weed presence persisted throughout the site and being most abundant in the upper riparian areas, and was comprised mainly by thistle, fleabane, blue heliotrope, black wattle, and dock (*Rumex sp*.), though weeds were also present in lower densities beneath the canopy.

Accumulated detrital deposits distributed among the riparian banks were indicative of flood water levels (most likely from the May 2025 event) however there were no indications of increased erosion activity from the existing erosion scars. The absence of new erosion following this event suggests a degree of resilience to flow disturbance, supported by continued vegetative groundcover of previously exposed soils and further grass expansion (**Figure 12**, right-hand side). Overall site conditions remained stable, with no changes recorded for the CSIRO ESA classification which remained *Stable* in 2025. A small increase in native canopy regeneration, driven by the presence of eucalypt saplings less than 1m in height, resulted in a marginal increase in the RARC score from 34.5 in 2024 to 35 in 2025, however the overall RARC rating remained as *Average*.



Figure 11: Wollombi Brook site BM37 looking upstream (left) and downstream (right) in 2025.



Figure 12: Site BM37 left bank (left) and right bank (right).

3.3 Loder Creek Site Visual Assessments 2025

3.3.1 Loder Creek site LC1

Site: LC1		28/10/2025	
Coordinates (MGA56):		E	N
		321974	6385382
CSIRO	Year	Score	Rating
	2024	72	Stable
	2025	72	Stable

The creekline at LC1 accomodates a Mount Thorley Warkworth mine Licensed Discharge Point (LDP) and the channel basin and banks have been stabilised with jute matting and logs underlying a boulder and cobble embankment (**Figures 13** and **14**), which has remained unchanged over a period of years.

Water levels were comparable to those observed in 2024, with no observable flow and only shallow pooled water present downstream among the channel rock armouring (**Figure 13**). The channel basin remained densely occupied by macrophytes, primarily spiny rush. A slight increase in density was noted along the channel edges. A deposit of fine sandy gravels and muddy sands had been deposited directly around the LDP outlet.

The swamp-oak riparian corridor remained mostly continuous along the southern bank, mixed with scattered eucalypts. Wattle and casuarina sapling exhibited strong regrowth. Along the northern bank, the swamp-oak corridor was more fragmented, with the only major break occuring upstream where the cleared bank section accomodates the LDP infrastructure (**Figure 14**).



Figure 13: Site LC1 looking upstream (left) and downstream (right).



Figure 14: Site LC1 left bank (left) and right bank (right).

Ground cover was dominated by grasses, with species composition similar to that recorded in the previuous survey; however, grass density had decreased, appearing less lush and patchier. Grass continued to colonise exposed soils along the lower drainage line walls. In addition to grass coverage, coir logs had been installed along the banks downstream of the LDP. Grasses and a layer of swamp-oak needles were present along both banks throughout the channel, and weeds persisted at low densities consistent with the previous survey, and were primarily composed of purple top and sow thistle.

Overall site conditions were consistent with those recorded during the previous monitoring round and this was reflected in the unchanged CSIRO ESA category scores, which continued to classify the site as *Stable* in 2025.

3.3.2 Loder Creek site LC2

Site: LC2		28/10/2025	
Coordinates (MGA56):		E	N
		322019	6385367
CSIRO	Year	Score	Rating
	2024	66	Potentially stabilising
	2025	66	Potentially stabilising

Site LC2 is contained within a narrow section of drainage channel with steep banks spanning the southern channel perimeter (**Figures 15** and **16**). Tanin stained water was present in a few localised pools, with overall site conditions remaining consistent with those recorded in 2024. Moist sediments within the channel indicated that water levels may have been receding over recent times.

Within the channel basin, spiny rush continued to dominate the vegetation, with no notable change in extent or coverage. The swamp-oak riparian corridor was showed some signs of minor growth since the 2024 survey. Groundcover beneath the swamp-oak canopy consisted of a dense layer of swamp-oak needles distributed across the channel walls and in the channel basin, which likely limits the establishment of understory vegetation. Patchy grasses and weeds were confined to localised areas similar to those recorded in the previous survey and while grass distribution remained consistent, overall, density had declined.

Sediment inputs to the channel appeared stable with no new erosion scars or changes to those documented across the previous four surveys. In the absence of new fine sediment contributions, channel substrates remained dominated by gravelly sands and detrital material comprised primarily of swamp-oak needles and eucalypt leaves which occurred in low to moderate densities. The CSIRO ESA classification for 2025 remained as *Potentially Stabilising*.



Figure 15: Site LC2 looking upstream (left) and looking downstream (right).



Figure 16: Site LC2 left bank (left) and right bank (right).

3.3.3 Loder Creek site LC3

Site: LC3		28/11/2025	
Coordinates (MGA56):		E	N
		322087	6385446
CSIRO	Year	Score	Rating
	2024	47	Very Active
	2025	50	Active

Loder Creek site is situated in a narrow section of drainage channel with moderately steep banks along both sides of the drainage channel (**Figures 17** and **18**). A small tributary drainage swale that enters the channel from the left-hand bank (north) contains some localised erosive features (gully erosion and bank undercutting), however the catchment area for the swale is small. No surface water was present within the site at the time of the survey, however dried mats of filamentous green alga in the upstream sections indicated that water had been present until recently.

The channel basin remained dominated by spiny rush, with no noticeable change in its distribution or abundance. The condition of the swamp-oak riparian corridor was largely unchanged for the 2025 survey. The coverage of the swamp-oak needle layer on the banks had increased since 2024, providing near complete ground coverage, and despite this, small patches of couch grass had showed signs of expansion along the right-hand bank. Weed occupation was very sparse, and a single prickly pear (*Opuntia sp*.) had colonised the site. Active sediment contribution to the channel basin remained negligible. Animal tracks and minor exposed banks continued to be the only notable areas of exposed soil, with the remainder covered by a dense layer of swamp-oak needles.



Figure 17: Site LC3 looking upstream (left) and looking downstream (right).



Figure 18: Site LC3 left hand bank (left) and right-hand bank (right).

The increased coverage provided swamp-oak needles since the previous survey led to a reassessment of the channel banks, resulting in the 'Nature of lateral flow regulation into drainage line' being reclassified to a 'moderate flow rate' contribution. This adjustment subsequently increased the LC3 site CSIRO ESA classification from *Very Active* to *Active*.

3.3.4 Loder Creek site LC4

Site: LC4		28/10/2025	
Coordinates (MGA56):		E	N
		322367	6385647
CSIRO	Year	Score	Rating
	2024	66	Potentially Stabilising
	2025	66	Potentially Stabilising

The LC4 site channel is relatively broad and flat-bottomed with a localised break in the riparian canopy corridor due to the powerline easement (**Figures 19** and **20**). The drainage channel is bordered by a near vertical, stepped bank along the left-hand side and shallow sloped bank along the right-hand side (**Figure 20**). There was no surface water observed throughout the site length for the 2025 survey.

Within the main channel, moderate accumulations of detritus (primarily spiny rush) were recorded, while the dense occupation of the channel bed by spiny rush likely stabilises (to some extent) new areas of erosion. A juvenile cumbungi plant was noted along the channel margins **(Figure 21).**

Weed composition remained similar to previous surveys, comprising grasses, fleabane, scotch thistle and African boxthorn. Although African boxthorn persisted in a healthy green state it's coverage was consistent with that in 2024, whereas fleabane exhibited a slight increase in abundance. The channel substrates remained soft and muddy with grasses colonising the lower track margins and dense spiny rush occupying much of the bed.

Riparian vegetation showed strong growth and vigour, maintaining a healthy and thriving conditions throughout the site. Pre-existing erosion features along the upper left bank remained stable, with compacted sands continuing to be the dominant exposed sediment type. There was no evidence of increased sediment loss from historical scars or any significant contribution of fine material to the channel bed. A small, recently formed erosion scar was observed along the left bank, contributing a minor amount of sediment **(Figure 21).**



Figure 19: Site LC4 looking upstream (left) and looking downstream (right).



Figure 20: Site LC4 left bank (left) and right bank (right).



Figure 21: Animal tracks and active erosion blocked via felled trees.

Site conditions were consistent with those observed in 2024, and the CSIRO ESA classification for LC4 remained as *Potentially Stabilising*.

3.3.5 Loder Creek site LC5

Site: LC5		28/10/2025	
Coordinates (MGA56):		E	N
		322484	6385655
CSIRO	Year	Score	Rating
	2024	69	Potentially Stabilising
	2025	69	Potentially Stabilising

The channel basin at LC5 comprises a V-shaped channel with mostly shallow sloped banks. The riparian corridor remained somewhat fragmented but was bordered upstream by a dense, continuous stand of swamp-oak. Despite this fragmentation, the understory and groundcover vegetation were well established and densely vegetated, providing strong structural complexity and habitat continuity throughout the site (**Figures 22** and **23**).

There was no surface water was present at LC5 for the 2025 survey. Evidence of a high flow event included accumulated spiny rush detrital deposits along the channel bank edges. Site channel and vegetation conditions remained largely consistent with previous assessments with dense spiny rush occurring throughout the length. Erosion scars noted in earlier surveys continued to act as minor sources of sediment input, although there was evidence of casuarina saplings establishing and slowly expanding within some of these eroded zones (**Figure 24**).



Figure 22: Looking upstream (left) and downstream (right) at LC5.



Figure 23: Site LC5 left bank (left) and erosion scar (right).



Figure 24: Site LC5 erosion scars with a proliferation of swamp-oak saplings.

Grasses within the riparian corridor and immediately downslope of the active erosion areas showed mixed health, with approximately half of the cover composed of dead material and the remainder of recent regrowth, reflecting a marginal decline in overall density compared to 2025.

Weed presence was dominated by lantana, purple top, fleabane, black wattle and dense occupation by spiny rush within the channel bed, and the lantana appeared to be recovering from earlier spraying, with new shoots and growth beginning to cover around half of the remaining dead branches and older growth. Overall, the conditions were found to be largely consistent with those recorded previously, and the CSIRO ESA classification for 2025 was maintained as *Potentially Stabilising* for 2025.

3.3.6 Loder Creek site LC6

Site: LC6		28/10/2025	
Coordinates (MGA56):		E	N
		322670	6385697
CSIRO	Year	Score	Rating
	2024	50	Active
	2025	50	Active

Site LC6 is situated in Loder Creek just upstream from the Nine Mile Creek confluence, in a V-shaped channel with moderately sloped channel walls and incised, box shaped channel. Surface water was present in 2025, with no observable flow. Water occurred throughout the channel but was confined to discrete pools separated by shallow breaks (**Figure 25**).

The riparian zone was characterised by a narrow, dense corridor of swamp-oak, with the closed canopy generating a substantial accumulation of needle litter across both the channel banks and basin. Couch grass remained well established and lush throughout the site, occurring alongside spiny rush within the channel floor. In permanently inundated sections, charophytes formed a continuous submerged mat, effectively carpeting the channel bed.

Active erosion persisted along the upper right-hand channel bank wall with further partial collapse of the erosion scar identified in previous annual reports (**Figure 27**). Animal tracks traversing the site continued to facilitate minor fine sediment input to the channel, however none of the existing erosion features dictated an increase in the CSIRO ESA category score. There were no indications of substantial or new sand deposition at the base of the right-hand bank wall with groundcover vegetation having occupied the settled sediments (**Figure 28**). The overall site conditions were mostly comparable to previous surveys, and the LC6 CSIRO ESA rating remained classified as *Active* in 2025.



Figure 25: Looking upstream at site LC6 (left) and looking downstream (right).



Figure 26: Site LC6 left bank (left) and right bank (right).



Figure 27: Bank erosion along upper right-hand bank at LC6.



Figure 28: Downslope from recent bank collapse and occupation of the lower riparian banks by couch grass and casuarina needle detritus at LC6.

3.3.7 Loder Creek site LC7

Site: LC7		28/10/2025	
Coordinates (MGA56):		E	N
		322759	6385778
CSIRO	Year	Score	Rating
	2024	59	Active
	2025	59	Active

Site LC7 is located downstream of the confluence of Loder Creek and Nine Mile Creek. The channel is incised and box-shaped, meandering through a broader V-shaped valley containing some moderately sloped banks on both sides (**Figures 29** and **30**). Water was present and continuous throughout the site, though no active flow was observed.

Evidence of previous higher flows was visible, with debris suggesting water levels had reached up to 1m above the current levels. These high flow event indicators extended across the full width of the channel basin, demonstrating that the high flow event influenced the entire channel basin.

The riparian banks and channel walls supported a partially fragmented but established band of mature swamp-oak trees, interspersed with scattered saplings and grasses beneath the canopy. Where canopy cover was reduced on the upper right-hand bank, grasses were notably more abundant. A thick layer of swamp-oak needles covered most of the ground surface. Overall, grasses appeared vigorous and healthy across the site, and weed presence remained relatively low although some of the existing lantana shrubs showed signs of recent renewed growth.



Figure 29: Looking upstream in LC7 (left) and looking downstream (right).



Figure 30: Site LC7 left bank (left) and right bank (right).

No new erosion scars were recorded and existing areas remained stable, however, the animal track dissecting the site continued to act as a source of sediment input with loose material observed within pools similar to that along channel walls at the animal crossing site. The CSIRO ESA rating remained as *Active* in 2025, consistent with previous surveys.

3.3.8 Loder Creek site LC11

Site: LC11		28/10/2025	
Coordinates (MGA56):		E	N
		322881	6386043
CSIRO	Year	Score	Rating
	2024	66	Potentially Stabilising
	2025	63	Potentially Stabilising

Compared to sites upstream in Loder Creek, the LC11 stream channel consists of a broad and flat-bottomed meandering channel, with intermittently occurring stepped bank edges intersected by shallow sloped (curved) banks (**Figures 31** and **32**).

Water was continuous throughout the site length however there was no observable surface flow at the time of survey. Vegetation within the LC11 drainage channel vegetation had flourished since 2024 (**Figure 31**). Aquatic vegetation was abundant within the channel, dominated by dense stands of common reed, with spiny rush and sago pondweed also present. Common reed density had increased within the site and upstream, while remaining comparable to 2024 conditions downstream, and couch grass was well established along the channel edges and had expanded compared to the previous survey (**Figure 31**).

The riparian corridor comprises a relatively wide stand of swamp-oak woodland with scattered eucalypts throughout. A swamp-oak needle layer was present across the site in generally low quantities owing to the dense understorey vegetation, which comprised mostly lantana and grasses. Animal tracks were evident along the channel floor; however, several had been partially stabilised through grass colonisation, suggesting reduced or historical use.

There was no change in the CSIRO ESA score at LC11 in 2025 which remained as *Potentially Stabilising*.



Figure 31: Looking upstream in LC7 (left) and looking downstream (right).



Figure 32: Site LC11 left bank (left) and right bank (right).

3.3.9 Loder Creek site LC12

Site: LC12		30/10/2025	
Coordinates (MGA56):		E	N
		323802	6388650
CSIRO	Year	Score	Rating
	2024	63	Potentially Stabilising
	2025	59	Active

The channel at LC12 comprises a flat-bottomed meandering channel with moderate incision into the surrounding valley floor, which is bordered by moderately sloping and higher left-hand bank and shallow sloped bank along the right-hand side (**Figures 33** and **34**). Continuous shallow water present at the site with a low flow at the time of survey.

The swamp-oak woodland formed a continuous riparian corridor bordered by cleared pastures, with livestock access permissible to the channel area from adjoining paddocks on the right-hand bank. There were animal tracks in the mud alongside the pool edges with evidence of cattle, wild pigs and kangaroos. The channel macrophyte assemblages were composed of spiny rush, sago pondweed and common reed, with overall vegetation abundance in the channel basin low and comparable to conditions recorded over the past 2 years. The groundcover beneath the canopy consisted of dense swamp-oak needles, spiny rush and scattered weed growth, with scattered weeds along the channel bank edges and slopes including lantana (partially dead from spraying on the left bank), dead African boxthorn (sprayed), thistle, prairie grass, ribwort plantain (*Plantago lanceolata*) along pasture edges, and purple top. This reduction in vegetation cover led to a downgrade in the 'Vegetation on drainage line floor' category, with the CSIRO ESA score decreasing from *Potentially Stabilising* to *Active* in 2025, a return to the levels recorded in 2022 and 2023.



Figure 33: Looking upstream and downstream at LC12 in 2025.



Figure 34: Looking at the left and right bank at LC12 in 2025.

3.3.13 Loder Creek site LC14

Site: LC14		29/10/2025	
Coordinates (MGA56):		E	N
		323800	6389222
CSIRO	Year	Score	Rating
	2024	63	Potentially Stabilising
	2025	63	Potentially Stabilising

The Loder Creek channel at LC14 comprises a flat-bottomed meandering channel with variable incision into the surrounding valley floor, with a steep bank bordering the stream along the left-hand side and shallow profile bank to the right (**Figures 35** and **36**). Slightly turbid water was moving through the site at a low flow rate over the concrete crossing.

Aquatic vegetation had increased in density compared to the previous survey, with the common reed showing a slight expansion in coverage and sago pondweed remaining abundant throughout the channel. Smaller amounts of arrowgrass and rushes (*Juncus spp*.) were also present, while filamentous green algae persisted at a high abundance.

The riparian canopy comprised a fragmented swamp-oak band with localised dense sections occurring intermittently between breaks. A complex understorey was characterised by a mix of grasses, weeds and detritus with a dense layer of swamp-oak needles beneath the riparian woodland canopy, which limited the establishment of other groundcover species in areas of high canopy cover. Groundcover extensive across the site, particularly in areas lacking canopy cover, where grasses, predominantly couch and rescue grass, had expanded to the water's edge and appeared to have recently colonised areas previously recorded as exposed soils. Weed assemblages included, but were not limited to, small patches of lantana, thistle, sow thistle, Rumex spp., rescue grass, fleabane, ribwort plantain, and African boxthorn and while weeds were distributed throughout the riparian corridor, their highest abundances occurred in more open, canopy free sections.

Active erosion remained largely confined to the prominent exposed left-hand bank along the downstream bend, where evidence of higher flows earlier in the year had resulted in additional bank undercutting and a modest increase in erosion extent relative to 2024. No signs of cattle or livestock disturbance were observed, and grass growth around the crossing appeared to be contributing to localised stabilisation of the channel margins.

There were no changes in the site conditions and therefore the CSIRO rating remained as *Potentially Stabilising* in 2025.



Figure 35: Looking upstream at LC14 (left) and looking downstream (right) in 2025.



Figure 36: Site LC14 left bank (left) and right bank (right).

3.3.10 Loder Creek site LC8

Site: LC8		29/10/2025	
Coordinates (MGA56):		E	N
		323948	6389351
CSIRO	Year	Score	Rating
	2024	66	Potentially Stabilising
	2025	66	Potentially Stabilising

The drainage channel at LC8 comprises a steep, vertical bank along the western side and shallower sloped, stepped bank to the east, and both edges support a thin and continuous strip of riparian swamp-oak trees which are undercut in parts (**Figure 37** and **38**). Water remained continuous through the site with a gentle low flow, while indicators of previous high-flow events were evident up to approximately 1.5–2 m above current water levels.

Couch grass remained along the channel edges., and the overall vegetation structure and condition remained stable and consistent with 2024. Sago pondweed, arrowgrass and rushes (*Juncus spp*.) persisted at comparable densities to the previous survey, while spiny rush occurred along channel margins. The condition of the swamp-oak corridor showed little change, maintaining similar density and distribution to previous surveys. Beneath the swamp-oak canopy, the groundcover was comprised a mix of grasses and weeds, including fleabane, thistle, sow thistle, African boxthorn, and ribwort plantain. Some swamp-oak needles detritus had been removed or thinned in areas affected by high-flow events, but for the most part a thick layer occurred among the more heavily vegetation bank edges. Channel morphology remained stable with no new erosional features or changes to the existing erosion scars.



Figure 37: Looking upstream at LC8 (left) and looking downstream (right).



Figure 38: Site LC8 left bank (left) and right bank (right).

No alterations were made to the CSIRO ESA category scores in 2025 and site remained as *Potentially Stabilising*.

3.3.11 Loder Creek site LC9

Site: LC9		29/10/2025	
Coordinates (MGA56):		E	N
		323996	6389540
CSIRO	Year	Score	Rating
	2024	69	Potentially Stabilising
	2025	69	Potentially Stabilising

Loder Creek site LC9 channel is generally straight with low profile banks, with a dense and thin strip of swamp-oak riparian corridor up and downstream of the open channel area surrounding the middle of the site (**Figures 39** and **40**).

Slightly turbid water was slowly trickling through the site at a low flow. Evidence throughout the site suggested previous flows up to 2m above current level. Aquatic vegetation remained stable with spiny rush and dense stands of common reed present throughout the site. Notably, common reed had increased in density since 2024. Recent bank erosion spanning approximately 1m x 1m was observed on the right-hand bank (**Figure 40**), though it appeared to have contributed only a minor quantity of sediment to the channel. Cattle access continued to impact channel edges through trampling and disturbance.

The intermittent swamp-oak canopy both upstream and downstream remained dense and largely unchanged. Beneath the canopy, a thick layer of swamp-oak needles continued to dominate the ground surface, potentially limiting the establishment and growth of other vegetation. Weed abundance within the channel basin was consistent with previous surveys, while grasses along the banks had expanded, forming denser cover on erosion slopes and adjoining pastures. The left-hand bank pasture continued to support thistle, alongside other weeds in the channel such as purple top, ribwort plantain, and curled dock.



Figure 39: Looking upstream (left) and downstream (right) at LC9.



Figure 40: Site LC9 left bank (left) and right bank (right).

Despite the minor physical and vegetation changes, no alterations were made to the LC9 CSIRO ESA scores which remained as *Potentially Stabilising* for 2025.

3.3.12 Loder Creek site LC10

Site: LC10		29/10/2025	
Coordinates (MGA56):		E	N
		324131	6390142
CSIRO	Year	Score	Rating
	2024	63	Potentially Stabilising
	2025	63	Potentially Stabilising

Site LC10 is located in the lower limits of Loder Creek at a concrete causeway with a narrow 100mm piped culvert (**Figures 41** and **42**). The channel is incised into the surrounding valley floor, and moderately steep V-shaped banks along both sides of the creek (reaching 5 to 8m above the channel floor), with bank undercutting prevalent throughout the section. Waters levels remained consistent, with slightly turbid water continuing to flow over the road crossing at a low flow.

The site channel and riparian conditions remained largely unchanged since the previous survey. Cattle access persisted as a localised disturbance with trampling concentrated around the creek crossing. Algal cover among aquatic habitats had reduced substantially compared to 2024, with the upstream pool free of smothering growth (**Figure 40**). Swamp-oak needle accumulation beneath the canopy remained consistent, maintaining its characteristic dense coverage, and grasses persisted as the dominant groundcover in adjoining pastures and along bank areas not under the swamp-oak canopy.



Figure 41: Site LC10 looking upstream from causeway (left) and looking downstream (right).



Figure 42: LC10 left bank (left) and right bank (right).

Aside from a few minor new erosion scars (< 20 cm) formed along the left-hand bank downstream, the channel erosion features showed little variation to previous surveys and there were no changes made to the LC10 site CSIRO ESA rating of *Potentially Stabilising* between 2024 and 2025.

3.3.13 Loder Creek site LC15

Site: LC15		29/10/2025	
Coordinates (MGA56):		E	N
		324150	6390239
CSIRO	Year	Score	Rating
	2024	53	Active
	2025	53	Active

Site LC15 is contained in a generally straight section of drainage, within a V-shaped valley with stream channel incised into the surrounding valley floor at depths of 8 to 10m. The creekline contains moderately steep to near vertical sections of bank along both sides with bank undercutting and stepped bank walls prevalent throughout the section as a result of livestock access and fluvial processes (**Figures 43** and **44**). Surface waters were slightly turbid with a low trickle flow for the 2025 survey.

Aquatic vegetation within the main channel was sparse, limited to charophytes, whereas the adjoining tributary supported moderate growth of the common reed and river bulrush. The riparian corridor comprised a very narrow and discontinuous band of swamp-oaks, with groundcover comprising mostly pasture grasses. Weed species were generally more concentrated along the upper banks and into adjacent paddocks, while areas beneath the swamp-oak canopy supported a limited swamp-oak needle layer overlying muds and soils.

Overall weed abundance (mostly thistle) along the banks had declined markedly since the previous survey, with the remaining weed species comprising thistle, sow thistle, rescue grass, slender vervain (*Verbena rigida*), and onion weed (*Nothoscordum spp.*).

The active erosion scar previously identified on the right-hand bank showed further localised slumping (**Figure 44**), although much of the surrounding bank remained stabilised by grass cover. Minor cattle damage and exposed tracks were observed on the left-hand bank but did not appear to contribute substantially to sediment input. The overall site condition remained consistent with previous assessments, and the CSIRO ESA rating remained classified as *Stable* for the 2025 survey.



Figure 43: Site LC15 looking upstream (left) and looking downstream (right).



Figure 44: LC15 left bank (left) and right bank (right).

3.3.13 Loder Creek site LC13

Site: LC13		29/10/2025	
Coordinates (MGA56):		E	N
		324160	6390408
CSIRO	Year	Score	Rating
	2024	63	Potentially Stabilising
	2025	63	Potentially Stabilising

The channel form at LC13 is similar to that noted for LC10, and consists of a V-shaped channel, deeply incised (7 to 10m) into the surrounding catchment area with fragmented riparian corridor consisting of mature swamp-oak and eucalypts (**Figures 45** and **46**). Turbid water was slowly moving through the site at a low flow.

Swamp-oak canopy inputs continued to generate a substantial needle layer along portions of the right (eastern) bank, while the remainder of the site was largely characterised by grass dominated groundcover with intermittent weed occurrence. Weed density along the immediate bank slopes adjacent to the channel had decreased markedly since the previous survey, most notably for thistle which persisted in association with other common pasture and riparian weeds, including dock (*Rumex spp*.), fleabane, fireweed and rescue grass.

Several cattle access tracks along the banks exhibited partial recolonisation by grasses, indicating reduced trampling pressure. Woody debris was abundant throughout the site length, with numerous large logs and branches present both within the channel and along its margins (**Figures 45** and **46**).



Figure 45: Looking upstream (left) and downstream (right) at LC13.



Figure 46: Looking at the left bank (left) and right bank (right) at LC13.

Based on these observations, site condition remained consistent overall and the LC13 CSIRO ESA classification was unchanged, remaining *Potentially Stabilising* in 2025

3.3.13 Loder Creek site LC16

Site: LC16		29/10/2025	
Coordinates (MGA56):		E	N
		324329	6390543
CSIRO	Year	Score	Rating
	2024	56	Active
	2025	56	Active

Site LC16 is located in the lower limits of Loder Creek, around 150m upstream from the confluence of the Hunter River. The channel banks are moderately sloped with very sparse occurrences of trees (gaps of 50m or more) (**Figures 47** and **48**). Water was turbid with a sluggish surface flow at the time of survey.

Overall, channel conditions remained broadly consistent with those recorded during the previous survey in 2024. The channel edge banks at LC16 supported aquatic vegetation dominated by dense common reed stands with lesser amounts of river clubrush (*Schoenoplectus validus*). Sections of the lower channel margins contained areas of muddy substrate, with exposed muds showing surface cracking. Weed growth along the banks and extending into the adjoining paddock had partially reduced in density, mostly along the lower banks, consisting mainly of grasses with scattered thistle, sow thistle, and dock (*Rumex spp*.). The large erosion scar on the upper right-hand bank persisted as an exposed soil face and remained active (**Figure 47**), though its overall extent was similar to that observed in 2024.

The LC16 channel is considered highly susceptible to flood-driven scouring and potential exacerbation of existing erosion, largely due to the absence of a well-developed wooded riparian corridor. Site conditions showed no substantial change in 2025, and accordingly, the CSIRO ESA rating for LC16 remained classified as *Active*.



Figure 47: Looking upstream (left) and downstream (right) at site LC16 in 2025.



Figure 48: Looking along the left-hand bank at LC16 (left) and right-hand bank (right).

4 SUMMARY

Marine Pollution Research (MPR) was engaged by Mount Thorley Warkworth (MTW) to undertake the 2025 Annual Stream Health and Channel Stability monitoring program across creek line drainages downstream of the MTW discharge point and adjacent to the mine footprint in the Upper Hunter Valley, NSW. The program was implemented in accordance with the requirements of Section 7.4 of the approved MTW Water Management Plan (WMP; Version 5.1, October 2021). Monitoring was undertaken in late October 2025 and included assessment of stream health, channel stability and riparian condition, with results compared against data from previous survey years.

The 2025 survey followed a year of highly variable climatic conditions, with periods of elevated rainfall and associated high flow events earlier in the year, followed by a return to relatively dry and stable conditions leading into the survey period. Evidence of these earlier flows was apparent at a number of monitoring sites, including elevated debris lines, detrital accumulations and indicators of high flow events over the previous year. At the time of monitoring, however, stream conditions were generally characterised by low flows, isolated pooled water or slow-moving water within the drainage networks.

Across the monitoring network, CSIRO Ephemeral Stream Assessment (ESA) results indicated a high degree of consistency in channel condition between 2024 and 2025 with most sites retained their previous classification ratings (**Table 4**). Although several sites continue to exhibit active erosion features, including exposed banks, slumped sections and animal access tracks, these features were generally persistent, spatially limited and consistent with those recorded during previous monitoring periods. In many instances, erosion features showed evidence of partial stabilisation through grass colonisation, swamp-oak sapling establishment and weed growth, particularly where colluvial sediments had accumulated. Where changes in scores were recorded, these were typically minor and associated with localised changes in vegetation cover rather than any widespread changes in channel and riparian bank geomorphology.

Two sites recorded changes to their overall CSIRO ESA classification during the 2025 assessment. At LC3, improved ground cover and increased regulation of lateral flow contributed to a reduction in activity rating from *Very Active* to *Active*, indicating a modest improvement in channel condition relative to 2024. In contrast, LC12 recorded a decline in vegetation cover across the drainage line floor, resulting in a downgrade from *Potentially Stabilising* to *Active* and returning the site to a condition consistent with that recorded in 2022 and 2023.

Stream Health Monitoring using the Rapid Appraisal of Riparian Condition (RARC) method showed that overall riparian condition at the four primary monitoring sites (MTW LDP2, BM34, BM35 and BM37) remained stable in 2025. RARC classifications continued to range from *Average* to *Good*, with no changes to overall ratings. These outcomes reflect the ongoing influence of relatively intact riparian canopies dominated by mature swamp-oak and river-oak species, which provide structural stability, detrital inputs and shading, despite generally limited native understorey complexity and varying levels of weed presence.

Across the broader Loder Creek network, riparian condition and channel stability remained strongly influenced by site specific factors, including livestock access, weed pressure, canopy continuity and historical erosion. Sites characterised by narrow or fragmented riparian corridors and ongoing livestock access (e.g. LC6, LC7, LC12, LC15 and LC16) continued to display a higher susceptibility to disturbance and erosion, whereas sites supporting more continuous canopy cover and well-established groundcover exhibited greater resilience to flow events.

In summary, the 2025 MTW Stream Health and Channel Stability monitoring program indicates that the assessed creek systems remain generally stable, with no evidence of widespread degradation attributable to MTW mine operations. While localised erosion and vegetation fluctuations persist at several sites, these are consistent with historical conditions and are often counterbalanced by natural recovery processes. Continued management measures, including targeted weed control, stock exclusion where practicable and ongoing annual monitoring, are recommended to support incremental improvements in riparian condition and to ensure early detection of any future changes in channel stability.

Table 4 MTW RARC and CSIRO Summary Results 2023 to 2025						
	RARC			CSIRO		
	Dec-23	Nov-24	Oct-25	Dec-23	Nov-24	Oct-25
MTW LDP2	NA	Average	Average	NA	Potentially Stabilising	Potentially Stabilising
BM34	Good	Good	Good	Stable	Stable	Stable
BM35	Average	Average	Average	Active	Active	Active
BM37	Average	Average	Average	Stable	Stable	Stable
LC1	NA	NA	NA	Stable	Stable	Stable
LC2	NA	NA	NA	Potentially Stabilising	Potentially Stabilising	Potentially Stabilising
LC3	NA	NA	NA	Active	Very Active	Active
LC4	NA	NA	NA	Potentially Stabilising	Potentially Stabilising	Potentially Stabilising
LC5	NA	NA	NA	Potentially Stabilising	Potentially Stabilising	Potentially Stabilising
LC6	NA	NA	NA	Active	Active	Active
LC7	NA	NA	NA	Active	Active	Active
LC8	NA	NA	NA	Potentially Stabilising	Potentially Stabilising	Potentially Stabilising
LC9	NA	NA	NA	Potentially Stabilising	Potentially Stabilising	Potentially Stabilising
LC10	NA	NA	NA	Potentially Stabilising	Potentially Stabilising	Potentially Stabilising
LC11	NA	NA	NA	Potentially Stabilising	Potentially Stabilising	Potentially Stabilising
LC12	NA	NA	NA	Active	Potentially Stabilising	Active
LC13	NA	NA	NA	Potentially Stabilising	Potentially Stabilising	Potentially Stabilising
LC14	NA	NA	NA	Active	Potentially Stabilising	Potentially Stabilising
LC15	NA	NA	NA	Active	Active	Active
LC16	NA	NA	NA	Active	Active	Active

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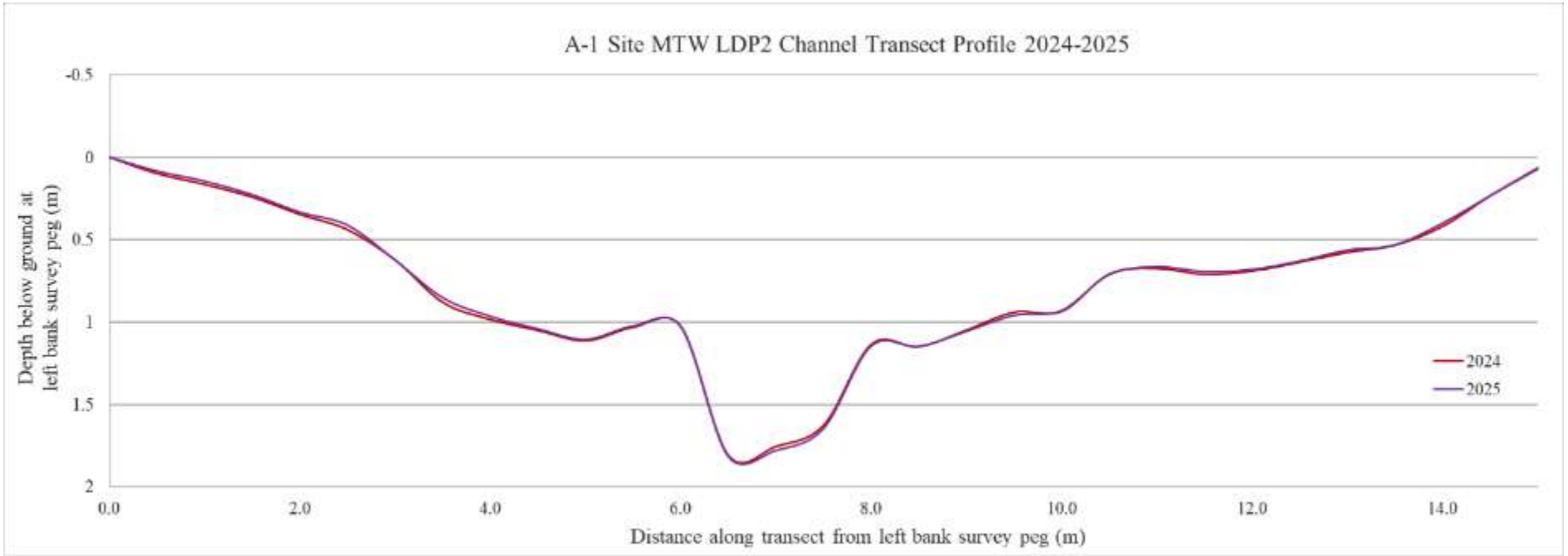
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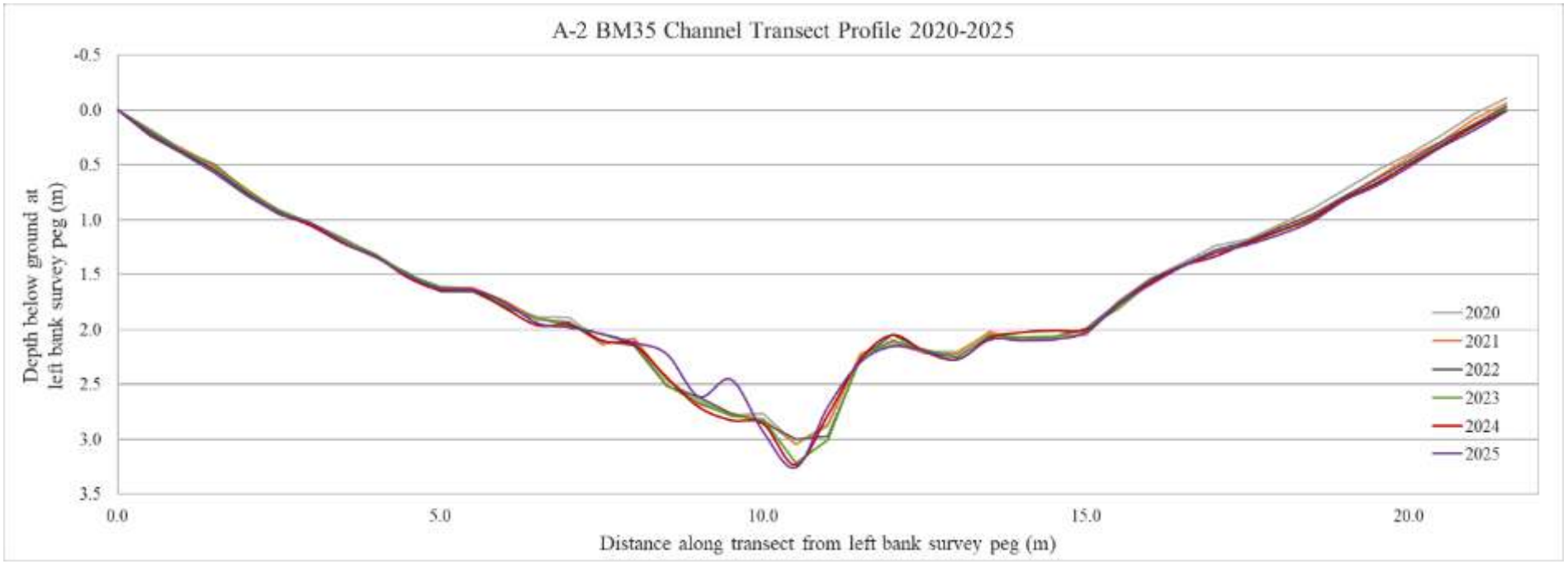
APPENDIX A

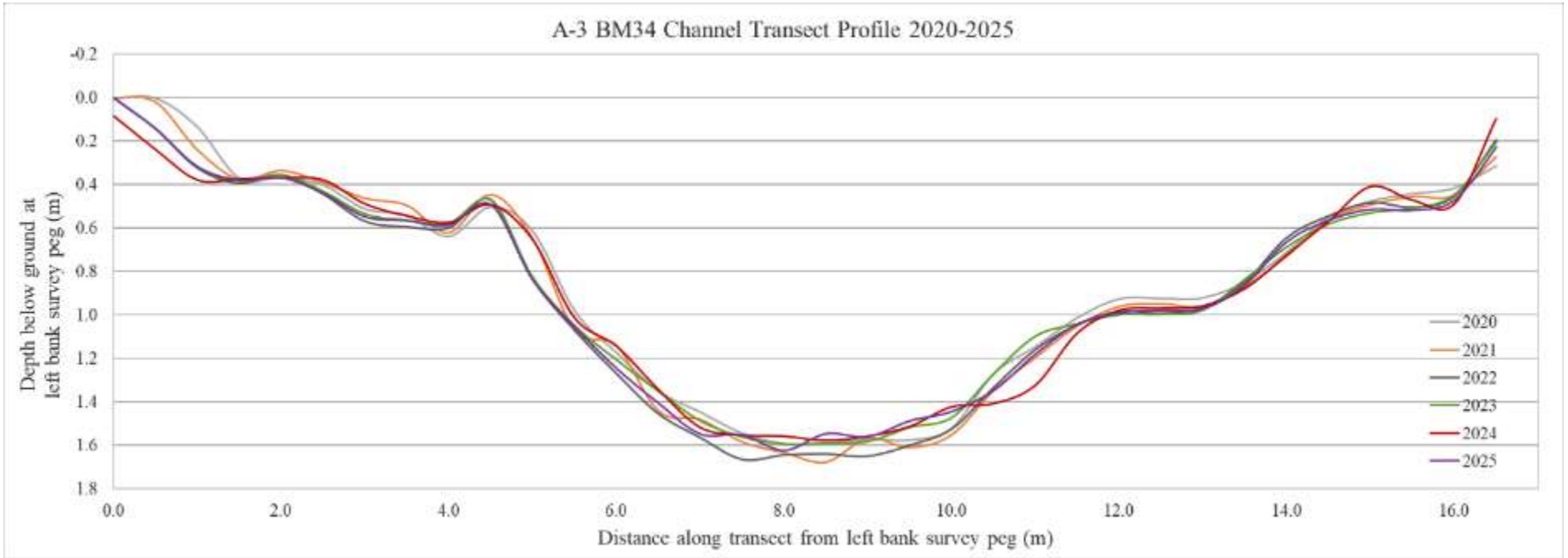
STREAM HEALTH & STABILITY

MONITORING SITE

CHANNEL TRANSECTS


A-1 Site MTW LDP2 Channel Transect Profile 2024-2025
Depth below ground at left bank survey peg (m)
-0.5
0
0.5
1
1.5
2
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
Distance along transect from left bank survey peg (m)
2024
2025


A-2 BM35 Channel Transect Profile 2020-2025
Depth below ground at left bank survey peg (m)
-0.5
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
0.0
5.0
10.0
15.0
20.0
Distance along transect from left bank survey peg (m)
2020
2021
2022
2023
2024
2025


A-3 BM34 Channel Transect Profile 2020-2025
Depth below ground at left bank survey peg (m)
-0.2
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
Distance along transect from left bank survey peg (m)
2020
2021
2022
2023
2024
2025

APPENDIX B

STREAM HEALTH & STABILITY

MONITORING SITE

RARC FIELDSHEET DATA

Rapid Appraisal of Riparian Condition

Site:	Loder Creek		Site Number	MTW LDP2
Date:	28/10/2025	Observer:	JB + AG	

Longitudinal continuity of riparian canopy vegetation (>5m wide)

Map	Score
	3

0 = <50%, 1 = 50-64%, 2 = 65-79%, 3 = 80-94%, 4 = ≥95% vegetated bank; with ½ point subtracted for each significant discontinuity (>50m long)

Width of riparian canopy vegetation

Transect	Channel Width (CW)	Vegetation Width (VW)	Score
1	3	25	3
2	2	50	4
3	2	20	3
4	2	50	4
Average	2.25	36.25	3.5

Proximity

Score
2

Nearest patch of native vegetation >10ha:
0 = >1km, 1 = 200m-1km, 2 = contiguous,
3 = contiguous with patch >50ha

Channel ≤10m wide: 0 = VW <5m, 1 = VW 5-9m , 2 = VW 10-19m, 3 = VW 20-39m, 4 = VW ≥40m

Channel >10m wide: 0 = VW/CW <0.5, 1 = VW/CW 0.5-0.9, 2 = VW/CW 1-1.9, 3 = VW/CW 2-3.9, 4 = VW/CW ≥4

Vegetation cover: Canopy >5m, Understorey 1-5m, Ground cover <1m

Transect	Canopy	Native canopy	Understorey	Native understorey	Ground cover	Native ground cover	# layers
1	2	2	1	1	1	1	3
2	2	2	1	1	1	1	3
3	3	3	1	1	1	1	3
4	3	3	1	1	1	1	3
Average	2.5	2.5	1	1	1	1	3

Canopy and ground cover: 0 = none, 1 = 1-30%, 2 = 31-60%, 3 = >60%

Understorey cover: 0 = none, 1 = 1-5%, 2 = 6-30%, 3 = >30%

Debris

Transect	Leaf litter	Native leaf litter	Standing dead trees	Hollow-bearing trees	Fallen logs
1	3	3	1	1	1
2	2	2	0	0	1
3	3	3	0	0	1
4	3	3	1	0	1
Average	2.75	2.75	0.5	0.25	1

Leaf litter & native leaf litter cover: 0 = none, 1 = 1-30%, 2 = 31-60%, 3 = >60%

Standing dead trees (>20cm dbh) & hollow-bearing trees: 0 = absent, 1 = present

Fallen logs (>10cm diameter): 0 = none, 1 = small quantities, 2 = abundant

Features

Transect	Native canopy species	Native understorey	Large native tussock grasses	Reeds
1	1	1	1	0
2	1	1	1	0
3	1	1	1	0
4	1	0	0	0
Average	1	0.75	0.75	0

Regeneration <1m tall: 0 = none, 1 = scattered, and 2 = abundant, with ½ point subtracted for grazing damage

Reeds & large tussock grasses: 0 = none, 1 = scattered, and 2 = abundant

Calculation of scores

Site Number:	MTW LDP2

Longitudinal continuity of riparian canopy vegetation

Score
3.5

Width of riparian canopy vegetation

Average	3.5

Proximity

Score
1

Vegetation cover

	Canopy	Native canopy	Understorey	Native understorey	Ground cover	Native ground cover	# layers
Average	2.5	2.5	1	1	1	1	3

Debris

	Leaf litter	Native leaf litter	Standing dead trees	Hollow-bearing trees	Fallen logs
Average	2.75	2.75	0.5	0.25	1

Features

	Native canopy species	Native understorey	Large native tussock grasses	Reeds
Average	1	0.75	0.75	0

TOTALS

Site:	Habitat	Cover	Natives	Debris	Features	**Total**
(out of)	11	12	9	10	8	50
	8	7.5	4.5	7.25	2.5	29.75

Rapid Appraisal of Riparian Condition

Site:	Nine Mile Creek	Site Number	BM35
Date:	28/10/25	Observer:	JB + AG

Longitudinal continuity of riparian canopy vegetation (>5m wide)

Map	Score
	3

0 = <50%, 1 = 50-64%, 2 = 65-79%, 3 = 80-94%, 4 = ≥95% vegetated bank; with ½ point subtracted for each significant discontinuity (>50m long)

Width of riparian canopy vegetation

Transect	Channel Width (CW)	Vegetation Width (VW)	Score
1	5	50	4
2	3	20	3
3	6	50	4
4	5	55	4
Average			3.75

Channel ≤10m wide: 0 = VW <5m, 1 = VW 5-9m , 2 = VW 10-19m, 3 = VW 20-39m, 4 = VW ≥40m

Channel >10m wide: 0 = VW/CW <0.5, 1 = VW/CW 0.5-0.9, 2 = VW/CW 1-1.9, 3 = VW/CW 2-3.9, 4 = VW/CW ≥4

Proximity

Score
3

Nearest patch of native vegetation >10ha:
0 = >1km, 1 = 200m-1km, 2 = contiguous,
3 = contiguous with patch >50ha

Vegetation cover: Canopy >5m, Understorey 1-5m, Ground cover <1m

Transect	Canopy	Native canopy	Understorey	Native understorey	Ground cover	Native ground cover	# layers
1	3	3	2	1	1	1	3
2	3	3	2	1	2	1	3
3	3	3	2	1	2	1	3
4	3	3	2	0	1	0	3
Average	3	3	2	0.75	1.5	0.75	3

Canopy and ground cover: 0 = none, 1 = 1-30%, 2 = 31-60%, 3 = >60%

Understorey cover: 0 = none, 1 = 1-5%, 2 = 6-30%, 3 = >30%

Debris

Transect	Leaf litter	Native leaf litter	Standing dead trees	Hollow-bearing trees	Fallen logs
1	3	3	0	0	1
2	3	3	0	0	1
3	3	3	0	1	1
4	3	3	0	0	1
Average	3	3	0	0.25	1

Leaf litter & native leaf litter cover: 0 = none, 1 = 1-30%, 2 = 31-60%, 3 = >60%

Standing dead trees (>20cm dbh) & hollow-bearing trees: 0 = absent, 1 = present

Fallen logs (>10cm diameter): 0 = none, 1 = small quantities, 2 = abundant

Features

Transect	Native canopy species	Native understorey	Large native tussock grasses	Reeds
1	1	0	1	0
2	1	0	1	1
3	1	0	1	1
4	1	0	1	1
Average	1	0	1	0.75

Regeneration <1m tall: 0 = none, 1 = scattered, and 2 = abundant, with ½ point subtracted for grazing damage

Reeds & large tussock grasses: 0 = none, 1 = scattered, and 2 = abundant

Calculation of scores

Site Number:	BM35

Longitudinal continuity of riparian canopy vegetation

Score
3

Width of riparian canopy vegetation

Average	3.75

Proximity

Score
3

Vegetation cover

	Canopy	Native canopy	Understorey	Native understorey	Ground cover	Native ground cover	# layers
Average	3	3	2	0.75	1.5	0.75	3

Debris

	Leaf litter	Native leaf litter	Standing dead trees	Hollow-bearing trees	Fallen logs
Average	3	3	0	0.25	1

Features

	Native canopy species	Native understorey	Large native tussock grasses	Reeds
Average	1	0	1	0.75

TOTALS

Site:	Habitat	Cover	Natives	Debris	Features	**Total**
(out of)	11	12	9	10	8	50
	9.75	9.5	4.5	7.25	2.75	33.8

Rapid Appraisal of Riparian Condition

Site:	Wollombi Brook		Site Number	BM37
Date:	29/10/2025	Observer:	OB + JB	

Longitudinal continuity of riparian canopy vegetation (>5m wide)

Map	Score
	3.5

0 = <50%, 1 = 50-64%, 2 = 65-79%, 3 = 80-94%, 4 = ≥95% vegetated bank; with ½ point subtracted for each significant discontinuity (>50m long)

Width of riparian canopy vegetation

Transect	Channel Width (CW)	Vegetation Width (VW)	Score
1	11	25	3
2	16	21	3
3	16	24	3
4	18	35	3
Average	15.25	26.25	3

Channel ≤10m wide: 0 = VW <5m, 1 = VW 5-9m , 2 = VW 10-19m, 3 = VW 20-39m, 4 = VW ≥40m

Channel >10m wide: 0 = VW/CW <0.5, 1 = VW/CW 0.5-0.9, 2 = VW/CW 1-1.9, 3 = VW/CW 2-3.9, 4 = VW/CW ≥4

Proximity

Score
2

Nearest patch of native vegetation >10ha:
0 = >1km, 1 = 200m-1km, 2 = contiguous,
3 = contiguous with patch >50ha

Vegetation cover: Canopy >5m, Understorey 1-5m, Ground cover <1m

Transect	Canopy	Native canopy	Understorey	Native understorey	Ground cover	Native ground cover	# layers
1	2	2	2	1	2	2	3
2	3	3	2	1	3	2	3
3	3	3	2	1	3	2	3
4	2	2	2	2	2	2	3
Average	2.5	2.5	2	1.25	2.5	2	3

Canopy and ground cover: 0 = none, 1 = 1-30%, 2 = 31-60%, 3 = >60%

Understorey cover: 0 = none, 1 = 1-5%, 2 = 6-30%, 3 = >30%

Debris

Transect	Leaf litter	Native leaf litter	Standing dead trees	Hollow-bearing trees	Fallen logs
1	2	2	1	0	2
2	2	2	1	0	2
3	2	2	1	0	2
4	2	2	1	0	2
Average	2	2	1	0	2

Leaf litter & native leaf litter cover: 0 = none, 1 = 1-30%, 2 = 31-60%, 3 = >60%

Standing dead trees (>20cm dbh) & hollow-bearing trees: 0 = absent, 1 = present

Fallen logs (>10cm diameter): 0 = none, 1 = small quantities, 2 = abundant

Features

Transect	Native canopy species	Native understorey	Large native tussock grasses	Reeds
1	1	0	1	1
2	1	0	1	2
3	0	0	1	2
4	1	1	1	2
Average	0.75	0.25	1	1.75

Regeneration <1m tall: 0 = none, 1 = scattered, and 2 = abundant, with ½ point subtracted for grazing damage

Reeds & large tussock grasses: 0 = none, 1 = scattered, and 2 = abundant

Calculation of scores

Site Number:	BM37

Longitudinal continuity of riparian canopy vegetation

Score
3.5

Width of riparian canopy vegetation

Average	3

Proximity

Score
2

Vegetation cover

	Canopy	Native canopy	Understorey	Native understorey	Ground cover	Native ground cover	# layers
Average	2.5	2.5	2	1.25	2.5	2	3

Debris

	Leaf litter	Native leaf litter	Standing dead trees	Hollow-bearing trees	Fallen logs
Average	2	2	1	0	2

Features

	Native canopy species	Native understorey	Large native tussock grasses	Reeds
Average	0.75	0.25	1	1.75

TOTALS

Site:	Habitat	Cover	Natives	Debris	Features	**Total**
(out of)	11	12	9	10	8	50
	8.5	10	5.75	7	3.75	35

APPENDIX C

STREAM HEALTH & STABILITY

MONITORING SITE

CSIRO ESA FIELDSHEET DATA

BSO CSIRO Ephemeral Stream Assessment					
Site	**Date of Monitoring**		**Dec-23**	**Nov-24**	**Oct-25**
	Category Description	**Rating Range**	MPR	MPR	MPR
LC1	Vegetation on D/L floor	1-3	3	3	3
	Vegetation on D/L walls	1-3	3	3	3
	Shape & aspect ratio of D/L cross-section	1-5	3	3	3
	Longitudinal morphology of D/L	1-4	3	3	3
	Particle size of materials on floor	1-3	1	1	1
	Nature of D/L wall materials	1-4	3	3	3
	Shape of stream bordering flats/ slopes	1-5	4	4	4
	Nature of lateral flow regulation into D/L	1-5	3	3	3
	Sum of Scores		**23**	**23**	**23**
	Activity Score		**72**	**72**	**72**
	Classification		**Stable**	**Stable**	**Stable**
LC2	Vegetation on D/L floor	1-3	3	3	3
	Vegetation on D/L walls	1-3	2	2	2
	Shape & aspect ratio of D/L cross-section	1-5	3	3	3
	Longitudinal morphology of D/L	1-4	2	2	2
	Particle size of materials on floor	1-3	2	2	2
	Nature of D/L wall materials	1-4	1	1	1
	Shape of stream bordering flats/ slopes	1-5	4	4	4
	Nature of lateral flow regulation into D/L	1-5	4	4	4
	Sum of Scores		**21**	**21**	**21**
	Activity Score		**66**	**66**	**66**
	Classification		**Potentially Stabilising**	**Potentially Stabilising**	**Potentially Stabilising**

BSO CSIRO Ephemeral Stream Assessment					
Site	**Date of Monitoring**		**Dec-23**	**Nov-24**	**Oct-25**
	Category Description	**Rating Range**	MPR	MPR	MPR
LC3	Vegetation on D/L floor	1-3	3	3	3
	Vegetation on D/L walls	1-3	1	1	1
	Shape & aspect ratio of D/L cross-section	1-5	2	2	2
	Longitudinal morphology of D/L	1-4	2	2	2
	Particle size of materials on floor	1-3	2	1	1
	Nature of D/L wall materials	1-4	1	1	1
	Shape of stream bordering flats/ slopes	1-5	3	3	3
	Nature of lateral flow regulation into D/L	1-5	2	2	3
	Sum of Scores		**16**	**15**	**16**
	Activity Score		**50**	**47**	**50**
	Classification		**Active**	**Very Active**	**Active**
LC4	Vegetation on D/L floor	1-3	3	3	3
	Vegetation on D/L walls	1-3	3	3	3
	Shape & aspect ratio of D/L cross-section	1-5	2	2	2
	Longitudinal morphology of D/L	1-4	3	3	3
	Particle size of materials on floor	1-3	1	1	1
	Nature of D/L wall materials	1-4	1	1	1
	Shape of stream bordering flats/ slopes	1-5	4	4	4
	Nature of lateral flow regulation into D/L	1-5	4	4	4
	Sum of Scores		**21**	**21**	**21**
	Activity Score		**66**	**66**	**66**
	Classification		**Potentially Stabilising**	**Potentially Stabilising**	**Potentially Stabilising**

BSO CSIRO Ephemeral Stream Assessment					
Site	**Date of Monitoring**		**Dec-23**	**Nov-24**	**Oct-25**
	Category Description	**Rating Range**	MPR	MPR	MPR
LC5	Vegetation on D/L floor	1-3	3	3	3
	Vegetation on D/L walls	1-3	2	2	2
	Shape & aspect ratio of D/L cross-section	1-5	3	3	3
	Longitudinal morphology of D/L	1-4	3	3	3
	Particle size of materials on floor	1-3	1	1	1
	Nature of D/L wall materials	1-4	3	3	3
	Shape of stream bordering flats/ slopes	1-5	3	3	3
	Nature of lateral flow regulation into D/L	1-5	4	4	4
	Sum of Scores		**22**	**22**	**22**
	Activity Score		**69**	**69**	**69**
	Classification		**Potentially Stabilising**	**Potentially Stabilising**	**Potentially Stabilising**
LC6	Vegetation on D/L floor	1-3	2	2	2
	Vegetation on D/L walls	1-3	2	2	2
	Shape & aspect ratio of D/L cross-section	1-5	2	2	2
	Longitudinal morphology of D/L	1-4	2	2	2
	Particle size of materials on floor	1-3	1	1	1
	Nature of D/L wall materials	1-4	1	1	1
	Shape of stream bordering flats/ slopes	1-5	3	3	3
	Nature of lateral flow regulation into D/L	1-5	3	3	3
	Sum of Scores		**16**	**16**	**16**
	Activity Score		**50**	**50**	**50**
	Classification		**Active**	**Active**	**Active**

BSO CSIRO Ephemeral Stream Assessment					
Site	**Date of Monitoring**		**Dec-23**	**Nov-24**	**Oct-25**
	Category Description	**Rating Range**	MPR	MPR	MPR
LC7	Vegetation on D/L floor	1-3	3	3	3
	Vegetation on D/L walls	1-3	2	2	2
	Shape & aspect ratio of D/L cross-section	1-5	2	2	2
	Longitudinal morphology of D/L	1-4	2	2	2
	Particle size of materials on floor	1-3	1	1	1
	Nature of D/L wall materials	1-4	2	2	2
	Shape of stream bordering flats/ slopes	1-5	4	4	4
	Nature of lateral flow regulation into D/L	1-5	3	3	3
	Sum of Scores		**19**	**19**	**19**
	Activity Score		**59**	**59**	**59**
	Classification		**Active**	**Active**	**Active**
LC8	Vegetation on D/L floor	1-3	2	2	2
	Vegetation on D/L walls	1-3	2	2	2
	Shape & aspect ratio of D/L cross-section	1-5	3	3	3
	Longitudinal morphology of D/L	1-4	3	3	3
	Particle size of materials on floor	1-3	1	1	1
	Nature of D/L wall materials	1-4	2	2	2
	Shape of stream bordering flats/ slopes	1-5	4	4	4
	Nature of lateral flow regulation into D/L	1-5	4	4	4
	Sum of Scores		**21**	**21**	**21**
	Activity Score		**66**	**66**	**66**
	Classification		**Potentially Stabilising**	**Potentially Stabilising**	**Potentially Stabilising**

BSO CSIRO Ephemeral Stream Assessment					
Site	**Date of Monitoring**		**Dec-23**	**Nov-24**	**Oct-25**
	Category Description	**Rating Range**	MPR	MPR	MPR
LC9	Vegetation on D/L floor	1-3	3	3	3
	Vegetation on D/L walls	1-3	3	3	3
	Shape & aspect ratio of D/L cross-section	1-5	3	3	3
	Longitudinal morphology of D/L	1-4	2	2	2
	Particle size of materials on floor	1-3	1	1	1
	Nature of D/L wall materials	1-4	2	2	2
	Shape of stream bordering flats/ slopes	1-5	4	4	4
	Nature of lateral flow regulation into D/L	1-5	4	4	4
	Sum of Scores		**22**	**22**	**22**
	Activity Score		**69**	**69**	**69**
	Classification		**Potentially Stabilising**	**Potentially Stabilising**	**Potentially Stabilising**
LC10	Vegetation on D/L floor	1-3	1	1	1
	Vegetation on D/L walls	1-3	1	1	1
	Shape & aspect ratio of D/L cross-section	1-5	2	2	2
	Longitudinal morphology of D/L	1-4	2	2	2
	Particle size of materials on floor	1-3	2	2	2
	Nature of D/L wall materials	1-4	4	4	4
	Shape of stream bordering flats/ slopes	1-5	4	4	4
	Nature of lateral flow regulation into D/L	1-5	4	4	4
	Sum of Ratings		**20**	**20**	**20**
	Activity Rating		**63**	**63**	**63**
	Classification		**Potentially Stabilising**	**Potentially Stabilising**	**Potentially Stabilising**

BSO CSIRO Ephemeral Stream Assessment					
Site	**Date of Monitoring**		**Dec-23**	**Nov-24**	**Oct-25**
	Category Description	**Rating Range**	MPR	MPR	MPR
LC11	Vegetation on D/L floor	1-3	2	2	2
	Vegetation on D/L walls	1-3	3	3	3
	Shape & aspect ratio of D/L cross-section	1-5	3	3	3
	Longitudinal morphology of D/L	1-4	3	3	3
	Particle size of materials on floor	1-3	1	1	1
	Nature of D/L wall materials	1-4	2	2	2
	Shape of stream bordering flats/ slopes	1-5	3	3	3
	Nature of lateral flow regulation into D/L	1-5	4	4	4
	Sum of Scores		**21**	**21**	**21**
	Activity Score		**66**	**66**	**66**
	Classification		**Potentially Stabilising**	**Potentially Stabilising**	**Potentially Stabilising**
LC12	Vegetation on D/L floor	1-3	2	3	2
	Vegetation on D/L walls	1-3	2	2	2
	Shape & aspect ratio of D/L cross-section	1-5	3	3	3
	Longitudinal morphology of D/L	1-4	3	3	3
	Particle size of materials on floor	1-3	1	1	1
	Nature of D/L wall materials	1-4	1	1	1
	Shape of stream bordering flats/ slopes	1-5	3	3	3
	Nature of lateral flow regulation into D/L	1-5	4	4	4
	Sum of Scores		**19**	**20**	**19**
	Activity Score		**59**	**63**	**59**
	Classification		**Active**	**Potentially Stabilising**	**Active**

MTW CSIRO Ephemeral Stream Assessment					
Site	**Date of Monitoring**		**Dec-23**	**Nov-24**	**Oct-25**
	Category Description	**Rating Range**	MPR	MPR	MPR
LC13	Vegetation on D/L floor	1-3	1	1	1
	Vegetation on D/L walls	1-3	2	2	2
	Shape & aspect ratio of D/L cross-section	1-3	3	3	3
	Longitudinal morphology of D/L	1-3	3	3	3
	Particle size of materials on floor	1-3	1	1	1
	Nature of D/L wall materials	1-3	2	2	2
	Shape of stream bordering flats/ slopes	1-3	4	4	4
	Nature of lateral flow regulation into D/L	1-3	4	4	4
	Sum of Scores		**20**	**20**	**20**
	Activity Score		**63**	**63**	**63**
	Classification		**Potentially Stabilising**	**Potentially Stabilising**	**Potentially Stabilising**
LC14	Vegetation on D/L floor	1-3	2	3	3
	Vegetation on D/L walls	1-3	3	3	3
	Shape & aspect ratio of D/L cross-section	1-3	2	2	2
	Longitudinal morphology of D/L	1-3	2	2	2
	Particle size of materials on floor	1-3	1	1	1
	Nature of D/L wall materials	1-3	1	1	1
	Shape of stream bordering flats/ slopes	1-3	4	4	4
	Nature of lateral flow regulation into D/L	1-3	4	4	4
	Sum of Scores		**19**	**20**	**20**
	Activity Score		**59**	**63**	**63**
	Classification		**Active**	**Potentially Stabilising**	**Potentially Stabilising**

MTW CSIRO Ephemeral Stream Assessment					
Site	**Date of Monitoring**		**Dec-23**	**Nov-24**	**Oct-25**
	Category Description	**Rating Range**	MPR	MPR	MPR
LC15	Vegetation on D/L floor	1-3	1	1	1
	Vegetation on D/L walls	1-3	2	2	2
	Shape & aspect ratio of D/L cross-section	1-3	2	2	2
	Longitudinal morphology of D/L	1-3	2	2	2
	Particle size of materials on floor	1-3	1	1	1
	Nature of D/L wall materials	1-3	1	1	1
	Shape of stream bordering flats/ slopes	1-3	4	4	4
	Nature of lateral flow regulation into D/L	1-3	4	4	4
	Sum of Scores		**17**	**17**	**17**
	Activity Score		**53**	**53**	**53**
	Classification		**Active**	**Active**	**Active**
LC16	Vegetation on D/L floor	1-3	1	1	1
	Vegetation on D/L walls	1-3	2	2	2
	Shape & aspect ratio of D/L cross-section	1-3	2	2	2
	Longitudinal morphology of D/L	1-3	2	2	2
	Particle size of materials on floor	1-3	1	1	1
	Nature of D/L wall materials	1-3	1	2	2
	Shape of stream bordering flats/ slopes	1-3	4	4	4
	Nature of lateral flow regulation into D/L	1-3	4	4	4
	Sum of Scores		**17**	**18**	**18**
	Activity Score		**53**	**56**	**56**
	Classification		**Active**	**Active**	**Active**

MTW CSIRO Ephemeral Stream Assessment					
Site	**Date of Monitoring**		**Dec-23**	**Nov-24**	**Oct-25**
	Category Description	**Rating Range**	MPR	MPR	MPR
MTW LDP2	Vegetation on D/L floor	1-3		3	3
	Vegetation on D/L walls	1-3		2	2
	Shape & aspect ratio of D/L cross-section	1-3		3	3
	Longitudinal morphology of D/L	1-3		2	2
	Particle size of materials on floor	1-3		2	2
	Nature of D/L wall materials	1-3		2	2
	Shape of stream bordering flats/ slopes	1-3		4	4
	Nature of lateral flow regulation into D/L	1-3		4	4
	Sum of Scores			**22**	**22**
	Activity Score			**69**	**69**
	Classification			**Potentially Stabilising**	**Potentially Stabilising**
BM34	Vegetation on D/L floor	1-3	3	3	3
	Vegetation on D/L walls	1-3	3	3	3
	Shape & aspect ratio of D/L cross-section	1-5	5	5	5
	Longitudinal morphology of D/L	1-4	3	3	3
	Particle size of materials on floor	1-3	1	1	1
	Nature of D/L wall materials	1-4	3	3	3
	Shape of stream bordering flats/ slopes	1-5	3	3	3
	Nature of lateral flow regulation into D/L	1-5	4	4	4
	Sum of Scores		**25**	**25**	**25**
	Activity Score		**78**	**78**	**78**
	Classification		**Stable**	**Stable**	**Stable**

MTW CSIRO Ephemeral Stream Assessment					
Site	**Date of Monitoring**		**Dec-23**	**Nov-24**	**Oct-25**
	Category Description	**Rating Range**	MPR	MPR	MPR
BM35	Vegetation on D/L floor	1-3	3	3	3
	Vegetation on D/L walls	1-3	2	2	2
	Shape & aspect ratio of D/L cross-section	1-5	2	2	2
	Longitudinal morphology of D/L	1-4	2	2	2
	Particle size of materials on floor	1-3	2	2	2
	Nature of D/L wall materials	1-4	2	2	2
	Shape of stream bordering flats/ slopes	1-5	3	3	3
	Nature of lateral flow regulation into D/L	1-5	3	3	3
	Sum of Scores		**19**	**19**	**19**
	Activity Score		**59**	**59**	**59**
	Classification		**Active**	**Active**	**Active**
BM37	Vegetation on D/L floor	1-3	2	2	2
	Vegetation on D/L walls	1-3	3	3	3
	Shape & aspect ratio of D/L cross-section	1-3	3	3	3
	Longitudinal morphology of D/L	1-3	4	4	4
	Particle size of materials on floor	1-3	1	1	1
	Nature of D/L wall materials	1-3	2	2	2
	Shape of stream bordering flats/ slopes	1-3	4	4	4
	Nature of lateral flow regulation into D/L	1-3	4	4	4
	Sum of Scores		**23**	**23**	**23**
	Activity Score		**72**	**72**	**72**
	Classification		**Stable**	**Stable**	**Stable**

MARINE POLLUTION RESEARCH PTY LTD

Marine, Estuarine and Freshwater Ecology, Sediment and Water Quality Dynamics

A.B.N. 64 003 796 576

25 RICHARD ROAD SCOTLAND ISLAND NSW 2105

PO BOX 279 CHURCH POINT NSW 2105

TELEPHONE (02) 9997 6541 E-MAIL panink@bigpond.com

Appendix 6:

Annual Ground Water Review Report

Australasian Groundwater & Environmental Consultants

Report on

Mount Thorley Warkworth Annual Groundwater Monitoring Review 2025

Prepared for
Mount Thorney Warkworth

Project No. 20250082.MTW5014.000
March 2026

ageconsultants.com.au

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Australasian Groundwater and Environmental Consultants Pty Ltd

Brisbane (Head Office)
Level 2, 15 Mallon Street
Bowen Hills QLD 4006
t: (07) 3257 2055

Adelaide
Office 13, 62 Queen Street
Glenunga SA 5064
t: (07) 3257 2055

Newcastle
4 Hudson Street
Hamilton NSW 2303
t: (02) 4962 2091

Perth
46B Angove Street
North Perth WA 6006
t: (08) 6383 9970

Townsville
Unit 1, 60 Ingham Road
West End QLD 4810
t: (07) 4413 2020

ageconsultants.com.au | linkedin.com/company/ageconsultants

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Mount Thorley Warkworth
Annual Groundwater Monitoring Review 2025

1 Introduction

Yancoal Australia Ltd (Yancoal) operate the Mount Thorley and Warkworth Mines (MTW) as an amalgamated complex known as MTW, which is located 15 km south-west of Singleton in the Hunter Valley Region of NSW. The mine consists of two separate open cut mining pits operated and owned by Yancoal, accessing a series of coal seams within the Permian Wittingham Coal Measures.

