

MACQUARIE COAL

GLENCORE



Macquarie Coal
Rehabilitation Management Plan

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1. Introduction

This *Rehabilitation Management Plan* (RMP) details the current and proposed rehabilitation at the Macquarie Coal Complex (the Complex), which is operated by Oceanic Coal Australia Pty Limited (OCAL). The Complex encompasses the West Wallsend Colliery (WWC), the Macquarie Coal Preparation Plant (MCP), the former open-cut Westside Mine and the former Teralba Colliery (Northgate and Southgate sites). These sites are located approximately 20 kilometres northwest of Newcastle in the Lake Macquarie region of New South Wales (NSW). The Complex is owned by the Macquarie Coal Joint Vent (MCJV) which includes OCAL (70%), Marunbeni Coal Pty Ltd (17%), OCAL Macquarie Pty Ltd (10%), and JFE Minerals (Australia) Pty Ltd (3%). OCAL and OCAL Macquarie Pty Ltd are wholly owned by Glencore Coal Australia Limited (Glencore).

The Complex has ceased mining operations with the last extraction of coal from the West Wallsend underground mine completed in May 2016. Coal washing operations and tailings reject generation ceased in July 2016 with the last coal railed from the product stockpile in October of that year.

This RMP has been prepared in accordance with the *Form and Way Rehabilitation Management Plan for Large Mines* (NSW Resources Regulator, 2021). It has also been prepared to satisfy the requirements of 'Rehabilitation Management Plan' as required under Schedule 4, Condition 29 of the project approval (PA 09_0203). The RMP incorporates the relevant outcomes from the Detailed Mine Closure Plan (DCMP) and the Mine Closure Mining Operations Plan (MOP) to provide a description of decommissioning, rehabilitation, and closure activities at the Complex through to lease relinquishment.

1.1 Reference to MOP and Domains

Prior to this RMP the Complex has been operating its closure activities in accordance with the approved Mine Closure Mining Operations Plan (MOP). Discussions were held between Macquarie Coal, Glencore and the Resources Regulator in February 2022 regarding the development of this RMP and its relationship to the previous MOP. It was agreed that this RMP would be consolidated with reference to the MOP where possible. The Mine Closure MOP is attached as **Appendix A**.

The initial development of the MOP in 2016 divided the Complex into sixteen (16) closure domains. However, as part of the new RMP guidelines, the Resources Regulator strictly prescribes domain titles which must align with the Resources Regulator portal.

As closure activities have been in progress since 2016, and some areas of the Complex have achieved relinquishment, the original 16 domains are now referred to as "management areas". Within these management areas are smaller domains that now align with the RMP guidelines. These domains and management areas are detailed in **Table 1-1 and 1-2**. Domains are further explained in **Section 2.4**.

Table 1-1 Macquarie Coal Domain Summary

Final Land Use Domain	Code	Mining Domain	Code
Native Ecosystem	A	Infrastructure Area	1
Agricultural – Grazing	B	Tailings Storage Facility	2
Agricultural – Cropping	C	Water Management Area	3
Rehabilitation Biodiversity Offset Area	D	Overburden Emplacement Area	4
Industrial	E	Active Mining Area (Open cut void)	5
Water Management Areas	F	Underground Mining Area (SMP)	6
Water Storage (Excluding Final Void)	G	Beneficiation Facility	7
Heritage Area	H	Other	8
Infrastructure	I		
Final Void	J		
<p>Other - Subsidence Management Area</p> <p><i>Relevant to management area 15.</i></p> <p><i>This outlines the footprint of the approved underground workings. Underground mining ceased in 2012.</i></p> <p><i>Area is part of the Sugarloaf State Conservation Area (SSCA).</i></p>	K-A		

Table 1-2 Macquarie Coal Domain Summary by Management Area

Current MOP Management Area No.	Current MOP Management Area	Proposed Mining Domains / Rehab Status (for 2022 RMP)	Current MOP Secondary Domain	Proposed Final Land Use Domain (2022 RMP)	Proposed Activities July 2022 – July 2025	Color Code: Black = General Information Red = To be completed Green = Completed
1	Admin Workshop and Haul Road	<p>Disturbance Status - Domain 1 – Infrastructure Area</p> <p>Domain 3 – Water Management Area</p> <p>Rehabilitation Status - Domain A – Native Ecosystem (bushland)</p>	<p>Retained infrastructure for Light industrial (access road, buildings)</p> <p>Bushland</p> <p>Water management</p>	<p>Domain A – Native Ecosystem (bushland)</p> <p>Domain G - Water Storage</p> <p>Domain I - Infrastructure (powerline, access road)</p>	<p>Domain A – Native Ecosystem (bushland)</p> <ul style="list-style-type: none"> - 0.29ha rehabilitated to bushland (Wakefield Road Underpass) required for the Westside-MCPP internal haul road to be backfilled. - 0.6ha of existing rehab – still considered under establishment. - Total of 3.91ha of the domain is undisturbed or remanent bushland, including riparian vegetation alongside Cockle Creek. <p>Domain G – Water Storage</p> <ul style="list-style-type: none"> - Dams C, G and H will be retained, and existing pipe and pumping network maintained. - Dam C to continue to be utilized as an area to treat water (i.e. flocculation) prior to discharge off-site at point EPA 3 (Domain 14). - Some minor earthworks required for Dam C for long-term stability (clearing vegetation, upgrading spillway to more permanent structure. Re-shape and line spillway with geo-fabric and rip rap. - Vegetation clearing required along embankments of Dams C and H. - Water monitoring of sediment dam no longer undertaken. Water monitoring of final void is still undertaken. - Sampling confirm minimal contamination of sediments from Dam G have minimal contamination, therefore no remediation is required to be completed. <p>Domain I - Infrastructure</p> <ul style="list-style-type: none"> - 11kV power and potable water retained. - Access to site will be from the existing access off Wakefield Road. - Haul Road has been reduced to a standard light vehicle access road. - Workshop and oily water separator have been removed. - Demountable buildings have been decommissioned and removed. - Limited civil earthworks required aside from decommissioning and filling/grouting the Wakefield Road Underpass. - Road cutting leading to the underpass to be backfilled to natural surface. 	
2	North Rehab Area	<p>Rehabilitation Status - Domain A – Native Ecosystem</p> <p>***Area has been relinquished.***</p>	<p>Bushland</p> <p>Water management</p> <p>Retained access tracks</p>	<p>Domain A – Native Ecosystem (bushland)</p> <p>Domain G – Water Storage (Dams J, K)</p> <p>Domain I – Infrastructure (retained roads)</p>	<p>No further work. All activities in this domain have been completed.</p> <p>Sign off received from Resources Regulator on 28 January 2020.</p>	
3	Southwest Pit	<p>Disturbance Status -</p>	<p>Bushland,</p>	<p>Domain A – Native Ecosystem (bushland)</p>	<p>Domain A – Native Ecosystem (bushland)</p> <p>- 1 Historical Auger Mining Area rehabilitation completed.</p>	

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		<p>Domain 1 – Infrastructure</p> <p>Domain 3 – Water Management Area (Dams E, F and EV1)</p> <p>Domain 5 – Active Mining Area (Open Cut Void)</p> <p>- South Pit Final Void Area</p> <p>- West Pit Void</p> <p>Rehabilitation Status –</p> <p>Domain A – Native Ecosystem (bushland)</p>	<p><i>Water management,</i></p> <p><i>Retained access tracks</i></p>	<p>Domain G – Water Storage (Dam E and F)</p> <p>Domain J – Final Void (South Pit)</p> <p>Domain I – Infrastructure (access road)</p>	<p>- 67.67ha of area rehabilitated to bushland and at various stages of establishment.</p> <p>- All rehabilitation works have been completed.</p> <p>Domain G – Water Storage</p> <p>- Dam F was filled in and the area was rehabilitated.</p> <p>- Dam E – spillway has been constructed and minor earthworks have been completed.</p> <p>- Dam EV1 is the void from the former East Pit in the Southern Extension Area.</p> <p>Domain J – Final Void (South Pit)</p> <p>- 3.55ha final void area assessed as requiring additional rehabilitation works as the revegetation is poor quality and significant gully erosion is present.</p> <p>- 1.94ha subject to subsidence and surface cracking</p> <p>- Earthworks and landform work relating to this domain have been completed.</p> <p>Domain I – Infrastructure (Access Road)</p> <p>- Access track and haul roads maintained for light vehicle and bushfire access has been completed.</p> <p>- Likelihood of borrow pit being used for capping material in Domain 7 and 8 is low. Only completed rehabilitation in this domain is related to the stabilization of batters. No further plans for rehabilitation in this domain.</p>	
4	Westside Final void	<p>Disturbance Status –</p> <p>Domain 1 – Infrastructure Area</p> <p>Domain 3 – Water Management Area</p> <p>Domain 5 – Active Mining Area (Open cut void)</p> <p>Rehabilitation Status –</p> <p>Domain A – Native Ecosystem (bushland)</p> <p>Domain B - Grazing</p> <p>Domain J – Final Void</p>	<p><i>Pit Lake</i></p> <p><i>Bushland</i></p> <p><i>Pasture</i></p> <p><i>Water management</i></p> <p><i>Retained access tracks</i></p>	<p>Domain A – Native Ecosystem (bushland)</p> <p>Domain B – Agriculture - Grazing</p> <p>Domain F – Water Management Areas</p> <p>Domain I – Infrastructure (access track, pipeline)</p> <p>Domain J – Final Void</p>	<p>Domain A – Native Ecosystem (bushland)</p> <p>- All rehabilitation works have been completed.</p> <p>Domain B – Agriculture - Grazing</p> <p>- small area of pasture on the northern section of the void.</p> <p>- Pasture to be established in areas below RL12.</p> <p>- All rehabilitation works have been completed.</p> <p>Domain F – Water Management Areas</p> <p>- Bioremediation area will be levelled out and spread away from the planned spillway.</p> <p>- Spillway located on the northern side of the final void which would report to Cockle Creek.</p> <p>- Current water management system will remain in place for the duration of the mine closure phase until the rehabilitation has stabilised and runoff is considered clean.</p> <p>Domain I – Infrastructure</p> <p>- Retained access track</p> <p>- 0.66ha of auger mining remediation underlying Westside Mine Access Road.</p> <p>- Remaining infrastructure includes void de-watering pipeline and the LW11 pipeline</p> <p>Domain J – Final Void (Westside East Pit)</p>	

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					<ul style="list-style-type: none"> - 19ha Pit Lake - High water level pit disturbance requires rehabilitation - Erosion on batters has been repaired and rehabilitation is now complete. 	
5	VCAs	<p>Disturbance Status – Domain 1 – Infrastructure</p> <p>Rehabilitation Status – Domain A – Native Ecosystem (bushland)</p>	<p><i>Bushland (managed as Voluntary Conservation Areas)</i></p> <p><i>Retained access tracks</i></p>	<p>Domain A – Native Ecosystem (bushland)</p> <p>Domain I – Infrastructure (access tracks)</p>	<p>Domain A – Native Ecosystem (bushland)</p> <ul style="list-style-type: none"> - weed maintenance along the powerline easement to continue. - Conservation of <i>T. juncea</i> to continue. - Conservation of Sydney Coastal Estuary Swamp Forest to continue. - Conservation of protected and regionally specific flora and fauna to continue. - Conservation of heritage values to continue. - May be a requirement to undertake remediation of the subsidence cracks within VCA B. <p>Domain I – Infrastructure</p> <ul style="list-style-type: none"> - Retained access tracks (through VCA B) for light vehicles. - Powerline has been removed <p>- Monitoring and maintenance of VCAs will continue.</p>	
6	Pit Top Facilities	<p>Disturbance Status – Domain 1 – Infrastructure Area</p> <p>Domain 3 – Water Management Area</p> <p>Rehabilitation Status – Domain A – Native Ecosystem (bushland)</p> <p>Domain B – Agriculture - Grazing (Pasture)</p>	<p><i>Retained infrastructure for Light industrial (access road, buildings)</i></p> <p><i>Bushland</i></p> <p><i>Pasture</i></p> <p><i>Water management</i></p>	<p>Domain A – Native Ecosystem (bushland)</p> <p>Domain B – Agriculture – Grazing (Pasture)</p> <p>Domain F – Water Management Area</p> <p>Domain G – Water Storage (excluding Final Void)</p> <p>Domain I – Infrastructure (hardstands, all buildings except coal clearance infrastructure, access road)</p>	<p>Domain A – Native Ecosystem (bushland)</p> <ul style="list-style-type: none"> - 9.55ha of existing bushland. <p>Domain B – Agriculture - Grazing (Pasture)</p> <ul style="list-style-type: none"> - 0.93ha of existing pasture. <p>Domain F – Water Management Area</p> <ul style="list-style-type: none"> - Sediment and erosion control measures for areas where drainage by-passes the surface dams and is discharged off site to be installed. - Retention of licensed discharge points. <p>Domain G – Water Storage Area (excluding Final Void)</p> <ul style="list-style-type: none"> - Moderate erosion has occurred on the exposed downstream embankment face for Bottom Dam Cell 2. - Top Dam, Bottom Dam and Northeast Dam retained. - Existing dams will continue to be dewater and desilted in accordance with the monitoring and maintenance plan. - Contamination testing confirmed there is no remediation required but sediment dams will remain. - Testing of sediment dams 1-4 is now complete and requires no remediation. <p>Domain I - Infrastructure</p> <ul style="list-style-type: none"> - Bitumen, roadways, car parks, hardstand areas around admin building, store areas and workshop to be removed if not required. - Works required regarding the power supply to the 11kV powerline 	

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					<ul style="list-style-type: none"> - approximately 10ha of existing infrastructure/hardstands will be retained for light industrial use. - All buildings other than coal clearance infrastructure will be retained - access road retained for site access and bushfires. - Waste management hub to support primary waste hub in Domain 9. Will have equipment for segregating and stockpiling wastes. 	
7	Tailings Dam	<p>Disturbance Status – Domain 2 – Tailings Storage Facility</p> <p>Domain 3 – Water Management Area</p> <p>Rehabilitation Status – Domain A – Native Ecosystem (bushland)</p>	<p>Pasture</p> <p>Bushland</p> <p>Water management</p>	<p>Domain A – Native Ecosystem (bushland)</p> <p>Domain B – Agriculture – Grazing (pasture)</p> <p>Domain F – Water Management Areas</p> <p>Domain G – Water Storage (excluding Final Void)</p>	<p>Domain A – Native Ecosystem (bushland) - Disturbance to the south to be rehabilitated to bushland.</p> <p>Domain B – Agriculture – Grazing (pasture) - 29.69ha of tailings dam surface to be rehabilitated to pasture.</p> <p>Domain F – Water Management Area - 0.05ha of water management (spillway). - Series of unlined drains will be developed to facilitate the drainage system. - Diversion drain will be installed to direct runoff from forested areas to the north to natural drainage lines.</p> <p>Domain G – Water Storage (excluding Final Void) - Current buttress is sufficient. Long-term stability has been approved and signed off by Dam Safety NSW. - Decanting to maintain the decant pond at its minimum practicable extents and facilitate development of significant crust shear strength on the tailings beach. - Capping continues, however no final rehabilitation of this domain yet. - Research project to investigate the benefit of trees being planted on tailings dam surfaces to speed up drying (Australian Coal Association Research Program, ACARP). - long term maintenance of the capped surface to maintain a free-draining landform will be required. - Placement of 0.5m growth media layer on Northern saddle batter, Tailings Storage facility surface and dam wall. - Detailed Tailings and REA Post Closure Management plan to be developed.</p>	
8	REA	<p>Disturbance Status – Domain 3 – Water Management Area</p> <p>Domain 4 - Overburden Emplacement Area</p> <p>Rehabilitation Status – Domain A – Native Ecosystem (bushland)</p>	<p>Pasture</p> <p>Water management</p>	<p>Domain A – Native Ecosystem (bushland)</p> <p>Domain B – Agriculture – Grazing (pasture)</p> <p>Domain F – Water Management Areas</p> <p>Domain G – Water Storage (excluding Final Void)</p>	<p>Domain A – Native Ecosystem (bushland) - Existing bushland</p> <p>Domain B – Agriculture – Grazing (pasture) - Establishment of 48.66ha of pasture revegetation over the REA surface.</p> <p>Domain F – Water Management Areas - Installation of contour drains. - 6 standing pipe boreholes have been installed in the REA.</p> <p>Domain G – Water Storage (excluding Final Void)</p>	

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					<ul style="list-style-type: none"> - Treatment dams report to Pond 3 before discharging offsite. - Remove impacted sediments from pond and drainage channels following completion of Tailings Dam/REA rehabilitation works and return to Tailings Dam. - No active rehabilitation has been undertaken. - Civil earthworks and landforms work to be completed. - Installation of standard erosion and sediment control measures during decommissioning works required. 	
9	Surface Facilities	<p>Disturbance Status – Domain 1 – Infrastructure Area</p> <p>Domain 3 – Water Management Area</p> <p>Rehabilitation Status – Domain A – Native Ecosystem (bushland)</p>	<p><i>Retained Infrastructure - light industrial (rail loop, access roads, buildings, hardstands)</i></p> <p><i>Bushland</i></p> <p><i>Pasture</i></p> <p><i>Water management</i></p>	<p>Domain A – Native Ecosystem (bushland)</p> <p>Domain B – Agriculture – Grazing (Pasture)</p> <p>Domain I – Infrastructure (retained Rail Loop, hardstand areas, administration building, workshop, car parks,)</p> <p>Domain G – Water Management Areas (water conveyance channel from the TSF)</p>	<p>Domain A – Native Ecosystem (bushland) - Existing rehabilitation will be retained as bushland.</p> <p>Domain B – Agriculture – Grazing (pasture) - Rehabilitation works have been completed.</p> <p>Domain I – Infrastructure - Existing infrastructure includes washery, workshop, administration building, laydown storage area, fuel storage facilities, run-of-mine stacker and reclaim infrastructure, and hardstands. - Underground asbestos pipes are known to exist throughout the domain.</p> <p>Domain G – Water Management Areas - Pumping equipment remains in place at Catchment Dam 2 and other dams.</p> <p>- Domain is currently active and subject to ongoing operations. - Works in this area have been completed with capping of remnant coal. - Continue to test and investigate sediments for potential contamination with a contamination specialist.</p>	
10	Maturation Ponds	<p>Disturbance Status – Domain 1 – Infrastructure Area</p> <p>Domain 3 – Water Management Area</p> <p>Rehabilitation Status – Domain B – Agriculture – Grazing (pasture)</p>	<p><i>Non-Macquarie Coal Industrial (substation, access road)</i></p> <p><i>Pasture</i></p> <p><i>Water management</i></p>	<p>Domain B – Agriculture – Grazing (pasture)</p> <p>Domain G – Water Storage (excluding Final Void)</p> <p>Domain I – Infrastructure (substation, access roads, non-Macquarie Coal infrastructure)</p>	<p>Domain B – Agriculture – Grazing (pasture) - 9.72ha of disturbance has been converted to pasture.</p> <p>Domain G – Water Storage (excluding Final Void) - maturation ponds work has been completed.</p> <p>Domain I – Infrastructure - 2.0ha of non-Macquarie Coal infrastructure has been retained (substation) -0.5ha of roadways and hardstand has been retained for access to non-Macquarie Coal infrastructure</p>	
11	Teralba Northgate	<p>Disturbance Status – Domain 1 – Infrastructure Area</p>	<p><i>Light Industrial (hardstands, non-Macquarie Coal infrastructure)</i></p>	<p>Domain A – Native Ecosystem (bushland)</p>	<p>Domain A – Native Ecosystem (bushland) - 1.20ha of existing bushland.</p>	

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		<p>Rehabilitation Status – Domain A – Native Ecosystem (bushland)</p> <p>Domain B – Agriculture – Grazing (pasture)</p>	<p><i>Bushland</i></p> <p><i>Pasture</i></p>	<p>Domain B – Agriculture – Grazing (pasture)</p> <p>Domain I – Infrastructure (hardstands, non- Macquarie Coal infrastructure)</p>	<p>Domain B – Agriculture – Grazing (pasture) - 5.46ha of existing pasture.</p> <p>Domain I - Infrastructure - 2.87ha of infrastructure (buildings, roads/hardstands and associated yards) - 0.20ha of retained non-Macquarie Coal infrastructure.</p> <p>- 2.76ha of disturbance rehabilitated for grazing</p> <p>***Closure activities have been completed in this domain.***</p>	
12	Infrastructure	<p>Disturbance Status – Domain 1 – Infrastructure Area</p> <p>Domain 3- Water Management Area</p> <p>Rehabilitation Status – Domain A – Native Ecosystem (bushland)</p>	<p><i>Bushland</i></p> <p><i>Water management</i></p>	<p>Domain A – Native Ecosystem (bushland)</p> <p>Domain B – Agriculture – Grazing (pasture)</p> <p>Domain F – Water Management Areas</p> <p>Domain I - Infrastructure</p>	<p>- Closure activities have been completed.</p> <p>- Fan sealing (#3 and #4 Shafts) have been sealed</p> <p>- Fan #3 Boreholes have been sealed.</p>	
13	Teralba Southgate	<p>Disturbance Status – Domain 1 - Infrastructure Area</p> <p>Domain 3 – Water Management Area</p> <p>Rehabilitation Status – Domain A – Native Ecosystem (bushland)</p> <p>Domain B – Agriculture – Grazing (pasture)</p>	<p><i>Retained infrastructure Light industrial (hardstands)</i></p> <p><i>Bushland</i></p> <p><i>Water management</i></p>	<p>Domain A – Native Ecosystem (bushland)</p> <p>Domain B – Agriculture – Grazing (pasture)</p> <p>Domain F – Water Management Areas</p> <p>Domain I – Infrastructure (hardstand)</p>	<p>Domain A – Native Ecosystem (bushland) - 0.47ha of existing bushland.</p> <p>Domain B – Agriculture – Grazing (pasture) - 2.39ha of existing pasture.</p> <p>Domain F – Water Management Areas - Surface water storage dam.</p> <p>Domain I - Infrastructure - 4.06ha of infrastructure (hardstand). - Demolition completed</p> <p>- Aside from sealing works, no active rehabilitation has been undertaken in this domain to date.</p> <p>- UGM no longer at this site.</p> <p>- Civil earthworks and landform work completed.</p> <p>- Revegetation works completed.</p>	

Current MOP Management Area No.	Current MOP Management Area	Proposed Mining Domains / Rehab Status (for 2022 RMP)	Current MOP Secondary Domain	Proposed Final Land Use Domain (2022 RMP)	Proposed Activities July 2022 – July 2025	Color Code: Black = General Information Red = To be completed Green = Completed
14	Other Mine Owned Lands	<p>Disturbance Status – Domain 1 – Infrastructure</p> <p>Domain 3 – Water Management Area</p> <p>Rehabilitation Status – Domain A – Native Ecosystem (bushland)</p> <p>Domain B – Agriculture – Grazing (pasture)</p>	<p><i>Non-Macquarie Coal infrastructure (roadways, powerline corridors), Retained access roads</i></p> <p><i>Residential</i></p> <p><i>Bushland</i></p> <p><i>Water management</i></p> <p><i>Wetland</i></p>	<p>Domain A – Native Ecosystem (bushland)</p> <p>Domain B – Agriculture – Grazing (pasture)</p> <p>Domain F – Water Management Areas</p> <p>Domain I – Infrastructure (hardstands)</p>	<p>Domain A – Native Ecosystem (bushland) - Establishment of 11.39ha of bushland rehabilitation has been completed. - 620.26ha of existing bushland will be retained.</p> <p>Domain B – Agriculture – Grazing (pasture) - 7.96ha of existing pasture will be retained.</p> <p>Domain F – Water Management Areas - 0.2ha of spillway associated with Westside Final Void (Domain 4) spillway has been completed. - 0.88ha of drainage line from the REA Toe Dam (Domain 8) to the MCPP (Domain 9) is no longer required. - 1.43ha of drainage line from the REA (Domain 8) to the MCPP (Domain 9) is no longer required.</p> <p>Domain I - Infrastructure - 12.06ha of access roads (small amounts to be retained), hardstands.</p> <p>Other lands not required to be managed by Macquarie Coal - 28.95ha of wetland to be retained. - 0.73ha of existing residential. - 33.97ha of non-Macquarie Coal infrastructure (buildings, roads, powerline, corridors, etc).</p> <p>*** Closure activities within this domain have either been completed or are no longer required.***</p>	
15	Project Approval Area	<p>Disturbance Status – Domain 1 – Infrastructure</p> <p>Domain 6 – Underground Mining Area (SMP)</p> <p>Rehabilitation Status – Domain A – Native Ecosystem (bushland)</p> <p>Domain K-A – Other (Subsidence management area)</p>	<p><i>Existing Bushland – (State Conservation Area) - Recreation</i></p>	<p>Domain A – Native Ecosystem (bushland)</p> <p>Domain K-A – Other (Subsidence Management Area)</p>	<p>Domain A – Native Ecosystem (bushland) - Area will be reopened to the public once subsidence remediation works are completed.</p> <p>Domain K-A – Other (Subsidence Management Area) - This domain is located in part of the Sugarloaf State Conservation Area (SSCA) - Piezometer boreholes have been decommissioned and remedial works are now complete. - Erosion and sediment control measures have been installed. - Some remediation of surface subsidence cracks and stabilization at risk surface cliff and rocks requires completion. - Surface equipment has been removed.</p>	
16	Rural Residential Property	<p>Disturbance Status – Domain I – Infrastructure (sewage treatment)</p>	<p><i>Existing Residential (houses, access roads)</i></p>	<p>Macquarie Coal is not required to manage this land. Land will remain as residential.</p>	<p>Residential - Currently have 30.53ha of residential land.</p>	

Current MOP Management Area No.	Current MOP Management Area	Proposed Mining Domains / Rehab Status (for 2022 RMP)	Current MOP Secondary Domain	Proposed Final Land Use Domain (2022 RMP)	Proposed Activities July 2022 – July 2025	Color Code: Black = General Information Red = To be completed Green = Completed
		<p>Rehabilitation Status – No management or rehabilitation requirements.</p>			<p>- No decommissioning or construction works will be undertaken in Management Area 16.</p>	

1.2 History of Operations

Mining at the facilities that comprise the Complex began with WWC (consent 1969, previously West Wallsend No. 2 Colliery), Teralba Colliery (consent 1973, as a merger between Macquarie/Pacific Colliery and Stockton Borehole Colliery), Macquarie Coal Preparation Plant (consent 1981 in conjunction with Stockton Borehole Colliery) and Westside Mine (consent 1990).

A brief description of the operations that comprise the Complex is summarised in **Section 1.2.1** to **Section 1.2.4**. A description of other disturbance historically associated with the Complex is summarised in **Section 1.2.5**.

1.2.1 West Wallsend Colliery

WWC was originally granted development consent DA B66-69 for the pit top facilities and No. 2 ventilation fan in 1969. A bord and pillar mining operation commenced in 1969 and continued until 1987 at the commencement of longwall operations. Longwall mining was undertaken to the north and south of the pit top in the Borehole and West Borehole Seams; since 1989 only longwall operations were undertaken in the vicinity of Holmesville, Edgeworth and the Sugarloaf State Conservation Area (SSCA).

Coal was transported via conveyor to surface then hauled by truck via private haul road to the MCPP. The majority of coal mined from WWC was washed and loaded onto trains at the MCPP to be transported to Newcastle Port for export. A small percentage of coal mined from WWC was railed to Eraring Power Station.

The former Department of Planning and Infrastructure (DP&I) approved continued underground mining at WWC in 2012, and in October 2014, a modification to the Project Approval PA 09_0203 was granted to include the additional Longwalls 51 and 52 to allow underground mining to continue until December 2021. In May 2016 longwall mining was completed at WWC.

WWC currently holds the following mining leases: Coal Consolidated Lease (CCL) 725 and CCL 718, Mining Lease (ML) 1336 and ML 1451 and Private Lands Lease (PLL) 153. Historically WWC also held ML 1438 and sub-leases CCL 774 and CCL 727, these have since expired or have been cancelled.

Infrastructure at WWC includes pit top facilities with most of these being removed or sealed. The No.2 and No.3 ventilation shafts have since been removed, and the ballast borehole facility is now sealed. Some exploration and groundwater boreholes associated with WWC still exist and Longwall (LW) 11 will be retained long-term.

1.2.2 Macquarie Coal Preparation Plan (MCPP)

The MCPP was granted Development Consent DA 88-4-2005 on 21 July 1981. It was initially established as part of the Stockton Borehole Colliery which was owned and operated by the Broken Hill Proprietary Company Limited (BHP). During 1988, the preparation plant was renamed to the Macquarie Coal Preparation Plan and from 19 May 1989 to 12 January 1990, the plant was part of the Pacific Copper Limited Group. Subsequently, the plant became part of the FAI Mining Group, where, on 26 September 1992, it was included in the Macquarie Coal Joint Venture. FAI Mining Limited changed its name to OCAL on 10 June 1993, however the legal identity and ownership of the company did not change. In July 1999, OCAL was purchased by Glencore. The MCPP is located in the CCL 718 boundary.

