



Forward Program – 2023 to 2025

Mount Thorley Warkworth

DOCUMENT CONTROL

Version	Date	Revision Description	Author	Approver
1.0	01/05/2023	Original combined ARR and FP document prepared to satisfy new Standard Conditions on Mining Leases	Bill Baxter Environmental Specialist - Rehabilitation	Gary Mulhearn Environment & Community Manager
2.0	05/06/2023	Separate FP document on Yancoal template.	Bill Baxter Environmental Specialist - Rehabilitation	Gary Mulhearn

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DEFINITIONS / ABBREVIATIONS

AGS – Abbey Green South

CCC – Community Consultative Committee

CCL – Consolidated Coal Lease

CL – Coal Lease

CR – Centre Ramp

DPE – NSW Department of Planning and Environment

EL – Exploration Lease

GDP – Ground Disturbance Permit

LP – Loders Pit

MTO - Mount Thorley Operations

MTW - Mount Thorley Warkworth Coal Mine (combined operations)

NOOP – North Out-of-Pit Dam

TSF – Tailings Storage Facility

TWMS – Total Waste Management System

WML - Warkworth Mining Limited

Name of mine:	Mount Thorley Warkworth	
Forward Program Period:	START DATE:	END DATE:
	1 January 2023	31 December 2025
Forward Program revision dates and version numbers:	Revision 1 (version 2.0) 5 th June 2023	
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)	Mt Thorley Operations Pty Ltd Warkworth Mining Limited Mount Thorley Coal Loading Ltd	
Date of Submission	1 MAY 2023	

1.0 THREE YEAR FORECAST – SURFACE DISTURBANCE ACTIVITIES

1.1 PROJECT DESCRIPTION

Mount Thorley Warkworth (MTW) is a coal mine managed by Coal & Allied (NSW) Pty Ltd, a wholly owned subsidiary of Yancoal Australia Limited (Yancoal). MTW is situated approximately 14 km South-west to Singleton in the Upper Hunter Valley of New South Wales (NSW). MTW is an amalgamation of two open cut mines, Mount Thorley Operations (MTO) and Warkworth Mining Limited (WML). Currently operating, MTW extract coal from the Whittingham Coal Measures of the Hunter Coalfield. Resulting product is then transported by rail to the port of Newcastle where it is shipped to international customers.

Schedule 2 Condition 5 of both SSD-6364 and SSD-6465 outline the approved life of the mine. The Forward Program dates have been amended for this submission with dates now covering calendar years (Year 1 - 2023, Year 2 – 2024 and Year 3 – 2025).

1.2 DESCRIPTION OF SURFACE DISTURBANCE ACTIVITIES

1.2.1 Exploration Activities

MTW will continue to undertake exploration drilling to assess coal reserves. An Exploration Report is sent to Resources Regulator annually which outlines the status at site.

All exploration drilling activities are reviewed prior to commencement as part of MTW's Ground Disturbance Permit (GDP) process. Planned borehole locations and access tracks are assessed for environmental, cultural heritage, approval and mining title issues and necessary constraints and conditions are placed on drilling locations for each borehole location.

All boreholes are surveyed and if not required for monitoring purposes are cement sealed on completion. All casing is removed where practicable. However, in isolated holes, this may not be possible requiring the casing to be cut off below ground level. Borehole sites are then rehabilitated to an appropriate standard, as dictated by the GDP.

1.2.2 Construction Activities

Planned construction activities over the next three years will include:

Year 1 - 2023

- New workshop to be built at Warkworth to accommodate ultra-class haul trucks. The site has received approval for this in a Modification SSD-6464 Mod 2 granted on 27 May 2022.
- Construction of North Out of Pit (NOOP) Dam to increase mine water storage capacity.
- Infrastructure upgrades to increase HRSTS capacity from Mount Thorley.

Year 2 - 2024

- Likely continuation of the new ultra-class haul truck workshop to be built at Warkworth.

- Construction of infrastructure to allow for mine water transfers to Lemington Underground Void storage as approved in SSD-6464 Mod 2.

Year 3 – 2025

- None planned at this point; however, updates will occur in future Forward Programs.

1.2.3 Mining Schedule

The proposed mining method within MTW is the same as that currently employed.