Whilst MTW is operated in an amalgamated manner, the Mount Thorley and Warkworth Mines currently have separate conditions of approval issued by the NSW Department of Planning, Industry and Environment. The Development Consents for both mines (Warkworth: SSD-6464; Mount Thorley: SSD-6465) include conditions that require environmental monitoring data to be collected at each mine, with this data being reviewed and reported in an Annual Review document.

Yancoal have commissioned Australasian Groundwater and Environmental Consultants Pty Ltd (AGE) to review groundwater monitoring data collected at MTW during 2025 and provide the results in an Annual Review.

1.1 Scope

This report is a review of groundwater monitoring data collected during the one-year monitoring period 1 January 2025 to 31 December 2025. AGE were commissioned by MTW to undertake the following scope of work:

- review alluvial and rock aquifer groundwater levels and quality;
- update relevant 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;
- identify exceedances of trigger criteria outlined in the approved Water Management Plan (WMP; Water Management Plan Mount Thorley Warkworth version 5.1, dated 15 November 2021);
- assess the adequacy of the existing monitoring bore network and monitoring program; and
- provide recommendations if necessary.

2 Physical setting

2.1 Climate and rainfall

Long-term rainfall data covering the period 2007 – 2025 were obtained from MTWs Charlton Ridge weather station and are summarised in Table 2.1.

The total annual rainfall recorded at MTW for 2025 was 702.8 mm. August was the wettest month, with 107.0 mm of recorded rain, and November was the driest with 27.4 mm of rain recorded (Table 2.1). A comparison of the total annual 2025 rainfall (702.8 mm) at MTW with the longer-term 2007 to 2024 average (678.4 mm) illustrates a slightly above-average rainfall trend for the year.

Table 2.1 2025 rainfall data

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
MTW monthly Total Rainfall (mm) 2025	51.8	57.4	105.6	61.2	101.6	16.0	28.6	107.0	61.8	32.6	27.4	51.8	702.8
MTW long-term monthly Total Rainfall (mm) 2007-2025	67.1	82.8	95.2	51.4	34.1	55.7	32.3	33.1	37.5	45.5	73.3	70.3	678.4

Historical rainfall was 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 CRD (Figure 2.1) displayed an increasing trend throughout 2020, 2021 and 2022, following drought conditions from early 2017 to late 2019. However, the CRD displayed a decreasing trend throughout 2023, reflective of the typically below-average rainfall experienced throughout the year. Average rainfall was recorded during 2024 and 2025, as indicated by the CRD curve, which exhibited minimal fluctuation during this timeframe (Table 2.1; Figure 2.1).

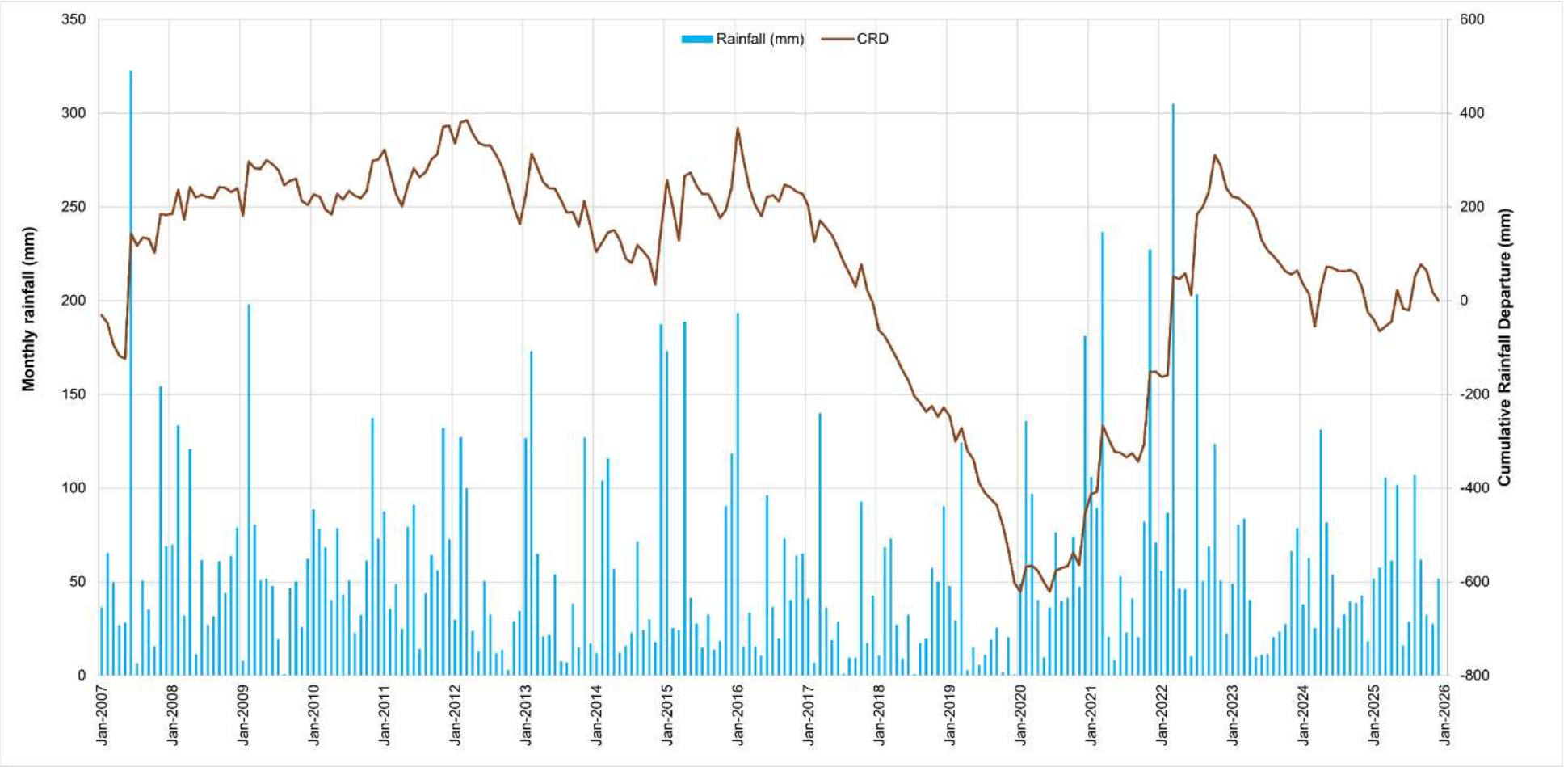


Figure 2.1 Cumulative rainfall departure (2007 to 2025) for MTW Charlton Ridge weather station

2.2 Surface water

MTW is bound by Wollombi Brook to the east and Hunter River to the north and north-east. Real time stream flow data was collected from Wollombi Brook at Warkworth (210004), Hunter River at Maison Dieu (210128) and Hunter River at Long Point (210134) from January 2016 to December 2025 (Figure 2.2).

Excepting short term fluctuations following heavy rainfall events, surface water levels remained steady at surface water monitoring stations on the Hunter River at Long Point, Maison Dieu and also in the station located in Wollombi Brook at Warkworth. Hunter River is regulated at Glenbawn Dam with daily releases to maintain flow and environmental quality. Wollombi Brook has held water since January 2020, following an extended period with no flow (period with no data on chart; Figure 2.2). In 2024, river levels recorded a modest increase, aligning with the CRD following a period of decline throughout 2023. Significant rainfall events in mid-2025, followed by controlled dam releases, elevated stream levels to their highest point since 2022.

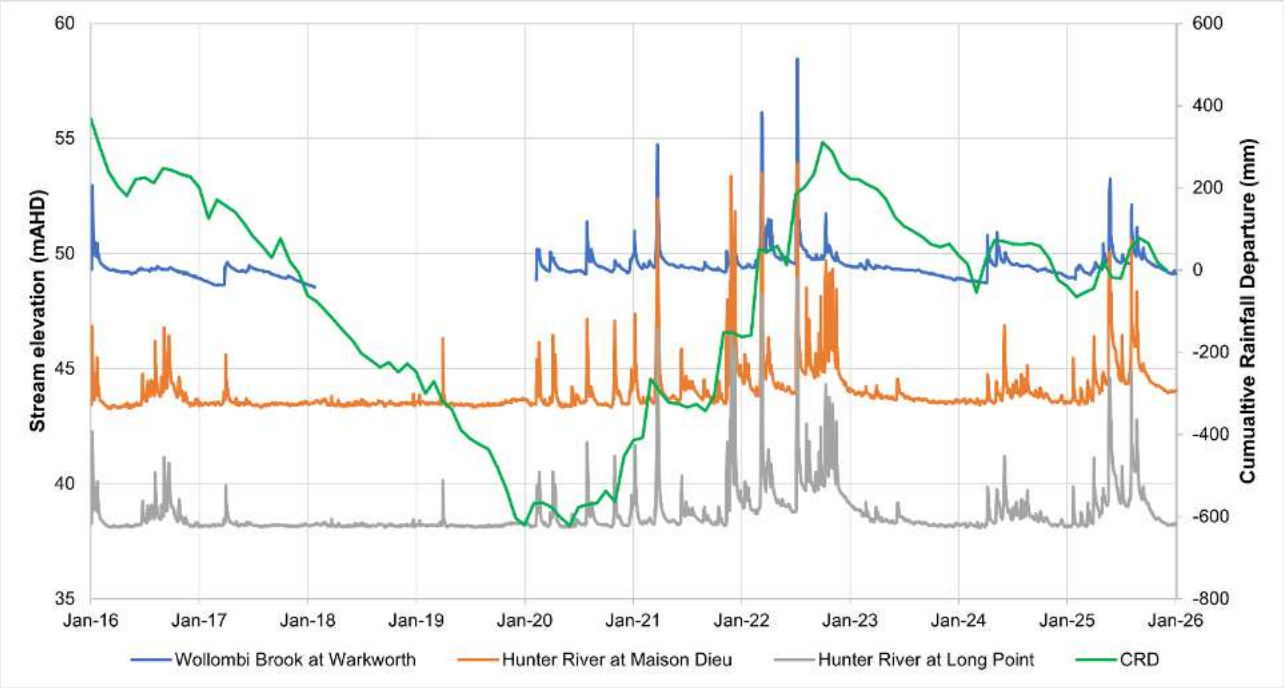


Figure 2.2 Surface water levels

2.3 Geology

MTW is located within the Hunter Coalfield in the Sydney Basin; a Permian-Triassic age sedimentary basin situated in the southern section of the Sydney-Gunnedah-Bowen Basin. The Sydney Basin's north-eastern extents are constrained by the New England Fold Belt and constrained by the Lachlan Fold Belt towards the south and west. The New England Fold Belt's periphery is distinguished by the Hunter-Mooki Thrust, defined by a progression of reverse faults alternated by mid-carboniferous rocks and Permian Sydney Basin strata.

The main stratigraphic units (Figure 2.3) occurring in the vicinity of the Project Area and the dominant lithology within each are:

- Quaternary alluvium– unconsolidated clays, silts, sands, and gravels mainly associated with Wollombi Brook to the west and Hunter River to the east of MTW;
- Warkworth sands – aeolian sand dunes unconformably overlying the Wittingham Coal Measures towards the northeast of the Project area; and
- Permian age Wittingham Coal Measures including the Jerry Plains and Vane sub-groups comprising multiple coal seams with intervening claystones, siltstones, sandstones, and conglomerates.

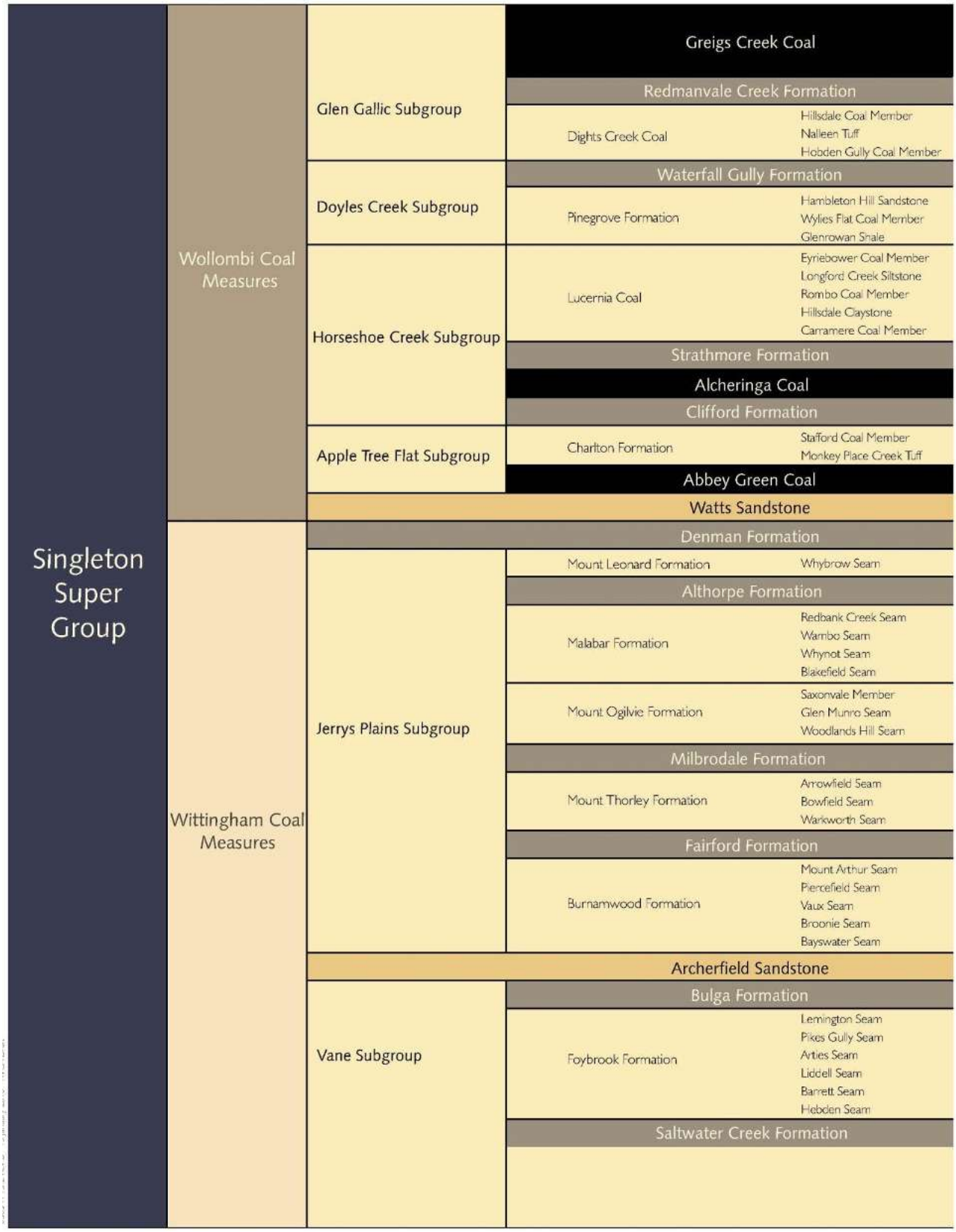


Figure 2.3 Stratigraphic column

3 Groundwater monitoring network

An updated WMP, for MTW, received approval 15 November 2021 (Yancoal 2021). The WMP contains a Groundwater Management Plan (Section 8 of the WMP), which outlines the groundwater monitoring network (Figure 3.1) and water quality triggers (Table 3.2).

The groundwater monitoring network comprises a total of 70 monitoring sites with 60 monitoring bores and 10 Vibrating Wire Piezometer (VWP) installations which require quarterly groundwater level, pH and Electrical Conductivity (EC) monitoring, and comprehensive annual lab analyses. Appendix A contains a list of the known details for each monitoring sites, as well as the monitoring plan reproduced from the WMP. The bores target alluvial aquifers (Wollombi Brook and Hunter River) as well as coal seams and interburden units within the Permian coal measures sequence. The coal seams currently mined at Warkworth Mine include the Redbank Creek, Wambo, Whynot, Blakefield, Glen Munro, Woodlands Hill, Arrowfield, Bowfield, Warkworth, and Mt Arthur Seams. Currently approved mining at Mt Thorley targets seams down to the Woodlands Hill.

VWP installations comprise pressure sensors grouted within each borehole and are used for monitoring of piezometric head.

Six bores had blockages or access issues during the 2025 monitoring period, these are detailed in Table 3.1 below.

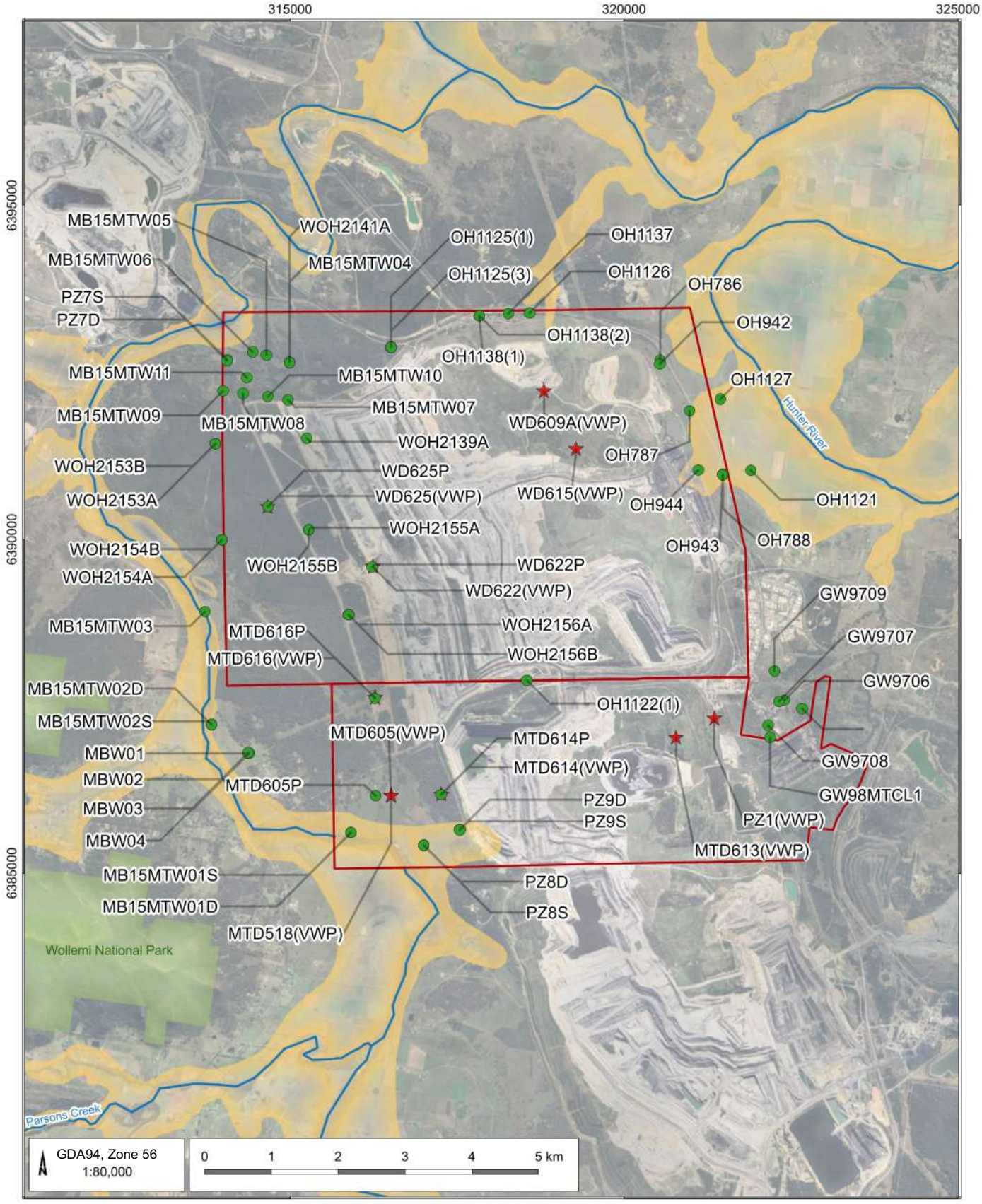
Table 3.1 Bore condition report – 2025

Bore ID	Comment(s) from field sheets[1]	Current status
OH1127	Blocked by pump stuck in bore.	Blocked (since March 2023).
OH943	Blockage in bore (thick sludge/vegetation).	Blocked (June 2024).
SP02	Sampling equipment is consistently becoming lodged in the bore during sampling. Further investigation is required.	Blocked (14/8/2025).
OH786	Large perforation in bore wall at 1.33 to 1.40 m. Bore is likely compromised to rainwater ingress.	Bore is Compromised (July 2025).
OH944	Standpipe “Not attached”.	Construction issue (details unclear) with bore indicated in field notes (December 2025).
OH1137	Site RL has not been provided for this bore. RL appears to have changed over time based on historical data.	No RL provided, bore requires resurveying.
MBW06A	Site RL has not been provided for this bore.	No RL provided, bore requires resurveying.
MB15MTW04	Site RL has not been provided for this bore.	No RL provided, bore requires resurveying.
MB15MTW05	Site RL has not been provided for this bore.	No RL provided, bore requires resurveying.
MB15MTW06	Site RL has not been provided for this bore.	No RL provided, bore requires resurveying.
MB15MTW07	Site RL has not been provided for this bore.	No RL provided, bore requires resurveying.
MB15MTW08	Site RL has not been provided for this bore.	No RL provided, bore requires resurveying.
MB15MTW09	Site RL has not been provided for this bore.	No RL provided, bore requires resurveying.
MB15MTW10	Site RL has not been provided for this bore.	No RL provided, bore requires resurveying.
MB15MTW11	Site RL inconsistent in monitoring datafile. RL needs to be confirmed.	RL needs to be confirmed bore requires resurveying.

Note: AECOM Groundwater quality monitoring field sheets – 2025.

At each monitoring bore site, groundwater levels, EC and pH are measured in the field on a quarterly basis. A groundwater sample is also collected from each monitoring bore annually and analysed by an offsite laboratory for:

- total dissolved solids (TDS);
- major ions – Ca, Mg, Na, K, Cl, SO_4(or S);
- total alkalinity, bicarbonate alkalinity, carbonate alkalinity, hydroxide alkalinity; and
- trace elements - Al, As, B, Cd, Cu, Hg, Ni, Pb, Se, Zn (plus Mo, V and Cr for selected bores).



LEGEND

- Monitoring bore
- VWP
- MTW Leases
- Major water courses

MTW Annual Groundwater Review 2025
(20250082.MTW5014.000)

Groundwater monitoring network

AGE

DATE
18/02/2026

FIGURE No:
3.1

©2026 Australasian Groundwater and Environmental Consultants Pty Ltd (AGE) - www.ageconsultants.com.au
Source: LiDAR DEM - © Department Finance, Services and Innovation.; GEODATA TOPO 250K Series 3 - © Commonwealth of Australia (Geoscience Australia) 2006.;
G:\Projects\MTW5008.001 MTW Annual Review 2023\3_GIS\Workspaces\001_MTW AGMR 2023\03.01_MTW5008.001_Groundwater monitoring network.qgz

3.1 Trigger values

The WMP outlines trigger values for groundwater EC and pH in Hunter River Alluvium, Wollombi Brook Alluvium, Aeolian Warkworth Sands, shallow overburden, and various coal seams. Trigger limits are applied to bores with a sufficient baseline dataset. The triggers apply and are calculated for groups of bores installed within the same geological unit and utilise percentiles of the available data to trigger further investigation. Three consecutive measurements falling outside the 5th and 95th percentile for pH triggers further investigation, whilst three consecutive results above the 95th percentile for EC require investigation. Groundwater quality triggers are summarised in Table 3.2.

The WMP provides a methodology to investigate samples that exceed the triggers for pH and EC. The WMP requires that '*in the event that a water quality measurement exceeds a predetermined trigger value, exceedances will be recorded and MTW will initiate a site-specific investigation if*':

- *professional judgement determines that the single deviation or a developing trend could result in environmental harm; or*
- *three consecutive measurements of EC or pH exceed trigger values.*

The investigation will:

- *determine the source and risk of impact on downstream water quality;*
- *determine the need for and extent of contingency measures;*
- *communicate outcomes to senior management; and*
- *be reported in the Annual Review.'*

Whilst the WMP does not specify a trigger for groundwater levels it does require an annual review of '*depressurisation of coal measures and alluvium by a suitably qualified hydrogeologist*.'

Table 3.2 Groundwater quality trigger levels

Sample Point	Target Seam	Electrical Conductivity (µS/cm)	pH	
		95th	5th	95th
OH786	Hunter River Alluvium	1,551	6.9	7.7
OH787	Hunter River Alluvium	19,351	7.2	7.7
OH942	Hunter River Alluvium	25,400	6.5	6.8
OH943	Hunter River Alluvium	8,395	7.1	7.6
OH788	Hunter River Alluvium	13,480	6.9	7.9
PZ8S	Wollombi Brook Alluvium	15,190	6.5	7.0
PZ9S	Wollombi Brook Alluvium	16,197	6.8	7.0
PZ7S	Aeolian Warkworth Sands	1,747	6.7	7.5
GW9706	Bayswater	22,982	6.6	7.5
GW9707				
GW9708				
GW9709				
GW98MTCL1				
GW98MTCL2				
OH1127				
OH1125(3)	Bowfield Seam	14,600	6.6	6.9
OH1122(1)	Blakefield	14,825	6.6	8.0
WOH2139A				
OH1125(1)				

Sample Point	Target Seam	Electrical Conductivity (µS/cm)	pH	
		95th	5th	95th
WOH2153A	Redbank	15,482	7.0	7.9
WOH2154A				
WOH2155A				
WOH2156A				
MTD614P	Shallow Overburden	17,516	6.7	8.0
MTD616P				
MTD605P				
PZ7D				
MBW02				
MB15MTW01D				
MB15MTW02D				
MB15MTW03				
PZ8D				
PZ9D				
OH1137	Vaux	17,740	6.7	7.2
OH1126				
OH1121				
WD622P	Wambo	14,114	6.9	7.8
WOH2153B				
WOH2154B				
WOH2155B				
MBW04				
WOH2156B				
OH1138(2)	Warkworth	19,872	5.9	6.9
OH1138(1)				
WD625P	Woodlands Hill	12,483	6.9	7.3
WOH2141A	Whynot	10,689	7.5	7.8

3.2 Sampling methods

The WMP states that groundwater monitoring will be undertaken "*in accordance with AS 5667.1:-1998, Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples and AS 5667.11-1998, Guidance on Sampling of Groundwaters*".

A review of field sheet data indicate that quarterly groundwater samples were collected as grab samples or following purging in all bores. Limited information on purged volumes was made available, with three volumes of water purged prior to sampling where possible.

4 Water licensing

Groundwater licenses held for MTW are outlined in Table 4.1.

Table 4.1 Summary of licences held by MTW

Licence No.	DWE Reference	Share Component (ML)	Location/Purpose
10543	20AL201239	1009	Zone 2B: Hunter River from Wollombi Brook junction to Oakhampton Rail Bridge
963	20AL201242	243	Warkworth farm - Hunter River pump (Zone 2B)
971	20AL201258	270	Warkworth farm - Hunter River pump (Zone 2B)
1008	20AL201341	243	Warkworth farm - Hunter River pump (Zone 2B)
995	20AL201302	243	Anndale farm – Hunter River pump (Zone 2B)
1009	20AL201343	435	Anndale farm – Hunter River pump (Zone 2B)
19022	20AL209903	60	Sandy Hollow Creek (Unregulated river – Singleton Water Source)
18558	20AL208627	50	Lower Wollombi Brook Water Source
18469	20AL20858	245	Lower Wollombi Brook Water Source
40464	20AL218784	180	Mt Thorley Excavation; North Coast Fractured and Porous Rock Groundwater Sources
40465	20AL218785	750	Warkworth Excavation; North Coast Fractured and Porous Rock Groundwater Sources

Note: Water licence details obtained from the approved WMP (15 November 2021).

5 Groundwater monitoring results

Groundwater level measurements provided by Yancoal were used to prepare hydrographs for each monitoring point. The groundwater levels were also plotted along with the CRD to determine if trends in water levels were related to climatic factors or other influences. The CRD shows monthly rainfall trends compared with long term averages. An increase trend in the CRD indicates periods of above average rainfall, whilst a declining trend indicates below average rainfall. Where recharge occurs from rainfall, groundwater levels are often correlated with the CRD. This comparison can be used to 'screen out' climatic trends and determine where other factors such as mining are influencing groundwater levels.

Appendix C contains the hydrographs generated for each bore and compared to modelled predictions. The hydrographs include long term data preceding the 2025 reporting year to ensure long term trends are identified and considered. Appendix B contains groundwater level hydrographs with the bores grouped according to geological unit. These figures also show the pH and EC measured for each bore (with a trigger applied) to allow water levels and water quality trends to be compared and determine if they are interrelated.

The groundwater level trends observed within the monitoring network depend on the location and geological units screened and long-term trends can therefore be grouped into:

- Western down-dip depressurisation zone – monitoring bores in Permian coal measures to the west and 'down-dip' of the mining area that are recording depressurisation due to mining operations, as predicted by groundwater modelling.
- Eastern up-dip coal measures and alluvium – bores to the east of the mining area within Hunter River alluvium and Bayswater coal seam that are 'up-dip' of mining and are responding only to climatic influences.
- Wollombi Brook alluvium – bores within the Wollombi Brook alluvium that have a varied response, suggesting localised impact where mining is close to the flood plain and no impact where mining is more distant.
- Warkworth Sands – bores within the perched aquifer of the Warkworth Sands, which is located in elevated areas, generally do not respond to mining.

The sections below discuss water level and quality trends within each of these zones. Samples collected that exceeded the nominated triggers values are also discussed.

5.1 Western down-dip depressurisation zone

A number of numerical models to simulate groundwater flow at MTW have been developed (within EIS reports from 2002, 2009 and 2014). The most recent update to the model was conducted by AGE (2015) which updated the model developed for the 2014 EIS. All numerical models developed have consistently predicted mining will depressurise groundwater within the coal measures down-dip and west of the mining area. The models predict the zone of depressurised Permian bedrock will extend under the Wollombi Brook alluvium, but the alluvium water level will be largely unaffected. Groundwater monitoring generally confirms this conclusion with a general loss of water pressure and level occurring in many of the monitoring sites installed within Permian bedrock to the west of the mining area.

The measured decline in water levels is not as uniform as predicted by groundwater modelling due to heterogeneities within the groundwater systems. The sections below discuss the water level and quality data collected from the bores grouped together for trigger levels. Water level and quality graphs for each group of bores are included within Appendix B.

5.1.1 Redbank Creek coal seam bores

There are four bores (WOH2153A, WOH2154A, WOH2155A and WOH2156A) within this group located west and down-dip of the mine (Figure B 1). The data for these bores indicates:

- A long-term declining trend in groundwater levels as predicted by groundwater modelling.
- Groundwater levels continued to steadily decline at all bores throughout 2025.
- During the 2025 monitoring period, groundwater pH remained generally stable in Redbank Creek coal seam bores. In November, a reading of 6.9 was observed in WOH2156A, which fell below the established lower trigger limit of 7.0. No other exceedances were identified in the remaining bores within this group.
- During the 2025 monitoring period, groundwater EC values measured at Redbank Creek coal seam bores either showed a slight decrease or stayed consistent. Throughout the monitoring period, all EC values remained below the set trigger criteria.

5.1.2 Wambo coal seam bores

There are six bores (WD622P, WOH2153B, WOH2154B, WOH2155B, WOH2156B and MBW04) within the Wambo coal seam group, west and down-dip of the mine (Figure B 2). The data for these bores indicates:

- A long-term declining trend in groundwater levels was observed in bore WD622P before it was decommissioned in May 2023. The remaining Wambo coal seam bores have remained relatively stable.
- Excepting WOH2156B, groundwater levels in the Wambo coal seam bores were typically stable throughout 2025. WOH2156B continued to display variable groundwater level trends which correlate with rainfall patterns.
- During Q1 2024, groundwater pH in WOH2156B dropped below the lower trigger level. This was alongside unstable water level data recorded in the borehole throughout 2024. WOH2156B stayed below the established lower trigger level into 2025. AGE conducted an investigation in 2025 and found that mining-related impacts likely caused the decreasing water levels and pH observed in this bore. The investigation also noted possible errors in the WOH series bore records, with verification of the target unit for each bore recommended. For the rest of the Wambo coal seam monitoring bores, water levels fluctuated within the trigger range during 2025, except for WOH2155B, which had four consecutive readings at the lower trigger level (6.9).
- Groundwater EC values in Wambo coal seam bores during 2025 showed variable but generally stable trends. EC in WOH2155B rose sharply between Q4 2024 and Q2 2025, then declined for the rest of the year.

5.1.3 Blakefield coal seam bores

There are three bores (OH1122(1), OH1125(1) and WOH2139A) within this group, downdip of the Warkworth mining area (Figure B 3). The data indicates:

- No data is available for WOH2139A because the bore was decommissioned in early 2023, and monitoring bore OH1122(1) went dry during 2023. As a result, there is no water level or quality data for these bores for 2025. This means OH1125(1) is now the only monitoring bore still providing data for the Blakefield coal seam bores.
- OH1125 (1) groundwater elevation was relatively steady during 2025, with a modest rise in the second quarter and a slight decline in the third and fourth quarters.
- Groundwater pH at OH1125(1) consistently remained within the established trigger range during the 2025 monitoring period, with a single measurement in November aligning with the lower threshold (6.6). No exceedances of pH trigger levels were observed throughout 2025, and recorded fluctuations are attributed to natural variability.
- Groundwater EC in OH1125(1) decreased during 2025, with no recorded EC exceedances throughout the monitoring period.

5.1.4 Bowfield coal seam bores

There is one bore [OH1125(3)] installed within this group to the north of Warkworth mine (Figure B 4). The data for this bore indicates:

- Long-term groundwater levels in OH1125(3) indicate a declining trend in groundwater level. OH1125(3) had remained dry since July 2023, before water levels recovered in September 2025.
- Since the last reading before this bore ran dry in July 2023, groundwater pH levels have returned to within acceptable limits, and no exceedances were noted for this bore in 2025.
- During 2025, groundwater electrical conductivity at OH1125 (3) consistently remained below the established trigger criteria.

5.1.5 Whynot coal seam bores

There is one monitoring bore (WOH2141A) installed within this group to the north of Warkworth mine (Figure B 5). The data for this bore indicates:

- Long-term data confirm that groundwater levels in WOH2141A are declining, consistent with model predictions.
- During the 2025 monitoring period, groundwater levels in the Whynot coal seam bore WOH2141A fell after the significant peak at the start of the year. Throughout the rest of 2025, water levels resumed the downward trend that had been seen prior to the first quarter.
- Groundwater pH in WOH2141A varied significantly during 2025, dropping below the trigger threshold (7.5) to 7.4 in Q1. No pH exceedances occurred in this bore for 2025.
- EC values in WOH2141A showed no clear trend in 2025, and no EC exceedances were recorded.

5.1.6 Woodlands Hill coal seam bore

There is one monitoring bore (WD625P) installed within the Woodlands Hill coal seam to the west of MTW (Figure B 6). The data for this bore indicates:

- Long-term gradually declining trend in groundwater level.
- Groundwater level remained relatively stable throughout 2025.
- Groundwater pH remained stable in 2025, with no trigger exceedances recorded during the year.
- Groundwater EC in WD625P declined overall during the 2025 monitoring period and remained within the exceedance thresholds.

5.1.7 Shallow overburden underlying Wollombi Brook alluvium bores

There are six bores installed within shallow overburden material underlying the Wollombi Brook alluvium (PZ8D, PZ9D, MB15MTW01D, MB15MTW02D and MB15MTW03) and Warkworth Sands (PZ7D) to the west of the Warkworth and Mt Thorley mines (Figure B 7 and Figure B 8). The bores are paired with shallow bores monitoring the overlying alluvial and aeolian sediments. The data for these bores indicates:

- Long-term groundwater level data indicate that shallow overburden monitoring bores underlying Wollombi Brook alluvium and Warkworth Sands exhibit a delayed response to rainfall recharge. Unlike the other bores in this group, PZ7D has displayed a consistent long term declining trend since August 2023.
- Groundwater level in shallow overburden monitoring bores underlying the Wollombi Brook alluvium and Warkworth Sands remained relatively stable throughout the 2025 monitoring period.
- The pH values in monitoring bores underlying the Wollombi Brook alluvium and Warkworth Sands were generally stable in 2025. Several bores recorded slight increases or decreases in pH during the May or August monitoring rounds. MB15MTW01D pH has been consistently observed below the 5th percentile trigger criteria since November 2018. Continued pH exceedances MB15MTW01D were investigated by AGE (2022) and concluded that inappropriate trigger values were the likely cause of the exceedances. No other pH exceedances were recorded during 2025.
- Groundwater EC in shallow overburden monitoring bores underlying Wollombi Brook alluvium and Warkworth Sands were typically stable during the 2025 monitoring period. No groundwater EC exceedances were recorded during 2025.

5.1.8 Shallow overburden bores

There are four bores (MBW02, MTD614P, MTD605P and MTD616P) installed within the shallow overburden to the west of MTW, and east of the Wollombi Brook alluvium (Figure B 7 and Figure B 8). The data for these bores indicate:

- MTD616P was decommissioned in Q2 of 2023; therefore, no data is available for the 2025 monitoring period.
- Groundwater levels in shallow overburden bores east of Wollombi Brook alluvium were typically stable during the 2025 monitoring period.
- pH values in shallow overburden monitoring bores were typically stable during the 2025 monitoring period. All bores remained relatively stable during the 2025 monitoring period. No groundwater pH exceedances were recorded during the reporting period.
- EC values in shallow overburden bores showed variable trends during the 2025 monitoring period. MTD605P slightly exceeded the trigger level of 17,516 µS/cm in Q1, Q2, and Q3 of 2025; this bore often remains near the threshold, so minor exceedances likely reflect natural variation. No other exceedances were recorded in these bores in 2025.

5.2 Eastern up-dip coal measures and alluvium

A network of monitoring bores is present to the east of the MTW mining area. This network includes bores screened within the Hunter River alluvium and also bores screened within the Bayswater seam underlying the alluvium. The sections below discuss the monitoring results for each of these bores.

5.2.1 Hunter River alluvium bores

There are six bores (OH786, OH787, OH788, OH942, OH943 and OH944) located to the east of the Warkworth mining area screened within the Hunter River alluvium (Figure B 9 through Figure B 14). The monitoring data for these bores indicates:

- OH943 has been blocked since Q4 2023 and is awaiting repairs. No data is available for this bore for 2025. OH944 has been recorded as dry with moisture near the base of the bore since September 2023. During December 2025 monitoring, AECOM indicated that the standpipe of this bore is detached. OH787 was inaccessible during Q2 2025 due to boggy conditions affecting site access.
- Excepting OH786 in which groundwater level has fluctuated, long-term groundwater levels in Hunter River alluvial monitoring bores have been mostly stable.
- Groundwater levels in the Hunter River alluvial bores were mostly stable or slightly lower during 2025, except at OH786, which showed fluctuations. Bore OH944 remained dry throughout 2025, as it has since 2016. OH943 became blocked in June 2024 and is pending repairs; no groundwater level or water quality data was collected for OH943 or OH944 during 2025.
- pH values in the Hunter River alluvial monitoring bores showed variable trends in 2025. In the first half of the year, all bores moved toward neutral pH. In the second half, OH786 and OH787 showed a notable increase, while OH788 and OH942 decreased. OH786 and OH788 had some readings at their trigger levels but stayed within limits. OH787 recorded two consecutive readings above the upper trigger level in Q3 and Q4, and OH942 had one such reading in Q3. No groundwater pH exceedances were recorded in 2025.
- During the 2025 monitoring period, groundwater electrical conductivity (EC) in Hunter River alluvial bores exhibited a slight upward trend. Increases in EC were observed across all monitored bores, albeit to varying extents. Notably, bore OH786 experienced a significant rise in EC during Q1, surpassing its trigger threshold, but subsequently fell below this criterion in Q2 and then increased again remaining within trigger limits for the remainder of the year. No EC exceedances were recorded in any of these bores throughout 2025.

5.2.2 Bayswater coal seam bores

The Bayswater seam is the basal coal seam within the Jerry's Plains subgroup. Mining at MTW does not remove the Bayswater seam, and therefore it is representative of the 'under-burden' bedrock sequence within the pit floor. There are seven bores (GW9706, GW9707, GW9708, GW9709, GW98MTCL1, GW98MTCL2 and OH1127) within the Bayswater group (Figure B 15), with the monitoring data indicating:

- OH1127 has remained blocked since Q1 2023 and therefore has no water level (or quality) data for the 2025 period.
- Long-term groundwater levels are stable within Bayswater coal seam monitoring bores.
- Groundwater levels in Bayswater coal seam monitoring bores were typically stable during the 2025 monitoring period. All bores showed steady increases through the first three quarters of 2025 and a slight decrease during Q4
- In 2025, groundwater pH in Bayswater coal seam monitoring bores fluctuated. Bores GW9708 and GW98MTCL2 recorded pH values below the trigger of 6.6 in Q2, but later returned to acceptable levels. No groundwater pH exceedances occurred during 2025.
- Groundwater EC values in most Bayswater coal seam bores were stable during 2025. Bores GW9707 and GW9709 showed the highest variance but remained generally stable. GW9706 was mostly steady or slightly decreasing, with a minor increase in Q4. Other bores—GW98MTCL1, GW98MTCL2, and GW9706—also displayed stable EC. No EC exceedances occurred in 2025.

5.2.3 Warkworth coal seam bores

There are two nested bores (OH1138(1) and OH1138(2)) within this group located to the north of Warkworth Mine (Figure B 16). The data for these bores indicates:

- Long-term groundwater levels in Warkworth coal seam bores correlate to the CRD trend, indicating a lagged response to rainfall.
- Groundwater levels in Warkworth coal seam monitoring bores decreased during the 2025 monitoring period, with drops of about 0.2 m at OH1138(1) and 0.6 m at OH1138(2).
- Groundwater pH values showed varying trends in Warkworth coal seam bores throughout the 2025 monitoring period. Values for pH in OH1138(1) varied heavily in comparison to recent data, fluctuating between 6.1 and 6.4 and an outlying reading of 7.2 exceeding the upper trigger level in October. This outlier may be resultant from sampling techniques or transcription errors and results should continue to be closely monitored. Groundwater pH in OH1138(2) remained stable between 6.6 and 6.7 throughout 2025. No other pH readings exceeded trigger criteria during the year.
- Groundwater EC values in the Warkworth coal seam monitoring bores showed minor fluctuations throughout 2025. In both OH1138(1) and OH1138(2), EC levels declined at the beginning of 2025 and remained largely stable for the rest of the year. One reading in OH1138(1) during February 2025 was recorded at 20,000 µS/cm, marginally exceeding the groundwater EC trigger threshold of 19,872 µS/cm. All other measurements from this bore during the 2025 monitoring period were below the trigger threshold. No groundwater EC exceedances were observed in 2025.

5.2.4 Vaux coal seam bores

There are three bores (OH1121, OH1126 and OH1137) installed within the Vaux seam group that surround the Warkworth Mine to the north and east (Figure B 17). The data for these bores indicate:

- Bore OH1137 on the AECOM field sheets has "No RL provided." While groundwater level data exists in depth-to-water units, it cannot be converted to RL due to missing survey data. The RL for this bore has not been consistent historically. Further review of both past and any relevant survey data is recommended. As a result, WL data for OH1137 is unavailable for 2025.
- Groundwater elevation in Vaux coal seam monitoring bores remained stable or declined slightly in 2025. Water levels at OH1121 and OH1126 were generally stable throughout the monitoring period.
- Groundwater pH levels in the Vaux coal seam monitoring bores showed highly variable patterns throughout the 2025 monitoring period. Bore OH1121 exceeded its upper groundwater pH trigger levels during Q2, Q3, and Q4, resulting in a trigger level exceedance for this bore. Similarly, bore OH1126 surpassed its lower groundwater pH trigger levels in Q1, Q2, and Q3, also constituting a trigger level exceedance for this bore.
- Bore OH1137 had one reading outside the trigger limits in 2025: its Q3 measurement went above the upper trigger level, but all other readings stayed within acceptable limits during the remaining monitoring periods. No other pH values observed during 2025 exceeded the trigger criteria.
- The groundwater EC values in Vaux coal seam monitoring bores remained mostly stable with some variation throughout 2025. Bores OH1126 and OH1137 showed an overall decrease over the year, while OH1121 recorded an overall increase. No groundwater EC exceedances were recorded during 2025.

5.3 Wollombi Brook alluvium bores

Two bores (PZ8S and PZ9S) are installed within the Wollombi Brook alluvium. The bores are in proximity to the Mt Thorley Mine Loders Pit, where the Wollombi Brook alluvium encroaches on this location (Figure B 18 and Figure B 19). The data for these bores indicates:

- Long-term trends indicate that Wollombi Brook alluvial groundwater levels strongly correlate with climatic trends.
- Groundwater levels in the Wollombi Brook alluvium slightly increased during the 2025 monitoring period, correlating strongly with the CRD trend.
- Groundwater pH at PZ8S was generally stable in 2025, decreasing between Q1 and Q2, then rising between Q3 and Q4. At PZ9S, pH levels exceeded the upper trigger limit during Q3, Q4, and the extra sampling in October; Q2 readings were at the trigger limit (7.0). In contrast, all pH readings at PZ8S stayed within trigger limits throughout 2025.
- Groundwater EC in PZ8S remained relatively stable (approximately 13,200 µS/cm) throughout the 2025 monitoring period. EC in PZ9S fluctuated sharply throughout 2025, declining between Q1 and Q3 before sharply increasing again between Q3 and Q4, 2025. No EC exceedances were recorded in Wollombi Brook Alluvium bores during the 2025 monitoring period.

5.4 Warkworth Sands bore

A single monitoring bore (PZ7S) is installed at the foot-slopes of the Warkworth Sands Woodland (Figure B 20). The dataset for this bore indicates:

- Long-term groundwater level data indicate PZ7S is weakly correlated with climatic conditions.
- Groundwater level in PZ7S steadily decreased during the 2025 monitoring period, correlating closely with CRD trends.
- 2025 groundwater pH recordings in PZ7S were at or below the lower trigger threshold during 2025, recording readings beneath the lower trigger level during Q1 and Q4. No observed pH values exceeded the trigger criteria in 2025.
- Groundwater EC in PZ7S remained overall stable during the 2025 monitoring period, recording a large dip during Q3 before recovering to levels close the recent average. No groundwater EC exceedances were recorded in 2025.

5.5 Additional bores

Groundwater level, pH and EC trends in monitoring bores outlined in the WMP but without water quality trigger values are outlined in this section.

5.5.1 Wollombi Brook alluvium bores

Three additional monitoring bores (MB15MTW01S, MB15MTW02S and MBW01) are installed into the Wollombi Brook alluvium (Figure B 21). Data in these bores has been collected since August 2017. No trigger values are established for these bores. The data indicates:

- Long-term groundwater levels correlate with the CRD.
- Groundwater levels at Wollombi Brook alluvium monitoring bores MB15MTW01S, MB15MTW02S increased between Q1 and Q3 before decreasing during the Q4 monitoring period. After an initial dip in Q1 MBW01 showed a consistent gradually increasing trend for the remainder of 2025.
- Groundwater pH in Wollombi Brook alluvial monitoring bores displayed varying trends but remained relatively stable throughout the 2025 monitoring period except bore MB15MTW02S which recorded a significant, temporary increase in pH during Q3 monitoring. Groundwater pH at MBW01 and MB15MTW01S remained mostly steady with the former recording a slight overall increase and the latter recording a slight overall decrease.
- Groundwater EC remained stable in the additional Wollombi Brook alluvium bores during 2025. MBW01 continues to record elevated EC levels. MB15MTW01S recorded a slight dip in groundwater EC during Q2 monitoring that steadily recovered through the remainder of the year. MB15MTW02S recorded steady levels through 2025.

5.5.2 Warkworth Sands bores

Eight additional monitoring bores (MB15MTW04, MB15MTW05, MB15MTW06, MB15MTW07, MB15MTW08, MB15MTW09, MB15MTW10 and MB15MTW11) are installed into the Warkworth Sands (Figure B 22). No bore survey or construction details were made available. Therefore, groundwater level is shown as mTOC (metres top of casing) not water level mAHD. The dataset for these bores indicates:

- Warkworth Sands monitoring bores MB15MTW04, MB15MTW05, MB15MTW07, MB15MTW10 and were dry throughout 2025 and therefore have no water level (or quality) data available. MB15MTW08, MB15MTW09 and MB15MTW11 were dry for every quarter except Q3 in which water levels momentarily recovered.
- Groundwater levels in MB15MTW06 increased during 2025 monitoring. During the 2025 monitoring period a single water level reading was able to be taken for MB15MTW08, MB15MTW09 and MB15MTW11 in Q3 (August) however there was insufficient water available to take pH or EC samples for MB15MTW11.
- Groundwater pH in Warkworth Sands monitoring bores varied in 2025. MB15MTW06 dropped from Q1 to Q2, then reached its highest pH levels since Q2 2021 in Q3 and Q4. MB15MTW08 and MB15MTW09 recorded their first readings since 2023; MB15MTW08's pH increased, while MB15MTW09's decreased.
- Groundwater EC values in Warkworth Sands bores showed variable trends. EC in MB15MTW06 remained relatively stable through the 2025 monitoring period, observing an initial slight drop between Q1 and Q2 before steadily increasing through the remainder of the year. MB15MTW08 and MB15MTW09 recorded their first groundwater EC reading since 2023, with the former recording decreasing values and the latter recording increasing EC values.

5.5.3 Whybrow coal seam bores

A single monitoring bore (MBW03) is installed in the Whybrow coal seam (Figure B 23). No groundwater quality triggers are assigned to this bore. The dataset indicates the following:

- Groundwater level remained consistent through 2025 (approximately 55 mAHD).
- Groundwater pH values in MBW03 remained stable (7.2), before increasing slightly between Q3 and Q4.
- Groundwater EC values during 2025 initially saw a large reduction between Q4 2024 (9340 µS/cm) and Q1 2025 (4010 µS/cm) and then sharply increased between Q1 and Q2 (8890 µS/cm). EC continued to gradually increase thereafter.

5.5.4 MBW6A

No survey coordinates or bore construction details are available for MBW6A (Figure B 24). Groundwater level and EC data has been recorded consistently since September 2017. The dataset indicates the following:

- Long-term groundwater level trend decreased until November 2019, increasing gradually thereafter until Q3 2022 where a large drop in water level occurred. Water levels in the bore immediately recovered following this event and have generally remained consistent through to the end of 2025.
- Groundwater levels initially rose between Q1 and Q3 and then declined during the remainder of the 2025 monitoring period.
- Groundwater pH in MBW6A was relatively stable during the 2025 monitoring period, rising between Q1 and Q3 and dropping in Q4.
- Groundwater EC initially decreased for Q1 and Q3 before increasing again during the Q4 monitoring period.

5.6 VWP pressure heads

VWP pressure head data collected during the 2025 monitoring period was combined with historic data and the figures are presented in Appendix D. The following observations can be noted for 2025:

- The VWP pressure head in WD609A at 110 m (spoil) (Figure D 1) decreased until early May, then steadily increased for the rest of 2025. Although the sensor occasionally records null values, it has thus far returned correct data given time.
- VWP data for WD615 (Figure D 2) saw a continued declining pressure head trend in the sensor at 225 m (Bayswater seam). The sensor in the Piercefield seam (133 m) remained steady during 2025. Pressure head in the deeper Bayswater seam was initially higher than the shallower Piercefield seam indicating that an upward hydraulic gradient was present in the Bayswater seam before depressurisation due to mining.
- VWP pressure heads in WD625 (Figure D 3) mostly declined throughout the 2025 monitoring period except the sensor at 354 m (Mt Arthur seam) which remained relatively stable and the sensor at 217 m (Woodlands Hill seam) which saw a significant recovery and stabilisation during 2025.
- VWP WD622 was decommissioned in August 2022 prior the site being mined through. No data was collected at this site during the 2025 monitoring period (Figure D 4).
- VWP MTD616 was decommissioned in August 2022 prior to the site being mined through. No data was collected at this site during the 2025 monitoring period (Figure D 5).
- During the 2025 monitoring period, pressure head in MTD613 sensor at 384 m (Broonie/Bayswater) displayed a steeply declining trend aligning with trends observed in 2024 in this bore as well as data from other sensors placed in the Bayswater seam (Figure D 6).
- Pressure heads in MTD605 (Figure D 7) remained typically stable throughout 2025. Pressure readings from sensors at 58 m (Overburden), 149 m (Interburden), remained relatively steady. Sensors at 100 m (Whybrow), 368 m (Mt Arthur) and 429 m (Vaux) all showed increasing pressure head trends. The remaining three sensors all showed a slight declining trend. The VWP sensor at 502 m (Bayswater) is showing higher pressures than the shallower sensors at 215 m (Blakefield) and 368 m (Mt Arthur). This indicates an upward hydraulic gradient in the deeper seam at this location.

- Pressure heads in sensors at 64 m (Whybrow) and 191 m (Glen Munro) in MTD614 (Figure D 8) showed increasing trends during the 2025 monitoring period. The sensor at 64 m showed an increasing trend during the beginning of 2025 and began to decline through the remainder of the year. The sensor at 191 m (Glen Munro) ceased recording data in October 2024 and has not since recorded any valid data. No data, or erroneous data, has been recorded in the sensor at 383 m (Vaux) since June 2016. Data from sensors at 342 m (Mt Arthur) and 453 m (Bowfield) have been erroneous since they were installed. This is likely due to the sensors being damaged during the installation process. Periodically, data is recorded in these sensors, however, the pressure readings fluctuate significantly between each reading.
- Pressure heads in VWP MTD518 (Figure D 9) continued to steadily decline in sensors at 142.5 m (Mt Arthur) and 226.5 m (Blakefield/Woodlands Hill). Data from the sensor at 358 m (Wambo) was highly erroneous, very likely indicating the sensor failed during 2021.
- PZ1 calibration factors weren't available. Calibration factors should be located so that PZ1 can be reviewed in the next Annual Review.

6 Model verification

Observed groundwater level data and numerical groundwater model predictions (AGE, 2015) have been graphed in Appendix C. Review of the data indicate that observed groundwater level trends generally correlate with 2025 modelled predictions. However, at multiple monitoring locations observed and modelled groundwater levels don't align, these are discussed below:

- Observed groundwater levels in Redbank seam monitoring bores have trended downward since 2011. The observed downward trend is more rapid than model predictions, particularly in WOH2153A and WOH2154A in which modelled groundwater levels are generally stable.
- Observed groundwater levels in Wambo seam monitoring bores are slightly lower than predictions. The exceptions being WOH2155B in which observed data indicate relatively stable groundwater levels in recent years, with the model predicting a sightly declining groundwater level trend WOH2156B also displays a relatively stable groundwater level in comparison to the model predictions; however, during late 2023 and throughout 2024 the data has begun to show a higher degree of variability.
- An investigation into groundwater quality exceedances in WOH2156B was conducted by AGE (2025). It concluded that mining related impacts were likely responsible for falling water levels and falling pH levels observed in this bore. During this investigation large discrepancies in the borehole records for the "WOH" series bores were identified during the investigation. It was noted that in the MTW GWMP (2021) the 'B' series bores were indicated as targeting the stratigraphically deeper Wambo Coal seam and the "A" series bores as targeting the Redbank Creek Seam (a stratigraphically shallower unit). Field readings taken at these bores by AECOM in recent monitoring periods indicated that the "A" series bores were deeper than their "B" series sister bores seems to directly contradict the GWMP records. AGE recommended further investigation into this issue.
- Observed groundwater levels in WOH2139A (Blakefield seam) have been trending downward since 2011, correlating closely with modelled predictions. Predicted groundwater levels in the remaining Blakefield coal seam bores are significantly lower than observed levels. This is especially evident in OH1122(1) in which observed groundwater levels are >35 m higher than model predictions, however this bore went dry in September 2023. Upon further investigation into OH1122(1) this bore terminates at 52.8 meters below ground level (48.39 mRL) which is far higher than the modelled data which predicts the water level to remain around 20 mRL. OH1125 (1) is declining at a similar rate to modelled predictions, however it remains >20 m higher than modelled predictions.
- A weak correlation between observed and predicted groundwater level trends in Bowfield monitoring bore OH1125(3) is evident. Observed data show a fluctuating groundwater level, whilst modelled predictions indicate a gradually declining groundwater level from 2015 to 2022, after which groundwater level stabilises. This borehole has remained dry from March 2023 to September 2025 when water levels in the bore recovered suddenly.
- Water levels in Warkworth seam bores OH1138 (1) and OH1138 (2) matched model predictions until 2023. While predicted groundwater declined through 2023, observed levels initially rose due to 2022 rainfall before stabilising. By 2025, both bores show downward trends as predicted, though OH1138(2) observed levels remain higher than predicted.
- Excepting OH1121, in which observed groundwater levels have consistently been below modelled predictions, observed groundwater levels in Vaux seam monitoring bores are above predictions. OH1126 has recorded decreasing groundwater levels from 2016 to 2021, stabilising during 2022 before increasing throughout 2023. Following a gap in sampling during 2023 (bore blockage) a declining trend was observed during 2024 which stabilized in 2025. Borehole OH1137 does not have any associated survey data.
- Observed groundwater level in shallow overburden monitoring bores correlate with predictions, excepting PZ8D and PZ9D. PZ8D correlated with predicted levels strongly up to late 2022, when observed levels remained relatively stable and converse to modelled predictions, recorded an overall increase from late 2022 through to 2025. PZ9D has remained relatively stable since 2016, despite modelled levels gradually declining.
- Similar to the modelled predictions, groundwater level in Hunter River alluvial bores have remained stable in recent years. Observed levels are typically lower than predictions.