Wakefield Colliery (later referred to as Lachlan Colliery) obtained a development consent in 1990 comprising surface facilities and extension of underground mining to the southwest of the West Wallsend lease holding. A ventilation shaft (WWC Shaft No. 3) was constructed in this area and the

WWC operations incorporated the proposed underground workings addressed within the Wakefield Colliery development application.

The MCPP received coal from Teralba Colliery (up to May 2001), Westside Mine (up to 2012 with coal being delivered to Eraring), and WWC (up to 2016). Key activities undertaken in the MCPP area included receipt and stockpiling of run of mine (ROM) coal from WWC and Teralba Colliery and processing ROM coal to produce thermal and coking products; stockpiling and train loading product coal; emplacement of coarse and fine reject material; rehabilitation of emplacement areas; receipt of treated effluent from the Edgeworth Sewerage Treatment Plant (STP) and onsite STPs at MCPP and WWC for use in coal processing; and general maintenance and land management including surface water management, erosion and sediment control and weed management.

Under Sections 100, 102 and 126 of the *Coal Mine Health and Safety Act 2002*, the MCPP secured approvals for the construction and use of the (coarse) Reject Emplacement Area (REA) and Tailings Storage Facility (Dam) and associated dam wall buttress support. The Tailings Dam at the MCPP (previously Stockton Borehole Tailings) is a 'Prescribed Dam' under Schedule 1 of the Dams Safety Act 1978.

Other key MCPP infrastructure included Maturation Ponds, Catch Dams, stockpiles, administration area, and winder house. These have since been removed or remediated.

When Westside Mine ceased operations, the Complex submitted a Section 100 application under the *Coal Mine Health and Safety Act 2002* and the *Environmental Planning & Assessment Act 1979* proposing the use of Westside Mine void for coarse reject emplacement from MCPP. This application was approved in January 2012.

1.2.3 Westside Mine

Westside Mine began as an underground mining operation in the 1950s and 1960s in the South Pit Area, with coal extracted from the Great Northern Seam by the RW Millar Company who at the time operated the former Rhondda Colliery West Tunnel. This was worked using bord and pillar operations. Current mining leases applicable to the Westside Mine are ML 1532, CCL 725, CCL 718, ML 1336 and PLL 153.

Development consent DA 90/0242 was granted to Westside Mine in 1990 for open cut mining in the northern and southern portions of the mine lease area, with mining commencing in 1992. Mining within the North, South (West) and East Pits targeted both the Great Northern and Fassifern Seams. Mining was by truck and shovel method using contractors with sequential mining of narrow strips followed by backfilling of mined strips and rehabilitation on a continuous basis. Raw coal was screened at the site and transported from the mine by truck via a private haul road connecting to Powercoal's (now Centennial) private haul road to access the Central Coast Power Stations. At the end of operations, part of the southern pit wall was auger mined.

Mining operations ceased in 2012 culminating in the East Pit area with site undergoing progressive rehabilitation. The North Rehabilitation Area received ESF2 Rehabilitation Completion sign-off by the Resources Regulator on 28 January 2020.

1.2.4 Teralba Colliery

Mining in the Teralba area commenced in 1886 with mining in the Great Northern Seam. The site was owned by the Great Northern Coal Company and operated under several names including: the Northern Colliery, the Pacific Coal Co-operative, and the Pacific Colliery. In 1967 BHP purchased the Southgate site and subsequently renamed it the Macquarie Colliery. It changed names again to the Pacific Colliery in 1985 and finally became the Teralba Colliery (rationalisation of Stockton Borehole Colliery and Pacific Colliery) in 1988. In 1989 Teralba was part of the FAI Mining Group, subsequently

becoming OCAL in 1993, which was eventually acquired by Glencore in that same year. Development occurred under the existing development consent which was approved in 1973. To date, Teralba Colliery only holds mining lease CCL 718, as its other leases have since expired or have been cancelled.

The Teralba Colliery consists of two sites. The Northgate site has been used for coal mining purposes for the last 100 years and is located adjacent to the MCPP. The Southgate site is approximately 7 ha of pit top located 4 km south on the corner of York Street and Pitt Street, Teralba. The site is situated adjacent to residential development, with a retirement village to the east and the Main Northern Railway bordering the south-western side.

During operations, coal was transported to two underground bins which were then conveyed to the surface via a drift conveyor at the Northgate site. The drift was also used to transport heavy machinery to and from the underground workings. The site was composed of several buildings including workshops, storage buildings, disused shaft winder and headframe, yard storage areas, administration buildings, bath house, drift winder, methane drainage stack, loco charging room and an electrical sub-station. All ROM coal was conveyed to the MCPP for processing.

Teralba was put under care and maintenance after the last coal was mined from Longwall 17 in May 2001. Rationalisation activities including appropriate disposal of unwanted equipment were then undertaken by Teralba Colliery.

In 2003, Lake Macquarie City Council (LMCC) granted development consent DC/01/03498/1R for underground coal mining within 1567. UGM were the nominated site operator and held responsible for the activities. The property and mining lease were to still be owned by OCAL. No operations were ever undertaken and UGM left the site in 2020.

The Envirogen power generating plant was built at the Northgate site following the demolition of infrastructure in 2003. The area (Lot 1) and the access road to the power plant were excised from the Teralba lease subject to agreement with Envirogen.

The Methane Drainage Plant was located at Teralba Southgate and extracted methane from underground longwall goaf areas and vented to the Southgate atmosphere via the No. 2 Shaft. Methane was also extracted by the Envirogen plant via the Northgate No. 1 Shaft from the abandoned underground workings.

Following a heritage assessment of existing infrastructure at the Northgate site undertaken in 2009, two pit houses (owned by Teralba on the road to the MCPP) were demolished and approximately 0.4ha of land was hydro-mulched on the area. A permanent air lock seal for the Northgate drift was also installed.

A Section 92 approval under the *Coal Mines Health and Safety Act 2002* was granted by the (now) DPE on 31 August 2009 to fill the No. 1 and No. 2 Shafts at the Southgate site in accordance with the *Guidelines for the Permanent Filling and Capping of Surface Entries to Coal Seams* and in consultation with DPE. The filling of the No. 1 and No.2 Shafts commenced in late 2009 with material sourced from an old coarse refuse dump at the site of the former bathhouse at the Northgate site. The project was completed in 2010.

In 2010, UGM was granted development consent DA/1174/2010 to undertake mining related activities and rationalisation activities including demolition at the Teralba Southgate site. An agreement was established between the Complex and UGM for these works and other mining related activities including the use of buildings and workshop, mechanical / electrical repair of mining equipment and overhaul and testing of equipment related to the mining industry. UGM assumed operational control of the surface facilities at Southgate in 2010. Structures demolished or removed in 2010 included the shaft winder, stone dust bin and diesel tank at Southgate and the bathhouse and office building at Northgate.

A MOP amendment was submitted to, and approved by, DPE in 2010 to undertake rationalisation and decommissioning activities including sealing Ventilation Shafts 3 and 4. Demolition works have continued through Teralba including the removal of the EDL gas drainage plan. UGM left the site in 2020.

1.2.5 Other Historic Disturbance

All areas currently and historically disturbed within the existing land owned by the Complex are addressed in this RMP. Other historic disturbance outside of the existing closure domains that were associated with the existing Complex area and infrastructure (e.g. previously BHP, Stockton Borehole Colliery, Pacific Colliery, etc.) include Bolton Point and Brush Creek Borehole. This historic disturbance is summarised below.

Brush Creek Borehole located at Fredrick St., Argenton (off Glendale) was previously used for the dewatering of New Wallsend No. 2 Mine. It was re-activated and licensed as Environment Protection Agency (EPA) Point 11 under the EPL in 2004 to discharge mine water that would potentially impact future mining at Teralba to Brush Creek. Mine water was extracted from the borehole up to December 2008. No surface mining lease was held for the Brush Creek Borehole and the Complex previously held an access agreement with landowner Waratah Golf Club.

In November 2010 approval of a Mining Operations Plan amendment and was granted by the (now) DPE to decommission and seal Brush Creek Borehole and in July – August 2011 it was decommissioned and rehabilitated. The water pump was decommissioned and removed, security fencing removed, electrical lines and other surface infrastructure removed, concrete culvert from Brush Creek Borehole to Brush Creek removed, the borehole sealed, and the area rehabilitated including topsoiling and revegetation with native grass species.

Penrose Street (Edgeworth) Borehole was a small diameter borehole located on private property near Cockle Creek without any additional surface infrastructure. This borehole was used to obtain water levels in the adjacent Gretley / New Wallsend Colliery workings. In 2011 it was decommissioned and rehabilitated by filling and sealing the borehole in accordance with Resources Regulator requirements followed by topsoiling and revegetation with native grass species.

Bolton Point was a drill site kept as a Mining Purposes Lease; approval was gained in March 1997 for the proposed Teralba No. 3 ventilation shaft at Bolton Point. No shaft was ever constructed in this location and the drillhole was rehabilitated in accordance with Resources Regulator requirements followed by topsoiling and revegetation with native grass species.

1.3 Current Development Consents, Leases and Licences

As the Complex progresses with closure activities, numerous of its original leases, licences and approvals have been relinquished, surrendered, or cancelled. A full table of all leases that apply to the Complex, including those that are no longer relevant, is detailed in Section 1 of the *Mine Closure MOP*.

The current applicable leases, consents, licences, and approval that still apply to the Complex, or that have not been cancelled, surrendered or relinquished is detailed in **Table 1-3**.

Table 1-3 Current Development Consents, Leases and Licences

Approval	Description	Consent Authority	Date Granted	Expiry Date
Development Consents				
B/525-73TR	Mining operation and surface facilities at Teralba.	LMCC	10 July 1973	NA
DA 88-4-2005	Original development consent for the (former) Stockton Borehole Colliery (incl. washery operation and surface facilities at MCPP. Conditions of consent modified on 03 June 1994.	DPE	21 July 1981	Not specified
89/0012	WWC Overland Coal Conveyor	LMCC	4 May 1989	Perpetuity
DA 91/00557	Westside Mine Haul Road	LMCC	21 December 1991	Perpetuity
DA 90/0725	Lachlan Colliery (incl. No.3 Ventilation Shaft) at WWC and approval for extension to surface facilities including coal stockpiles at MCPP.	LMCC	28 February 1991	Perpetuity
DA 90/0725	Ensures the landscape and scenic quality of the locality at MCPP is maintained.	DPE	28 February 1991	Not specified
90/725/B	Modification for construction of new ballast borehole at WWC.	LMCC	28 February 1991 (modification determined 15 April 2010).	Perpetuity

Approval	Description	Consent Authority	Date Granted	Expiry Date
DA 90/0242	Westside Mine access road, office amenities and maintenance buildings.	LMCC	18 July 1990	Perpetuity
BA/98/01288	WWC ballast borehole facility and hopper.	LMCC	18 June 1999	Perpetuity
BA/98/02182	Addition to WWC ventilation fan installation.	LMCC	4 June 1999	Perpetuity
DC/01/03498/1R	Mining within ML 1567 at Teralba.	LMCC	21 January 2022	Not specified
DC/02/02090/1M	WWC regional office records room	LMCC	5 September 2022	Perpetuity
DA 125-5-2022	Westside Mine southern extension development	DPE	23 January 2003	1 February 2026
DA 2434/2005	LW11 borehole pump shed at Westside Mine and borehole pumping shed for LW11 borehole at WWC.	LMCC	29 December 2005	Perpetuity
OSSM-SEPTI/14/2017 WWU Killingworth	Approval to operate a sewage treatment system at WWC.	LMCC	20 November 2017	20 November 2022
DA/90/0725C	Installation of new ballast borehole adjacent to existing ballast borehole at WWC.	LMCC	15 April 2010	Perpetuity
PA 09_0203	WWC Continued Operations Project Approval.	DPE	25 January 2012	31 December 2021
PA 09_0203 MOD 1	Mod 1 – Modified to include the extraction of additional LW panels LW 51 and LW 52 at WWC.	DPE	21 October 2014	31 December 2021
Mining Leases				
CCL 718	Consolidated Coal Lease for WWC, MCPP and Teralba.	Resources Regulator	16 September 1991	10 January 2030

Approval	Description	Consent Authority	Date Granted	Expiry Date
CCL 725	Consolidated Coal Lease for WWC.	Resources Regulator	16 September 1991	10 October 2029
ML 1336	Applies to WWC and Westside Mine.	Resources Regulator	2 November 1993	2 November 2035
ML 1451	WWC Extension	Resources Regulator	17 June 1999	16 June 2020*
ML 1532	Westside Mine	Resources Regulator	23 February 2003	25 February 2024
PLL 153	Westside Mine	Resources Regulator	30 April 2007	29 March 2024
Licence, Permits and Other Consents				
Environment Protection Licence (EPL) 1360	Consolidated EPL for WWC, MCPP, Westside and Teralba	Environment Protection Authority	Anniversary Date: 31 December	Until surrender

1.4 Land ownership and land use

1.4.1 Land Ownership

A large area of the land within the Complex is owned by MCJV and managed by OCAL. The Complex is situated within both the Lake Macquarie and Cessnock LGAs.

There is an area of land owned by LMCC above the previously mined LW 51 and adjacent to LW 51 and LW 52 which is a designated biodiversity offset area. Additionally, majority of the balance of the land directly above these longwalls is Crown Land, which is managed by the National Parks and Wildlife Service (NPWS), and is known as the Sugarloaf State Conservation Area (SSCA), with additional small areas constituting unformed Crown Land reserves. A schedule of lands is attached as **Appendix C**.

1.4.2 Land Use

At WWC the surrounding land uses include the M1 motorway and associated services, local roads and rural land holdings. The SSCA has previously been used for timber logging but is now primarily used for recreation and habitat purposes. There are also unsealed roads, tracks and fire trails within this area.

MCPP is adjacent to Cockle Creek, which is the principle northern tributary of Lake Macquarie (2 km to the south). Cockle Creek estuarine is in the vicinity of the site producing wetland areas on the flood plain including State Environmental Planning Policy (SEPP) 14 wetlands adjacent to the MCPP rail embankment.

The areas to the west and southwest of MCPP are predominantly bushland with varying degrees of past disturbance including historic mining (Rhondda Colliery), open cut mining (Westside Mine) and power transmission easements. Remnant vegetation associated with the forested ridge borders MCPP to the south. The ridge has local high points reaching approximately 67m AHD in proximity to the MCPP.

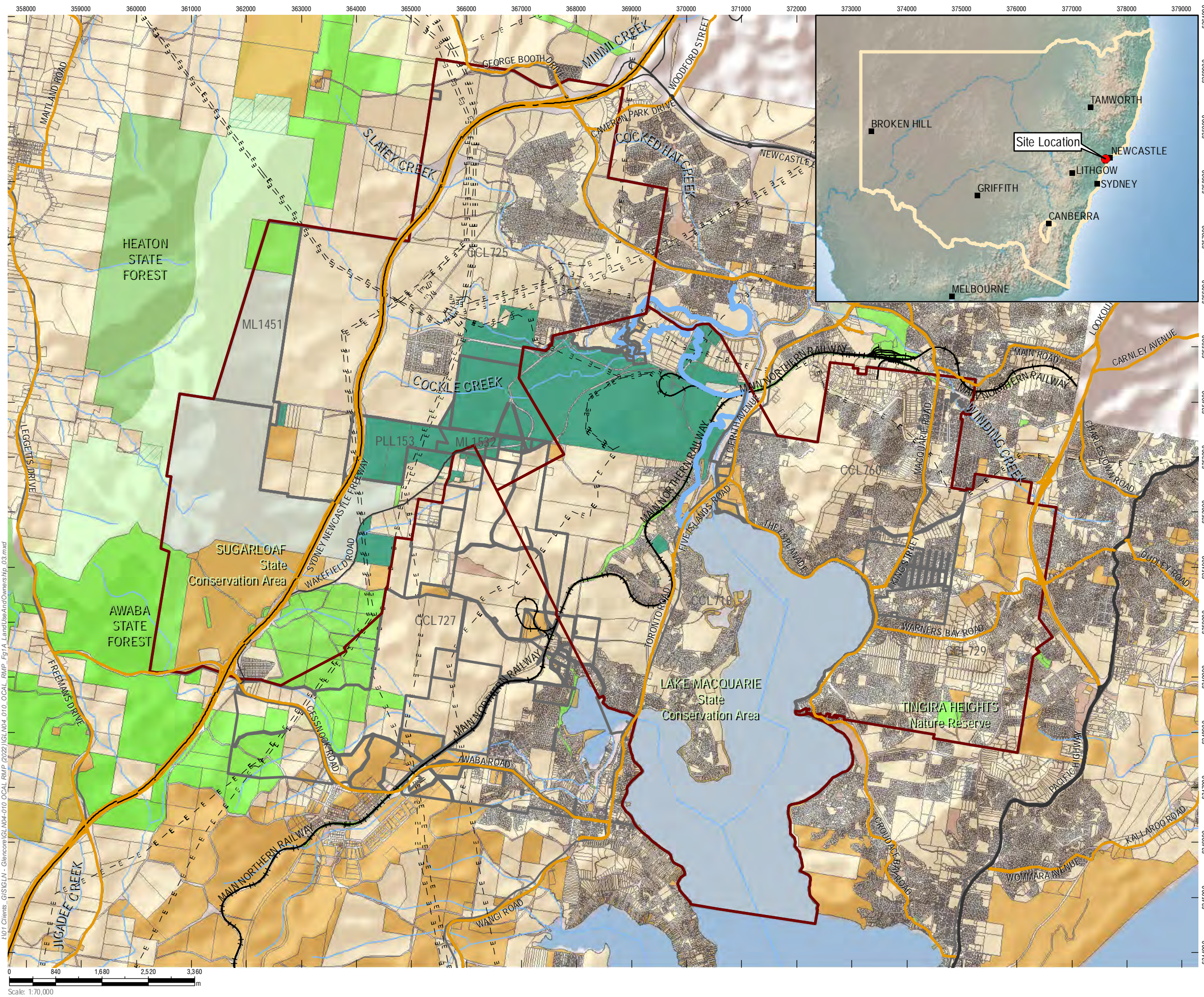
There is also Edgeworth STP, rural landholdings and the residential areas of Barnsley, Boolaroo and Teralba within 2 kilometres of the MCPP. The nearest private residence to MCPP (not owned by the Complex) is approximately 700 m to the south.

Westside Mine is predominantly surrounded by native vegetation, with some areas of open cut and underground mining and quarrying activities. Westside Mine is directly adjacent to the old Rhondda Colliery which is currently undergoing rehabilitation. The landscape is characterised by natural vegetation which forms part of a relatively large expanse of remnant forest which forms a corridor with the Heaton and Awaba State Forests. Portions of the surrounding area are also used for low intensity agriculture with rural residential properties located in Wakefield approximately 2 kilometres from Westside Mine.

Teralba Northgate is located directly adjacent to MCPP. The site is separated from Cockle Creek to the east by the Main Northern Railway and to the north by the Boolaroo Sanitary Depot, which is situated on the floodplain of the creek. The area to the west and southwest of the Northgate and MCPP site is predominantly bushland, although much of the land has been disturbed by a variety of past land uses, including underground mining and power transmission lines. The Metromix gravel quarry is located approximately 2 kilometres southwest of the site.

Teralba Southgate is adjacent to residential development, with a retirement village to the east of the site and the Main Northern Railway bordering the south-western side of the site. A bushland reserve is to the east. The site was leased to UGM until 2 December 2020.

Land ownership is detailed in Figure 1a. Land use is detailed in **Figure 1b** with vegetation shown in **Figure 1c**. **Figure 1d** shows current rehabilitation status.



- LEGEND**
- Project Approval Boundary
 - ▲ Cultural Heritage (Destroyed)
 - ▲ Historical Heritage
 - 1 in 100 Flood Level
 - Major Roads**
 - Motorway
 - Arterial Road
 - Primary Road
 - Sub Arterial Road
 - Railway
 - Electricity Transmission Line
 - Major Road
 - Major Waterway
 - Current Authorisations**
 - Macquarie Coal Joint Venture
 - Land Ownership**
 - Crown
 - Freehold
 - Local Government Authority
 - NSW Government
 - Unknown
 - Macquarie Coal Complex
 - State Forest
 - NPWS Reserve

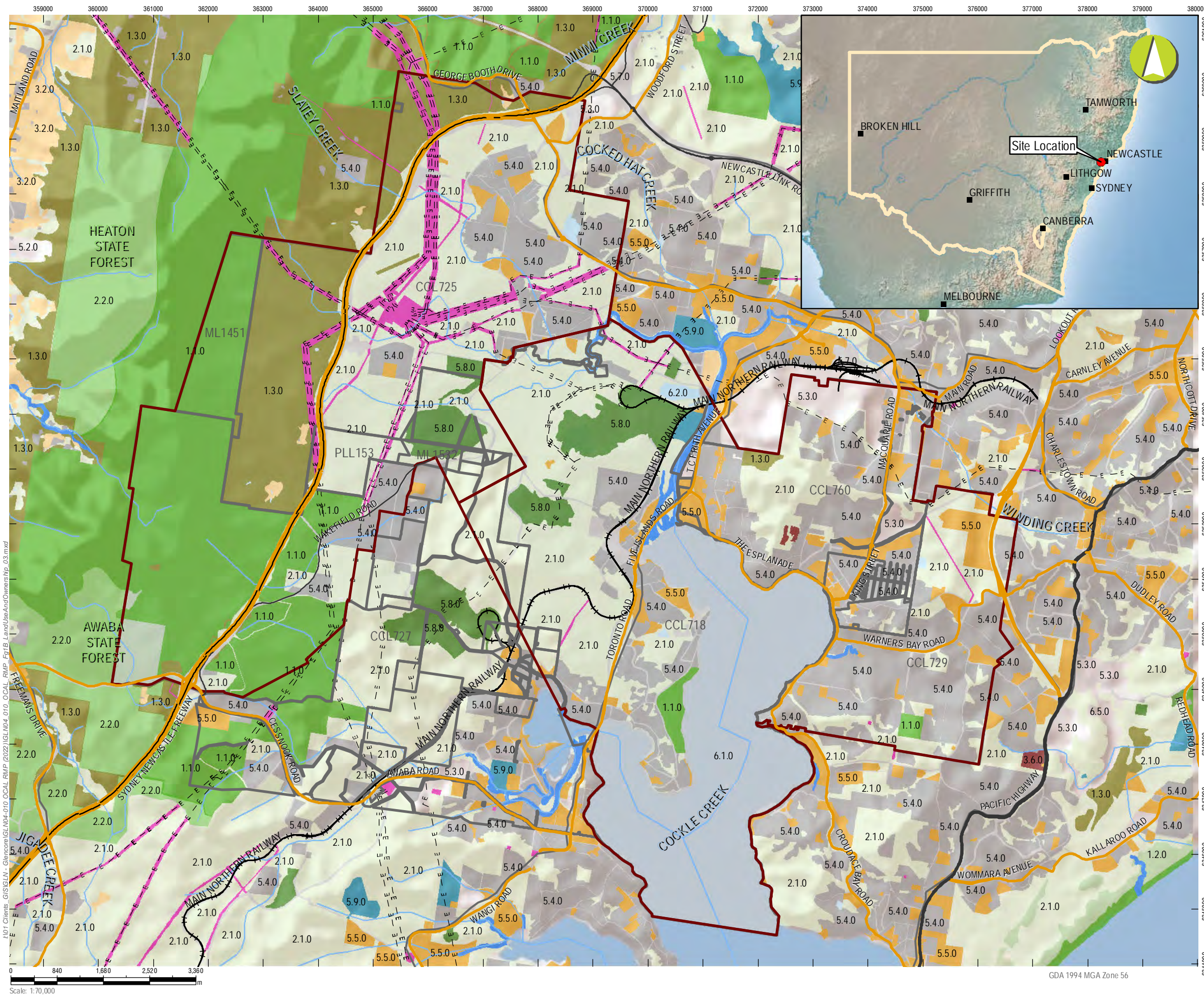
Macquarie Coal Complex

Land Ownership

FIGURE 1A

Mine name	Macquarie Coal Complex
Plan name	Rehabilitation Management Plan 2022
Year of anticipated relinquishment	TBA following Portal Submission
Data theme submission ID No.	XXXXXX
Spatial Reference	GDA 1994 MGA Zone 56
Plan date (date created)	4/08/2022

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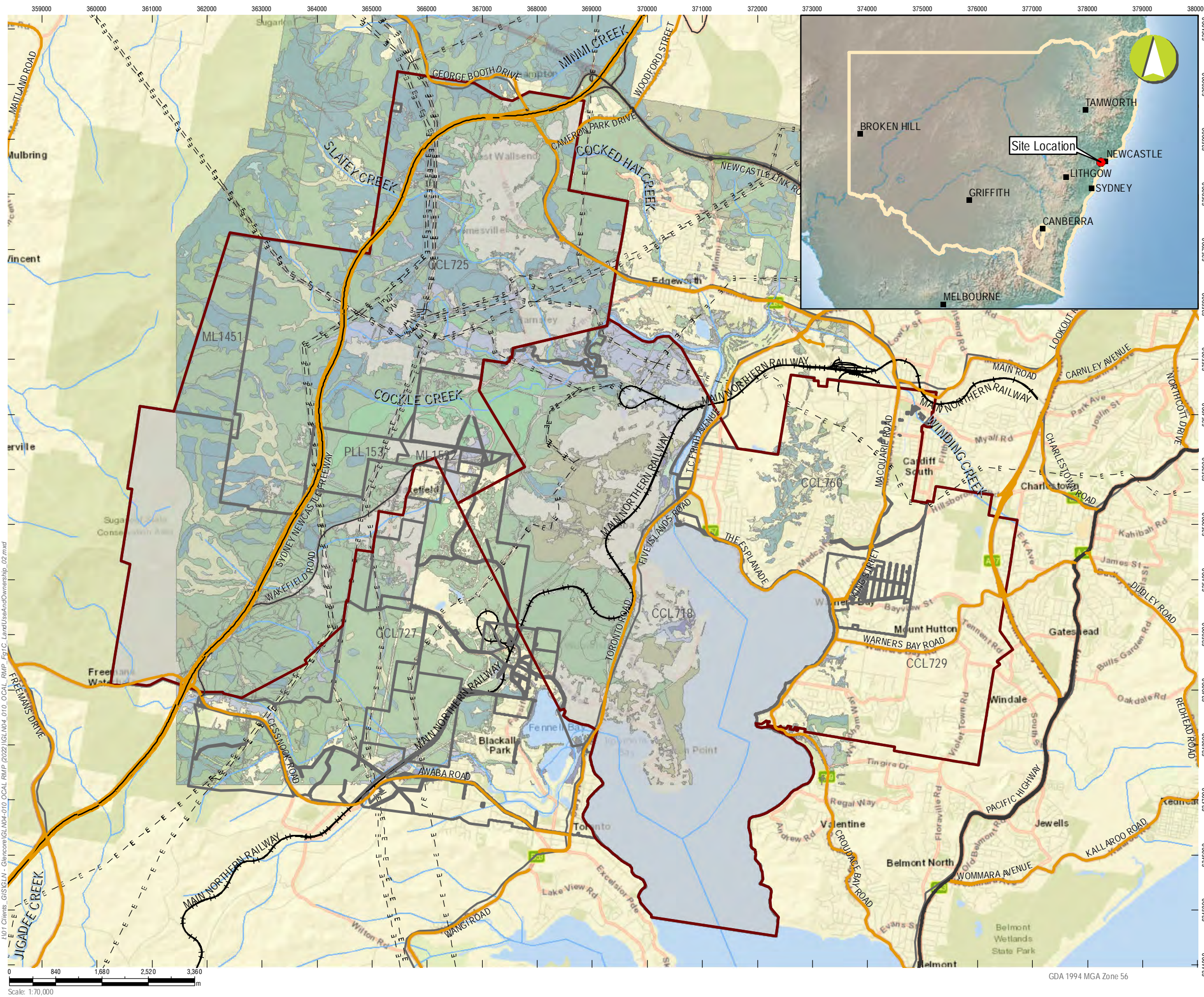
- LEGEND**
- Project Approval Boundary
 - Major Roads**
 - Motorway
 - Arterial Road
 - Primary Road
 - Sub Arterial Road
 - Major Road
 - Railway
 - Electricity Transmission Line
 - Major Waterway
 - Current Authorisations**
 - Macquarie Coal Joint Venture
 - State Forest
 - Land Use**
 - 1.1.0 Nature conservation
 - 1.2.0 Managed resource protection
 - 1.3.0 Other minimal use
 - 2.1.0 Grazing native vegetation
 - 3.2.0 Grazing modified pastures
 - 3.6.0 Land in transition
 - 5.4.0 Residential and farm infrastructure
 - 5.5.0 Services
 - 5.6.0 Utilities
 - 5.7.0 Transport and communication
 - 5.8.0 Mining
 - 5.9.0 Waste treatment and disposal
 - 6.2.0 Reservoir/dam
 - 6.3.0 River