Pit progression will continue in a westerly direction in both North and West Pit at Warkworth. Mining is completed in Warkworth's South Pit and the South Pit void is planned to be backfilled with overburden. Currently, this void is being used as a mine water storage so dumping can only occur on the northern edge of the South Pit void outside the footprint of the water storage until the water is removed. The construction of the North Out-of-Pit (NOOP) Dam and construction of infrastructure to allow water to be transferred to the Lemington Underground Void will provide additional mine water storage. Once this additional storage capacity is available it will allow the South Pit void to be dewatered and backfilled with overburden. Dewatering of the South Pit void is planned to occur during the Forward Program period.

A small amount of coal will be mined from the highwall of Loders Pit at Mount Thorley during this Forward Program period. Access for mining of this coal will be provided as the southern end of Loders pit is filled with overburden and reaches the height of this coal in the highwall.

Describe the areas identified for emplacements, the sequencing of emplacements, construction, and management

Mining Domain 4 covers MTW's Overburden Emplacement Areas. Overburden is produced and disposed of within mined out sections of the open cut to create a final landform or designated out of pit emplacement area. Overburden material may be transferred different areas at the site to assist in the creation of the final landform. The placement of overburden occurs with the mine plans for the various MTW pits.

Mining progression in Warkworth's West and North Pits will provide overburden for continued construction of rehabilitation areas in North and West Pit overburden emplacements. Overburden from West Pit will also be transferred to Mount Thorley to continue construction of rehabilitation areas in Mount Thorley. The southern end of Loders Pit will also be backfilled to construct the Loders Pit TSF in the Northern section of the Loders Pit void. The height of backfilling in the southern end is required to stay above the height of tailings being deposited in the Loders Pit TSF.

The excavation of the NOOP dam is planned to be completed during 2024 which will allow the spoil dumping areas on top of Tailings Dam 1 to be rehabilitated during the Forward Program period.

Capping of Tailings Dam 2 is planned to continue during the Forward Program period but will be dependent on geotechnical stability being suitable for the equipment undertaking the capping activities.

1.2.4 Infrastructure and Tailings Facilities

There are six tailings' emplacements within the MTW mining area. These are:

- Tailings Dam No. 1, within CL 753, currently nil activity for tailings emplacement. Capping and rehabilitation completed 2015.

- Tailings Dam No. 2, within CL 753, currently nil activity for tailings emplacement. Closure of the Redbank Power Station has resulted in cessation of ash disposal on Tailings Dam 2. Partial capping has been undertaken on Tailings Dam 2.
- Centre Ramp Tailings Storage Facility (CR TSF), within CL 219, currently active.
- Ministrip Tailings Storage Facility, within CL 219, currently nil activity for tailings emplacement. Capping is planned to commence during the Forward Program period.
- Abbey Green South Tailings Storage Facility (AGS TSF), within CL 219, currently active.
- Eastern Tailings Dam, within CL 219, currently nil activity for tailings emplacement. Capping commenced in 2015.
- Loders Pit Tailings Storage Facility (LP TSF), within CL 219, currently active.

1.2.5 Waste Management

Waste disposal and materials handling operations over the next three years.

The handling and disposal of industrial and putrescible wastes generated from MTW is in accordance with the MTW Total Waste Management System (TWMS), local ordinances, and regulatory guidelines. All waste management contractors used by MTW are licensed by Department of Planning and Environment (DPE).

The site contains a specialised oil and grease storage facility which is a part of the fuel storage facility that meets Australian Standards. A licensed waste hydrocarbon disposal company removes and recycles all waste hydrocarbons produced onsite.

A licensed contractor removes recyclable wastes from site to the Thornton Materials Recycling Facility. Nonrecyclable wastes are disposed of at the Singleton Shire Council Landfill.