- Observed groundwater levels in Bayswater coal seam bores generally align with predicted levels. The exceptions are GW9709, in which observed groundwater levels are below predictions; GW98MTCL2, in which observed groundwater levels are higher than model predictions (>10 m); or OH1127, in which observed groundwater levels are below prediction (approximately 10 m). All bores within this group appear to correlate strongly with the stable pressure head trends predicted by the model data.
- Groundwater levels in Wollombi Brook alluvium monitoring bore PZ8S, strongly correlate with predictions. Observed groundwater levels at PZ9S were typically stable throughout 2022 to 2024; however, modelled groundwater levels gradually declined during this period.
- Observed groundwater levels in Warkworth Sands bore PZ7S are approximately 5 m lower than predicted. PZ7S is showing near identical water level data to its neighbouring bore PZ7D which monitors the shallow overburden, suggesting hydraulic connectivity between these units.
- Observed pressure heads in VWP WD625 vary compared to modelled predictions. Pressure head in sensor 1 (217 mBGL) has been gradually declining in recent years compared to a more rapid predicted decline. Pressure head measured in sensor 3 (375 mBGL), although stable, is lower than predicted (approximately 10 m).
- Observed groundwater levels in Woodlands Hill bore WD625P closely followed modelled predictions, but has remained relatively stable, whereas modelled predictions show a steepening decline from 2022 onwards.
- Pressure heads recorded in VWP WD622 prior to its decommissioning in August 2022 varied compared to modelled predictions. Pressure heads in sensor 1 (54 mBGL) and sensor 4 (334 mBGL) correlate closely with predictions. Data from sensor 2 (165 mBGL) and sensor 3 (314 mBGL) indicate stable pressure heads, whilst the model predicts declining pressure heads at those depths. Pressure head in sensor 5 (408 mBGL) is significantly lower than predictions (>60 m).
- Observed pressure heads in VWP MTD605 typically align with the pressure head trend predicted by the model, although pressure heads are generally lower than those predicted. The exceptions being sensor 4 (215 mBGL), in which observed pressure heads are greater than predicted. Sensor 1 (58 m) in the overburden is the only sensor to record a consistently increasing pressure head trend (since mid 2016), contrary to the modelled predictions.
- Observed pressure heads in VWP MTD614 vary considerably to modelled predictions. Observed pressure head in sensor 1 (64 mBGL) is higher than predictions (approximately 20 m), whilst sensor 2 (191 mBGL) is lower (approximately 20 m). No data is available for the remaining sensors likely due to faults in the sensors.
- Pressure heads observed in VWP MTD518 sensors 2 (226.5 mBGL) and sensor 3 (142.5 mBGL) show a trend typically similar to modelled predictions, although observations are lower than those predicted. Observed pressure head data in sensor 1 (358 mBGL) appears to be the result of a faulty sensor, so comparison to modelled predictions cannot be determined.
- The observed pressure head trend in VWP WD615 sensor 1 (133 mBGL) aligns closely with predictions. While predicted pressure heads in sensor 2 (225 mBGL) remained stable, actual values fell 120 m below predictions in 2018, recovered by 2024, and then declined again through 2025.

7 Summary

A summary of the findings of this report are as follows:

- Groundwater level in coal seams in the Western down-dip depressurised zone generally declined or remained stable during the 2025 monitoring period.
- Groundwater levels in shallow overburden monitoring bores underlying the Wollombi Brook alluvium and Warkworth Sands typically declined or remained stable during the 2025 monitoring period. Minimal interaction between the Wollombi Brook alluvium and the shallow overburden is evident.
- Groundwater level in coal seams eastward and up-dip of mining recorded variable results during 2025. Bayswater monitoring bores were typically stable, whilst groundwater levels in Warkworth coal seam bores decreased, and Vaux monitoring bores either remained stable or slightly declined during the monitoring period.
- Groundwater level in Hunter River alluvial bores were stable or slightly decreased during 2025. OH786 continues to fluctuate heavily compared to other Hunter River alluvium bores.
- Groundwater level in Wollombi Brook alluvium monitoring bores correlate strongly with the CRD, indicating no mining related impacts.
- Groundwater level in Warkworth Sands monitoring bore PZ7S steadily declined during the 2025 monitoring period and shows a correlation with CRD trends.
- Trigger level exceedances were recorded in two shallow overburden monitoring bores underlying the Wollombi Brook alluvium. MB15MTW01D exceeded its prescribed lower trigger threshold for groundwater pH for all monitoring periods during 2025. This is consistent with all recent data taken at this bore. Previous exceedances for pH in MB15MTW01D were investigated (AGE, 2022 and 2025) and concluded that inappropriate trigger values were the likely cause of the exceedances. Three groundwater EC readings at MTD605P were recorded above the trigger level (17516 µS/cm) in 2025 during Q1, Q2 and Q3, thus registering a trigger level exceedance for this bore. Historically this bore consistently remains close to the prescribed trigger level so these marginal exceedances are likely attributable to natural variation.
- Trigger level exceedances for pH were recorded in WOH2156B monitoring the Wambo seam. Trigger values below the lower trigger threshold of 6.9 were observed during all four monitoring periods of 2025 (in February, May, August and November). This is consistent with readings taken in 2024 which were investigated by AGE Previous exceedances in WOH2156B for groundwater pH in were investigated (AGE 2025) concluded that mining related impacts were responsible for the sudden drop in water level observed in this bore at the beginning of 2024 and was likely the cause of the abnormal pH levels. As part of this investigation AGE also recommended a review into the bore records of the WOH series bores which, as discussed previously in Section 6, show discrepancies between GWMP records and field readings.
- Two trigger level exceedance for pH were recorded during 2025 at boreholes OH1121 and OH1126 (monitoring the Vaux seam). OH1121 recorded 3 consecutive readings above the upper pH trigger threshold (7.2) during Q2, Q3 and Q4. Conversely, OH1126 recorded three consecutive readings below the lower trigger threshold (6.7) during Q1, Q2, and Q3. The remaining Vaux monitoring bore OH1137 recorded a single reading above the upper trigger level in Q2 (7.3) with all other 2025 readings remaining within trigger limits.
- Three consecutive exceedance level readings for groundwater pH were recorded in borehole PZ9S (monitoring the Wollombi Brook Alluvium) during Q3 and Q4 monitoring (September and December) and also during the extra Q3 sampling round (October) that was requested by MTW. Groundwater pH readings for Q2 (March) was equal to the upper trigger level of 7.0.
- 2025 groundwater pH measurements in PZ7S were below the lower trigger threshold during Q1 and Q4 with readings in Q2 and Q3 commensurate with the lower trigger level (6.7). Despite groundwater pH readings being at or below the lower trigger during 2025, this did not constitute a trigger level exceedance.
- Hunter River Monitoring bore OH786 recorded a single reading above the trigger threshold for groundwater EC during Q1 (March) with a reading of 2270 µS/cm, above the trigger threshold of 1551 µS/cm. OH786 also displayed highly variable groundwater pH data, recording readings commensurate with the lower (6.9) and upper (7.7) trigger levels during Q2 and Q4 respectively. No trigger level exceedances were recorded in Hunter River alluvium bores during 2025.

- Warkworth seam monitoring bore OH1138(1) recorded one groundwater pH reading in September (7.2) that was significantly above the upper trigger threshold (6.9). All previous readings at this bore were between 6.1 and 6.4 making the reading in September a significant outlier. This abnormal reading can possibly be attributed to transcription error a change in sampling technique. No trigger level exceedances were recorded in Warkworth Seam monitoring bores in 2025.
- Overall sensors in WD625, MTD613, MTD518 and MTD605 recorded mostly declining pressure heads throughout the year to varying degrees. MTD614 showed stable trends in sensors 1 and 2 with the remaining sensors showing data faults. No pressure head data was available for the 2025 period from VWPs MTD616 and WD622 (both bores were decommissioned in 2022).
- VWP sensors installed into the Bayswater coal seam recorded overall declining pressure heads during the 2025 monitoring period.
- VWP pressure head in sensors installed into the Mt Arthur coal seam remained stable or declined slightly during the 2025 monitoring period. The sensor in WD625 (sensor 2) recorded a significant decline between the beginning of 2023 and 2025 but stabilized during the remainder of 2025.
- VWP sensors installed into Woodlands Hill coal seam recorded stable pressure heads during 2025. The sensor in WD625 (sensor 1) recorded a steady decline from the date of its installation in 2013 but recorded a significant uptick in pressure head during the 2025 monitoring period.
- There were no VWP data available from sensors in the Wambo coal seam for 2025. Data from the sensor installed into the Wambo coal seam at VWP MTD518 indicates the sensor has likely failed.
- Pressure head varied in VWP sensors in the Vaux coal seam for 2025. The sensor in the Vaux seam in bore WD625 recorded a continuing steady decrease in pressure head, whereas the sensor in MTD605 (sensor 6) recorded a relatively steady trend.
- Whybrow coal seam VWP sensor pressure head in MTD614 (sensor 1) recorded an overall increase in 2025.
- VWP pressure heads in the Glen Munro seam at MTD614 (sensor 2) began to record invalid data during October 2024.
- VWP pressure head in the Blakefield seam at MTD605 (sensor 4) were stable during 2025.
- VWP pressure head in the Piercefield seam at WD615 (sensor 1) were stable during 2025.
- PZ1 calibration factors weren't available. Calibration factors should be located so that PZ1 can be reviewed in future reports.
- Observed groundwater levels generally align with model predictions, except for OH1122(1) in Blakefield seam where observed levels are over 35 m higher, weak correlations in Bowfield seam bores, and GW98MTCL2 which shows discrepancies exceeding 10 m. WOH2156B has remained relatively stable but has shown increased variability and marked decline since late 2023. Overall, VWP pressure heads do not closely match modelled data, and no model predictions exist for bores installed after 2015.
- It is assumed that the following bores have been decommissioned: WOH2139A, MTD616P, MTD616 (VWP), WD622P and WD622 (VWP).

8 Recommendations

Based on the findings of this report the following recommendations have been made:

- An investigation should be undertaken to determine the cause of pH exceedances in OH1121, OH1126, PZ9S. Bores WOH2156B and MB15MTW01D exceedances were previously investigated (AGE, 2025).An investigation should be undertaken to determine the cause of EC exceedances in MTDP605P.
- Calibration factors for VWP PZ1 should be determined so that pressure head trends can be discussed in future annual reviews.
- Mount Arthur, Bowfield and Vaux seam VWP sensor cables should be inspected in MTD614 for damage to determine if erroneous data is due to a poor connection to the logger and can be rectified.
- The MTD605 Interburden sensors (sensor 3), Vaux seam (sensor 6), Bayswater (sensor 7) should be inspected for poor connections to the logger unit to confirm weather erroneous data from these sensors can be rectified.
- The sensor targeting Glen Munro (sensor 2) in MTD614 should be inspected for its connection to the logger unit to confirm if sensor errors can be rectified.
- Investigate/remediate at: OH1127 (blocked by pump), MB15MTW11 (confirm bore is blocked), SPO2 (sampling tool consistently becoming stuck in bore). OH786 was indicated as having a perforation in the bore wall at 1.4 m. OH944 was noted as having a ‘detatched standpipe’ in field notes. This should be investigated to make sure it has not been compromised as this can affect groundwater parameters.
- Survey data (coordinates and top of PVC mAHD) should be confirmed for bores MB15MTW01 through MB15MTW10, as well as MBW06A, OH1137 and MB15MTW11 which historically have inconsistent RL data.
- Consider installing a new monitoring bore to monitor the Bowfield seam. The last remaining monitoring bore for this seam OH1125(3) went dry during 2022.An investigation should be undertaken into the depth discrepancies between field observations and GWMP records in the WOH series boreholes (WOH2153A and B, WOH2154A and B, WOH2155A and B, WOH2156A and B). Field sheets suggest that the deeper of the pairs of these bores are the ‘A-series’ whereas the GWMP indicates that the ‘B-series' target the deeper of the two target coal seams (Wambo). Installation records should be compared with field measurements of depth to the base of the bore, the borehole logs and any other relevant installation notes to confirm the target units of these monitoring bores.
- Consider updating the groundwater model to incorporate newly constructed monitoring installations. There are no modelled data for bores constructed after 2015.

9 References

Australasian Groundwater & Environmental Consultants Pty Ltd (AGE). (2015). *Mount Thorley and Warkworth Mines, Long Term Approvals Model Update*. Submitted February 2015.

Australasian Groundwater & Environmental Consultants Pty Ltd (AGE). (2022). *MTW 2021 Annual Review Triger Exceedances Investigation*. Prepared for Yancoal Australia. Project No. MTW5004.001. August 2022.

Australasian Groundwater & Environmental Consultants Pty Ltd (AGE). (2023). *MTW – DTW Investigation*. Prepared for Yancoal Australia. Project No. MTW5006.001. April 2023.

Australasian Groundwater & Environmental Consultants Pty Ltd (AGE). (2025). *MTW –MTW pH Exceedance Investigation* Project No. MTW5010.001. May 2025.

Appendix A

Summary of groundwater monitoring program

Table A 1 Summary of 2023 groundwater monitoring program

Sample Point	Easting	Northing	ToC RL (mAHD)	Bore depth (m)	Target Seam	Water Level	EC	pH	Comprehensive Analysis
OH786	320542	6392674	55.7	7.1	Hunter River Alluvium	Q	Q	Q	A
OH787	320982	6391921	50	12.1	Hunter River Alluvium	Q	Q	Q	NA[4]
OH788	321482	6390967	45.4	22.1	Hunter River Alluvium	Q	Q[1]	Q[1]	A
OH942	320536	6392622	55.8	13.2	Hunter River Alluvium	Q	Q	Q	A*
OH943	321476	6390963	45	9.9	Hunter River Alluvium	Q	Q	Q	NA[6]
OH944	321113	6391035	47.9	8.2	Hunter River Alluvium	Q	-	-	NA
OH1121	321902	6391030	45.6	20.3	Vaux	Q	Q	Q	A
OH1122 (1)	318545	6387886	100.6	49.6	Blakefield	Q	-	-	NA
OH1125 (1)	316511	6392875	86.2	40	Blakefield	Q	Q	Q	A*
OH1125 (3)	316511	6392875	86.2	62.7	Bowfield Seam	M	-	-	NA
OH1126	318586	6393387	64.5	52.5	Vaux	-	-	-	A
OH1127	321444	6392097	51.2	29	Bayswater	-	-	-	NA[3]
OH1137	318266	6393377	67.9	17.8	Vaux	Q	Q	Q	A
OH1138 (1)	317835	6393346	70.7	24.8	Warkworth	M	M	M	A
OH1138 (2)	317835	6393346	70.7	42.8	Warkworth	M	M	M	A
WOH2139A	315249	6391511	91.7	96	Blakefield	-	-	-	Decommissioned
WOH2153A	313881	6391429	68.3	42.6	Redbank	Q	Q	Q	A
WOH2153B	313881	6391429	68.3	62.4	Wambo	Q	Q	Q	A
WOH2154A	313976	6389990	68.9	69.4	Redbank	Q	Q	Q	NA[1]
WOH2154B	313976	6389990	68.9	98	Wambo	Q	Q	Q	NA[1]
WOH2155A	315278	6390138	74.6	46	Redbank	Q	Q	Q	A
WOH2155B	315278	6390138	74.6	73.1	Wambo	Q	Q	Q	A

Sample Point	Easting	Northing	ToC RL (mAHD)	Bore depth (m)	Target Seam	Water Level	EC	pH	Comprehensive Analysis
WOH2156A	315874	6388866	80.4	31.5	Redbank	Q	Q	Q	A
WOH2156B	315874	6388866	80.4	80.1	Wambo	Q	Q	Q	A
WOH2141A	314989	6392647	91.6	45.6	Whynot	Q	Q	Q	A
PZ7D	314057	6392684	58.4	30.5	Shallow overburden	Q	Q	Q	A
PZ7S	314055	6392671	58.4	11.1	Aeolian Warkworth Sands	Q	Q	Q	A
PZ8D	317001	6385418	65.8	37	Shallow overburden	Q	Q	Q	A
PZ8S	317002	6385411	65.8	-	Wollombi Brook Alluvium	Q	Q	Q	A
PZ9D	317541	6385652	65.5	24	Shallow overburden	Q	Q	Q	A
PZ9S	317542	6385642	65.4	6.9	Wollombi Brook Alluvium	Q	Q	Q	A
GW9706	322404	6387589	64.2	21.2	Bayswater	Q	Q	Q	A
GW9707	322319	6387569	63.9	21	Bayswater	Q	Q	Q	A
GW9708	322158	6387209	73.1	29.6	Bayswater	Q	Q	Q	A
GW9709	322251	6388026	60.3	21	Bayswater	Q	Q	Q	A
GW98MTCL1	322188	6387032	77.8	19.7	Bayswater	Q	Q	Q	A
GW98MTCL2	322669	6387462	79.5	27.6	Bayswater	Q	Q	Q	A
PZ1 (VWP)	321350	6387310	72.1	41 42	Mt Arthur (Shallow) Mt Arthur (Deep)	Q	-	-	-
WD609A (VWP)	318803	63922	129.9	110	Spoil	Q	-	-	-
WD615 (VWP)	319281	6391347	160	133 225	Piercefield Bayswater	ND	-	-	-
WD625 (VWP)	314663	6390483	76.4	217 354 375	Woodlands Hill Mt Arthur Vaux	Q	-	-	-

Sample Point	Easting	Northing	ToC RL (mAHD)	Bore depth (m)	Target Seam	Water Level	EC	pH	Comprehensive Analysis
				441	Bayswater				
WD625P	314669	6390487	76.4	31	Woodlands Hill	Q	Q	Q	A
WD622 (VWP)	316236	6389588	84.5	54	Wambo	ND	-	-	-
				165	Woodlands Hill				
				314	Mt Arthur				
				334	Vaux				
				408	Bayswater				
WD622P	316229	6389585	84.5	55	Wambo	Q1	Q1	Q1	Decommissioned
MTD616 (VWP)	316274	6387621	77.7	42	Whybrow	ND	-	-	-
				109	Wambo				
				215	Woodlands Hill				
				343	Mt Arthur				
				378	Vaux				
				446	Bayswater				
MTD616P	316269	6387618	77.8	29	Shallow overburden	Q1	Q1	Q1	Decommissioned
MTD613 (VWP)	320778	6387025	150.5	384	Broonie/Bayswater	Q	-	-	-
MTD605 (VWP)	316512	6386159	77.1	58	Overburden	Q	-	-	-
				100	Whybrow				
				149	Interburden				
				215	Blakefield				
				368	Mt Arthur				
				429	Vaux				
				502	Bayswater				

Sample Point	Easting	Northing	ToC RL (mAHD)	Bore depth (m)	Target Seam	Water Level	EC	pH	Comprehensive Analysis
MTD605P	316279	6386156	77.4	42	Shallow overburden	Q	Q	Q	A
MTD614 (VWP)	317265	6386174	72.4	64	Whybrow	Q	-	-	-
				191	Glen Munro				
				342	Mt Arthur				
				383	Vaux				
				453	Bowfield				
MTD614P	317259	6386175	72.6	30	Shallow overburden	Q	Q	Q	A
MTD518 (VWP)	316512	6386156	80	142.5	Mt Arthur	Q	-	-	-
				226.5	Blakefield/Woodlands Hill				
				358	Wambo				
MB15MTW01S	315909	6385605	-	-	Wollombi Brook Alluvium	Q	Q	Q	A
MB15MTW01D	315910	6385604	-	-	Shallow overburden	Q	Q	Q	A
MB15MTW02S	313823	6387224	-	-	Wollombi Brook Alluvium	Q	Q	Q	A
MB15MTW02D	313823	6387219	-	-	Shallow overburden	Q	Q	Q	A
MB15MTW03	313722	6388917	-	22.7	Shallow overburden	Q	Q	Q	A
MB15MTW04	314993	6392645	-	6.5	Warkworth Sands	Q	Q	Q	NA
MB15MTW05	314645	6392758	-	6.9	Warkworth Sands	Q	Q	Q	NA
MB15MTW06	314438	6392801	-	6.9	Warkworth Sands	Q	Q	Q	A
MB15MTW07	314965	6392085	-	6.8	Warkworth Sands	Q	Q	Q	NA
MB15MTW08	314296	6392182	-	6.8	Warkworth Sands	Q	Q	Q	NA
MB15MTW09	313995	6392219	-	3.1	Warkworth Sands	Q	Q	Q	NA
MB15MTW10	314667	6392134	-	3.7	Warkworth Sands	Q	Q	Q	NA
MB15MTW11	314352	6392417	-	6.9	Warkworth Sands	Q	Q	Q	NA[2]

Sample Point	Easting	Northing	ToC RL (mAHD)	Bore depth (m)	Target Seam	Water Level	EC	pH	Comprehensive Analysis
MBW01	314379	6386796	62.4	11	Wollombi Brook Alluvium	Q	Q	Q	A
MBW02	314373	6386798	62.6	60.4	Shallow overburden	Q	Q	Q	A
MBW03	314387	6386794	62.4	84.2	Whybrow seam	Q	Q	Q	A
MBW04	314368	6386800	62.4	162	Wambo	Q	Q	Q	A
MBW6A	-	-	-	-	-	Q	Q	Q	A

Notes: ToC RL: top of casing reference elevation.

VWP: vibrating wire piezometer.

Q: quarterly.

A: annual.

M: monthly.

Comprehensive analysis includes major ions TDS, Al, As, B, Ca, Cd, Cl, (CO3), Cu, Hg, K, Mg, Na, Ni, Pb, Se, SO4 (or S), Zn, Total Alkalinity, Bicarbonate Alkalinity, Carbonate Alkalinity, Hydroxide Alkalinity.

* Comprehensive analysis also includes Mo, V, and Cr.

NA: not applicable – bore dry/ insufficient water.

[1] No access during Q3 and Q4.

[2] Monument damaged 2023 and repaired during Q1 and dry for remainder of 2024.

[3] Obstruction – no data during 2024.

[4] Inaccessible during Q2 – no sample taken for comprehensive analysis.

[5] Insufficient water to sample during Q3; bore broken/collapsed during Q4.

[6] Bore dry in Q1 and blocked for remainder of 2024.

Appendix B

Groundwater level and quality graphs

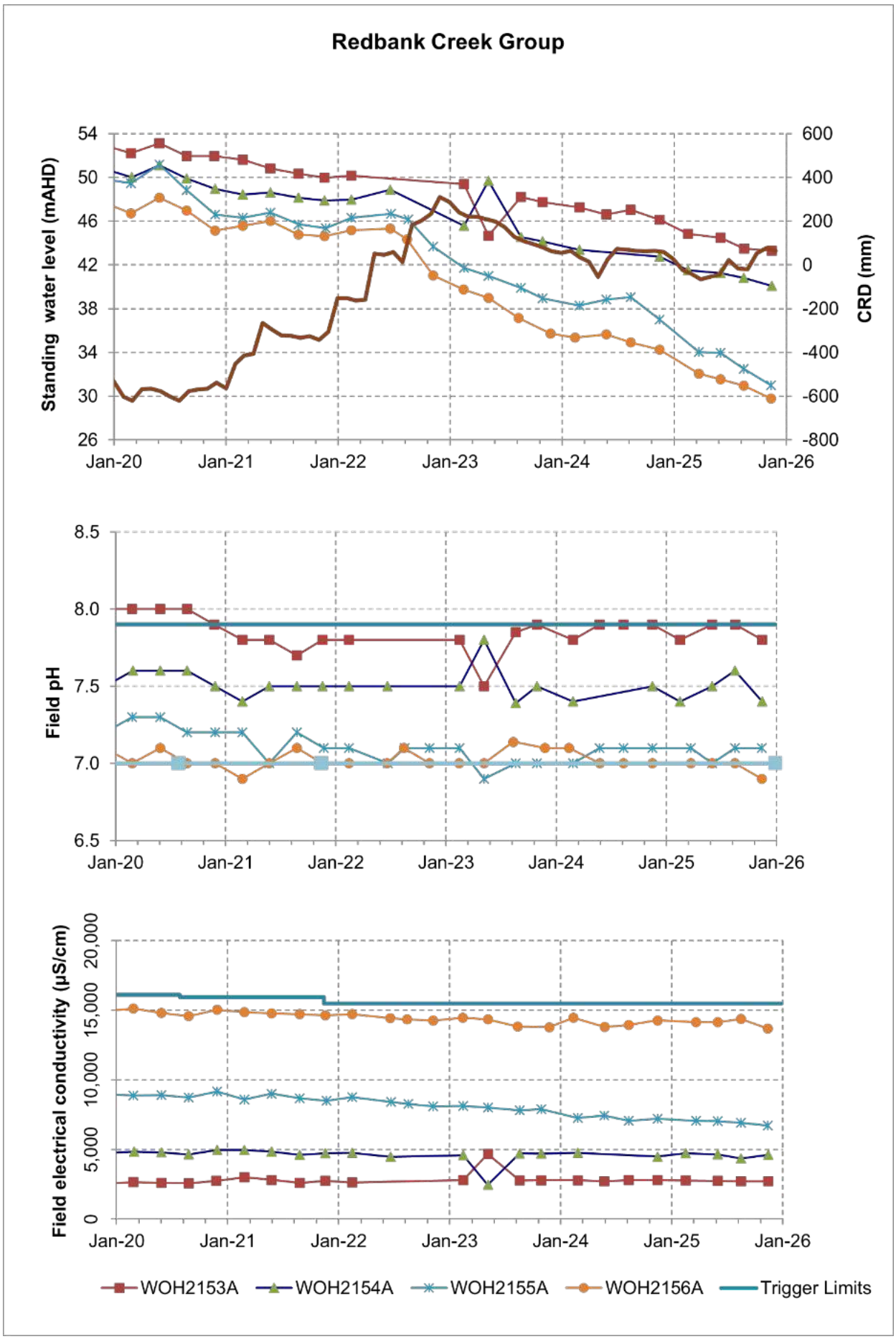


Figure B 1 Redbank Creek seam bores GWL, pH, and EC

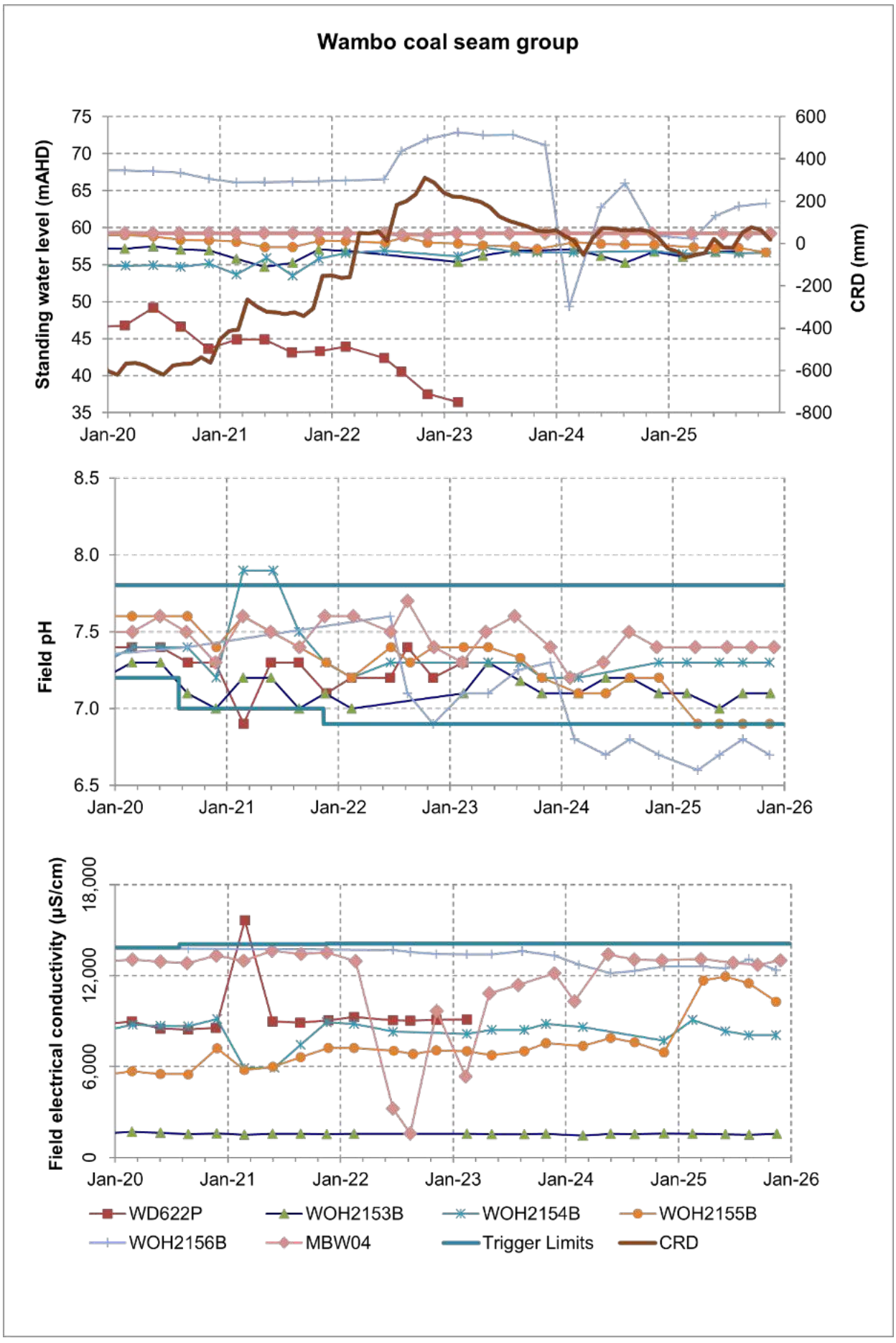


Figure B 2 Wambo coal seam bores GWL, pH, and EC

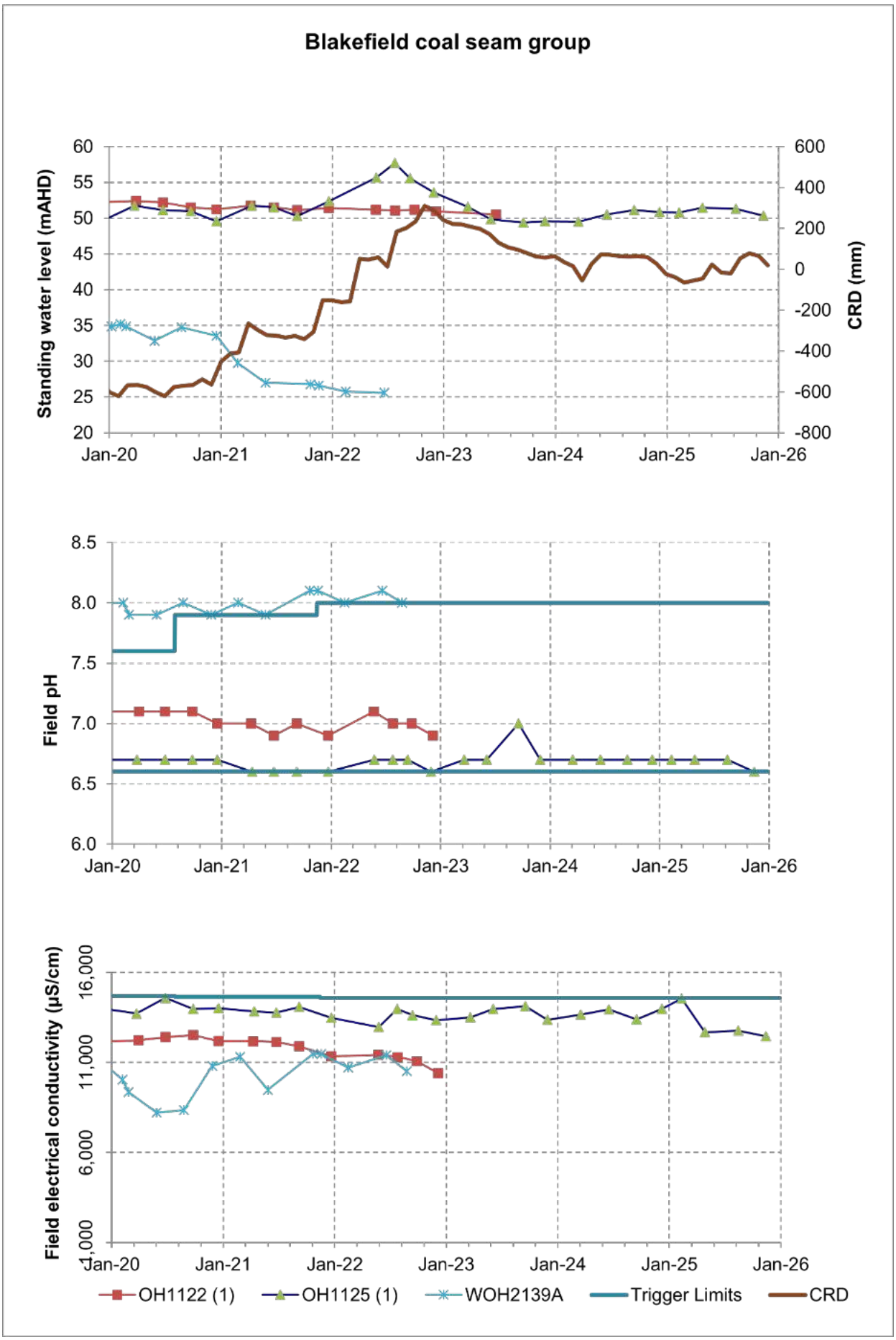


Figure B 3 Blakefield coal seam bores GWL, pH, and EC

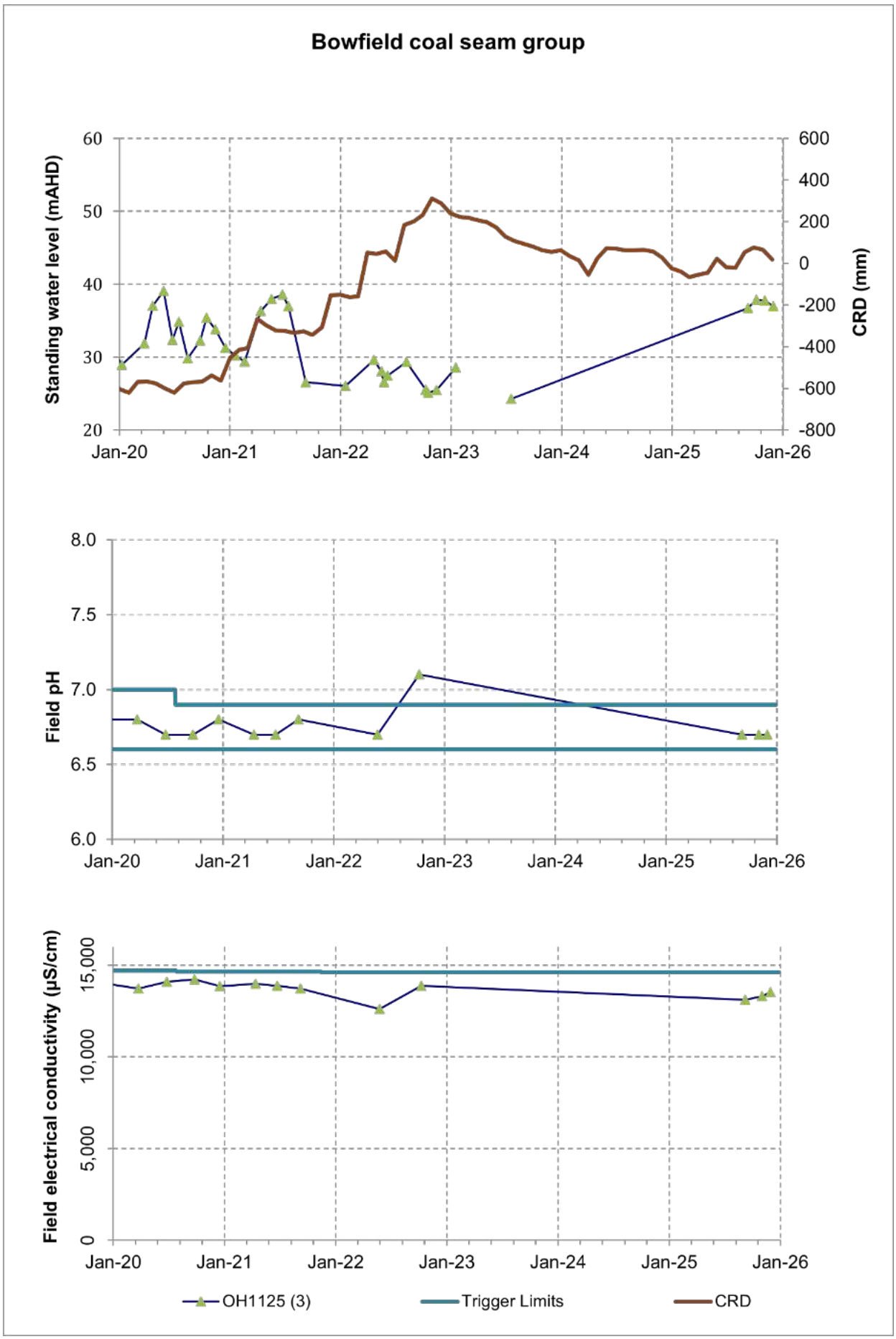


Figure B 4 Bowfield coal seam bores GWL, pH, and EC

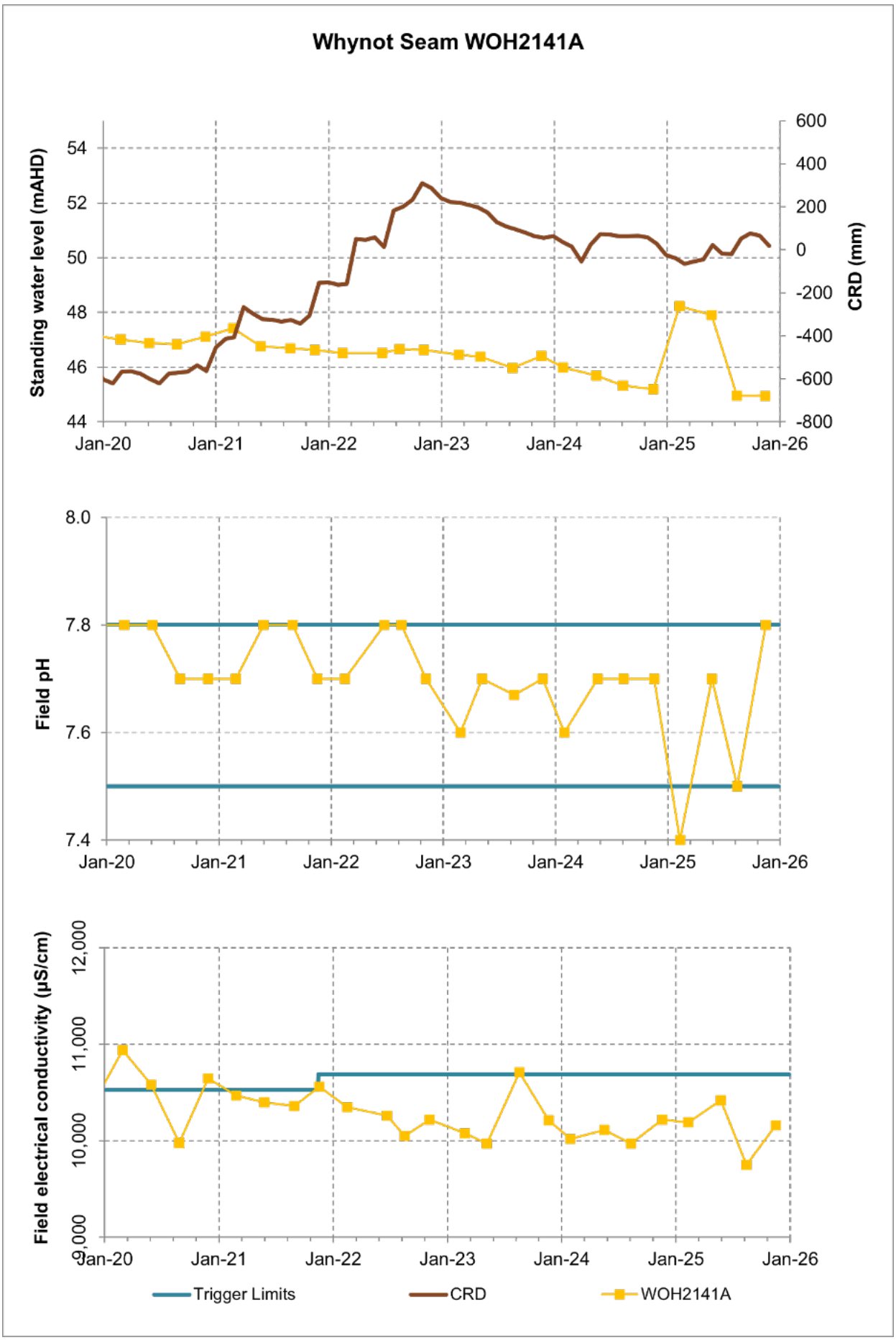


Figure B 5 Whynot coal seam bores GWL, pH, and EC

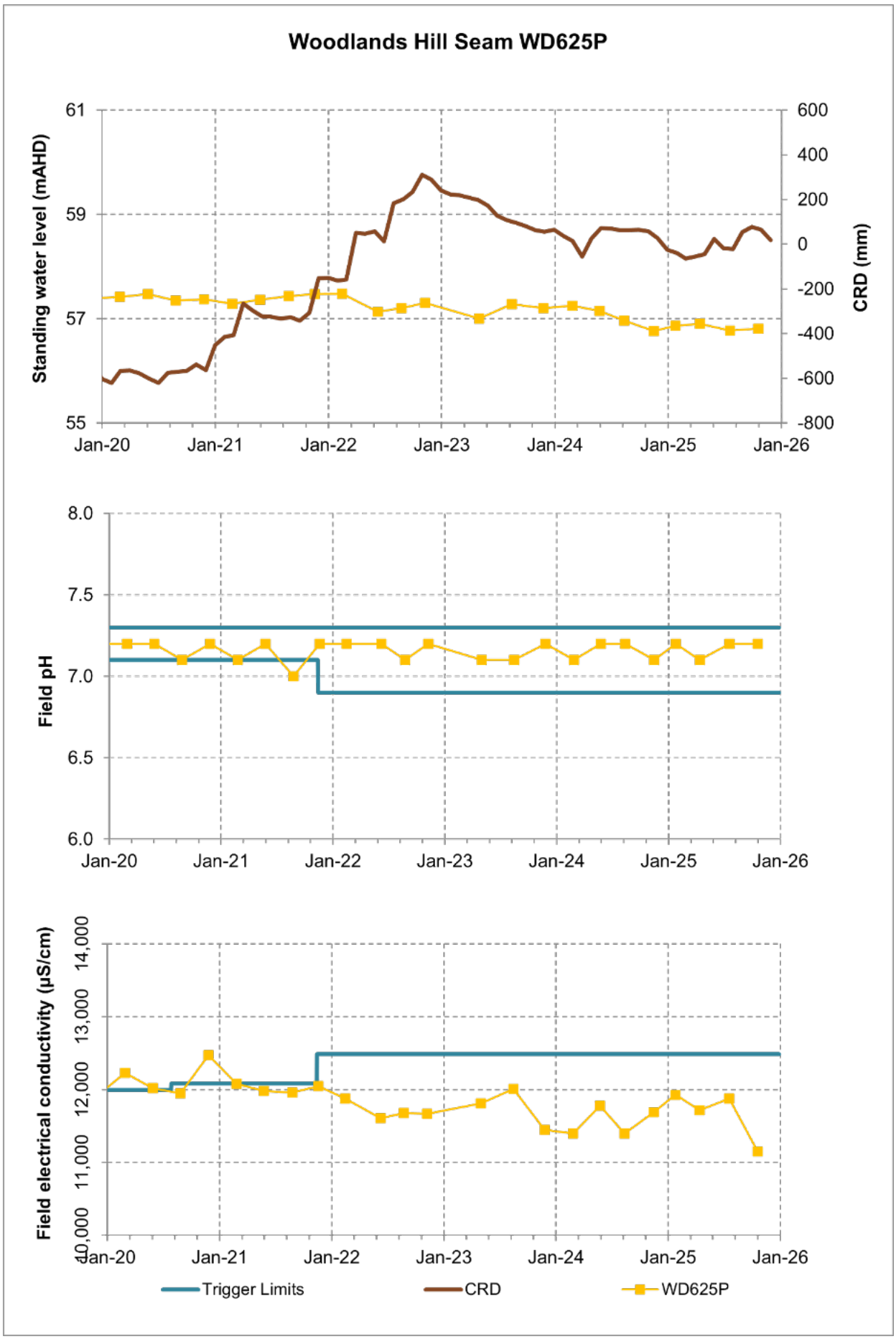


Figure B 6 Woodlands Hill coal seam bores GWL, pH, and EC

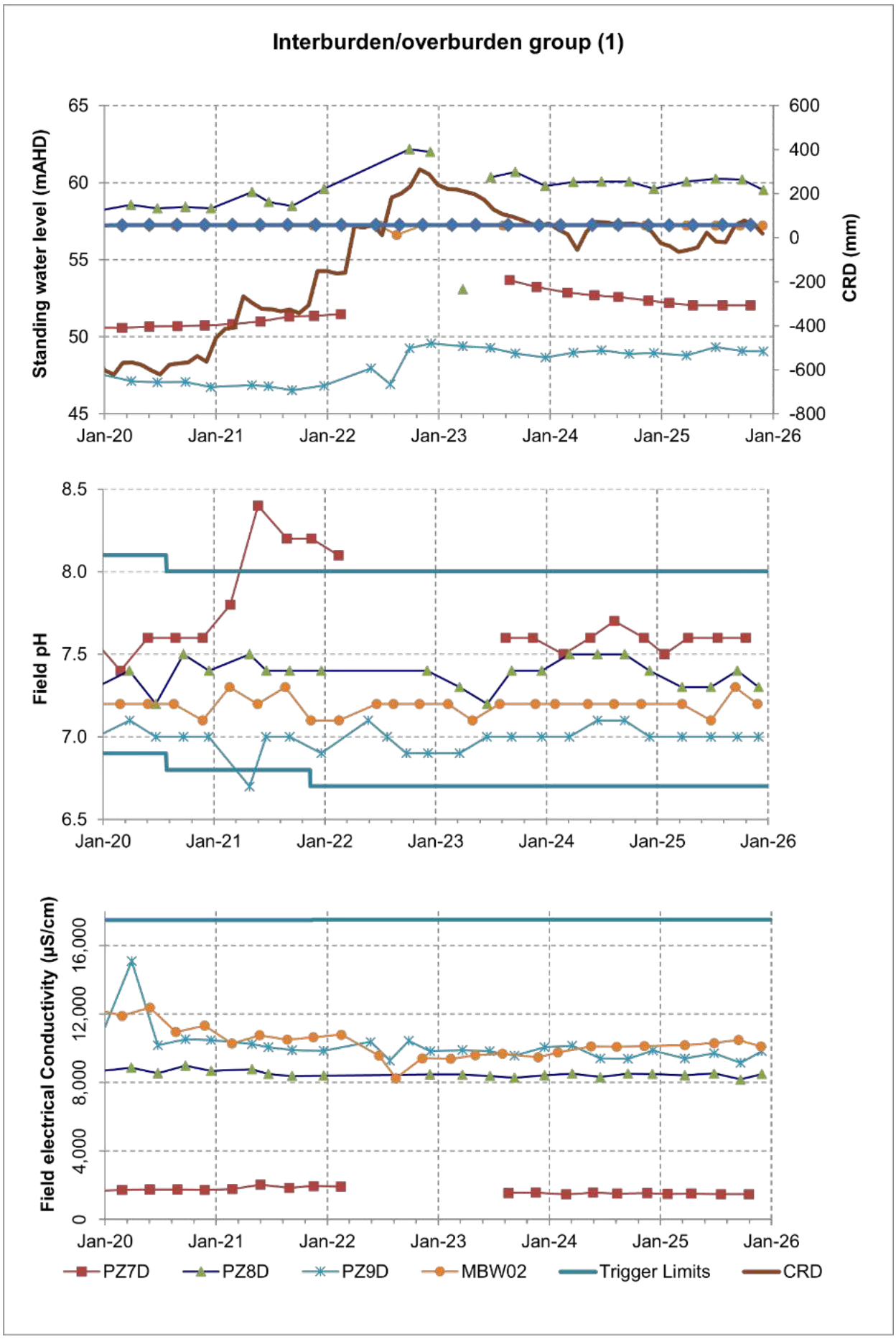


Figure B 7 Shallow overburden bores GWL, pH, and EC (1)

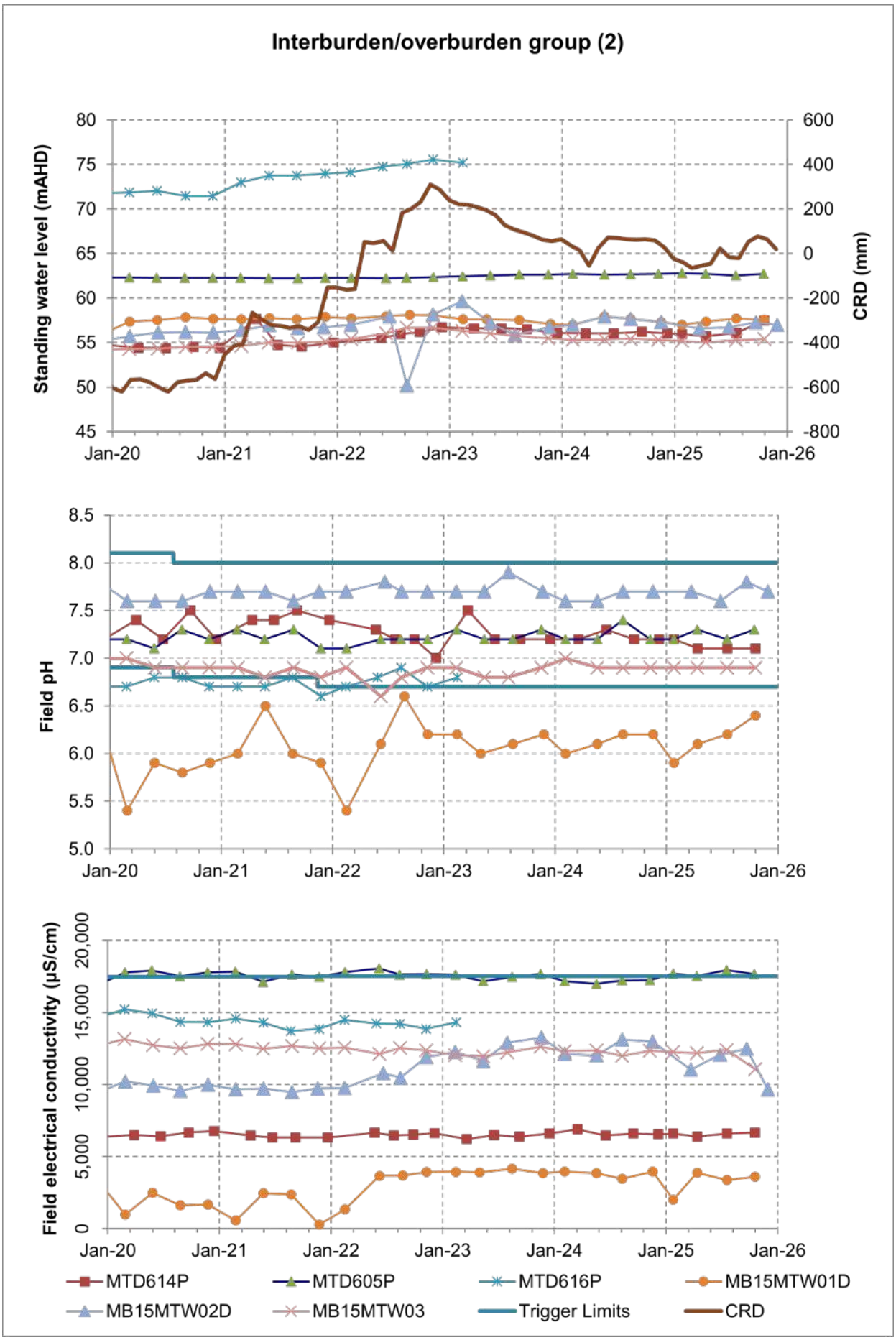


Figure B 8 Shallow overburden bores GWL, pH, and EC (2)