Macquarie Coal Complex

Land Use

FIGURE 1B

Mine name	Macquarie Coal Complex
Plan name	Rehabilitation Management Plan 2022
Year of anticipated relinquishment	TBA following Portal Submission
Data theme submission ID No.	XXXXXX
Plan date (date created)	4/08/2022



LEGEND

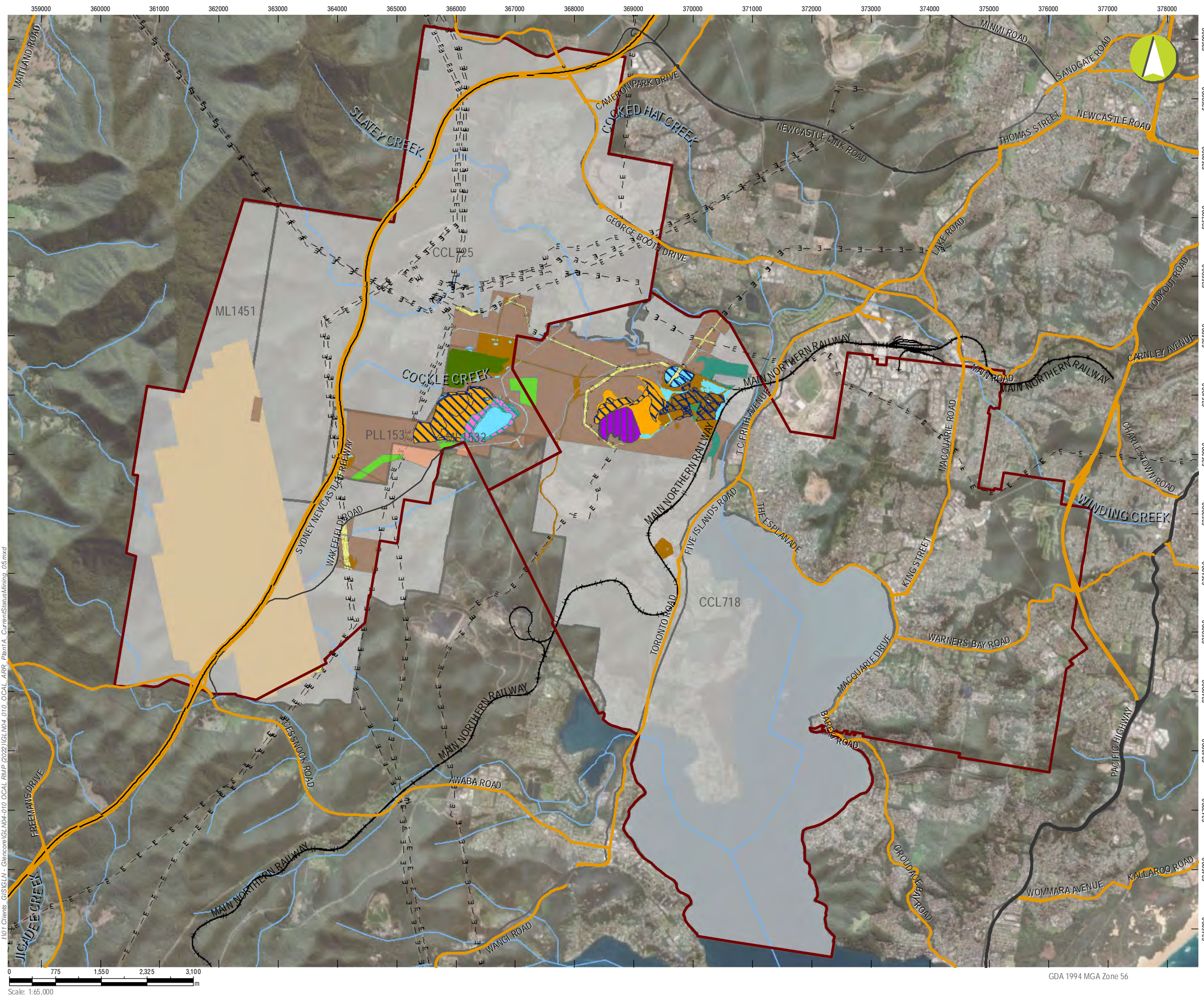
- Project Approval Boundary
- Major Roads**
- Motorway
- Arterial Road
- Primary Road
- Sub Arterial Road
- Major Road
- Railway
- Electricity Transmission Line
- Major Waterway
- Current Authorisations**
- Macquarie Coal Joint Venture
- Vegetation**
- Coastal Dune Dry Sclerophyll Forests
- Coastal Floodplain Wetlands
- Coastal Freshwater Lagoons
- Coastal Swamp Forests
- Coastal Valley Grassy Woodlands
- Hunter-Macleay Dry Sclerophyll Forests
- Mangrove Swamps
- North Coast Wet Sclerophyll Forests
- Northern Hinterland Wet Sclerophyll Forests
- Northern Warm Temperate Rainforests/ Subtropical Rainforests
- Saltmarshes
- Sydney Coastal Dry Sclerophyll Forests
- n/a

Macquarie Coal Complex

Vegetation

FIGURE 1C

Mine name	Macquarie Coal Complex
Plan name	Rehabilitation Management Plan 2022
Year of anticipated relinquishment	TBA following Portal Submission
Data theme submission ID No.	XXXXXX
Plan date (date created)	4/08/2022



- LEGEND**
- Project Approval Boundary
 - Major Roads**
 - Motorway
 - Arterial Road
 - Primary Road
 - Sub Arterial Road
 - Major Road
 - Railway
 - Electricity Transmission Line
 - Major Waterway
 - Current Authorisations**
 - Macquarie Coal Joint Venture
 - Surrounding areas within Site**
 - Biodiversity Offset Area
 - Mine Owned Lands
 - Non-Mac Coal Infrastructure
 - Residential
 - Wetlands
 - Rehabilitation Phase**
 - Decommissioning
 - Landform Establishment
 - Ecosystem and Land Use Establishment
 - Ecosystem and Land Use Development
 - Relinquishment (Rehabilitated)
 - 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 6: Underground Mining Area (SMP)

Macquarie Coal Complex

Current Status of Mining and Rehabilitation

FIGURE 1D

Mine name	Macquarie Coal Complex
Plan name	Rehabilitation Management Plan 2022
Year of anticipated relinquishment	TBA following Portal Submission
Data theme submission ID No.	2293 / 2498
Spatial Reference	GDA 1994 MGA Zone 56
Plan date (date created)	4/08/2022

2. Final Land Use

2.1 Regulatory Requirements for Rehabilitation

Rehabilitation activities have been undertaken in accordance with the relevant conditions outlined in the Macquarie Coal approvals, relevant legislation and policies and guidelines. Regulatory requirements relevant to rehabilitation at the Complex are detailed in **Table 2-1** to **Table 2-4**.

Table 2-1 Regulatory Requirements for Rehabilitation at WWC

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
Environmental Impact Statements / Environmental Assessments / Approval Applications				
West Wallsend Colliery Continued Operations Project EA 2010				
Section 5.15.26	Following the demolition of all surface buildings, the on-site sewage treatment system will be decommissioned.	Section 6.2.2	Domain 1 – Infrastructure Area	To be completed
Section 5.15.3.8	<p>A Rehabilitation Strategy will be developed in consideration of a range of factors including:</p> <ul style="list-style-type: none"> • characteristics of the WMC surface areas including the opportunities and constraints associated with existing land resources in relation to soils and land capability (refer to Section 5.15.). • key environmental features of the WMC surface areas and surrounds including ecological features; • the Strategic Framework for Mine Closure (ANZMEC/MEC); and • the pit top is to be returned to a condition where its landform, soils, hydrology, flora and fauna are self- sustaining, and compatible with the surrounding land use. <p>The rehabilitation process that will be employed to achieve the aims of the conceptual closure strategy is described in detail and is summarised as follows:</p> <ul style="list-style-type: none"> • stabilising disturbed landforms and ensuring they are free-draining; • revegetating these areas in accordance with their planned final land use; and • ongoing monitoring and maintenance of rehabilitated areas to ensure rehabilitation is meeting the designated objectives and criteria, which will enable 	This RMP	PA 09_0203 Approval Area	Ongoing

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
	lease relinquishment.			
Section 5.15.3.9	<p>Depending upon the outcomes of the rehabilitation monitoring programs as outlined in section 5.15.3.9, the scope of the rehabilitation care and maintenance phase include the following:</p> <ul style="list-style-type: none"> weed and feral animal control of rehabilitation; erosion control works re-seeding/planting of rehabilitation areas that may have failed; maintenance fertilising; and repair of fences lines, access tracks and other general related land management activities. <p>It is envisaged that this program will be continued was required until it can be demonstrated that the rehabilitation has satisfied the closure criteria.</p>	Section 8	PA 09_0203 Approval Area	Ongoing
Development Consents				
PA 09_0203				
Schedule 2, Condition 12	<p>Demolition</p> <p>The Proponent shall ensure that all demolition work is carried out in accordance with Australian Standard AS 2601-2001: The Demolition of Structures, or its latest version.</p>	Section 6.2.2.2	Domain 1 – Infrastructure Area	Ongoing
Schedule 4, Condition 27	<p>The proponent shall rehabilitate the site to the satisfaction of the Executive Director Mineral Resources. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EA, and comply with the objectives in Table 10.</p> <p style="text-align: center;">Table 10: Rehabilitation Objectives</p>	Section 4.1	PA 09_0203 Approval Area	Ongoing

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
	<p>Mine Site (as a whole) Safe, stable and non-polluting. Final land use compatible with surrounding land uses.</p> <p>Surface Infrastructure To be decommissioned and removed, unless the Executive Director Mineral Resources agrees otherwise.</p> <p>Portals and Vent Shafts To be decommissioned and made safe and stable. Retain habitat for threatened species (e.g. bats) where practicable.</p> <p>Watercourses within project area Hydraulically and geomorphologically stable.</p> <p>Cliffs No additional risk to public safety compared to prior mining.</p> <p>Other land affected by the project Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of:</p> <ul style="list-style-type: none"> • Local native plant species (unless the Executive Director Mineral Resources agrees otherwise); and • A landform consistent with the surrounding environment. <p>Built features damaged by mining operations Repair to pre-mining condition or equivalent unless:</p> <ul style="list-style-type: none"> • the owner agrees otherwise; or • The damage is fully restored, repaired or compensated under the Mine Subsidence Compensation Act 1961. <p>Community Ensure public safety. Minimise the adviser socio-economic effects associated with mine closure.</p> <p><i>Notes to Table 10:</i></p> <ul style="list-style-type: none"> • <i>These rehabilitation objectives apply to all subsidence impacts and environmental consequences caused by mining taking place after the date of this approval; and to all project surface infrastructure part of the project; whether constructed prior to or following the date of this approval.</i> 			

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
	<ul style="list-style-type: none"> Rehabilitation of subsidence impacts and environmental consequences caused by mining which took place prior to the date of this approval may be subject to the requirements of other approvals (e.g. under a mining lease or a Subsidence Management Plan approval) or the Proponent's commitments. 			
<p>Schedule 4, Condition 29</p>	<p>Rehabilitation Management Plan</p> <p>The proponent shall prepare and implement a Rehabilitation Management Plan for the project, to the satisfaction of the Executive Director Mineral Resources. This plan must:</p> <ol style="list-style-type: none"> be prepared in consultation with the Department, OEH, NOW, Council and the CCC, and be submitted to the Executive Director Mineral Resources in DRE for approval within 6 months of this approval, or as otherwise agreed by the Secretary; be prepared in accordance with any relevant DRE guideline, and be consistent with the rehabilitation objectives in the EA and in Table 10; build, to the maximum extent practicable, on other management plans required under this approval; and address all aspects of rehabilitation and mine closure, including final land use assessment, rehabilitation objectives, domain objectives, completion criteria and rehabilitation monitoring. <p><i>Note: The Rehabilitation Management Plan should address all land impacted by the Project, whether prior to or following the date of this approval.</i></p>	<ol style="list-style-type: none"> Section 4.2.2 Section 2.1 Noted. Sections 2.4.1, 2.2, 2.4, 4 and 8. 	<p>PA 09_0203 Approval Area</p>	<p>Ongoing</p>
<p>Appendix 3, Condition 6.3.2</p>	<p>Subsidence</p> <p>Remediation and rehabilitation of mining related subsidence impacts will be carried out, as detailed in Section 5.2.4 of the EA, as soon as practicable following subsidence.</p>	<p>Section 6.2.1.12</p>	<p>Domain 6 – Underground Mining Area (SMP)</p>	<p>Completed</p>

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
89/0012				
Condition 4	Stormwater drainage from the site being connected to the existing drains.	Section 6.2.3.1	Domain 3 – Water Management Area	Ongoing
90/725/B				
Condition 5	<p>Site Rehabilitation and Landscaping</p> <p>(a) The site shall be landscaped with all disturbed ground being rendered erosion resistant to Council's satisfaction.</p> <p>(b) A detailed landscape rehabilitation plan for the site shall be submitted to Council for approval. Plans prepared by a qualified landscape architect or designer are preferred. The plan shall be submitted with or prior to submission of the building application. It shall incorporate planting of native trees and shrubs; establishment of an effective erosion resistant ground cover (turf, seeded mulch or equivalent); protection from vehicular traffic by kerbing or other similar barrier; and screening of clothes drying areas and garbage receptacles from public view. All landscaping works shall be completed in accordance with the approved landscape plan prior to occupation of the premises.</p> <p>(c) Particular attention should be given to establishment of landscaping adjacent to areas most affected by the proposal.</p> <p>(d) All landscaping shall be permanently maintained in a good condition and in accordance with the intent of the landscape plan.</p>	Section 6.2.5	DA 90/725/B Approval Area	Ongoing

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
Condition 6	<p>Specifications and Standards for Erosion Control and Rehabilitation Works</p> <p>Site clearing, runoff and erosion control works and rehabilitation shall conform to the specifications and standards contained in:</p> <ul style="list-style-type: none"> • Erosion Control Policy (Lake Macquarie City Council) • Urban Erosion and Sediment Control Manual (NSW Soil Conservation Service) • Pollution Control Manual for Urban Stormwater (State Pollution Control Commission). 	Section 6.2.1.10	DA 90/725/B Approval Area	Ongoing
Condition 24	<p>Decommissioning of the Existing Ballast Borehole</p> <p>Decommissioning of the 'Existing Ballast Borehole' and rehabilitation of the surface area is to be in accordance with the Statement of Environmental Effects titled 'Proposed Minor Relocation of Ballast Borehole Facility at West Wallsend Colliery' by Umwelt (Australia) Pty Ltd, dated February 2010 and the Department of Investment and Industry requirements for sealing boreholes.</p> <p>The decommissioning and rehabilitation of the existing ballast borehole is to be completed as soon as practical.</p>	Section 6.2.2	Domain 1 – Infrastructure Area	Completed
Condition 26	<p>Landscaping Works</p> <p>The site shall be landscaped with all disturbed ground being rendered erosion resistant to Council's satisfaction.</p>	Section 6.2.1.10	DA 90/725/B Approval Area	Ongoing
90/725/C				
Condition 5	<p>Site Rehabilitation and Landscaping</p> <p>(a) The site shall be landscaped with all disturbed ground being rendered erosion resistant to Council's satisfaction.</p> <p>(b) A detailed landscape rehabilitation plan for the site shall be submitted to Council for</p>	Section 6.2.3	DA 90/725/C Approval Area	Ongoing

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
	<p>approval. Plans prepared by a qualified landscape architect or designer are preferred. The plan shall be submitted with or prior to submission of the building application. It shall incorporate planting of native trees and shrubs; establishment of an effective erosion resistant ground cover (turf, seeded mulch or equivalent); protection from vehicular traffic by kerbing or other similar barrier; and screening of clothes drying areas and garbage receptacles from public view. All landscaping works shall be completed in accordance with the approved landscape plan prior to occupation of the premises.</p> <p>(c) Particular attention should be given to establishment of landscaping adjacent to areas most affected by the proposal.</p> <p>(d) All landscaping shall be permanently maintained in a good condition and in accordance with the intent of the landscape plan.</p>			
<p>Condition 6</p>	<p>Specifications and Standards for Erosion Control and Rehabilitation Works</p> <p>Site clearing, runoff and erosion control works and rehabilitation shall conform to the specifications and standards contained in:</p> <ul style="list-style-type: none"> • Erosion Control Policy (Lake Macquarie City Council) • Urban Erosion and Sediment Control Manual (NSW Soil Conservation Service) • Pollution Control Manual for Urban Stormwater (State Pollution Control Commission). 	<p>Section 6.2.1.10</p>	<p>DA 90/725/C Approval Area</p>	<p>Ongoing</p>
<p>Condition 18</p>	<p>External Agencies</p> <p>The applicant shall comply with, among others, the requirements of:</p> <p>(a) Department of Minerals & Energy</p> <p>(b) State Pollution Control Commission</p> <p>(c) Soil Conservation Service</p>	<p>Section 2.1</p>	<p>DA 90/725/C Approval Area</p>	<p>Ongoing</p>

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
	(d) National Parks & Wildlife Service (e) Shortland Electricity (f) Hunter Water Board.			
Condition 23	Decommissioning of the Ballast Boreholes Following the cessation of mining activities both Ballast Boreholes are to be decommissioned. Decommissioning of the Ballast Borehole is to be in accordance with the Statement of Environmental Effects titled 'Proposed Minor Relocation of Ballast Borehole Facility at West Wallsend Colliery' by Umwelt (Australia) Pty Ltd, dated May 2011 and the Department of Investment and Industry publication Borehole Sealing Requirements on Land: Coal Exploration. The decommissioning and rehabilitation of the existing ballast borehole is to be completed as soon as practical.	Section 6.2.2	Domain 1 – Infrastructure Area	Completed
Condition 25	Landscaping Works The site shall be landscaped with all disturbed ground being rendered erosion resistant to Council's satisfaction.	Section 6.2.1.10	DA 90/725/C Approval Area	Ongoing
2434/2005				
Condition 8	Landscaping Works The site shall be landscaped with all disturbed ground being rendered erosion resistant to Council's satisfaction.	Section 6.2.1.10	DA 2434/2005 Approval Area	Ongoing
Condition 9	Topsoil Topsoil shall only be stripped from approved areas and shall be stockpiled for re-use during site rehabilitation and landscaping.	Section 6.2.1.1	DA 2434/2005 Approval Area	Completed

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
Condition 10	<p>Stockpiles of Topsoil</p> <p>Stockpiles of topsoil, sand, aggregate, spoil or other material capable of being moved by running water shall be stored clear of any drainage line or easement, natural watercourse, footpath, kerb or road surface.</p>	Section 6.2.1.4	DA 2434/2005 Approval Area	Completed
B/66-69DC:BM				
	<p>(a) The provision of a dense arboreal screen at least 100 ft. wide between the road to Killingworth and the development on both sides of the road as well as landscaping the development sites to improve aesthetic appearance.</p> <p>(c) The location of mining waste dumps at least 150 ft. clear of road boundaries and other boundaries of the company's holding.</p> <p>(d) The location, the contouring and landscaping of the mining waste dumps to create a new landform suitable for future development for those purposes other than quarrying and mining permitted in a non Urban ""A"" zone under the provisions of the Planning Scheme Ordinance.</p> <p>(f) The fencing of the development as well as taking other measures to secure public safety.</p> <p>(g) The company executing an agreement with Council with respect to:</p> <p>(ii) to the restoration of the land affected by mining and maintenance of the restored land for a period of three (3) years after cessation of mining operations; and</p> <p>(iii) for the provision of traffic control devices at the level crossing in Wakefield Road in accordance with requirements of the Inter-Departmental Committee.</p>	Section 6.2.5	B/66-69 DC:BM Approval Area	Ongoing
Leases				
CCL 725				

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
Condition 2	<p>Rehabilitation</p> <p>Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.</p>	Section 4	CCL 725 Lease Area	Ongoing
Condition 9	<p>Cooperation Agreement</p> <p>The lease holder must make every reasonable attempt, & be able to demonstrate its attempts, to enter into a cooperative agreement with the holder(s) of any overlapping title(s). The cooperative agreement should address but not be limited to:</p> <ul style="list-style-type: none"> • access arrangements • operational interaction procedures • dispute resolution • information exchange • well location • timing of drilling • potential resource extraction conflicts; and • rehabilitation issues 	Section 4.2.2	CCL 725 Lease Area	Ongoing
CCL 718 and ML 1336				
Condition 2	<p>Rehabilitation</p> <p>Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.</p>	Section 4	CCL 718 and ML 1336 Lease Areas	Ongoing
Condition 3f	<p>The lease holder must prepare a Rehabilitation Report to the satisfaction of the Minister. The report must:</p> <ol style="list-style-type: none"> i. Provide a detailed review of the progress of the rehabilitation against the 	Annual Review submitted	CCL 718 and ML 1336 Lease Areas	Annual

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
	<p>performance measures and criteria established in the MOP</p> <p>ii. Be submitted annually on the grant anniversary date (or at such other times as agreed by the Minister)</p> <p>iii. Be prepared in accordance with the relevant annual reporting guidelines published on the Department's website at www.resources.nsw.gov.au/environment</p> <p><i>Note: The Rehabilitation Report replaces the Annual Environmental Management Report.</i></p>	annually.		
Condition 9	<p>Cooperation Agreement</p> <p>The lease holder must make every reasonable attempt, & be able to demonstrate its attempts, to enter into a cooperative agreement with the holder(s) of any overlapping title(s). The cooperative agreement should address but not be limited to:</p> <ul style="list-style-type: none"> • access arrangements • operational interaction procedures • dispute resolution • information exchange • well location • time of drilling • potential resource extraction conflicts; and • rehabilitation issues. 	Section 4.2.2	CCL 718 and ML 1336 Lease Areas	Ongoing
EPL 1360				
Condition E1.1	The licensee must consider contamination and remediation of the former Teralba Colliery and its water management dam during the mine closure	Section 6.2.3.1	Domain 3 – Water Management	Ongoing

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
	process for the West Wallsend Colliery, Teralba Colliery and Macquarie Coal Preparation Plan area.		Areas	

Table 2-2 Regulatory Requirements for Rehabilitation and Post Mining Land Use at MCPP

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
Environmental Impact Statements / Environmental Assessments / Approval Applications				
Stockton Borehole EIS - 1980				
Section 5.15	All disturbed area to be revegetated following disturbance. Vegetative screen to be established to improve visual amenity.	Section 6.2.5	DA 88-4-2005 Approval Area	Ongoing
Stockton Borehole Colliery Development EIA - 1981				
Section 5.6	<p>Rehabilitation</p> <p>The EIS indicates that the coarse refuse embankment would be revegetated with native flora using previously stored topsoil, when available. The Tailings Dam would ultimately be encased in coarse refuse and would on completion of its life would be covered by coarse refuse and available topsoil and stabilised with grasses and shrubs.</p> <p>The Soil Conservation Service has expressed reservations about using native grasses and the potential for invasion of native trees, recommending the use of pasture species and maintenance thereof to control volunteer tree species. It is considered the Company should consult with the Service on these matters.</p>	Section 6.2.5	DA 88-4-2005 Approval Area	Ongoing
Appendix 2	(f) lighting on the site be so designed as not to direct light onto adjoining properties or roadways; details of such lighting to be submitted for Council's approval with the building application;	Section 6.2.5	DA 88-4-2005 Approval Area	Ongoing

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
	(i) The refuse disposal area be revegetated and rehabilitated in consultation with the Soil Conservation Service 1 The Service to be consulted prior to any revegetation taking place; (j) A screen of existing vegetation, 50 m wide be left between the road and the refuse disposal area; (o) The development be monitored throughout its life (p) Garbage and refuse be stored and disposed of to the satisfaction of the Municipal Health Surveyor.			
Section 100 Application - Life of Mine Rejects Emplacement Strategy and Eastern Face				
Section 7.2	Conceptual Final Landform <ul style="list-style-type: none"> The final height of the REA will be 85 m AHD, similar to adjacent ridges (maximum height of 95 m AHD) The REA will be free draining and have batter slopes between 10 and 12.5 degrees, and slopes up to 4 degrees across the top. 	Section 6.2.3 Appendix D	Domain 4 – Overburden Emplacement Area	Ongoing
Section 7.3.2	Coarse Reject Emplacement Decommissioning <ul style="list-style-type: none"> Final landform of the REA to be capped with 0.5m of inert material which includes 0.10 metres of topsoil and revegetated with pasture species and shallow-rooted shrubs concentrated in small clusters across the site. If inadequate supplies of topsoil are unavailable, bio solids will be used to establish vegetation on the surface of the reject emplacement area (as discussed with DPI in September 2006). 	Section 6.2.3 Appendix D	Domain 4 – Overburden Emplacement Area	Ongoing

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
Section 7.3.3	<p>Final Landform Revegetation</p> <p>In order to prevent bushfire and spontaneous combustion, revegetation will initially involve the establishment of pasture species. Areas planted to shrubs will have to be fenced to protect them from grazing, which is the proposed end landuse. Revegetation activities will commence in either Autumn or Spring as areas that have been capped and shaped to final contour become available.</p>	Section 6.2.3 Appendix D	DA 88-4-2005 Approval Area	Ongoing
Section 102 Application - Tailings Dam Wall Buttress Support				
Section 6.1	<p>Conceptual Final Landform</p> <p>Final landform of the Northern Buttress will blend in with the surrounding environment and be constructed to a maximum height of 70 m AHD.</p>	Section 6.2.3 Appendix D	Domain 2 – Tailings Storage Facility	Completed
Section 6.2	<p>Final Landform Revegetation</p> <ul style="list-style-type: none"> Final landform of the REA to be capped with 0.5m of inert material which includes 0.10 metres of topsoil and revegetated with pasture species and shallow-rooted shrubs concentrated in small clusters across the site. If inadequate supplies of topsoil are unavailable, bio solids will be used to establish vegetation on the surface of the reject emplacement area (as discussed with DPI in September 2006). In order to prevent bushfire and spontaneous combustion, revegetation will initially involve the establishment of pasture species. Areas planted to shrubs will have to be fenced to protect them from grazing, which is the proposed end landuse. Revegetation activities will commence in either Autumn or Spring as areas that have been capped and shaped to final contour become available. 	Section 6.2.3 Appendix D	Domain 4 – Overburden Emplacement Area	Ongoing
Development Consents				

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
88-4-2005 (1981 Stockton Borehole Consent)				
Condition viii	That the applicant shall ensure consult with the Soil Conservation Service on the rehabilitation of the washery waste emplacement having regard to the grassing of the finished surface.	Section 6.2.3	DA 88-4-2005 Approval Area	Ongoing
DA 90/0725				
Condition 5	<p>Site Rehabilitation and Landscaping</p> <p>(a) The site shall be landscaped with all disturbed ground being rendered erosion resistant to Council's satisfaction.</p> <p>(b) A detailed landscape rehabilitation plan for the site shall be submitted to Council for approval. Plans prepared by a qualified landscape architect or designer are preferred. The plan shall be submitted with or prior to submission of the building application. It shall incorporate planting of native trees and shrubs; establishment of an effective erosion resistant ground cover (turf, seeded mulch or equivalent); protection from vehicular traffic by kerbing or other similar barrier; and screening of clothes drying areas and garbage receptacles from public view. All landscaping works shall be completed in accordance with the approved landscape plan prior to occupation of the premises.</p> <p>(c) Particular attention should be given to establishment of landscaping adjacent to areas most affected by the proposal.</p> <p>(d) All landscaping shall be permanently maintained in a good condition and in accordance with the intent of the landscape plan.</p>	Throughout document	DA 90/0725 Approval Area	Ongoing
Condition 6	<p>Specifications and Standards for Erosion Control and Rehabilitation Works</p> <p>Site clearing, runoff and erosion control works and rehabilitation shall conform to the specifications and standards contained in:</p>	Section 6.2.1.10	DA 90/0725 Approval Area CCL 718 Lease	Ongoing

Condition / Commitment	Requirement	Section in RMP	Applicable Area(s)	Timing
	<ul style="list-style-type: none"> Erosion Control Policy (Lake Macquarie City Council) Urban Erosion and Sediment Control Manual (NSW Soil Conservation Service) Pollution Control Manual for Urban Stormwater (State Pollution Control Commission). 		Area	
Leases				
CCL 718				
Condition 2	<p>Rehabilitation</p> <p>Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.</p>	Throughout document	CCL 718 Lease Area	Ongoing
Condition 9	<p>Cooperation Agreement</p> <p>The lease holder must make every reasonable attempt, & be able to demonstrate its attempts, to enter into a cooperative agreement with the holder(s) of any overlapping title(s). The cooperative agreement should address but not be limited to:</p> <ul style="list-style-type: none"> access arrangements operational interaction procedures dispute resolution information exchange well location timing of drilling potential resource extraction conflicts; and rehabilitation issues. 	Section 4.2.2	CCL 718 Lease Area	Ongoing

Table 2-3 Regulatory Requirements for Rehabilitation and Post Mining Land Use at Westside Mine