The TWMS includes waste monitoring, particularly the recording of waste types, weight, and cost. These statistics are summarised and reported in the Annual Review, enabling MTW to assess waste management over long-term periods and identify opportunities to mitigate waste and contamination risks to rehabilitation

1.3 KEY PRODUCTION MILESTONES

Table 1: Key Production Milestones (Three Year Forecast)

Material	Unit	Year 1 (2023)	Year 2 (2024)	Year 3 (2025)
Stripped Topsoil	(m3)	90,683	70,756	71,145
Rock / Overburden (Prime + Rehandle)	(m3)	113,846,797	106,556,187	113,532,897
Ore (Mined + Rehandle)	(Mt)	20.35	20.29	21.23
Reject Material (Includes coarse rejects, tailings and any other wastes resulting from beneficiation)	(Mt)	5.20	5.18	5.35
Product	(Mt)	11.22	11.02	11.98

2.0 THREE-YEAR REHABILITATION FORECAST

Spatial depiction of progressive rehabilitation shown on Plan 2.

2.1 REHABILITATION PLANNING SCHEDULE

Mining and rehabilitation will continue at MTW, with the majority of work completed at the North Pit, West Pit and Loders Pit areas. Mining will progress towards the west, with rehabilitation to occur behind this, as shown in the staged plans. The site undertakes a mining design process to maximise progressive rehabilitation.

Relevant stakeholder consultation that will be carried out over the next three years

Apart from liaising with the Resources Regulator there is no specific consultation proposed for rehabilitation and closure.

As rehabilitation progresses, MTW will continue to consult with all relevant stakeholders regarding rehabilitation. Updates relating to rehabilitation will be outlined to the CCC.

Provide an overview of rehabilitation studies, risk assessments that will be carried out over the next three years

Risk associated with rehabilitation progression have been identified during a rehabilitation risk assessment undertaken for MTW in June 2022. Details of these risks and how they are managed are provided in the MTW Rehabilitation Management Plan (2022).

MTW are planning to undertake the following during the Forward Program period:

- conduct studies to reduce the area of Loders Pit TSF. The aim of this study is to reduce the capping requirement on this facility at closure.
- Conduct an analysis of the final landform stability using a landform evolution model. The study will require the collection of erosion field parameters to facilitate erosion model development.
- Implementation of a water quality monitoring program in rehabilitation areas to assess the suitability of rehabilitation runoff compared to background water quality in local watercourses.
- Review seed mixes used to ensure that appropriate species and rates are being applied to new rehabilitation areas.

2.2 REHABILITATION MAINTENANCE AND CORRECTIVE ACTIONS

MTW proposed the following maintenance and corrective action activities include:

- Weed and feral animal control within rehabilitation;
- Erosion control works;
- Maintenance fertilising;
- Re-seeding; and
- Repair of fence lines, access tracks and other general related land management activities.

Rehabilitation monitoring will help define the types of maintenance activities for the site.

2.3 REHABILITATION SCHEDULE

Progressive rehabilitation occurring is provided in Plans 2A – 2C. Mining continues to progress towards the west with rehabilitation occurring behind this.

Year 1 - 2023

- Continuation of rehabilitation of overburden emplacements in North Pit, West Pit and Loders Pit. Dumping on the capped surface on Tailings Dam 1, with material from the excavation of the North Out of Pit (NOOP) Dam.
- Continuation of capping activities on Tailings Dam 2, dependent on geotechnical stability.

Year 2 - 2024

- Continuation of rehabilitation of overburden emplacements in North Pit, West Pit and Loders Pit. Dumping on the capped surface on Tailings Dam 1, with material from the excavation of the North Out of Pit (NOOP) Dam. TD1 area rehabilitated in 2024.
- Continuation of capping activities on Tailings Dam 2, dependent on geotechnical stability.

Year 3 – 2025

- Continuation of rehabilitation of overburden emplacements in North Pit, West Pit and Loders Pit.

2.4 SUBSIDENCE REMEDIATION FOR UNDERGROUND OPERATIONS

There are no underground workings in the project approval areas.

2.5 REHABILITATION RESEARCH AND TRIALS

MTW will undertake the following trials in the Forward Program period:

- trials to test the suitability of different compost types for use on topsoil and mine spoil growth mediums.
- trials to test the success of pre-treatments to improve germination of *Bursaria spinosa* in rehabilitation, typical MTW growth mediums will be included in the germination trials.
- Trials to test methods for native vegetation establishment on areas dominated by exotic grasses. Trials likely to investigate use of topsoil scalping and fire treatments. Further information on these trials will be included in the next Forward Program when a scope of works has been finalised.