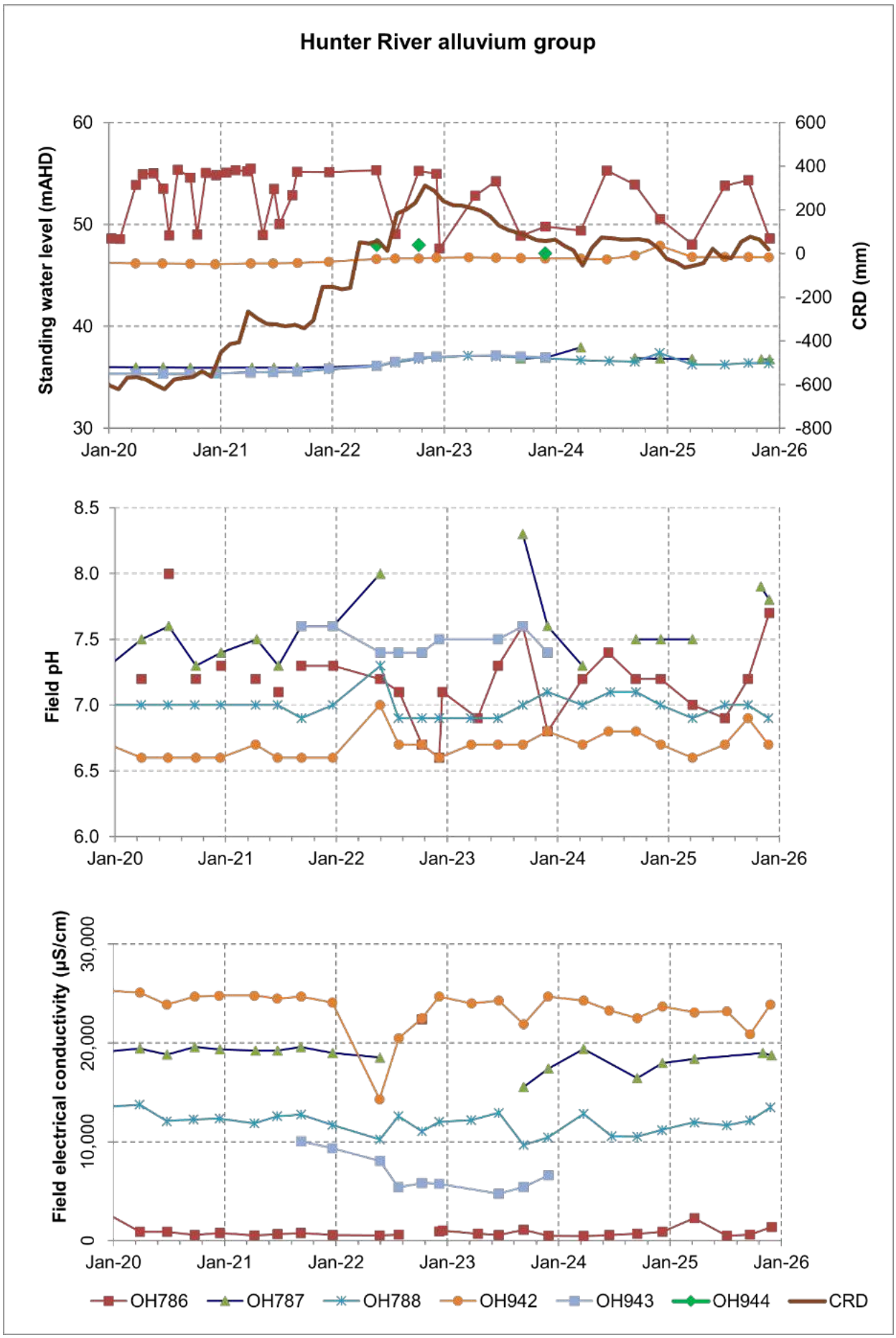


Figure B 9 Hunter River alluvium bores GWL, pH, and EC

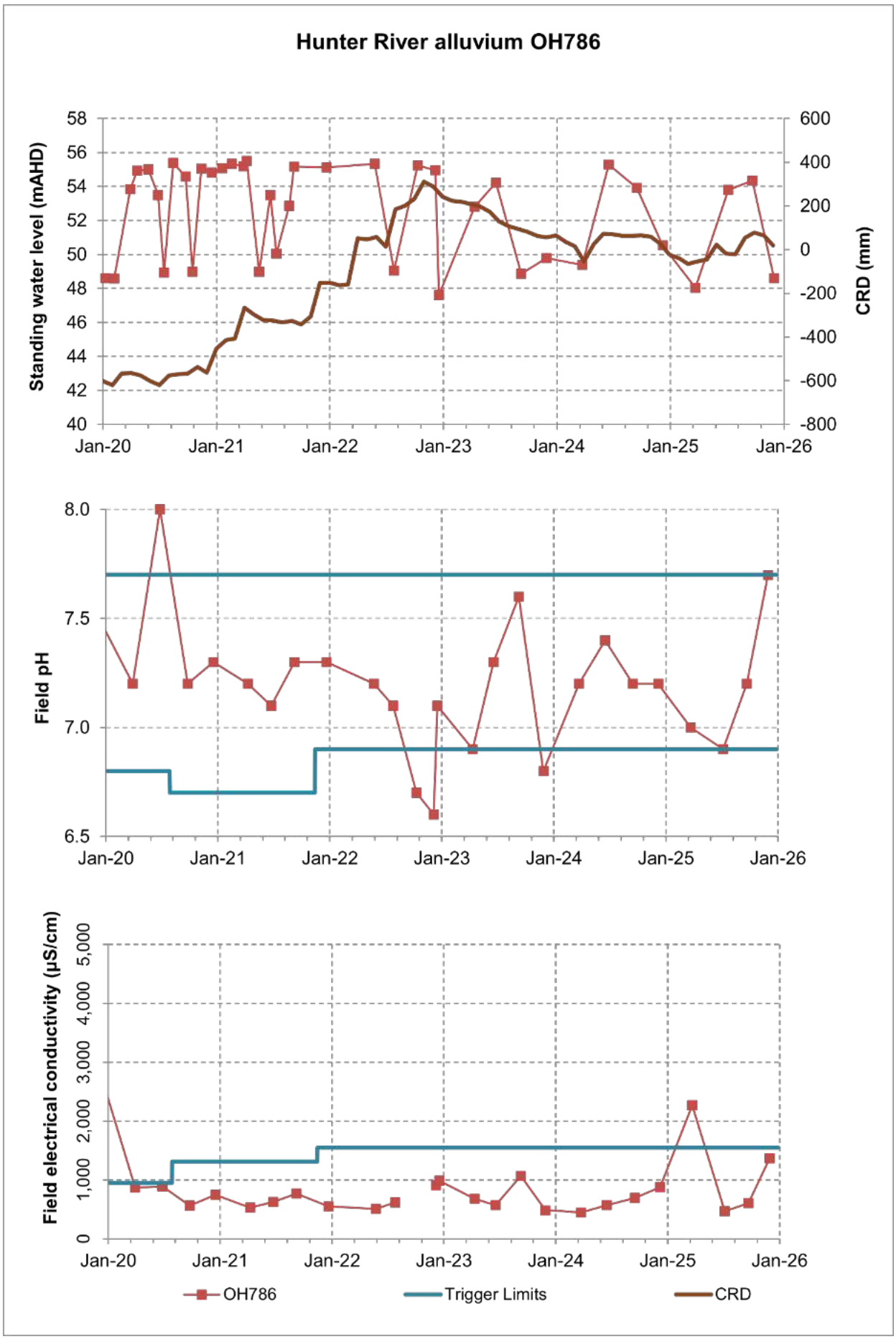


Figure B 10 Hunter River bore OH786 GWL, pH, and EC

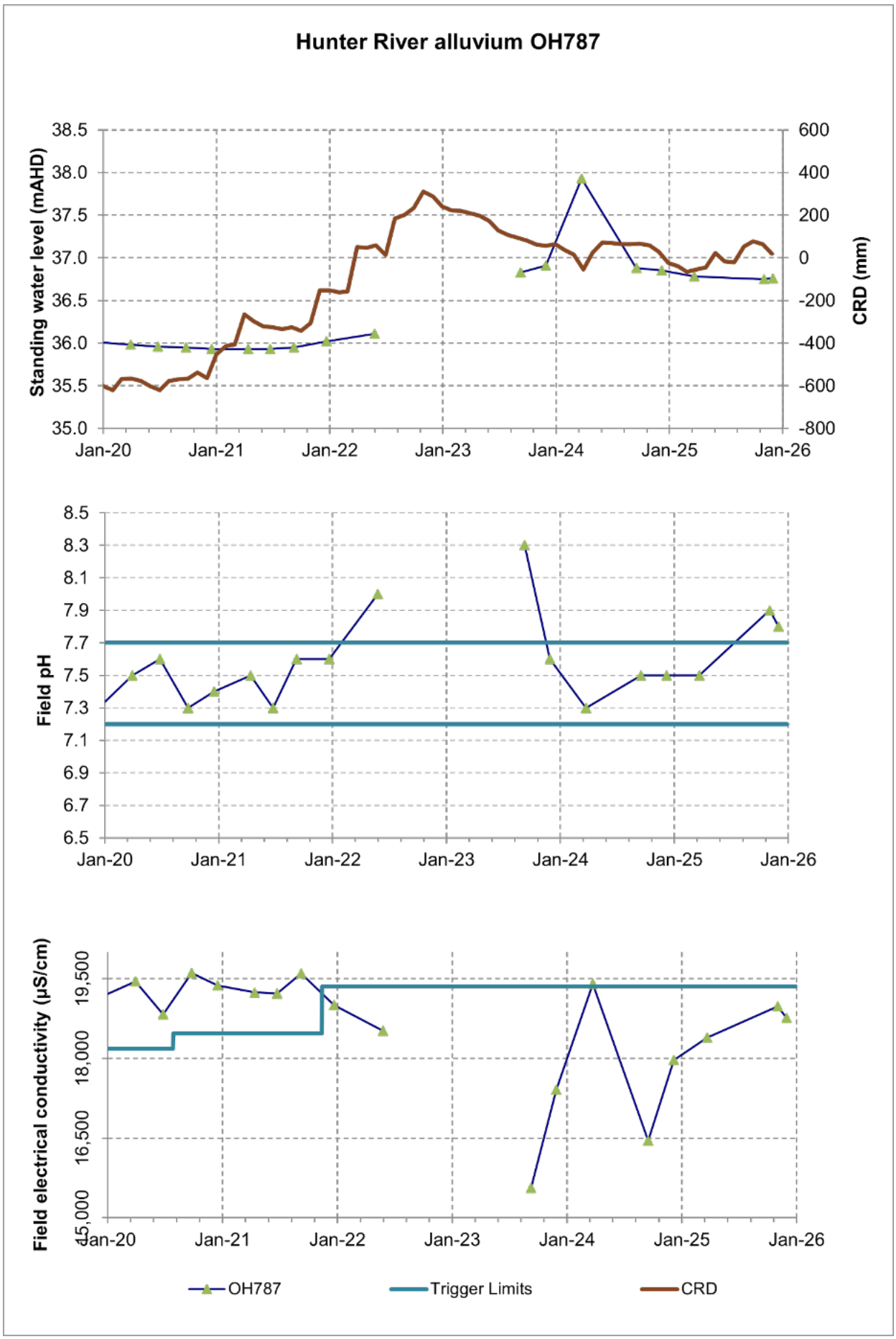


Figure B 11 Hunter River bore OH787 GWL, pH, and EC

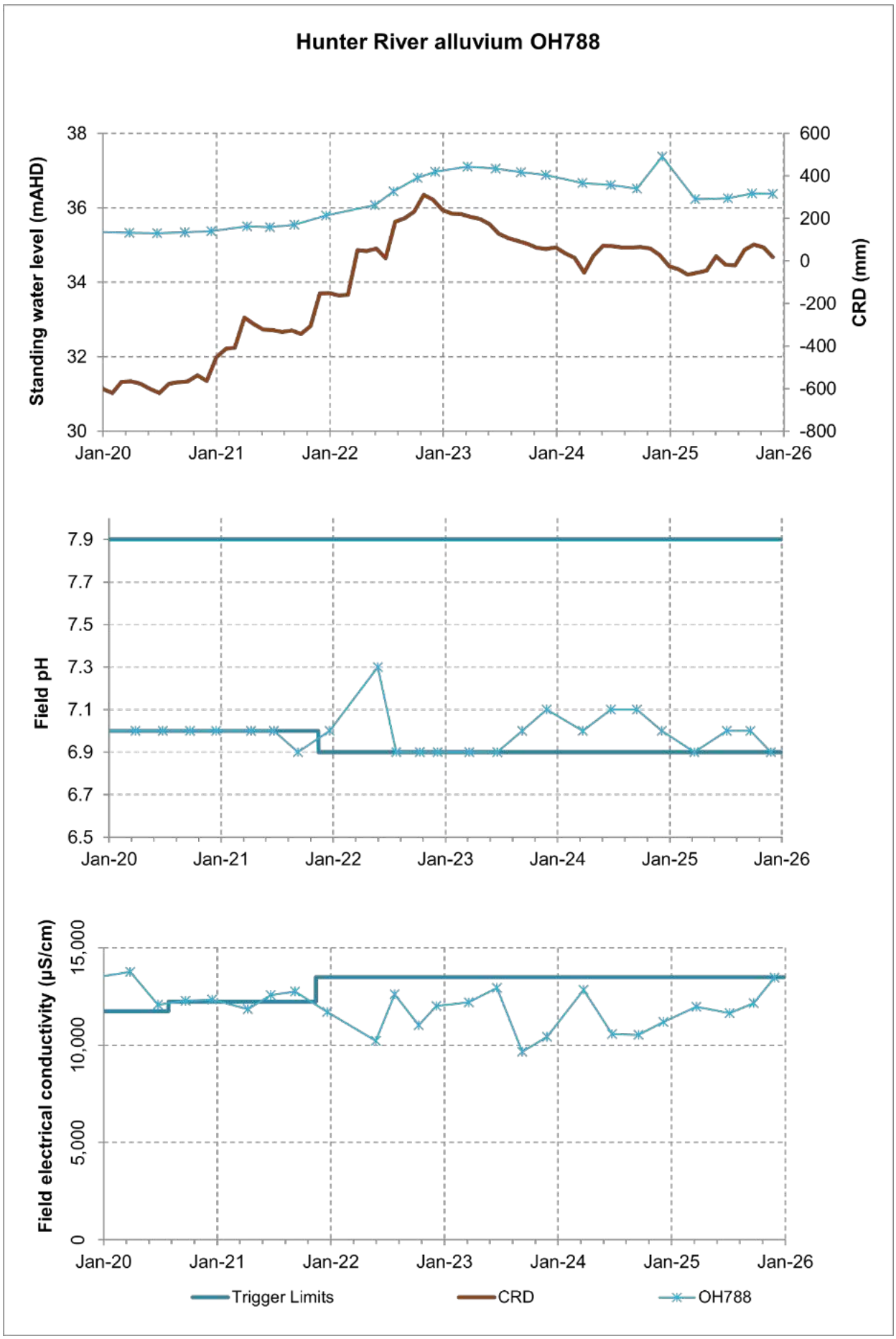


Figure B 12 Hunter River bore OH788 GWL, pH, and EC

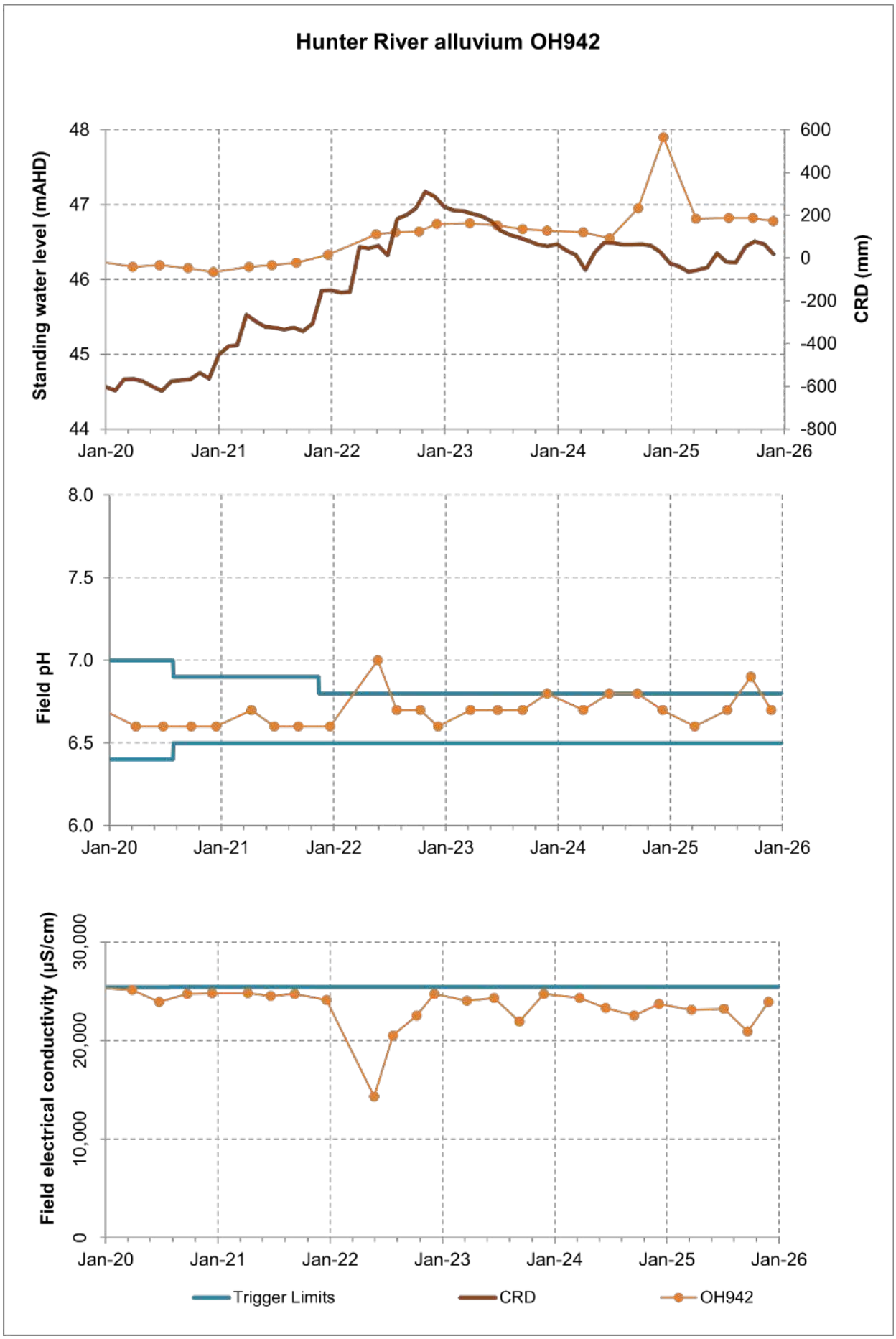


Figure B 13 Hunter River bore OH942 GWL, pH, and EC

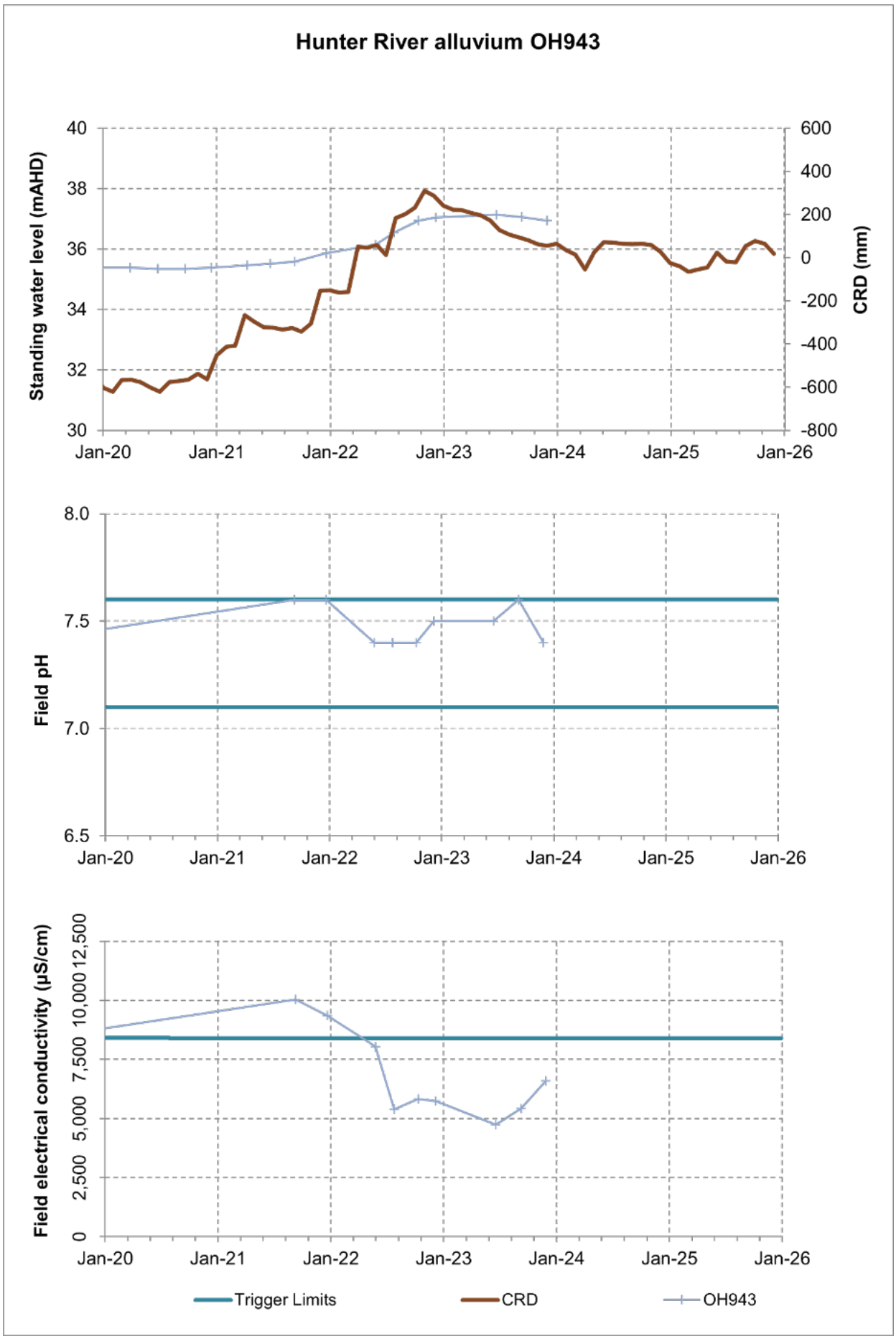


Figure B 14 Hunter River bore OH943 GWL, pH, and EC

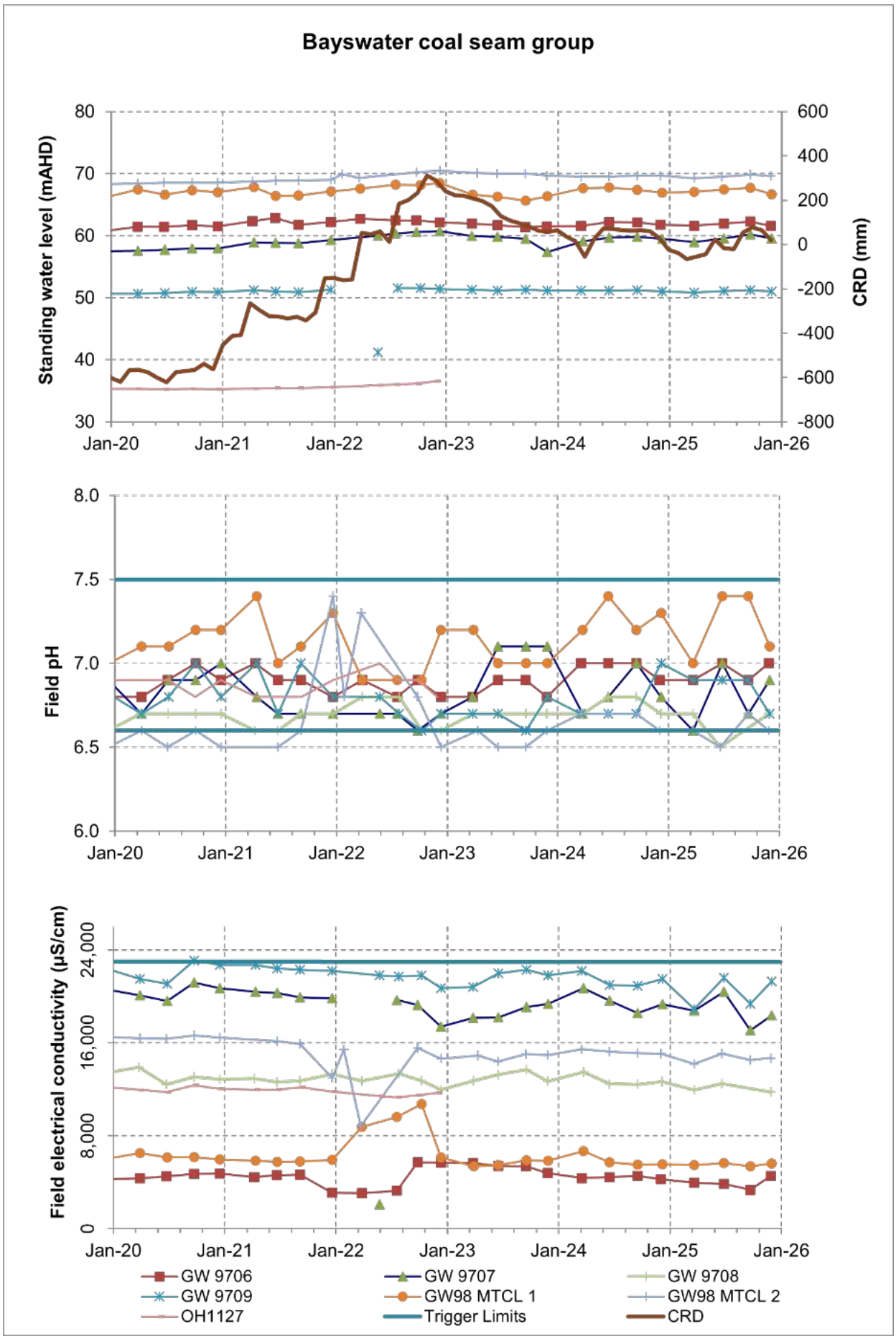


Figure B 15 Bayswater coal seam bores GWL, pH, and EC

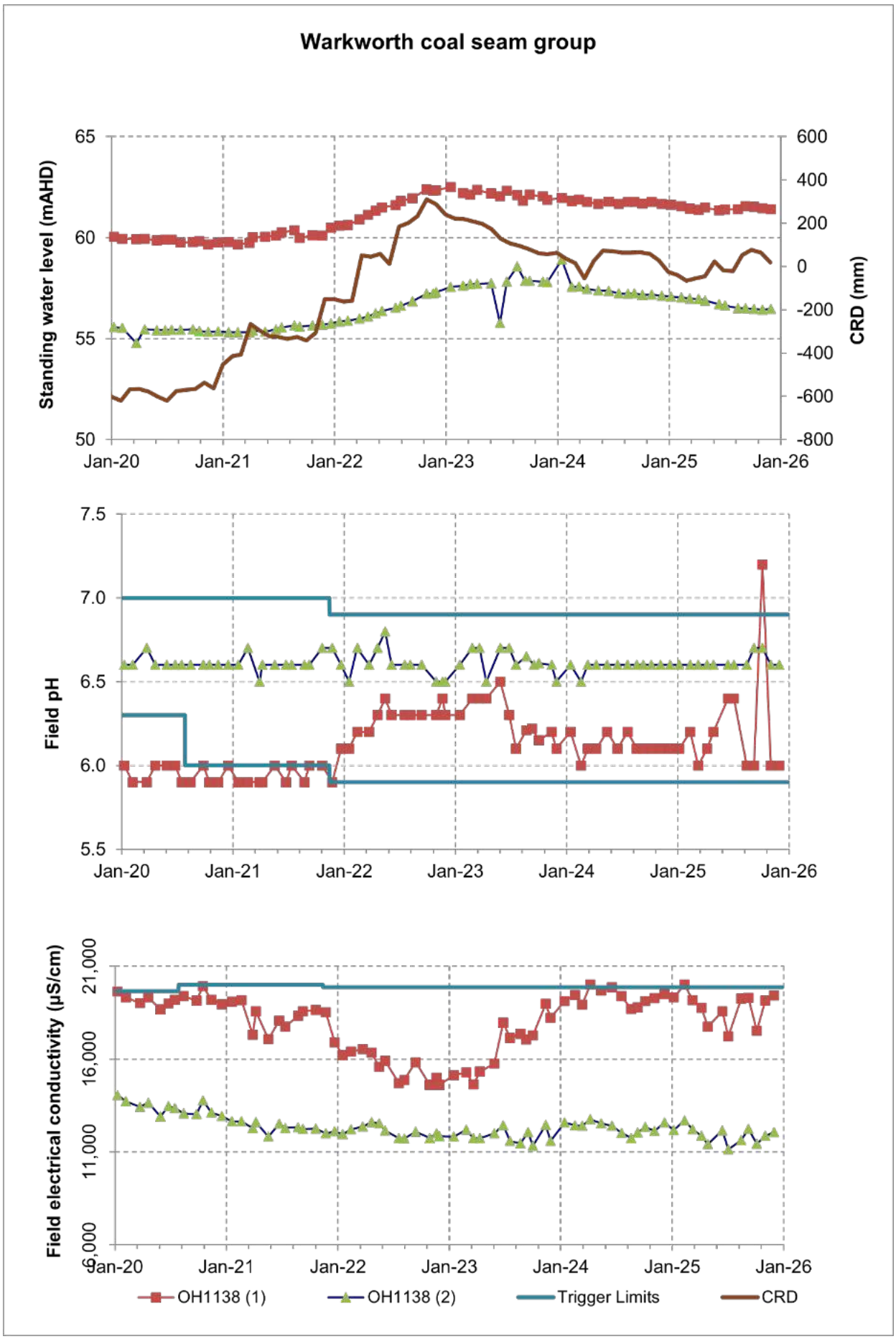


Figure B 16 Warkworth coal seam bores GWL, pH, and EC

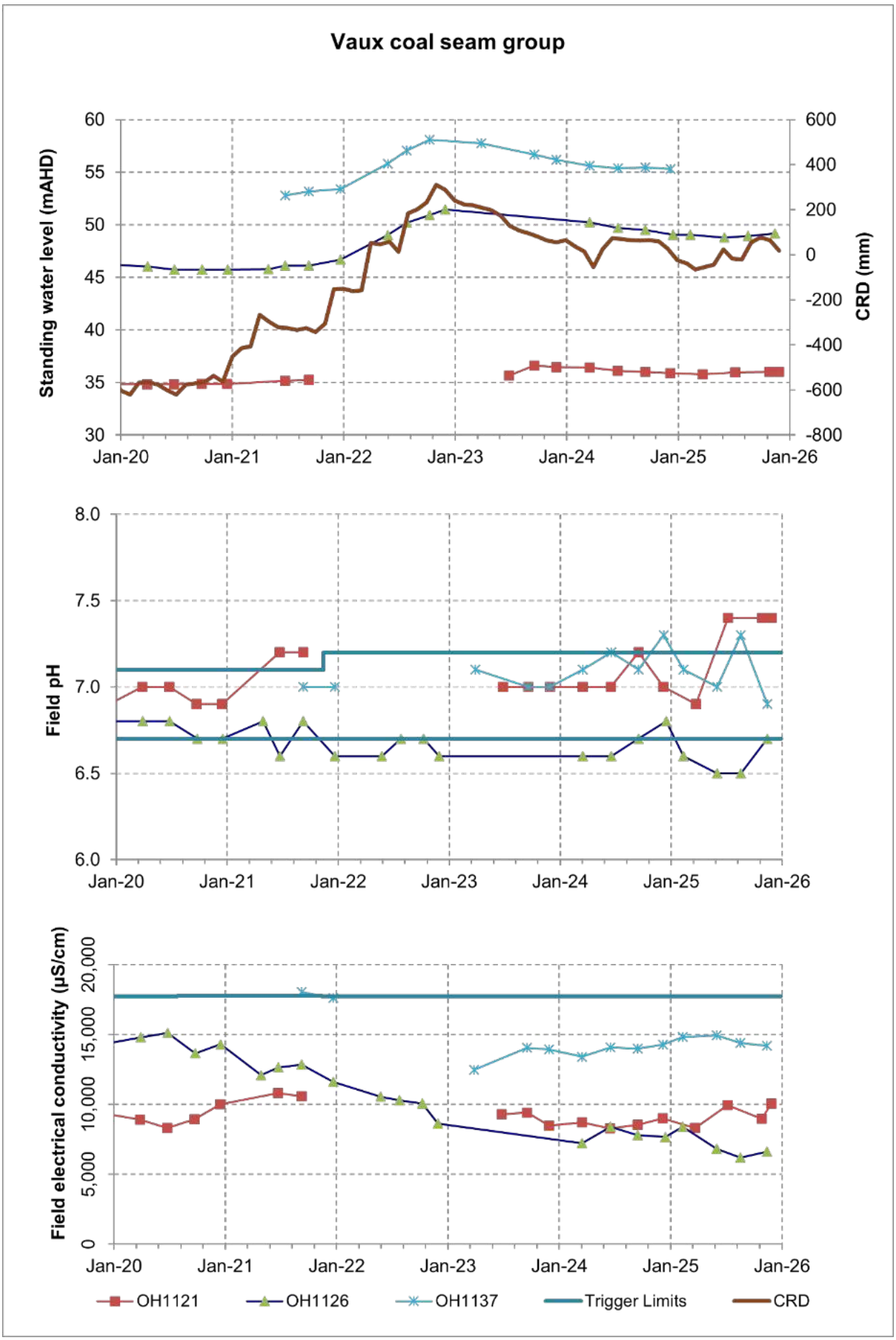


Figure B 17 Vaux coal seam bores GWL, pH, and EC

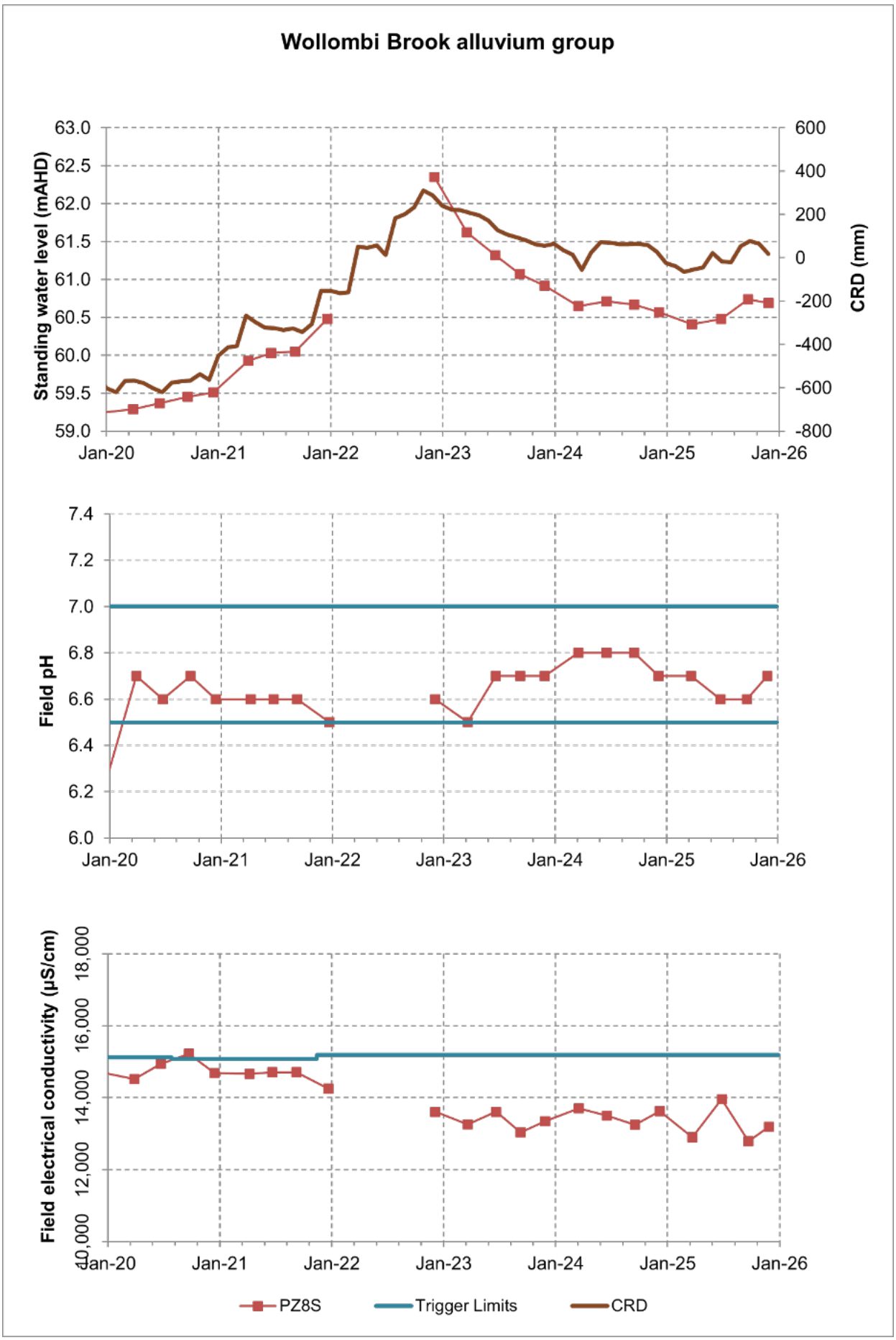


Figure B 18 Wollombi Brook alluvium bore PZ8S GWL, pH, and EC

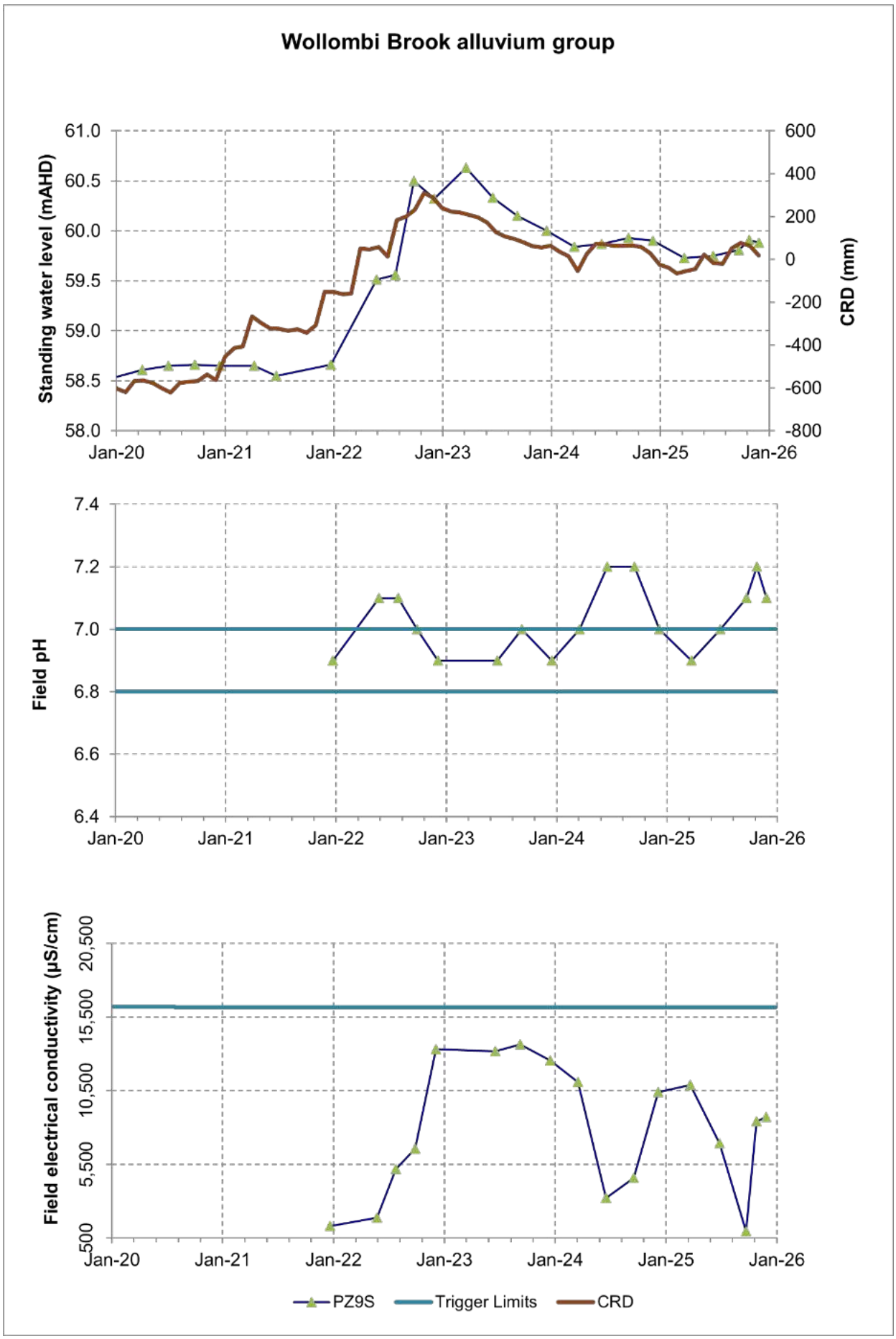


Figure B 19 Wollombi Brook alluvium bore PZ9S GWL, pH, and EC

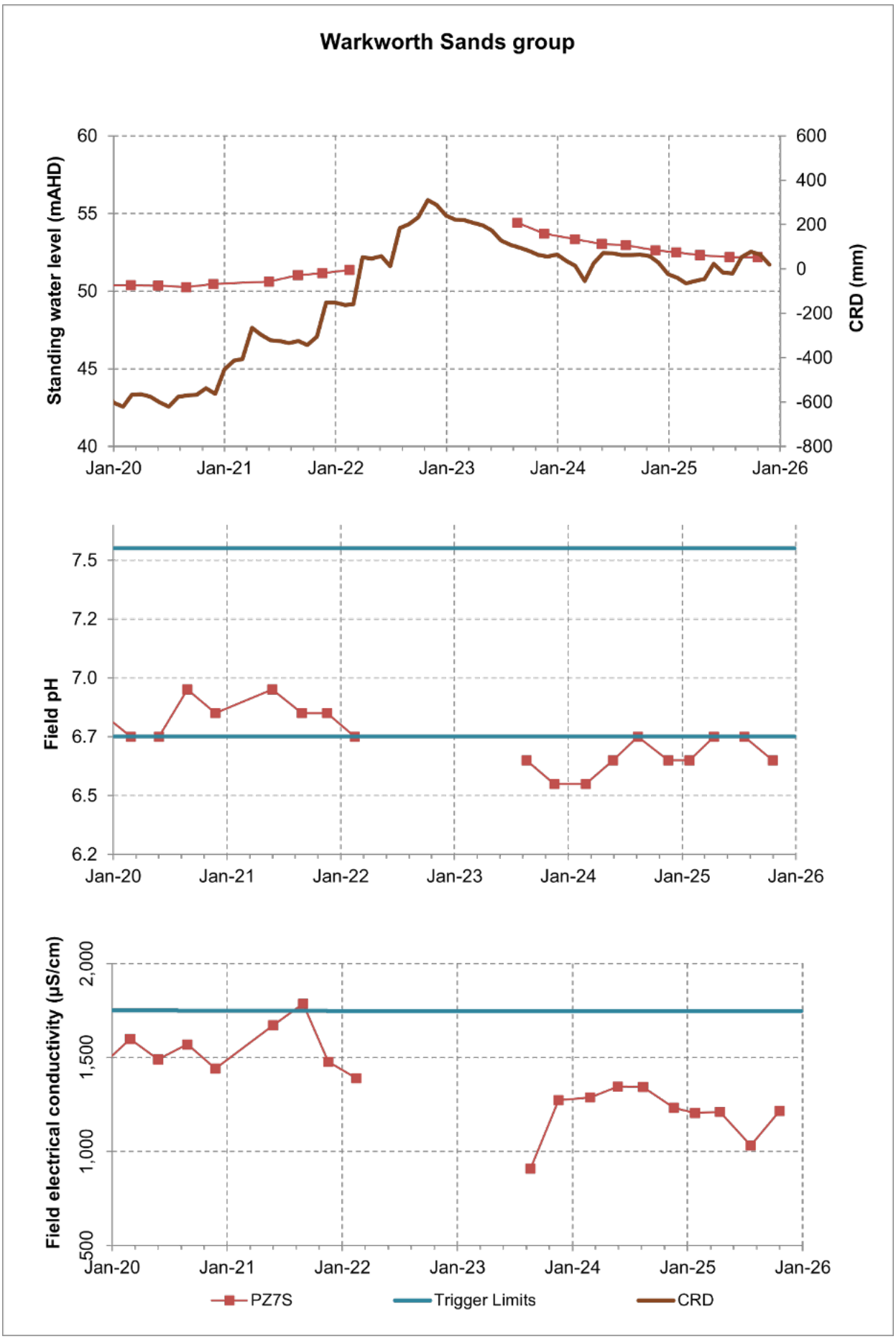


Figure B 20 Warkworth Sands bore PZ7S GWL, pH, and EC

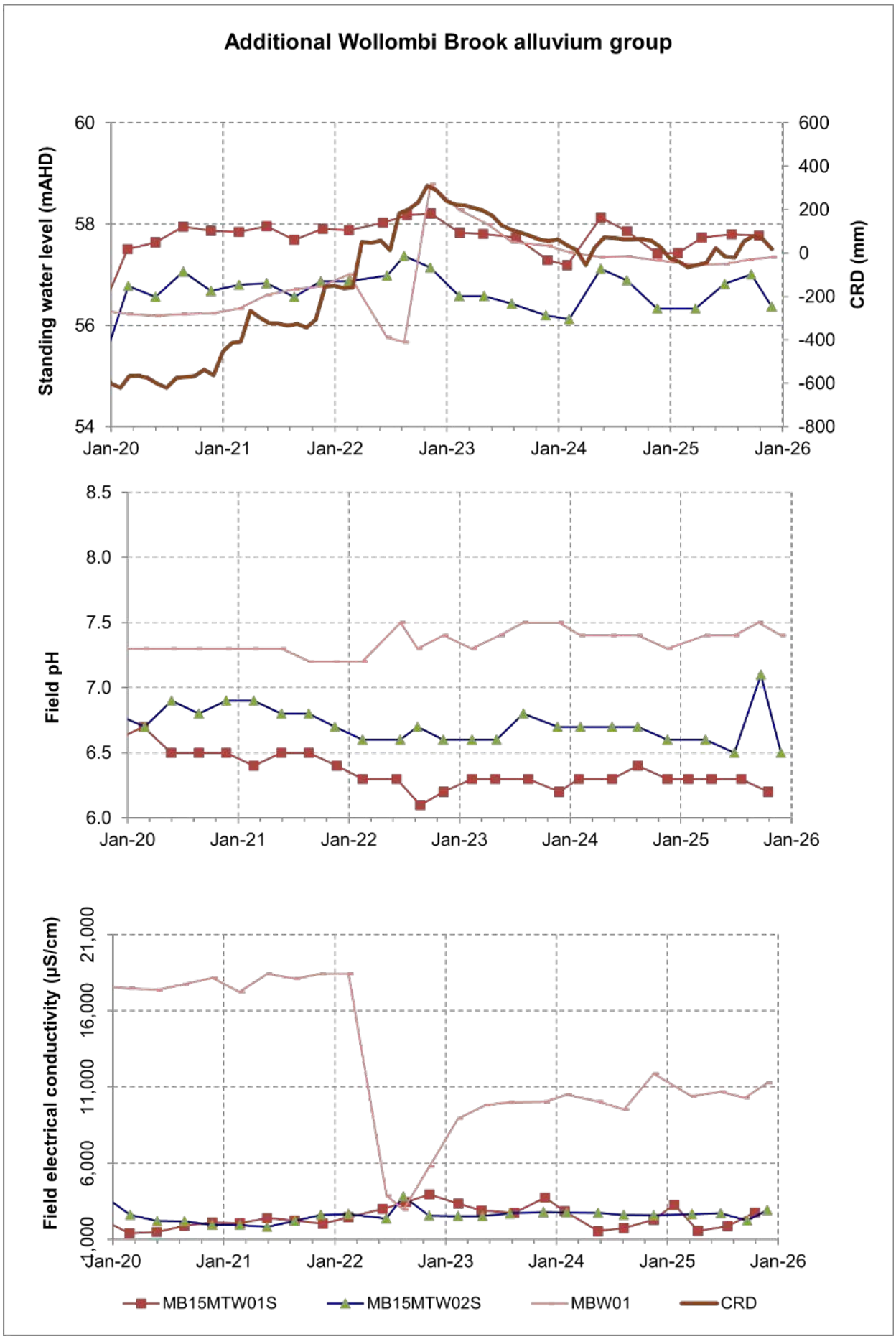


Figure B 21 Additional Wollombi Brook alluvium bores GWL, pH, and EC

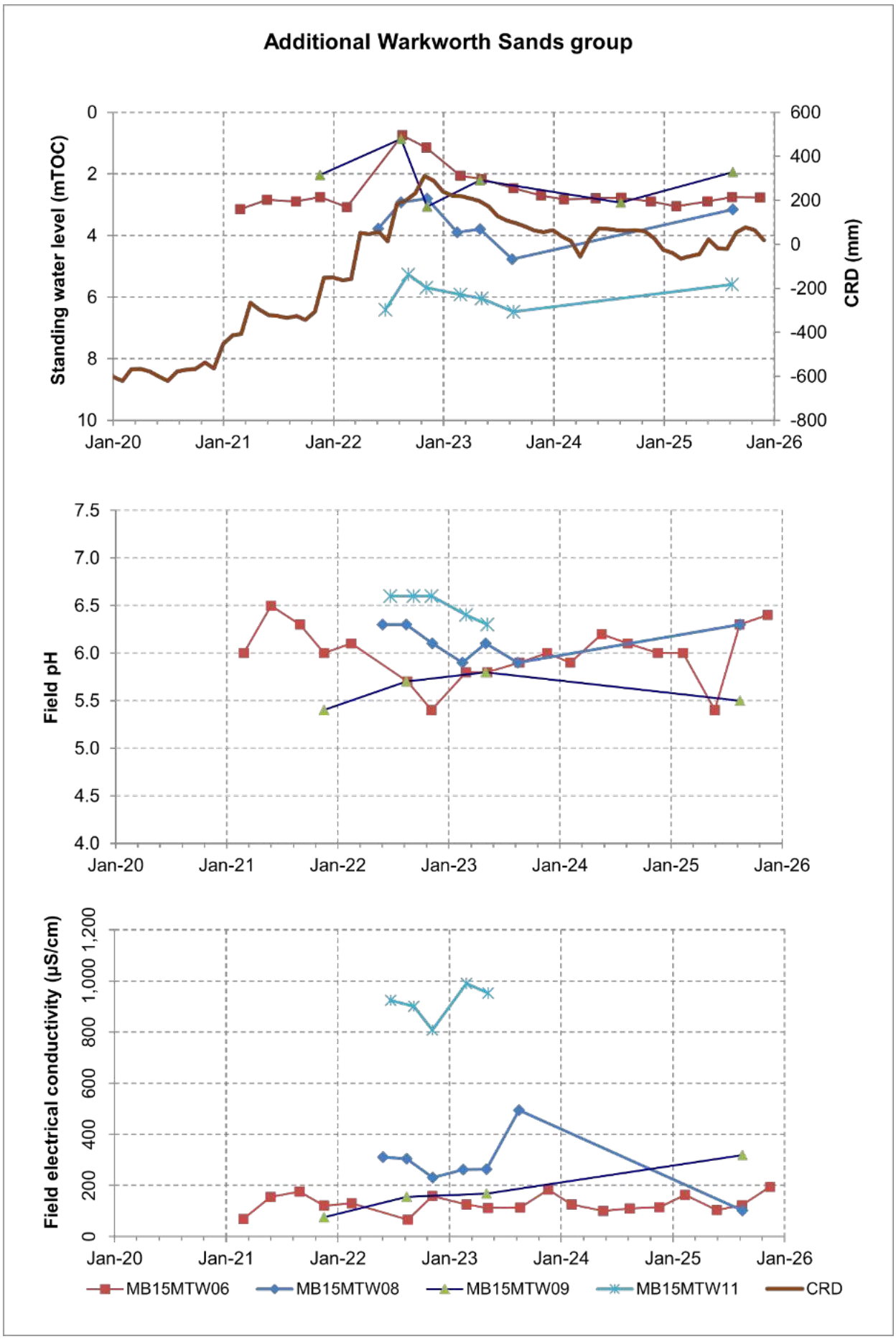


Figure B 22 Additional Warkworth Sands bores GWL, pH, and EC

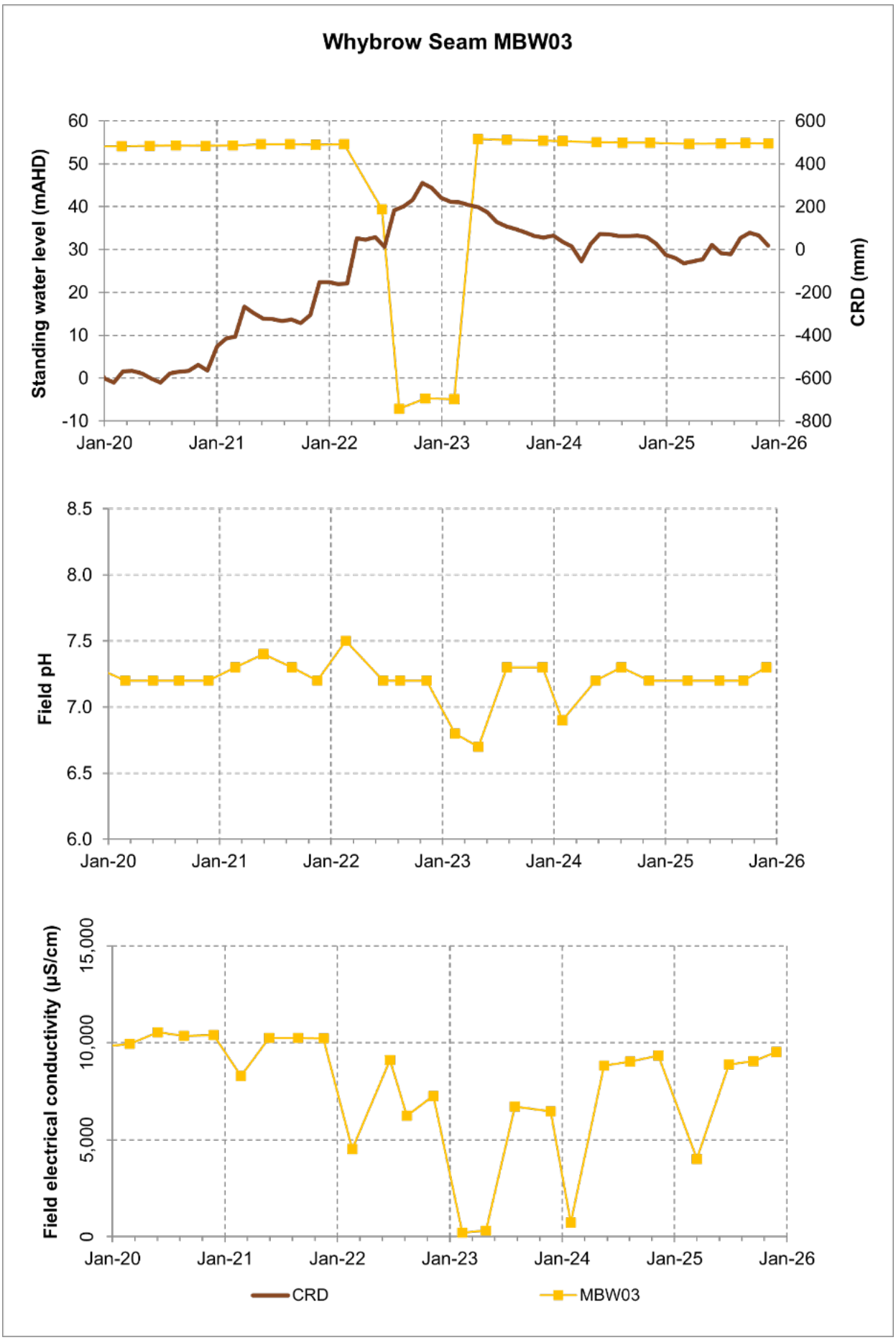


Figure B 23 Whybrow coal seam bore MBW03 GWL, pH, and EC

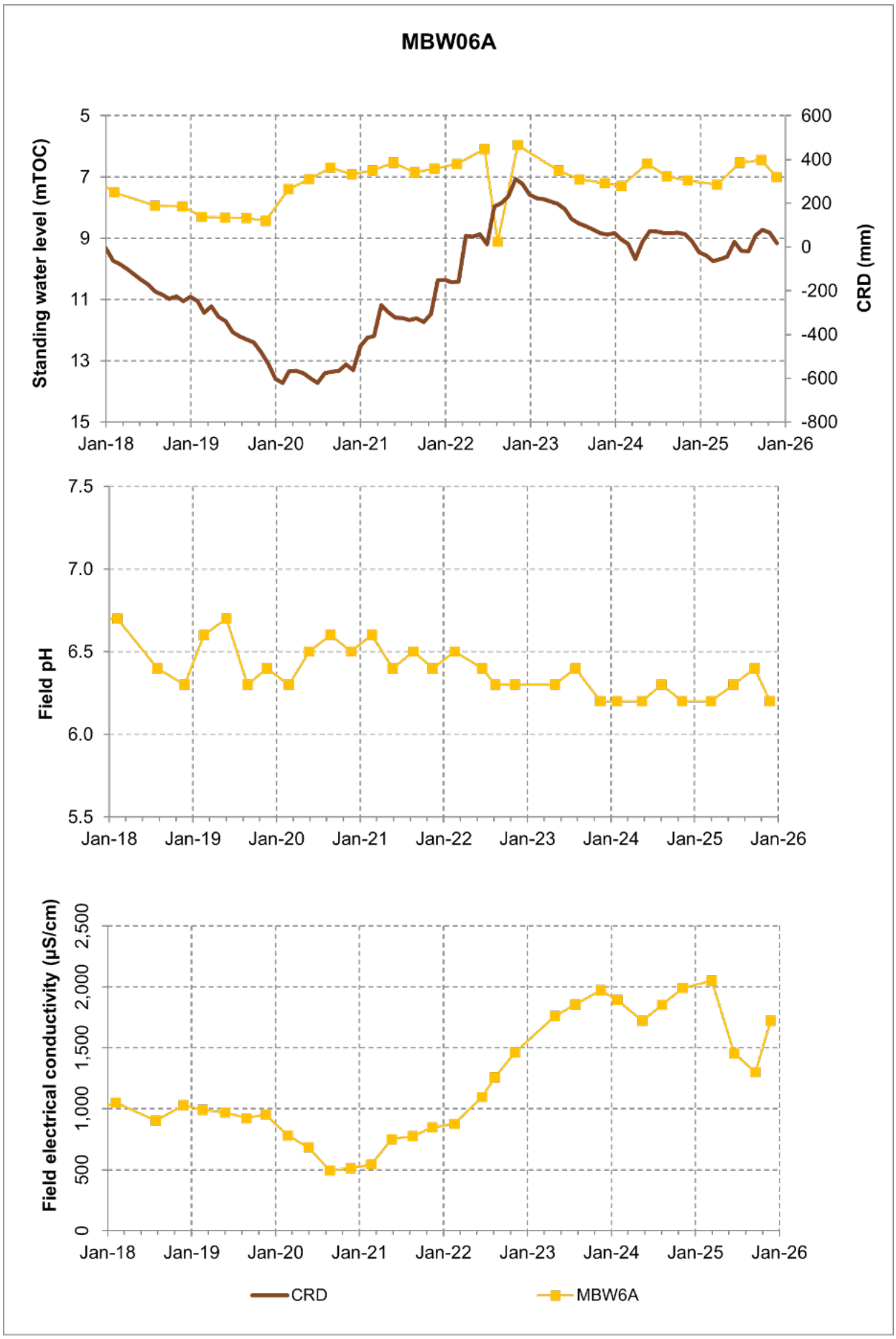
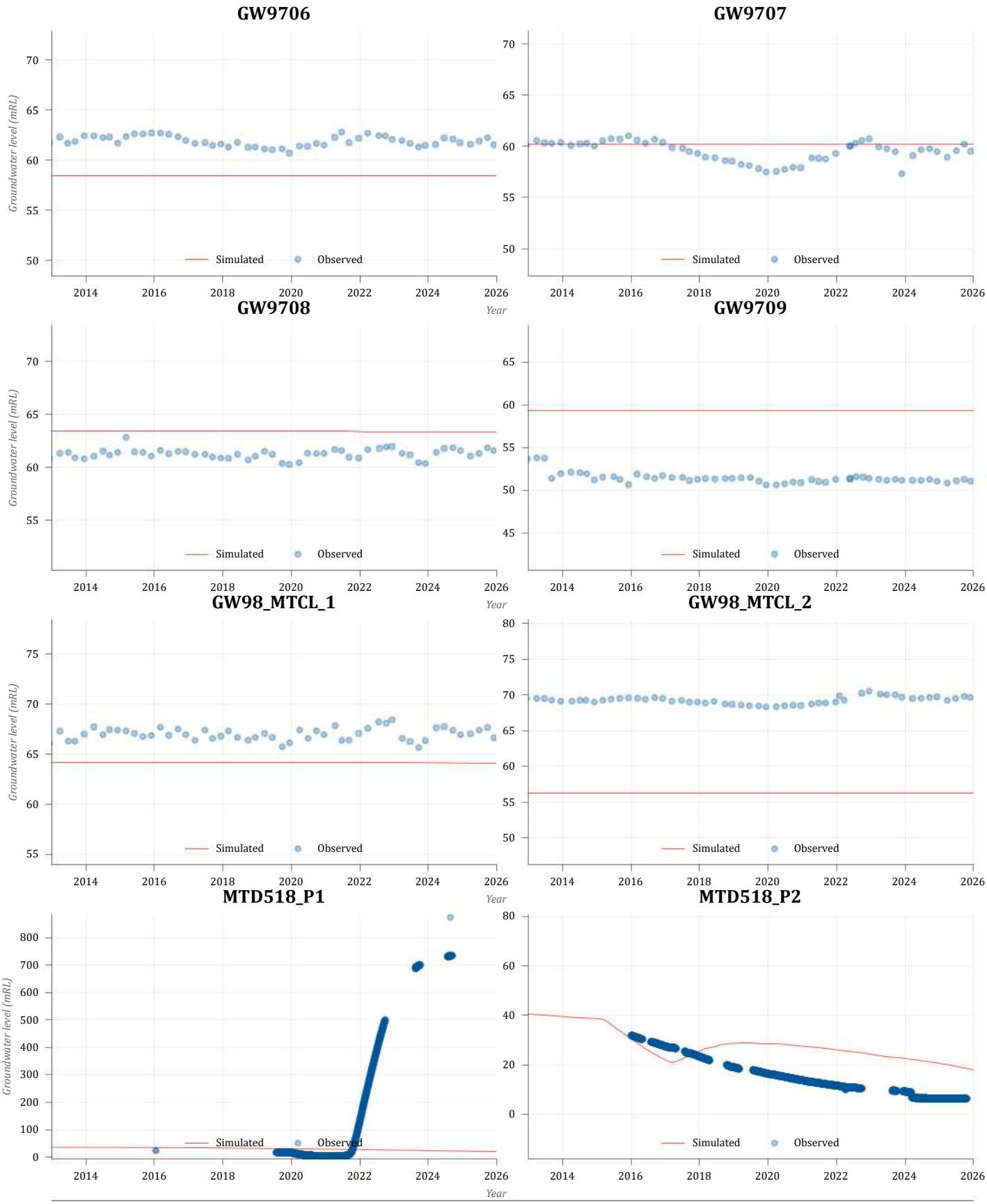
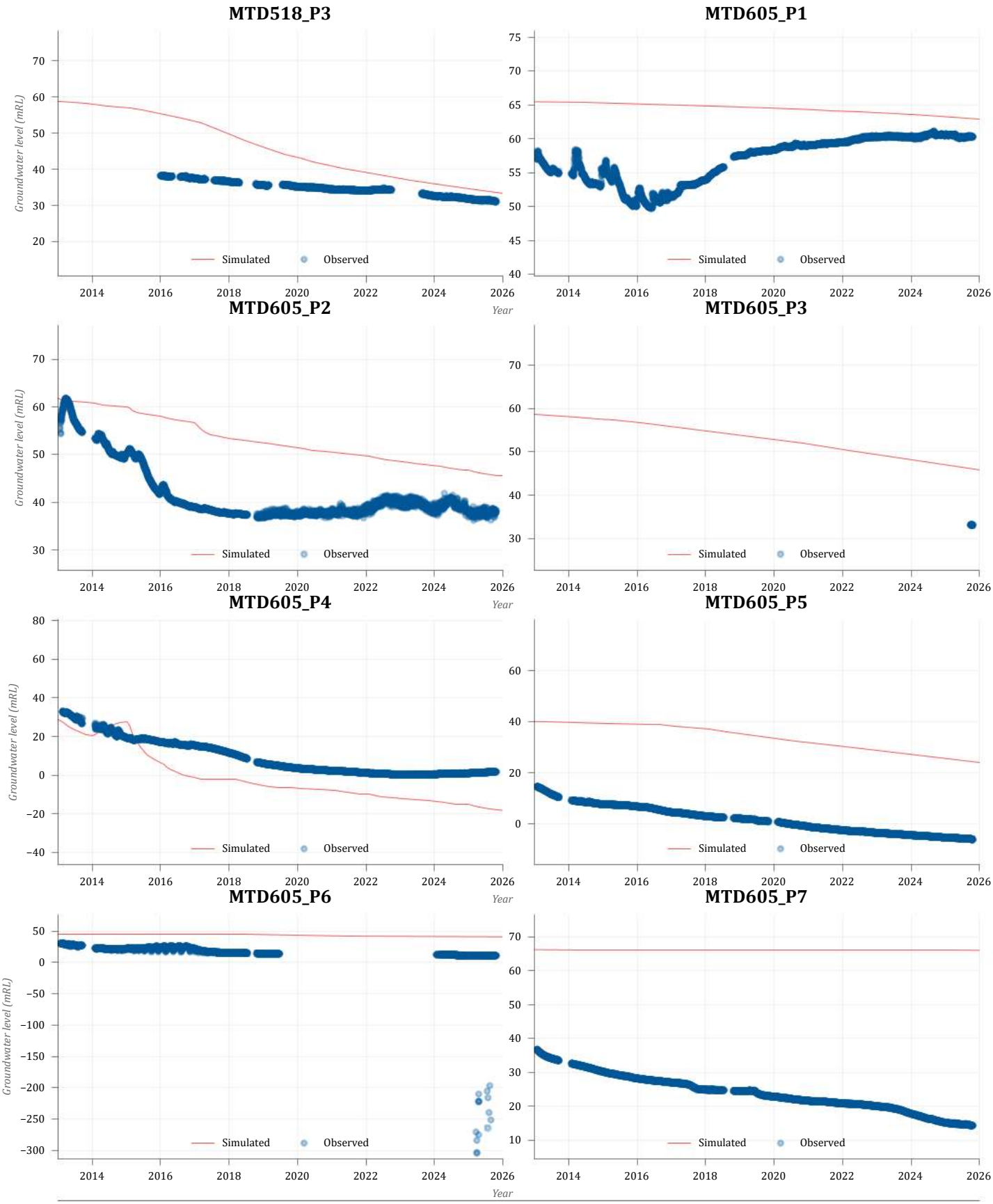


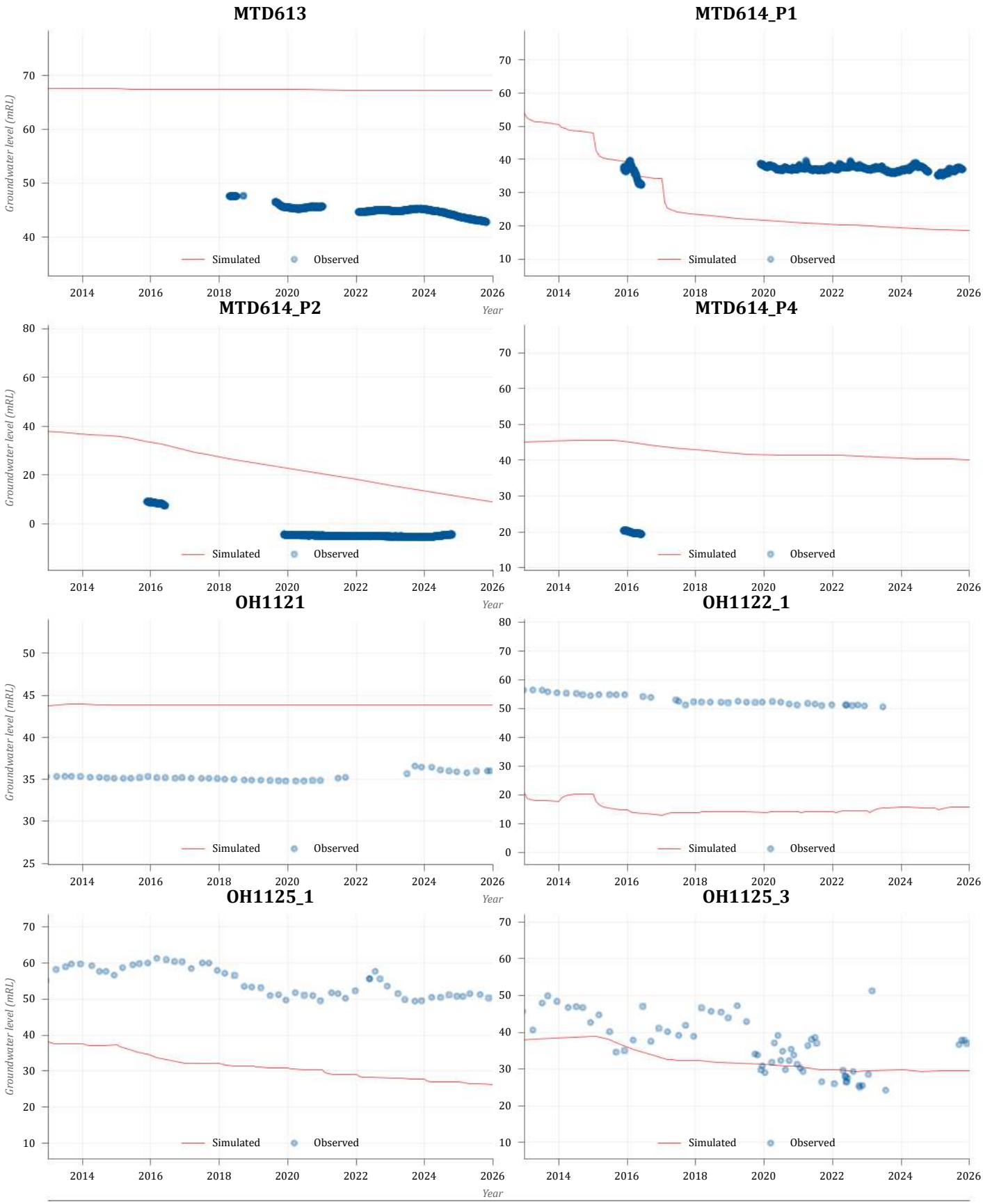
Figure B 24 MBW06 GWL, pH, and EC

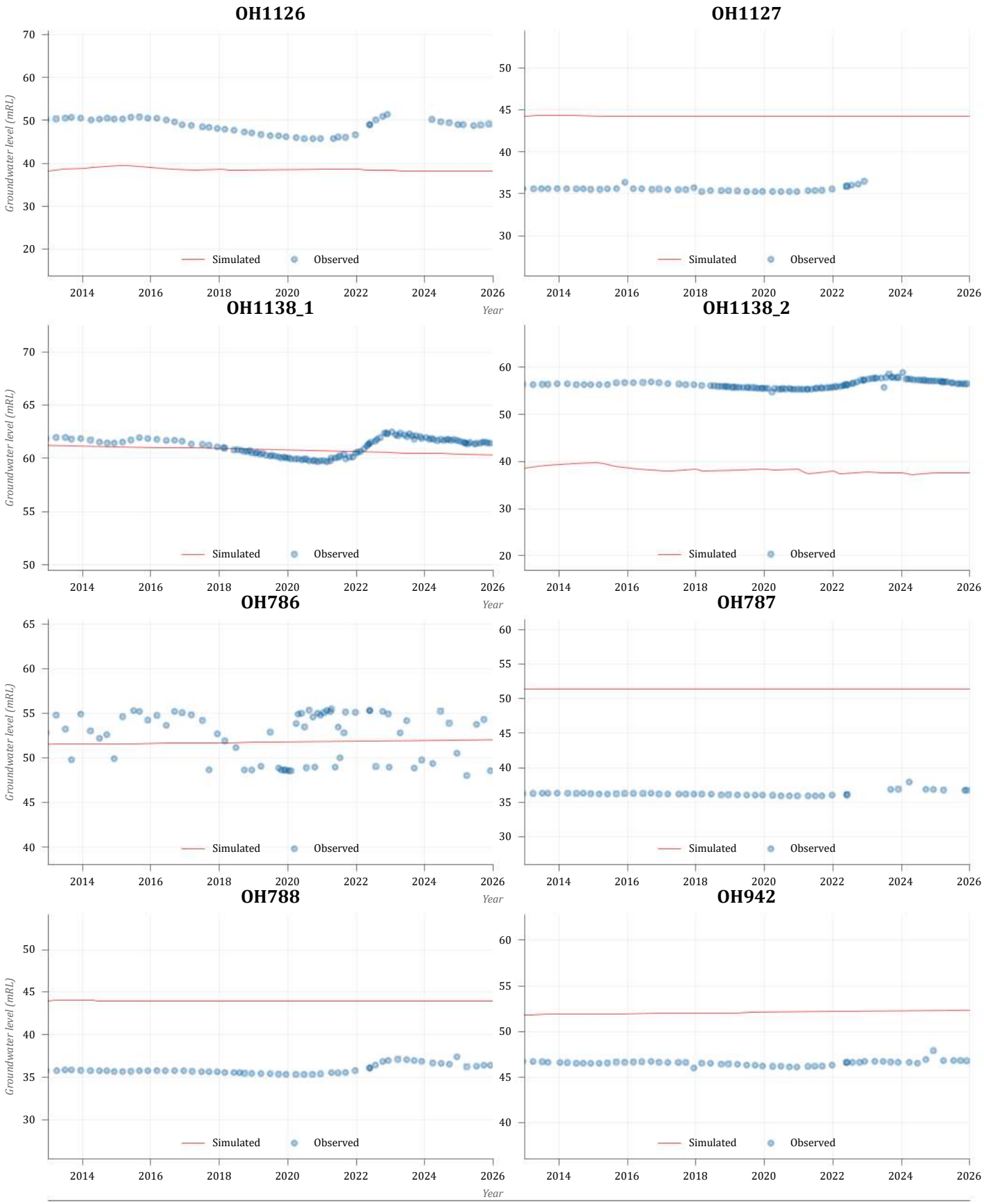
Appendix C

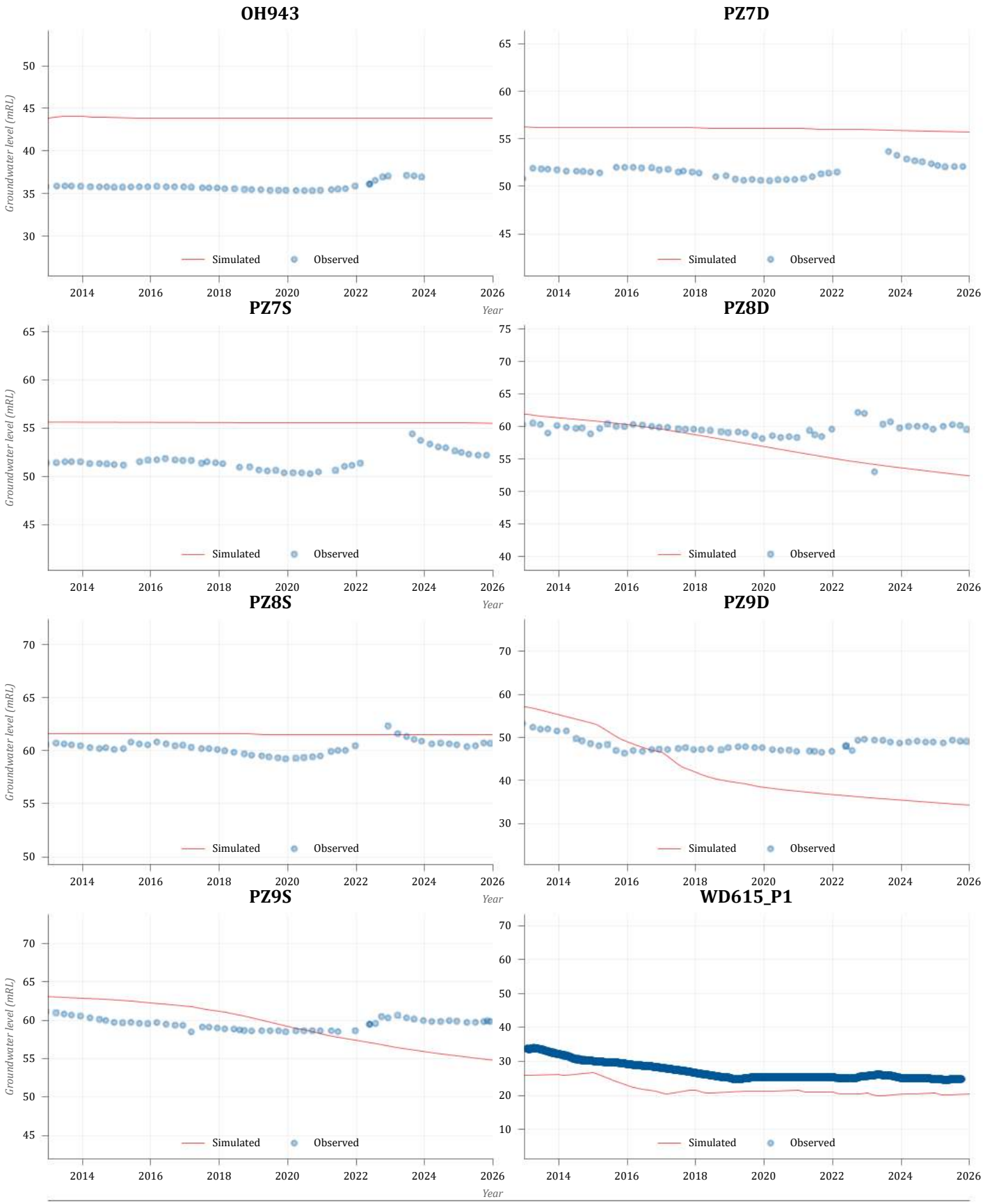
Model verification graphs

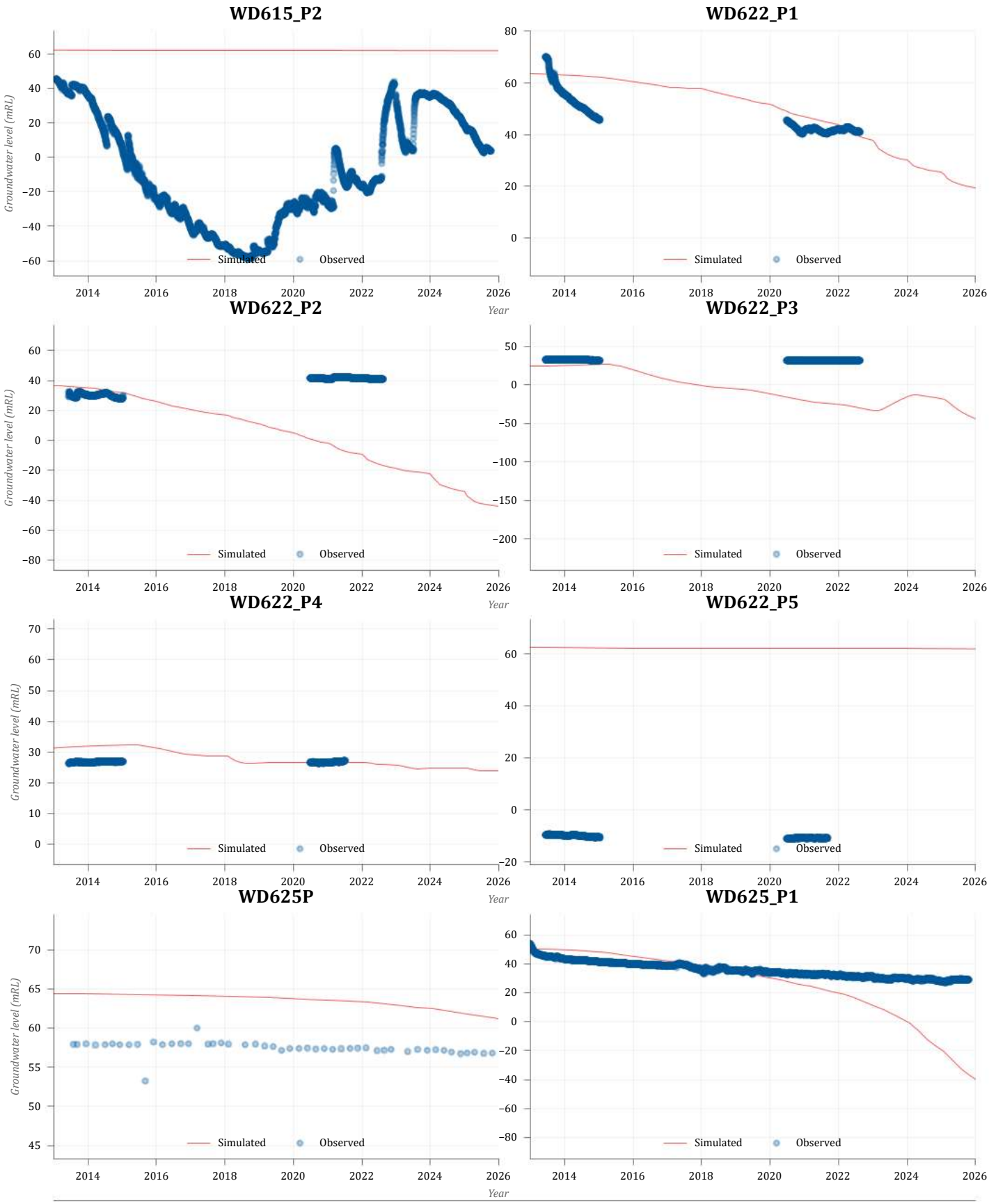

GW9706
GW9707
GW9708
GW9709
GW98_MTCL_1
GW98_MTCL_2
MTD518_P1
MTD518_P2
Groundwater level (mRL)
Year
Simulated
Observed