Condition / Commitment	Requirement	Section in Report	Applicable Area(s)	Timing
Environmental Impact Statements / Environmental Assessments / Approval Applications				
Westside Mine Southern Extension EIS				
Section 4.17	<p>After mining, it is proposed that the area be progressively returned to open bushland, with terrain similar to that which occurs naturally on site.</p> <p>Elements such as ridgelines, contour drains, drainage paths and emplacements will be shaped in undulating profiles in keeping with natural landforms of the surrounding environment. Detailed design of the final landform will be documented in the Mining Operation Plans which are required to be submitted to the DMR periodically.</p> <p>Overburden emplacement areas will be shaped using bulldozers to produce slopes with profiles that are compatible with the proposed future land use and not prone to an unacceptable rate of erosion. In general, varying slope angles of no more than 14 degrees will be constructed.</p> <p>The final landform will include a drainage pattern capable of conveying runoff from newly created sub catchments whilst minimising the risk of erosion and sedimentation. Drainage characteristics for the site will be developed in accordance with the Draft Guidelines for Designing Stable Drainage Lines on Rehabilitated Mine Sites (DLWC, 1999).</p>	Section 6.2.3	DA 125-5-2002 Approval Area	Ongoing
Section 6.10.1	<p>Existing Rehabilitation and Land Management</p> <p>The main objective of Westside Mine’s rehabilitation program is to produce a post-mining landscape that is stable and at least as productive as the woodlands that previously existed in the area.</p>	Section 6.2.3	DA 125-5-2002 Approval Area	Ongoing
Section 6.10.2	<p>Proposed Rehabilitation and Land Management</p> <p>The rehabilitation program will include reshaping of slopes to less than 14 degrees, where possible, construction of soil conservation works and re-establishment of</p>	Section 6.2.3	DA 125-5-2002 Approval Area	Ongoing

Condition / Commitment	Requirement	Section in Report	Applicable Area(s)	Timing
	vegetation. Revegetation will primarily involve establishment of native bushland.			
Section 7.3.3	Areas disturbed during open cut mining will be revegetated, utilising a range of locally indigenous species, in order to minimise the long-term effects on biological diversity.	Section 6.2.3	Domain A – Native Ecosystem (bushland)	Ongoing
Development Consents				
DA 125-5-2002				
Condition 1.4a	<p>Decommissioning</p> <p>At least 2 years prior to decommissioning of the site, the Applicant shall consult EPA, DLWC, NPWS and LMCC and determine and report on a final strategy for implementation for the future use of the site within Westside Mine holdings to the satisfaction of the DMR and the Director-General.</p> <p>The final strategy shall include and not be limited to:</p> <ul style="list-style-type: none"> • re-instatement of natural drainage to the satisfaction of DLWC; • removal of structures identified as redundant to the satisfaction of LMCC; • final land uses of ecological benefit to indigenous flora and fauna; and • land uses of social benefit to the community in the Lake Macquarie Local Government Area. 	Section 6.2.2	Domain 1 – Infrastructure Area	Completed
Condition 1.4b	<p>Decommissioning</p> <p>Implementation of the final strategy (see 1.4 a above) shall commence at the same time as decommissioning commences and shall be completed in a timely manner to the satisfaction of the DMR and the Director-General in consultation with NPWS, EPA, DLWC</p>	Section 6.2.2	Domain 1 – Infrastructure Area	Completed

Condition / Commitment	Requirement	Section in Report	Applicable Area(s)	Timing
	and LMCC.			
Condition 2.3	<p>Hours of Mining Construction and Operation</p> <p>All activities, apart from security, maintenance and mine water pumping shall be only conducted between the hours of 7.00am to 10:00pm Monday to Saturday unless otherwise agreed by the Director-General in consultation with the EPA. No activities except security, maintenance and mine water pumping shall take place on Sundays or Public Holidays.</p>	Not Applicable	DA 125-5-2002 Approval Area	Completed
Condition 3.5	The Applicant shall carry out rehabilitation of all mine areas in accordance with the requirements of any Mining Lease granted by the Minister for Mineral Resources and shall ensure that the progressive rehabilitation of the area is also to the satisfaction of DLWC.	Section 4	DA 125-5-2002 Approval Area	Ongoing
Condition 4.2.1a	<p>Groundwater Monitoring</p> <p>As part of the SWMP, the Applicant shall prepare and implement a Groundwater Monitoring Program to the satisfaction of the DLWC to monitor the effects of the operational and post-operational impacts on groundwater, connected surface water sources and any groundwater- dependent ecosystems.</p>	<p><i>Mine Closure MOP</i></p> <p><i>Underground Water Management (SLR, 2016)</i></p>	Domain 3 – Water Management Area	Completed
Condition 4.4a	<p>Void Management</p> <p>The Applicant shall, at least two years prior to completion of mining from the Southern Extension of Westside Mine, prepare a Final Void Management Plan to the satisfaction of the Director-General, in consultation with the DMR, DLWC, and LMCC. The Plan shall include, but not be limited to, the following:</p> <ul style="list-style-type: none"> i) details of a strategy for the long term management of the final voids and the water contained in them; ii) strategies that shall be implemented to minimise any adverse impacts where the assessment indicates the potential for degradation to surrounding water resources; 	<i>Final Void Management Plan (GHD, 2010)</i>	Domain F – Water Management Areas	Completed

Condition / Commitment	Requirement	Section in Report	Applicable Area(s)	Timing
	and iii) any further requirements as set out at that time through consultation with the Director-General, DMR, DLWC, and LMCC.			
Condition 5.1.4a	Dust Suppression and Control The Applicant shall ensure the prompt and effective rehabilitation of all disturbed areas of the DA area following the completion of mining and associated activities in that area to minimise the generation of windblown dust.	Section 6.2	DA 125-5-2002 Approval Area	Ongoing
Condition 7.1c	Waste, Spoil and Hazardous Material Management The Applicant shall dispose of all solid waste and putrescible matter from the site to the satisfaction of LMCC or EPA, as relevant.	Section 6.2.1.5	DA 125-5-2002 Approval Area	Ongoing
Condition 7.1.1a	Storage of Materials Including Spoil and Hazardous Materials The Applicant shall undertake measures, as far as practical, to prevent spontaneous combustion from occurring on the site.	Section 6.2.2.6	DA 125-5-2002 Approval Area	Ongoing
Condition 7.1.3a	Storage, Removal and Acceptance of Materials to/from the DA Area Material stockpiles/storage areas of material for sale, exchange or free removal shall be maintained at all times to minimise loss to air and to ground areas outside the stockpile.	Section 6.2.1.1	DA 125-5-2002 Approval Area	Ongoing
Condition 12.1b	The Applicant shall arrange for all development/subdivision and associated works to be designed in accordance with the following publications (as amended or updated), as applicable: (i) Australian Rainfall and Runoff (1987); (iii) Department of Land and Water Conservation The Constructed Wetlands Manual (1998).	Section 2.1	DA 125-5-2002 Approval Area	Ongoing
90/0242				

Condition / Commitment	Requirement	Section in Report	Applicable Area(s)	Timing
<p>Condition 9</p>	<p>Specifications and Standards for Erosion Control and Rehabilitation Works</p> <p>Site clearing, runoff and erosion control works and rehabilitation shall conform to the specifications and standards contained in:</p> <ul style="list-style-type: none"> • Erosion Control Policy (Lake Macquarie City Council) • Urban Erosion and Sediment Control Manual (NSW Soil Conservation Service) • Pollution Control Manual for Urban Stormwater (State Pollution Control Commission) <p>The reason for this condition is to ensure that erosion control and rehabilitation works are carried out to an acceptable standard.</p>	<p>Section 6.2.1.10</p>	<p>DA 90/0242 Approval Area</p>	<p>Ongoing</p>
<p>Condition 16</p>	<p>The applicant shall consult with the requirements of all relevant statutory authorities including:</p> <ol style="list-style-type: none"> 1. Department of Minerals & Energy 2. State Pollution Control Commission 3. Soil Conservation Service 4. National Parks & Wildlife Service 5. Department of Water Resources. 	<p>Section 4.2.2</p>	<p>DA 90/0242 Approval Area</p>	<p>Ongoing</p>
<p>91/00557</p>				
<p>Condition 5</p>	<p>Site Rehabilitation and Landscaping</p> <p>(a) The site shall be landscaped with all disturbed ground being rendered erosion resistant to Council's satisfaction.</p> <p>(b) A detailed landscape rehabilitation plan for the site shall be submitted to Council for approval. Plans prepared by a qualified landscape architect or designer are preferred.</p>	<p>Throughout document</p>	<p>DA 91/00557 Approval Area</p>	<p>Ongoing</p>

Condition / Commitment	Requirement	Section in Report	Applicable Area(s)	Timing
	<p>The plan shall be submitted with or prior to submission of the building application. It shall incorporate planting of native trees and shrubs; establishment of an effective erosion resistant ground cover (turf, seeded mulch or equivalent); protection from vehicular traffic by kerbing or other similar barrier; and screening of clothes drying areas and garbage receptacles from public view. All landscaping works shall be completed in accordance with the approved landscape plan prior to occupation of the premises.</p> <p>(c) Particular attention should be given to establishment of landscaping adjacent to areas most affected by the proposal.</p> <p>(d) All landscaping shall be permanently maintained in a good condition and in accordance with the intent of the landscape plan.</p>			
<p>Condition 6</p>	<p>Specifications and Standards for Erosion Control and Rehabilitation Works</p> <p>Site clearing, runoff and erosion control works and rehabilitation shall conform to the specifications and standards contained in:</p> <ul style="list-style-type: none"> • Erosion Control Policy (Lake Macquarie City Council) • Urban Erosion and Sediment Control Manual (NSW Soil Conservation Service) • Pollution Control Manual for Urban Stormwater (State Pollution Control Commission). 	<p>Section 6.2.1.10</p>	<p>DA 91/00557 Approval Area</p>	<p>Ongoing</p>
<p>Condition 12</p>	<p>Rehabilitation of Disturbed Areas</p> <p>The applicant shall rehabilitate disturbed areas in the vicinity of the proposed road. Attention shall be given to the land within R 170078 (administered by Great North Walk Trust). Rehabilitation shall be to the satisfaction of Council and completed prior to the use of the proposed road.</p>	<p>Throughout document</p>	<p>DA 91/00557 Approval Area</p>	<p>Ongoing</p>
<p>2434/2005</p>				

Condition / Commitment	Requirement	Section in Report	Applicable Area(s)	Timing
Condition 8	Landscaping Works The site shall be landscaped with all disturbed ground being rendered erosion resistant to Council's satisfaction.	Throughout document	DA 91/00557 Approval Area	Ongoing
Condition 9	Topsoil Topsoil shall only be stripped from approved areas and shall be stockpiled for re-use during site rehabilitation and landscaping.	Section 6.2.1.1	Domain 2 – Tailings Storage Facility	Completed
Condition 10	Stockpiles of Topsoil Stockpiles of topsoil, sand, aggregate, spoil or other material capable of being moved by running water shall be stored clear of any drainage line or easement, natural watercourse, footpath, kerb or road surface.	Section 6.2.1.1	DA 91/00557 Approval Area	Completed
Leases				
CCL 725				
Condition 2	Rehabilitation Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.	Throughout document	CCL 725 Approval Area	Ongoing
Condition 9	Cooperation Agreement The lease holder must make every reasonable attempt, & be able to demonstrate its attempts, to enter into a cooperative agreement with the holder(s) of any overlapping title(s). The cooperative agreement should address but not be limited to: <ul style="list-style-type: none"> • access arrangements • operational interaction procedures 	Section 4.2.2	CCL 725 Approval Area	Ongoing

Condition / Commitment	Requirement	Section in Report	Applicable Area(s)	Timing
	<ul style="list-style-type: none"> • dispute resolution • information exchange • well location • timing of drilling • potential resource extraction conflicts; and • rehabilitation issues. 			
ML 1336				
Condition 2	<p>Rehabilitation</p> <p>Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.</p>	Throughout Document	ML 1336 Approval Area	Ongoing
Condition 3b	<p>The MOP must identify the post mining land use & set out a detailed rehabilitation strategy which:</p> <p>(iii) identifies how the mine will be managed & rehabilitated to achieve post mining land use;</p> <p>(v) reflects the conditions of approval under:</p> <ul style="list-style-type: none"> • the Environment Planning and Assessment Act 1979 • the Protection of the Environment Operations Act 1997 • any other approval relevant to the development including the conditions of this mining lease. 	Mine Closure MOP	ML 1336 Approval Area	Completed
Condition 9	<p>Cooperation Agreement</p> <p>The lease holder must make every reasonable attempt, & be able to demonstrate its attempts, to enter into a cooperative agreement with the holder(s) of any overlapping</p>	Section 4.2.2	ML 1336 Approval Area	Ongoing

Condition / Commitment	Requirement	Section in Report	Applicable Area(s)	Timing
	<p>title(s). The cooperative agreement should address but not be limited to:</p> <ul style="list-style-type: none"> • access arrangements • operational interaction procedures • dispute resolution • information exchange • well location • timing of drilling • potential resource extraction conflicts; and • rehabilitation issues. 			
ML 1532				
Condition 4.2	<p>The MOP (the Plan) must present a schedule of proposed mine development for a period of up to seven (7) years and contain diagrams and documentation which identify:</p> <p>(b) mining and rehabilitation method(s) to be used and their sequence;</p> <p>(c) areas to be used for disposal of tailings/waste;</p> <p>(e) progressive rehabilitation schedules;</p> <p>(g) water management systems (including erosion and sediment controls);</p> <p>(i) where the mine will cease extraction during the term of the Plan, a closure plan including final rehabilitation objectives/methods and post mining land use/vegetation.</p>	Mine Closure MOP	ML 1532 Approval Area	Ongoing
Condition 20	<p>Upon completion of operations on the surface of the subject area or upon the expiry or sooner determination of this authority (Department of Mineral Resources) or any renewal thereof, the lease holder shall remove from such buildings, machinery, plant,</p>	Section 6.2.2	Domain 1 – Infrastructure Area	Completed

Condition / Commitment	Requirement	Section in Report	Applicable Area(s)	Timing
	equipment, constructions and works as may be directed by the Minister and such surface shall be rehabilitated and left in a clean, tidy and safe condition to the satisfaction of the Minister.			
Condition 21	If so directed by the Minister the lease holder shall rehabilitate to the satisfactions of the Minister any lands within the subject area which may have been disturbed by mining or prospecting operations whether such operations were or were not carried out by the lease holder.	Throughout document	ML 1532 Approval Area	Ongoing
Condition 22	Upon completion of operations on the surface of the subject area or upon the expiry or sooner determination of this authority or any renewal thereof, the lease holder shall remove from such surface such buildings, machinery, plant, equipment, constructions and works as may be directed by the Minister and such surface shall be rehabilitated and left in a clean, tidy and safe condition to the satisfaction of the Minister.	Section 6.2.2	Domain 1 – Infrastructure Area	Completed
Condition 23	If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister and within such time as may be allowed by the Minister any lands within the subject area which may have been disturbed by mining or prospecting operations whether such operations were or were not carried out by the lease holder.	Throughout document	ML 1532 Approval Area	Ongoing
PLL 153				
Condition 2(4)	<p>MOP</p> <p>The Plan must present a schedule of proposed mine development for a period of up to 7 years & contain diagrams & documentation which identify:-</p> <ul style="list-style-type: none"> (b) mining and rehabilitation method(s) to be used and their sequence (e) progressive rehabilitation schedules (g) water management systems (including erosion and sediment controls) (i) where the mine will cease extraction during the term of the Plan, a closure plan 	Mine Closure MOP and This RMP	PLL 153 Approval Area	Completed

Condition / Commitment	Requirement	Section in Report	Applicable Area(s)	Timing
	including final rehabilitation objectives/methods and post mining land use/vegetation.			
Condition 4.2	The MOP (the Plan) must present a schedule of proposed mine development for a period of up to seven (7) years and contain diagrams and documentation which identify: <ul style="list-style-type: none"> (b) mining and rehabilitation method(s) to be used and their sequence; (c) areas to be used for disposal of tailings/waste; (e) progressive rehabilitation schedules; (g) water management systems (including erosion and sediment controls); (i) where the mine will cease extraction during the term of the Plan, a closure plan including final rehabilitation objectives/methods and post mining land use/vegetation. 	Mine Closure MOP	PLL 153 Approval Area	Completed
Condition 20	Upon completion of operations on the surface of the subject area or upon the expiry or sooner determination of this authority (Department of Mineral Resources) or any renewal thereof, the lease holder shall remove from such buildings, machinery, plant, equipment, constructions and works as may be directed by the Minister and such surface shall be rehabilitated and left in a clean, tidy and safe condition to the satisfaction of the Minister.	Section 6.2.2	Domain 1 – Infrastructure Area	Completed
Condition 21	If so directed by the Minister the lease holder shall rehabilitate to the satisfactions of the Minister any lands within the subject area which may have been disturbed by mining or prospecting operations whether such operations were or were not carried out by the lease holder.	Throughout document	PLL 153 Approval Area	Ongoing
Condition 22	Upon completion of operations on the surface of the subject area or upon the expiry or sooner determination of this authority or any renewal thereof, the lease holder shall remove from such surface such buildings, machinery, plant, equipment, constructions and works as may be directed by the Minister and such surface shall be rehabilitated and left in a clean, tidy and safe condition to the satisfaction of the Minister.	Section 6.2.2	Domain 1 – Infrastructure Area	Completed
Condition 23	If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister and within such time as may be allowed by the Minister any lands within the	Throughout	PLL 153	Ongoing

Condition / Commitment	Requirement	Section in Report	Applicable Area(s)	Timing
	subject area which may have been disturbed by mining or prospecting operations whether such operations were or were not carried out by the lease holder.	document	Approval Area	

Table 2-4 Regulatory Requirements for Rehabilitation and Post Mining Land Use at Teralba Colliery

Condition / Commitment	Requirement	Section in Report	Applicable Area(s)	Timing
Development Consents				
93/00175				
Condition 4	Site Rehabilitation and Landscaping The site shall be landscaped with all disturbed ground being rendered erosion resistant to Council's satisfaction.	Throughout document	DA 93/00175 Approval Area	Ongoing
Condition 5	Specifications and Standards for Erosion Control and Rehabilitation Works Site clearing, runoff and erosion control works and rehabilitation shall conform to the specifications and standards contained in: <ul style="list-style-type: none"> Erosion Control Policy (Lake Macquarie City Council) Urban Erosion and Sediment Control Manual (NSW Soil Conservation Service) Pollution Control Manual for Urban Stormwater (State Pollution Control Commission). 	Section 6.2.1.10	DA 93/00175 Approval Area	Ongoing
Condition 6	Stormwater Controls Stormwater shall be disposed of to Council's satisfaction.	Section 6.2.3.1	Domain 3 – Water Management Area	Ongoing

Condition / Commitment	Requirement	Section in Report	Applicable Area(s)	Timing
96/00774				
Section 5	<p>Site Rehabilitation and Landscaping</p> <p>The site shall be landscaped with all disturbed ground being rendered erosion resistant to Council's satisfaction. Planting of shrubs and medium height trees is to be undertaken around the perimeter of the site in order to screen views from The Ridgeway. Where practical those temporary facilities visible from vantage points during construction should be coloured or camouflaged to blend with surrounding vegetation.</p>	Throughout document	DA 96/00774 Approval Area	Ongoing
Section 6	<p>A detailed landscape rehabilitation plan for the site shall be submitted to Council for approval. Plans prepared by a qualified landscape architect or designer are preferred. The plan shall be submitted with or prior to submission of the building application. It shall incorporate planting of native trees and shrubs; establishment of an effective erosion resistant ground cover (turf, seeded mulch or equivalent) and protection from vehicular traffic by kerbing or other similar barrier. All landscaping works shall be completed in accordance with the approved landscape plan prior to occupation of the premises.</p>	Mine Closure MOP and This RMP	DA 96/00774 Approval Area	Ongoing
Leases				
CCL 718				
Condition 2	<p>Rehabilitation</p> <p>Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.</p>	Throughout document	CCL 718 Approval Area	Ongoing
Condition 3b	<p>The MOP must identify the post mining land use & set out a detailed rehabilitation strategy which:</p> <p>(iii) identifies how the mine will be managed & rehabilitated to achieve post mining land use;</p>	Mine Closure MOP And This RMP	CCL 718 Approval Area	Completed

Condition / Commitment	Requirement	Section in Report	Applicable Area(s)	Timing
	<p>(v) reflects the conditions of approval under:</p> <ul style="list-style-type: none"> • the Environment Planning and Assessment Act 1979 • the Protection of the Environment Operations Act 1997 <p>any other approval relevant to the development including the conditions of this mining lease.</p>			
Condition 3f	<p>The lease holder must prepare a Rehabilitation Report to the satisfaction of the Minister. The report must:</p> <ul style="list-style-type: none"> iv. Provide a detailed review of the progress of the rehabilitation against the performance measures and criteria established in the MOP v. Be submitted annually on the grant anniversary date (or at such other times as agreed by the Minister) vi. Be prepared in accordance with the relevant annual reporting guidelines published on the Department's website <u>at www.resources.nsw.gov.au/environment</u> <p>Note: The Rehabilitation Report replaces the Annual Environmental Management Report.</p>	Annual Review submitted annually	CCL 718 Approval Area	Annually
Condition 9	<p>Cooperation Agreement</p> <p>The lease holder must make every reasonable attempt, & be able to demonstrate its attempts, to enter into a cooperative agreement with the holder(s) of any overlapping title(s). The cooperative agreement should address but not be limited to:</p> <ul style="list-style-type: none"> • access arrangements • operational interaction procedures • dispute resolution • information exchange 	Section 4.2.2	CCL 718 Approval Area	Ongoing

Condition / Commitment	Requirement	Section in Report	Applicable Area(s)	Timing
	<ul style="list-style-type: none">• well location• timing of drilling• potential resource extraction conflicts; and• rehabilitation issues.			

2.2 Final Land Use Options Assessment

This section is not applicable due to final land use already being determined through the existing project approval process and previous MOP.

See **Section 2.4** for details on final land use domains.

2.3 Final Land Use Statement

Rehabilitation objectives are provided in Schedule 4, Condition 27 of PA 09_0203 which requires the site to be rehabilitated to be safe, stable, and non-polluting with a final land use that is compatible with the surrounding land uses.

Final land use is further detailed in **Section 2.4**.

2.4 Final Land Use and Mining Domains

Domains are used to divide a mine site into small, more manageable areas. They are usually determined based on the consideration of specific requirements of the mining location and local environment. These are classified as land management units with a discrete operational function (e.g. overburden emplacement), and therefore similar geophysical characteristics, that will require specific rehabilitation treatments to achieve the final land use(s).

The NSW Resources Regulator has provided a list of Final Land Use and Mining domain names and codes that must be adhered to when preparing the new RMPs. **Table 2-5** details the specific domain titles and the relevant codes. Applicable domains are shown in bold and non-relevant ones are highlighted in grey.

Table 2-5 NSW Resource Regulator Domain Codes (2021)

Final Land Use Domain	Code	Mining Domain	Code
Native Ecosystem	A	Infrastructure Area	1
Agricultural – Grazing	B	Tailings Storage Facility	2
Agricultural – Cropping	C	Water Management Area	3
Rehabilitation Biodiversity Offset Area	D	Overburden Emplacement Area	4
Industrial	E	Active Mining Area (Open cut void)	5
Water Management Areas	F	Underground Mining Area (SMP)	6
Water Storage (Excluding Final Void)	G	Beneficiation Facility	7
Heritage Area	H	Other	8
Infrastructure	I		
Final Void	J		
Other – Subsidence Management Area	K-A		

2.4.1 Final land use Domains

Table 2-6 outlines the relevant final land use domains for the site. These domains are shown on **Plan 1b** and discussed in **Section 5**. The domain numbering aligns with the specific NSW Resources Regulator requirements.

Table 2-6 Final Land Use Domains

Code	Final Land Use Domain	Description
A	Native Ecosystem	<p>Rehabilitation will include Native Ecosystem – Bushland. Native vegetation established predominantly on the slopes of overburden emplacements and final voids.</p> <p>This also includes the Biodiversity offsets include the conservation of:</p> <ul style="list-style-type: none"> • <i>T. juncea</i>; • Sydney Coastal Estuary Swam Forest; • Protected and regionally specific flora and fauna; • Remediation of subsidence cracks in VCA B; and • Management of Domain D is covered by a Biodiversity Offset Strategy in accordance with Condition 6.4.1 in the Statement of Commitments.
B	Agricultural - Grazing	<p>This will include:</p> <ul style="list-style-type: none"> • Areas below RL 12 • Small pasture on northern section of East Pit Final Void; • Tailings Dam and REA surface; and • Areas containing coal stockpiles. <p>There are also small areas of pasture that need to be re-worked.</p>
F	Water Management Areas	<p>This refers to any significant final landform water management features (e.g drop structures) that will be retained in perpetuity, including:</p> <ul style="list-style-type: none"> • Existing water management systems; • Installation of stormwater pipes under roadways to allow water to pass under the road; • Spillway construction; • Retention of licensed discharge points; • The development of a series of unlined and contour drains; and • Installation of 6 standing pipe boreholes in the REA;
G	Water Storage Areas (excluding Final Void)	<p>This will capture the network of dams and ponds to be retained in perpetuity (excluding final voids).</p>
I	Infrastructure	<p>This will include:</p> <ul style="list-style-type: none"> • Retention of access roads; • Retention of powerlines; • Retention all buildings except for coal clearance infrastructure in the Pit Top Facilities; and • Retention of the Rail Loop;

Code	Final Land Use Domain	Description
J	Final Void	The footprint of the open cut voids not backfilled in the final landform (South West Pit and Westside East Pit). Final voids will create permanent water bodies. Highwalls above pit water level will be vegetated with bushland vegetation communities.
K-A	Other – Subsidence Management Area	This is relevant to management area 15 and outlines the footprint of the approved underground workings which ceased in 2012. The area is part of the Sugarloaf State Conservation Area (SSCA).

2.4.2 Mining Domains

Although there are no current mining operations occurring at the Complex, there are still operational areas which include infrastructure, the tailings dam, water management structures and the reject emplacement area (REA).

The operational mining domains for the Complex are defined in **Table 2-7** and shown on the Final Landform and Rehabilitation Plan discussed in **Section 5**.

Table 2-7 Mining Domains

Code	Mining Domain	Description
1	Infrastructure Area	Includes all existing built infrastructure and facilities (other than water management structures). Includes the workshops, pipelines, administration buildings, access roads, haul roads, hardstand/laydown areas, and open boreholes.
2	Tailings Storage Facility	The footprint of current and former tailings emplacement areas and associated tailings infrastructure.
3	Water Management Area	This includes the network of dams and associated water management structures at the complex (excluding final voids).
4	Overburden Emplacement Area	<ul style="list-style-type: none"> The footprint of all in-pit and out of pit waste rock emplacements (overburden and coarse rejects). The footprint of soil stockpiles and tailings capping material borrow areas. Existing overburden rehabilitation areas at the Complex.
6	Underground Mining Area (SMP)	Mining area at Westside where underground mining activities previously occurred.

3. Rehabilitation Risk Assessment

During the preparation of the Mine Closure MOP, three risk assessments were held between Macquarie Coal, Glencore and SLR. The objective of the risk assessment was to identify and risk assess the identified rehabilitation and closure risks for the site, in accordance with:

- Rehabilitation Risk Assessment Guideline (NSW Resources Regulator, 2021); and
- AS/NZS ISO 31000:2018 Risk management Guidelines; and list risk mitigation actions to reduce the risks.

The risk register has been continuously updated as closure works progress. The most recent risk assessment review was conducted in June 2022 for the preparation of this RMP in consultation with Macquarie Coal, Glencore and Integrated Environmental Management Australia (IEMA).

The Risk Assessment identified 62 low risks, 10 medium risks and no high risks. A summary of the medium risks are outlined in **Table 3-1**. The Rehabilitation Risk Assessment has been provided in full as **Appendix B**.