Further details on the outcomes of the trials will be reported in the Annual Rehabilitation Report, through the Resources Regulator's Portal.

Table 2: List of Active Rehabilitation Research and Trials (Three Year Forecast)

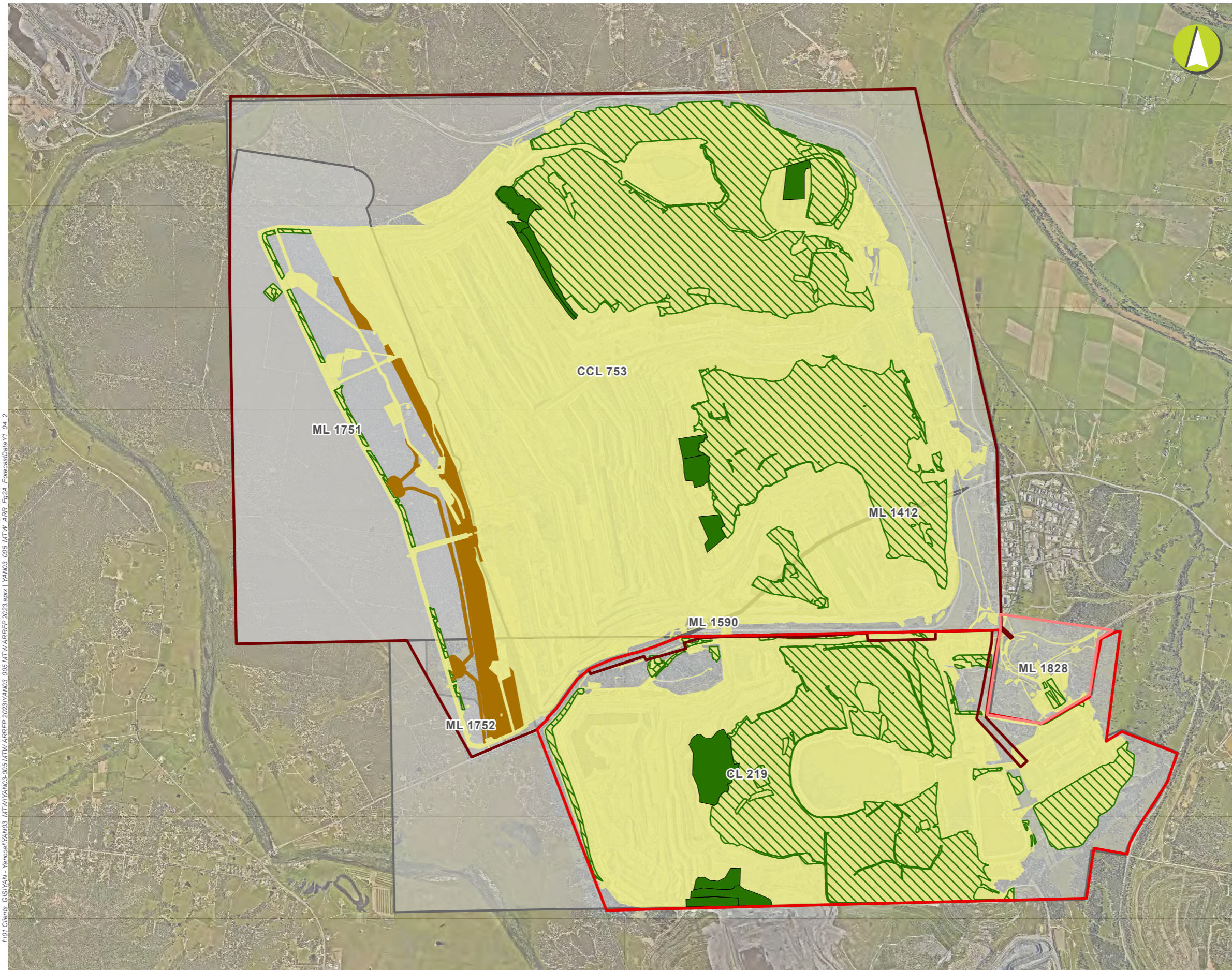
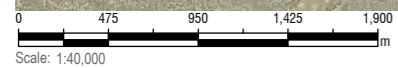
No.	Project/Trial Name	Objective of Project/Trial	Methodology	Expected Date of Completion	Completion Date Update
1	Bursaria spinosa Germination Trial	Germination testing: 1) if freezing pre-treatment of seed improves germination rates; and 2) if germination rates in MTW topsoil's and spoils are comparable to seed raising mix.	Subject seed to freezing temps pre-treatment and run a germination trial with the following treatments: Provenance 1(Hunter Valley) control/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.	30/11/2023	30/11/2023
2	Compost Type Trial (Spoil/Compost Application)	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	30/06/2024