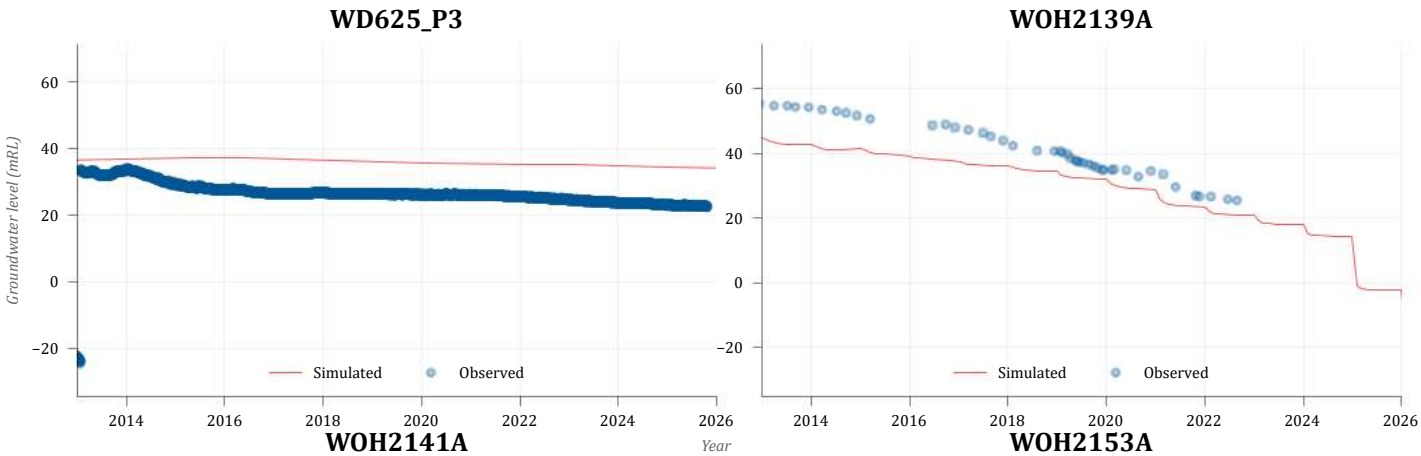

MTD518_P3
MTD605_P1
MTD605_P2
MTD605_P3
MTD605_P4
MTD605_P5
MTD605_P6
MTD605_P7
Groundwater level (mRL)
Year
Simulated
Observed


MTD613
MTD614_P1
MTD614_P2
MTD614_P4
OH1121
OH1122_1
OH1125_1
OH1125_3
Groundwater level (mRL)
Year
Simulated
Observed

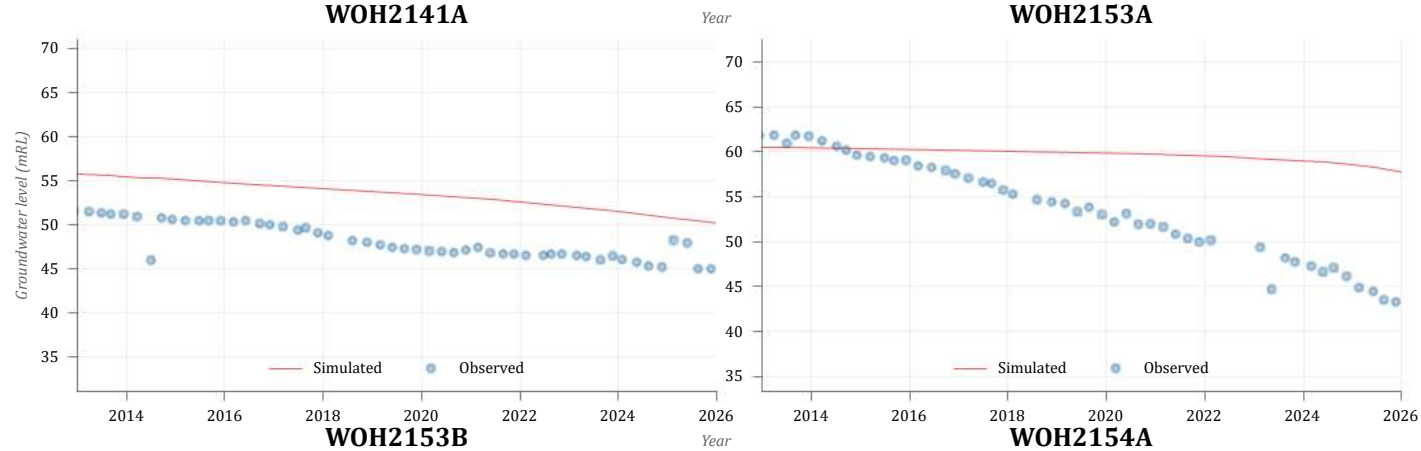

OH1126
OH1127
OH1138_1
OH1138_2
OH786
OH787
OH788
OH942
Groundwater level (mRL)
Year
Simulated
Observed


OH943
PZ7D
PZ7S
PZ8D
PZ8S
PZ9D
PZ9S
WD615_P1
Groundwater level (mRL)
Year
Simulated
Observed

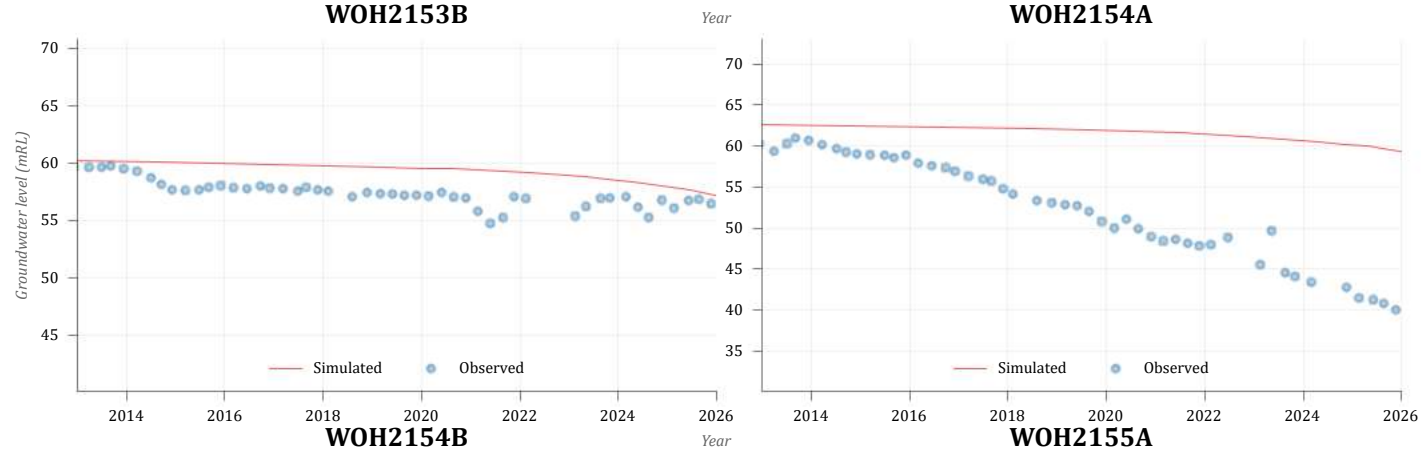

WD615_P2
WD622_P1
WD622_P2
WD622_P3
WD622_P4
WD622_P5
WD625P
WD625_P1
Groundwater level (mRL)
Year
Simulated
Observed


WD625_P3
Groundwater level (mRL)
Simulated
Observed
2014
2016
2018
2020
2022
2024
2026
Year

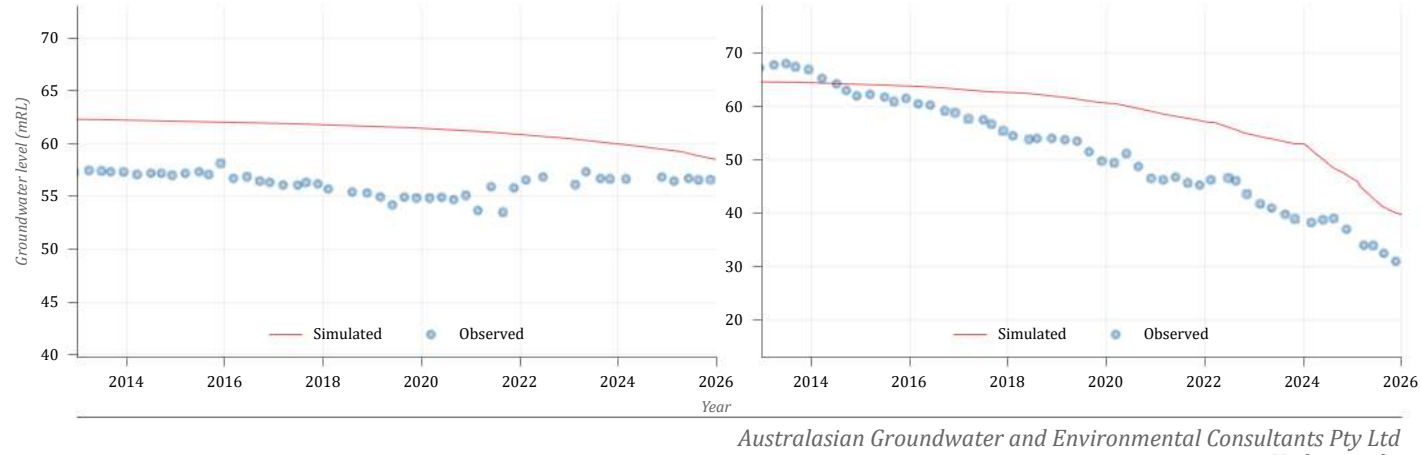
WOH2139A
Simulated
Observed


WOH2141A
Groundwater level (mRL)
Simulated
Observed
Year

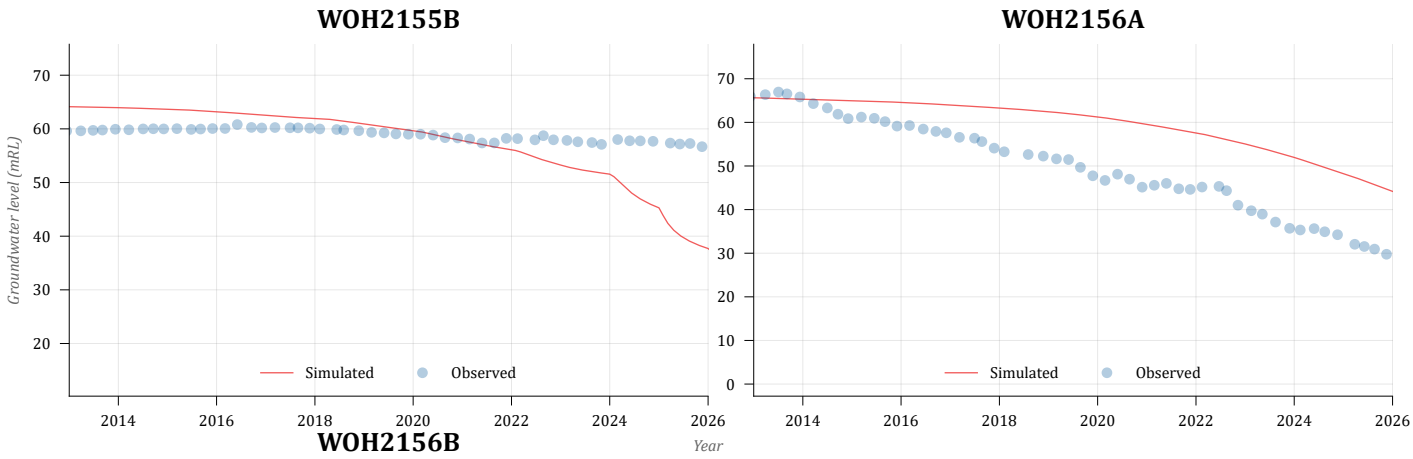
WOH2153A
Simulated
Observed

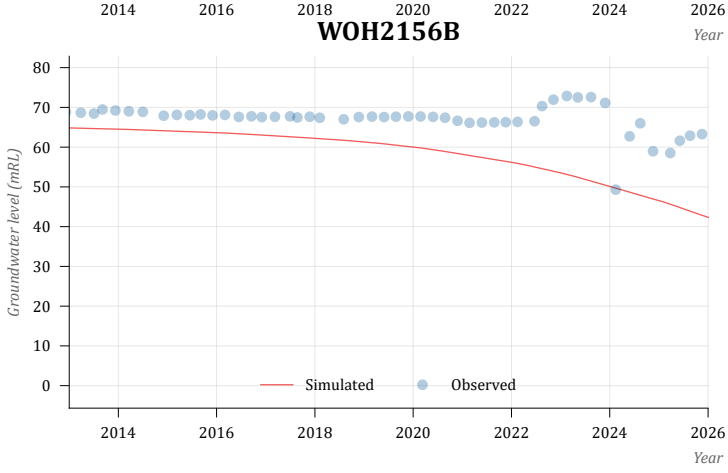

WOH2153B
Groundwater level (mRL)
Simulated
Observed
Year

WOH2154A
Simulated
Observed


WOH2154B
Groundwater level (mRL)
Simulated
Observed
Year

WOH2155A
Simulated
Observed


WOH2155B
Groundwater level (mRL)
70
60
50
40
30
20
Simulated
Observed
2014
2016
2018
2020
2022
2024
2026
Year
WOH2156A
70
60
50
40
30
20
10
0
Simulated
Observed
2014
2016
2018
2020
2022
2024
2026


WOH2156B
Groundwater level (mRL)
80
70
60
50
40
30
20
10
0
Simulated
Observed
2014
2016
2018
2020
2022
2024
2026
Year

Appendix D

VWP figures



Figure D 1 VWP WD609A pressure head

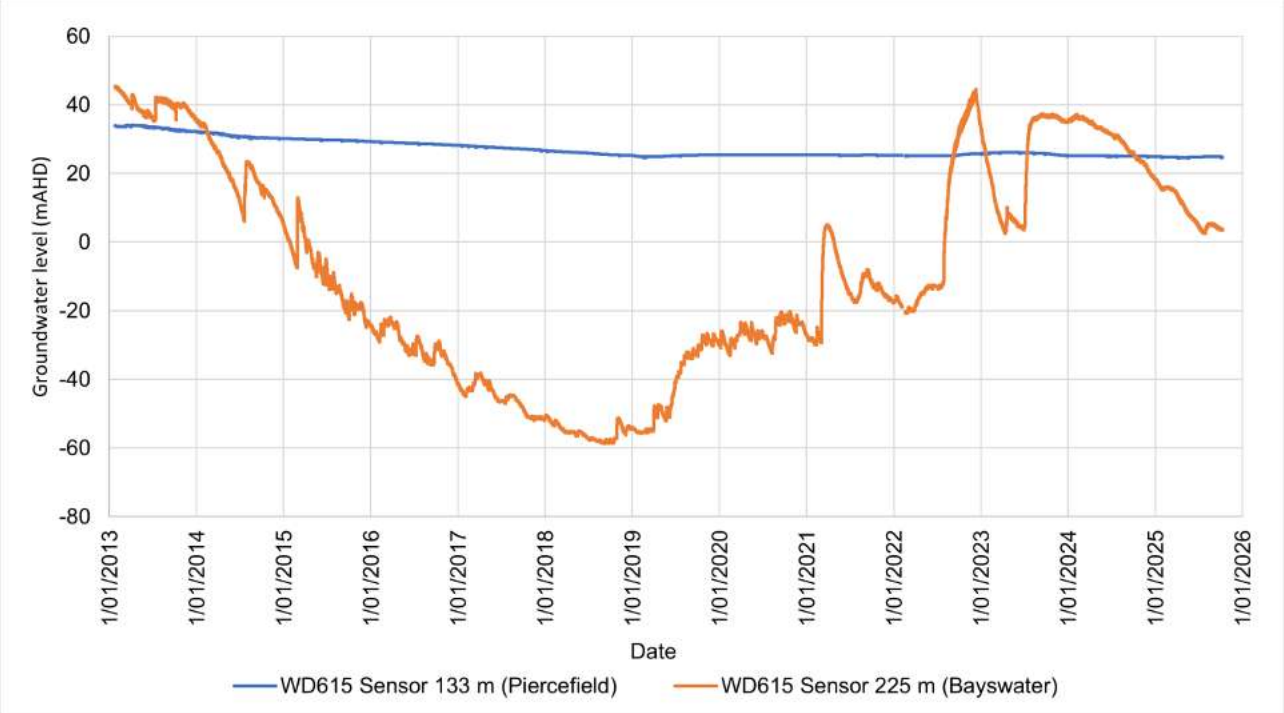


Figure D 2 VWP WD615 pressure heads

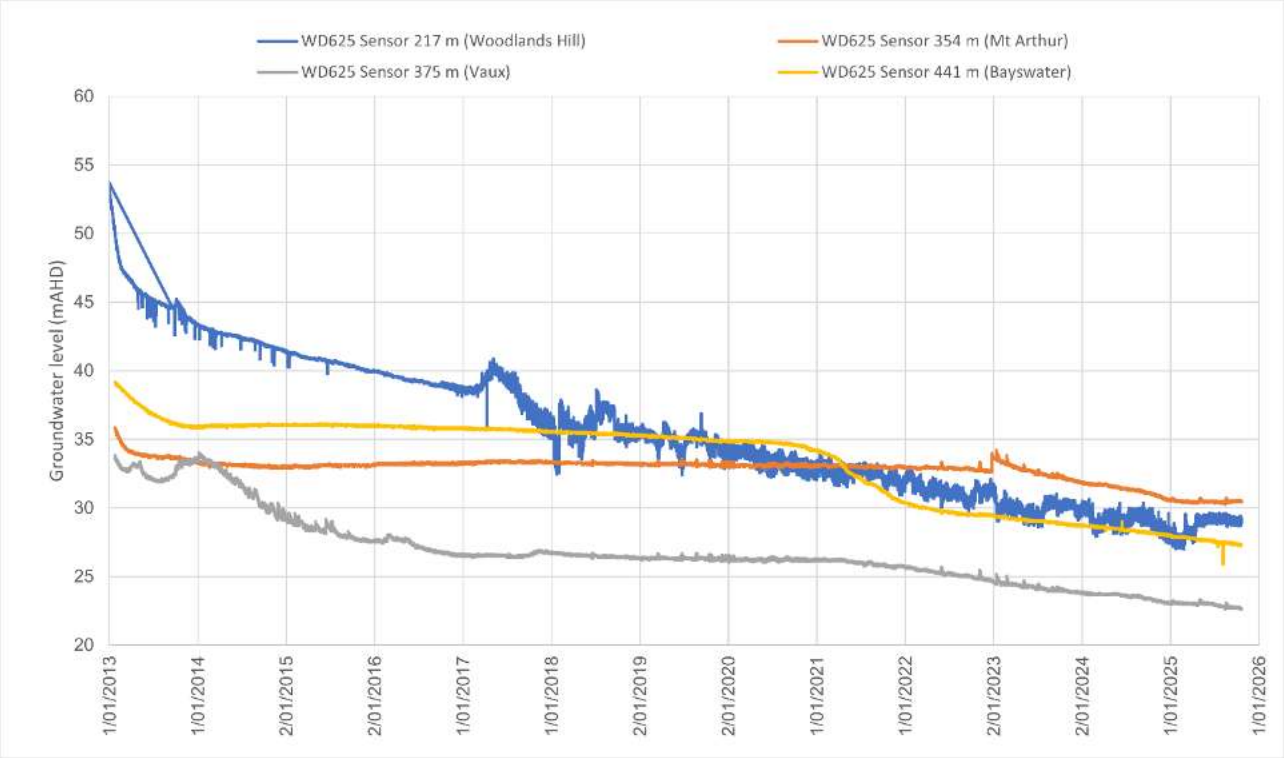


Figure D 3 VWP WD625 pressure heads

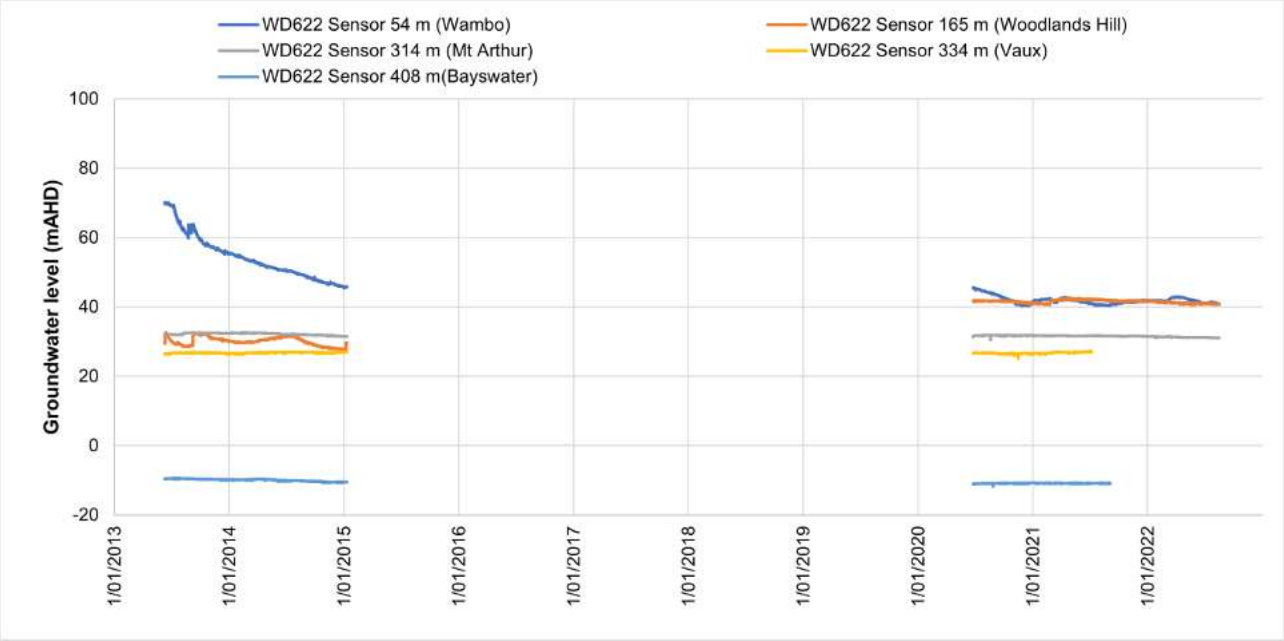


Figure D 4 VWP WD622 pressure heads

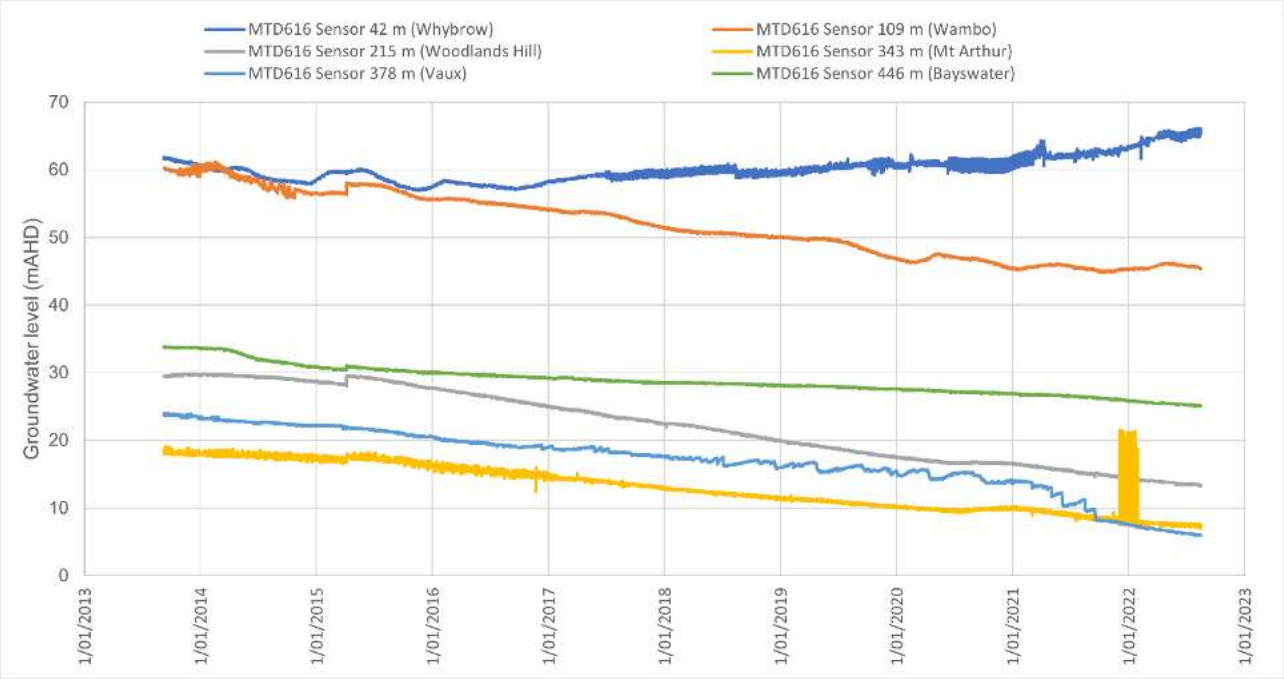


Figure D 5 VWP MTD616 pressure heads

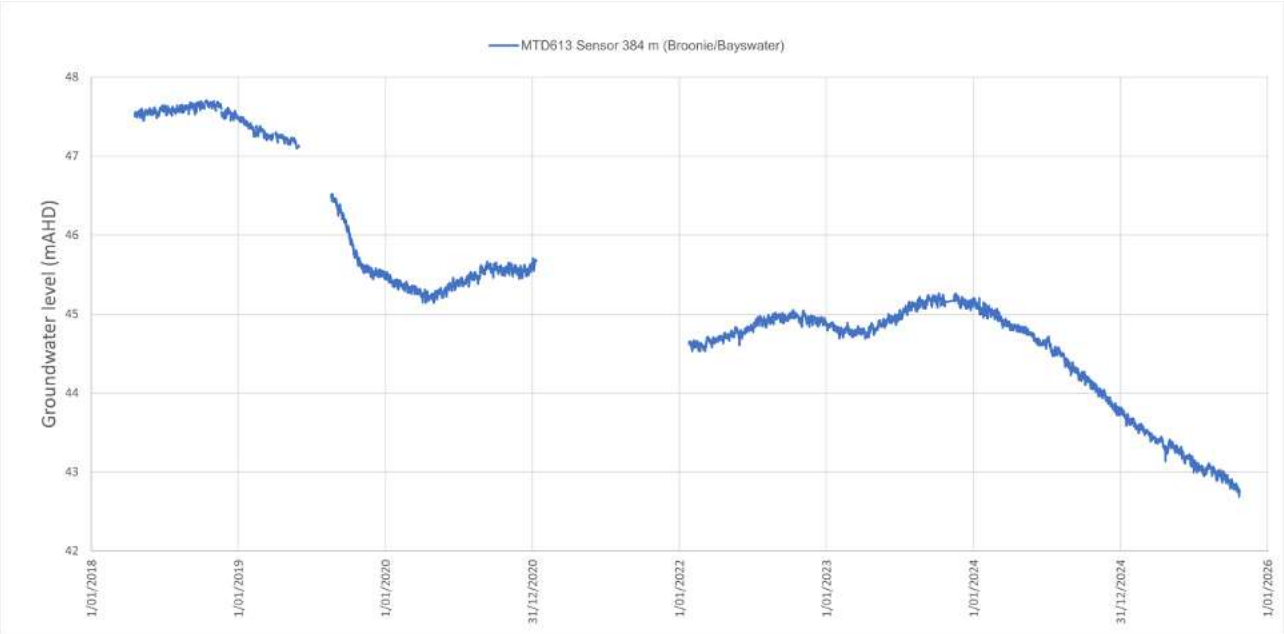


Figure D 6 VWP MTD613 pressure head

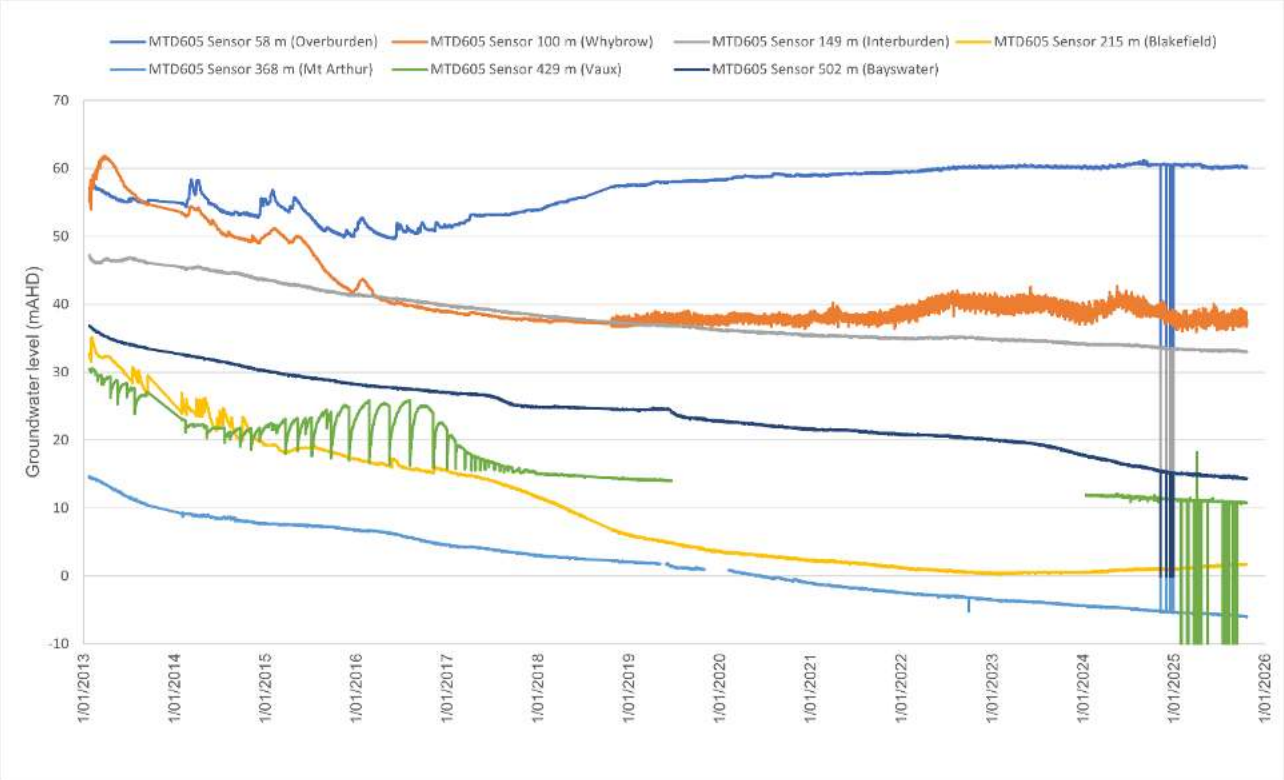


Figure D 7 VWP MTD605 pressure heads

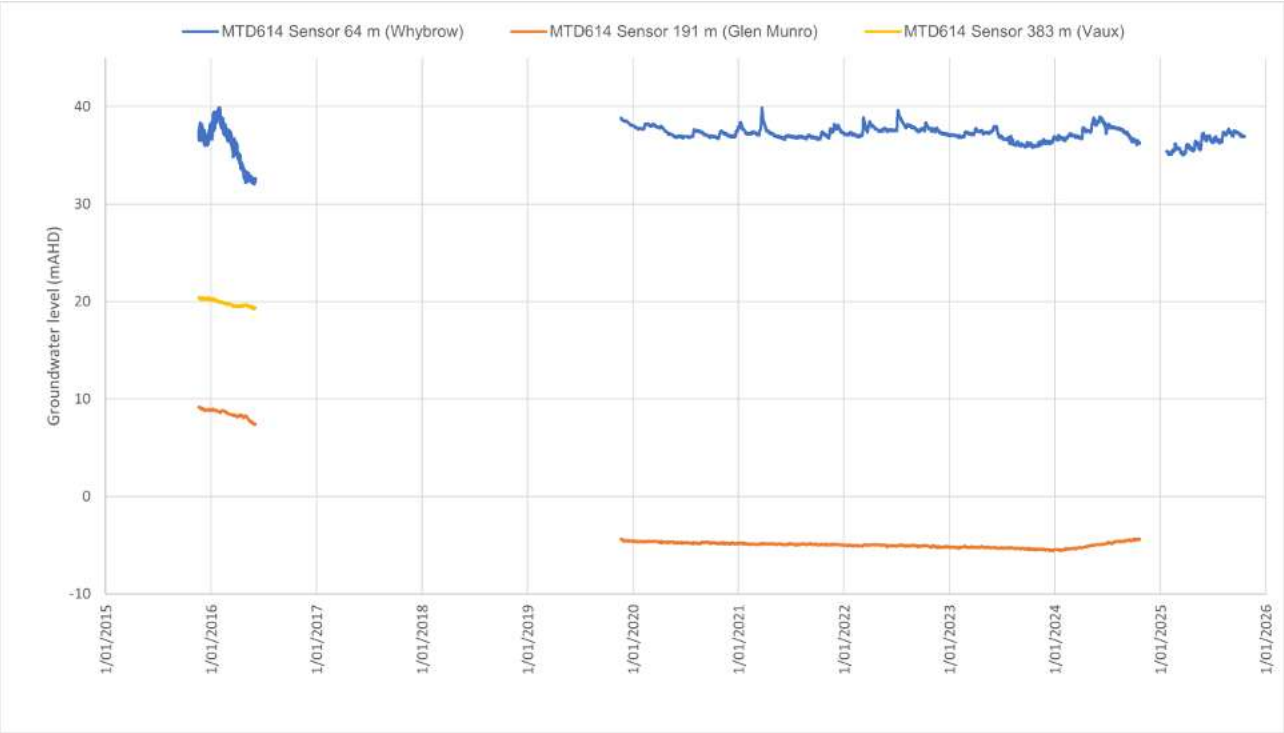


Figure D 8 VWP MTD614 pressure heads

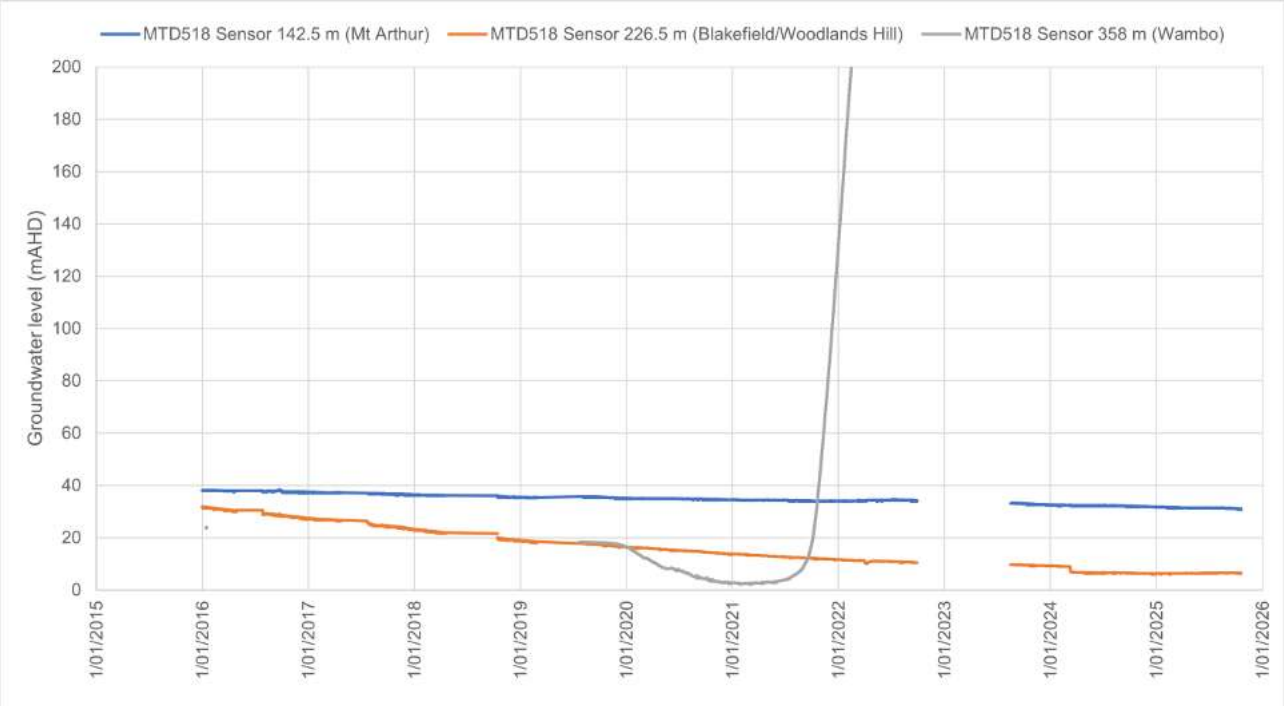


Figure D 9 VWP MTD518 pressure heads

Appendix E

Annual groundwater quality laboratory results

Table E 1 Annual groundwater quality laboratory results - 2024

Sample Point	Date	Time	EC Field (uS/cm (25TRef))	pH Field	RL Standing Water Level (m)	Water Temp (Deg C)	TDS - Total (mg/l)	Hydroxide Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Acidity as CaCO3	SO4 - Total (mg/l)	Cl- (mg/l)	Ca - Total (mg/l)	Mg - Total (mg/l)	Na - Total (mg/l)
GW 9706	20/03/2024	1:15:00 PM	4,350	7.00	61.57	22	-	-	-	-	-	-	-	-	-	-	-
GW 9706	19/06/2024	10:10:00 AM	4,430	7.00	62.22	21.9	-	<1	<1	504	504	-	869	627	124	101	826
GW 9706	19/09/2024	11:05:00 AM	4,540	7.00	62.12	18.5	-	-	-	-	-	-	-	-	-	-	-
GW 9706	5/12/2024	1:45:00 PM	4,270	6.90	61.76	22.4	-	-	-	-	-	-	-	-	-	-	-
GW 9707	26/03/2024	10:20:00 AM	20,700	6.70	59.08	23	-	-	-	-	-	-	-	-	-	-	-
GW 9707	19/06/2024	11:00:00 AM	19,650	6.80	59.66	18.6	-	<1	<1	601	601	-	5,180	4,880	552	747	3,970
GW 9707	19/09/2024	10:10:00 AM	18,560	7.00	59.78	18.7	-	-	-	-	-	-	-	-	-	-	-
GW 9707	10/12/2024	9:00:00 AM	19,320	6.80	59.49	18.8	-	-	-	-	-	-	-	-	-	-	-
GW 9708	26/03/2024	9:20:00 AM	13,480	6.70	61.44	20.2	-	-	-	-	-	-	-	-	-	-	-
GW 9708	19/06/2024	11:20:00 AM	12,470	6.80	61.8	22	-	<1	<1	685	685	-	4,720	1,680	520	490	2,440
GW 9708	19/09/2024	9:30:00 AM	12,410	6.80	61.86	18.7	-	-	-	-	-	-	-	-	-	-	-
GW 9708	9/12/2024	12:30:00 PM	12,650	6.70	61.57	18	-	-	-	-	-	-	-	-	-	-	-
GW 9709	20/03/2024	11:50:00 AM	22,200	6.70	51.13	22.2	-	-	-	-	-	-	-	-	-	-	-
GW 9709	19/06/2024	8:30:00 AM	21,000	6.70	51.13	18.6	-	<1	<1	809	809	-	5,660	5,020	607	806	4,110
GW 9709	19/09/2024	9:00:00 AM	20,900	6.70	51.23	20.1	-	-	-	-	-	-	-	-	-	-	-
GW 9709	10/12/2024	8:30:00 AM	21,500	7.00	51.03	19.4	-	-	-	-	-	-	-	-	-	-	-
GW98 MTCL 1	26/03/2024	9:00:00 AM	6,690	7.20	67.65	19.9	-	-	-	-	-	-	-	-	-	-	-
GW98 MTCL 1	19/06/2024	11:15:00 AM	5,720	7.40	67.75	18.5	-	<1	<1	918	918	-	812	825	56	89	1,240
GW98 MTCL 1	19/09/2024	9:15:00 AM	5,500	7.20	67.38	19.6	-	-	-	-	-	-	-	-	-	-	-
GW98 MTCL 1	10/12/2024	8:40:00 AM	5,550	7.30	66.94	18.3	-	-	-	-	-	-	-	-	-	-	-
GW98 MTCL 2	20/03/2024	12:20:00 PM	15,440	6.70	69.49	20	-	-	-	-	-	-	-	-	-	-	-
GW98 MTCL 2	19/06/2024	9:00:00 AM	15,250	6.70	69.52	19.1	-	<1	<1	641	641	-	4,270	3,380	627	570	2,780
GW98 MTCL 2	19/09/2024	10:25:00 AM	15,100	6.70	69.67	19.4	-	-	-	-	-	-	-	-	-	-	-
GW98 MTCL 2	5/12/2024	1:10:00 PM	15,070	6.60	69.71	19	-	-	-	-	-	-	-	-	-	-	-
MB15MTW01D	7/02/2024	11:25:00 AM	3,960	6.00	56.963	19.4	-	-	-	-	-	-	-	-	-	-	-
MB15MTW01D	21/05/2024	8:35:00 AM	3,850	6.10	57.943	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW01D	14/08/2024	11:00:00 AM	3,440	6.20	57.643	-	-	<1	<1	34	34	-	107	910	108	72	434
MB15MTW01D	21/11/2024	11:40:00 AM	3,950	6.20	57.303	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW01S	1/02/2024	2:00:00 PM	2,850	6.30	57.188	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW01S	21/05/2024	8:10:00 AM	1,542	6.30	58.128	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW01S	14/08/2024	10:40:00 AM	1,749	6.40	57.858	-	-	<1	<1	56	56	-	50	486	39	40	193
MB15MTW01S	21/11/2024	11:15:00 AM	2,300	6.30	57.418	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW02D	7/02/2024	10:50:00 AM	12,120	7.60	56.661	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW02D	21/05/2024	11:25:00 AM	12,010	7.60	56.731	22.6	-	-	-	-	-	-	-	-	-	-	-
MB15MTW02D	14/08/2024	8:50:00 AM	13,110	7.70	56.731	20.9	-	<1	<1	1,400	1400	-	<10	3,300	39	26	3,010
MB15MTW02D	21/11/2024	12:30:00 PM	12,970	7.70	56.601	17.5	-	-	-	-	-	-	-	-	-	-	-
MB15MTW02S	7/02/2024	10:40:00 AM	2,770	6.70	56.12	20.1	-	-	-	-	-	-	-	-	-	-	-
MB15MTW02S	21/05/2024	11:10:00 AM	2,740	6.70	57.12	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW02S	14/08/2024	8:30:00 AM	2,620	6.70	56.89	-	-	<1	<1	184	184	-	12	687	39	33	416
MB15MTW02S	21/11/2024	12:15:00 PM	2,580	6.60	56.33	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW03	7/02/2024	9:40:00 AM	12,310	6.90	55.317	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW03	21/05/2024	12:00:00 PM	12,370	6.90	55.377	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW03	14/08/2024	1:00:00 PM	11,970	6.90	55.427	-	-	<1	<1	923	923	-	380	3,590	249	227	2,310
MB15MTW03	12/11/2024	1:00:00 PM	12,340	6.90	55.327	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW04	1/02/2024	8:50:00 AM	-	-	dry	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW04	20/05/2024	8:40:00 AM	-	-	dry	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW04	13/08/2024	9:30:00 AM	-	-	dry	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW04	21/11/2024	10:00:00 AM	-	-	dry	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW05	1/02/2024	8:25:00 AM	-	-	dry	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW05	20/05/2024	8:20:00 AM	-	-	dry	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW05	13/08/2024	9:15:00 AM	-	-	dry	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW05	21/11/2024	10:15:00 AM	-	-	dry	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW06	7/02/2024	8:35:00 AM	126	5.90	Top RL not provided	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW06	21/05/2024	2:25:00 PM	101	6.20	Top RL not provided	-	-	-	-	-	-	-	-	-	-	-	-

Table E 1 Annual groundwater quality laboratory results - 2024 Continued

Sample Point	Date	Time	K - Total (mg/l)	Al - Total (mg/l)	As - Total (mg/l)	Cd - Total (mg/l)	Cu - Total (mg/l)	Pb - Total (mg/l)	Ni - Total (mg/l)	Se (mg/l)	Zn - Total (mg/l)	B (mg/l)	Hg - Total (mg/l)	Mo (mg/l)	V (mg/l)	Cr (mg/l)	Total anions	Total Cations	Ionic Balance
GW 9706	20/03/2024	1:15:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW 9706	19/06/2024	10:10:00 AM	13	<0.01	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	0.14	<0.0001	----	----	----	45.8	50.8	5.08
GW 9706	19/09/2024	11:05:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW 9706	5/12/2024	1:45:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW 9707	26/03/2024	10:20:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW 9707	19/06/2024	11:00:00 AM	21	0.04	<0.001	0.0002	0.001	<0.001	0.009	<0.01	0.005	0.38	<0.0001	----	----	----	258	262	0.91
GW 9707	19/09/2024	10:10:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW 9707	10/12/2024	9:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW 9708	26/03/2024	9:20:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW 9708	19/06/2024	11:20:00 AM	24	0.07	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	0.27	<0.0001	----	----	----	159	173	4.11
GW 9708	19/09/2024	9:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW 9708	9/12/2024	12:30:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW 9709	20/03/2024	11:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW 9709	19/06/2024	8:30:00 AM	22	0.06	<0.001	<0.0001	0.003	<0.001	0.006	<0.01	0.013	0.31	<0.0001	----	----	----	276	276	0.06
GW 9709	19/09/2024	9:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW 9709	10/12/2024	8:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW98 MTCL 1	26/03/2024	9:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW98 MTCL 1	19/06/2024	11:15:00 AM	18	0.06	<0.001	<0.0001	<0.001	<0.001	0.002	0.02	0.009	0.16	<0.0001	----	----	----	58.5	64.5	4.87
GW98 MTCL 1	19/09/2024	9:15:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW98 MTCL 1	10/12/2024	8:40:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW98 MTCL 2	20/03/2024	12:20:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW98 MTCL 2	19/06/2024	9:00:00 AM	42	<0.01	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	0.21	<0.0001	----	----	----	197	200	0.79
GW98 MTCL 2	19/09/2024	10:25:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GW98 MTCL 2	5/12/2024	1:10:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW01D	7/02/2024	11:25:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW01D	21/05/2024	8:35:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW01D	14/08/2024	11:00:00 AM	8	0.09	<0.001	<0.0001	<0.001	<0.001	0.004	<0.01	0.028	<0.05	<0.0001	-	-	-	28.6	30.4	3.09
MB15MTW01D	21/11/2024	11:40:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW01S	1/02/2024	2:00:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW01S	21/05/2024	8:10:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW01S	14/08/2024	10:40:00 AM	5	0.02	0.002	<0.0001	<0.001	<0.001	0.003	<0.01	0.01	<0.05	<0.0001	-	-	-	15.9	13.8	7.12
MB15MTW01S	21/11/2024	11:15:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW02D	7/02/2024	10:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW02D	21/05/2024	11:25:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW02D	14/08/2024	8:50:00 AM	9	0.34	<0.001	<0.0001	0.002	<0.001	0.002	<0.01	0.027	0.23	<0.0001	-	-	-	121	135	5.53
MB15MTW02D	21/11/2024	12:30:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW02S	7/02/2024	10:40:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW02S	21/05/2024	11:10:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW02S	14/08/2024	8:30:00 AM	6	<0.01	0.001	<0.0001	<0.001	<0.001	0.004	<0.01	0.013	<0.05	<0.0001	-	-	-	23.3	22.9	0.85
MB15MTW02S	21/11/2024	12:15:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW03	7/02/2024	9:40:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW03	21/05/2024	12:00:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW03	14/08/2024	1:00:00 PM	20	0.06	<0.001	<0.0001	<0.001	<0.001	0.004	<0.01	<0.005	0.1	<0.0001	-	-	-	128	132	1.72
MB15MTW03	12/11/2024	1:00:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW04	1/02/2024	8:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW04	20/05/2024	8:40:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW04	13/08/2024	9:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW04	21/11/2024	10:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW05	1/02/2024	8:25:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW05	20/05/2024	8:20:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW05	13/08/2024	9:15:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW05	21/11/2024	10:15:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW06	7/02/2024	8:35:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW06	21/05/2024	2:25:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E 1 Annual groundwater quality laboratory results - 2024 Continued

Sample Point	Date	Time	EC Field (uS/cm (25TRef))	pH Field	RL Standing Water Level (m)	Water Temp (Deg C)	TDS - Total (mg/l)	Hydroxide Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Acidity as CaCO3	SO4 - Total (mg/l)	Cl- (mg/l)	Ca - Total (mg/l)	Mg - Total (mg/l)	Na - Total (mg/l)
MB15MTW06	15/08/2024	10:10:00 AM	110	6.10	Top RL not provided	-	-	<1	<1	23	23	-	6	14	4	<1	16
MB15MTW06	21/11/2024	9:00:00 AM	115	6.00	Top RL not provided	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW07	1/02/2024	10:05:00 AM	-	-	dry	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW07	20/05/2024	9:55:00 AM	-	-	dry	18.9	-	-	-	-	-	-	-	-	-	-	-
MB15MTW07	13/08/2024	11:10:00 AM	-	-	dry	20.1	-	-	-	-	-	-	-	-	-	-	-
MB15MTW07	18/11/2024	1:15:00 PM	-	-	dry	19.3	-	-	-	-	-	-	-	-	-	-	-
MB15MTW08	1/02/2024	9:45:00 AM	-	-	dry	20.3	-	-	-	-	-	-	-	-	-	-	-
MB15MTW08	20/05/2024	9:30:00 AM	-	-	dry	21.6	-	-	-	-	-	-	-	-	-	-	-
MB15MTW08	13/08/2024	11:00:00 AM	-	-	dry	20.9	-	-	-	-	-	-	-	-	-	-	-
MB15MTW08	18/11/2024	1:05:00 PM	-	-	dry	20.9	-	-	-	-	-	-	-	-	-	-	-
MB15MTW09	1/02/2024	9:35:00 AM	-	-	dry	20.6	-	-	-	-	-	-	-	-	-	-	-
MB15MTW09	21/05/2024	1:20:00 PM	-	-	dry	20.6	-	-	-	-	-	-	-	-	-	-	-
MB15MTW09	13/08/2024	10:35:00 AM	-	-	Top RL not provided	21.6	-	-	-	-	-	-	-	-	-	-	-
MB15MTW09	18/11/2024	1:00:00 PM	-	-	dry	21.5	-	-	-	-	-	-	-	-	-	-	-
MB15MTW10	1/02/2024	9:55:00 AM	-	-	dry	21.7	-	-	-	-	-	-	-	-	-	-	-
MB15MTW10	20/05/2024	9:50:00 AM	-	-	dry	22	-	-	-	-	-	-	-	-	-	-	-
MB15MTW10	13/08/2024	11:20:00 AM	-	-	dry	23.3	-	-	-	-	-	-	-	-	-	-	-
MB15MTW10	18/11/2024	1:20:00 PM	-	-	dry	21.2	-	-	-	-	-	-	-	-	-	-	-
MB15MTW11	1/02/2024	9:10:00 AM	-	-	dry	22.1	-	-	-	-	-	-	-	-	-	-	-
MB15MTW11	28/05/2024	9:10:00 AM	-	-	dry	20.9	-	-	-	-	-	-	-	-	-	-	-
MB15MTW11	13/08/2024	10:10:00 AM	-	-	dry	20.7	-	-	-	-	-	-	-	-	-	-	-
MB15MTW11	21/11/2024	10:30:00 AM	-	-	dry	19	-	-	-	-	-	-	-	-	-	-	-
MBW01	7/02/2024	1:10:00 PM	10,500	7.40	57.44	20.9	-	-	-	-	-	-	-	-	-	-	-
MBW01	20/05/2024	12:45:00 PM	10,050	7.40	57.35	20.8	-	-	-	-	-	-	-	-	-	-	-
MBW01	15/08/2024	11:20:00 AM	9,520	7.40	57.36	20.9	-	<1	<1	720	720	-	236	2,810	34	96	1,940
MBW01	21/11/2024	12:50:00 PM	11,860	7.30	57.28	20.6	-	-	-	-	-	-	-	-	-	-	-
MBW02	1/02/2024	12:35:00 PM	9,760	7.20	55.2	22.3	-	-	-	-	-	-	-	-	-	-	-
MBW02	20/05/2024	12:10:00 PM	10,110	7.20	55.07	20.6	-	-	-	-	-	-	-	-	-	-	-
MBW02	13/08/2024	1:30:00 PM	10,090	7.20	55.08	18.2	-	<1	<1	1,610	1610	-	<10	2,290	59	35	2,200
MBW02	12/11/2024	11:15:00 AM	10,140	7.20	54.98	20.8	-	-	-	-	-	-	-	-	-	-	-
MBW03	1/02/2024	12:30:00 PM	728	6.90	55.27	20.2	-	-	-	-	-	-	-	-	-	-	-
MBW03	20/05/2024	12:20:00 PM	8,830	7.20	54.99	20	-	-	-	-	-	-	-	-	-	-	-
MBW03	13/08/2024	2:00:00 PM	9,030	7.30	54.95	19.5	-	<1	<1	2,280	2280	-	<10	1,690	26	20	2,110
MBW03	12/11/2024	11:30:00 AM	9,340	7.20	54.9	22.4	-	-	-	-	-	-	-	-	-	-	-
MBW04	1/02/2024	1:00:00 PM	10,310	7.20	47.99	17.8	-	-	-	-	-	-	-	-	-	-	-
MBW04	20/05/2024	12:30:00 PM	13,400	7.30	48.14	-	-	-	-	-	-	-	-	-	-	-	-
MBW04	13/08/2024	2:15:00 PM	13,050	7.50	48.04	-	-	<1	<1	1,530	1530	-	288	3,590	44	131	2,610
MBW04	12/11/2024	11:45:00 AM	13,020	7.40	48.01	-	-	-	-	-	-	-	-	-	-	-	-
MBW6A	1/02/2024	11:50:00 AM	1,892	6.20	Top RL not provided	-	-	-	-	-	-	-	-	-	-	-	-
MBW6A	21/05/2024	10:20:00 AM	1,720	6.20	Top RL not provided	-	-	-	-	-	-	-	-	-	-	-	-
MBW6A	14/08/2024	9:30:00 AM	1,853	6.30	Top RL not provided	-	-	<1	<1	108	108	-	43	495	34	38	275
MBW6A	12/11/2024	10:30:00 AM	1,989	6.20	Top RL not provided	21.1	-	-	-	-	-	-	-	-	-	-	-
MTD605P	7/02/2024	11:50:00 AM	16,980	7.20	62.7	22.7	-	-	-	-	-	-	-	-	-	-	-
MTD605P	21/05/2024	9:10:00 AM	17,220	7.20	62.6	20.1	-	-	-	-	-	-	-	-	-	-	-
MTD605P	14/08/2024	11:30:00 AM	17,240	7.40	62.65	19.7	-	<1	<1	2,040	2040	-	968	4,180	54	27	4,270
MTD605P	12/11/2024	9:35:00 AM	17,700	7.20	62.73	22.9	-	-	-	-	-	-	-	-	-	-	-
MTD614P	20/03/2024	10:35:00 AM	6,870	7.20	56.02	18.9	-	-	-	-	-	-	-	-	-	-	-
MTD614P	20/06/2024	9:40:00 AM	6,460	7.30	56.04	18.9	-	<1	<1	1,680	1680	----	125	1,130	70	175	1,440
MTD614P	19/09/2024	12:50:00 PM	6,600	7.20	56.22	18.7	-	-	-	-	-	-	-	-	-	-	-
MTD614P	10/12/2024	7:20:00 AM	6,540	7.20	56.03	16.8	-	-	-	-	-	-	-	-	-	-	-
OH1121	19/03/2024	1:00:00 PM	8,700	7.00	36.41	-	-	-	-	-	-	-	-	-	-	-	-
OH1121	19/06/2024	12:30:00 PM	8,270	7.00	36.09	-	-	<1	<1	673	673	-	230	2,510	191	176	1,580
OH1121	18/09/2024	10:50:00 AM	8,530	7.20	35.98	-	-	-	-	-	-	-	-	-	-	-	-
OH1121	9/12/2024	11:45:00 AM	9,000	7.00	35.89	-	-	-	-	-	-	-	-	-	-	-	-
OH1122 (1)	20/03/2024	11:10:00 AM	-	-	dry	-	-	-	-	-	-	-	-	-	-	-	-
OH1122 (1)	14/06/2024	10:45:00 AM	-	-	dry	21.1	-	-	-	-	-	-	-	-	-	-	-