Table 3-1 Rehabilitation Risk Assessment Summary

Risk to Rehabilitation	Risk Control	Where Addressed in RMP
Efficient construction of the final TSF cap cannot be achieved in 5 years.	<ul style="list-style-type: none"> Phase 2 forward works to be completed to determine shear strengths, etc. and inform construction strategy and timeline. Current TSF capping is expected to be completed in 2025. 	Appendix D
Long-term instability and failure of the tailings dam at MCPP.	<ul style="list-style-type: none"> TSF/REA Phase 1 Factors of Safety (FoS) assessment completed for strategy; Section 100 design; MCPP Tailings Dam Management Plan (includes regular dam wall piezometer testing and annual inspections by a Geotechnical Consultant); TSF and REA Post-Closure Management Plan planned; and Monitoring includes consolidation, piezometers and annual surveillance inspections. 	Appendix D
Methane leaks from seal at Teralba Southgate.	<ul style="list-style-type: none"> Secured access to the area (fencing); Seal design completed for leaking shafts; Methane strategy confirmed to include excavation, underground and surface detection monitoring; and Monitoring to date shows methane emissions around the sealed shafts are minimal to nil. 	Section 6.2.2
Water discharge from underground workings rise to the surface. This applies to all relevant underground sites including Teralba.	<ul style="list-style-type: none"> Groundwater model is updated regularly and includes voids for old workings; Groundwater model predicts discharge is unlikely; Groundwater monitoring is undertaken in key areas; and Groundwater model has been peer reviewed by GCAA and site personnel. 	Section 6.2.3
Unknown commitments not considered in closure strategy due to legal register being incomplete.	<ul style="list-style-type: none"> Legal register document review list; Archiving process; CMO; Stakeholder Engagement Plan; and 	Section 2.1

Risk to Rehabilitation	Risk Control	Where Addressed in RMP
	<ul style="list-style-type: none"> Finalised register collated. 	
Burdensome EPA conditions attached to approval for waste transport between sites.	<ul style="list-style-type: none"> Waste Management Plan; and Stakeholder Engagement Plan 	Section 6.2.1.5
Program of works extends beyond 2030.	<ul style="list-style-type: none"> Mine Closure MOP; Rehabilitation Management Plan; and ; and Scheduling of program execution. 	Section 6.1
Inappropriate packaging of assets and leases for relinquishment or for sale.	<ul style="list-style-type: none"> Advice sought on sale/packaging of VCAs; Strategies under consideration for relinquishment include packaging lands. 	Section 2.2
Failure to achieve the rehabilitation outcome prescribed in the Mine Closure MOP/ Development Consent.	<ul style="list-style-type: none"> Extraction Plan approvals; Interagency committee; Criteria reviewed to meet ESG3 expectations; Sealing methodology reviewed by a third party; and Subsidence monitoring and remediation undertaken. 	Section 8
Groundwater pollution deteriorates groundwater quality.	<ul style="list-style-type: none"> Targeted Contamination and Land Quality sampling program completed; and Groundwater monitoring program included for contamination in Environment and Rehabilitation Monitoring Plan. 	Section 7

4. Rehabilitation Objectives and Rehabilitation Completion Criteria

4.1 Rehabilitation Objectives and Rehabilitation Completion Criteria

Rehabilitation will be undertaken in accordance with the objectives outlines in Project Approval 09_0203 and to the satisfaction of the Resources Regulator. As the Complex has been progressing with rehabilitation activities since 2016, it has its own set of rehabilitation criteria and objectives unlike the other Glencore sites which include an overarching corporate set of criteria. **Table 4-1** details the approved completion criteria at the Complex.

Table 4-1 Rehabilitation Objectives and Completion Criteria

Phase	Final Land Use Domain	Mining Domain	Rehabilitation Objectives	Completion Criteria	Performance Indices	Justification / Validation Methods
Decommissioning	All	All	Free of public safety risks, or measures implemented to restrict access and protect public safety.	Appropriate security measures implemented (where required) prior to commencing decommissioning and demolition.	Risk assessment completed and actioned.	NSW Work Health and Safety (Mines and Petroleum Sites) Act 2013.
			Public access managed and minimised.			Site Security Plan.
			Minimise risk of injury to site people and animals from decommissioning activities.	Shafts, drifts, large boreholes filled and capped in accordance with DPE guidelines for the Permanent Filling and Capping of Entries to coal seams (MDG 6001).	Engineered design and final construction reports.	Schedule 4, Condition 27 of PA 09_0203.
			Chemically stable within accepted criteria.	Methane levels lower than explosive levels at the surface during decommissioning works or appropriately managed.	Methane levels records.	Mine Closure MOP.
			Retention of infrastructure where there is a demonstrated beneficial use.	All surface infrastructure retained with appropriate risk assessment and appropriate documented agreement.	Existing third-party owner or contract with third-party post mining land user.	Mine Closure MOP.
			Surface water dams and spillways to be appropriate for post mining land use.	All surface infrastructure that is not required for the post-mining land use has either been retained with appropriate risk assessment or demolished/dismantled and removed from the site.	Site records and engineering reports.	Mine Closure MOP.
			Infrastructure removed to ensure the site is safe and free of hazardous materials.			PA 09_0203 Mining lease requirements Mine Closure MOP The Demolition of Structures (AS 2601-2001)
			The site is safe and free of hazardous materials.	Hazardous materials (including hydrocarbons, asbestos containing materials, lead paints, synthetic mineral fibres, and polychlorinated biphenyls (PCBs)) are identified and removed from the areas to be rehabilitated or managed.	Certificates of disposal or Asbestos Management Register.	Mine Closure MOP.
			Contaminated areas identified and remediated, controlled or otherwise managed.	Contaminated soils presenting constraints to final land use are identified and removed from the areas to be rehabilitated or managed (in accordance with legislation).	Certificates of disposal or validation testing.	Mine Closure MOP.
	Waste tracking in accordance with legal requirements.	Waste tracking is compliant with legislation for all waste being disposed off-site.	Certificates of waste disposal.	Mine Closure MOP.		
Domain A – Native	Domain 2 – Tailings	Tailings management for save and stable cover construction.	Tailings dewatered/desiccated to the appropriate density to meet cover criteria.	Tailings testing records.	Mine Closure MOP.	

Phase	Final Land Use Domain	Mining Domain	Rehabilitation Objectives	Completion Criteria	Performance Indices	Justification / Validation Methods
	Ecosystem (bushland)	Storage Facility	Minimise risk of injury to site people and animals from decommissioning activities.	Decant point filled and capped in accordance with department guideline EDG 01 Borehole Sealing Requirements on Land.	Engineered design and final construction reports.	EDG01 – Borehole Sealing Requirements on Land.
	Domain B – Agriculture – Grazing (pasture)	Domain 3- Water Management Area				
	Domain F – Water Management Areas					
	Domain G – Water Storage (excluding Final Void)					
	Domain B – Agriculture – Grazing (pasture)	Domain 1 – Infrastructure Area	Management of contamination for closure.	Manage contaminated dam sediments to prevent adverse impacts or additional contamination.	Dam sediment treatment and validation and groundwater monitoring results.	Mine Closure MOP.
	Domain G – Water Storage (excluding Final Void)	Domain 3 – Water Management Area				
	Domain I - Infrastructure					
	Domain A – Native Ecosystem (bushland)	Domain 1 – Infrastructure	Removal of non-Macquarie Coal owned infrastructure without beneficial post mining land use.	Appropriate infrastructure removal by Envirogen and rehabilitation to meet criteria.	Envirogen Plant removal.	Contract.
	Domain B – Agriculture – Grazing (pasture)					
	Domain I – Infrastructure.					
Landform Establishment	All	All	Bushfire risk management	Bushfire management planning incorporated into the rehabilitation plan.	Nil.	Mine Closure MOP. Mining lease conditions
			Landform suitable for final land use and compatible with surrounding landscape.	Rehabilitated slopes are free draining generally <14 degrees, a maximum of 18 degrees or to the satisfaction of the appropriate regulatory authority.	Visual and/or remote sensing GIS assessment of slope and stability at walkover/flyover.	Mine Closure MOP. Mining lease conditions.
				Visual inspections confirm rehabilitated landforms exhibit an absence of significant slumping.		
			Spillways constructed where required to be stable and facilitate free-draining landforms.			

Phase	Final Land Use Domain	Mining Domain	Rehabilitation Objectives	Completion Criteria	Performance Indices	Justification / Validation Methods
			Minimal active accelerated erosion.	Runoff directed away from re-established landforms where practicable.	Visual assessment record.	Mine Closure MOP.
				No areas of active gully erosion (i.e. >1 m deep and 1 m wide).	Visual and/or remote sensing GIS assessment of gully erosion at walkover/flyover.	
				No evidence of tunnel erosion.		
				Rill erosion is limited to isolated areas of minor rilling up to 200 mm deep.		
	Domain A – Native Ecosystem (bushland) Domain G – Water Storage	Domain 1 – Infrastructure Area Domain 3 – Water Management Area	Landform is suitable for final land use and compatible with surrounding landscape as sustainable native ecosystem.	Maximum slope of final landform should be <14 degrees, maximum of 18 degrees. Where the landform exceeds 10 degrees, a geotechnical assessment undertaken by a suitable qualified person concludes that the landform is stable and suitable for the final land use objective.	Landform design.	Mine Closure MOP.
				Longitudinal grade of contour drains <2%. Where the landform exceeds the criteria, a geotechnical assessment undertaken by a suitably qualified person concludes that the drainage line is stable and suitable for the final land use objective.		
				Contour banks are stable and there is no evidence of overtopping or significant scouring as a result of runoff.		
				Surface layer is free of any hazardous materials.		
				Spillway of final void has been constructed in accordance with hydrological design.		
				Minimal active accelerated erosion.		
	No areas of active gully erosion (i.e. > 1 m deep and 1 m wide).					
	No evidence of tunnel erosion.					
	Domain A – Native Ecosystem (bushland) Domain B – Agriculture – Grazing (pasture) Domain F – Water Management Areas	Domain 2- Tailings Storage Facility	Final landforms are safe, stable, non-polluting and free draining.	Following completion of the filling and capping of the dam, an appropriate as-built survey report is submitted to the Dams Safety NSW.	Engineered design and final construction reports.	Dams Safety NSW requirements.
				All tailings are covered by a sufficient capping depth appropriate to erosion risk.	Engineered design and erosion modelling results.	
				Materials with low risk for spontaneous combustion used in capping based on propensity testing.	Spontaneous combustion test results and review.	
Domain 3 – Water Management Area		Water runoff is managed in accordance with Dams Safety NSW requirements.	Appropriately designed spillway installed and approved by a suitably qualified engineer.	Engineered design and final construction reports.	Dams Safety NSW “Tailings Dams” Guidance Sheet DSC3F (2012).	
Tailings dam seismic stability is managed in accordance with Dams Safety NSW requirements.	Appropriately designed final tailings dam landform (for long-term seismic stability) modifications completed and approved by a suitably qualified engineer.					

Phase	Final Land Use Domain	Mining Domain	Rehabilitation Objectives	Completion Criteria	Performance Indices	Justification / Validation Methods
	Domain G – Water Storage (excluding Final Void)					
	Domain A – Native Ecosystem (bushland)	Domain 3 – Water Management Area	Final landforms are safe, stable, non-polluting and free draining.	Final landforms for the Northern Buttress and REA are constructed to an appropriate height to facilitate visual amenity with the surroundings.	Engineered design and final construction reports.	Section 6.2.3 Section 102 Application (Northern Buttress Section 100 Application – (Life of Mine Rejects Emplacement Strategy)
	Domain B – Agriculture – Grazing (pasture)			Slopes on the final landform designed and constructed to provide an appropriate factor of safety and minimise erosion and approved by a suitably qualified geotechnical engineer (TSF Northern and Eastern Embankments).		Mine Closure MOP.
	Domain F – Water Management Areas	Domain 4 – Overburden Emplacement Area		Final landform covered by a sufficient growth media depth of suitable inert material appropriate to erosion risk (0.5 m). Materials with low risk for spontaneous combustion.	Engineered design and as built survey reports.	Section 6.2 Section 102 Application (Northern Face test results and review)
	Domain G – Water Storage (excluding Final Void)		Final landform considers visual amenity.	The Eastern Face blends in with the surrounding environment.	3D visual assessment of the final landform.	Section 6.2.3 Section 7 Section 100 Application (Eastern Face)
	Domain A – Native Ecosystem (bushland)	Domain 1 - Infrastructure	Final landforms are safe, stable, non-polluting and free draining.	Subsidence remediated cracks are stable and can be released for public use.	Subsidence monitoring results.	Extraction Plan Public Safety Management Plans. Long-Term Monitoring Plan Methodology for LW 38 to LW 52 Steep Slopes (Douglas Partners, 2014). WWC Environmental Management Strategy Pre-Mining Assessments. LW 51 and LW 52 Built Features Management Plan (WWC SD PLN 0129)
			Subsided slopes are stable.	Post subsidence slope stability with minimum erosion as approved by a suitably qualified expert.	Slope stability monitoring.	
			Stable waterways post subsidence.	Maintain appropriate hydraulic and geomorphic conditions within the surrounding landscape post subsidence.	Channel stability monitoring results.	
			Built features are safe and serviceable	Damage repaired, replaced or fully compensated.	Built features monitoring results.	
	Growth Medium Development	All	All	Areas of rehabilitation top-dressed with a suitable growing media.	Topsoil or suitable alternative are spread uniformly at the specified depth appropriate for the final land use.	Visual assessment of depth and rehabilitation establishment records.
Growth media characterised and ameliorated for use in final land uses.				Ameliorants (such as gypsum, organics, and fertilisers) that are certificated and non-contaminated are spread at the recommended rate per hectare as recommended by soil analysis appropriate to the final land use.		
Habitat features are salvaged and re-used in native vegetation rehabilitation to provide fauna habitat resources.				Habitat features, including structures suitable for target species, are incorporated into rehabilitation areas at required densities, where appropriate.		
Domain A – Native Ecosystem (bushland)		Domain 3 - Water Management Area	Areas disturbed by mining are top dressed with a suitable depth growth media.	Final landform of the REA to be covered with appropriate thickness (0.5 m) of inert material.	Growth media depth.	Mine Closure MOP Section 102 Application (Northern Buttress) Section 6.2.3 Section 100 Application (Eastern Face)

Phase	Final Land Use Domain	Mining Domain	Rehabilitation Objectives	Completion Criteria	Performance Indices	Justification / Validation Methods
	Domain B – Agriculture – Grazing (pasture) Domain F – Water Management Areas Domain G – Water Storage (excluding Final Void)	Domain 4 – Overburden Emplacement Area				
Ecosystem and Land Use Establishment	All	All	Monitoring demonstrates appropriate soil quality in rehabilitated areas.	Bare areas of soil >400m ² are tested for pH, EC, ESP, macro-nutrients and trace elements.	Soil testing/monitoring records.	Rehabilitation monitoring reports.
			Bushfire risk management.	The area does not pose a fire hazard greater than the surrounding landscape.	Nil.	Mine Closure MOP.
			Rehabilitation areas species diversity and abundance is comparable to analogue bushland vegetation community.	Native Ecosystem (bushland) – Indicative minimum total tree/shrub densities for seeded areas to be: Year 1: 1,000 stems/ha Year 5: 500 stems/ha Year 10: 400 stems/ha Note: These are initial targets and will be based on site monitoring and other relevant available data.	Quantitative density assessments for woody species along transects.	PA 09_0203 Mine Closure MOP.
				Native Ecosystem (bushland) – Revegetation areas contain flora species assemblages characteristics of each strata for the desired native vegetation communities.	Quantitative richness assessments for all species along transects.	
			Vegetation establishment as per criteria.	Native Ecosystem (bushland) – Survey confirms that a minimum of 155 ha of bushland has been established.	Survey records.	Mine Closure MOP.
			Rehabilitation areas species diversity and cover is comparable to district.	Agriculture – Grazing (pasture) – Pasture composition comprises palatable grasses and legumes appropriate to the district.	Quantitative richness assessment for all species along transects.	Mine Closure MOP.
				Agriculture – Grazing (pasture) – Ground cover (vegetation, leaf litter, mulch) is greater than 70%.	Quantitative assessment of all species along transects.	Mine Closure MOP.
			Erosion will be controlled within acceptable erosion and sediment mobilisation rates (similar to natural/analogue).	Monitoring indicates there is no significant and active erosion (gully depth >500 mm) that compromises land capability or the intended final land use.	Assessment of erosion and sediment control structures at walkover/flyover and at transects using erosion rating system.	Mine Closure MOP.
			Weeds are controlled on Macquarie Coal owned lands.	Weed presence does not pose a risk to the establishment of rehabilitation areas.	Quantitative assessment of weed presence at walkover/flyover as well as long-term monitoring transects.	WWC Biodiversity and Land Management Plan.
Pests and animals are controlled on Macquarie Coal owned lands.	Pest and animal presence does not pose a risk to the establishment of rehabilitation areas.	Land management records, opportunistic sightings during ecological monitoring.				

Phase	Final Land Use Domain	Mining Domain	Rehabilitation Objectives	Completion Criteria	Performance Indices	Justification / Validation Methods
	Domain A – Native Ecosystem (bushland) Domain G – Water Storage (excluding Final Void)	Domain 1 – Infrastructure Domain 3 – Water Management Areas	Revegetation is sustainable for the long term and only required maintenance that is consistent with the intended final land use.	Monitoring demonstrates soil profile development in rehabilitated areas (e.g. development of organic layer, litter layer).	Return of affected areas to open bushland.	Mine Closure MOP.
				Revegetation areas contain flora species assemblages characteristic of species found within the region and will provide habitat value in the future.		
				Second generation tree seedlings are present, or likely to be, based on monitoring in comparable older rehabilitation sites.		
				More than 75% of trees are healthy and growing as indicated by monitoring.		
				No treeless areas greater than 0.5 ha are present (with the exception of dedicated access or bushfire control tracks).		
				No bare areas that have obviously failed and are greater than 0.1 ha in total area, or greater than 5 m in width extending >10 m down the slope, are present.		
				There is no significant weed infestation such that weeds do not compromise a significant proportion of the species in the stratum.		
				Visual inspections indicate that no crusting or excessive compaction exists that may affect plant growth or recruitment.		
				Runoff water quality from rehabilitation areas is within the range of water quality data recorded from analogue sites and does not pose a threat to downstream water quality, specifically in relation to pH, EC and TSS.		
			Appropriate bushfire hazard controls have been implemented on advice from the NSW Rural Fire Service.			
Ecosystem and Land Use Development	All	All	Appropriate access and supporting infrastructure retained on Macquarie Coal owned lands.	Adequate access and infrastructure are retained (e.g. access tracks, drainage, water storages) in large contiguous rehabilitation areas for relinquishment. Monitoring and associated disturbances rehabilitated post closure prior to relinquishment as required.	Nil.	Mine Closure MOP.
			Appropriate soil quality capable of supporting present rehabilitation.	Soils do not limit plant establishment.	Soil testing/monitoring records.	Mine Closure MOP.
			Native vegetation rehabilitation areas ecosystem is comparable to surrounding native vegetation community.	Native Ecosystem (bushland) – Rehabilitation areas contain flora species assemblages characteristic of the desired native vegetation communities.	Quantitative richness assessments for transects.	Mine Closure MOP.
				Native Ecosystem (bushland) – Native rehabilitation areas provide a range of structural features (e.g.	Estimation canopy, mid-layer and ground cover.	

Phase	Final Land Use Domain	Mining Domain	Rehabilitation Objectives	Completion Criteria	Performance Indices	Justification / Validation Methods		
				trees, shrubs, ground cover, developing litter layer, etc).				
				Native Ecosystem (bushland) – Rehabilitation monitoring verifies second generation tree seedlings are present or likely to be, based on comparable older rehabilitation sites.	Regeneration metric.			
				Native Ecosystem (bushland) – Habitat corridors are established and consistent with desired vegetation community compositions where required.	Regular flyovers and/or GIS polygons demonstrate progression towards connectivity of vegetation communities.			
			Rehabilitation areas species diversity and cover is comparable to district.	Agriculture – Grazing (pasture) – Pasture composition comprises palatable grasses and legumes appropriate to the district.	Quantitative richness assessment for all species along transects.	Mine Closure MOP.		
				Agriculture – Grazing (pasture) – Ground cover (vegetation, leaf litter, mulch) is greater than 70%.	Quantitative assessment of all species along transects.			
			Weeds are controlled on Macquarie Coal owned lands.	Weed presence does not present a risk to rehabilitation.	Quantitative assessment of weed presence at walkover/flyover as well as long-term monitoring.	WWC Biodiversity and Land Management Plan.		
			Fauna diversity is progressing towards the ecosystems planned in the final land use.	Native Ecosystem (bushland) – Monitoring confirms target native fauna species are recorded utilising rehabilitation areas or habitat suitable for target species is present.	Range metrics in ecological monitoring.	Mine Closure MOP.		
			Pest and animals are controlled on Macquarie Coal owned land.	Pest and animals are controlled in accordance with legislation.	Land management records, opportunistic sightings during ecological monitoring.	WWC Biodiversity and Land Management Plan.		
			Erosion does not present a safety hazard or compromise the post mining land capability.	No significant erosion is present that constitutes a safety hazard or compromises the capability of the supporting final land use.	Assessment of erosion and sediment control structures at walkover/flyover and at transects using rating system.	CCL 718 Condition 26 and 32.		
			The site blends in with the surrounding landscape.	Vegetation screens have been established and maintained to improve visual amenity (where required).	Rehabilitation records.	PA 09_0203.		
			Water from rehabilitation areas meet appropriate quality.	Appropriate runoff water and groundwater quality contributions from rehabilitated areas into surface water and groundwater in the surrounding environment.	Water quality records.	WWC Water Management Plan.		
			Minimise adverse socio-economic effects associated with mine closure and maximise benefits where practicable.	Appropriate engagement undertaken with stakeholders throughout the closure execution and post-closure phases.	Stakeholder engagement records.	Stakeholder Engagement Plan.		
			Domain A – Native Ecosystem (bushland)	Domain 1 – Infrastructure	Restricted unauthorised access.	Appropriate barriers and signage are in place to caution against entry of unauthorised personnel into the VCAs.	Land management inspections/ fencing.	Conservation Management Plan.
			Domain D – Rehabilitation Biodiversity Offset Area	Domain 8 – Other (VCA)	Comparable composition and diversity as per criteria.	<i>T. juncea</i> performance against benchmark values published by NSW Government or collect at analogue sites.	Biometric vegetation attribute (species richness, exotic plant cover, etc).	Annual VCA monitoring.
			Domain I – Infrastructure		Weeds are controlled in VCAs.	Weed presence does not pose a threat to <i>T. juncea</i> populations.	Quantitative assessment of weed presence at walkover/flyover as well as long-term monitoring transects.	Annual VCA monitoring.
		Pest and animals are controlled in VCAs.	Mosquito Fish (<i>Gambusia holbrooki</i>) detection in the creeks and drainage lines of VCAs accompanied by appropriate management actions considering the <i>Gambusia holbrooki</i> Threat Abatement Plan (NPWS, 2002).	Opportunistic sightings during ecological monitoring.	Conservation Management Plan.			

Phase	Final Land Use Domain	Mining Domain	Rehabilitation Objectives	Completion Criteria	Performance Indices	Justification / Validation Methods
			Stock excluded from VCAs.	Stock proof fencing maintained to protect VCAs.	Land management inspections (fencing).	Mine Closure MOP.
			The conservation value of the area is not threatened by bushfire.	Hazard reduction burns should not be undertaken within <i>T. juncea</i> conservation areas or endangered ecological community Sydney Coastal Estuary Swamp Forest Complex (SCESFC) vegetation or areas of <i>Grevillea parviflora</i> subsp. <i>parviflora</i> .	Hazard reduction burn records.	Mine Closure MOP.
				Monitor response of <i>T. juncea</i> and <i>G. parviflora</i> subsp. <i>parviflora</i> following any fires. Rates of survival mechanism of regeneration, as measure in existing monitoring plots.	Ecological monitoring records.	
No adverse impacts of runoff or hydrological changes on waterways.	Regular monitoring reveals that water management measures have been successful in protecting natural systems from adverse impacts.	Water quality.				
Relinquishment	All	All	Site is capable of sustaining the post-mining land uses.	Sign-off from the department that the landforms developed are compatible with the surrounding landscape and they approve such landform as part of the MOP approval.	Sign-off records from relevant authorities.	PA 09_0203.

4.2 Rehabilitation Objectives and Rehabilitation Completion Criteria – Stakeholder Consultation

4.2.1 Rehabilitation Objectives and Completion Criteria Consultation

Rehabilitation objectives by management area are summarised in Sections 6-22 of *the Mine Closure MOP*. In addition to management area specific objectives, the overarching rehabilitation objectives are:

- Safe;
- Stable;
- Non-polluting;
- Sustainable; and
- Compatible.

The overall stated objective of rehabilitation and closure at the Complex is to:

Maximise the retention of existing infrastructure for reuse, rehabilitate remaining disturbed areas to be consistent with adjoining areas whilst not prohibiting potential future re-development of the site, and establish long-term stable landforms appropriate for the selected final land uses (“beneficial land use”).

As mentioned above, the Complex operates closure activities based on the *Mine Closure MOP* and does not adhere to the *Glencore Rehabilitation Objectives and Completion Criteria*.

4.2.2 2022 Consultation

Macquarie Coal is regularly liaising with key agencies as part of rehabilitation and closure. The Resources Regulator were consulted during the previous detailed MOP.

All consultation that has been undertaken in relation to post mining land use, rehabilitation objectives and completion criteria are summarised in **Table 4-2**. A copy of the draft RMP has been sent to relevant agencies to meet the requirements of Schedule 4, Condition 29 of PA 09_0203. Agencies have had the chance to comment on the post mining land use, rehabilitation objectives and completion criteria.

Table 4-2 Stakeholder Consultation during 2022

Date	Stakeholder	Details of Consultation	Actions by Macquarie Coal
July 2022	DPE	A copy of this RMP has been sent to this department for comment.	To be updated if there are comments.
July 2022	NRAR	A copy of this RMP has been sent to this department for comment.	To be updated if there are comments.
July 2022	LMCC	A copy of this RMP has been sent to this department for comment.	To be updated if there are comments.
July 2022	MEG	A copy of this RMP has been sent to this department for comment.	To be updated if there are comments.

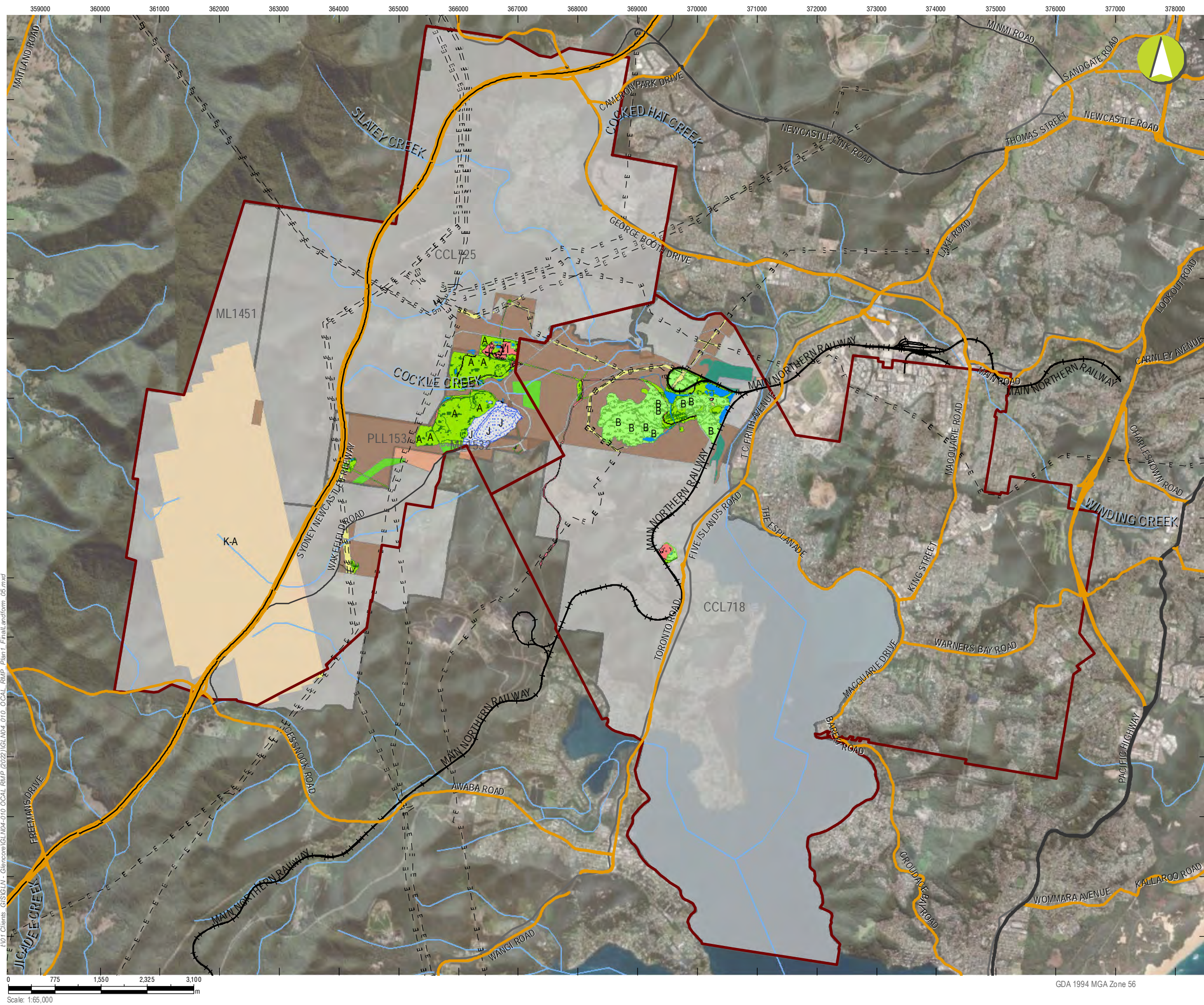
Date	Stakeholder	Details of Consultation	Actions by Macquarie Coal
July 2022	DEES	A copy of this RMP has been sent to this department for comment.	To be updated if there are comments.
July 2022	CCC	A copy of this RMP has been sent to this department for comment.	To be updated if there are comments.

