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 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 1,564.9ha 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

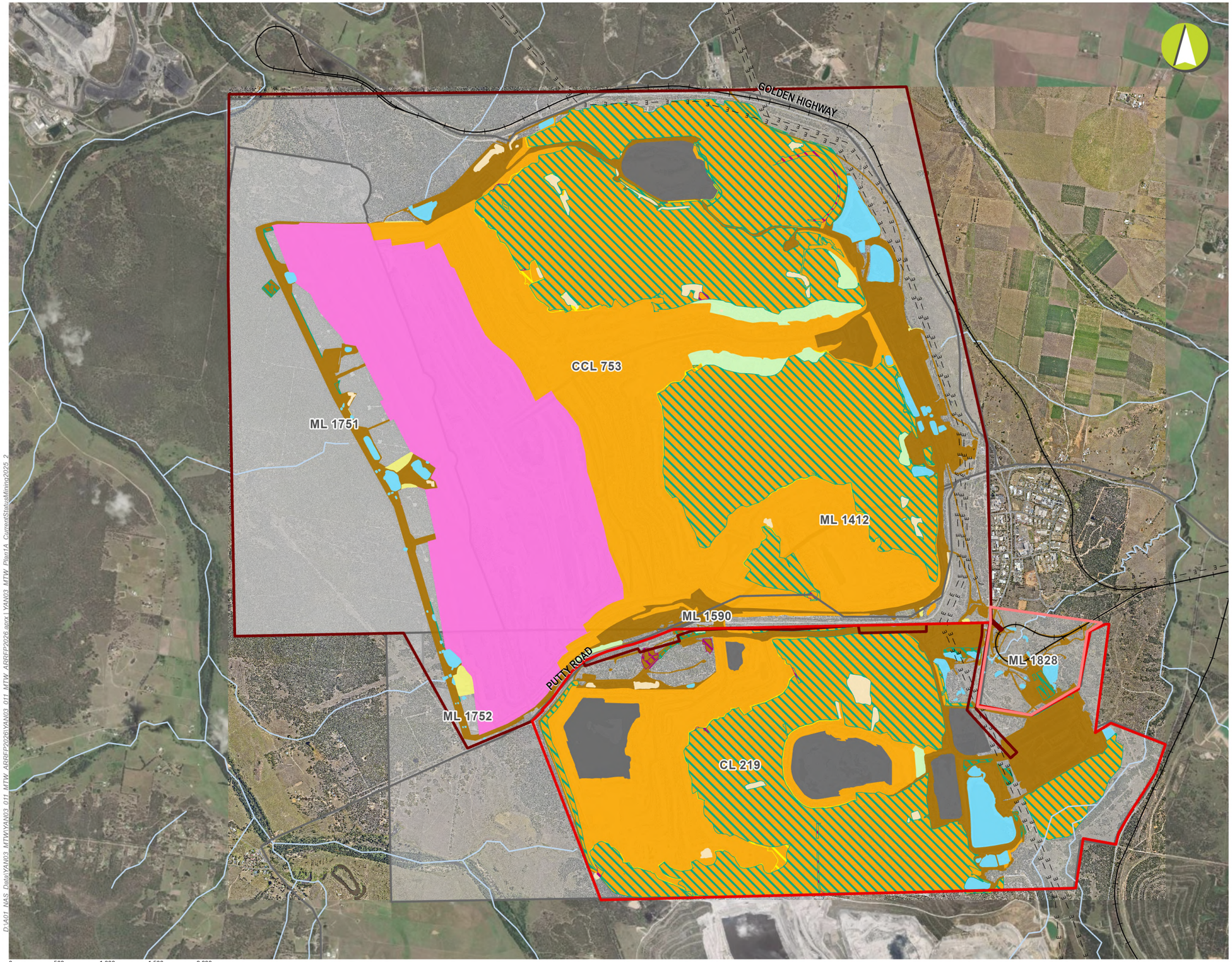
No areas achieved final land use during the 2025 reporting period.

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

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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).

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

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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

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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 topsoil's 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.