Table E 1 Annual groundwater quality laboratory results - 2024 Continued

Sample Point	Date	Time	K - Total (mg/l)	Al - Total (mg/l)	As - Total (mg/l)	Cd - Total (mg/l)	Cu - Total (mg/l)	Pb - Total (mg/l)	Ni - Total (mg/l)	Se (mg/l)	Zn - Total (mg/l)	B (mg/l)	Hg - Total (mg/l)	Mo (mg/l)	V (mg/l)	Cr (mg/l)	Total anions	Total Cations	Ionic Balance
MB15MTW06	15/08/2024	10:10:00 AM	2	1.6	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.05	<0.0001	-	-	-	0.98	0.95	----
MB15MTW06	21/11/2024	9:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW07	1/02/2024	10:05:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW07	20/05/2024	9:55:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW07	13/08/2024	11:10:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW07	18/11/2024	1:15:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW08	1/02/2024	9:45:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW08	20/05/2024	9:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW08	13/08/2024	11:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW08	18/11/2024	1:05:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW09	1/02/2024	9:35:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW09	21/05/2024	1:20:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW09	13/08/2024	10:35:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW09	18/11/2024	1:00:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW10	1/02/2024	9:55:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW10	20/05/2024	9:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW10	13/08/2024	11:20:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW10	18/11/2024	1:20:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW11	1/02/2024	9:10:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW11	28/05/2024	9:10:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW11	13/08/2024	10:10:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MB15MTW11	21/11/2024	10:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBW01	7/02/2024	1:10:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBW01	20/05/2024	12:45:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBW01	15/08/2024	11:20:00 AM	19	0.44	0.001	<0.0001	0.001	<0.001	0.003	<0.01	0.009	<0.05	<0.0001	-	-	-	98.6	94.5	2.12
MBW01	21/11/2024	12:50:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBW02	1/02/2024	12:35:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBW02	20/05/2024	12:10:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBW02	13/08/2024	1:30:00 PM	16	<0.01	0.013	<0.0001	<0.001	<0.001	0.003	<0.01	<0.005	0.17	<0.0001	-	-	-	96.8	102	2.6
MBW02	12/11/2024	11:15:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBW03	1/02/2024	12:30:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBW03	20/05/2024	12:20:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBW03	13/08/2024	2:00:00 PM	16	3.45	0.001	<0.0001	<0.001	0.011	0.004	<0.01	0.023	0.17	<0.0001	-	-	-	93.2	95.1	1.01
MBW03	12/11/2024	11:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBW04	1/02/2024	1:00:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBW04	20/05/2024	12:30:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBW04	13/08/2024	2:15:00 PM	20	0.19	<0.001	<0.0001	<0.001	<0.001	0.001	<0.01	<0.005	0.12	<0.0001	-	-	-	138	127	4.08
MBW04	12/11/2024	11:45:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBW6A	1/02/2024	11:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBW6A	21/05/2024	10:20:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MBW6A	14/08/2024	9:30:00 AM	4	5.31	0.001	<0.0001	0.008	0.006	0.012	<0.01	0.147	0.08	<0.0001	-	-	-	17	16.9	0.38
MBW6A	12/11/2024	10:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTD605P	7/02/2024	11:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTD605P	21/05/2024	9:10:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTD605P	14/08/2024	11:30:00 AM	12	0.04	<0.001	<0.0001	<0.001	<0.001	0.005	<0.01	<0.005	0.3	<0.0001	-	-	-	179	191	3.28
MTD605P	12/11/2024	9:35:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTD614P	20/03/2024	10:35:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTD614P	20/06/2024	9:40:00 AM	13	0.04	0.002	<0.0001	0.001	<0.001	0.002	<0.01	<0.005	0.11	<0.0001	----	----	----	68	80.9	8.61
MTD614P	19/09/2024	12:50:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTD614P	10/12/2024	7:20:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1121	19/03/2024	1:00:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1121	19/06/2024	12:30:00 PM	14	0.06	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	0.09	<0.0001	----	----	----	89	93.1	2.23
OH1121	18/09/2024	10:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1121	9/12/2024	11:45:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1122 (1)	20/03/2024	11:10:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1122 (1)	14/06/2024	10:45:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E 1 Annual groundwater quality laboratory results - 2024 Continued

Sample Point	Date	Time	EC Field (uS/cm (25TRef))	pH Field	RL Standing Water Level (m)	Water Temp (Deg C)	TDS - Total (mg/l)	Hydroxide Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Acidity as CaCO3	SO4 - Total (mg/l)	Cl- (mg/l)	Ca - Total (mg/l)	Mg - Total (mg/l)	Na - Total (mg/l)
OH1122 (1)	19/09/2024	1:15:00 PM	-	-	dry	21.5	-	-	-	-	-	-	-	-	-	-	-
OH1122 (1)	5/12/2024	11:40:00 AM	-	-	dry	21.1	-	-	-	-	-	-	-	-	-	-	-
OH1125 (1)	19/03/2024	8:30:00 AM	13,670	6.70	49.5	21.1	-	-	-	-	-	-	-	-	-	-	-
OH1125 (1)	20/06/2024	10:40:00 AM	13,960	6.70	50.5	-	-	<1	<1	956	956	113	778	4,460	381	615	2,240
OH1125 (1)	18/09/2024	9:20:00 AM	13,390	6.70	51.13	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (1)	10/12/2024	9:30:00 AM	13,980	6.70	50.83	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	17/01/2024	10:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	20/02/2024	10:15:00 AM	-	-	dry	21.2	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	14/03/2024	12:40:00 PM	-	-	dry	18.8	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	10/04/2024	10:50:00 AM	-	-	dry	19.7	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	16/05/2024	8:45:00 AM	-	-	dry	23.7	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	20/06/2024	10:30:00 AM	-	-	dry	20.7	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	22/07/2024	12:50:00 PM	-	-	dry	20.3	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	22/08/2024	9:55:00 AM	-	-	dry	21.9	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	12/09/2024	11:15:00 AM	-	-	dry	20.7	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	8/10/2024	8:50:00 AM	-	-	dry	19.1	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	7/11/2024	9:15:00 AM	-	-	dry	19.3	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	10/12/2024	9:20:00 AM	-	-	dry	18.9	-	-	-	-	-	-	-	-	-	-	-
OH1126	19/03/2024	9:30:00 AM	7,210	6.60	50.22	19.5	-	-	-	-	-	-	-	-	-	-	-
OH1126	20/06/2024	11:50:00 AM	8,380	6.60	49.69	20.1	-	<1	<1	616	616	98	593	2,320	78	204	1,640
OH1126	18/09/2024	10:05:00 AM	7,780	6.70	49.5	19.8	-	-	-	-	-	-	-	-	-	-	-
OH1126	18/12/2024	11:10:00 AM	7,660	6.80	49.05	21.6	-	-	-	-	-	-	-	-	-	-	-
OH1127	19/03/2024	12:45:00 PM	-	-	-	21.2	-	-	-	-	-	-	-	-	-	-	-
OH1127	19/06/2024	12:15:00 PM	-	-	-	21.3	-	-	-	-	-	-	-	-	-	-	-
OH1127	18/09/2024	10:40:00 AM	-	-	-	20.9	-	-	-	-	-	-	-	-	-	-	-
OH1127	9/12/2024	11:35:00 AM	-	-	-	22.5	-	-	-	-	-	-	-	-	-	-	-
OH1137	19/03/2024	9:00:00 AM	13,400	7.10	Top RL not provided	19.7	-	-	-	-	-	-	-	-	-	-	-
OH1137	20/06/2024	11:20:00 AM	14,070	7.20	Top RL not provided	19.2	-	<1	<1	1,130	1130	----	680	4,130	112	322	2,890
OH1137	18/09/2024	9:45:00 AM	13,980	7.10	Top RL not provided	19.9	-	-	-	-	-	-	-	-	-	-	-
OH1137	10/12/2024	10:10:00 AM	14,270	7.30	Top RL not provided	19.3	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	17/01/2024	11:50:00 AM	19,130	6.20	61.97	19.1	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	20/02/2024	9:50:00 AM	19,450	6.00	61.81	20	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	14/03/2024	1:25:00 PM	18,920	6.10	61.88	19.5	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	10/04/2024	10:25:00 AM	20,000	6.10	61.76	21.5	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	16/05/2024	9:15:00 AM	19,690	6.20	61.66	21.3	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	20/06/2024	1:20:00 PM	19,860	6.10	61.79	21.3	-	<1	<1	246	246	----	459	6,770	163	844	3,070
OH1138 (1)	22/07/2024	12:30:00 PM	19,390	6.20	61.67	18.3	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	22/08/2024	10:10:00 AM	18,700	6.10	61.76	19.2	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	12/09/2024	11:25:00 AM	18,770	6.10	61.76	20.8	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	8/10/2024	9:00:00 AM	19,130	6.10	61.69	20.7	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	7/11/2024	8:55:00 AM	19,280	6.10	61.76	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	10/12/2024	9:50:00 AM	19,490	6.10	61.67	19.7	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	17/01/2024	11:30:00 AM	12,580	6.60	58.9	22.3	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	20/02/2024	9:10:00 AM	12,430	6.50	57.56	21.1	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	14/03/2024	12:55:00 PM	12,410	6.60	57.57	19.3	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	10/04/2024	10:00:00 AM	12,760	6.60	57.45	20.9	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	16/05/2024	9:00:00 AM	12,540	6.60	57.37	20.2	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	20/06/2024	1:00:00 PM	12,400	6.60	57.35	21.5	-	<1	<1	734	734	----	590	4,020	564	480	1,780
OH1138 (2)	22/07/2024	12:40:00 PM	12,020	6.60	57.24	19	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	22/08/2024	10:00:00 AM	11,750	6.60	57.22	19	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	12/09/2024	11:30:00 AM	12,050	6.60	57.23	21.5	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	8/10/2024	9:10:00 AM	12,350	6.60	57.16	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	7/11/2024	9:05:00 AM	12,130	6.60	57.17	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	10/12/2024	10:00:00 AM	12,590	6.60	57.12	-	-	-	-	-	-	-	-	-	-	-	-
OH786	26/03/2024	11:55:00 AM	449	7.20	49.39	-	-	-	-	-	-	-	-	-	-	-	-
OH786	19/06/2024	1:10:00 PM	572	7.40	55.28	-	-	<1	<1	150	150	-	20	75	25	14	67

Table E 1 Annual groundwater quality laboratory results - 2024 Continued

Sample Point	Date	Time	K - Total (mg/l)	Al - Total (mg/l)	As - Total (mg/l)	Cd - Total (mg/l)	Cu - Total (mg/l)	Pb - Total (mg/l)	Ni - Total (mg/l)	Se (mg/l)	Zn - Total (mg/l)	B (mg/l)	Hg - Total (mg/l)	Mo (mg/l)	V (mg/l)	Cr (mg/l)	Total anions	Total Cations	Ionic Balance
OH1122 (1)	19/09/2024	1:15:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1122 (1)	5/12/2024	11:40:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (1)	19/03/2024	8:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (1)	20/06/2024	10:40:00 AM	26	0.08	<0.001	0.0001	0.005	<0.001	0.003	<0.01	0.013	0.08	<0.0001	<0.001	<0.01	<0.001	161	168	2.01
OH1125 (1)	18/09/2024	9:20:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (1)	10/12/2024	9:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	17/01/2024	10:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	20/02/2024	10:15:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	14/03/2024	12:40:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	10/04/2024	10:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	16/05/2024	8:45:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	20/06/2024	10:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	22/07/2024	12:50:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	22/08/2024	9:55:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	12/09/2024	11:15:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	8/10/2024	8:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	7/11/2024	9:15:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1125 (3)	10/12/2024	9:20:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1126	19/03/2024	9:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1126	20/06/2024	11:50:00 AM	21	33.5	0.008	0.0004	0.127	0.053	0.056	0.02	0.235	0.09	<0.0001	----	----	----	90.1	92.6	1.34
OH1126	18/09/2024	10:05:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1126	18/12/2024	11:10:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1127	19/03/2024	12:45:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1127	19/06/2024	12:15:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1127	18/09/2024	10:40:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1127	9/12/2024	11:35:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1137	19/03/2024	9:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1137	20/06/2024	11:20:00 AM	31	0.65	<0.001	<0.0001	0.011	0.002	0.006	<0.01	0.025	<0.05	0.0002	----	----	----	153	158	1.72
OH1137	18/09/2024	9:45:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1137	10/12/2024	10:10:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	17/01/2024	11:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	20/02/2024	9:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	14/03/2024	1:25:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	10/04/2024	10:25:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	16/05/2024	9:15:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	20/06/2024	1:20:00 PM	68	0.69	<0.001	0.001	0.002	<0.001	0.017	<0.01	0.022	<0.05	0.0005	----	----	----	205	213	1.78
OH1138 (1)	22/07/2024	12:30:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	22/08/2024	10:10:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	12/09/2024	11:25:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	8/10/2024	9:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	7/11/2024	8:55:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (1)	10/12/2024	9:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	17/01/2024	11:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	20/02/2024	9:10:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	14/03/2024	12:55:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	10/04/2024	10:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	16/05/2024	9:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	20/06/2024	1:00:00 PM	23	0.02	0.002	<0.0001	<0.001	<0.001	0.002	<0.01	<0.005	<0.05	<0.0001	----	----	----	140	146	1.86
OH1138 (2)	22/07/2024	12:40:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	22/08/2024	10:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	12/09/2024	11:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	8/10/2024	9:10:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	7/11/2024	9:05:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH1138 (2)	10/12/2024	10:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH786	26/03/2024	11:55:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH786	19/06/2024	1:10:00 PM	5	1.08	<0.001	0.0002	0.017	0.005	0.007	<0.01	0.358	<0.05	<0.0001	----	----	----	5.53	5.44	0.79

Table E 1 Annual groundwater quality laboratory results - 2024 Continued

Sample Point	Date	Time	EC Field (uS/cm (25TRef))	pH Field	RL Standing Water Level (m)	Water Temp (Deg C)	TDS - Total (mg/l)	Hydroxide Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Acidity as CaCO3	SO4 - Total (mg/l)	Cl- (mg/l)	Ca - Total (mg/l)	Mg - Total (mg/l)	Na - Total (mg/l)
OH786	18/09/2024	8:05:00 AM	689	7.20	53.92	-	-	-	-	-	-	-	-	-	-	-	-
OH786	10/12/2024	11:40:00 AM	873	7.20	50.53	-	-	-	-	-	-	-	-	-	-	-	-
OH787	26/03/2024	12:15:00 PM	19,400	7.30	37.93	-	-	-	-	-	-	-	-	-	-	-	-
OH787	26/06/2024	10:35:00 AM	-	-	-	22.4	-	-	-	-	-	-	-	-	-	-	-
OH787	19/09/2024	8:20:00 AM	16,450	7.50	36.88	19.8	-	<1	<1	1,190	1190	8	328	5,700	119	268	3,630
OH787	10/12/2024	12:00:00 PM	17,970	7.50	36.85	19.6	-	-	-	-	-	-	-	-	-	-	-
OH788	26/03/2024	10:50:00 AM	12,840	7.00	36.67	20.6	-	-	-	-	-	-	-	-	-	-	-
OH788	26/06/2024	10:45:00 AM	10,570	7.10	36.61	21.7	-	<1	<1	1,110	1110	-	394	2,840	98	260	2,090
OH788	19/09/2024	1:00:00 PM	10,530	7.10	36.52	20.1	-	-	-	-	-	-	-	-	-	-	-
OH788	9/12/2024	10:15:00 AM	11,190	7.00	37.38	19.5	-	-	-	-	-	-	-	-	-	-	-
OH942	26/03/2024	11:45:00 AM	24,300	6.70	46.63	19.7	-	-	-	-	-	-	-	-	-	-	-
OH942	19/06/2024	2:00:00 PM	23,300	6.80	46.55	20.3	-	<1	<1	726	726	-	961	7,760	214	759	4,730
OH942	19/09/2024	7:50:00 AM	22,500	6.80	46.95	16.4	-	-	-	-	-	-	-	-	-	-	-
OH942	10/12/2024	11:30:00 AM	23,700	6.70	47.9	22.2	-	-	-	-	-	-	-	-	-	-	-
OH943	18/03/2024	1:00:00 PM	-	-	dry	20.4	-	-	-	-	-	-	-	-	-	-	-
OH943	26/06/2024	10:50:00 AM	-	-	-	19.4	-	-	-	-	-	-	-	-	-	-	-
OH943	18/09/2024	12:55:00 PM	-	-	-	17.8	-	-	-	-	-	-	-	-	-	-	-
OH943	9/12/2024	10:20:00 AM	-	-	-	21.1	-	-	-	-	-	-	-	-	-	-	-
OH944	18/03/2024	1:35:00 PM	-	-	dry	19.8	-	-	-	-	-	-	-	-	-	-	-
OH944	14/06/2024	12:45:00 PM	-	-	dry	20.1	-	-	-	-	-	-	-	-	-	-	-
OH944	18/09/2024	2:05:00 PM	-	-	dry	16.9	-	-	-	-	-	-	-	-	-	-	-
OH944	9/12/2024	10:00:00 AM	-	-	dry	20.5	-	-	-	-	-	-	-	-	-	-	-
PZ7D	29/02/2024	12:30:00 PM	1,480	7.50	52.87	19.7	-	-	-	-	-	-	-	-	-	-	-
PZ7D	27/05/2024	10:50:00 AM	1,560	7.60	52.69	20.4	-	-	-	-	-	-	-	-	-	-	-
PZ7D	15/08/2024	9:10:00 AM	1,520	7.70	52.58	16.3	-	<1	<1	466	466	-	24	234	22	19	322
PZ7D	21/11/2024	8:30:00 AM	1,549	7.60	52.35	19	-	-	-	-	-	-	-	-	-	-	-
PZ7S	29/02/2024	12:10:00 PM	1,287	6.50	53.34	18.7	-	-	-	-	-	-	-	-	-	-	-
PZ7S	27/05/2024	10:20:00 AM	1,345	6.60	53.03	25.2	-	-	-	-	-	-	-	-	-	-	-
PZ7S	15/08/2024	8:30:00 AM	1,344	6.70	52.95	21.6	-	<1	<1	274	274	-	22	294	51	40	187
PZ7S	21/11/2024	8:00:00 AM	1,232	6.60	52.63	22.6	-	-	-	-	-	-	-	-	-	-	-
PZ8D	20/03/2024	9:00:00 AM	8,510	7.50	60.03	22	-	-	-	-	-	-	-	-	-	-	-
PZ8D	20/06/2024	8:20:00 AM	8,320	7.50	60.07	21.4	-	<1	<1	1,790	1790	----	35	1,940	35	38	2,000
PZ8D	19/09/2024	11:50:00 AM	8,510	7.50	60.06	20.3	-	-	-	-	-	-	-	-	-	-	-
PZ8D	9/12/2024	1:30:00 PM	8,500	7.40	59.6	20.6	-	-	-	-	-	-	-	-	-	-	-
PZ8S	20/03/2024	8:30:00 AM	13,700	6.80	60.65	19.9	-	-	-	-	-	-	-	-	-	-	-
PZ8S	20/06/2024	8:10:00 AM	13,500	6.80	60.71	21.4	-	<1	<1	647	647	----	532	4,310	126	297	2,710
PZ8S	19/09/2024	11:40:00 AM	13,250	6.80	60.67	21.2	-	<1	<1	628	628	----	518	4,690	125	289	2,700
PZ8S	9/12/2024	1:20:00 PM	13,630	6.70	60.57	21.5	-	-	-	-	-	-	-	-	-	-	-
PZ9D	20/03/2024	9:40:00 AM	10,160	7.00	48.97	23.5	-	-	-	-	-	-	-	-	-	-	-
PZ9D	20/06/2024	9:10:00 AM	9,400	7.10	49.12	22	-	<1	<1	985	985	----	433	2,380	205	279	1,670
PZ9D	19/09/2024	12:20:00 PM	9,390	7.10	48.9	21.2	-	-	-	-	-	-	-	-	-	-	-
PZ9D	10/12/2024	7:40:00 AM	9,880	7.00	48.94	21.4	-	-	-	-	-	-	-	-	-	-	-
PZ9S	20/03/2024	10:00:00 AM	11,080	7.00	59.84	20.1	-	-	-	-	-	-	-	-	-	-	-
PZ9S	20/06/2024	9:20:00 AM	3,200	7.20	59.87	20.5	-	<1	<1	281	281	----	158	758	49	89	506
PZ9S	19/09/2024	12:30:00 PM	4,580	7.20	59.93	20.3	-	<1	<1	383	383	----	220	1,220	70	144	771
PZ9S	10/12/2024	7:50:00 AM	10,390	7.00	59.9	20.7	-	-	-	-	-	-	-	-	-	-	-
WD625P	29/02/2024	9:30:00 AM	11,400	7.10	57.25	19.9	-	-	-	-	-	-	-	-	-	-	-
WD625P	27/05/2024	9:10:00 AM	11,780	7.20	57.15	21.1	-	-	-	-	-	-	-	-	-	-	-
WD625P	15/08/2024	2:20:00 PM	11,400	7.20	56.96	-	-	<1	<1	1,210	1210	-	257	3,660	117	213	2,420
WD625P	18/11/2024	10:40:00 AM	11,690	7.10	56.76	-	-	-	-	-	-	-	-	-	-	-	-
WOH2141A	1/02/2024	8:50:00 AM	10,020	7.60	45.99	19.5	-	-	-	-	-	-	-	-	-	-	-
WOH2141A	20/05/2024	8:45:00 AM	10,110	7.70	45.69	21.9	-	-	-	-	-	-	-	-	-	-	-
WOH2141A	13/08/2024	9:40:00 AM	9,970	7.70	45.32	18.8	-	<1	<1	1,230	1230	-	<10	2,720	39	21	2,170
WOH2141A	21/11/2024	9:45:00 AM	10,220	7.70	45.19	20	-	-	-	-	-	-	-	-	-	-	-
WOH2153A	29/02/2024	10:50:00 AM	2,790	7.80	47.25	21.2	-	-	-	-	-	-	-	-	-	-	-
WOH2153A	27/05/2024	9:50:00 AM	2,730	7.90	46.6	21	-	-	-	-	-	-	-	-	-	-	-

Table E 1 Annual groundwater quality laboratory results - 2024 Continued

Sample Point	Date	Time	K - Total (mg/l)	Al - Total (mg/l)	As - Total (mg/l)	Cd - Total (mg/l)	Cu - Total (mg/l)	Pb - Total (mg/l)	Ni - Total (mg/l)	Se (mg/l)	Zn - Total (mg/l)	B (mg/l)	Hg - Total (mg/l)	Mo (mg/l)	V (mg/l)	Cr (mg/l)	Total anions	Total Cations	Ionic Balance
OH786	18/09/2024	8:05:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH786	10/12/2024	11:40:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH787	26/03/2024	12:15:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH787	26/06/2024	10:35:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH787	19/09/2024	8:20:00 AM	28	0.12	0.001	<0.0001	<0.001	<0.001	0.005	<0.01	0.012	0.08	<0.0001	0.002	<0.01	0.001	191	187	1.27
OH787	10/12/2024	12:00:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH788	26/03/2024	10:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH788	26/06/2024	10:45:00 AM	38	0.02	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	0.08	<0.0001	----	----	----	110	118	3.36
OH788	19/09/2024	1:00:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH788	9/12/2024	10:15:00 AM	-	-	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	0.09	<0.0001	-	<0.01	<0.001	-	-	-
OH942	26/03/2024	11:45:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH942	19/06/2024	2:00:00 PM	45	0.14	0.001	<0.0001	0.001	0.001	0.006	<0.01	<0.005	0.05	0.0002	<0.001	<0.01	<0.001	253	280	4.99
OH942	19/09/2024	7:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH942	10/12/2024	11:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH943	18/03/2024	1:00:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH943	26/06/2024	10:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH943	18/09/2024	12:55:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH943	9/12/2024	10:20:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH944	18/03/2024	1:35:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH944	14/06/2024	12:45:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH944	18/09/2024	2:05:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OH944	9/12/2024	10:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ7D	29/02/2024	12:30:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ7D	27/05/2024	10:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ7D	15/08/2024	9:10:00 AM	6	<0.01	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	0.11	<0.0001	-	-	-	16.4	16.8	1.23
PZ7D	21/11/2024	8:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ7S	29/02/2024	12:10:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ7S	27/05/2024	10:20:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ7S	15/08/2024	8:30:00 AM	13	0.13	<0.001	<0.0001	<0.001	<0.001	0.01	<0.01	0.005	<0.05	<0.0001	-	-	-	14.2	14.3	0.27
PZ7S	21/11/2024	8:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ8D	20/03/2024	9:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ8D	20/06/2024	8:20:00 AM	12	0.06	0.005	0.0003	0.006	0.001	0.063	<0.01	0.156	0.19	<0.0001	----	----	----	91.2	92.2	0.52
PZ8D	19/09/2024	11:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ8D	9/12/2024	1:30:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ8S	20/03/2024	8:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ8S	20/06/2024	8:10:00 AM	12	1.71	0.002	0.0001	0.015	0.001	0.019	<0.01	0.007	<0.05	<0.0001	----	----	----	146	149	1.13
PZ8S	19/09/2024	11:40:00 AM	11	0.36	0.001	<0.0001	0.005	<0.001	0.002	<0.01	<0.005	<0.05	<0.0001	----	----	----	156	148	2.6
PZ8S	9/12/2024	1:20:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ9D	20/03/2024	9:40:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ9D	20/06/2024	9:10:00 AM	24	0.67	<0.001	0.0005	2.08	0.001	0.01	<0.01	0.022	0.07	<0.0001	----	----	----	95.8	106	5.25
PZ9D	19/09/2024	12:20:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ9D	10/12/2024	7:40:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ9S	20/03/2024	10:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ9S	20/06/2024	9:20:00 AM	21	14.8	0.003	0.001	0.056	0.006	0.012	<0.01	0.039	<0.05	<0.0001	----	----	----	30.3	32.3	3.24
PZ9S	19/09/2024	12:30:00 PM	25	7.72	0.002	<0.0001	0.11	0.004	0.012	<0.01	0.014	<0.05	<0.0001	----	----	----	46.6	49.5	2.99
PZ9S	10/12/2024	7:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WD625P	29/02/2024	9:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WD625P	27/05/2024	9:10:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WD625P	15/08/2024	2:20:00 PM	16	0.02	<0.001	<0.0001	<0.001	<0.001	0.001	<0.01	0.008	0.16	<0.0001	-	-	-	133	129	1.42
WD625P	18/11/2024	10:40:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2141A	1/02/2024	8:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2141A	20/05/2024	8:45:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2141A	13/08/2024	9:40:00 AM	11	0.1	<0.001	<0.0001	<0.001	<0.001	0.002	<0.01	0.043	0.16	<0.0001	-	-	-	101	98.3	1.48
WOH2141A	21/11/2024	9:45:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2153A	29/02/2024	10:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2153A	27/05/2024	9:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E 1 Annual groundwater quality laboratory results - 2024 Continued

Sample Point	Date	Time	EC Field (uS/cm (25TRef))	pH Field	RL Standing Water Level (m)	Water Temp (Deg C)	TDS - Total (mg/l)	Hydroxide Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Acidity as CaCO3	SO4 - Total (mg/l)	Cl- (mg/l)	Ca - Total (mg/l)	Mg - Total (mg/l)	Na - Total (mg/l)
WOH2153A	15/08/2024	1:40:00 PM	2,810	7.90	47.05	19.2	-	<1	<1	1,090	1090	-	10	271	3	3	660
WOH2153A	18/11/2024	11:15:00 AM	2,810	7.90	46.13	20.1	-	-	-	-	-	-	-	-	-	-	-
WOH2153B	29/02/2024	11:00:00 AM	1,457	7.10	57.04	20.5	-	-	-	-	-	-	-	-	-	-	-
WOH2153B	28/05/2024	9:40:00 AM	1,543	7.20	56.17	22.2	-	-	-	-	-	-	-	-	-	-	-
WOH2153B	15/08/2024	1:50:00 PM	1,524	7.20	55.26	19.8	-	<1	<1	485	485	-	36	218	18	18	328
WOH2153B	18/11/2024	11:30:00 AM	1,584	7.10	56.77	21	-	-	-	-	-	-	-	-	-	-	-
WOH2154A	29/02/2024	10:00:00 AM	4,770	7.40	43.39	21.5	-	-	-	-	-	-	-	-	-	-	-
WOH2154A	27/05/2024	9:25:00 AM	-	-	-	21.7	-	-	-	-	-	-	-	-	-	-	-
WOH2154A	15/08/2024	2:10:00 PM	-	-	-	19.9	-	-	-	-	-	-	-	-	-	-	-
WOH2154A	18/11/2024	9:20:00 AM	4,490	7.50	42.75	19.9	-	<1	<1	979	979	-	131	973	8	5	1,020
WOH2154B	29/02/2024	10:20:00 AM	8,600	7.20	56.65	20.8	-	-	-	-	-	-	-	-	-	-	-
WOH2154B	27/05/2024	9:25:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2154B	15/08/2024	2:10:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2154B	18/11/2024	9:30:00 AM	7,710	7.30	56.84	-	-	<1	<1	951	951	-	222	2,360	93	140	1,480
WOH2155A	29/02/2024	8:40:00 AM	7,270	7.00	38.28	-	-	-	-	-	-	-	-	-	-	-	-
WOH2155A	27/05/2024	9:00:00 AM	7,450	7.10	38.83	-	-	-	-	-	-	-	-	-	-	-	-
WOH2155A	15/08/2024	12:30:00 PM	7,080	7.10	39.05	-	-	<1	<1	817	817	-	608	1,590	29	55	1,630
WOH2155A	18/11/2024	12:10:00 PM	7,210	7.10	36.99	-	-	-	-	-	-	-	-	-	-	-	-
WOH2155B	29/02/2024	8:50:00 AM	7,370	7.10	58.01	-	-	-	-	-	-	-	-	-	-	-	-
WOH2155B	28/05/2024	10:35:00 AM	7,890	7.10	57.78	-	-	-	-	-	-	-	-	-	-	-	-
WOH2155B	15/08/2024	12:45:00 PM	7,590	7.20	57.76	-	-	<1	<1	723	723	-	450	1,940	108	86	1,590
WOH2155B	18/11/2024	12:20:00 PM	6,940	7.20	57.68	-	-	-	-	-	-	-	-	-	-	-	-
WOH2156A	15/02/2024	12:50:00 PM	14,480	7.10	35.33	-	-	-	-	-	-	-	-	-	-	-	-
WOH2156A	28/05/2024	12:20:00 PM	13,800	7.00	35.64	-	-	-	-	-	-	-	-	-	-	-	-
WOH2156A	15/08/2024	11:50:00 AM	13,960	7.00	34.92	-	-	<1	<1	1,210	1210	-	1,020	4,290	143	232	3,020
WOH2156A	18/11/2024	8:40:00 AM	14,280	7.00	34.24	-	-	-	-	-	-	-	-	-	-	-	-
WOH2156B	15/02/2024	1:10:00 PM	12,730	6.80	49.31	-	-	-	-	-	-	-	-	-	-	-	-
WOH2156B	28/05/2024	11:30:00 AM	12,170	6.70	62.72	-	-	-	-	-	-	-	-	-	-	-	-
WOH2156B	15/08/2024	12:00:00 PM	12,320	6.80	66	-	-	<1	<1	790	790	-	881	3,810	164	204	2,690
WOH2156B	18/11/2024	8:50:00 AM	12,620	6.70	58.96	-	-	-	-	-	-	-	-	-	-	-	-

Table E 1 Annual groundwater quality laboratory results - 2024 Continued

Sample Point	Date	Time	K - Total (mg/l)	Al - Total (mg/l)	As - Total (mg/l)	Cd - Total (mg/l)	Cu - Total (mg/l)	Pb - Total (mg/l)	Ni - Total (mg/l)	Se (mg/l)	Zn - Total (mg/l)	B (mg/l)	Hg - Total (mg/l)	Mo (mg/l)	V (mg/l)	Cr (mg/l)	Total anions	Total Cations	Ionic Balance
WOH2153A	15/08/2024	1:40:00 PM	6	0.35	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	0.074	0.16	<0.0001	-	-	-	29.6	29.2	0.63
WOH2153A	18/11/2024	11:15:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2153B	29/02/2024	11:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2153B	28/05/2024	9:40:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2153B	15/08/2024	1:50:00 PM	7	6.9	<0.001	0.0001	0.004	0.007	0.003	<0.01	0.075	0.1	<0.0001	-	-	-	16.6	16.8	0.71
WOH2153B	18/11/2024	11:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2154A	29/02/2024	10:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2154A	27/05/2024	9:25:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2154A	15/08/2024	2:10:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2154A	18/11/2024	9:20:00 AM	6	0.36	<0.001	0.0002	0.032	<0.001	0.004	<0.01	0.139	0.13	<0.0001	-	-	-	49.7	45.3	4.63
WOH2154B	29/02/2024	10:20:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2154B	27/05/2024	9:25:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2154B	15/08/2024	2:10:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2154B	18/11/2024	9:30:00 AM	16	11.4	0.003	0.0003	0.011	0.009	0.011	<0.01	0.194	0.12	<0.0001	-	-	-	90.2	80.9	5.4
WOH2155A	29/02/2024	8:40:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2155A	27/05/2024	9:00:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2155A	15/08/2024	12:30:00 PM	14	0.12	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	0.09	<0.0001	-	-	-	73.8	77.2	2.25
WOH2155A	18/11/2024	12:10:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2155B	29/02/2024	8:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2155B	28/05/2024	10:35:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2155B	15/08/2024	12:45:00 PM	14	17.5	0.002	<0.0001	0.006	0.036	0.004	<0.01	0.033	0.2	<0.0001	-	-	-	78.5	82	2.15
WOH2155B	18/11/2024	12:20:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2156A	15/02/2024	12:50:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2156A	28/05/2024	12:20:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2156A	15/08/2024	11:50:00 AM	24	0.16	0.001	<0.0001	<0.001	<0.001	0.002	<0.01	0.063	0.14	<0.0001	-	-	-	166	158	2.53
WOH2156A	18/11/2024	8:40:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2156B	15/02/2024	1:10:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2156B	28/05/2024	11:30:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WOH2156B	15/08/2024	12:00:00 PM	25	0.29	<0.001	<0.0001	<0.001	<0.001	0.006	<0.01	0.034	0.17	<0.0001	-	-	-	142	143	0.36
WOH2156B	18/11/2024	8:50:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix 7:

Annual Rehabilitation Report



Annual Rehabilitation Report - 2025

Mount Thorley Warkworth

DOCUMENT CONTROL

Version	Date	Revision Description	Author	Approver
1.0	30/03/2026	ARR document prepared to satisfy Standard Conditions on Mining Leases	Bill Baxter Environmental Specialist - Rehabilitation	Gary Mulhearn Environment & Community Manager

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DEFINITIONS / ABBREVIATIONS

ARR – Annual Rehabilitation Report
BBAM - BioBanking Assessment Method
CCC – Community consultative Committee
CCL – Consolidated Coal Lease
CL – Coal Lease
DPHI – NSW Department of Planning Housing and Infrastructure
EIS – Environmental Impact Statement
EL – Exploration Licence
EPBC - Environment Protection and Biodiversity Conservation Act
EPA – NSW Environment and Protection Authority
EPL – Environment Protection Licence
FLRP – Final Landform and Rehabilitation Plan
LEM – Landform Evolution Model
LOM – Life of Mine
ML – Mining Lease
MTO - Mount Thorley Operations
MTW - Mount Thorley Warkworth Coal Mine (combined operations)
RML - Radiation Management Licence
RMP – Rehabilitation Management Plan
RR – NSW Resources Regulator
TAP – Targeted Assessment Program
TSF – Tailings Storage Facility
WML - Warkworth Mining Limited

Name of mine:	Mount Thorley Warkworth	
Annual Rehabilitation Report Period:	**START DATE:**	**END DATE:**
	1 January 2025	31 December 2025
Annual Rehabilitation Report revision dates and version numbers:	Version 1.0 - 30 March 2026	
Mining leases	**No**	**Expiry**
	CL 219	23 September 2044
	ML 1752	17 March 2038
	CCL 753	17 February 2034
	ML 1412	11 January 2038
	ML 1590	26 February 2028
	ML 1751	17 March 2038
	ML 1828	25 February 2043
Name of Lease holder(s)	Mount Thorley Operations Pty Ltd Warkworth Mining Limited Mount Thorley Coal Loading Ltd	
Date of Submission	30 March 2026	

1.0 MINING DETAILS

1.1 PROJECT DESCRIPTION

Mount Thorley Warkworth (MTW) is an integrated operation of two open cut mines, Warkworth Mining Limited (WML) and Mount Thorley Operations (MTO), managed by Coal & Allied (NSW) Pty Ltd, a wholly owned subsidiary of Yancoal Australia Limited (Yancoal). MTW is located 14 km south west of Singleton in the Hunter Valley region of New South Wales.

Development Consent for the Warkworth Continuation Project (SSD-6464) and Mount Thorley Continuation Project (SSD-6465) was granted on 26 November 2015. A modification to the Warkworth Continuation Project (SSD-6464 MOD2) was granted on 27 May 2022.

The Projects are described in detail in the Environmental Impact Statements and supporting documents (EMGA Mitchell McLennan, June 2014), and the Modification Report (SSD-6464 MOD 2, September 2021).

1.2 CURRENT DEVELOPMENT CONSENTS, LEASES, AND LICENCES

Environment Protection Licence (EPL): EPL 24, EPL 1976, EPL 1376.

Environment Protection and Biodiversity Conservation (EPBC) Act Approval: EPBC 2002/629, EPBC 2009/5081.

General Water Licences: WAL963, WAL10543, WAL18233, WAL18558, WAL19022, WAL39798, WAL40464, WAL40465, WAL43056, WAL43057, 20BL168821, 20BL171729, 20BL171841, 20BL171842, 20BL171843, 20BL171844, 20BL171845, 20BL171846, 20BL171847, 20BL171848, 20BL171849, 20BL171850, 20BL171891, 20BL171892, 20BL171893, 20BL171894, 20BL172272, 20BL172273, 20BL172439, 20BL172518, 20BL173065, 20BL173276.

Development Consents: SSD-6464, SSD-6465, DA 177/94.

Radiation Management License: RML 5061110, RML 5061122.

Prospecting and Coal Mining: CL 219, (Part) ML 1547 (Sublease), ML 1752, EL7712, EL 8824, CCL 753, ML 1412, ML1590, ML 1751, ML 1828.

Store Explosives License: XSTR100160.

In 2025, EPL 1376 (Warkworth) and EPL 1976 (Mount Thorley) were varied following a five yearly review by NSW Environment Protection Authority (EPA). This variation added a further Operating Condition that clarifies the minimum requirements for bunding, and included revised conditions for the operation and management of sewage treatment systems and effluent utilisation areas on the Premises.

1.3 LAND OWNERSHIP AND LAND USE

There were no ownership or land use changes for land related to MTW that occurred during the reporting period.

2.0 COMPLAINTS

No complaints related to rehabilitation received in 2025.

3.0 STAKEHOLDER CONSULTATION

Table 1: Stakeholder Consultation 2025

Date	Stakeholder	Consultation Forms	Matters	Actions
February 2025	Community Consultative Committee (CCC)	CCC Meeting	Progress against rehabilitation and disturbance targets for 2024. Rehabilitation and disturbance forecasts for 2025 and YTD progress Feedback on content of the Rehabilitation Management Plan was invited from CCC.	No actions required
May 2025	Community Consultative Committee	CCC Meeting	YTD progress against rehabilitation and disturbance targets for 2025. Notification of delay to submission of Annual Rehabilitation Report (ARR), Forward Program (FP) and Rehabilitation Cost Estimate (RCE) due to Resources Regulator Portal issues. Feedback on content of content of the Rehabilitation Management Plan was invited from CCC.	No actions required

Date	Stakeholder	Consultation Forms	Matters	Actions
May 2025	Near Neighbour	Visit to Private Residence	Visual amenity impacts from MTW overburden emplacements.	Offer made to plant vegetative screens (not taken up). Details of issue provided to Department of Planning, Housing and Infrastructure (DPHI) at request of near neighbour.
August 2025	Community Consultative Committee	CCC Meeting	YTD progress against rehabilitation and disturbance targets for 2025. Feedback on content of content of the Rehabilitation Management Plan was invited from CCC.	No actions required
November 2025	Community Consultative Committee	CCC Meeting	YTD progress against rehabilitation and disturbance targets for 2025. Rehabilitation tour at WML including survey check of West Pit dump height against Final Landform. Feedback on content of content of the Rehabilitation Management Plan was invited from CCC.	No actions required

4.0 SURFACE DISTURBANCE AND REHABILITATION ACTIVITIES

Surface disturbance activities included:

- Progression of mining in North Pit and West Pit (53.5ha)
- MTO water management and infrastructure areas (3.1ha)
- North Out of Pit (NOOP) Dam construction (0.4ha)

- Rehabilitation disturbance at MTO to remediate a spontaneous combustion area (3.0ha); and Woodlands to recover a topsoil stockpile (0.2ha).

The disturbance in this reporting period was 60.2ha. This is more than the 52.0ha of disturbance that was forecast in the Forward Program due to the infrastructure and rehabilitation disturbance areas listed above.

Rehabilitation activities included:

- Overburden emplacements in Mount Thorley (36.6ha), Woodlands Dump (11.3ha), South Pit (16.4ha) and North Pit (22.6ha).
- Tailings Dam 1 (12.1ha)
- Reclassification of access tracks within rehabilitation areas in MTO and West Pit (1.1ha).

The rehabilitation (Ecosystem and Land Use Establishment) undertaken in this reporting period was 100.1ha.

The 2014 Environmental Impact Statements (EISs) for the Warkworth Continuation Project and the Mount Thorley Continuation Project modelled MTW's conceptual progress with mining and rehabilitation in indicative mine plans at different stages over the course of MTW executing its operations. These documents modelled a total of 1,607.8 ha of rehabilitation completion by the end of 2023. At the end of the 2025 reporting period there had been 1,564.9ha of rehabilitation completed across Warkworth and Mount Thorley, which is 42.9ha less than predicted in the indicative EIS forecast for the end of 2023.

Rehabilitation Planning Activities

The MTW Final Landform and Rehabilitation Plan (FLRP) was approved by RR on 8 December 2023 (FLRP0001145). The final landform of MTW has been designed using a geomorphological landform design approach based on alluvial analogues. The landform design work was undertaken using WSP Australia and an erosional risk analysis has been conducted to determine areas that require rock lining for erosion protection.

The landform design work included the sizing and positioning of a temporary stockpile of capping material for the Loders Pit Tailings Storage Facility (TSF) which will be used for tailings deposition through to the closure of MTW. Sufficient material will be needed to be stockpiled adjacent to this facility during the operational phase of the mine to facilitate capping at closure. The indicative location and extent of the temporary capping stockpile is presented on the Life of Mine (LOM) progressive rehab plans in the MTW Rehabilitation Management Plan (RMP) (January 2026).

Drainage designs have been developed to facilitate staged offsite release of stabilised rehabilitation catchments from the southwest corner of Mount Thorley. Water release from rehabilitation catchments will be contingent upon MTW demonstrating that the water quality of runoff from rehabilitation areas is consistent with the natural watercourses that the rehabilitation catchments will report to.

A monitoring network has been designed to collect water quality information for runoff from rehabilitation catchments in most areas of existing rehabilitation.

Subsidence Repair Undertaken

As MTW is an open cut operation, subsidence has been regarded as a negligible risk. Regardless, mine subsidence was examined and risk-ranked in the RMP Risk Assessment. No subsidence incidents have been recorded at MTW. As such this RMP does not introduce measures and methods to address subsidence impacts to rehabilitation during the active phase of mining.

Rehabilitation Management and Maintenance Activities

The following weed management activities were conducted across rehabilitation areas at MTW:

- Weed wiping of various exotic grasses and broadleaf weeds (83.0ha);
- Manual removal (mulching) of *Acacia saligna* shrubs (51.4ha);
- Slashing of pasture areas to remove rank Rhodes grass and control various broadleaf weeds (14.7ha);
- Selective spraying (backpack and Quikspray) of various exotic grasses and broadleaf weeds (168.2ha); and
- Manual removal (Cut and Paint) of *Acacia saligna,* African boxthorn (*Lycium ferocissimum*), Lantana (*Lantana camara*) and African Olive (*Olea europaea subsp. cuspidata*) shrubs (103.1ha)

Pasture areas were spread with compost or fertiliser and oversown to improve pasture composition and growth (14.8ha). Native vegetation areas with poor native plant establishment were resown with native woodland seed mixes (38.7ha). Native vegetation rehabilitation (established in 2017) that was affected by spontaneous combustion was capped with clay material and re-rehabilitated (3ha).

Two 1080 ground baiting programmes utilising meat baits were undertaken during autumn and spring to target wild dogs and foxes. The program consisted of approximately 55 bait sites across MTW, including rehabilitation areas. Results from these two programs recorded 109 bait takes by wild dogs and foxes.

Two feral pig trapping and baiting programmes were carried out across MTW, one in summer and one in winter, that resulted in a total of 108 feral pigs being controlled.

Rehabilitation Actions

Several actions have been undertaken in response to matters identified in Targeted Assessment Programs (TAPs) or other inspections by the Resources Regulator:

- The Rehabilitation Risk Assessment was updated. [Recommendation from TAP Landform Establishment (LETT0006074); and TAP - Revegetation (LETT0009402)].
- The RMP was updated to incorporate the revised Rehabilitation Risk Assessment, LOM rehabilitation progression plans and address other matters identified in TAPs. [Recommendations from TAP Revegetation (LETT0009402) and Planned Inspection Program - Rehabilitation ASARP (LETT0010333)].
- An indicative location and extent of the temporary capping material stockpile required for capping and closure of the Loders Pit TSF is presented on the LOM rehabilitation progression plans in the RMP. [Recommendation from TAP Landform Establishment (LETT0006074)].
- Importation of rock for use on rock-lined drains in Geofluv landform areas. [Recommendation from TAP Landform Establishment (LETT0006074)].

- SIBERIA modelling undertaken by external consultancy to investigate long term stability of the highwall in West Pit/North Pit and Loders Pit was revised to include climate change scenarios. [Recommendation from Targeted Assessment Program Landform Establishment (LETT0006074)].Investigations conducted to determine the source of overburdens/interburdens that have performed well/poorly as growth medium in rehabilitation areas. [Recommendation from Planned Inspection Program - Rehabilitation ASARP letter (LETT0010333)].

Rehabilitation Areas That Have Achieved the Final Land Use

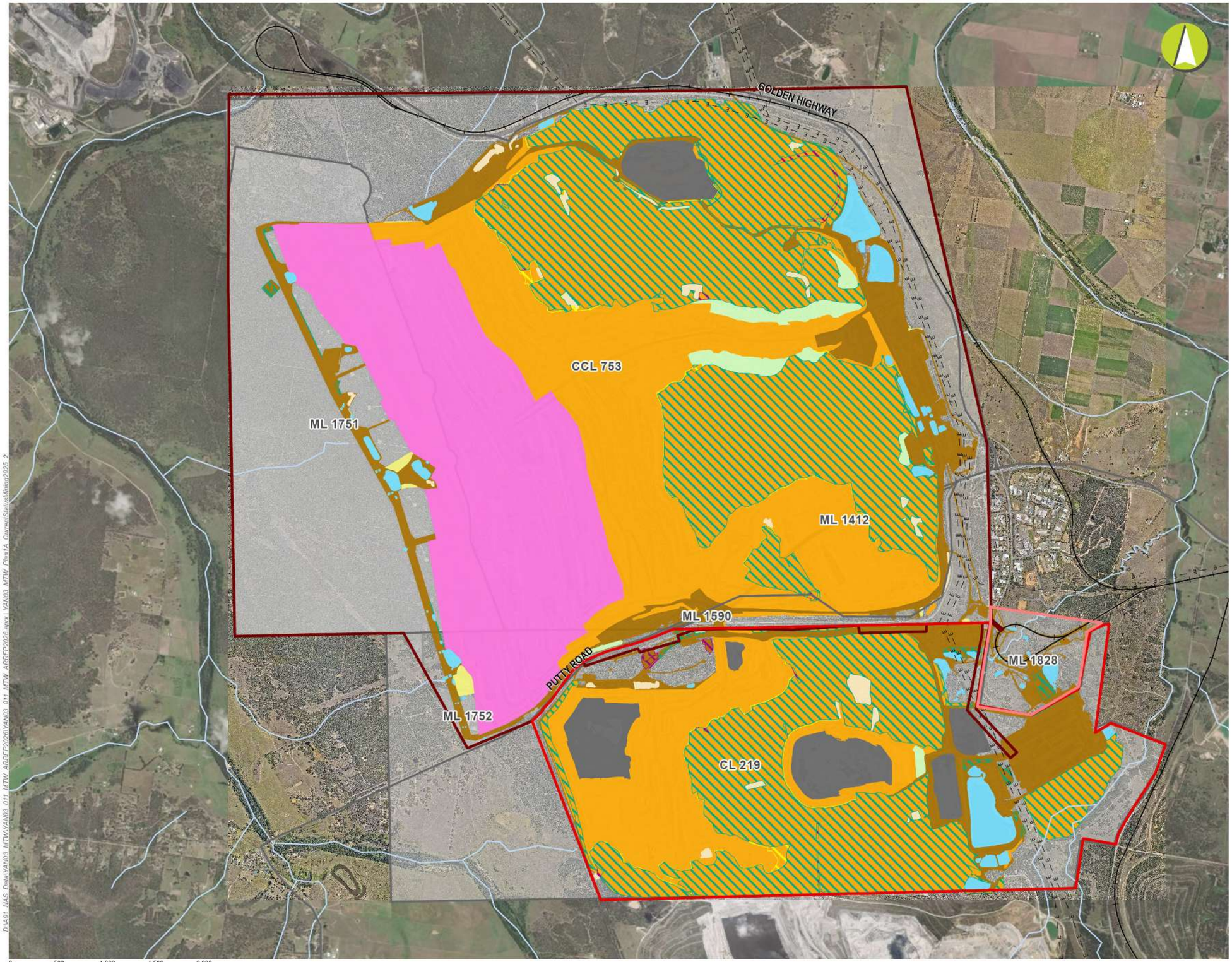
No areas achieved final land use during the 2025 reporting period.

Key Production Milestones

Table 2: Key Production Milestones Calendar Year 2025

Material	Unit	Year 1 2025 Forward Program	This report
Stripped topsoil	m3	52,011	60,200
Rock / Overburden	m3	115,182,944	116,218,665
Ore	Mt	17.5	17.7
Reject Material (Includes coarse rejects, tailings and any other wastes resulting from beneficiation)	Mt	5.44	6.0
Product	Mt	11.93	11.8

Figure 1: Plan 1A - Current Status of Mining and Rehabilitation



LEGEND

Project Approval Number

- SSD 6464 - Warkworth
- SSD 6465 - Mount Thorley
- ML 1828 - Mount Thorley Coal Loader
- Railway
- Major Road
- Waterways
- Electricity Transmission Line

Current Authorisations

- Relevant Mining Title

Rehabilitation Phase

- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment

Mining Domain Type

- Domain 1: Infrastructure Area
- Domain 2: Tailings Storage Facility
- Domain 3: Water Management Area
- Domain 4: Overburden Emplacement Area
- Domain 5: Active Mining Area (Open cut void)
- Domain 8a: Other - Topsoil Stockpile
- Domain 8b: Other - Topsoil Stripped
- Domain 8c: Other - Temporary Rehabilitation

Mount Thorley Warkworth Complex

Current Status Mining and Rehabilitation
PLAN 1A

Mine name	Mount Thorley Warkworth Complex
Plan name	Mount Thorley Warkworth ARR
Year of anticipated relinquishment	To be determined closer to closure
Data theme submission ID No.	TBD
Spatial Reference	GDA2020 MGA Zone 56
Plan date (date created)	26/03/2026

Sheet Size : A3

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MT THORLEY WARKWORTH

Source: Project Approval Boundary, Rehabilitation, Disturbance, watercourses and Current Authorisations from Yancoal (2025). Aerial imagery from Yancoal (2025).

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Figure 2: Plan 1B - Current Landform Contours



LEGEND

Project Approval Number

- SSD 6464 - Warkworth
- SSD 6465 - Mount Thorley
- ML 1828 - Mount Thorley Coal Loader
- Current Landform Contours (10m)
- Railway
- Major Road
- Major Waterways
- Electricity Transmission Line

Current Authorisations

- Relevant Minerals Title

0 500 1,000 1,500 2,000 m

Scale: 1:40,000

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MT THORLEY WARKWORTH

Source: Project Approval Boundary, Contours watercourses and Current Authorisations from Yancoal (2025). Aerial imagery from Yancoal (2025).

Mount Thorley Warkworth Complex

Current Landform Contours
PLAN 1B

Mine name	Mount Thorley Warkworth Complex
Plan name	Mount Thorley Warkworth ARR
Year of anticipated relinquishment	To be determined closer to closure
Data theme submission ID No.	TBD
Spatial Reference	GDA2020 MGA Zone 56
Plan date (date created)	23/03/2026

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Disturbance and Rehabilitation Statistics

Table 3: Current Disturbance and Rehabilitation Progression Calendar Year 2025

	Annual Reporting Period	This report
A	Total disturbance footprint surface disturbance	4,274.43
B	Total active disturbance (Ha)	2,680.68
C	Rehabilitation land preparation (Ha)	28.87
D	Ecosystem and land use establishment (Ha)	1,564.88
E	Ecosystem and land use development (Ha)	0
F	Rehabilitation completion (Ha)	0

Table 4: Rehabilitation key Performance Indicators (KPI's) Calendar Year 2025

	Annual Reporting Period	This report
G	Total active disturbance during reporting period (Ha)	54.92
H	Area of land proposed for active rehabilitation during reporting period (Ha)	96.38
I	Established rehabilitation (Ha)	0
J	Annual rehabilitation to disturbance ratio	1.75
K	Ecosystem and land use development (Ha) % Rehabilitation land to total mine footprint	0

Table 5: Progressive Achievement of Established Rehabilitation Calendar Year 2025

	Annual Reporting Period	This report
L	Established rehabilitation for agricultural final land uses (%)	0
M	Established rehabilitation for native ecosystem final land uses (%)	0
N	Established rehabilitation for other/ non-vegetated final land uses (%)	0

4.1 VARIATION TO THE REHABILITATION SCHEDULE

Identify the components of the most recent forward program that were not achieved.

The rehabilitation forecast in the 2025 Forward Program was 89.1ha and the amount of rehabilitation progressing to Ecosystem and Land Use Establishment phase during the reporting period was 100.1ha.

The disturbance forecast in the 2025 Forward Program was 52.0ha and the amount of disturbance undertaken during the reporting period was 60.2ha. This included 5.1ha of rehabilitation disturbance.

The quantity of rehabilitation was greater than the forecast amount, with additional rehabilitation in the South Pit/Woodlands areas offsetting less rehabilitation in the Mount Thorley area.

The increased amount of disturbance compared to the Forward Program forecast was due to disturbance for infrastructure and water management; and rehabilitation disturbance to remediate spontaneous combustion and recover a topsoil stockpile.

Key factors that have delayed the progressive rehabilitation.

Rehabilitation progression during 2025 was consistent with the forecast in the 2025 Forward Program.

Outline actions to minimise disturbance and undertake progressive rehabilitation.

Dump scheduling has been undertaken by Medium Term Planning team to identify the timing of dump releases for the Forward Program period. Carryover of dump release and bulk shaped areas is planned each year to provide rehabilitation crews with consistent work through the year. Capping of Tailings Dam 2 is being progressed to facilitate rehabilitation of the eastern side of this facility in 2028.
New disturbance is planned by Medium Term Planning team to minimise disturbance while supporting mine progression.

5.0 REHABILITATION MONITORING AND RESEARCH FINDINGS

5.1 REHABILITATION MONITORING

No rehabilitation monitoring was conducted at MTW during 2025 due to revised rehabilitation completion criteria still being developed. The MTW rehabilitation completion criteria will be reviewed in 2026 and submitted to Resources Regulator for approval. MTW is investigating the alignment of completion criteria with other companies in the Hunter Valley to enable sharing of monitoring data for reference sites in target vegetation communities. The rehabilitation monitoring program will be revised to be consistent with the approved completion criteria and updated in the RMP.

A total of 54 rehabilitation inspections were undertaken during 2025 to determine maintenance requirements related to vegetation establishment, weed management, water management and other management (i.e. disturbance, rubbish, vertebrate pest management etc.). These inspections were used to guide rehabilitation maintenance activities undertaken during 2025.

5.2 STATUS OF PERFORMANCE AGAINST REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA

Previous monitoring methods incorporated and addressed the requirements specified in MTW RMP (2022). This included: a combination of plot-based monitoring in accordance with the NSW BioBanking Assessment Method (BBAM) (to assess native vegetation) together with walkover inspections of rehabilitation areas to detect potential issues occurring at the broader scale; Landscape Functional Analysis; soil assessment (chemical/nutrition and microbial); and native canopy development.

The MTW rehabilitation completion criteria will be reviewed in 2026 and submitted to Resources Regulator for approval. The rehabilitation monitoring program will be revised to be consistent with the approved completion criteria.

Are all rehabilitation areas in the Landform Establishment phase or higher represented in the monitoring program

New rehabilitation areas completed since 2022 have not been included in the monitoring program due to monitoring being suspended while Completion Criteria are being revised. However, these new areas have been covered by the rehabilitation inspection program to determine rehabilitation maintenance requirements.

Include an appraisal of whether rehabilitation is moving towards achieving the proposed rehabilitation objectives, rehabilitation completion criteria and final landform and rehabilitation plan

The Independent Review of Rehabilitation Progress (Emergent Ecology (September 2019)) found that the Domain B Agriculture Grazing and Domain A Native Ecosystem rehab areas had achieved some of the targets for the Ecosystem and Land Use Establishment phase however did not meet all the targets, particularly those relating to exotic plant cover. Some of these rehab areas that were established using older techniques could not progress from Ecosystem and Land Use Establishment phase through to the Development phase when assessed against the current completion criteria. To address this, Emergent Ecology recommended modifications to the completion criteria for the Agriculture Grazing and Native Ecosystem domains that would provide appropriate outcomes for each of the secondary domains and still achieve the desired land use outcomes from Project Approvals.

At the time of the review in 2019, the majority of Woodland EEC (Domain D Rehabilitation Biodiversity Offset Area) areas were in early establishment and therefore would not be expected to achieve targets beyond the Ecosystem and Land Use Establishment phase. They did however support a diversity of native plant species and were tracking towards achieving completion criteria. Emergent Ecology stated that continued use and refinement of the contemporary strategies being implemented by MTW should result in establishment of woodland rehab that resembles a locally occurring vegetation community.

Please select the best description of the appraisal

Regulator Portal Options	MTW Selection
Rehabilitation is moving towards achieving the final land use as soon as reasonably practicable.	
There are performance issues preventing rehabilitation moving towards achieving the final land use as soon as reasonably practicable.	X

Summarise the findings of the Rehabilitation Monitoring Program

The 2022 monitoring program targeted 37 Woodland EEC rehabilitation sites between the Northern (North Pit), Central (Centre Dump, Woodlands, West Pit) and Southern (Mount Thorley) Rehabilitation Areas and six remnant Grey Box-Ironbark Woodland reference sites.

Northern area generally provided good native species richness and good cover of native groundcover species. Weed cover was high, dominated by invasive perennial grass species. Fallen log and tree hollow resources were low throughout the area. The Northern area has potential to progress towards the target vegetation community if weed control activities continue.

Central area provided low species richness and cover with a high cover of invasive perennial grass species. Tree and shrub density was generally low, with poor tree/shrub connectivity through the area. A moderate density of native groundcover species indicates good potential resilience if intense weed control is undertaken. Fallen log and tree hollow resources were low throughout the area. In general, this area is not currently trending towards the target vegetation community and requires management action to progress.

Southern area provided moderate native species richness, good cover of native grass species and moderate abundance of fallen log resources. Weed cover was high, dominated by invasive perennial grass species and galenia. The Southern area has potential to progress towards the target vegetation community if weed control activities continue.

Identify any performance issues

Performance issues identified in the Rehabilitation Enhancement Strategy 2026:

Zone B1 Grassland

Issue: presence of Acacia saligna thickets, erosion tunnelling/contour bank failure.

Zone A1 Sugar Gum Forest and A2 Sugar Gum and Mixed Native Forest

Issue: high density exotic canopy species. Knowledge Gap: value of Sugar Gum as foraging habitat for Regent Honeyeater and Swift Parrot in the context of Hunter Valley rehab, completion criteria that allow non-local species and maintain rehab objectives.

Zone A3 Spotted Gum Forest (High Stem Density)

Issue: High stem density of canopy species. Knowledge Gap: completion criteria that define targets for canopy cover.

Zone D1 Early Phase Woodland EEC and D2 Intermediate Phase Woodland EEC

Issue: High exotic plant cover, limited canopy species establishment (Early Phase only). Knowledge Gap: completion criteria to define targets for cover levels and species diversity, assess monitoring results to determine need for supplementary seeding/planting of canopy species, assess monitoring results to confirm shading results in decline of exotic grass cover.

Zone D3 Poor Establishment (Topsoil) Woodland EEC

Issue: High rates of exotic plant cover, limited native species establishment. Knowledge Gap: trial topsoil scalping/smothering to remove exotic grass competition.

Zone D4 Poor Establishment (Spoil) Woodland EEC

Issue: poor soil structure, limited native species establishment. Knowledge Gap: trial repeated ameliorant application/deep ripping to improve soil structure, LOM growth medium strategy.

5.3 OUTCOMES OF REHABILITATION RESEARCH AND TRIALS

Table 6: List of Active Rehabilitation Research and Trials

No.	Project/Trial Name	Objective of Trial Project	Methodology	Expected Date of Completion
1	Transition to Native Trees/Shrub Using Selective Grass Herbicide (RRT0001149)	Transition areas that are dominated with exotic grasses to native vegetation.	Utilise selective grass herbicides to control exotic grasses, follow up sowing with native tree/shrub seed mixes to increase native vegetation establishment.	31/12/2027
2	Compost Type Trial (Spoil/Compost Application) (RRT0001150)	Rehabilitation trials to test if different types of compost result in improved native vegetation establishment in spoil/compost applications.	Application of 2 types of compost: Bettergrow (with Biosolids) and LOOP Biomix to a rehabilitation area with mine spoil as growth medium. Trial areas seeded with diverse native seed mix and monitored to detect differences in native vegetation establishment.	31/12/2027
3	Topsoil Scalping/Smothering (RRT0001165)	Transition areas that are dominated with exotic grasses to native vegetation.	Soil testing to determine suitability of spoil as a growth medium. If spoil is suitable conduct trial of topsoil scalping: scalp topsoil to remove weed seed load; ameliorate/fertilise spoil; rip/cultivate spoil; seed native seed mix in scalped area. If spoil is unsuitable conduct trial of topsoil smothering: import suitable subsoil/spoil material to provide 100mm cover over weed affected topsoil; ameliorate/fertilise spoil, seed native seed mix in covered areas.	31/12/2028

No.	Project/Trial Name	Objective of Trial Project	Methodology	Expected Date of Completion
			Weed control of exotic grasses.	
4	Spoil Growth Medium Amelioration (RRT0001166)	Ameliorate spoil with poor agronomic properties to establish native vegetation.	Weed management to prevent ingress of galenia and exotic grasses. Trial repeated application of gypsum/compost to improve soil structure. Deep ripping with each ameliorant application to aerate spoil and incorporate ameliorants. Soil testing following each amelioration application to measure improvements in spoil properties. Conduct annual seeding of native seed mixes to gauge if soil improvements translate into improved native species germination.	31/12/2028
5	Soil Preparation Methods (RRT0001167)	Assess soil preparation methods for erosion stability and establishment of native vegetation	Undertake soil preparation using different methods i.e. aerator, contour ripping and cultivation within gently sloping and steep rehabilitation areas. Monitor rehabilitation in early establishment phase to measure erosional stability and native vegetation establishment.	30/06/2028

Table 7: List of Inactive Rehabilitation Research and Trials

No.	Project/Trial Name	Objective of Trial Project	Methodology	Date Completed
1	Bursaria spinosa Germination trial (RRT0001088)	Germination testing: 1) if freezing pre-treatment of seed	Subject seed to freezing temps pre-treatment and run a germination trial with the following treatments: Provenance 1(Hunter Valley) control/seed raising mix;	30/11/2023

No.	Project/Trial Name	Objective of Trial Project	Methodology	Date Completed
		improves germination rates; and 2) if germination rates in MTW topsoils and spoils are comparable to seed raising mix.	Prov. 1 freeze treatment/seed raising mix; Prov. 1 freeze treatment/typical MTW topsoil; Prov. 1 freeze treatment/typical MTW spoil/ameliorant. Provenance 2(Coonabarabran) control/seed raising mix; Prov. 2 freeze treatment/seed raising mix; Prov 2 freeze treatment/typical MTW topsoil; Prov. 2 freeze treatment/typical MTW spoil/ameliorant.	
2	Compost Type Trial (Spoil/Compost Application) (RRT0001089)	Rehabilitation trials to test if different types of compost result in improved native vegetation establishment in spoil/compost applications	Application of 3 types of compost: Remondis (coarse), Remondis (with fines), Bettergrow (with Biosolids) to a rehabilitation area with mine spoil as growth medium. Trial areas seeded with diverse native seed mix and monitored to detect differences in native vegetation establishment.	30/06/2024

Provide details about how the outcomes of completed trials and research have been used to influence rehabilitation planning and methodologies and/or continuously improve rehabilitation techniques

Trial RRT0001088 demonstrated that freezing pre-treatment improved the germination of Bursaria spinosa. Freezing pre-treatment is therefore recommended for this species. However, germination of Bursaria spinosa only occurred in the seed raising mix. No germination was observed in the MTW topsoil or spoil growth mediums that were provided for use in the trial. This indicates that there are further impediments to germination in the MTW rehabilitation environment that require further investigation.