5. Final Landform and Rehabilitation Plan

This section outlines the Final Landform and Rehabilitation Plans for the Complex which have been prepared as per the RMP Form and Way Document.

The two plans include:

- Plan 1: Final Landform Features
- Plan 2: Final Landform Contours.



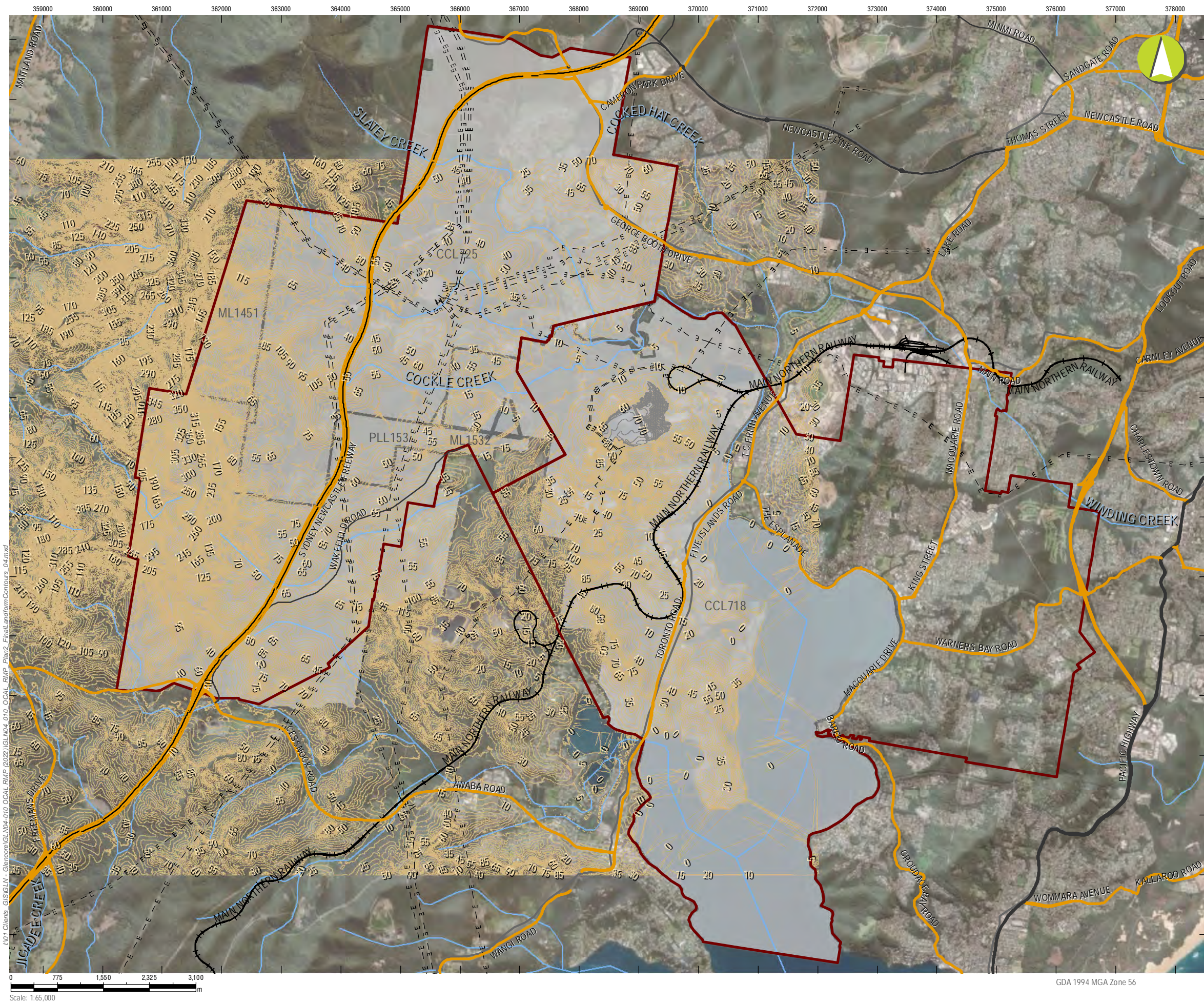
- LEGEND**
- Project Approval Boundary
 - Major Roads**
 - Motorway
 - Arterial Road
 - Primary Road
 - Sub Arterial Road
 - Major Road
 - Railway
 - Electricity Transmission Line
 - Major Waterway
 - Current Authorisations**
 - Macquarie Coal Joint Venture
 - Surrounding areas within Site**
 - Biodiversity Offset Area
 - Mine Owned Lands
 - Non-Mac Coal Infrastructure
 - Residential
 - Wetlands
 - Final Landuse Domain**
 - Domain A: Native Ecosystem
 - Domain B: Agricultural – Grazing
 - Domain F: Water Management Areas
 - Domain G: Water Storage (Excluding Final Void)
 - Domain I: Infrastructure
 - Domain J: Final Void
 - Domain K-A: Subsidence Management Area

Macquarie Coal Complex

**Final Landform and Rehabilitation Plan
Final Landform Features**

PLAN 1

Mine name	Macquarie Coal Complex
Plan name	Rehabilitation Management Plan 2022
Year of anticipated relinquishment	TBA following Portal Submission
Data theme submission ID No.	2294
Spatial Reference	GDA 1994 MGA Zone 56
Plan date (date created)	4/08/2022



LEGEND

- Project Approval Boundary
- Final Landform Contours (5m AHD)
- Motorway
- Arterial Road
- Primary Road
- Sub Arterial Road
- Major Road
- Railway
- Electricity Transmission Line
- Major Waterway

Current Authorisations

- Macquarie Coal Joint Venture

Macquarie Coal Complex

**Final Landform and Rehabilitation Plan
Final Landform Contours**

PLAN 2

Mine name	Macquarie Coal Complex
Plan name	Rehabilitation Management Plan 2022
Year of anticipated relinquishment	TBA following Portal Submission
Data theme submission ID No.	2503
Spatial Reference	GDA 1994 MGA Zone 56
Plan date (date created)	4/08/2022

6. Rehabilitation Implementation

6.1 Life of Mine Rehabilitation Schedule

The RMP Form and Way document states that this section should describe the rehabilitation schedule over the life of the mine, from the commencement of the RMP until lease relinquishment. The life of mine rehabilitation schedule must include a series of plans illustrating the proposed mine layout and sequence of progressive rehabilitation across the leasehold area at a minimum of five-yearly intervals until completion of mining and achievement of the final land use.

Detailed mine planning is completed annually and outlines the proposed and completed rehabilitation. There is no further mining or disturbance expected to occur on site as the Complex has not operated since 2016. Detailed figures will be prepared as part of the Annual Rehabilitation Report and the Forward Program, with these outlining the activities over the next three years, and therefore are not included in this RMP.

6.2 Phases of Rehabilitation and General Methodologies

The final land use objectives will be achieved through a series of conceptual stages which can be described as:

- **Active** – The RMP Form and Way document states in the context of rehabilitation, land associated with mining domains is considered ‘active’ for the period following disturbance until the commencement of rehabilitation. Note, there is no active mining occurring at the Complex.
- **Stage 1: Decommissioning** – Removal of infrastructure associated with mining activities including preparation plants, hard stand areas, buildings, contaminated materials, hazardous materials. The RMP Form and Way document states that this phase of rehabilitation may also include studies and assessments associated with decommissioning and demolition of infrastructure or works carried out to make safe or ‘fit for purpose’ built infrastructure to be retained for future use(s) following lease relinquishment.
- **Stage 2: Landform Establishment** – The RMP Form and Way document states that this phase of rehabilitation consists of the processes and activities required to construct the approved final landform (as per the development consent and, for large mines, the approved Final Landform and Rehabilitation Plan). In addition to profiling the surface of rehabilitation areas to the approved final landform profile this phase may include works to construct surface water drainage features, encapsulate problematic materials such as tailings, and prepare a substrate with the desired physical and chemical characteristics (that is, rock raking or ameliorating sodic materials). The landform design and construction part of this phase incorporates gradient, slope, aspect, drainage, substrate material characterisation and morphology.
- **Stage 3: Growing Media Development** – The RMP Form and Way document states that this phase of rehabilitation consists of activities required to establish the physical, chemical and biological components of the substrate required to establish the desired vegetation community (including short-lived pioneer species). This phase may include spreading the prepared landform with topsoil and/or subsoil and/or soil substitutes, applying soil ameliorants to enhance the physical, chemical and biological characteristics of the growth media, and actions to minimise loss of growth media due to erosion. Additional characterisation of materials e.g. subsoils, topsoils, organic additives and overburden surface is usually required in this phase to cross check data from the earlier phases.

- **Stage 4: Ecosystem and Land Use Establishment** – This RMP Form and Way document outlines that this phase of rehabilitation consists of the processes to establish the approved final land use following construction of the final landform. For vegetated land uses this rehabilitation phase includes establishing the desired vegetation community (e.g. Seeding or tube stocking) and implementing land management activities such as weed control. This phase of rehabilitation may also include habitat augmentation such as installation of nest boxes.
- **Stage 5: Ecosystem and Land Use Development** – The RMP Form and Way document outlines that this phase of rehabilitation consists of the activities to manage maturing rehabilitation areas on a trajectory to achieving rehabilitation objectives, completion criteria and the Final Landform and Rehabilitation Plan. Completion criteria for this phase will include components of floristic structure, nutrient cycling recruitment and recovery, community structure and function which are the key elements of a sustainable landscape.
- **Stage 6: Rehabilitation Competition** – The RMP Form and Way document outlines that this final phase of rehabilitation occurs where a rehabilitation area has achieved the final land use for the mining area as stated in the approved rehabilitation objectives and the approved rehabilitation completion criteria and spatially depicted in the approved Final Landform and Rehabilitation Plan. Rehabilitation areas may be classified as complete when the NSW Resources Regulator has determined in writing that rehabilitation has achieved the final land use following submission of the relevant application by the lease holder.

6.2.1 Active Mining Phase

The following subsections have been prepared in accordance with the RMP Form and Way document and summarise the risks and opportunities associated with the ‘active mining phase’ across the mining domains.

While the site is not in an ‘active mining’ phase since operations ceased in 2016, there are still active areas within the Complex including the tailings dam, REA, and the administration area.

6.2.1.1 Soils and Materials

Several soil and contamination studies have been completed as the site progresses with closure including:

- A 2018 study done by Coffey Services Australia (Coffey) on stockpiled materials and underlying soils within the bioremediation area of the final void;
- A Contamination Site Assessment (CSA) on the sediment dams in the pit top facilities area done by Coffey in 2020; and
- Tailings capping investigations undertaken by ATC Williams.

Soil loss prediction has on the Tailings Dam area has been calculated using both the Revised Universal Soil Loss Equation (RULSE) and SIBERIA. The predicted long-term average soil losses are considered “very low” based on the Erosion Hazard rating threshold.

Management area specific soil and materials details are provided in Sections 6-22 of the *Mine Closure MOP*.

6.2.1.2 Flora

Biodiversity management is taken in accordance with the *WWC Biodiversity Management Plan*, *Westside Environmental Management Plan* and the *Macquarie Coal Biodiversity and Land Management Plan*.

Flora management includes fertiliser and seed application, spread of growth media (biosolids and/or topsoil), ripping, amelioration and hydro-mulching.

Closure commitments within the Voluntary Conservation Area (VCA) include conservation of *Tetratheca juncea*, conservation of Sydney Coastal Estuary Swamp Forest, conservation of protected flora species, conservation of regionally significant flora and fauna species and conservation of threatened species.

Management area specific flora management is detailed in Sections 6-22 of the *Mine Closure MOP*.

6.2.1.3 Fauna

The Complex manages fauna in accordance with the site *Biodiversity and Land Management Plan* and the *Westside Mine Flora and Fauna Management Plan*. The Complex implements biodiversity management measures such as stock exclusion, fencing and controlling access and feral animal control.

As part of the approval of the Westside Mine Southern Extension, biodiversity offsets were negotiated with the NSW Government to compensate for the loss of vegetation, threatened species habitats and other biodiversity values associated with the development. A Conservation Management Plan was approved by the then Office of Environment and Heritage (OEH) for the establishment of a VCA.

Fauna management is detailed by management area in Sections 6-22 of the *Mine Closure MOP*.

6.2.1.4 Rock / Overburden Emplacement

As the site has not been operating since 2016, there is no new overburden.

At present there are insufficient topsoil stockpile resources for the necessary rehabilitation required across the Complex. Where there are insufficient volumes of topsoil for rehabilitation works, topsoil will be sourced from external providers. Further details on how materials will be sourced is included in the *Materials Management Protocol* (Appendix J of the *Mine Closure MOP*).

6.2.1.5 Waste Management

A Waste Disposal Strategy was prepared by SLR (2016) which provides a summary of the categories and amount of anticipated waste during closure.

Waste management by management area is detailed in Sections 6-22 of the *Mine Closure MOP* and in the Annual Review.

6.2.1.6 Geology and Geochemistry

Geochemical risks relate to the lack of knowledge of the characteristics of the capping material, either onsite or imported. This is managed through the *Procedure for Receipt of Capping Material* which includes the handling procedures for topsoil and other substitutes brought onsite for rehabilitation.

Geochemical testing was undertaken by SLR to provide an analysis of the potential spontaneous combustion and acid mine drainage (AMD) from the coal fines and coarse rejects material.

Environmental risk management related to geology and geochemistry is detailed in Section 3.2 of the *Mine Closure MOP*.

6.2.1.7 Material Prone to Spontaneous Combustion

A spontaneous combustion investigation was undertaken by SLR to develop a more detailed understanding of the geochemical risks associated with using coarse reject material to cap the Tailings

Dam and the Northern Saddle Dam embankment. The results showed the collected samples had a moderate to low propensity to spontaneous combustion.

The historically low risk of spontaneous combustion in the stockpiles or within the coal is due to the low volatile to fixed carbon ratio – resulting in a lower risk of spontaneous combustion. Additionally, the coal was typically high in montmorillonite which absorbs water and displaces air, and the rejects material having a high ash content, all which contribute to low risk of spontaneous combustion.

Spontaneous combustion management is further detailed by management area in Sections 6-22 of the *Mine Closure MOP*.

6.2.1.8 Material Prone to Generating Acid Mine Drainage

AMD is not considered to be an issue within the Complex due to the low propensity for coarse and fine rejects material to be emplaced at the site to leach acid. In 1981 McColl characterised rejects at the MCPP and concluded that due to the insignificant pyrite content, any acidity produced would likely be absorbed by the alkaline material of the reject.

The slightly acidic soils at the Great Northern seam overburden at the Westside Mine, they did not indicate oxidised sulphide minerals and associated clay minerals that would form AMD.

AMD management is further detailed by management area in Sections 6-22 of the *Mine Closure MOP*.

6.2.1.9 Ore Beneficiation Waste Management (Reject and Tailings Disposal)

As the site does not produce any tailings, this section is not relevant.

6.2.1.10 Erosion and Sediment Control

The Complex implements a range of general erosion and sediment controls in accordance with the *Managing Urban Stormwater: Soils and Construction Volume 1* (Landcom, 2004) and Volumes 2A, 2C, 2D and 2E (DECC, 2008) (the Blue Book).

The MCPP also manages erosion and sediment control in accordance with the MCPP *Water Management Plan* and the *Erosion and Sediment Management Plan*. WWC manages erosion in accordance with the *Surface Water Management Plan*.

Erosion and sediment control is further detailed in Section 3.2 of the *Mine Closure MOP*.

6.2.1.11 Ongoing Management of Biological Resources for Use in Rehabilitation

Management of biological resources required for rehabilitation is detailed in Section 3 of the *Mine Closure MOP*.

6.2.1.12 Mine Subsidence

Areas where underground mining occurred will be monitored for subsidence and cracks. Subsidence remediation progress is tracked through the WWC GIS database. Updates on recent subsidence inspections and monitoring are provided in the Annual Review.

6.2.1.13 Management of Potential Cultural and Heritage Issues

The Complex operates in accordance with the *Aboriginal Cultural Heritage Management Plan* (ACHMP) which was developed to meet the requirements of Schedule 3, Condition 5(k) of PA 09_0203, and in consultation with Aboriginal stakeholders.

A Heritage Assessment was undertaken by Weir Phillips Heritage (2015) and no items of historical significance were identified.

An *Archaeological Constraints and Opportunities Report* was developed by RPS and no Aboriginal heritage constraints were identified.

More details on how heritage is managed by management areas is detailed in Section 6-22 of the *Mine Closure MOP*.

6.2.1.14 Exploration Activities

This section is not relevant as there are no further exploration activities being undertaken at the Complex.

6.2.2 Decommissioning

A detailed register has been prepared which includes an inventory of all assets, including a comment and photograph of all identified equipment. As closure works continue, this register has been regularly updated to reflect the current remaining assets. The asset register as of 2022 is attached as **Appendix E**.

6.2.2.1 Site Security

Safety measures that are implemented at the Complex to prevent unauthorised access to the site include but are not limited to:

- Site security patrols undertaken and the site is fenced and sign-posted;
- 24 hour building security;
- A sign in/sign out procedure for all visitors to the site;
- All visitors and contractors are inducted to site management procedures;
- All visitors to the site are accompanied by an official at all times;
- Restricting access to rehabilitated areas by trail bike riders and four wheel drive operators; and
- A site security system at Teralba Southgate which responds to unauthorised access as required.

6.2.2.2 Infrastructure to be Removed or Demolished

A demolition report was prepared by Liberty Industrial (2015) which included a review of all relevant infrastructure, a method statement and cost estimate to undertake demolition works.

Infrastructure that has been removed and/or demolished is detailed by management area in Sections 6-22 of the *Mine Closure MOP*.

6.2.2.3 Buildings, Structure and Fixed Plant to be retained

Infrastructure to be retained includes light industrial (rail loop, access roads, hardstands and buildings).

Infrastructure to be retained is detailed by management area in Sections 6-22 of the *Mine Closure MOP*.

6.2.2.4 Management of Carbonaceous / Contaminated Material

An extensive review of existing information and in-field sampling to identify the potential for contaminated materials was undertaken by SLR (2016) during the preparation of the *Mine Closure MOP*.

Refer to Sections 6-22 of the *Mine Closure MOP* for details of contaminated material by management area.

6.2.2.5 Underground Infrastructure

This section is not applicable. Underground infrastructure has been mostly removed. Remaining Macquarie Coal underground infrastructure will be managed in accordance with the *Mine Closure MOP*.

6.2.2.6 Hazardous Materials Management

A *Hazardous Materials Report and Plan* (SLR, 2016) was prepared to review the HAZMAT, dangerous goods, and hazardous substances information across the Complex to assess the likelihood of hazardous materials at the site.

Storage of hazardous materials is undertaken in accordance with the relevant legislative requirements and the relevant sections of the *WWC Environmental Management Strategy*.

Historical data indicates that illegal dumping of asbestos containing materials (ACM) has occurred on Macquarie Coal owned lands. A complex-wide ‘unexpected HAZMAT finds’ procedure was developed for any finds during decommissioning.

Further details of hazardous materials by management area are in Sections 6-22 of the *Mine Closure MOP*.

6.2.3 Landform Establishment

Landform establishment is the process of shaping the final landform to a safe, stable and free draining landform that is appropriate for the desired final land use and consistent with the surrounding landscape.

The final shaped landform will be constructed in accordance with the requirements of this document. Rehabilitation has been undertaken progressively, commencing as soon as practicable following the completion of mining related activities.

A Targeted Assessment Program (TAP) was issued to Macquarie Coal by the NSW Resources Regulator on 1 September 2021 requesting that this RMP address certain aspects of landform establishment. The TAP recommendations and Macquarie Coal’s response is detailed in **Table 6-1**.

Table 6-1 2021 Landform Establishment TAP Recommendations and Macquarie Coal Response

Recommendation	Macquarie Coal Response
Consolidate a summary of all the findings of the various rehabilitation and closure risk assessments that have been conducted at the mine. Revised risk assessments should include consideration of risk at the level discussed during the assessment (i.e., long-term settlement of tailings).	Risk assessment updated in June 2022 and is included in Section 3 .

Recommendation	Macquarie Coal Response
Provide further detail on the landform construction quality assurance process to ensure a comprehensive validation that the landform has been constructed in accordance with the design and detail design tolerances.	Landform construction is designed and signed-off in consultation with a geotechnical engineer.
Review material characterisation to ensure testing and assessments consider risks associated with ignition (combustibility) of wastes as well as how these materials will support final land use vegetation, including inevitable tree growth.	There has been no ignition to date with mining having ceased in 2016. Macquarie Coal personnel continue to monitor.
Review the final landform hydrological performance and surface water management requirements in the vicinity of the tailings storage facility and coarse reject emplacement area, noting specific requirements in ANCOLD and now the ICMM Global Tailings Standard Review that stipulates design life requirements for tailings facilities at closure. This review should include consideration of the appropriateness of the northern contour banks capacity and the overflow from the spillway directed towards the small culvert. This review must consider the consequence to the stability of the emplacement in the event these surface water management structures do not contain flows from a significant weather event.	Macquarie Coal will continue to monitor and maintain as required.
A review of the landform design/surface water management is required where erosion scours were noted in the western side of the Western final void. This review should consider the design and performance of the surface water drainage in this area rather than repeating repairs previously undertaken.	Macquarie Coal personnel will continue to monitor and maintain as required.
To assess the long-term stability of final landforms constructed across the site (both currently constructed and proposed), consider using a Landform Evolution Model (LEM) to determine the scope (if any) of management/maintenance requirements that may be needed to address potential erosion issues.	Macquarie Coal personnel will continue to monitor and maintain as required.
The collection of actual erosion field parameters (e.g. soil loss and movement) to facilitate erosion model development and to validate the landform design performance over an extended period of time. This will also facilitate in providing evidence to support the eventual closure and relinquishment sign-off process to demonstrate that the risk of unacceptable long-term erosion from the rehabilitated landform is low.	Records and reports will be kept on hand and will be made available to the Resources Regulator.

6.2.3.1 Water Management Infrastructure

Water management infrastructure to remain on site includes catchment dams, sediment dams, storage dams, spillways and drainage systems.

Details of how this infrastructure will be managed within each management area is provided in Sections 6-22 of *the Mine Closure MOP*.

6.2.3.2 Final Landform Construction: General Requirements

The overarching general requirements for final landform and rehabilitation at the Complex is to ensure that the site achieves a landform appropriate for the selected final land use within the respective management areas.

Macquarie Coal is committed to rehabilitating all areas disturbed by mining to create a final landform that is:

- Free-draining, stable, safe, and non-polluting;
- Compatible with the surrounding landforms and land uses; and
- An aesthetically pleasing landscape that blends into the surrounding topography.

The final landform objectives and requirements within each management area is detailed in Sections 6-22 of the *Mine Closure MOP*.

6.2.3.3 Final Landform Construction: Reject Emplacement Areas and Tailings Dams

The Tailings Dam footprint will be filled with coarse rejects to produce a free-draining landform which blends the tailing area with the REA for a suitable post-mining land use. Final landform construction of the Tailings Dam and REA is further detailed in **Appendix D**.

6.2.3.4 Final Landform Construction: Final Voids, Highwalls and Low Walls

Final voids at the Complex include the South Pit and the Westside final void.

Final land uses around the voids include:

- Existing rehabilitated lands to be retained as bushland;
- Haul roads and access tracks to be retained for light vehicle access;
- Dams J and K to be retained as water for native fauna; and
- Dam B to be retained as an active water management structure to allow discharge from EPA licenced discharge point 2.

Several studies have been undertaken to assess final void water quality and the predicted final void water balance which is included in the *Final Void Management Plan (FVMP)* (GHD, 2010). A more recent study by BMT (2019) completed a hydrodynamic model over a 100-year period predicting future saline and temperature profiles for the Westside final void.

Following the TAP issued in September 2021, minor changes were made to the landform design. Remedial works have been completed.

Further details of the final voids are included in Sections 7 and 8 of the *Mine Closure MOP*.

6.2.3.5 Construction of Creek / River Diversion Works

This section is not relevant. There have been no creek or river diversion works at the Complex.

6.2.4 Growth Medium Development

At present, there are insufficient topsoil resources for rehabilitation available on site. Where there are insufficient volumes, the Complex will source topsoil from external sources, as detailed in the *Materials Management Protocol*. Any material sourced from an outside source will be done in accordance with the *POEO Act*, waste regulations and EPA guidelines.

Onsite borrow pits adjacent to the Tailings Dam and REA, along with overburden from Westside may also be used as onsite sources of growth media. The use of biosolids or compost will most likely be required to further enhance the establishment of suitable vegetation cover.

Growth medium establishment strategies include the following:

- The use of biosolids where topsoil is not available;
- The use of ameliorated subsoil or other suitable growth media (e.g. composted material) spread to a depth of 100 mm where topsoil and biosolids cannot be used;
- Hydro-seeding will be used on steeper slopes to ensure vegetation is established quickly to provide erosion protection;
- Growth media will be spread with a grader or a dozer. This will consist of a single pass application of the spreading of topsoil/subsoil to not overwork, over roll, or over track the material causing excess compaction and structure loss; and
- Spreading of fertiliser and/or gypsum using a mechanical spreader prior to ripping if required.

Temporary rehabilitation will be undertaken to control wind-blown dust. This will most likely occur in the tailings dam and REA areas.

Maintenance during growth medium establishment includes ripping, amelioration and seeding. Weeds are controlled in accordance with the *Weed Action Plan*. Erosion and sediment control procedures will be implemented in accordance with the *MCPP Water Management Plan* and the *Erosion and Sediment Management Plan*.

6.2.5 Ecosystem and Land Use Establishment

This section provides details on the methodologies that have been implemented to establish and manage vegetation communities for the intended final land use. Approved final land use at the Complex includes bushland and pasture.

Site specific ecosystem and land use establishment methodologies include:

- Ripping to a depth of 300 mm with a type spacing of 0.75 – 1 m along the contour in all management areas except for the tailings dam and REA. Ripping is used immediately prior to seeding to incorporate ameliorants, fertiliser and assist with the prevention of land slip, vegetation penetration, encourage water infiltration and percolation and minimise erosion. Large rocks that become exposed are raked aside and reburied;
- Surfaces are harrowed to a depth of 100 mm after application of growth media and immediately prior to seeding in Management Areas 7 and 9;
- Direct seeding is undertaken by hand seeding, a seed spreader or helicopter with consideration to the area being seeded, site safety, timing, site access and associated efficiencies and economy. As the Complex is in a coastal area, direct seeding can be undertaken year-round as required;
- Hydro-mulching will be used to enhance pasture establishment areas such as the Northern Embankment of the capped and covered TSF and REA. Seed, fertiliser, mulch, soil binder and water will be thoroughly mixed in a hydro-mulcher to provide slurry and then applied under pressure onto the batter using selected rates for fertiliser and pasture seed. Wood-fibre mulch will be included at 2.5 tonnes/ha and polymer binder at 250 litres/ha;
- Native tree, understorey and Acacia species will be established by directly seeding at a rate of 7.5 kg/ha with a seasonal cover crop (millet in spring and oats in autumn at 2 kg/ha);
- A suitable di-ammonium phosphate (DAP) fertiliser will be applied at 300 kg/ha; and
- A mixture of seasonal cover crop (millet in spring/summer, oats in autumn/winter at 10 kg/ha) and pasture species at a rate of 45 kg/ha.

Seed species used for rehabilitation will be constantly reviewed and revised based on monitoring results. Weed and pest management is undertaken in accordance with the *WWC Biodiversity and Land Management Plan* and the *Weed Action Plan*.

6.2.6 Ecosystem and Land Use Development

Activities associated with the ecosystem and land use development phase of rehabilitation are generally ongoing maintenance, land management activities and rehabilitation monitoring. Maintenance at rehabilitated areas will include, but not be limited to:

- Weeds and pest animal control;
- Bushfire protection works;
- Minor earthworks to remediate any significant erosion features, including contour banks and diversion channels;
- Infill planting and/or seeding to meet vegetation community requirements; and
- Maintaining erosion and sediment controls.

Macquarie Coal have developed a formal rehabilitation monitoring program to assess the progress of rehabilitation areas toward the nominated completion criteria. Rehabilitation monitoring will be undertaken until it can be demonstrated that rehabilitation areas have met all conditions for relinquishment.

Areas that are intended for future agricultural use will involve liaison between the future landowner and the government agencies regarding how these areas will be managed. Rehabilitation monitoring is discussed in **Section 8**.

6.3 Rehabilitation of Areas Affected by Subsidence

Areas where underground mining occurred will be monitored for subsidence and cracks. Subsidence remediation progress is tracked through the WWC GIS database. Updates on recent subsidence inspections and monitoring are provided in the Annual Review. As of 2022, subsidence remediation has been completed. An ESF2 form will be submitted once the subsidence cracks are stable and National Parks is satisfied with the remedial works.