Table 3: List of Inactive Rehabilitation Research and Trials (Three Year Forecast)

No.	Project/Trial Name	Objective of Project/Trial	Methodology	Expected Date of Completion	Status	On Track
Nil	Nil	Nil	Nil	N/A	N/A	N/A

Figure 1: Plan 2A: Mining and Rehabilitation - Year 1 (2023)

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LEGEND

Project Approval Number

- SSD 6464 - Warkworth
- SSD 6465 - Mount Thorley
- ML 1828 - Mount Thorley Coal Loader

Status

- Relevant Minerals Title

Forecast Area Type - Year 1 (2023)

- Forecast Disturbance (2023)
- Forecast Land Prepared for Rehabilitation (2023)
- Previous Disturbance
- Previous Rehabilitation

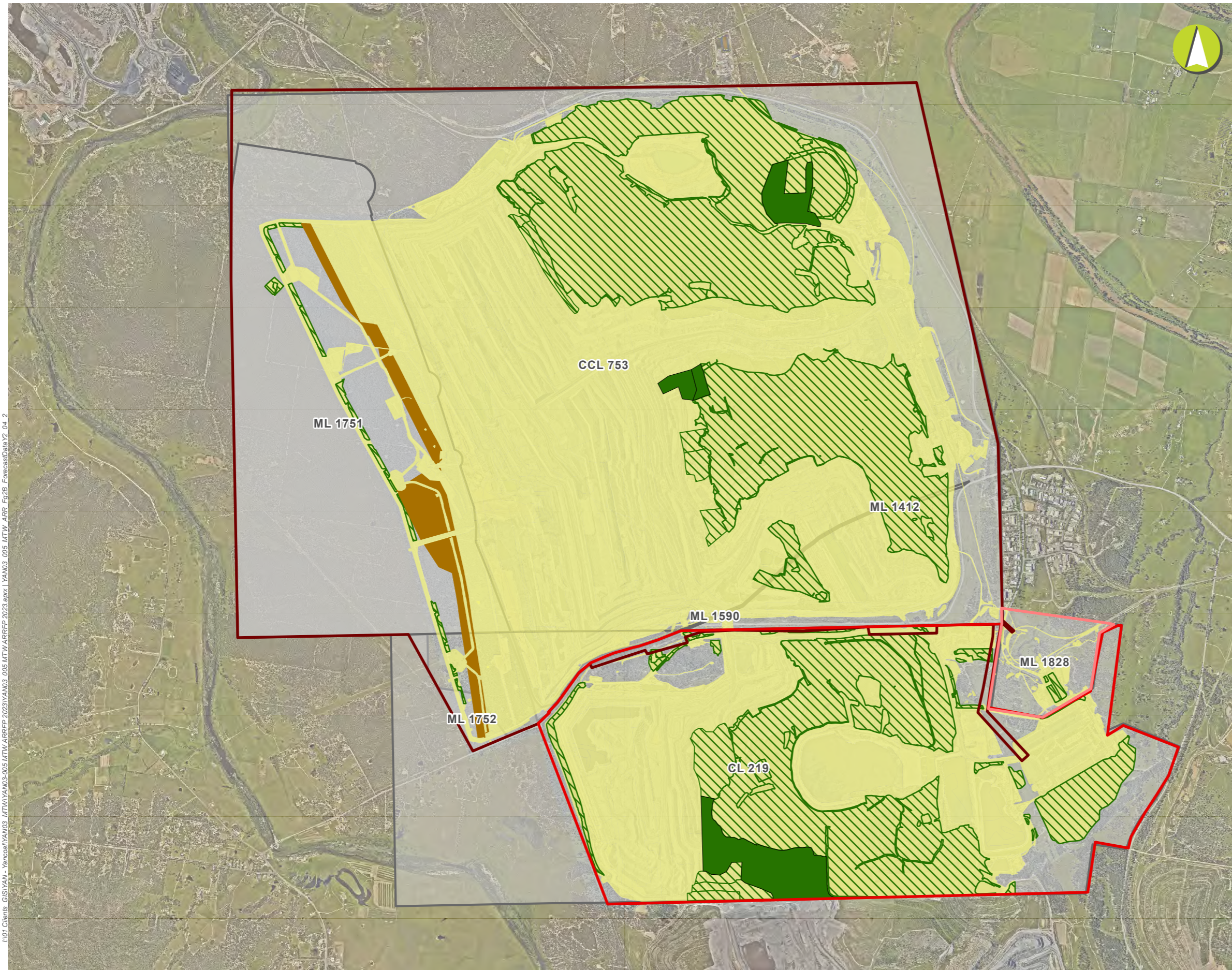
Mount Thorley Warkworth Complex

Mining and Rehabilitation Year 1 - 2023 PLAN 2A

Mine name	Mount Thorley Warkworth Complex
Plan name	Mount Thorley Warkworth FP