In the spoil growth medium that the compost trial (RRT0001089) was conducted in, native vegetation establishment was improved in the plots that utilised higher nutrient composts (i.e. Remondis (with fines) and Bettergrow (with Biosolids)). MTW has adopted the use of high nutrient composts in spoil/compost areas where mine spoil rather than topsoil is used as the growth medium. A follow-up trial (RRT0001150) of two different types of high nutrient compost will be conducted in a future spoil/compost rehabilitation area.

Appendix 8:

Local and Regional Biodiversity Areas Annual Compliance Reports



Local Biodiversity Areas

Annual Report 2025

Annual report for the period from January to December 2025, for activities described in the Management Plans for all Local Warkworth Mining Limited offsets including:

- Southern Biodiversity Area (including the Putty Road Offset Area)
- Northern Biodiversity Area

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Revision

Version No.	Version Details	Document Status	Date
1.0	**Environment and Community Advisor**	**Final**	**30/03/2026**

1 INTRODUCTION

This annual report is a requirement of the management plans for all Local Warkworth Mining Limited offsets for the 2025 reporting period (1 January 2025 to 31 December 2025).

The report provides a summary of the key management activities completed across the biodiversity offset located within the Southern (includes the Putty Road Offset Area) and Northern Biodiversity Areas (BAs).

The management plans describe the conservation management strategies and monitoring to achieve, and measure improvement and protection of the offset's biodiversity values. It is a compliance requirement of the Commonwealth and NSW environmental approvals to implement the management plans.

The Local OMP (November 2014) was prepared to satisfy the consent requirements for the New South Wales (NSW) Warkworth Mine Development Approval (DA 300-9-2002i) and replaces the former *Flora and Fauna Management Plan* and *Warkworth Sands Woodland (WSW) Offset Area OMP*. In November 2015 the NSW Warkworth Continuation Project Approval (SSD-6464) was granted providing both NSW and Commonwealth approval for the same disturbance area. Phase 2 of the EPBC2009/5081 action also commenced on 16 February 2016. In response to the granting of these new approvals, new Management Plans for the Southern and Northern BA have been prepared to satisfy the Commonwealth approval EPBC2009/5081 and the NSW consent (SSD-6464), replacing both the Local and Putty Road OMPs.

The Biodiversity Offset Portal contains the supporting documentation for this report, including photo point monitoring. Access to the portal is restricted, relevant regulators have been provided with login details; please contact Mount Thorley Warkworth should you require assistance.

2 LOCATION AND LANDHOLDER DETAILS

The locations of the local BAs are shown in **Figure 1**, **Figure 2** and **Figure 3**, details are provided in **Table 1**.

Table 1 Local Biodiversity Areas

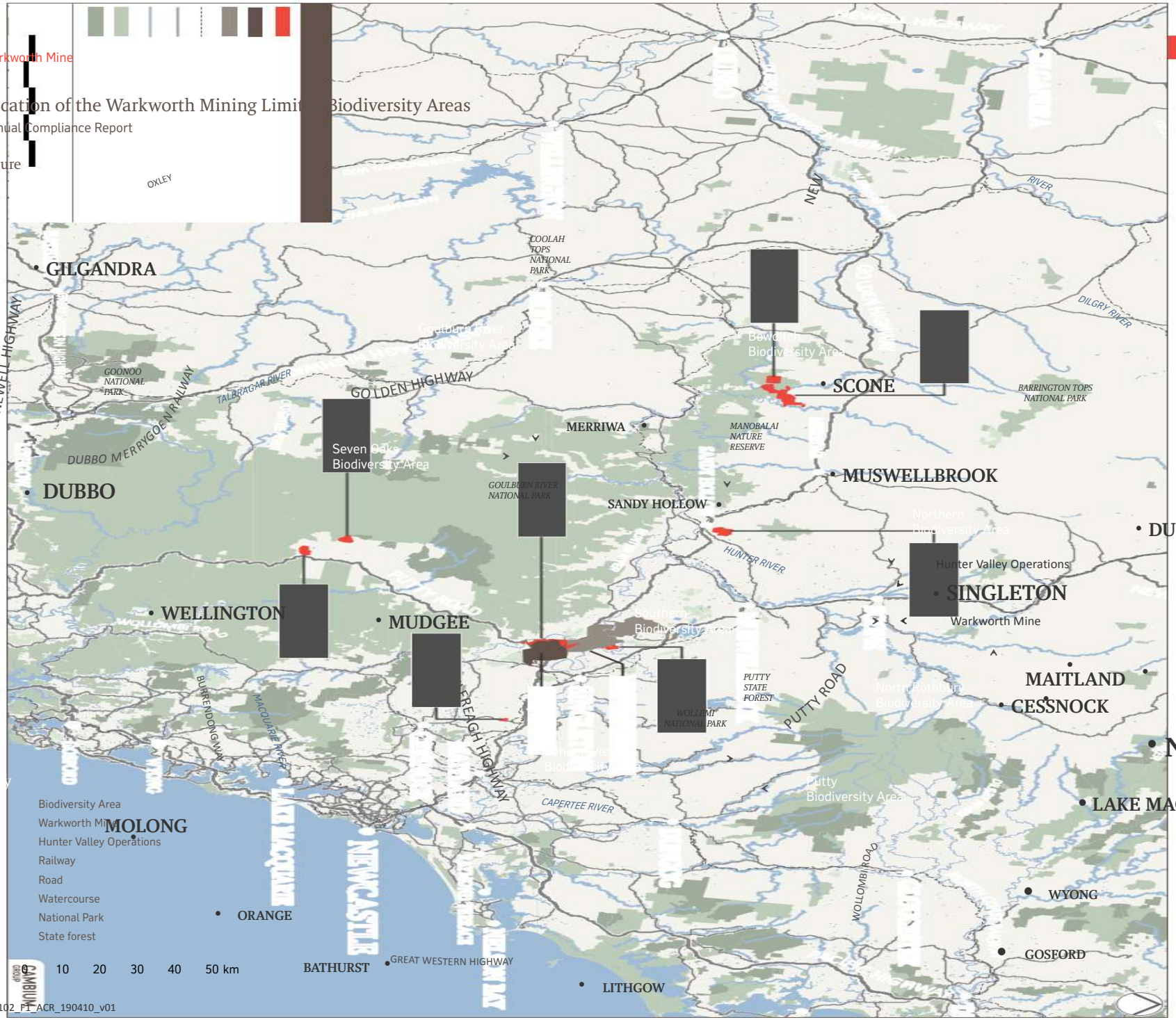
Biodiversity Area	Land Owner	Area (ha)	Offset Area (ha)	Location
Northern BA	Coal & Allied Operations Pty Ltd	344	341	Approximately 7km north of the Warkworth Mining Lease and in close proximity to the Hunter Valley Operations. Accessed via Comleroi Road.
Southern BA (including the Putty Road Offset)	Coal & Allied Operations Pty Ltd Miller Pohang Coal Company Pty Ltd Warkworth Mining Limited	1,023	986	Immediately west and north of Warkworth Mine. Intersected by Putty Road in the south, and Wallaby Scrub Road and the Golden Highway in the north.

Warkworth Mine

Location of the Warkworth Mining Limited Biodiversity Areas

Annual Compliance Report

Figure

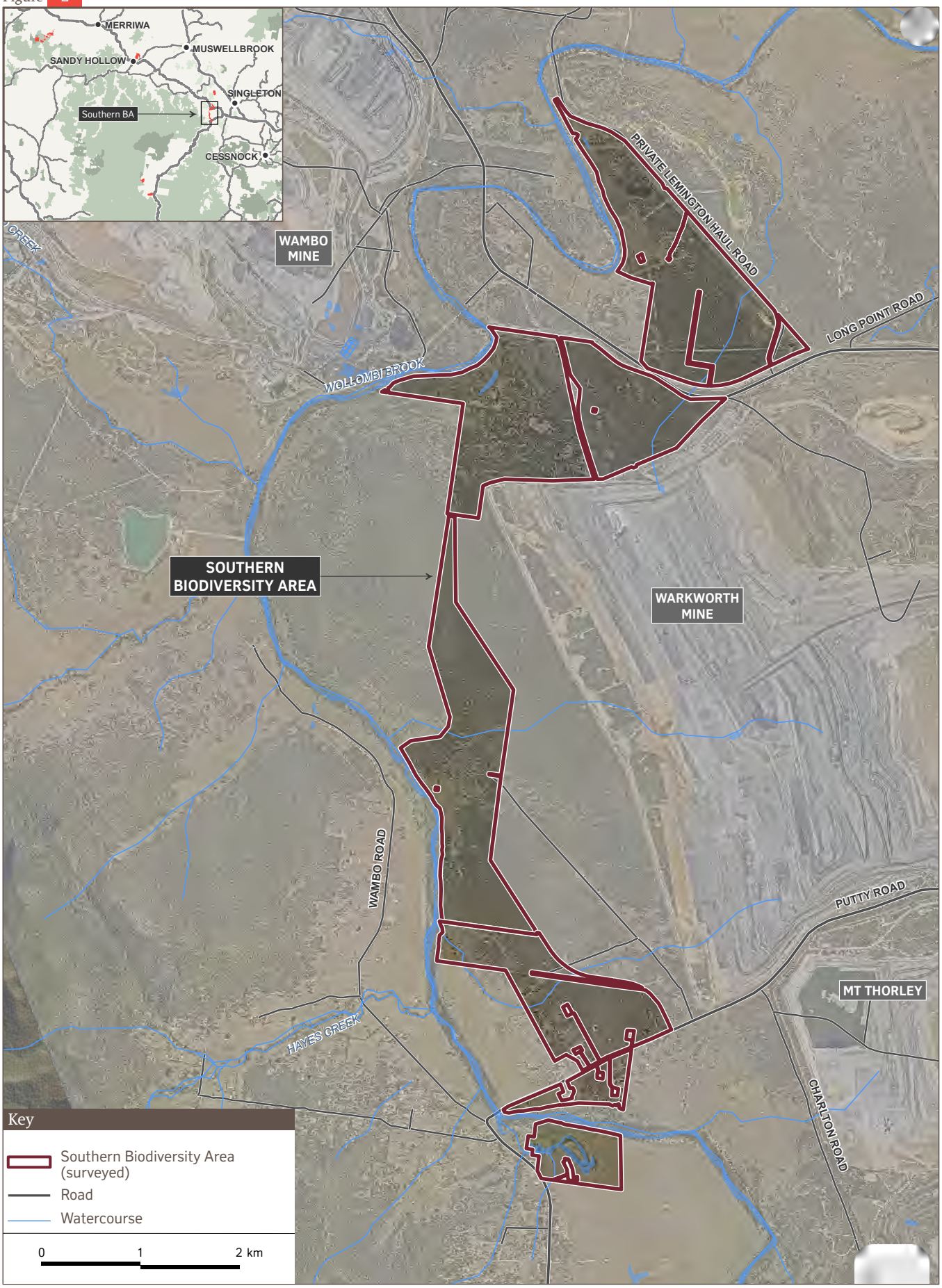


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Southern Biodiversity Area

Annual Compliance Report

Figure 2

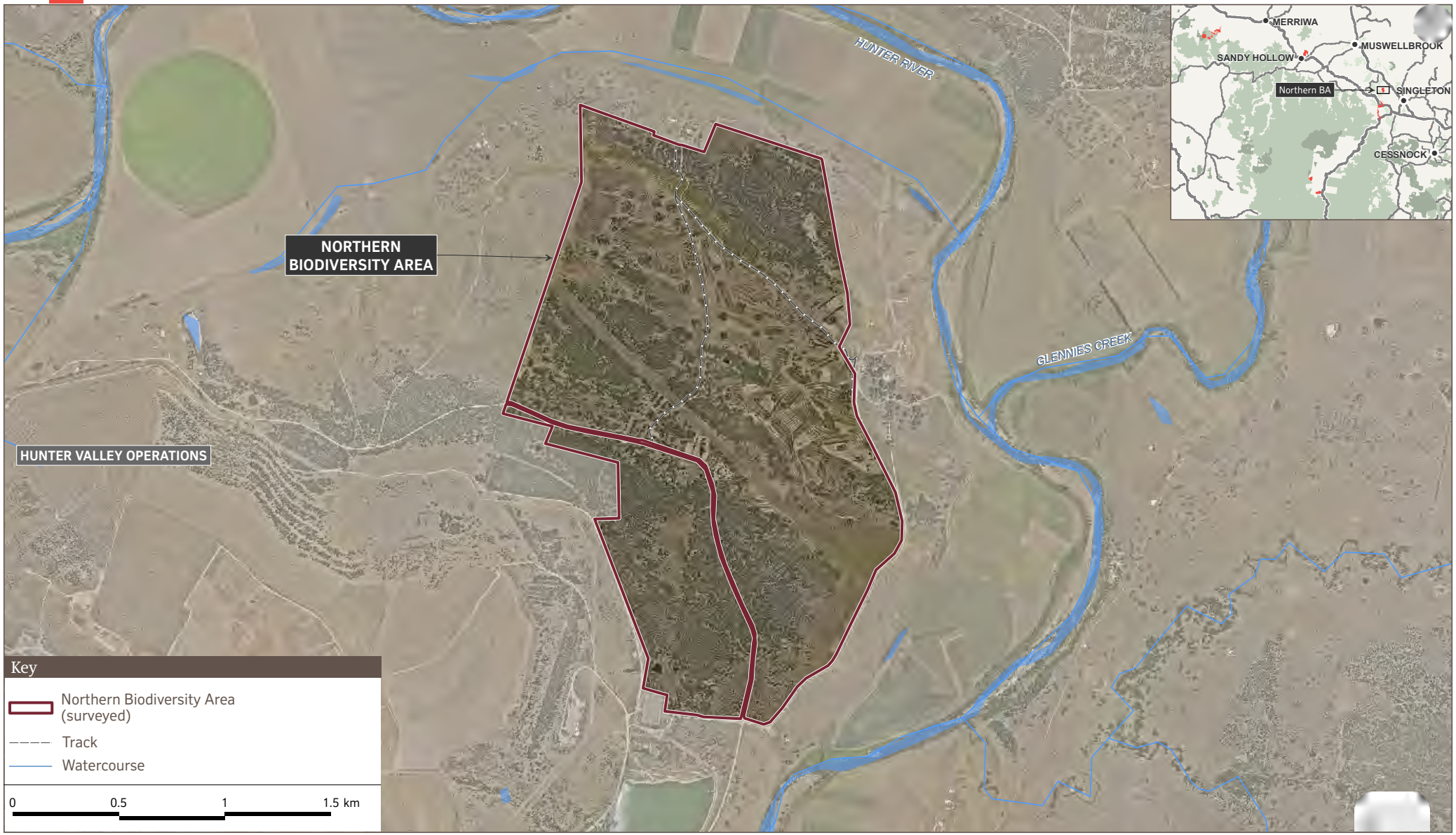


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Northern Biodiversity Area

Annual Compliance Report

Figure 3



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3 SUMMARY OF ACTIVITIES – 2025

Table 2 provides a summary of the activities undertaken during the reporting period (Year 8) and the progress in attaining the Performance Criteria for the key Conservation Management Strategies in the management plans.

3.1 Summary of climatic conditions

Figure 4 and **Figure 5** show the monthly actual rainfall compared to the long-term average for the Northern BA and Southern BA for the reporting period. In 2025, rainfall was above average for March, April, May, August and September, with close to or below average for remaining months. The Southern BA received ~754mm of rainfall which was ~56mm above the long-term average and the Northern BA received ~744mm which was ~68mm above the long-term average.

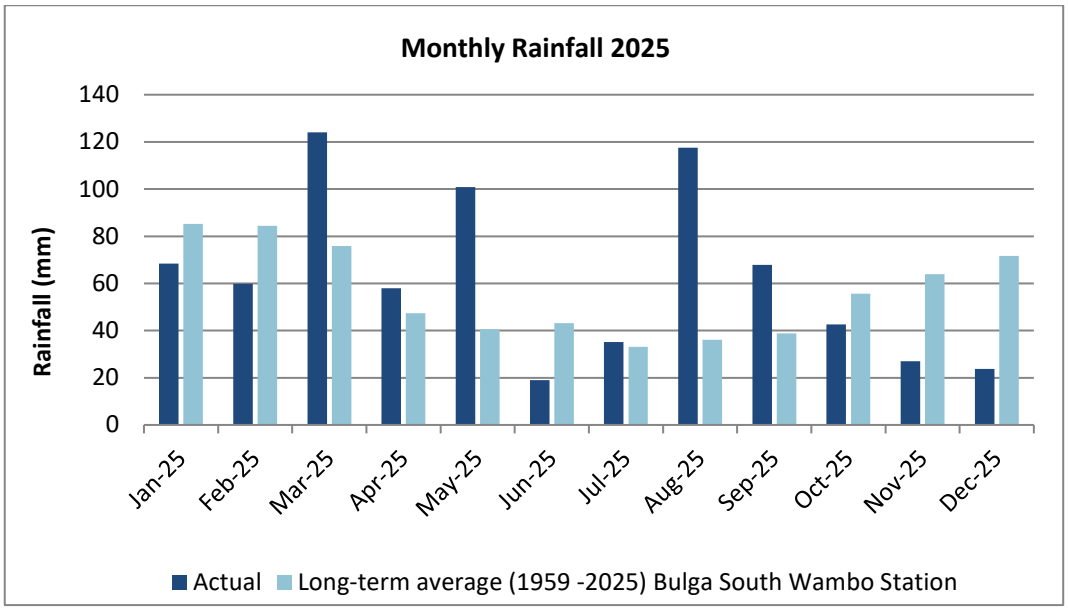


FIGURE 4 MONTHLY RAINFALL – NORTHERN BA

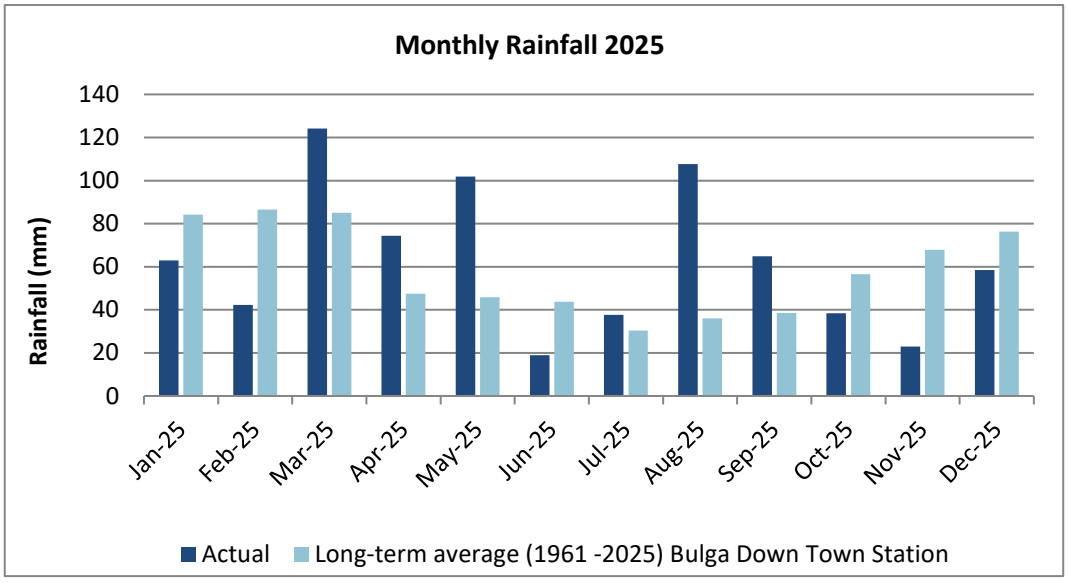


FIGURE 5 MONTHLY RAINFALL –SOUTHERN BA

Table 2 Summary of progress against Performance Criteria

Conservation Actions	Year 1 to Year 5	Year 6 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
ACTIVE RESTORATION				
Southern BA WSW planting (40ha)				
Performance Criteria	*Collection of seed. Plant propagation. Tubestock planted.* *Completed survival assessment.*	*Biennial ecological monitoring completed*	*Ecological monitoring demonstrates a trajectory toward the reference site or the benchmark values for HU872 for all attributes measured over the three consecutive assessments (the average of all plots).*	
Activity / Progress	Seed collection and plant propagation was undertaken. In 2017 1ha of WSW tubestock was planted in the Southern BA. In 2018 14 ha of WSW tubestock was planted in the Southern BA including replanting the sand quarry and old orchard areas. In 2019 maintenance of planting areas was undertaken and included infill planting of over 9,000 tubestock. In 2020 maintenance of planting areas was undertaken and included infill planting of over 2,000 tubestock. Survival assessments were completed for all planting areas.	Seed collection and plant propagation was undertaken. In 2022 planting of tubestock included 3,000 WSW tubestock in the grassland area of Southern BA1 and infill planting of 4,400 tubestock throughout the Southern BA. Ecological monitoring undertaken in 2022 and 2024. In 2023 planting of tubestock included 800 WSW tubestock in the grassland area of Southern BA1. In 2024, WSW planting progressed with ~5000 m^3 of WSW sand stripped from ahead of mining at MTW and hauled to the Southern BA3. This WSW sand was spread, seeded with native grasses and then 4,000 WSW tubestock were planted into the planting areas. In 2025, WSW infill planting included 960 tubestock in Southern BA3. Survival assessment completed for planting areas.		Seed collection. Undertake survival assessments. Undertake Ecological monitoring. Review and revise Southern Biodiversity Area Management Plan, to include updates to the supplementary planting section.

Conservation Actions	Year 1 to Year 5	Year 6 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
Southern BA CHGBIW planting (240ha)				
Performance Criteria	*Collection of seed. Plant propagation. Tubestock planted.* *Completed survival assessment.*	*Biennial ecological monitoring completed.*	*Ecological monitoring demonstrates a trajectory toward the reference site or the NSW Biometric HU817 for all attributes measured over three consecutive assessments (the average of all plots).*	
Activity / Progress	Seed collection and plant propagation was undertaken. Restoration activities included tubestock planting of Central Hunter Grey Box – Ironbark Woodland in the Southern BA. In 2017, 89 ha of the Southern BA was planted with over 13,000 tubestock planted into rip lines. In 2018 118 ha of the Southern BA was planted with over 20,000 tubestock planted into rip lines. In 2019 maintenance of planting areas was undertaken and included infill planting of over 10,000 tubestock. In 2020 maintenance of planting areas was undertaken and included infill planting of over 3,800 tubestock. In 2021 maintenance of planting areas was undertaken and included infill planting of 9,000 tubestock. The site preparation for these sites included ripping by dozer and weed control. To mimic nature the tree species were planted at a spacing of 5 -10m and shrubs species planted in clumps as commonly found with understory species within this vegetation type. All plants were watered, fertilised and protected with a tree guard. Survival Assessments were completed for all planting areas.	Seed collection and plant propagation was undertaken. In 2022 maintenance of planting areas was undertaken and included infill planting of 7,000 tubestock. In 2024 maintenance of planting areas was undertaken and included infill planting of 4,780 tubestock. Ecological monitoring undertaken in 2022 and 2024. Survival assessment completed for planting areas.		Seed collection. Undertake Ecological monitoring. Review and revise Southern Biodiversity Area Management Plan, to include updates to the supplementary planting section.

Conservation Actions	Year 1 to Year 5	Year 6 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
Southern BA ROF planting (26ha)				
Performance Criteria	*Collection of seed. Plant propagation. Tubestock planted.* *Completed survival assessment.*		*Survival assessment greater than 70%*	
Activity / Progress	Seed collection and plant propagation was undertaken. Restoration activities included planting River Oak Forest in the Southern BA. In 2018, 11ha of the Southern BA was planted with over 2,000 tubestock planted into rip lines. In 2019 maintenance of planting areas was undertaken and included infill planting of over 800 tubestock. In 2020 maintenance of planting areas was undertaken and included infill planting of 3,200 tubestock. In 2021 maintenance of planting areas was undertaken and included infill planting of 4,000 tubestock. The site preparation for this site included ripping by dozer and weed control. To mimic nature the tree species were planted at a spacing of 5 -10m and shrubs species planted in clumps as commonly found with understory species within this vegetation type. All plants were watered, fertilised and protected with a tree guard. Survival Assessments were completed for all planting areas.	In 2022 maintenance of planting areas was undertaken and included infill planting of 5,000 tubestock. In 2024 maintenance of planting areas was undertaken and included infill planting of 1,460 tubestock. Seed collection and plant propagation was undertaken. Survival assessment completed for planting areas.		Seed collection. Undertake Ecological monitoring. Review and revise Southern Biodiversity Area Management Plan, to include updates to the supplementary planting section.

Conservation Actions	Year 1 to Year 5	Year 6 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
Northern BA WSW planting (195ha)				
Performance Criteria	*Collection of seed. Plant propagation. Tubestock planted.* *Completed survival assessment.*	*Biennial ecological monitoring completed.*	*Ecological monitoring demonstrates a trajectory toward the reference site or the benchmark values for HU872 for all attributes measured over three consecutive assessments (the average of all plots).*	
Activity / Progress	Seed collection and plant propagation was undertaken. Restoration activities included planting Warkworth Sands Woodland in the Northern BA. In 2014 work commenced to restore over 80 hectares of Warkworth Sands Woodland, this involved the planting of seedlings and the relocation of sand salvaged ahead of mining activities. In 2017, 10,800 tubestock were planted into 44 50x50m patches. Topsoil from ahead of mining operations at MTW was salvaged and hauled to the Biodiversity Area prior to planting commencing. In total Ten patches received 50mm of topsoil over the whole patch, two received 50mm of topsoil over half the patch, 12 received 25mm of topsoil over the patch and ten received no topsoil. Holes were dug for tubestock, either by hand or auger and all plants were watered, fertilised and protected with a tree guard. In 2018 maintenance of planting areas was undertaken and included infill planting of over 8,000 tubestock. In 2019 maintenance of planting areas was undertaken and included infill planting of over 3,000 tubestock. In 2020 planting progressed at the Northern BA with 9,112m³ of WSW sand stripped ahead of mining at MTW and hauled to the Northern Biodiversity Area. 5,480m³ of this WSW sand was spread into strips and seeded with native grasses to increase the groundcover diversity then planted with 4,500 tubestock	Seed collection and plant propagation was undertaken. In 2022 maintenance of planting areas was undertaken and included infill planting of 3,400 WSW tubestock. Ecological monitoring undertaken in 2022 and 2024. Planting of 10,000 Warkworth Sands Woodland tube stock was delayed due to access issues transporting sand into the planting areas, this was rescheduled for 2023. In 2023, WSW planting progressed with ~5,000 m³ of WSW sand stripped from ahead of mining at MTW and hauled to the Northern Biodiversity Area. This WSW sand was spread into strips and more broadly in some areas, seeded with native grasses and then 10,000 WSW tubestock were planted into the planting areas. In 2024, WSW planting progressed with ~13,000 m³ of WSW sand stripped from ahead of mining at MTW and hauled to the Northern Biodiversity Area. This WSW sand was spread into strips and more broadly in some areas, seeded with native grasses and then 15,100 WSW tubestock were planted into the planting areas. In 2025, WSW planting progressed with ~11,000 m³ of WSW sand stripped from ahead of mining at MTW and hauled to the Northern Biodiversity Area. This WSW sand was spread into strips and		Seed collection and plant propagation. Undertake track maintenance to allow sand to be transported to the planting areas. Spread topsoil from ahead of mining operations at MTW into the Northern BA planting areas. Undertake planting of Warkworth Sands Woodland tube stock. Undertake Ecological monitoring. Undertake survival assessments.

Conservation Actions	Year 1 to Year 5	Year 6 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
	In 2021 WSW planting progressed with 3,632 m^3 of sand from ahead of mining at MTW spread into strips and seeded with native grasses then planted with 1,500 tubestock. Survival Assessments were completed for all planting areas A separate Ecological monitoring program was undertaken in 2021 to capture the WSW planting areas.	more broadly in some areas, seeded with native grasses and then 9,800 WSW tubestock were planted into the planting areas. Survival Assessments were completed for planting areas.		
Northern BA CHGBIW planting (23ha)				
Performance Criteria	*Collection of seed. Plant propagation. Tubestock planted.* *Completed survival assessment.*	*Biennial ecological monitoring completed.*	*Ecological monitoring demonstrates a trajectory toward the reference site or the NSW Biometric HU817 for all three attributes measured over three consecutive assessments (the average of all plots).*	
Activity / Progress	Restoration activities included tubestock planting of Central Hunter Grey Box – Ironbark Woodland in the Northern BA. In 2017, 6ha of the Northern BA was planted with 2,780 tubestock planted into rip lines. The site preparation for this site included ripping by dozer and weed control. To mimic nature the tree species were planted at a spacing of 5 -10m and shrubs species planted in clumps as commonly found with understory species within this vegetation type. All plants were watered, fertilised and protected with a tree guard. In 2018 maintenance of planting areas was undertaken and included infill planting. Survival Assessments were completed for all planting areas.	Ecological monitoring undertaken in 2022 and 2024.		Seed collection. Undertake Ecological monitoring.

Conservation Actions	Year 1 to Year 5	Year 6 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
PASSIVE RESTORATION				
Weed control and monitoring				
Performance Criteria	*At least two weed control events each year for species listed in Table 14 of Management Plans* *and other weeds recorded from monitoring activities.* *All actions recorded in Annual Report.* *Complete Rapid Condition Assessments and* *Property Inspections.*	*At least one weed control event each year for species listed in Table 14 of Management Plans and other weeds recorded from monitoring activities.* *All actions recorded in Annual Report.* *Complete Rapid Condition Assessments and Property Inspections.*	*Ecological monitoring data indicates a trajectory for reduction in exotic plant cover over three consecutive assessments.*	
Activity / Progress	Weed contractor engaged to undertake weed control activities at the Northern and Southern BA throughout the year. Rapid Condition Assessment and Property Inspections were completed.	In 2025 weed control targeted the following species: African boxthorn (*Lycium ferocissimum),* African lovegrass *(Eragrostis curvulva),* African olive (*Olea europaea),* Ashwagandha *(Withania somnifera),* Balloon vine *(Cardiospermum grandiflorum),* Bidens (*Bidens pilosa),* Blue heliotrope *(Heliotropium amplexicaule),* Brazilian nightshade (*Solanum seaforthianum),* Bridal Creeper *(Asparagus asparagoides),* Carrion Flower *(Orbea variegata),* Castor Oil Plant *(Ricinus communis),* Cats Claw Creeper *(Dolichandra unguis-cati),* Common Pear *(Opuntia stricta),* Coolatai grass (*Hyparrhenia hirta),* Creeping pear *(Opuntia humifusa),* Fireweed *(Senecio madagascariensis),* Fleabane *(Erigeron bonariensis),* Galenia (*Galenia pubescens),* Golden wreath wattle (*Acacia saligna),* Green cestrum (*Cestrum parqui),* Guinea Grass *(Megathyrsus maximus),* Inkweed (*Phytolacca octandra),* Khaki Weed *(Alternanthera pungens),* Kikuyu *(Cenchrus clandestinus),* Lantana *(Lantana camara),* Mother of millions (*Bryophyllum delagoense),* Moth vine (*Araujia sericifera),* Mullein *(Verbascum sp.),* Narrow Leaf Cotton Bush *(Gomphocarpus fruticosus),* Paterson's		Control noxious species and stop weeds spreading into previously un-infested areas. Undertake Rapid Condition Assessments. Undertake Property Inspections.

Conservation Actions	Year 1 to Year 5	Year 6 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
		curse (*Echium plantagineum),* Peppercorn Tree *(Schinus molle),* Potato vine *(Solanum seaforthianum),* Prickly pear (*Opuntia stricta),* Rhodes grass *(Chloris gayana),* Scotch Thistle *(Onopordum acanthium),* Sowthistle *(Sonchus olearius),* Spear Thistle *(Cirsium vulgare),* Stinking roger (*Tagetes minuta),* Telegraph weed *(Heterotheca grandiflora),* Tiger Pear *(Opuntia aurantiaca),* Toadflax *(Linaria vulgaris),* Twiggy Mullein *(Verbascum virgatum),* Tree of Heaven *(Ailanthus altissima),* Turkey rhubarb *(Rumex sagittatus),* Whiskey Grass *(Andropogon virginicus),* White Cedar *(Melia azedarach)* Rapid condition assessments and property inspections were completed.		
Pest control and monitoring				
Performance Criteria	*At least two control events each year for species listed in Table 20 of Management Plans, and any other species recorded from monitoring activities.* *Active participation in programme coordinated by Hunter Local Land Service (HLLS), this may include local control actions.* *Complete biannual inspection and report all works completed and actions for next year.*	*At least one control events each year for species listed in Table 17 of Management Plans, and any other species recorded from monitoring activities.* *Active participation in programme coordinated by HLLS, this may include local control actions.* *Complete biannual inspection and report all works completed and actions for next year.*	*No observed vertebrate pest or damage.* *Ecological monitoring demonstrates a trajectory to benchmark values for all attributes measured over three consecutive assessments (the average of all plots).*	
Activity / Progress	Vertebrate pest contractor was engaged to undertake programmes across the Southern and Northern BA. Biannual property inspections were undertaken.	In 2022 a vertebrate pest contractor was engaged to undertake programmes across the Southern and Northern BA. In 2023, 1080 ground baiting programmes were undertaken targeting wild dogs and foxes in autumn and spring, across the Southern and Northern BA. Both programmes were coordinated with HLLS and neighbouring landholders across the broader Hunter Valley area.		Undertake vertebrate pest management including 1080 ground baiting programmes scheduled for autumn and spring to target wild dogs and foxes. Undertake pig trapping and baiting program across MTW and the Southern and Northern BA's. Undertake biannual property Inspections.

Conservation Actions	Year 1 to Year 5	Year 6 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
		In 2023, a trapping program was undertaken targeting pigs in Spring, across MTW and the Southern BA. In 2024, 1080 ground baiting programmes were undertaken targeting wild dogs and foxes in autumn and spring, across the Southern and Northern BA. Both programmes were coordinated with HLLS and neighbouring landholders across the broader Hunter Valley area. In 2024, a ground baiting program and a trapping/ground baiting program were undertaken in Autumn and Winter respectively, targeting pigs across MTW and the Southern and/or Northern BA's. In 2025, 1080 ground baiting programmes were undertaken targeting wild dogs and foxes in autumn and spring, across the Southern and Northern BA. Both programmes were coordinated with HLLS and neighbouring landholders across the broader Hunter Valley area. In 2025, trapping and ground baiting programs were undertaken in January and Winter, targeting pigs across MTW and the Southern and Northern BA's. Biannual property inspections were undertaken.		
Grazing				
Performance Criteria	*Grazing is conducted in accordance with the Management Plan.* *Boundary fences maintained.* *Complete Rapid Condition Assessment and Property Inspections.*			
Activity / Progress	No strategic grazing was undertaken in the BAs in 2025. Boundary fence repairs/replacements undertaken in the Southern and Northern BA. Property Inspections and Rapid Condition Assessments were undertaken in 2025.			Undertake Property Inspections. Undertake Rapid Condition Assessments. Maintain boundary fences.

Conservation Actions	Year 1 to Year 5	Year 6 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
Bushfire Management Plan (BFMP), Ecological burn and monitoring				
Performance Criteria	*Actions implemented.* *Review and revise if required.* *Complete Rapid Condition Assessments and* *Property Inspections.*	*Actions implemented.* *Review and revise if required.* *Complete Rapid Condition Assessments and Property Inspections.* *Completed ecological fire management plan for MZ1, MZ3, MZ5, MZ7, MZ8 and MZ9.*	*All required actions of BFMP have been implemented.* *BFMP has been reviewed annually and revised if required.*	
Activity / Progress	BFMP reviewed. Firebreaks were slashed. Property Inspections and Rapid Condition Assessments were undertaken.	BFMP reviewed and revised. Firebreaks were slashed at the Southern BA in 2023, 2024 and 2025. Areas were also slashed at Northern BA related to planting preparation activities, but which also served as firebreaks. Property Inspections and Rapid Condition Assessments were undertaken in 2022, 2023, 2024 and 2025.		Review BFMP. Undertake Property Inspections. Undertake Rapid Condition Assessments. Undertake fuel load assessments. Slash firebreaks.
Infrastructure Improvements and monitoring				
Performance Criteria	*Completed GDP for all infrastructure improvement actions.* *Maintenance of tracks and fences completed at least every 3 years.* *Property Inspections undertaken.*			.
Activity / Progress	GDP's completed for WSW planting program and access road maintenance in the Northern BA in 2025. GDP completed for fence repairs in the Southern BA in 2025. Boundary fences maintained, and Property Inspections undertaken in 2025.			Maintain tracks and boundary fences. Undertake Property Inspections
Erosion monitoring inspections and reports				
Performance Criteria	*Complete Rapid Condition Assessment and Property Inspections*			
Activity / Progress	Rapid Condition Assessments and Property Inspections undertaken in 2025. An erosion repair was undertaken at Southern BA5.			Undertake Rapid Condition Assessments. Undertake Property Inspections. Monitor/repair erosion area identified in Northern BA

Conservation Actions	Year 1 to Year 5	Year 6 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
Dam conversion and rehabilitation and monitoring				
Performance Criteria	*Prepare dam conversion plan.* *Dam conversion complete and rehabilitation has stabilised the site.* *Property inspections.*	*Observed natural flow regime and no erosion.* *Property inspections.*	*All works completed.*	
Activity / Progress	Property inspections undertaken. Dam conversion plan prepared.	Property inspections undertaken.		Implement actions from dam conversion plan. Undertake Property Inspections.
Natural Regeneration and monitoring				
Performance Criteria	Annual weed control, vertebrate pest and fire management actions implemented as per management plans. *Complete Rapid Condition Assessments and Property Inspections.*		*Ecological monitoring demonstrates a trajectory to benchmark values for all attributes measured over three consecutive assessments (the average of all plots).*	
Activity / Progress	Actions implemented in 2025 as per management plans. Rapid Condition Assessments and Property Inspections undertaken in 2025.			Undertake Property Inspections. Undertake annual weed control. Undertake Rapid Condition Assessments.
Controlled Activities				
Performance Criteria	*No reported incidents of prohibited actions undertaken Yancoal, contractors, consultants or other agents of Yancoal.* *Any clearing of vegetation reported in Annual Report.* *Signage and locks (where required) maintained.* *Complete risk assessment for any recreation activities.* *All occupants of residents compliant with requirements of the MP.* *No Cultural Heritage sites knowingly disturbed and any protective barricading maintained.* *Damaged and unwanted fences removed.* *All Property Inspections completed.*			
Activity / Progress	In 2017 trespassing and illegal tree clearing and timber getting within the Southern Biodiversity Area resulted in felling approximately 40 full sized trees and 100 small trees. This unauthorised activity was reported to both Department of Environment and Energy and Department of Planning and Environment in October 2017. Internal fences and waste were removed from the Southern BA areas to be planted in 2018 and sections of boundary fence at the Northern BA and Southern BA were			Undertake Property Inspections.

Conservation Actions	Year 1 to Year 5	Year 6 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
	repaired and replaced where needed. New Biodiversity Area signs were installed in 2017. In 2023, sections of boundary fence at the Northern BA and Southern BA were repaired and replaced where needed. In 2024 there were no reported incidents or prohibited actions undertaken on the Biodiversity Areas. In 2024, sections of boundary fence and a gate at the Southern BA were repaired and replaced where needed. In 2025, sections of the western boundary fence at the Northern BA were replaced/relocated, so that fenced along the property boundary. Sections of boundary fence and gates at Southern BA were replaced and/or repaired where needed. Regular property inspections were undertaken.			

4 MONITORING ACTIVITIES

The following table provides a summary of the monitoring activities undertaken as detailed in the MP. Monitoring reports and results are available on the Biodiversity Offset Portal.

Table 3 Monitoring Activity Summary

Monitoring	2025	Date/s	Completed by
Bird Assemblage	N/A	July – November 2024, next due July – October 2026	Future Fauna
Habitat Restoration	N/A	September - November 2024, next due September – November 2026	Mosaic Ecology and Leaf ERC
Rapid Condition Assessment	X	November and December 2025, next due September – November 2026	Franks Fencing (Land Management Advisor) and Rural and Environmental Management
Property Inspection	X	April/May/November 2025, next due April/November 2026	Environment and Community Advisor

4.1 Bird assemblages monitoring

Bird assemblage monitoring was not required to be undertaken during 2025. The results from the 2024 bird assemblage monitoring were presented in the 2024 Annual Report for Local Offsets.
The next bird assemblage monitoring is to be undertaken from July 2026.

4.2 Habitat restoration monitoring

Habitat restoration monitoring was not required to be undertaken during 2025. The results from the last round of habitat restoration monitoring conducted in 2024 were presented in the 2024 Annual Report for Local Offsets.
The next habitat restoration monitoring is to be undertaken from September 2026.

5 PROGRESS IN ATTAINING CONSERVATION OBJECTIVES AGAINST KEY PERFORMANCE INDICATORS

The primary conservation objectives for the local offset areas (including the Putty Road Offset) are to:

- enhance biodiversity values across the BAs;
- protect the WSW Offset Area and Putty Road Offset Area under a legally binding conservation covenant;
- increase the condition of WSW and Ironbark EECs and observe a transition from grassland to woodland;
- enhance habitat and foraging opportunities for the woodland birds; and
- contribute to and enhance the existing network of protected vegetation within the Hunter Valley.

Table 2 indicates the progress in attainment of the long-term conservation objectives, the ecological monitoring data supports the continued implementation of the conservation management strategies.

6 ADAPTIVE MANAGEMENT

No new environmental risks have been identified during the reporting period.

Table 4 Local Offset Areas Biodiversity Values and Key Performance Indicators

Area	Biodiversity Value	Description and baseline metric	KPI	Progress comment
Southern BA	Ironbark Woodland	Total area: 446.7ha RCA Average Health rating 18.0/20 (MZ1)	Extent and condition of woodland over 10 years.	RCA results: 2014 – 18/20 2015 – 18/20 2016 – 18/20 2017 – 18.5/20 2018 – 18.5/20 2019 – 18/20 2020 – 17.5/20 2021 – 17.5/20 2022 – 18/20 2023 – 18/20 2024 – 18/20 2025 – 17.5/20 Area and health maintained.
	Ironbark Grassland	Total area: 258.4ha	Transition of grassland to woodland.	2025 monitoring supports continued implementation of the conservation management strategies.
	WSW	Total area: 137ha RCA Average Health rating 17.0/20 (MZ3)	Extent and condition of woodland over 10 years.	RCA results: 2014 – 16/20 2015 – 18/20 2016 – 17/20 2017 – 18/20 2018 – 18/20 2019 – 18/20 2020 – 17/20 2021 – 17/20 2022 – 16/20 2023 – 16/20 2024 – 17/20 2025 – 16/20 Area and health maintained.

Area	Biodiversity Value	Description and baseline metric	KPI	Progress comment
	WS Grassland	Total area:40.3ha	Transition of grassland to woodland.	2025 monitoring supports continued implementation of the conservation management strategies.
	Hunter Lowland Red Gum Forest	Total area: 32.4ha RCA Average Health rating 18.4/20 (MZ5)	Extent and condition over 10 years.	RCA results: 2014 – 17/20 2015 – 19/20 2016 – 19/20 2017 – 19/20 2018 – 18.5/20 2019 – 18.5/20 2020 – 19/20 2021 - * 2022 - * 2023 – 18/20 2024 – 18/20 2025 – 18/20 *Sites were inaccessible due to flooding
	Fauna Habitat	Low potential habitat	Observe maintenance or increase habitat condition rating over 10 years	2025 monitoring supports continued implementation of the conservation management strategies.

Area	Biodiversity Value	Description and baseline metric	KPI	Progress comment
Northern BA	Ironbark Woodland	Total area: 103.6ha RCA Average Health rating 18.6/20 (MZ1)	Extent and condition of woodland over 10 years.	RCA results: 2014 – 18/20 2015 – 18.5/20 2016 – 19.5/20 2017 – 19.5/20 2018 – 18/20 2019 – 18/20 2020 – 19/20 2021 – 19/20 2022 – 18.5/20 2023 - 18.5/20 2024 – 18/20 2025 – 18.5/20 Area and health maintained.
	Ironbark Grassland	Total area: 23.1ha	Transition of grassland to woodland.	2025 monitoring supports continued implementation of the conservation management strategies.
	WSW	Total area: 19.5ha RCA Average Health rating 18.5/20 (MZ3)	Maintain woodland extent over 10 years.	RCA results: 2014 – 17.5/20 2015 – 18/20 2016 – 19/20 2017 – 19/20 2018 – 18.5/20 2019 – 18.5/20 2020 – 19/20 2021 – 18.5/20 2022 – 18.5/20 2023 – 18.5/20 2024 – 18.5/20 2025 – 19/20 Area and health maintained.

Area	Biodiversity Value	Description and baseline metric	KPI	Progress comment
	WS Grassland	Total area: 194.5	Transition of grassland to woodland	2025 monitoring supports continued implementation of the conservation management strategies.
	Fauna Habitat		Observe maintenance or increase habitat condition rating over 10 years	2025 monitoring supports continued implementation of the conservation management strategies.



Regional Biodiversity Areas

Annual Report 2025

Annual report for the period from January to December 2025, for activities described in the Management Plans for all regional Warkworth Mining Limited offsets including:

- Goulburn River Biodiversity Area
- Seven Oaks Biodiversity Area
- Bowditch Biodiversity Area
- Putty Biodiversity Area
- Condon View Biodiversity Area
- North Rothbury Biodiversity Area

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Revision

Version No.	Version Details	Document Status	Date
1.0	**Environment and Community Advisor**	**Final**	**30/03/2026**

1 INTRODUCTION

This annual report is a requirement of the Management Plans for all regional Warkworth Mining Limited offsets for the 2025 reporting period from 1 January through to 31 December 2025.

The annual report provides a summary of the key management activities completed across the biodiversity offsets located within the Goulburn River, Seven Oaks, Bowditch, Putty, Condon View and North Rothbury Biodiversity Areas (BAs).

The management plans describe the conservation management strategies and monitoring to achieve, and measure improvement and protection of the offset's biodiversity values. It is a compliance requirement of the Commonwealth and NSW environmental approvals to implement the management plans.

The Regional Offset Management Plan (ROMP) was prepared to satisfy the consent requirements for the New South Wales (NSW) Hunter Valley Operations (HVO) South Project Approval (PA 06_0261) and the Warkworth Mine Commonwealth EPBC 2002/629 Approval. In November 2015, the NSW Warkworth Continuation Project Approval (SSD-6464) was granted providing both NSW and Commonwealth approval for the same disturbance area. Phase 2 of the EPBC2009/5081 action also commenced on 16 February 2016. In response to the granting of these approvals, Management Plans for the Bowditch and Goulburn River BA's have been prepared to satisfy the Commonwealth approval EPBC2009/5081 and the NSW consent (SSD-6464), replacing the ROMP. On 10 October 2016 HVO was granted approval (EPBC2016/7604), The Condon View BA provides 168ha of suitable direct offset to be compliant with this approval. Management Plans have also been prepared and submitted for the regional BAs: Seven Oaks, Putty, Condon View and North Rothbury.

The Biodiversity Offset Portal contains all the supporting documentation for this report, including photo point monitoring. Access to the portal is restricted, relevant regulators have been provided with login details; please contact Mount Thorley Warkworth should you require assistance.

2 LOCATION AND LANDHOLDER DETAILS

The locations of the regional BAs are shown in **Figure 1**, further details are provided in **Table 1**. The land is owned by Warkworth Mining Limited (WML). The Goulburn River BA is owned by Warkworth Mining Limited and has a portion of the total area designated as an offset for Hunter Valley Operations (HVO). Details of the Warkworth and HVO Offset areas are in **Table 2 and Figure 1 and 2**.

Table 1 Regional Biodiversity Areas

Biodiversity Area	Local Government Area	Land Owner	Area (ha)	Offset Area (ha)	Location
Goulburn River	Upper Hunter / Mid-Western	Warkworth Mining Limited	1,539	1,206	'The Rivers' 30km west of Merriwa, via Dulhunty Road, Comialla Road and Golden Hwy.
Bowditch	Muswellbrook	Warkworth Mining Limited	607	602	3km north of Sandy Hollow, 3450 Wybong Road, via Golden Hwy.
Seven Oaks	Mid-Western	Warkworth Mining Limited	521	519	35km west of Merriwa via Ulan Road, Summer Hill Road, Durridgerie Road and Smedes Road.
Condon View	Singleton	Warkworth Mining Limited	445	345	5km west of Putty via Box Tree Clearing Trail off Putty Valley Road.
Putty	Singleton	Warkworth Mining Limited	386	383	5km south of Putty via Box Gap Road.
North Rothbury	Cessnock	Warkworth Mining Limited	41	41	1km south of North Rothbury via Wine Country Drive.

Table 2 Goulburn River Biodiversity Area

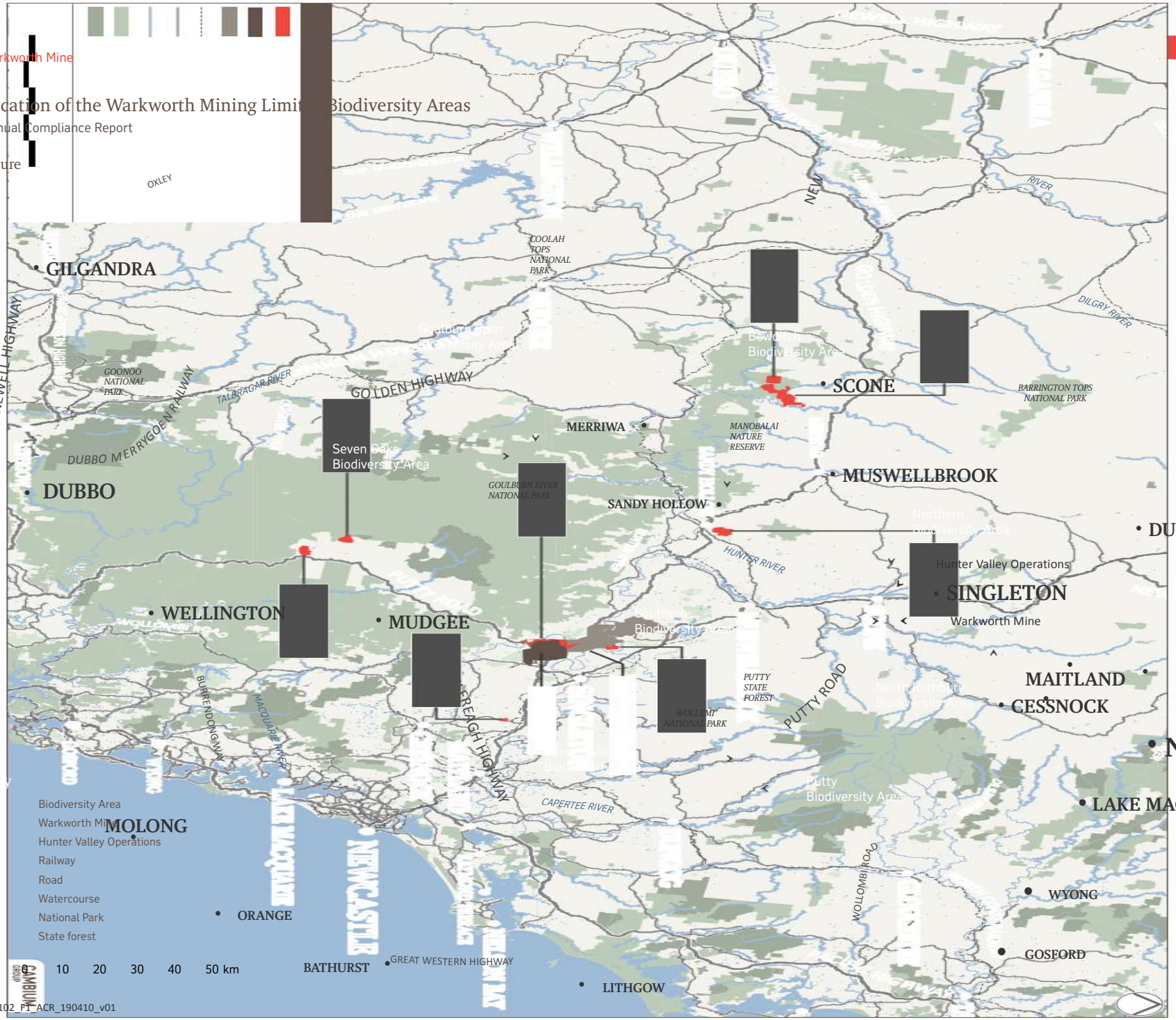
Biodiversity Area	Land Owner	Area (ha)	Warkworth Offset Area (ha)	HVO Offset Area (ha)
Goulburn River	Warkworth Mining Limited	1,539	1,066	140

Warkworth Mine

Location of the Warkworth Mining Limited Biodiversity Areas

Annual Compliance Report

Figure



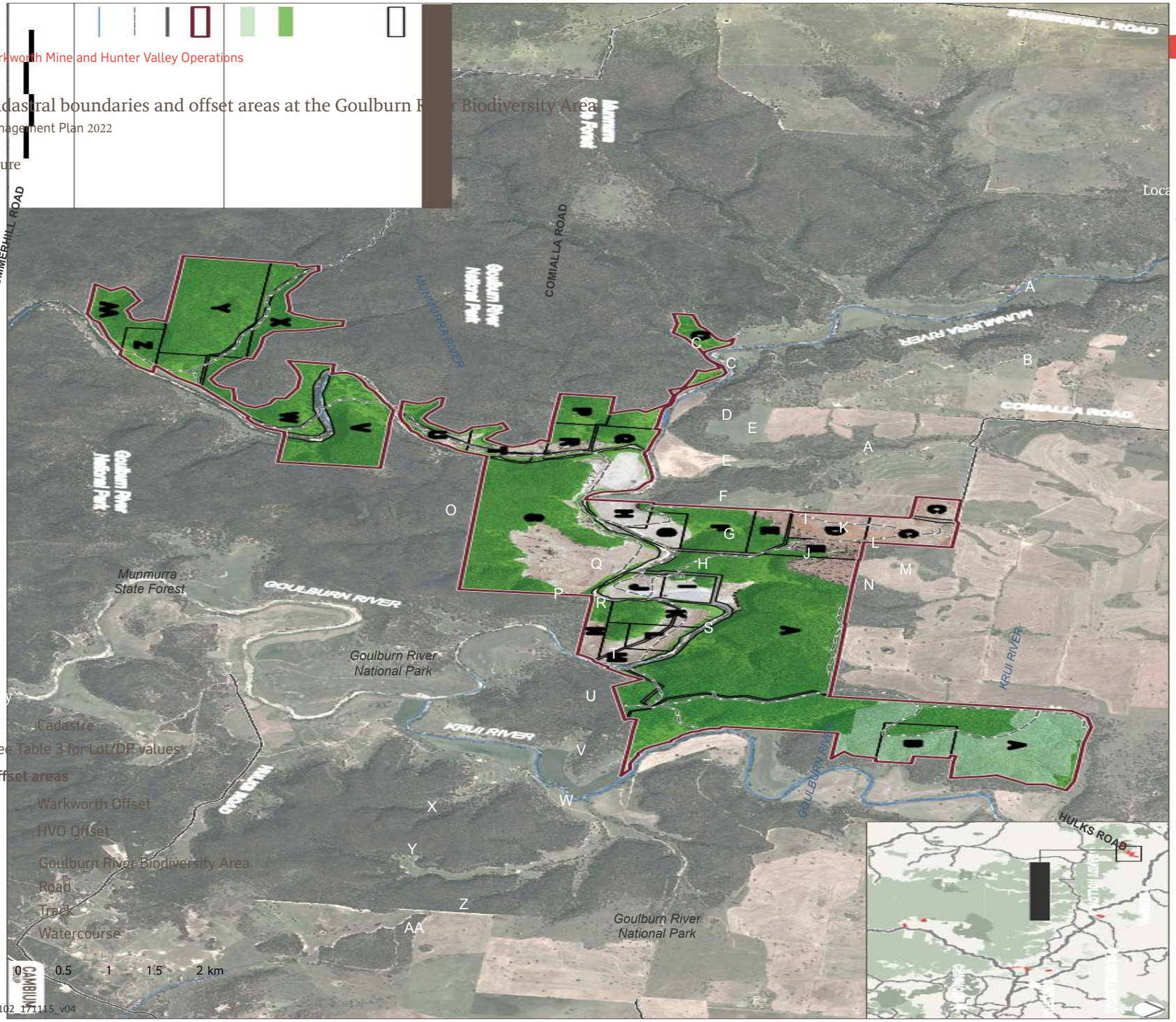
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Warkworth Mine and Hunter Valley Operations

Cadastral boundaries and offset areas at the Goulburn River Biodiversity Area

Management Plan 2022

Figure





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3 SUMMARY OF ACTIVITIES – 2025

Table 3 provides a summary of the activities undertaken during the reporting period (Year 9) and the progress in attaining the Performance Criteria for the key Conservation Management Strategies in the management plans.

3.1 Summary of climatic conditions

Figure 4 shows the monthly actual rainfall in 2025 compared to the long-term average for the regional Biodiversity Areas for the reporting period. The Putty region received 766mm which was 30mm above the long-term average. North Rothbury received 993mm, 250mm above the long-term average. Sandy Hollow received 523mm which was 69mm below the long-term average and the Merriwa region received 562mm, 36mm below the long-term average.

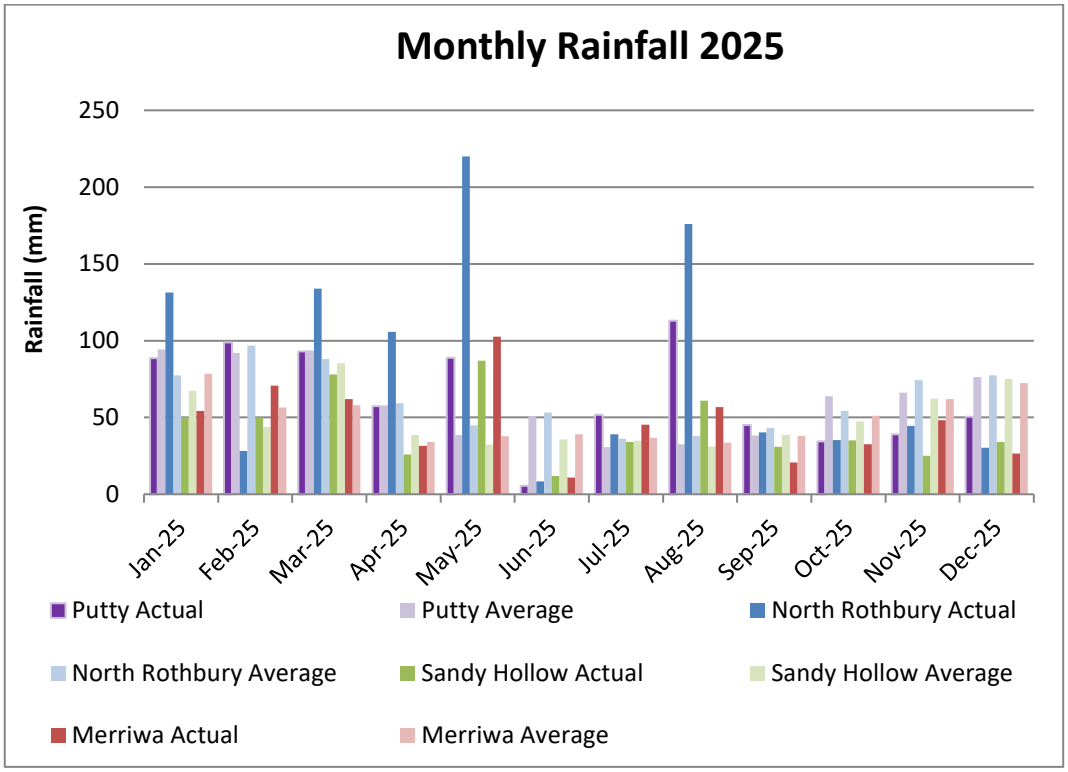


FIGURE 4 MONTHLY RAINFALL - 2025

Table 3 Summary of progress against Performance Criteria

Conservation Actions	Year 1 to Year 4	Year 5 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
ACTIVE RESTORATION				
Goulburn River BA Yellow Box – Grey Box – Red Gum grassy woodland (21.5ha) and River Oak riparian woodland (24.2ha)				
Performance Criteria	*Collection of seed. Plant propagation. Tubestock planted.* *Completed survival assessment.*		*Planting achieves above 70% survival.*	
Activity / Progress	Seed collection was undertaken at the Goulburn River BA in 2021. In 2019 17,000 tube stock was planted into 21.5ha of Yellow Box-Red Gum grassy woodland and 24.2ha of River Oak riparian woodland. The site preparation for these sites included ripping by dozer and weed control. To mimic nature the tree species were planted at a spacing of 5 -30m. All plants were watered, fertilised and protected with a tree guard. In 2020 maintenance of planting areas was undertaken and included infill planting of 12,000 tubestock. Survival assessments undertaken.	In 2021 maintenance of planting areas was undertaken and included infill planting of 12,000 tubestock into areas that could be accessed. In 2022 planting of 10,000 tube stock was delayed due access issues crossing the Goulburn River. In 2023 maintenance of planting areas was undertaken and included infill planting of 10,000 tubestock into areas that could be accessed. Survival assessment undertaken. In 2024 maintenance of planting areas was undertaken. In 2025 maintenance of planting areas was undertaken, including plant guard removal (such as from established plantings) and slashing works.		Seed collection. Review and revise Goulburn River Biodiversity Area Management Plan, to include updates to the supplementary planting section.
All Regional BA's				
Performance Criteria	*Review monitoring data to identify areas that require re-planting.* *If re-planting is identified, develop a re-establishment plan and implement within 12 months*			
Activity / Progress	Ecological monitoring results have identified infill planting requirements in the River Oak riparian areas of the Goulburn River BA and Cassinia/Acacia regenerating Shrubland/Woodland of the Seven Oaks BA. A consultant review of proposed revisions (based on recommendations from ecologist, bird monitoring specialist and bush regenerator) to the supplementary planting section of the Goulburn River and Seven Oaks Biodiversity Area Management Plans, was undertaken. The recommendations of the review report will be used to inform revisions to the supplementary sections of the relevant Management Plans and will be submitted to relevant stakeholders for their review in 2026.			

Conservation Actions	Year 1 to Year 4	Year 5 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
PASSIVE RESTORATION				
Weed control and monitoring				
Performance Criteria	*At least two weed control events each year for species listed in Table 14 of Management Plans and other weeds recorded from monitoring activities.* *Complete Ecological Monitoring, Rapid Condition Assessments and Property Inspections.*	*At least one weed control event each year for species listed in Table 14 of Management Plans and other weeds recorded from monitoring activities.* *Complete Ecological Monitoring, Rapid Condition Assessments and Property Inspections.*	*Ecological monitoring data indicates a trajectory for reduction in exotic plant cover over three consecutive assessments.*	
Activity / Progress		Weed contractor engaged to undertake weed control activities across all Regional BAs throughout the year to control noxious species and stop weeds spreading into previously un-infested areas. In 2025 weed control targeted the following species: African lovegrass *(Eragrostis curvulva),* African olive *(Olea europaea),* Blackberry *(Rubus armeniacus and anglocandicans),* Blue heliotrope *(Heliotropium amplexicaule),* Blue Passionflower *(Passiflora caerulea)* Brazilian nightshade *(Solanum seaforthianum),* Bridal creeper *(Asparagus asparagoides),* Cadaghi *(Corymbia torelliana),* Castor oil *(Ricinus communis),* Cats claw creeper *(Dolichandra unguis-cati),* Creeping pear *(Opuntia humifusa),* Duranta *(Duranta erecta),* Fireweed *(Scenecio madagascariensis),* Galenia *(Galenia pubescens),* Green cestrum *(Cestrum parqui),* Jacaranda *(Jacaranda mimosifolia),* Lantana *(Lantana camara),* Mother of Millions *(Bryohpyllum delagonese),* Moth Vine *(Araujia sericifera),* Mullein *(Verbascum sp.),* Narrow-leaf cotton bush *(Gomphocarpus fruticosus),* Ochna *(Ochna serrulata),* Peppercorn Tree *(Schinus molle),* Prickly pear *(Opuntia stricta),* Queensland Wattle *(Acacia podalyriifolia),* Ragwort *(Senecio jacobaea),* Robinia *(Robinia pseudoacacia),* Silky Oak *(Grevillea robusta),* St John's wort *(Hypericum perforatum),* Sticky nightshade *(Solanum sisymbriifolium),* Sweet Briar *(Rosa rubiginosa),* Thistle *(Cirsium sp.),* Trad *(Tradescantia fluminensis),* Tree of heaven *(Ailanthus altissima),* Whiskey grass *(Andropogon virginicus),* Wild Tobacco *(Solanum mauritianum),* Willows *(Salix sp.),* Yucca *(Yucca aloifolia).* Rapid Condition Assessments and Property Inspections were completed in 2025.		Control noxious species and stop weeds spreading into previously un-infested areas. Undertake Rapid Condition Assessments. Undertake Property Inspections. Undertake Ecological monitoring.