7. Rehabilitation Quality Assurance Process

Macquarie Coal has its own *Project Quality and Monitoring Plan* which is used to validate rehabilitation progress. In addition, contractors are to provide their own Quality Management Systems which is required to comply with AS/NZS IS 9001:2000. The systems define how the requirement of the works are met and what records are used to ensure compliance including Inspection and Test Plans (ITPs).

During closure planning, ATC Williams reviewed the long-term stability of the Tailings Dam and REA landforms, as well as other embankments on the dams being retained. The Tailings Dam and REA are subject to routine inspections by a certified engineer and a dam inspection / report is required by Dams Safety NSW.

8. Rehabilitation Monitoring Program

8.1 Analogue Site Baseline Monitoring

Analogue sites provide a benchmark for completion criteria and are an integral part of rehabilitation monitoring. During closure planning, SLR prepared a *Rehabilitation and Closure Criteria Report* (2016) which refined the existing criteria and key aspects such as importance / relevance of criteria to future site success, importance of indicators, and expected ability to achieve closure criteria. Closure Criteria is detailed in **Section 4**.

Six analogue sites for bushland and pasture rehabilitation monitoring were established at Westside. The monitoring results have been used to track progress towards completion criteria and inform any further monitoring frequency requirements. As closure criteria are approached, monitoring frequency has decreased.

8.2 Rehabilitation Establishment Monitoring

Rehabilitation monitoring is undertaken in accordance with the *WWC Biodiversity Management Plan*, *Glencore's Closure Criteria Development and Rehabilitation Monitoring*, and the *Detailed Mine Closure Plan* (DCMP).

Monitoring activities include:

- Rehabilitation and revegetation methodology records;
- Annual walkover inspections;
- A long-term rehabilitation program.

Regular monitoring will occur where rehabilitation has taken place in previous underground mining areas. Inspections will be in accordance with site procedures and continue until area is deemed to be self-sustaining. Both visual inspections and photo points will be used and will focus on:

- Germination rates;
- Success rates of tube stock;
- Weed and feral pest infestation; and
- General conditions.

MCP and Westside currently record the details of each rehabilitation and revegetation effort for later rehabilitation results comparisons. This allows for continued improvement of rehabilitation and revegetation standards on site. The key monitoring parameters included in the program are:

- Details of landform design;
- Details of drainage design;
- Characterisation of the substrate;
- Site preparation techniques (e.g. topsoil and source, time of sowing, soil ameliorants used, etc.);
- Revegetation methodologies (e.g. rate and type of fertiliser, cover crop and rate, seed viability);
- Weather;

- Photographic records; and
- Initial follow-up care and maintenance works.

Annual Rehabilitation Inspections

Annual inspections will be undertaken by suitably qualified personnel. Records will include:

- Germination rates of vegetation;
- Presence of second generation seedlings;
- Plant/tree health;
- Any treeless areas;
- Feral animal presence and management requirements;
- Requirements for additional planting;
- Need for fertiliser application;
- Requirement for lime or gypsum to control pH and improve soil structure;
- Presence of any excessive compaction or 'crusting' affecting plant growth;
- Erosion and the need for repair;
- Fuel loads and need for fire management;
- Quality and effectiveness of fencing;
- Signs of human or animal disturbance; and
- Success of any management programs implemented following previous monitoring inspections.

Long-Term Rehabilitation Monitoring

Long-term monitoring will commence when revegetation levels have achieved a level of maturity so that floristic aspects can be recorded accurately. This will be done by a suitably qualified person(s).

Methods for monitoring will include success-based rehabilitation monitoring and 20 m x 20 m quadrats that are suitable for measuring floristics of vegetation communities. This allows for early success-based information and obtains floristic data that shows the progression of rehabilitation and regeneration. Other long-term monitoring includes a fauna habitat assessment and biodiversity monitoring which is done in accordance with the Westside *Flora and Fauna Management Plan*.

VCA Monitoring

Westside also annually reports on monitoring results on the three VCAs. VCA monitoring includes, at a minimum:

- Monitoring of the *Tetratheca juncea*, populations at four monitoring sites within the VCA. This species is listed as vulnerable under the *Threatened Species Conservation Act 1995* (NSW), and the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth). The objective of the program is to ensure that the species is preserved within the area;
- Floristic monitoring within VCA area C including diversity and structure within permanent transects. The vegetation in this area is part of *Swamp Sclerophyll Forest on Coastal Floodplains* endangered ecological community (EEC) and the objectives of the monitoring are to assess any changes in floristic composition or vegetation structure;
- Weed mapping; and

- Fauna habitat assessment.

Monitoring results are provided in the Annual Review.

8.3 Measuring Performance Against Rehabilitation Objectives and Rehabilitation Completion Criteria

Monitoring is expected to continue across the Complex until the rehabilitation and revegetation has completely fulfilled the closure criteria. Monitoring results will be used to refine closure criteria and identify areas that require improvements or adaptations.

Inclusive of the monitoring detailed in **Section 8.2**, the overall goal is to achieve a positive feedback loop between monitoring and adaptive management. Adjustments will be made as soon as reasonably practicable, where necessary, in response to any new data gained from monitoring.

The results of the monitoring will inform further monitoring frequency. Ideally, the frequency will decrease as completion criteria, performance levels and /or stability are achieved.

Intervention and adaptive management strategies are detailed in **Section 10**.

9. Rehabilitation Research, Modelling and Trials

9.1 Current Rehabilitation Research, Modelling and Trials

No rehabilitation trials were undertaken as part of the closure planning procedure at the Complex as rehabilitation success at the Westside Mine demonstrated that the methodologies being used were adequate.

A coal ash (fly ash and pond ash) capping trial was undertaken on the Tailings Dam which was completed in June 2020. This ash is used to help stabilise the TSF and rehabilitate the land to an area that is free-draining. The method was investigated as means to provide an initial capping layer to facilitate the safe and timely capping of the TSF. The use of coal ash was the preferred method as it provided a safe method for placement of an initial capping layer without the need to traffic over the tailings until the layer is complete.

A *Contamination Site Assessment* was undertaken by Tetra Tech Coffey at Teralba Southgate in 2021. The purpose was to assess the identified soil and groundwater data gaps to inform future stages of mine closure and the potential requirements for rehabilitation and/or management of identified contamination.

9.2 Future Rehabilitation Research, Modelling and Trials

Key learnings from previous trials have been incorporated into rehabilitation and closure operations at the Complex. Following the Fly Ash trial, Macquarie Coal has now placed fly ash on 1/3 of the dam with geotextile reinforcement used in the weaker, central area of the dam.

Geotextile trials will commence in 2022 which will add strength to the tailings crust and allow fly ash placement and conventional capping to take place.

10. Intervention and Adaptive Management

Where rehabilitation monitoring indicates that rehabilitation outcomes are not trending toward the nominated completion criteria, early intervention and adaptive management will be instigated to minimise the potential for rehabilitation failure. Identification of threats to rehabilitation and the subsequent intervention is discussed in the sections below.

10.1 Threats to Rehabilitation

Unpredictable events such as bushfires, droughts and floods may present risks to rehabilitation both during the life of mine and post closure. These events generally have significant consequences for rehabilitation quality and are likely to require adaptive management to mitigate risks and achieve relinquishment of affected rehabilitation areas within a satisfactory timeframe.

Although these events may have a high degree of unpredictability, monitoring the status of contributing factors enables an assessment of the likelihood of a major impact to rehabilitation occurring. For example, measuring fuel loads in and adjacent to bushland rehabilitation areas informs a periodic assessment of the likelihood of a bushfire event.

Other major risks to rehabilitation may not present as sudden events, but as an increasing impact over an extended period. For example evolution of regulator or community expectations regarding post mining land-uses may present a risk to achieving relinquishment, or increasing feral pest numbers may increase pressure on native fauna and vegetation communities.

Key threats to rehabilitation were identified in the Risk Assessment (discussed in **Section 3** and attached as **Appendix B**). Where rehabilitation monitoring indicates that there is a significant threat to rehabilitation, the Complex will undertake adaptive management.

10.2 Trigger Action Response Plan

The following TARP for rehabilitation has been developed to identify required management actions in the event of impacts to rehabilitation, or where rehabilitation outcomes are not achieved in an acceptable timeframe. Where necessary, rehabilitation procedures will be amended accordingly with the aim of continually improving rehabilitation standards. The Complex will notify the Resources Regulator and other relevant stakeholders of any incident resulting in major impacts to rehabilitation.

The responses specified within the TARP have been based upon the rehabilitation completion criteria developed during the preparation of the Mine Closure MOP and the current rehabilitation monitoring program.

Monitoring of the TARP will be undertaken as outlined in the rehabilitation monitoring program. The rehabilitation monitoring program will trigger response actions, as specified in the TARP to ensure that threats to rehabilitation do not become unmanageable.

The TARP is provided as **Table 10-1**, and will be reviewed and may be revised as conditions at the Complex change or new threats to rehabilitation are identified.

Table 10-1 Trigger Action Response Plan

Aspect / Category	Key Element	Element Number	Trigger Response	1st Level Trigger	2nd Level Trigger
Landform stability	Slope gradient	1	Trigger	Slopes >10° but <14°, unless assessed to be stable.	Slopes >15°, unless assessed to be stable.
			Response	Undertake re-grading and revegetation of the area.	Undertake a review of the landform design, including survey if required. Undertake re-grading and revegetation of the area.
	Erosion control	2	Trigger	Minor gully or tunnel erosion present and/or minor rilling (rilling up to 200 mm in depth).	Slumping and /or significant gully or tunnel erosion present and/or significant rilling.
			Response	An inspection of the site will be undertaken by a suitably trained person. Investigate opportunities to install water management infrastructure to address erosion. Remediate as appropriate.	Engage a suitably qualified person to assist with the management of erosion and sedimentation at the site and provide recommendations to appropriately remediate the erosion. Remediate as soon as practicable.
	Free Draining Landforms	3	Trigger	Landforms exhibiting minor ponding.	Landforms exhibiting significant drainage issues, threatening or causing material harm to the environment.
			Response	An inspection of the site will be undertaken by a suitably trained person. Investigate opportunities to address issues. Remediate as appropriate.	Undertake a review of the landform design, including survey if required. Undertake re-grading and re-vegetation of the area.

Aspect / Category	Key Element	Element Number	Trigger Response	1st Level Trigger	2nd Level Trigger
	Water management Structures	4	Trigger	Water management structures (sediment dams, channels, contour banks) minor erosion and/or scouring.	Water management structures fail or display significant scouring / erosion.
			Response	An inspection of the site will be undertaken by a suitably trained person. Identify remedial actions such as amelioration, re-vegetation or alternative scour protection.	Engage suitable person to develop a site-specific remediation plan and review water management structure design criteria.
	Settlement of the Landform	5	Trigger	Minor settlement or slumping observed on the landform. Evidence of shallow ponded water present.	Significant settlement or slumping observed on the landform with significant areas of ponded water retained on the landform.
			Response	An inspection of the site will be undertaken by a suitably qualified surveyor to take survey. Identify remedial actions such as minor reshaping or filling on the areas affected. Revegetation disturbed is to be repaired.	An inspection of the site will be undertaken by a suitably qualified surveyor to take survey Engage suitable engineer to develop a site specific remediation plan that could include filling and reshaping of the landform to ensure water does not pond.
Water Quality	Water quality (LDP1)	6	Trigger	Water quality exceeds baseline or closure criteria values.	Long term upward trend outside relevant water quality parameters or guideline limits values.

Aspect / Category	Key Element	Element Number	Trigger Response	1st Level Trigger	2nd Level Trigger
			Response	Review and investigation of water quality monitoring and management where appropriate. Implement relevant remedial measures where required.	Hydrologist (or similar specialist) to review sampling and climate data and review likely cause(s). If mine related, undertake assessment to identify sources of water quality degradation and recommend remedial actions.
	Discharge water quality at licence discharge points	7	Trigger	Sediment basin discharge exceeds EPL criteria for pH, TSS, EC and oil/grease.	Long term trend outside relevant water quality parameters or guideline limits.
			Response	Repeat sampling to confirm results exceed limits, and investigate potential causes.	Review sediment basin maintenance and discharge procedures, and sediment basin capacity requirements.
Soil/capping material qualities	Salinity	8	Trigger	Increasing trend in soil/water salinity levels.	Presence of salt scalds.
			Response	Undertake testing to verify EC and recommend further soil amelioration.	Engage a suitable person to develop a site specific management report to be implemented to remediate salinity scalds.
	Soil suitability	9	Trigger	Soils tested for pH, EC, ESP, macronutrients and trace elements and found to be not appropriate for post mining land use.	Soils tested for pH, EC, ESP, macronutrients and trace elements and found to well outside appropriate levels required for the post mining land use.

Aspect / Category	Key Element	Element Number	Trigger Response	1st Level Trigger	2nd Level Trigger
			Response	Undertake further more detailed sampling across the rehabilitation areas.	Engaged a suitably qualified soil scientist / agronomist to review data and undertake further testing to determine required amelioration and undertake amelioration as required.
	Topsoil depth	10	Trigger	Topsoil is not reinstated at the minimum depth specified for the proposed final land use.	Sufficient suitable topsoil cannot be identified for reinstatement at the minimum specified depth for the proposed final land use.
			Response	Top dress with additional suitable topsoil resource. If additional suitable material is not immediately available stabilize the area with cover crop until additional suitable topsoil is sourced and re-replaced.	Undertake a review of the topsoil balance to confirm sufficient material to meet minimum depth requirements. Investigate suitable topsoil resource substitutes if required.
Biodiversity (native vegetation areas)	Ground Cover Percent	11	Trigger	Ground cover is less than 70% at Year 1.	Vegetative cover is 50% or less at year 1.
			Response	Undertake a field survey to identify likely causes of unsatisfactory germination rates. Re-seed areas with unsatisfactory cover. Review seeding procedures incl. seasonal mixes, timing and seed rate per hectare.	Engage a suitably qualified specialist to investigate causes for germination failure and recommend remedial actions. Implement appropriate management actions including revising rehabilitation procedures if required.
	Weed presence	12	Trigger	Six months following seeding, weed presence poses a risk to the establishment of rehabilitation areas.	Six months following seeding, weed presence poses a significant risk of rehabilitation failure.

Aspect / Category	Key Element	Element Number	Trigger Response	1st Level Trigger	2nd Level Trigger
			Response	Engage weed management contractor to remove / spray introduced weed species.	Engage weed management contractor to remove introduced weed species. Investigate management measures to improve native plant establishment and weed suppression including additional soil amelioration, establishment and retention of cover crops until weed presence is at acceptable levels. Implement recommendations as appropriate.
	Vegetation Health	13	Trigger	Vegetation health index not in the range of analogue sites.	Long term declining trend in vegetation health index.
			Response	Undertake a field survey to identify likely causes of unsatisfactory vegetation health.	Engage ecologist to undertake investigation to determine the cause of change. Prepare a site-specific management plan that aligns with the MOP.
	Pest animal species presence	14	Trigger	Pest animal species presence poses a risk to the establishment of rehabilitation.	Pest animal species presences poses a significant risk of rehabilitation failure.
			Response	Consult with the Livestock Health and Pest Authorities (LHPA) to recommend and implement appropriate pest animal control campaign.	Consult with LHPA to recommend and implement appropriate pest animal control campaign. Engage a suitably qualified specialist to prepare a site management plan and implement recommendations such as augmenting pest animal exclusion fencing and

Aspect / Category	Key Element	Element Number	Trigger Response	1st Level Trigger	2nd Level Trigger
					re-vegetation.
	Native fauna presence	15	Trigger	Loss or deterioration inside of design life of nest boxes, or pest animal species usage of nest boxes, (including ants and feral honeybees)	Decline in trend in recorded fauna numbers and/or presence and abundance (allow for natural variation occurring in analogue sites)
			Response	Replace damaged / lost nest boxes. Relocate and replace boxes adopted by ants and honeybees.	Engage ecologist to undertake investigation to determine the cause of change. A site-specific management report to be prepared and implemented where necessary that aligns with the RMP.

11. Review, Revision and Implementation

Ongoing monitoring and review on the performance and implementation of this RMP will be undertaken in accordance with the relevant project approvals. The RMP will be revised if necessary, annually or, in accordance with Schedule 6, Condition 5 of PA 09_0203, within three months of the submission of:

- An updated or additional management plan;
- An audit report;
- An Annual Review;
- An approval to modify the development consent.

The RMP may also be revised due to:

- Identification of deficiencies;
- Recommendations from rehabilitation monitoring events;
- Changes to environmental requirements due to (for example) changed legislation or regulatory requirements; and
- Changes to the operations or activities described in this RMP.

Any major amendments to the RMP that affects the application will be undertaken in consultation with the appropriate regulatory authorities and stakeholders. Any amendments would be completed in accordance with the latest RMP guidelines.

Macquarie Coal personnel are responsible for monitoring, reviewing and implementing this RMP, as listed in the following table.

Table 11-1 Responsibilities for RMP Implementation

Position	Responsibility
Macquarie Coal Operations Manager / Closure Project Manager	<ul style="list-style-type: none"> • Implement the procedures and plans referenced in this RMP; • Undertake training in the relevant management plans and procedures as required; • Provide resources and support required to implement this RMP; • Undertake mining operations in accordance with this RMP and manage operations to allow for progressive rehabilitation in accordance with this RMP.
Macquarie Coal and Environment Community Manager	<ul style="list-style-type: none"> • Implement, monitor and review programs and procedures associated with this RMP; • Consult with regulatory authorities as required; • Provide environmental training and assess the competence of all relevant personnel (as required) to implement this plan; • Report the progress of rehabilitation and biodiversity monitoring in the Annual Review.

Position	Responsibility
Macquarie Coal Environmental Officer	<ul style="list-style-type: none">• Provide support to the Environment and Community Manager for RMP implementation as required.
All employees and contractors	<ul style="list-style-type: none">• Comply with the requirements of this RMP; and• Report environmental incidents and/or community complaints immediately to their supervisor.

12. References

Australia and New Zealand Environment and Conservation Council (ANZECC) (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.

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Appendix A - Mine Closure MOP

The Mine Closure MOP can be found on the Macquarie Coal Complex website located at the following link:

<https://www.glencore.com.au/operations-and-projects/coal/past-operations/macquarie-coal/management-plans>

Appendix B - Risk Assessment

Macquarie Coal RMP Risk Assessment

Green = Still Applicable
 Cream = risk from Targeted Assessment Program (TAP) guidance

NOTE: Hidden cells in the risk register were not considered applicable to the RMP RA

Site	Type of Risk Assessment	Key Element (CURA Context/Category)	Risk Description - Something happens.....	Consequence - resulting in:	Causes - Caused by	Existing Control Description	RMP Status	Risk Control Effectiveness	Expected Consequence Category	Expected Risk Consequence	Risk Likelihood	Current Risk Rating	Potential Maximum Consequence	Potential Maximum Category	Treatment Plans/comment
Macquarie Coal	Major Project	Management area: Admin workshop and haul road	Approval from appropriate authorities is required to rezone/repurpose the facility (i.e. Council DA amendment) - rezoning	Additional costs and delays	LTA planning	More information / knowledge around the rezoning requirements and options Legal requirements and rezoning included in closure planning	Still Applicable	3	Legal & Compliance	3	E	6	3	Legal & Compliance	Unlikely to be required by Glencore as rezoning most likely to be done by future land owners to suit their needs.
Macquarie Coal	Major Project	Management area: Admin workshop and haul road	Haul road and culvert deteriorates	Haul road and/or culvert is no longer usable Road cannot be used to haul cover material from Westside	Changes to LTA maintenance	Haul road is presently maintained by operations. Post operations the haul road will need to be maintained. Culvert works designed and costed Haul road to be transferred to post mining land user	Still Applicable	3	Health & Safety	2	E	3	2	Health & Safety	Minor risk and could be removed to consolidate risk assessment
Macquarie Coal	Major Project	Management area: South West Pit	Overburden dumps (Westside) settle over time and slump	Changes to water management, ponding, and rehabilitation failure	Overburden not placed to any specific compaction standards	Westside RMP Existing survey Monitoring and Inspections No geotechnical issues identified in Geotech Constraints works	Still Applicable	3	Financial	1	D	2	1	Financial	Any issues picked up in ongoing monitoring and maintenance
Macquarie Coal	Major Project	Management area: South West Pit	Contaminated sediment run off from borrow pit	Poor quality water discharges to the environment	Inadequate erosion and sediment controls in landform considerations Inadequate surface water management	Increase Dam F in surface water strategies by ~10 ML Landform design including erosion controls Surface Water Assessment and Plan considered in closure planning	Still Applicable	3	Environment	2	D	5	3	Environment	Risk remains
Macquarie Coal	Major Project	Management area: South West Pit	Approvals not granted for load and haul of overburden cover material to tailings dam and REA	Delay to execution of capping and final landform Alternative cover materials required Additional costs	Regulatory constraints Inadequate understanding of approvals time frame	Approvals strategy by experienced planning and approvals team closure planning process including RMP Stakeholder Engagement Plan Considered in Range Analysis of costs	Still Applicable	3	Financial	3	E	6	3	Financial	No approvals constraints identified for this.
Macquarie Coal	Major Project	Management area: Westside Final Void	Slippage or failure of highwall/low wall when void fills	Failure of walls and uncontrolled water movement/ flows (i.e. no spillway)	Inadequate inspection and classification of dam with DSC. Spillway not built	Detailed design of the spillway underway and construction planned Vegetation works planned for high water level area to avoid slippage	Still Applicable	3	Environment	3	E	6	3	Environment	Monitoring to date so no issue and geotechnical assessment in mine closure plan suggest it will be stable long term.
Macquarie Coal	Major Project	Management area: Westside Final Void	Unacceptable water quality in final void post closure	Unable to relinquish lease Additional costs for water treatment Constraints to post mining land use	Accumulation of salts due to closed catchment and stratification	Surface Water Assessment and Plan (COMPLETED) Water quality monitoring Monitoring of potential contamination from disposed sediment Monitoring of water quality and hydraulic gradient completed. Longterm water quality suggests there wont be issues.	Still Applicable	3	Financial	3	E	6	3	Environment	Long term model completed with regular detailed monitoring informing model. Long term predictions suggest long term water we remain fine for recreation use.
Macquarie Coal	Major Project	Management area: VCA	Management obligations unmet	Inability to package with assets for transfer Additional costs required for revegetation and/or maintenance and management	Inadequate review of VCA quality and monitoring results against goals/objectives	Ecology Constraints Report recommendations to seek advice on transfer/sale options Maintenance and management planned CMO to be used as an active management system	Still Applicable	3	Financial	2	D	5	2	Financial	Site going through process of splitting up VCA areas to be attached to each individual land parcel.
Macquarie Coal	Major Project	Domain 5 - VCA	Geotechnical instability in old auger mining area in VCA B	Landform erosion and failure Injury to fauna Unable to relinquish area Additional costs for rework	Old auger workings subsidence and strata failure	Previous remediation undertaken Differential GPS mapping planned with exclusion fencing Auger subsidence investigation and remediation planned Auger remediation monitoring planned	Risk Removed	3	Health & Safety	3	E	6	3	Health & Safety	

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Macquarie Coal	Major Project	Management area - Pit top facilities	Unknown contaminated land volumes require management at closure	Contamination adversely impacts the environment Increased cost to remediate	Leaks, spills etc. Past poor practices	Contamination Site Assessment completed and strategies determined Asbestos impacted soils delineation investigation and removal planned Sampling of dam sediment planned STP decommissioning and contaminated soil disposal planned		3	Environment	3	E	6	3	Environment	Contamination testing completed across the site including sediment dam sediments, only issue found requiring remediation was a small amount of hydrocarbon contamination found which was removed from site to a licensed waste facility.
Macquarie Coal	Major Project	Management area - Pit top facilities	Inadequate management of Sewage Treatment Plant during closure	Additional costs and delays for management and use during closure	LTA planning	Project execution and operations plans to be developed as outlined in the closure planning STP decommissioning and contaminated soil disposal planned	Still Applicable	3	Environment	3	E	6	3	Environment	Former sewerage treatment system removed with new system installed with local government approval. Ongoing management and monitoring required by council approval with regular council inspections.
Macquarie Coal	Major Project	Management area: Pit top facilities	Discharge of sediment laden water post operations	Uncontrolled discharge off site Adverse impacts to areas downstream outside of EPL limits	LTA planning of post mining water management Erosion in Westside low grade (Emergency) coal stockpile at MCPP	Surface Water Assessment and Plan includes retention of the current system Maintenance for desilting and dewatering dams Water quality monitoring	Still Applicable	3	Environment	2	D	5	2	Environment	Existing EPL and pollution controls in place. Once rehab has been signed off approval will be sort form the NSW EPA to remove EPL licence across the site.
Macquarie Coal	Major Project	Management area: Pit top facilities	Location of existing services does not facilitate final land use	Unable to utilise existing services for post closure land use Additional costs to remove services, meet alternate post mining land use	Existing site layout	Land use decision Post closure site services plan Infrastructure retention/ demolition plan reviewed based on post mining land use and updated	Still Applicable	3	Financial	2	D	5	2	Financial	No longer a risk as future development will either utilise or remove remaining services
Macquarie Coal	Major Project	Management area: Tailings Dam	Final capping strategy for dam is not accepted	Major re-work of dam required Additional costs	DRE consultation removed from scope	SLR/ ATC completed capping and final landform design including seismic and DSC requirements Consultation with DSC planned within Phase Two forward works	Still Applicable	3	Financial	3	E	6	3	Financial	Site plans to install free draining land form on the tailings dam as a cap. Long term consolidation modelling suggest significant consolidation that needs to be considered in capping predictions. The long term consolidation model predicts a significant amount of tailings consolidation post capping due to weight of material. Key Action to redo consolidation modelling post capping to inform final capping design.
Macquarie Coal	Major Project	Management area: Tailings Dam	Efficient construction of the final TSF cap cannot be achieved in 5 years	Additional costs and delays in cap construction	Shear strengths in the TSF are unknown	Phase Two forward works to be completed to determine shear strengths etc. and inform construction strategy and timeline Phase Two commencing Q4 2016	Still Applicable	2	Financial	3	C	13	5	Financial	Current tsf capping expected to be completed in 2025.
Macquarie Coal	Major Project	Management area: Tailings Dam	Excessive dust levels at tailings dam and REA	Complaints Non-compliance	LTA dust control	Dust suppressant applied to part of the tailings dam No dust issues observed to date Temporary seeding will be considered during drilling program	Still Applicable	3	Community / Reputation	2	D	5	3	Community / Reputation	To has not been and issue. Dust managed with water cart, dust pressaion sprays on flyash stockpile and nearby real time dust monitors.
Macquarie Coal	Major Project	Management area: Tailings Dam	Long-term instability and failure of the tailings dam at MCPP	Public safety issues Impact to land/soil or water courses Inability to reach closure and relinquish lease	Geotechnical failure and Tailings Dam Design	TSF/REA Phase One FoS assessment completed for strategy Section 100 design MCPD Tailings Dam Management Plan (includes regular dam wall piezometer testing and annual inspections by a Geotechnical Consultant) TSF & REA Post Closure Management Plan planned Monitoring to include consolidation, piezometers and annual surveillance inspections	Still Applicable	3	Environment	5	E	15	5	Environment	Tailings dam considered long term stable including site specific earthquake analysis.