Year of anticipated relinquishment	To be determined closer to closure
Data theme submission ID No.	4759
Spatial Reference	GDA2020 MGA Zone 56
Plan date (date created)	1/05/2023

Source: Project Approval Boundary, rehabilitation, disturbance and Current Authorisations from Yancoal (2022). Aerial imagery from Yancoal (2022) and ArcGIS Online (capture date unknown).

Figure 2: Plan 2B: Mining and rehabilitation - Year 2 (2024)



LEGEND

Project Approval Number

- SSD 6464 - Warkworth
- SSD 6465 - Mount Thorley
- ML 1828 - Mount Thorley Coal Loader

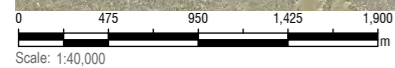
Status

- Relevant Minerals Title

Forecast Area Type - Year 2 (2024)

- Forecast Disturbance (2024)
- Forecast Land Prepared for Rehabilitation (2024)
- Previous Disturbance
- Previous Rehabilitation

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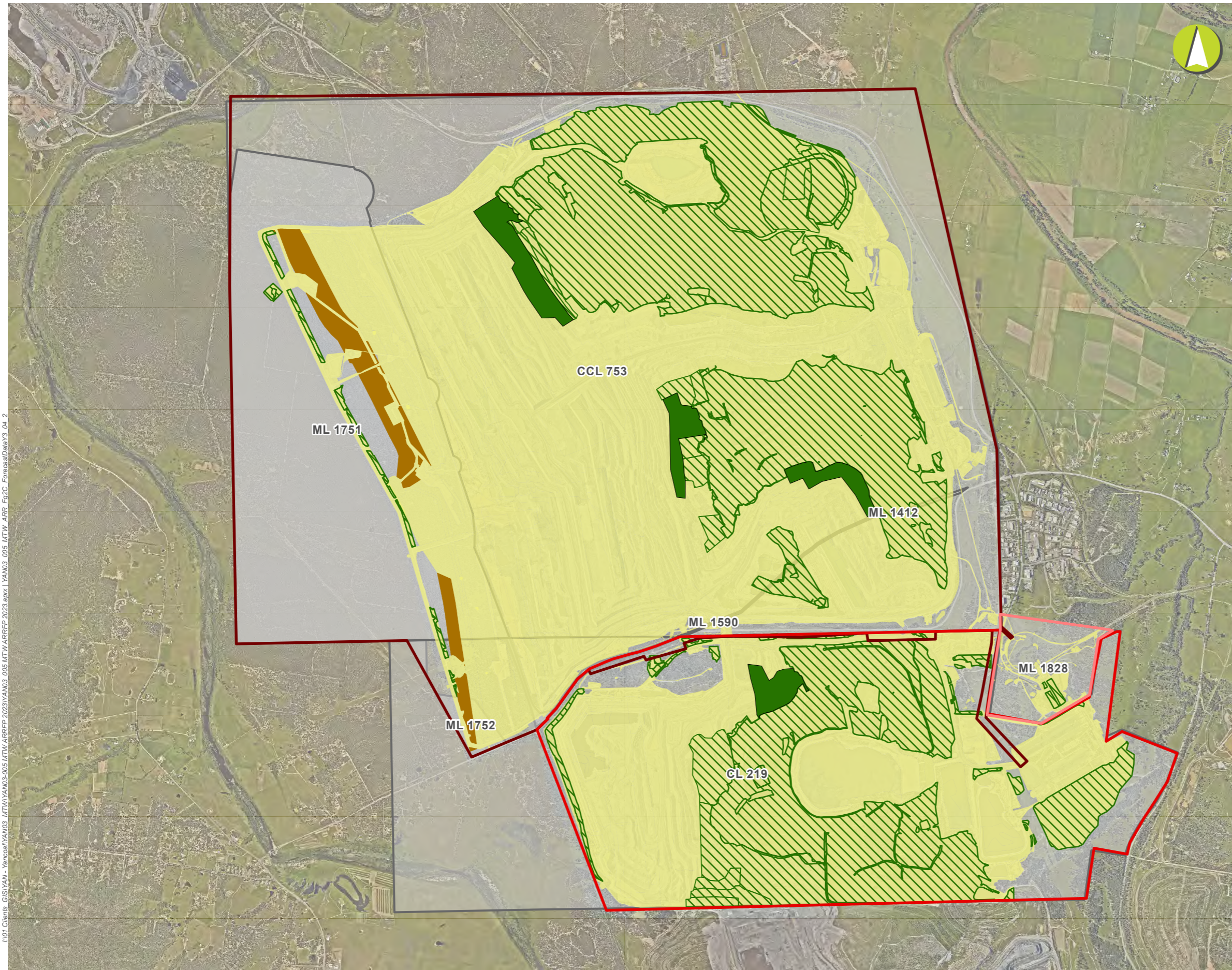