Conservation Actions	Year 1 to Year 4	Year 5 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
Pest control and monitoring				
Performance Criteria	*At least two control events each year for species listed in Management Plans, and any other species recorded from monitoring activities.* *All actions recorded in the Annual Report.* *Active participation in programme coordinated by Hunter Local Land Service (HLLS), this may include local control actions.* *Complete Rapid Condition Assessments and Property Inspections.*	*At least one control event each year for species listed in Management Plans, and any other species recorded from monitoring activities.* *All actions recorded in the Annual Report.* *Active participation in programme coordinated by HLLS, this may include local control actions.* *Complete Rapid Condition Assessments and Property Inspections.*	*No observed vertebrate pest or damage.* *Ecological monitoring demonstrates a trajectory to benchmark values for all attributes measured over three consecutive assessments (the average of all plots).*	
Activity / Progress		In 2025 vertebrate pest contractors were engaged to undertake programmes across all Regional BAs. Two 1080 ground baiting programmes targeting wild dogs and foxes were undertaken in autumn and spring in conjunction with neighbouring landholders and HLLS. A ground shooting program was undertaken at the Goulburn River BA in March controlling five feral pigs and one fox. A ground shooting program was undertaken at the Bowditch Biodiversity Area in March controlling nine feral deer and one fox. A Noisy Miner ground shoot was undertaken at the Goulburn River BA in August under a Licence to Harm Protected Animals (Biodiversity Conservation Act 2016). The programme aims to assist the survivability of the Regent Honeyeater. The Goulburn River BA programme which is in its ninth consecutive year resulted in the control of 252 Noisy Miners over seven days. Aerial shoots conducted by NPWS at the Goulburn River/Seven Oaks BA's in June and August controlled 29 and 14 feral pigs respectively. Rapid Condition Assessments and Property Inspections were completed in 2025.		Participate in HLLS and NPWS Aerial Baiting/shooting programmes. Undertake shooting and baiting programmes. Undertake a control programme for Noisy Miners in the Regent Honeyeater breeding area at GRBA and Bowditch. Undertake Rapid Condition Assessments. Undertake Property Inspections. Undertake Ecological monitoring.

Conservation Actions	Year 1 to Year 4	Year 5 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
Grazing				
Performance Criteria	*Grazing is conducted in accordance with the Management Plan.* *Boundary fences maintained.* *Complete Rapid Condition Assessment and Property Inspections.*			
Activity / Progress	No strategic grazing implemented on BAs in 2025. Rapid Condition Assessment and Property Inspections were completed in 2025. Boundary fences repaired or replaced at North Rothbury, Goulburn River and Condon View BAs in 2025.			Undertake Rapid Condition Assessments. Undertake Property Inspections. Maintenance of boundary fences.
Regional BA Bushfire Management Plan (BFMP) and monitoring				
Performance Criteria	*Actions implemented.* *Review and revise if required.* *Complete Rapid Condition Assessments and Property Inspections*	*Actions implemented.* *Review and revise if required.* *Complete Rapid Condition Assessments and Property Inspections.* *Completed ecological fire management plan.*	*All required actions of BFMP have been implemented.* *BFMP has been reviewed annually and revised if required.*	
Activity / Progress		BFMP reviewed and revised. Fuel load assessments were undertaken on Putty, Condon View, North Rothbury, Seven Oaks, Goulburn River and Bowditch BAs in 2025. A hazard reduction burn for the Seven Oaks BA was undertaken in May 2023, which treated approximately 90 Ha and reducing the fuel load to low. A Hazard Reduction Burn for North Rothbury BA was scheduled however conditions were outside the prescribed criteria, so the burn was rescheduled for 2026. Slashing of fire breaks was undertaken at North Rothbury and Goulburn River BAs. Rapid Condition Assessments and Property Inspections were completed in 2025.		Review BFMP. Undertake fire break slashing. Undertake annual fuel load assessments on all Regional BAs. Undertake the Hazard Reduction Burn at North Rothbury BA. Undertake Rapid Condition Assessments. Undertake Property Inspections.

Conservation Actions	Year 1 to Year 4	Year 5 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
Erosion monitoring inspections and reports				
Performance Criteria	*Complete Rapid Condition Assessment and Property Inspections*			
Activity / Progress	Erosion areas inspected/monitored at North Rothbury, Goulburn River and Condon View BA's. Erosion repair undertaken at Bowditch BA. Rapid Condition Assessment and Property Inspections were completed in 2025.			Undertake Rapid Condition Assessment. Undertake Property Inspections. Inspect/monitor erosion areas identified at North Rothbury and Goulburn River BA's. Repair erosion area at Condon View BA.
Dam conversion and rehabilitation and monitoring				
Performance Criteria	*Prepare dam conversion plan.* *Dam conversion complete and rehabilitation has stabilised the site.* Property inspections.	*Observed natural flow regime and no erosion.* *Property inspections.*	*All works completed.*	
Activity / Progress		Property inspections undertaken in 2025. A dam conversion plan was prepared in 2021.		Implement the dam conversion plan. Undertake Property Inspections.
Natural Regeneration and monitoring				
Performance Criteria	*Annual weed control, vertebrate pest and fire management actions implemented as per management plans.* *Complete Rapid Condition Assessment and Property Inspections.*		*Ecological monitoring demonstrates a trajectory to benchmark values for all attributes measured over three consecutive assessments (the average of all plots).*	
Activity / Progress	Rapid Condition Assessment and Property Inspections undertaken in 2025. Actions implemented as per management plans – see above.			Implement actions as per Management plans. Undertake Rapid Condition Assessment. Undertake Property Inspections. Undertake Ecological Monitoring.

Conservation Actions	Year 1 to Year 4	Year 5 to Year 10 (2025 is Year 9)	Completion Criteria	Actions 2026
Controlled Activities				
Performance Criteria	*No reported incidents of prohibited actions undertaken by Yancoal, contractors, consultants or other agents of Yancoal.* *Any clearing of vegetation reported in Annual Report.* *Signage and locks (where required) maintained.* *Complete risk assessment for any recreation activities.* *All occupants of residents compliant with requirements of the MP.* *No Cultural Heritage sites knowingly disturbed and any protective barricading maintained.* *Damaged and unwanted fences removed.* *All Property Inspections completed.*			
Activity / Progress	There was one incident at North Rothbury BA in 2024, which involved unauthorised access by a neighbouring resident. The resident realigned a section of the boundary fence and also used a small excavator to push up ground cover in the area. The neighbour was provided with a letter advising that no future unauthorised access was permitted and if any actions were deemed required, that these needed to be communicated to Yancoal MTW for follow up as required. The boundary fence was repaired and reinstated along its correct alignment. There was one reported incident of prohibited actions undertaken in 2025. Evidence of unauthorised vegetation clearing (two trees felled and removed) at the North Rothbury Biodiversity Area was observed by a contractor on 5 August 2025 whilst undertaking weed control activities at the North Rothbury Biodiversity Area. A follow up inspection identified that an additional tree had been cut through but had not yet fallen because it was “hung up” in an adjacent tree. Monitoring cameras and additional signage was subsequently installed. The incident was reported to DPHI and DCCEEW. Cultural Heritage sites are barricaded. Signage and locks maintained. Regular property inspections were undertaken in 2025.			Undertake Property Inspections. Repair Cultural Heritage barricading where required.

4 MONITORING ACTIVITIES

The following table provides a summary of the monitoring activities undertaken as detailed in the management plans. Monitoring reports and results are available on the Biodiversity Offset Portal.

Table 4 Monitoring Activity Summary

Monitoring	2025	Date/s	Completed by
Bird Assemblage	N/A	July – November 2024, next due July – October 2026	Future Fauna
Habitat Restoration	N/A	September – November 2024, next due September – November 2026	Mosaic Ecology and Leaf ERC
Rapid Condition Assessment	X	November/December 2025 next due September – November 2026	Franks Fencing (Land Management Advisor) and Rural & Environmental Management
Property Inspection	X	April/May/November/December 2025, next due April/November 2026	Mosaic Ecology

4.1 Bird assemblages monitoring

Bird assemblage monitoring was not required to be undertaken during 2025. The results from the 2024 Bird Assemblage monitoring were presented in the 2024 Annual Report for Regional Offsets. The next Bird Assemblage monitoring is scheduled for July 2026.

4.2 Habitat restoration monitoring

Habitat Restoration monitoring was not required to be undertaken during 2025. The results from the last round of Habitat Restoration monitoring conducted in 2024 were presented in the 2024 Annual Report for Regional Offsets. The next Habitat Restoration monitoring is scheduled for September 2026.

5 PROGRESS IN ATTAINING CONSERVATION OBJECTIVES AGAINST KEY PERFORMANCE INDICATORS

The primary conservation objectives for the Regional BAs are to:

- enhance landscape connectivity within the surrounding landscape;
- improve fauna movement and flora dispersal opportunities within the surrounding landscape;
- increased condition and area of suitable habitats for threatened fauna species within protected reserves, specifically for the Regent Honeyeater and Swift Parrot;
- provide refuge and habitat for local fauna populations and transient species, particularly threatened species; and
- enhance network of protected vegetation within the Hunter Valley.

Table 3 details the progress in attainment of the long-term conservation objectives. The baseline data presented is from the first monitoring completed in 2014. The Rapid Condition Assessment (RCA) monitoring results indicate that the vegetation and habitat health is being maintained in comparison to the baseline data **Table 5 – Table 10**.

6 ADAPTIVE MANAGEMENT

No new environmental risks have been identified during the reporting period.

Table 5 Goulburn River BA: Biodiversity Values and KPIs

Biodiversity Value	Nested Conservation Value(s)	Description and baseline metric	KPI	Progress comment
Woodland (MZ2, MZ3, MZ4, MZ5 and MZ7)		Total area: 1,169ha RCA Average Health rating 17.6/20	Maintain or increase area, connectivity and habitat condition over 10 years	RCA Average health rating 2015 – 17/20 2016 – 17.1/20
	Fauna Habitat	Moderate potential habitat for Swift Parrot and Regent Honeyeater	improved habitat condition over 10 years	2017 – 17.1/20 2018 - 18.1/20 2019 – 18.4/20 2020 - *17.5/20 2021 - *17.4/20 2022 - *18.2/20 2023 – 17.8/20 2024 – 17.4/20 2025 – 17.3/20 Area and health maintained *Some sites were inaccessible due to high water levels in the Goulburn River.

Table 6 Bowditch BA: Biodiversity Values and KPIs

Biodiversity Value	Nested Conservation Value(s)	Description and baseline metric	KPI	Progress comment
Woodland (MZ1, MZ2 and MZ4)		Total area: 602ha RCA Average Health rating 18.2/20	Observed and measured increase or maintained RCA scores over 10 years	RCA Average Health rating 2015 – 18/20 2016 – 18.4/20
	Fauna Habitat	Moderate potential habitat for Swift Parrot and Regent Honeyeater	Maintain or increase the condition and extent of habitat and bird usage over 10 years	2017 – 17.1/20 2018 – 17.7/20 2019 – 17.7/20 2020 – 18.1/20 2021 – 18.3/20 2022 – 18.7/20 2023 – 18.3/20 2024 – 18.8/20 2025 – 18.9/20 Area and health maintained

Table 7 Seven Oaks BA: Biodiversity Values and KPIs

Biodiversity Value	Nested Conservation Value(s)	Description and baseline metric	KPI	Progress comment
Woodland (MZ3, MZ4 and MZ5)		Total area: 519ha RCA Average Health rating 18.0/20	Observe an increase in area, connectivity and habitat condition over 10 years	RCA Average Health rating 2016 – 18/20 2017 – 17.3/20
	Fauna Habitat	Moderate potential habitat for Swift Parrot and Regent Honeyeater	Maintain or increase the condition and extent of habitat and bird usage over 10 years	2018 – 17.6/20 2019 – 17.6/20 2020 - 18.2/20 2021 – 18.2/20 2022 – 18.2/20 2023 – 18/20 2024 – 18.2/20 2025 – 18.2/20 Area and health maintained

Table 8 Condon View BA: Biodiversity Values and KPIs

Biodiversity Value	Nested Conservation Value(s)	Description and baseline metric	KPI	Progress comment
Woodland (MZ2 and MZ4)		Total area: 515ha RCA Average Health rating 19.2/20	Maintain or increase area, connectivity and habitat condition over 10 years	RCA Average Health rating 2016 – 20/20 2017 – 18.2/20
	Fauna Habitat	Moderate potential habitat for Swift Parrot and Regent Honeyeater	Maintain or increase the condition and extent of habitat and bird usage over 10 years	2018 – 18.6/20 2019 – 18.6/20 2020 – 19/20 2021 – 19.3/20 2022 – 19.3/20 2023 – 19.7/20 2024 – 19.7/20 2025 – 19.3/20 Area and health generally maintained

Table 9 Putty BA: Biodiversity Values and KPIs

Biodiversity Value	Nested Conservation Value(s)	Description and baseline metric	KPI	Progress comment
Woodland (MZ2, MZ3 and MZ4)		Total area: 383ha RCA Average Health rating 17.2/20	Observe an increase in area, connectivity and habitat condition over 10 years	RCA Average Health rating 2016 – 17.3/20 2017 – 17.6/20
	Fauna Habitat	Moderate potential habitat for Swift Parrot and Regent Honeyeater	Maintain or increase the condition and extent of habitat and bird usage over 10 years	2018 – 17.8/20 2019 – 15.6/20 2020 – 16.2/20 2021 – 16.8/20 2022 – 17/20 2023 – 17.3/20 2024 – 18/20 2025 – 18.8/20 (Bushfire in July and December 2019 reduced the health rating)

Table 10 North Rothbury BA: Biodiversity Values and KPIs

Biodiversity Value	Nested Conservation Value(s)	Description and baseline metric	KPI	Progress comment
Woodland (MZ1 and MZ2)		Total area: 41ha RCA Average Health rating 18.6/20	Observe an increase in area, connectivity and habitat condition over 10 years	RCA Average Health rating 2016 – 18/20 2017 – 18.2/20
	Fauna Habitat	Moderate potential habitat for Swift Parrot and Regent Honeyeater	Maintain or increase the condition and extent of habitat and bird usage over 10 years	2018 – 19/20 2019 – 18.7/20 2020 – 19/20 2021 – 19/20 2022 – 19/20 2023 – 18.75/20 2024 – 18.25/20 2025 – 18.25/20 Area and health maintained

Appendix 9:

IEA Action Status Table

Mount Thorley Warkworth Complex (SSD-6464 and SSD-6465) – Independent Environmental Audit 2023 – Progress with Audit Recommendations

NON-COMPLIANCE RECOMMENDATIONS AND RESPONSES				
Ref	**Compliance Requirement**	**Independent Audit Finding**	**Independent Audit Recommendation**	**MTW Response / Progress**
SSD 6464				
S2 C9	By the end of January 2017, unless the Planning Secretary agrees otherwise, the Applicant must surrender the existing development consent (DA-300-9-2002-i) for the Warkworth mine in accordance with Section 104A of the EP&A Act. Following the commencement of development under this consent, the conditions of this consent shall prevail to the extent of any inconsistency with the conditions of DA-300-9-2002-i.	Reported as non-compliant in the 2020 Annual Review. No documentation was available to the auditor that confirmed that the existing consents had been surrendered.	Work with DPE is close out the surrender of the development consents.	This is noted in the audit report as an administrative non-compliance. An application to surrender the development consent DA 300-9-20020i was submitted in June 2017 and progressed with correspondence with DPHI up to 2021. This was not progressed in the 2025 Annual review Period. MTW will continue to work with DPHI to progress surrender of the relevant consent during the 2026 Annual Review period.
S3 C5	From 1 January 2017, except for the land in Table 1, the Applicant must ensure that the noise generated by the Development does not exceed the noise criteria in Table 3 at any residence on privately owned land.	Section 6.2.2/3 of each Annual Review presents the results of the noise monthly noise monitoring undertaken by independent consultants. A summary of compliance is as follows: 2020 – no non compliances reported 2021 - no non compliances reported 2022 – six exceedances of the noise criteria were recorded One hundred and fifty-seven (157) noise complaints were received during the audit period. This consisted of 98 complaints in 2020, 49 in 2021, 47 in 2022 and 11 in 2023 (to the end of April. The Auditor notes that that 112 of the 162 (69%) noise complaints were from five residents. While there has been an improvement over the life of the project in the number of complaints (325 recorded in 2016), a contributing factor to the higher number of complaints during the early operational stages may potentially be attributed to a higher proportion of activities closer to ground level, with improvements achieved over the project life due to attenuation provided by the pit depth, mine walls and in acoustic vehicle technology.	Review current predictive tools and processes against available models that are currently being utilised in both the mining and construction industries with the objective of: • Identifying areas on site that have the potential to impact noise sensitive receivers; • Provides a Noise Impact Prediction Model that can be used by MTW to plan works in those areas with the objective to proactively ensure that noise from plant and equipment does not cause annoyance to local community and exceed the relevant criteria.	Completed. MTW has an existing predictive noise enhancement tool to identify potential noise enhancement at the various directions surrounding the mine, and additionally already implements the rigorous planning, noise monitoring and management measures described in the Noise Management Plan. In response to the audit recommendation, MTW has reviewed two alternative predictive noise tools (models), and additionally a weather enhancement tool used at MTW that has initially been developed to predict blast overpressure enhancement, which progressed to have the capability for hourly updates on enhancement conditions in 2023, but has continued using existing prediction tools. During 2024, MTW implemented an improved noise monitoring method for supplementary noise monitoring which involves post processing of the measured noise spectrum to identify potential low frequency modifying factor. This new tool was developed in conjunction with an acoustic consultant during 2023-2024 as an improvement measure. Since implementation, operations are modified in response to the measured site only level, including any modifying factor.

NON-COMPLIANCE RECOMMENDATIONS AND RESPONSES				
Ref	**Compliance Requirement**	**Independent Audit Finding**	**Independent Audit Recommendation**	**MTW Response / Progress**
		Prior to each shift, a predictive tool is utilised to assess potential impacts taking into account the prevailing meteorological conditions. MTW implements noise management and monitoring methods to identify if there is a potential issue and takes rectification action to modify operations where indicated. Following the receipt of noise complaints, a CRO is deployed to make observations and measure noise levels (5-minute sample). In many instances the CROs observations have verified the complaint and the noise readings have indicated that the noise levels from the mine were exceeding the relevant criteria. Where these potential exceedances are identified, MTW review the works being undertaken at the likely exceedance source and make changes to those works to reduce noise emissions. The Auditor understands that noise modelling of future works that may impact sensitive receivers is not routinely undertaken.		
S3 C19a and c	The Applicant must: a) implement all reasonable and feasible measures to minimise the: • odour, fume and dust emissions of the development; and • release of greenhouse gas emissions from the development; c) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note d to Tables 5-7 above);	Fifty-eight dust-related complaints were received during the audit period. No exceedances in dust criteria were reported during the audit period. Significant areas of the site have been cleared and progressive rehabilitation works are behind schedule. The Auditor also observed significant areas, that while not ready for final rehabilitation, would benefit from temporary stabilisation to help reduce dust emissions during adverse wind conditions.	Increase the rate of progressive rehabilitation works with the objective of meeting the established progressive rehabilitation targets. Prepare and implement a program for the stabilisation of unsealed / disturbed areas of the site including stockpiles, finished landforms, and disturbed areas that are not currently being actively worked / filled). The program should identify and classify all areas of the site that are currently disturbed according to the dust generation potential of those areas and establish clear targets for the stabilisation of those areas (either permanent or temporary) with the objective of meeting the requirements of the Blue Book.	MTW notes that the audit found there were no exceedances in dust criteria reported during the audit period. MTW has a well developed and implemented Air Quality Management Plan and considers that reasonable and feasible controls are being implemented. In relation to rehabilitation progression, MTW acknowledges the benefit rehabilitation progress has for minimising air quality impacts, and undertakes progressive rehabilitation as part of normal mine operations. MTW completed 100.1 Ha of rehabilitation in 2025, which greater than the planned 89.1 Ha in the Forward Program for 2025. MTW submits an updated rehabilitation Forward Program, as required by the conditions of mining leases, to be submitted to the Resources Regulator by end of March each year, which identifies rehabilitation progression for the upcoming 3 years. Refer to SSD-6464 S3 C57 for rehabilitation progression response. The Air Quality Management Plan for MTW includes as a control measures to undertake interim stabilisation works. In addition to completed rehabilitation works, during 2025, MTW identified further areas for interim stabilisation, which resulted in stabilisation treatment works including: -aerial seeding of 86Ha in December 2025 to an exotic pasture grass and legume mix suitable for summer sowing. Fertiliser was mixed with the seed prior to loading to provide sufficient nutrients for plant growth.

NON-COMPLIANCE RECOMMENDATIONS AND RESPONSES				
Ref	**Compliance Requirement**	**Independent Audit Finding**	**Independent Audit Recommendation**	**MTW Response / Progress**
S3 C24	Unless an EPL or the EPA authorises otherwise, the Applicant must ensure that all surface water discharges from the site comply with the: a) discharge limits (both volume and quality) set for the development in any EPL; and	The Annual Returns prepared for the Environment Protection Licence 1376 noted several non-compliances with this condition. Refer to audit schedule for EPL 1376 for details.	A risk assessment and review of the storage capacity of the retention dams be undertaken that takes into account the increasing risk of extreme weather events, including extended duration wet weather patterns.	Completed. MTW undertook a review and update of a risk assessment for all water storage dams at MTW in October 2023. This review included consideration of overtopping potential for the specific dams.
S3 C26 (Table 8)	Design, install and/or maintain mine water storage infrastructure to ensure no discharge of mine water off-site (except in accordance with condition 24) On-site storages (including mine infrastructure dams and treatment dams) are suitably designed, installed and/or maintained to minimise permeability Maintain adequate freeboard within the pit void at all times to minimise the risk of discharge to surface waters	This commitment is included in Table 5.1 of the WMP. There have been two incidents that resulted in the discharge of mine-water. The incident on 4/1/21 was from a water equipment park up area has spilled from a dam into a water course reporting into Wollombi Brook, the incident resulted penalty notices issued by both the DPE and EPA. In response to the Penalty notices, WML prepared an action plan which includes several actions relating to detailed engineering assessment, design and construction of civil infrastructure for improved surface water drainage infrastructure at WML North Pit North. Correspondence from DPE and WML confirms that the detailed design works for the North Pit North drainage improvements were completed in October 2021. The incident on 4/7/22 was reported as an overtopping event during a greater than design rainfall event. It was reported that samples were collected with no environmental harm caused. No further actions to prevent recurrence were proposed by WML.	In relation to the incident on the 4/7/21, no further actions are recommended over and above the actions taken by WML in response to the incident. In response to the incident on the 4/7/22, it is recommended that a risk assessment and review of the storage capacity of the retention dams be undertaken that takes into account the increasing risk of extreme weather events, including extended duration wet weather patterns.	Completed. Refer to response to SSD-6464 S3 C24.
S3 C28	Within 3 years of the date of commencement of development under this approval, the applicant will retire biodiversity credits of a class and number specified in Tables 9 and 10 below to the satisfaction of BCD.	DPE has yet to approve the retirement of biodiversity credits. However, it is acknowledged that some components such as the provision of supplementary measures (such as funding of research) have been met.	As the retirement of requisite credits is now over 4 years overdue, it is recommended that negotiations with the Department/BCD/BCT to reach an agreeable solution are given priority.	This is noted in the audit report as an administrative non-compliance. Warkworth Mining Ltd (WML) lodged a modification application for development consent SSD6464 (MOD1) in April 2021 to clarify biodiversity offset requirements for WML and to facilitate in-perpetuity conservation of biodiversity offset land. During 2024, WML continued in dialogue with DPHI and BCS regarding this matter, and progressed towards a Biodiversity

NON-COMPLIANCE RECOMMENDATIONS AND RESPONSES				
Ref	**Compliance Requirement**	**Independent Audit Finding**	**Independent Audit Recommendation**	**MTW Response / Progress**
				Stewardship Agreement (BSA) as this is the only mechanism acceptable to the NSW Government for in-perpetuity security of biodiversity offset land. During 2024, BCS completed an equivalence assessment associated with MTW's biodiversity offset land. With this step completed and in consultation with BCS, a BSA was progressed during 2025 for one offset area to develop the method for securing the BSA. A meeting occurred in July and December 2025 with NSW Conservation Programs and Heritage Regulation (CPHR) to present and discuss the proposed BSA management plan and Total Fund Deposit for the North Rothbury Offset Area test site. This process will continue into the 2026 Annual Review period. It is intended that after the individual offset BSA is completed and those credits retired, BSAs for each offset area will be progressed. The equivalent credit values established for each BSA will then be retired upon execution of the BSAs.
S3 C30	Within 3 years of the date of commencement of the development under this consent, the Applicant must secure offset areas listed in Table 12 under an in-perpetuity conservation mechanism such as entering into a biobank agreement, in accordance with the relevant provisions of the TSC Act. The direct land-based offsets may be used as offsets for any approval required under the EPBC Act for this development.	Date of commencement was 15 Feb 2016, therefore offset areas were to be secured under an in-perpetuity mechanism 14 February 2019 (i.e. within 3 years of commencement). Despite documentation/correspondence between WML, the Department and BCD since 2018, which has included submission of a modification application to DPE (SSD-6464 MOD1) to address securing of the offsets, this item remains incomplete. Actions are currently still being undertaken to reach an agreeable resolution with BCD and the department. However, no written correspondence between WML and the Department/BCD has been sited since the February 2022 correspondence.	As the securing of offset areas under an appropriate mechanism is now over 4 years overdue, it is recommended that negotiations with the Department/BCD/BCT to reach an agreeable solution are given priority.	This is noted in the audit report as an administrative non-compliance. Refer to response to SSD-6464 S3 C28.
S3 C34	Within 12 months of the commencement of the development under this consent, the Applicant must prepare an Integrated Management Plan for the Warkworth Sands Woodland EEC to the satisfaction of BCD. This plan must be prepared in consultation with the owners of Wambo and Bulga Mines and outline the measures that would be implemented to coordinate management and recovery efforts for the EEC.	Correspondence sighted confirmed that BCD had received the WSW IMP as submitted by WML. Correspondence from BCD confirmed that the review of the 2018 IMP was largely complete. However no subsequent correspondence sighted and no correspondence/documentation provided regarding approval of WSW IMP provided. It is noted that the WSW IMP has been prepared and provided to BCD. Non-compliance is mainly due to the document not yet being approved by BCD (i.e not approved within 12 months of the commencement of the development.	Work with BCD to progress the outstanding approval as a high priority.	This is noted in the audit report as an administrative non-compliance. No progress was achieved in the 2025 Annual Review period. MTW will work with BCS to progress toward approval of the WSW IMP during the 2026 Annual review period.

NON-COMPLIANCE RECOMMENDATIONS AND RESPONSES				
Ref	**Compliance Requirement**	**Independent Audit Finding**	**Independent Audit Recommendation**	**MTW Response / Progress**
S3 C51	The Applicant must: a) keep records of the amount of coal transported from the development in each calendar year; and b) make these records available on its website at the end of each calendar year.	The 2020 and 2021 Annual Reviews are publicly available on the MTW website; however, the 2022 Annual Review was not on the website at the time of this IEA. Therefore, the coal transport records for 2022 were not publicly available as required by this Condition. The Auditor notes that the 2022 Annual Review had been submitted to DPE but had not yet been approved.	Ensure that the coal transportation records are regularly updated.	Although this is noted in the audit report as an administrative non-compliance, MTW does not agree with this audit finding. Coal transportation records are included in the Annual Review report submitted to DPHI. The 2022 Annual Review Report was approved by DPHI 20/11/2023 and was uploaded to the MTW website that day. The 2023 Annual Review Report was approved by DPHI 1/08/2024 and was uploaded to the MTW website 12/08/2024. The 2024 Annual Review Report was approved by DPHI 12/08/2025 and was uploaded to the MTW website 14/08/2025.
S3 C52 a and c	The Applicant must: a) implement all reasonable and feasible measures to minimise the visual off-site lighting impacts of the development, including lighting impacts on road users and impacts of mining voids; b) ensure that all external lighting associated with the development complies with Australian Standard AS4282 (/NT) 1997 - Control of Obtrusive Effects of Outdoor Lighting, or its latest	Environmental induction covers lighting. The Lighting review undertaken in 2020 confirms the offsite lighting impacts was meeting the requirements of this condition. However, 94 lighting complaints were received during the audit period, 75 of those complaints came from three residents. A review of the complaints indicates that the community impacts are from relocatable lighting and mobile plant, but that fixed lighting is not generating complaints. As part of the internal complaint investigations, CROs assess mobile lighting and arrange changes in light locations or direction and that the actions, in general resolve the issues. It is apparent that there is insufficient planning for the location and use of mobile lighting and therefore all reasonable and feasible mitigation measures have not been used.	Ensure that personnel responsible for planning and / or managing night works undertake proactive planning for all after hours works. The planning should identify the optimal lighting setup for those activities and that the implementation of the lighting plans be checked prior to undertaking those activities by CROs or other appropriately trained personnel.	As stated in the audit finding, a review of lighting was conducted in 2020 (by an environmental/engineering consultant) specifically against AS4282, which confirmed that offsite lighting impacts were meeting the requirements of development consent condition S3 C52. In relation to potential lighting impacts from lighting plant, MTW has developed and implements processes involved with the siting and set up of lighting plant designed to minimise the risk of intrusive light impacts. MTW also conducts an inspection of established lighting as part of a routine process by Community Response Officers (CROs) on night shift – this occurs each night as a routine inspection and feedback to operations to make adjustments where necessary, and also will occur in response to community complaint regarding lighting. This represents significant effort regarding management of potential lighting impacts. 17 lighting complaints were received in 2023 and 2024, and 16 lighting complaints were recorded in 2025 which is a reduction compared to years prior to 2023.
S3 C57	The Applicant must rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable and feasible measures must be taken to minimise the total area exposed for dust generation at any time. Interim rehabilitation strategies must be employed when areas prone to dust generation cannot yet be permanently rehabilitated.	Annual Review reports detail progress of mine rehabilitation progress against MOP plans. The net rehabilitation progress (i.e. rehabilitation minus rehabilitation disturbance) for the 2015 – 2021 period was 20.4 ha higher than targets. A total of 47.9ha of new rehabilitation was completed during 2022 against a Mining Operations Plan 2022 target of 35ha. 2022 annual report notes that rehabilitation and disturbance forecasts submitted to Resources Regulator (submitted in August 2022) are based on financial year periods and therefore don't align with the calendar year Annual Review reporting period and the misalignment is intended to be corrected in the Forward Program to be submitted in May 2023.	Increase the rate of progressive rehabilitation works with the objective of meeting the established progressive rehabilitation targets.	MTW undertakes progressive rehabilitation as reported in previous Annual Review Reports and as planned in previous Mining Operations Plans (now Rehabilitation Management Plan). MTW submits a Forward Program to the Resources Regulator each year which outlines the next 3 years rehabilitation progress. In 2025, MTW completed 100.1Ha of rehabilitation, which exceeded the planned rehabilitation target of 89.1Ha for 2025. MTW continued proactive dump planning and review in 2023- 2025, with the resulting planned rehabilitation submitted with the updated Forward Program submissions each year in March.

NON-COMPLIANCE RECOMMENDATIONS AND RESPONSES				
Ref	**Compliance Requirement**	**Independent Audit Finding**	**Independent Audit Recommendation**	**MTW Response / Progress**
S3 C58 d, and h	d) Describe how the rehabilitation of the site would be integrated with the implementation of the biodiversity offset strategy; h) include interim rehabilitation where necessary to minimise the area exposed for dust generation;	The RMP does not address the integration of the mine site rehabilitation with the biodiversity off-set strategy. The RMP does not address the interim rehabilitation of the site to minimise dust generation.	Review and revise the plan to include the integration of the mine site rehabilitation with the biodiversity off-set strategy. Review and revise the plan to include the interim rehabilitation of the site to minimise dust generation.	Completed. The Rehabilitation Management Plan was updated (finalised 29 January 2024) and has addressed this IEA recommendations. RMP is available on the MTW website.
SSD-6465				
S3 C17 a and c	The Applicant must: a) implement all reasonable and feasible measures to minimise the: • odour, fume and dust emissions of the development; and • release of greenhouse gas emissions from the development; minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note d to Tables 5-7 above); and	The Air quality management plan describes the air quality management system and procedures including the predictive tools. Fifty-eight dust-related complaints were received during the audit period. No exceedances in dust criteria were reported during the audit period. Areas of the site are being cleared in preparation for mining, and the disposal of overburden is progressing. The planned progressive rehabilitation works are, however, behind schedule. The Auditor also observed areas, that while not ready for final rehabilitation, would benefit from temporary stabilisation to help reduce dust emissions during adverse wind conditions	Increase the rate of progressive rehabilitation works with the objective of meeting the established progressive rehabilitation targets. Prepare and implement a program for the stabilisation of unsealed / disturbed areas of the site including stockpiles, finished landforms, and disturbed areas that are not currently being actively worked / filled). The program should identify and classify all areas of the site that are currently disturbed according to the dust generation potential of those areas and establish clear targets for the stabilisation of those areas (either permanent or temporary) with the objective of meeting the requirements of the Blue Book.	MTW notes that the audit found there were no exceedances in dust criteria reported during the audit period. MTW has a well developed and implemented Air Quality Management Plan and considers that reasonable and feasible controls are being implemented. Refer to response to SSD-6464 S3 C19.
S3 C22 a and b	Unless an EPL or the EPA authorises otherwise, the Applicant must ensure that all surface water discharges from the site comply with the: discharge limits (both volume and quality) set for the development in any EPL; and	The Annual Returns prepared for the Environment Protection Licence 1976 noted several non-compliances with this condition. • Dam 1S overtopped as a result of heavy or sustained rainfall which caused significant runoff (2023 AR) • Dam 1S overtopped as a result of heavy or sustained rainfall which caused significant runoff (2021 AR) • Discharge from 9S via spillway to Loders Creek (2021 AR)	A risk assessment and review of the storage capacity of the retention dams be undertaken that takes into account the increasing risk of extreme weather events, including extended duration wet weather patterns.	Completed. Refer to response to SSD-6464 S3 C24.

NON-COMPLIANCE RECOMMENDATIONS AND RESPONSES				
Ref	**Compliance Requirement**	**Independent Audit Finding**	**Independent Audit Recommendation**	**MTW Response / Progress**
	relevant provisions of the POEO Act or Protection of the Environment Operations (Hunter River Salinity Trading Scheme) Regulation 2002	As reported in the 2021 Annual Return for EPL1976, Exceedance of the HRSTS hourly volume discharge limit during analysis of flow data following a discharge event. Note that this incident was not reported in the 2021 Annual Review.	The auditor understands that this discharge was an isolated event and has been investigated. No additional actions are required.	Noted
S3 C27	Within 3 years of the commencement of development under this consent, unless the Planning Secretary agrees otherwise, the Applicant must enter into a conservation agreement or agreements pursuant to section 698 of the National Parks and Wildlife Act 1974 relating to the Loaders Creek Aboriginal Cultural Heritage Conservation Area, recording the obligations assumed by the Applicant under the conditions of this consent in relation to the conservation area, and register the agreements pursuant to section 69F of the National Parks and Wildlife Act 1974.	The Department approved a request to extend the timeframe for completion of the agreement to the 15th of February 2020, however the agreement was not executed until the 3 November 2022. Whilst the conservation agreement has been entered into in November 2022, registration of the agreements has not been completed pursuant to s69F of the NPW Act.	Finalise the registration of the conservation agreement for Loders Creek.	This is noted in the audit report as an administrative non-compliance. The registration process for the Loders Creek Aboriginal Cultural Heritage Conservation Area conservation agreement that were executed on 3 November 2022 has progressed in 2024 with MTW and Heritage NSW/NPWS but is not completed. In 2024, the NPWS Deputy Secretary signed the registration documents, and progressed to NPWS legal team ahead of lodgement with Land Registry Service. Follow up has occurred with NPWS in Feb, Mar, May, June, Oct, Nov, Dec 2025, Feb 2026. This process will continue in the 2026 Annual Review Period.
S3 C29 a and b	The Applicant must: a) keep records of the amount of coal transported from the development in each calendar year; and b) make these records available on its website at the end of each year.	The 2020 and 2021 Annual Reviews are publicly available on the MTW website; however, the 2022 Annual Review was not on the website at the time of this IEA. Therefore, the coal transport records for 2022 were not publicly available as required by this Condition. The Auditor notes that the 2022 Annual Review had been submitted to DPE but had not yet been approved.	Ensure that the coal transportation records are regulatory updated.	Although this is noted in the audit report as an administrative non-compliance, MTW does not agree with this audit finding. Coal transportation records are included in the Annual Review report submitted to DPHI. The 2022 Annual Review Report was approved by DPHI 20/11/2023 and was uploaded to the MTW website that day. The 2023 Annual Review Report was approved by DPHI 1/08/2024 and was uploaded to the MTW website 12/08/2024. The 2024 Annual Review Report was approved by DPHI 12/08/2025 and was uploaded to the MTW website 14/08/2025.
S3 C30 a and c	The Applicant must: a) implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts of the development, including lighting impacts on road users and impacts of mining voids; c) ensure that all external lighting associated with the development complies with Australian Standard AS4282 (/NT) 1997 - Control of Obtrusive Effects of Outdoor Lighting, or its latest version; and	Environmental induction covers lighting. The Lighting review undertaken in 2020 confirms the offsite lighting impacts was meeting the requirements of this condition. However, 94 lighting complaints were received during the audit period, 75 of those complaints came from three residents. A review of the complaints indicates that the community impacts are from relocatable lighting and mobile plant, but that fixed lighting is not generating complaints. As part of the internal complaint investigations, CROs assess mobile lighting and arrange changes in light locations or direction and that the actions, in general resolve the issues. It is apparent that there is insufficient planning for the location and use of mobile lighting	Ensure that personnel responsible for planning and / or managing night works undertake proactive planning for all after hours works. The planning should identify the optimal lighting setup for those activities and that the implementation of the lighting plans be checked prior to undertaking those activities by CROs or other appropriately trained personnel.	Refer to response to SSD-6464 S3 C52.

NON-COMPLIANCE RECOMMENDATIONS AND RESPONSES				
Ref	**Compliance Requirement**	**Independent Audit Finding**	**Independent Audit Recommendation**	**MTW Response / Progress**
		and therefore all reasonable and feasible mitigation measures have not been used.		
S3 C36g	The RMP must: g) include interim rehabilitation where necessary to minimise the area exposed for dust generation;	The RMP does not address the interim rehabilitation of the site to minimise dust generation.	Review and revise the plan to include the interim rehabilitation of the site to minimise dust generation.	Completed. This is noted in the audit report as an administrative non-compliance. Temporary stabilisation of unused areas or dump slopes (foreshadowed to be inactive for 6 months or more) is described as a management strategy in the MTW Air Quality Management Plan. The Rehabilitation Management Plan was updated (finalised 29 January 2024) and has addressed this IEA recommendation. RMP is available on the MTW website.
EPL1376				
L1.1	Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.	The following non- compliances (generally associated with over topping of dams) were identified by the Annual Returns • WML Sediment Dams 53N, 54N and WML sump 5N overtopped as a result of heavy rainfall - 5 in total non-compliances reported (2022 AR) • WML Sediment Dams 53N, 54N, 55N, 46N SSD 09 - 4 in total (2021 AR) • WML sediment dames 50N and 53N overtopped as a result of heavy rainfall	A risk assessment and review of the storage capacity of the retention dams be undertaken that takes into account the increasing risk of extreme weather events, including extended duration wet weather patterns.	Completed. Refer to response to SSD-6464 S3 C24.
O3.1	The premises must be maintained in a condition which minimizes or prevents the emission of dust from the premises.	Fifty-eight dust-related complaints were received during the audit period. No exceedances in dust criteria were reported during the audit period. Significant areas of the site have been cleared and progressive rehabilitation works are behind schedule. The Auditor also observed significant areas, that while not ready for final rehabilitation, would benefit from temporary stabilisation to help reduce dust emissions during adverse wind conditions.	Increase the rate of progressive rehabilitation works with the objective of meeting the established progressive rehabilitation targets. Prepare and implement a program for the stabilisation of unsealed / disturbed areas of the site including stockpiles, finished landforms, and disturbed areas that are not currently being actively worked / filled). The program should identify and classify all areas of the site that are currently disturbed according to the dust generation potential of those areas and establish clear targets for the stabilisation of those areas (either permanent or temporary) with the objective of meeting the requirements of the Blue Book.	Refer to response to SSD-6464 S3 C19.

NON-COMPLIANCE RECOMMENDATIONS AND RESPONSES				
Ref	**Compliance Requirement**	**Independent Audit Finding**	**Independent Audit Recommendation**	**MTW Response / Progress**
M2.2	Air Monitoring Requirements: Continuous PM10 monitoring	As reported in the 2020, 2021 and 2022 Annual Returns, EPL 1376 requires continuous monitoring for EPA air monitoring Points 9, 10, 11 and 12. Monitoring data capture was >93%, but not continuous during the reporting period (4 occurrences)	Ensure that all continuous monitoring equipment is operational and well maintained.	Completed. Monitoring locations are subject to routine maintenance and calibration and system checks. Unplanned outages can occur at times with all continuous monitoring equipment. Scheduled maintenance is undertaken which can take monitoring equipment offline for 10 minutes or more due to the nature of the maintenance. Calibrations need to continue to occur and so brief outages will happen from time to time. As the audit noted, this is reported in Annual Returns to EPA. No further action required.
M2.3	Water and/or Land Monitoring Requirements	As reported in the Annual Returns, EPL water monitoring Points 26, 27, 28 and 30 were unable to be sampled due to sample area either unsafe to access due to rain events resulting in flooding, or being dry at time of sampling (6 occurrences)	Access to the sampling sites was not possible due to adverse weather conditions. No further actions are recommended.	This is noted in the audit report as an administrative non-compliance. Noted.
M4.1	Meteorological Monitoring Requirements	As reported in the 2021 and 2022 Annual Returns, EPL 1376 requires continuous monitoring for Charlton Ridge Meteorological Station. Monitoring data capture was >99%, but not continuous during the reporting period.	Ensure that all continuous monitoring equipment is operational and well maintained.	This is noted in the audit report as an administrative non-compliance. Completed. Monitoring locations are subject to routine maintenance and calibration. Unplanned outages can occur at times with all continuous monitoring equipment. Scheduled maintenance is undertaken at the met station and this can take monitoring equipment offline for 10 minutes or more due to the nature of the maintenance, which for example necessitates periodic lowering of the mast on which the wind speed and direction sensor is located and changing out sensors/calibrating etc. Calibrations need to continue to occur and so brief outages will happen from time to time. As the audit noted, this is reported in Annual Returns to EPA. No further action required.
M9.3	The licence must mark monitoring point(s) 4, with a sign which clearly indicates the name of the licensee, whether the monitoring point is up or down stream of the discharge point(s) and that it is a monitoring point for the Hunter River Salinity Trading Scheme.	The required signage was not installed at the time of this IEA.	Ensure that signage for Monitoring Point 4 is installed.	Completed. Signage installed on 30 August 2023
EPL1976				
L1.1	Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.	The following non- compliances were identified by the Annual Returns • Dam 1S overtopped as a result of heavy or sustained rainfall which caused significant runoff (2023 AR) • Dam 1S overtopped as a result of heavy or sustained rainfall which caused significant runoff (2021 AR) • Discharge from 9S via spillway to Loders Creek (2021 AR)	A risk assessment and review of the storage capacity of the retention dams be undertaken that takes into account the increasing risk of extreme weather events, including extended duration wet weather patterns.	Completed. Refer to response to SSD-6464 S3 C24.

NON-COMPLIANCE RECOMMENDATIONS AND RESPONSES				
Ref	**Compliance Requirement**	**Independent Audit Finding**	**Independent Audit Recommendation**	**MTW Response / Progress**
L2.1	For each monitoring/ discharge point or utilisation area specified in the table/s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.	One non-compliance was reported during the audit period. During 2021 one Grab Sample at Licensed Discharge and Monitoring Point 4 exceeded the upper 100 percentile limit for pH.	This single exceedance of the water quality criteria has been investigated. No systemic issues have been identified therefore no further actions are recommended.	Noted.
L2.2	Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.	One non-compliance was reported during the audit period. During 2021 one Grab Sample at Licensed Discharge and Monitoring Point 4 exceeded the upper 100 percentile limit for pH.	This single exceedance of the water quality criteria has been investigated. No systemic issues have been identified therefore no further actions are recommended.	Noted.
03.1	The premises must be maintained in a condition which minimizes or prevents the emission of dust from the premises.	Fifty-eight dust-related complaints were received during the audit period. Significant areas of the site have been cleared and progressive rehabilitation works are behind schedule. The Auditor also observed areas, that while not ready for final rehabilitation, would benefit from temporary stabilisation to help reduce dust emissions during adverse wind conditions. While no exceedances in dust criteria were reported during the audit period, the number of dust related complaints and the Auditor's observations relating to rehabilitation and stabilisation indicate that nuisance dust emissions are being generated by the mine.	Increase the rate of progressive rehabilitation works with the objective of meeting the established progressive rehabilitation targets. Prepare and implement a program for the stabilisation of unsealed / disturbed areas of the site including stockpiles, finished landforms, and disturbed areas that are not currently being actively worked / filled). The program should identify and classify all areas of the site that are currently disturbed according to the dust generation potential of those areas and establish clear targets for the stabilisation of those areas (either permanent or temporary) with the objective of meeting the requirements of the Blue Book.	Refer to response to SSD-6464 S3 C19.
M2.1	For each monitoring/ discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns.	During 2021, 2022 and 2023 Table M2.2 requires continuous PM10 monitoring for EPA air monitoring points 10,11,13 and 19. Monitoring data capture was >98% but not continuous during the reporting period. During 2021, 2022 and 2023 Table M2.3 requires continuous monitoring for pH at Point 4 during Discharge Monitoring data capture was >99% but not continuous during the reporting period. During 2021, 2022 and 2023 Table M2.3 requires continuous monitoring for conductivity at Point 4 during Discharge Monitoring data capture was >99% but not continuous during the reporting period.	Ensure that all continuous monitoring equipment is operational and well maintained.	Completed. Monitoring locations are subject to routine maintenance and calibration. Unplanned outages can occur at times with all continuous monitoring equipment. Scheduled maintenance is undertaken at the continuous monitoring locations and this can take monitoring equipment offline for 10 minutes or more due to the nature of the maintenance. Calibrations need to continue to occur and so brief outages will happen from time to time. As the audit noted, this is reported in Annual Returns to EPA. No further action required.

NON-COMPLIANCE RECOMMENDATIONS AND RESPONSES				
Ref	**Compliance Requirement**	**Independent Audit Finding**	**Independent Audit Recommendation**	**MTW Response / Progress**
M4.1	Meteorological Monitoring Requirements	As reported in the 2021 and 2022 Annual Returns, EPL 1376 requires continuous monitoring for Charlton Ridge Meteorological Station. Monitoring data capture was >99%, but not continuous during the reporting period.	Ensure that all continuous monitoring equipment is operational and well maintained.	Completed. Monitoring locations are subject to routine maintenance and calibration. Unplanned outages can occur at times with all continuous monitoring equipment. Scheduled maintenance is undertaken at the met station and this can take monitoring equipment offline for 10 minutes or more due to the nature of the maintenance, which for example necessitates periodic lowering of the mast on which the wind speed and direction sensor is located and changing out sensors/calibrating etc. Calibrations need to continue to occur and so brief outages will happen from time to time. As the audit noted, this is reported in Annual Returns to EPA. No further action required.
M7.1	Requirement to monitor volume or mass.	Table M7.1 requires continuous monitoring for volumetric flow at Point 4 during discharge. During 2021 monitoring data capture was not continuous during the reporting period.	Ensure that all continuous monitoring equipment is operational and well maintained.	Completed. Daily system checks are undertaken on working days to identify and resolve any monitoring issues. The monitors also undergo routine maintenance. As the audit noted, this was reported in the 2021 Annual return to EPA. No further action required.
E1.3	The licensee must not exceed the hourly volume discharge limit calculated using the following formula, at all discharge point(s) on this licence titled "Discharge of saline water under the Hunter River Salinity Trading Scheme (HRSTS)". H = V/ RRT	As reported in the 2021 Annual Return an exceedance of the HRSTS hourly volume discharge limit occurred on 20 March 2021. This non-compliance was discovered during the preparation of the 2021 Annual Return. The exceedance event has been reviewed by MTW and the discharge rate modified. No further exceedances have been recorded.	The single volume exceedance has been investigated and appropriate actions taken to prevent future exceedances. No additional actions have been identified.	Noted.
Mining Lease Standard Conditions (from July 2022)				
D1 C4	The holder of a mining lease must take all reasonable measures to prevent, or if that is not reasonably practicable, to minimise, harm to the environment caused by activities under the mining lease.	During the audit period (2021) non-complying overflows / discharges of water occurred from dams on both the Mt Thorley and Warkworth mines. These pollution events resulted in the issue of Penalty Notices by the EPA and DPE. For further information refer to Section 7.3 and Condition L1.1 on the EPL Compliance Registers above.	A risk assessment and review of the storage capacity of the retention dams be undertaken that takes into account the increasing risk of extreme weather events, including extended duration wet weather patterns.	Completed. Refer to response to SSD-6464 S3 C24.
D1 C5	The holder of a mining lease must rehabilitate land and water in the mining area that is disturbed by activities under the mining lease as soon as reasonably practicable after the disturbance occurs.	This condition is considered to be non-compliant as the predicted/forecast target for 2020 was not met and it is predicted that the forecast for 2023 will not be met. It is acknowledged that several factors, including weather conditions, have resulted in lower rehabilitation than predicted. It is noted however that the MOP rehabilitation targets were exceeded in both 2021 and 2022.	Continue progressive rehabilitation works with the objective of meeting the established progressive rehabilitation targets	Refer to response to SSD-6464 S3 C57.

NON-COMPLIANCE RECOMMENDATIONS AND RESPONSES				
Ref	**Compliance Requirement**	**Independent Audit Finding**	**Independent Audit Recommendation**	**MTW Response / Progress**
ML 1412				
17	Minimise Dust	Fifty-eight dust-related complaints were received during the audit period. No exceedances in dust criteria were reported during the audit period. Significant areas of the site have been cleared and progressive rehabilitation works are behind schedule. The Auditor also observed significant areas, that while not ready for final rehabilitation, would benefit from temporary stabilisation to help reduce dust emissions during adverse wind conditions.	Increase the rate of progressive rehabilitation works with the objective of meeting the established progressive rehabilitation targets. Prepare and implement a program for the stabilisation of unsealed / disturbed areas of the site including stockpiles, finished landforms, and disturbed areas that are not currently being actively worked / filled). The program should identify and classify all areas of the site that are currently disturbed according to the dust generation potential of those areas and establish clear targets for the stabilisation of those areas (either permanent or temporary) with the objective of meeting the requirements of the Blue Book.	Refer to response to SSD-6464 S3 C19.
27	Environment Protection / Prevention of Pollution	The Annual Returns prepared for the Environment Protection Licence 1276 noted several non-compliances with this condition. Refer to audit schedule for EPL 1376 for details.	A risk assessment and review of the storage capacity of the retention dams be undertaken that takes into account the increasing risk of extreme weather events, including extended duration wet weather patterns.	Completed. Refer to response to SSD-6464 S3 C24.
CCL753				
2	Operate in accordance with the Mining Operations Plan	Annual Review reports detail progress of mine rehabilitation progress against MOP plans. The net rehabilitation progress (i.e. rehabilitation minus rehabilitation disturbance) for the 2015 – 2021 period was 20.4 ha higher than targets. A total of 47.9ha of new rehabilitation was completed during 2022 against a Mining Operations Plan 2022 target of 35ha. 2022 annual report notes that rehabilitation and disturbance forecasts submitted to Resources Regulator (submitted in August 2022) are based on financial year periods and therefore don't align with the calendar year Annual Review reporting period and the misalignment is intended to be corrected in the Forward Program to be submitted in May 2023.	Increase the rate of progressive rehabilitation works with the objective of meeting the established progressive rehabilitation targets.	Refer to response to SSD-6464 S3 C57.

NON-COMPLIANCE RECOMMENDATIONS AND RESPONSES				
Ref	**Compliance Requirement**	**Independent Audit Finding**	**Independent Audit Recommendation**	**MTW Response / Progress**
16	Minimise Dust	Fifty-eight dust-related complaints were received during the audit period. No exceedances in dust criteria were reported during the audit period. Significant areas of the site have been cleared and progressive rehabilitation works are behind schedule. The Auditor also observed significant areas, that while not ready for final rehabilitation, would benefit from temporary stabilisation to help reduce dust emissions during adverse wind conditions.	Increase the rate of progressive rehabilitation works with the objective of meeting the established progressive rehabilitation targets. Prepare and implement a program for the stabilisation of unsealed / disturbed areas of the site including stockpiles, finished landforms, and disturbed areas that are not currently being actively worked / filled). The program should identify and classify all areas of the site that are currently disturbed according to the dust generation potential of those areas and establish clear targets for the stabilisation of those areas (either permanent or temporary) with the objective of meeting the requirements of the Blue Book.	Refer to response to SSD-6464 S3 C19.
25	Environment Protection / Prevention of Pollution	The Annual Returns prepared for the Environment Protection Licence 1376 noted several non-compliances with this condition. Refer to audit schedule for EPL 1376 for details.	A risk assessment and review of the storage capacity of the retention dams be undertaken that takes into account the increasing risk of extreme weather events, including extended duration wet weather patterns.	Completed. Refer to response to SSD-6464 S3 C24.
ML1590				
2	Operate in accordance with the Mining Operations Plan	Annual Review reports detail progress of mine rehabilitation progress against MOP plans. The net rehabilitation progress (i.e. rehabilitation minus rehabilitation disturbance) for the 2015 – 2021 period was 20.4 ha higher than targets. A total of 47.9ha of new rehabilitation was completed during 2022 against a Mining Operations Plan 2022 target of 35ha. 2022 annual report notes that rehabilitation and disturbance forecasts submitted to Resources Regulator (submitted in August 2022) are based on financial year periods and therefore don't align with the calendar year Annual Review reporting period and the misalignment is intended to be corrected in the Forward Program to be submitted in May 2023.	Increase the rate of progressive rehabilitation works with the objective of meeting the established progressive rehabilitation targets.	Refer to response to SSD-6464 S3 C57.

NON-COMPLIANCE RECOMMENDATIONS AND RESPONSES				
Ref	**Compliance Requirement**	**Independent Audit Finding**	**Independent Audit Recommendation**	**MTW Response / Progress**
13	Rehabilitate the site in accordance with the MOP	Annual Review reports detail progress of mine rehabilitation progress against MOP plans. The net rehabilitation progress (i.e. rehabilitation minus rehabilitation disturbance) for the 2015 – 2021 period was 20.4 ha higher than targets. A total of 47.9ha of new rehabilitation was completed during 2022 against a Mining Operations Plan 2022 target of 35ha. 2022 annual report notes that rehabilitation and disturbance forecasts submitted to Resources Regulator (submitted in August 2022) are based on financial year periods and therefore don't align with the calendar year Annual Review reporting period and the misalignment is intended to be corrected in the Forward Program to be submitted in May 2023.	Increase the rate of progressive rehabilitation works with the objective of meeting the established progressive rehabilitation targets.	Refer to response to SSD-6464 S3 C57.
ML1751				
3	Operate in accordance with the Mining Operations Plan	Annual Review reports detail progress of mine rehabilitation progress against MOP plans. The net rehabilitation progress (i.e. rehabilitation minus rehabilitation disturbance) for the 2015 – 2021 period was 20.4 ha higher than targets. A total of 47.9ha of new rehabilitation was completed during 2022 against a Mining Operations Plan 2022 target of 35ha. 2022 annual report notes that rehabilitation and disturbance forecasts submitted to Resources Regulator (submitted in August 2022) are based on financial year periods and therefore don't align with the calendar year Annual Review reporting period and the misalignment is intended to be corrected in the Forward Program to be submitted in May 2023.	Increase the rate of progressive rehabilitation works with the objective of meeting the established progressive rehabilitation targets.	Refer to response to SSD-6464 S3 C57.

NON-COMPLIANCE RECOMMENDATIONS AND RESPONSES				
Ref	**Compliance Requirement**	**Independent Audit Finding**	**Independent Audit Recommendation**	**MTW Response / Progress**
CL219				
2	Operate in accordance with the Mining Operations Plan	Annual Review reports detail progress of mine rehabilitation progress against MOP plans. The net rehabilitation progress (i.e., rehabilitation minus rehabilitation disturbance) for the 2015 – 2021 period was 20.4 ha higher than targets. A total of 47.9ha of new rehabilitation was completed during 2022 against a Mining Operations Plan 2022 target of 35ha. 2022 annual report notes that rehabilitation and disturbance forecasts submitted to Resources Regulator (submitted in August 2022) are based on financial year periods and therefore don't align with the calendar year Annual Review reporting period and the misalignment is intended to be corrected in the Forward Program to be submitted in May 2023.	Increase the rate of progressive rehabilitation works with the objective of meeting the established progressive rehabilitation targets.	Refer to response to SSD-6464 S3 C57.
17	Minimise Dust	Fifty-eight dust-related complaints were received during the audit period. No exceedances in dust criteria were reported during the audit period. Significant areas of the site have been cleared and progressive rehabilitation works are behind schedule. The Auditor also observed significant areas, that while not ready for final rehabilitation, would benefit from temporary stabilisation to help reduce dust emissions during adverse wind conditions.	Increase the rate of progressive rehabilitation works with the objective of meeting the established progressive rehabilitation targets. Prepare and implement a program for the stabilisation of unsealed / disturbed areas of the site including stockpiles, finished landforms, and disturbed areas that are not currently being actively worked / filled). The program should identify and classify all areas of the site that are currently disturbed according to the dust generation potential of those areas and establish clear targets for the stabilisation of those areas (either permanent or temporary) with the objective of meeting the requirements of the Blue Book.	Refer to response to SSD-6464 S3 C57.
25	Environment Protection / Prevention of Pollution	The Annual Returns prepared for the Environment Protection Licence 1976 noted several non-compliances with this condition. Refer to audit schedule for EPL 1976 for details. • Dam 1S overtopped as a result of heavy or sustained rainfall which caused significant runoff (2023 AR) • Dam 1S overtopped as a result of heavy or sustained rainfall which caused significant runoff (2021 AR) • Discharge from 9S via spillway to Loders Creek (2021 AR)	A risk assessment and review of the storage capacity of the retention dams be undertaken that takes into account the increasing risk of extreme weather events, including extended duration wet weather patterns.	Completed. Refer to response to SSD-6464 S3 C24.

CONTINUOUS IMPROVEMENT RECOMMENDATIONS		
Ref	**Independent Audit Recommendation**	**MTW Response / Progress**
SSD 6464 S3 C27 / SSD 6465 S3 C25	It is recommended that MTW review the water balance model to take into account the impacts of climate change, for example the impacts of higher-than-normal rainfall events due to more extreme La-Nina events.	MTW updated the water balance model in 2024, with the report being completed in 2025, which incorporated improvements to water management infrastructure including increased discharge. MTW has undertaken an internal review of climate related risks regarding drought conditions in 2025.
SSD 6464 S3 C27 / SSD 6465 S3 C25	That the Water Balance documented in the WMP is updated to reflect water volumes and quality from the STP, as well as any necessary treatment and/or testing of the waters discharged.	MTW has reviewed this recommendation and does not intend to implement this recommendation. On site sewage management (OSSM) is already approved and regulated by Singleton Council and is included on relevant Environment Protection Licences. The volumes from these systems is not large in the context of a mine water balance, so provide no improvement to water balance understanding.
SSD 6464 S3 C29 / SSD 6464 S3 C56	To improve the success of the rehabilitation works and to achieve the targets detailed in the Ecological monitoring reports, that: • More intensive weed control of High Threat Weeds be undertaken; • Control of overly dominant natives (e.g Corymbia maculate, Acacia species) via thinning or changes to seed mix; and • Widen the distribution of ground habitat features (such as logs);	Weed control works in rehabilitation areas is ongoing. MTW undertakes monitoring, rehabilitation inspections which then guide weed control effort in rehabilitation areas. Weed control in rehabilitation areas is currently constrained by available resources (land management crews). MTW has introduced an additional land management contractor to some land management aspects at MTW, which may alleviate resource constraints in future. Native seed mixes for MTW rehabilitation areas were reviewed in May 2020 to remove dominant species that are not considered to be a significant component of the target Grey Box – Ironbark Woodland (GBIBW) vegetation community. Relevant to this audit finding, the following species were changed to back-up species that would only be included in seed mixes if other GBIBW species were not available and at a reduced sowing rate when used: Corymbia maculata, Acacia crassa, Acacia elongata, and Acacia spectabilis. Acacia cultriformis has also been found to be dominant in some rehabilitation areas so the maximum sowing rate has also been reduced for this species. Thinning of Corymbia maculata will be conducted as required but may be intentionally delayed to allow sufficient tree growth to contribute towards the relevant habitat performance criteria (i.e. Length of Logs on the Ground (m) at least 10cm in diameter). The seed mix review recommendation was completed May 2020. The thinning recommendation is subject to ongoing review. Rehabilitation work program to increase distribution of ground habitat features through continued placement of salvaged logs in rehabilitation areas will continue in the next IEA period as an ongoing work item.
SSD 6464 S3 C29	That any future modification to the Approval consider seeking to remove specific mentions of the use of the NSW Biodiversity Offsets Policy for Major Projects as this is no longer available.	MTW agrees this would assist with clarity for Biodiversity descriptions in the consent, and is happy to engage with DPE on this matter for any future modifications for SSD 6464. It is noted that a modification is currently in progress (SSD 6464 MOD1) which seeks to address biodiversity offset conditions of the consent, given the change to biodiversity offset regulation.
SSD 6464 S3 C32	Warkworth Sands Woodland – Additional work is required to meet the final performance criteria, In particular it is recommended that consideration is given to amending seed mixes to include a higher diversity of non-grass native species to increase groundcover diversity. Restoration work scheduled for 2022 was delayed due to access issues associated with inclement weather and that works have been rescheduled for 2023. Based on the ecologist field observations, further active works, particularly in regard to increasing groundcover diversity, may be required to meet the required performance criteria by Year 15.	This recommendation has been adopted in planting programs. Examples: Native grass and non-grass seeding undertaken in May 2024 throughout all Autumn 2024 planting areas in Southern Biodiversity Area 3 and the Northern Biodiversity Area. Non-grass groundcovers seeded included Dichondra repens, Dianella longifolia/caerulea and Hardenbergia violacea. Native grass and non-grass seeding undertaken in April 2025 throughout all Spring 2025 planting areas in the Northern Biodiversity Area. Non-grass groundcovers seeded included Dichondra repens, Dianella longifolia/caerulea, Chysocephalum apiculatum, Imperata cylindrica and Hardenbergia violacea.