Mount Thorley Warkworth Complex

**Mining and Rehabilitation
Year 2 - 2024
PLAN 2B**

Mine name	Mount Thorley Warkworth Complex
Plan name	Mount Thorley Warkworth FP
Year of anticipated relinquishment	To be determined closer to closure
Data theme submission ID No.	4760
Spatial Reference	GDA2020 MGA Zone 56
Plan date (date created)	1/05/2023

Figure 3: Plan 2C: Mining and Rehabilitation - Year 3 (2025)



LEGEND

Project Approval Number

- SSD 6464 - Warkworth
- SSD 6465 - Mount Thorley
- ML 1828 - Mount Thorley Coal Loader

Status

- Relevant Minerals Title

Forecast Area Type - Year 3 (2025)

- Forecast Disturbance (2025)
- Forecast Land Prepared for Rehabilitation (2025)
- Previous Disturbance
- Previous Rehabilitation

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Mount Thorley Warkworth Complex

Mining and Rehabilitation Year 3 - 2025 PLAN 2C

Mine name	Mount Thorley Warkworth Complex
Plan name	Mount Thorley Warkworth FP
Year of anticipated relinquishment	To be determined closer to closure
Data theme submission ID No.	4761
Spatial Reference	GDA2020 MGA Zone 56
Plan date (date created)	1/05/2023

3.0 PROGRESSIVE MINING AND REHABILITATION STATISTICS

Table 4: Predicted Cumulative Disturbance and Rehabilitation Progression

	Item	Year 1 (2023)	Year 2 (2024)	Year 3 (2025)
A	Total disturbance footprint – surface disturbance (Ha)	4,157.92	4,227.92	4,297.84
B	Total active disturbance (Ha)	2,680.57	2,652.52	2,639.64
C	Rehabilitation – land preparation (Ha)	90.01	94.41	89.22
D	Ecosystem and land use establishment (Ha)	1,387.34	1,480.99	1,568.98

Table 5: Progressive Rehabilitation Key Performance Indicators

	Item	Year 1 (2023)	Year 2 (2024)	Year 3 (2025)
O	Total new active disturbance area during reporting period (Ha)	90.68	70.76	71.15
P	Total new area of land proposed for active rehabilitation during the reporting period (Ha)	90.01	94.41	89.22
Q	Annual Rehabilitation to disturbance ratio (Ha)	0.99	1.33	1.25