Site	Type of Risk Assessment	Key Element (CURA Context/Category)	Risk Description - Something happens.....	Consequence - resulting in:	Causes - Caused by	Existing Control Description	RMP Status	Risk Control Effectiveness	Expected Consequence Category	Expected Risk Consequence	Risk Likelihood	Current Risk Rating	Potential Maximum Consequence	Potential Maximum Category	Treatment Plans/comment
Macquarie Coal	Major Project	Management area: Tailings Dam	Structural integrity of decant water point is inadequate	Unable to use decant water point Additional costs and delays	Water point lowered too quickly causing tailings blockage	Water point is regularly inspected and included on maintenance items Other pumping options exist Decant point to be sealed	Still Applicable	3	Financial	1	D	2	1	Financial	Decant pipeline grouted so no longer can be used. Manual operated decant sump in place with spillway from dam to be used for large rainfall events.
Macquarie Coal	Major Project	Management area: Tailings Dam	Water pools continuously on the dam	Dam is unable to dry out in locations to facilitate capping	Low areas in dam	Decant water point Pipeline dewatering strategy planned Regular inspections of dam Dam operational plan considers final profile	Still Applicable	3	Financial	2	D	5	3	Financial	No change to risk
Macquarie Coal	Major Project	Management area: Tailings Dam	Excessive costs associated with sourcing required capping material (non-rejects) available to meet specifications	Additional costs for approvals and to borrow materials Inability to relinquish lease Additional costs to rework rehabilitation	Proximity to available cover material Cover thickness	Concept design Overburden available at Westside included in approval strategy Borrow pit investigations and cost analysis Erosion modelling planned for reduced thickness of cover	Still Applicable	3	Financial	2	D	5	2	Financial	No change to risk, budget on track as planned
Macquarie Coal	Major Project	Management area: Tailings Dam	Tailings dam capping settles over time and slumps greater than predictions	Ponding and infiltration Rehabilitation failure Changes to water management	Insufficient compaction during capping	Ongoing aerial imagery Engineering design Section 100 Truck dumping results in compaction of rejects Compaction assessment done as part of TSF strategy Phase Two study planned to assess shear strength and determine likely settlement		3	Financial	2	D	5	2	Financial	As per risk from line 34, however long term monitoring and maintenance needs to occur.
Macquarie Coal	Major Project	Management area: Tailings Dam	Disposal of materials to tailings leads to contamination	Land contamination Surface water and/or groundwater contamination	Runoff and water quality impacts from contaminated soils disposed on TSF	Disposal of potential contaminants minimised based on Contamination Site Assessment findings Environmental monitoring to include tailings water Piezometers installed on TSF northern embankment will monitor water quality	Still Applicable	3	Environment	2	D	5	2	Environment	No change
Macquarie Coal	Major Project	Management area: Rejects Emplacement Area	Failure to manage rejects and stockpile pad material in the closure process	Impact on the environment Inability to reach closure and relinquishment of the lease	Inappropriate final emplacement at closure	Landform and earthworks considerations Geochemistry investigation undertaken Section 100 Strategy determined for disposal to tailings dam	Still Applicable	3	Financial	3	E	6	3	Financial	No change
Macquarie Coal	Major Project	Management area: Rejects Emplacement Area	Unsuitable/contaminated material imported to site for use in capping of REA/tailings	Impact on the environment Inability to reach closure and relinquishment of the lease Increased costs	Lack of quality control of material	Procedure - Receipt of Materials for Offsite, including contracts with suppliers, certification, consultation etc. Construction QA/QC to be undertaken including borrow material	Still Applicable	3	Financial	2	D	5	2	Financial	No change
Macquarie Coal	Major Project	Management area: Rejects Emplacement Area	Higher than predicted erosion on the final landform	Gullies and rills Landform failure Contaminated run off (sediment) re-work required	Inadequate landform considerations	Landform design undertaken Erosion modelling undertaken on landform with controls e.g. contour banks - very low rates predicted Rehabilitation maintenance and monitoring planned	Still Applicable	3	Financial	2	D	5	4	Financial	Monitoring and maintenance regime in place
Macquarie Coal	Major Project	Management area: Surface Facilities	Ongoing maintenance of rail loop required	Additional costs	Current plan is to keep the rail loop which may require ongoing maintenance	Current maintenance program exists for rail loop	Still Applicable	3	Financial	2	D	5	2	Financial	Rail loop remains in place.
Macquarie Coal	Major Project	Management area: Surface Facilities	Existing rail embankment landform is inadequate for closure	Additional costs Flooding of area Geotechnical instability (slumps, etc.) Unable to relinquish area based on post mining land use	Inadequate embankment wall design for closure	Rail loop assessment in geotechnical constraints and surface water assessment Surface Water Assessment & Plan includes drainage options Drainage option to be implemented based on final land user	Still Applicable	3	Financial	2	D	5	2	Financial	No change
Macquarie Coal	Major Project	Management area: Surface Facilities	Poor quality water discharged off site	Non-compliance Adverse impacts on aquatic ecology Fines Loss of regulator confidence	Contamination on site Site fill geochemistry Water management and pumping to access sediments for removal	Water quality monitoring Surface Water Assessment & Plan including Catch Dam settling systems	Still Applicable	3	Financial	2	D	5	2	Financial	Still relevant

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Macquarie Coal	Major Project	Management area: Teralba Northgate	Unknown contaminated land volumes require management at closure	Contamination adversely impacts the environment Increased cost to remediate	Leaks, spills etc. Past poor practices	LQ/Contamination sampling and assessment completed Contamination removal and disposal planned	Still Applicable	3	Environment	1	D	2	1	Environment	Still relevant
Macquarie Coal	Major Project	Management area: Teralba Southgate	Leaking methane from seal	Additional costs Explosive incident/event	LTA monitoring of methane Inadequate long-term seal design/process	Secured access to the area (fenced) Seal designs completed for leaking shafts Methane strategy confirmed to include excavation, underground and surface detection monitoring Sealing and monitoring planned	Still Applicable	3	Health & Safety	3	D	9	3	Health & Safety	Methane monitoring to date around sealed shafts so minimal to nil methane emissions.
Macquarie Coal	Major Project	Management area: Project Approval Area	Sealing strategies for subsidence ineffective	Poor impacts on reputation Increased costs to remediate	Inadequate technology Continued cracking long-term (inadequate predictions) Inadequate resources to determine methodology	Ongoing monitoring Trials Studies Resources required for works planned based on methodology strategies	Still Applicable	3	Financial	3	E	6	4	Financial	Subsidence remediation complete with monitoring confirming majority of remediation completed stable and only minor maintenance required.
Macquarie Coal	Major Project	Sealing	Unconfirmed adequacy of seal design	Additional costs Inability to relinquish the site Significant residual risk payments required	Inadequate knowledge on gas pressures, water pressures, etc.	Sealing design and strategy in the scope for works underway and planned Sealing inspections Methane monitoring planned Technical specifications and designs reviewed by DRE GCAA peer review	Still Applicable	3	Financial	2	D	5	5	Financial	Engineering sign off of seal and drift sealing
Macquarie Coal	Major Project	Methane	Methane under pressure escapes from workings other than known seals (emissions to surface)	Complaints EPA investigations Additional costs and delays Unable to relinquish leases	Flooding of workings increasing gas pressure Strata relaxation/ subsidence liberating more methane	Geography Methane Management Plan includes risk assessment, monitoring and address of contingencies Subsidence Assessment Report completed (low risk of methane from cracks to surface)	Still Applicable	3	Community / Reputation	3	E	6	4	Community / Reputation	Methane monitoring to date has not detected methane at surface
Macquarie Coal	Major Project	Groundwater	Water discharge from underground workings to surface (applies to all relevant underground sites including Teralba)	Saline discharge to the environment Flooding Damage to infrastructure	Underground workings filling with water to reach equilibrium (higher than mine entry) Increased recharge Inaccurate groundwater model	Groundwater model updated to include voids for old workings Groundwater model predicts discharge unlikely Groundwater monitoring in key areas planned Peer review of groundwater model by GCAA and team	Still Applicable	3	Environment	4	E	10	4	Environment	Groundwater monitoring in place with groundwater model regularly updated.
Macquarie Coal	Major Project	Traffic	Increased traffic along Railway Street and Rhondda Street	Complaints	Increased vehicle movements to complete closure activities	Managed on a case by case basis Traffic management outlines considered in DMCP HSEC Plan and system to consider traffic management based on planned works	Still Applicable	3	Community / Reputation	2	D	5	2	Environment	
Macquarie Coal	Major Project	Legal and governance	Statutory requirements change during closure process affecting existing approvals	Additional costs and delays Unable to relinquish lease	Government changes Updated guidelines and standards	Legal and governance register developed as part of the Project Closure Plan Statutory positions considered in PEP	Still Applicable	3	Legal & Compliance	2	D	5	2	Legal & Compliance	
Macquarie Coal	Major Project	Legal and governance	Incomplete legal register	Unknown commitments not considered in closure strategies Loss of regulator confidence Litigation	All contracts, development consents, etc. could not be located	Legal Register document review list Archiving process CMO Finalised Register collated Stakeholder Engagement Plan		3	Legal & Compliance	3	D	9	3	Legal & Compliance	Mine closure plan has a complete legal register
Macquarie Coal	Major Project	Legal and governance	Non-compliance with legal requirements e.g. EPL's, consents	Delay to relinquish leases, consents etc. Non-compliance with approvals Litigation	Inadequate monitoring or management of activities Inadequate consideration in planning strategies e.g. plaques at seal locations, abandonment file Inadequate documentation and submissions to government e.g. as constructed drawings	Environment & Rehabilitation Monitoring Register and Plan Legal Register Relinquishment chapter under development to consider consents etc. CMO	Still Applicable	3	Financial	3	E	6	4	Financial	No change

Site	Type of Risk Assessment	Key Element (CURA Context/Category)	Risk Description - Something happens.....	Consequence - resulting in:	Causes - Caused by	Existing Control Description	RMP Status	Risk Control Effectiveness	Expected Consequence Category	Expected Risk Consequence	Risk Likelihood	Current Risk Rating	Potential Maximum Consequence	Potential Maximum Category	Treatment Plans/comment
Macquarie Coal	Major Project	Legal and governance	Changes to landform and landscape during rehabilitation lead to non-compliance	Additional costs and delays Complaints Fines and prosecution Inability to relinquish leases, consents	Unidentified characteristics for retention based on consents, etc. e.g. arboreal screens, fire trails, etc.	Landform strategy developed in concert with Legal Register which summarises consent, lease and other requirements Key features to be retained considered with OCAL	Still Applicable	3	Legal & Compliance	3	E	6	3	Legal & Compliance	No change
Macquarie Coal	Major Project	Legal and governance	Burdensome EPA conditions attached to approval for waste transporting between sites	Additional costs	Existing lot and site property delineation	Waste Management Plan Stakeholder Engagement Plan	Still Applicable	3	Financial	3	D	9	3	Financial	
Macquarie Coal	Major Project	General	Management of derelict properties required	Additional cost	LTA knowledge of existing infrastructure and heritage requirements	Included in 5 year budget for management	Still Applicable	3	Environment	2	D	5	2	Environment	
Macquarie Coal	Major Project	General	Inappropriate management of additional properties (Mitchells Flat)	Additional costs Complaints	Lack of focus at closure (off site)	Included in 5 year budget for management	Still Applicable	3	Community / Reputation	2	D	5	2	Community / Reputation	
Macquarie Coal	Major Project	General	Public access to the site prior to final closure	Personal injury	LTA fencing/gates Deliberate entry to property	Approved Extraction Plan contains Public Safety Management Plan Public safety risk assessment undertaken and action plan developed Security included in MOP Signage and fencing LTA fencing/gates Random patrols, alarm	Still Applicable	3	Health & Safety	3	E	6	3	Health & Safety	No change, but low risk
Macquarie Coal	Major Project	General	Geotechnical instability of final landform LTA (embankments/slopes) including road underpasses, haul roads and boreholes	Inability to reach closure and relinquishment of the lease Additional costs for rework Safety concerns.	LTA design	Section 100 approved Routine annual inspections by certified engineer Annual dam inspection/report required under Dam Safety Committee approval Engineer designed landforms Geotechnical constraints review TSF/REA Phase One Study included FoS assessment	Still Applicable	3	Financial	2	D	5	2	Financial	No change, but low inspection
Macquarie Coal	Major Project	General	Failure to achieve the rehabilitation outcome prescribed in the MOP	Inability to reach closure and relinquishment of the lease Requirement to treat water long term. Impact on environment	LTA knowledge of material that may result in AMD.	Surface water monitoring Monthly environmental inspections Adaptive management planned in Post Closure Management Plan	Still Applicable	3	Environment	3	E	6	3	Environment	No change
Macquarie Coal	Major Project	General	Erosion and sediment on disturbed areas. Uncontrolled discharge offsite of sediment laden water.	Impact on rehabilitation through erosion Impact on environment Breach of environmental licence	Failure to undertake progressive rehab during operations Failure of areas already rehabilitated LTA water management system and/or design	Surface Water Assessment and Plan Landform works based on rehabilitation	Still Applicable	3	Environment	2	D	5	2	Environment	No change
Macquarie Coal	Major Project	General	Inadequate volume of topsoil to achieve the rehabilitation outcome prescribed in the MOP	Inability to reach closure and relinquishment of the lease. Cost of sourcing ameliorants and alternates	Available topsoil used in existing rehabilitation	MOP including topsoil and growth media management strategy Growth media alternatives known and amelioration methods; considered in RCE	Still Applicable	3	Financial	3	E	6	3	Financial	No change
Macquarie Coal	Major Project	General	Adverse impact on threatened species and existing habitats	Inability to reach closure and relinquish lease Impacts to local populations	Failure to manage pests, subsidence, erosion, weeds, or threatened species occupying previously disturbed areas	Monitoring and maintenance planned Biodiversity and Buffer Management Plan	Still Applicable	3	Environment	1	E	1	1	Environment	No change

Site	Type of Risk Assessment	Key Element (CURA Context/Category)	Risk Description - Something happens.....	Consequence - resulting in:	Causes - Caused by	Existing Control Description	RMP Status	Risk Control Effectiveness	Expected Consequence Category	Expected Risk Consequence	Risk Likelihood	Current Risk Rating	Potential Maximum Consequence	Potential Maximum Category	Treatment Plans/comment
Macquarie Coal	Major Project	General	Vegetation fails to establish on reshaped areas and is not self-sustaining	Inability to relinquish lease Erosion of landform Completion criteria not met	Failure to manage weeds Unapproved grazing pressures (kangaroos, rabbits etc.) Disease or pests Poor species diversity LTA progressive rehabilitation Lack of topsoil	Section 100 Tree trial Successful rehabilitation of Westside Rehabilitation Monitoring Existing MOPs Quarterly inspections for weeds etc. Maintenance planned	Still Applicable	3	Financial	2	D	5	2	Financial	No change
Macquarie Coal	Major Project	General	Contaminated land occurring on the site at closure	Impact on environment Constraint for future land use Significant additional cost to execute closure	Fuel use at the site Spills, leaks etc. Past poor practices	Targeted Contamination and Land Quality site investigations completed Treatment, management and removal strategies planned Monitoring strategies planned	Still Applicable	3	Financial	2	E	3	4	Environment	Changed to low risk
Macquarie Coal	Major Project	General	Landforms do not meet post mining land use requirements	Unable to relinquish leases Additional costs for works required	Inadequate landform considerations	Landform assessment and development considered post mining land use and consent conditions	Still Applicable	3	Financial	3	E	6	3	Financial	No change
Macquarie Coal	Major Project	General	Post closure surface water dam walls integrity compromised without maintenance	Unable to relinquish leases High residual risk payment required Additional maintenance costs during and post closure	Dams not constructed for long-term stability without maintenance	Dams assessed for risk and some identified for self-attenuation Risk based approach to works based on Geotechnical Constraints report Operational budget includes maintenance works for dams during execution for self-attenuation or handover to post mining land user	Still Applicable	3	Environment	2	D	5	3	Environment	Maintenance to occur long term
Macquarie Coal	Major Project	General	Acid Sulfate Soils/Potential Acid Sulfate Soils poorly managed (haul road, MCPP)	Acid drainage requires management Fines and penalties	Geology and soil type	ASS management considered in closure strategies for rehabilitation Management strategy for closure to avoid disturbance and monitor works	Still Applicable	3	Environment	2	D	5	3	Environment	No change
Macquarie Coal	Major Project	General	No post mining land user found for key infrastructure - rail loop, substation, buildings	Additional costs to maintain land Additional rehabilitation costs Inability to economically dispose assets Poor return on asset value	View of asset value Location, access and approvals requirements	Maintenance works for short-term planned and in operational budgets Works to be completed for locating post mining land users GCAA has responsibility for rail maintenance and all marketing	Still Applicable	3	Financial	2	D	5	4	Financial	No change
Macquarie Coal	Major Project	General	Retained infrastructure poses a hazard to personnel and the public	Injury Illness Costs increased	Poor condition of infrastructure Inadequate security Asbestos Containing Materials in poor condition release fibres	Security program Hazmat survey GCAA structural integrity report Structural integrity report to be reviewed periodically	Still Applicable	3	Health & Safety	3	E	6	3	Health & Safety	No change, however demolition complete
Macquarie Coal	Major Project	General	New evidence of threatened species in the project area	Delays to closure execution changes required to project design Additional cost	Populations and ecology	Monitoring Field surveys Update on threatened species periodically Areas available for offsets if required	Still Applicable	3	Financial	2	D	5	4	Financial	No change
Macquarie Coal	Major Project	General	Greater than provisioned biodiversity offsets required to implement preferred closure strategies	Additional costs (high) Delays to works to obtain offsets to meet requirements	Preferred closure strategies for best fit and economics	Identify offset requirements early in strategy planning process Avoid additional disturbance where possible Use available offset areas where possible	Still Applicable	3	Financial	2	E	3	4	Financial	No change
Macquarie Coal	Major Project	General	Inadequate maintenance of rehabilitation	Rehabilitation does not meet closure criteria Additional cost for rehabilitation	Inadequate maintenance strategy for rehabilitation	Rehabilitation monitoring Annual rehab walkover ARLMP process Maintenance planned	Still Applicable	3	Financial	3	E	6	3	Financial	No change
Macquarie Coal	Major Project	General	Spontaneous combustion in underground workings	Inability to relinquish leases High residual risk payments required Additional monitoring required Additional costs for remediation	Metromix drawdown leaves working dry Geology and propensity for combustion	Low propensity for spon com Workings being flooded currently Monitoring of groundwater recovery levels Communication with Metromix on risk associated with drawdown - their planned strategy is to recycle more water	Still Applicable	3	Financial	3	E	6	4	Financial	No change

Site	Type of Risk Assessment	Key Element (CURA Context/Category)	Risk Description - Something happens.....	Consequence - resulting in:	Causes - Caused by	Existing Control Description	RMP Status	Risk Control Effectiveness	Expected Consequence Category	Expected Risk Consequence	Risk Likelihood	Current Risk Rating	Potential Maximum Consequence	Potential Maximum Category	Treatment Plans/comment
Macquarie Coal	Major Project	General	Excessive rehabilitation and environmental monitoring and maintenance requirements	Additional costs for resources and expenses	Inadequate rationalisation of monitoring program	Environment and Rehabilitation Monitoring Register and Plan reviewed with OCAL for rationalisation Regulatory consultation where required Approvals strategy considers monitoring changes	Still Applicable	3	Financial	2	D	5	2	Financial	No change
Macquarie Coal	Major Project	General	Changing legislation and community expectations	Additional costs required to meet changed expectations	Regulatory climate Community expectations change	Consultation with stakeholders including regulatory Stakeholder Engagement Strategy implementation Approved stakeholder mitigation strategies in progress	Still Applicable	3	Community / Reputation	2	D	5	2	Community / Reputation	No change
Macquarie Coal	Major Project	General	Program of works extends beyond 2030	Additional costs required	Delay to achieve rehabilitation criteria	MOP Scheduling of program execution	Still Applicable	2	Financial	3	D	9	3	Financial	No change
Macquarie Coal	Major Project	General	Inappropriate packaging of assets and leases for relinquishment or on sale	Inability to divest lands Long-term management required for some lands Residual risk payment for relinquishment	Packaging of beneficial lands with lands requiring additional management not undertaken	Advice to be sought on sale/packaging of VCAs Strategies under consideration for relinquishment include packaging lands	Still Applicable	2	Financial	3	D	9	3	Financial	No change
Macquarie Coal	Major Project	Asset Management	Uneconomic salvage/ retention of assets	High costs for asset management/ disposal	Inadequate cost-benefit considerations Inadequate asset/salvage planning	Salvage plans developed, internal OCAL review process GCAA ECAS approvals process	Still Applicable	3	Financial	2	D	5	2	Financial	No change
Macquarie Coal	Major Project	Asset Management	Inadequate management of Westside and Teralba assets	Loss of assets Poor economic return because of management	Gap in asset planning for Complex	Knowledge of assets and storage information Assets reviewed and strategy developed Appropriate asset management to be applied considering closure strategies	Still Applicable	3	Financial	2	D	5	4	Financial	No change
Macquarie Coal	Major Project	Asset Management	Inadequate asset management (storage, maintenance, etc.)	Reduced asset value Additional costs associated with disposal	Inadequate management and maintenance planning	Maintenance program and budget developed for OCAL 2017	Still Applicable	3	Financial	2	D	5	2	Financial	No change
Macquarie Coal	Major Project	Execution	Statutory inspections and operational requirements not completed as required	Non-compliance with legislation, etc.	Inadequate identification of operating requirements Inadequate planning for project execution	Project Manager in place PEP being developed considering Legal Register and statutory requirements	Still Applicable	3	Legal & Compliance	2	D	5	3	Legal & Compliance	No change
Macquarie Coal	Major Project	Execution	Monitoring not completed as required	Non-compliance with EPL's, approved Plans, etc.	Inadequate identification of monitoring requirements Inadequate planning for project execution	Environment and Rehabilitation Monitoring Register and Plan	Still Applicable	3	Legal & Compliance	2	D	5	2	Legal & Compliance	No change
Macquarie Coal	Major Project	Mine Subsidence	Failure to achieve the rehabilitation outcome prescribed in the MOP/development consent	Damage to structures and/or infrastructure following mining (roads, fencing, power lines) Ponding, cracking, altered hydrological flows, altered drainage, erosion, changes to vegetation, impacts to arch sites, changes to creek bed profile Delay or an inability for the regulator to sign off Potential for public safety related concerns Additional costs	Mine subsidence	Extraction Plan approval Interagency committee Criteria reviewed to meet ESG3 expectations Sealing methodology reviewed by third party Subsidence monitoring and remediation planned	Still Applicable	3	Financial	3	D	9	3	Financial	Maintenace will occur long term
Macquarie Coal	Major Project	Surface Water	Discharge of sediment laden water post-operations	Uncontrolled discharge and impacts to areas downstream outside of EPL limits	No ongoing consumption of water as no longer operating	Surface Water Assessment & Plan Rehabilitation Plan Landform design Erosion and sediment controls including sediment ponds/ basins	Still Applicable	3	Environment	2	D	5	3	Environment	No change

Site	Type of Risk Assessment	Key Element (CURA Context/Category)	Risk Description - Something happens.....	Consequence - resulting in:	Causes - Caused by	Existing Control Description	RMP Status	Risk Control Effectiveness	Expected Consequence Category	Expected Risk Consequence	Risk Likelihood	Current Risk Rating	Potential Maximum Consequence	Potential Maximum Category	Treatment Plans/comment
Macquarie Coal	Major Project	Surface Water	Dam retention and surface water strategy exceeds maximum harvestable rights	Fines and penalties Additional cost not identified	Erosion control requirements in water management strategy	Surface Water Assessment and Plan developed for 'The Book' Maximum Harvestable Rights Dam Capacity not exceeded based on strategies	Still Applicable	3	Financial	3	E	6	3	Financial	No change
Macquarie Coal	Major Project	Contamination	Groundwater pollution	Deterioration of groundwater quality	Leaking/spilt hydrocarbons Contamination during operations	Targeted Contamination and Land Quality sampling program completed Groundwater monitoring program included for contamination in Environment and Rehabilitation Monitoring Plan	Still Applicable	3	Financial	2	C	8	2	Financial	No change
Macquarie Coal	Major Project	Natural Disasters	Bushfire, drought, flood etc. adversely impact rehabilitation significantly	Loss of established rehabilitation Delays to rehabilitation process Additional costs for rework of rehabilitation Exposed areas (erosion, sediment, dust) Structure of vegetation altered by fire event	Bushfire LTA fuel management Fire caused by site activities/ equipment failure Lightning strike Drought Flood	Bushfire Management Plans Emergency Response Plan Fire trailer Consultation with Rural Fire Service Rehabilitation Planning Landform modelling and design for flood - Surface Water Assessment and Plan Bushfire maintenance works (asset protection, fuel load reduction)	Still Applicable	3	Financial	2	D	5	2	Financial	No change
Macquarie Coal	Major Project	Waste Management	Waste material is not appropriate to perform as a growth medium.	Insufficient material to use as a growth medium Additional costs to import growth medium material Cannot achieve final land use criteria Inability to relinquish lease	Material received from offsite unsuitable	Actively sourcing such material and have been successful in getting enough material for works to date	Still Applicable	3	Environment	2	e	3	3	Environment	Access opportunities for fill from local quarry, local borrow pits and Westside as fall back if insufficient suitable material can be sourced from offsite.
Macquarie Coal	Major Project	Waste Management	Waste material ignites.	Impact on the environment Additional costs for treatment Loss of waste material for rehabilitation	Spon com	Low risk as no incidents to date	Still Applicable	3	Environment	2	E	3	3	Environment	Continue to monitor, however no ignition to date with mining being completed in 2016.
Macquarie Coal	Major Project	Management area: Tailings Dam	Less than adequate management to maximise dewatering and consolidation of tailings resulting in low strength, poorly consolidated tailings profile.	Additional costs for sourced materials and studies for alternate options Inability to relinquish site Failure to meet closure standards within timeframe	Low strength tailings	Identify engineering solutions to cap over low strength tailings	Still Applicable	3	Environment	2	E	3	3	Environment	Geotextile being trialled in 2022 to add strength to tailings crust to allow flyash placement and conventional capping to take place.
Macquarie Coal	Major Project	Surface Water	Less than adequate design of surface water structures surrounding the tailings facility which cannot withstand a significant weather event.	Spillway failure Contour bank failure Poor water quality off site Unlicensed discharge off site Fines and penalties	Less than adequate design	Spillway and drainage structure designs to suitable criteria	Still Applicable	3	Environment	2	e	3	3	Environment	Continue to monitor and maintain as required.
Macquarie Coal	Major Project	Landform construction	Less than adequate records on landform construction and quality assurance	Delay or inability for regulator to sign off Loss of records	Less than adequate quality control	Inspection, test plan process in place and working well to date	Still Applicable	3	Environment	2	e	3	3	Environment	Keep records and reports on hand to be made available to the Regulator
Macquarie Coal	Major Project	Final Landform	Ongoing erosion occurs in the final void.	Additional costs to maintain erosion control Erosion results increase in suspended solids Rehabilitation does not meet closure criteria Inability to receive sign-off from Regulator	Less than adequate monitoring and maintenance	Monitoring and maintenance regime in place	Still Applicable	3	Environment	2	E	3	3	Environment	Continue to monitor and maintain as required.

Appendix C - Schedule of Lands

LOT	DP	Parish	County
50	755262	Teralba	Northumberland
311	539420	Teralba	Northumberland
1	1061644	Teralba	Northumberland
34	755262	Teralba	Northumberland
1, 2 and 3	983839	Teralba	Northumberland
1	1093590	Teralba	Northumberland
84 and 93	755262	Teralba	Northumberland
1	926190	Teralba	Northumberland
5	777014	Teralba	Northumberland
7027	1051359	Teralba	Northumberland
131	755262	Awaba	Northumberland
60, 131, 132, 133, 136, 138, 139, 140, 262, 263 and 269	755207	Awaba	Northumberland
4	788116	Awaba	Northumberland
6	738276	Awaba	Northumberland

Appendix D - Landform Establishment of Tailings Dam and REA

1. Tailings Dam Background

Landform establishment of the Tailings Dam and REA have been provided as an appendix to satisfy the requirements of **Section 6.2.3** of the RMP.

The MCPP Tailings Dam / Tailings Storage Facility (TSF) was the sole tailings storage since the commissioning of the facility in 1983. Due to the topography of the site, retaining embankments were required, those being the Eastern Embankment and the Northern Saddle Dam (which is also part of the Reject Emplacement Area (REA)). The Tailings Dam is a prescribed dam under the NSW Dams Safety Act 1978 and has been assigned a consequence category of 'Significant' by Dams Safety NSW. No emergency spillway exists, which is acceptable as the Tailings Dam has always had substantial available freeboard relative to the assigned consequence category and the small catchment external to the Tailings Dam (in the order of 20% of the current tailings surface area).

ATC Williams completed a preliminary analysis on the stability of the northern embankment when subjected to a Maximum Design Earthquake (MDE) loading condition. Based on the results, buttressing of the downstream slope by flattening the face was required to render the Northern Saddle Dam safe in the long-term and satisfied Dam Safety NSW enough to support deregistering the dam.

The Tailings Dam will be filled with coarse rejects to produce a free-draining landform which blends the tailing area with the REA for a suitable post-mining land use. Geotechnical studies have been completed by ATC Williams and Golder to design the final landform of the Tailings Dam area. Characteristics for the final landform in the Tailings and the REA area are summarised as:

- A ridge on the northern side of the Tailings Dam forcing flow away from the outside walls and back towards the spillway;
- Multi-directional free draining at a 2% gradient;
- A 1:5.8H gradient on the Eastern Embankment;
- Majority of the former REA at a 1% grading in the easterly direction;
- A spillway located on the south-east corner of the Tailings Dam directing runoff to a diversion channel excavated in natural ground; and
- Reject cap depths ranging from at least 0.5m at the spillway with no exposed tailings to 10m in the north-west corner.

Tailings capping commenced at the site and is expected to continue until 2026. No active rehabilitation has been undertaken in this area to date, however regular strength testing of the capping has been performed for more accurate timing of final capping and is updated in the project schedule.

A detailed *Tailings and REA Post Closure Management Plan* will be developed as closure works continue. This will explain management of this area and will be used as guidance material for future landowners.

1.1 Tailings Dam Final Landform Design

The final landform is defined as a subsequent placement of materials over an initial cap layer. The materials are built and shaped as required to achieve a stable landform that is non-polluting, free draining and commensurate with the final land use and surrounding environment. Inert material of suitable thickness will be the surface layer to support media growth.

The initial design was engineered following the completion of:

- The prediction of tailings consolidation and settlement;
- A stability analysis of the Northern Saddle Dam Buttress; and
- A stability analysis of the REA and Eastern Embankment.

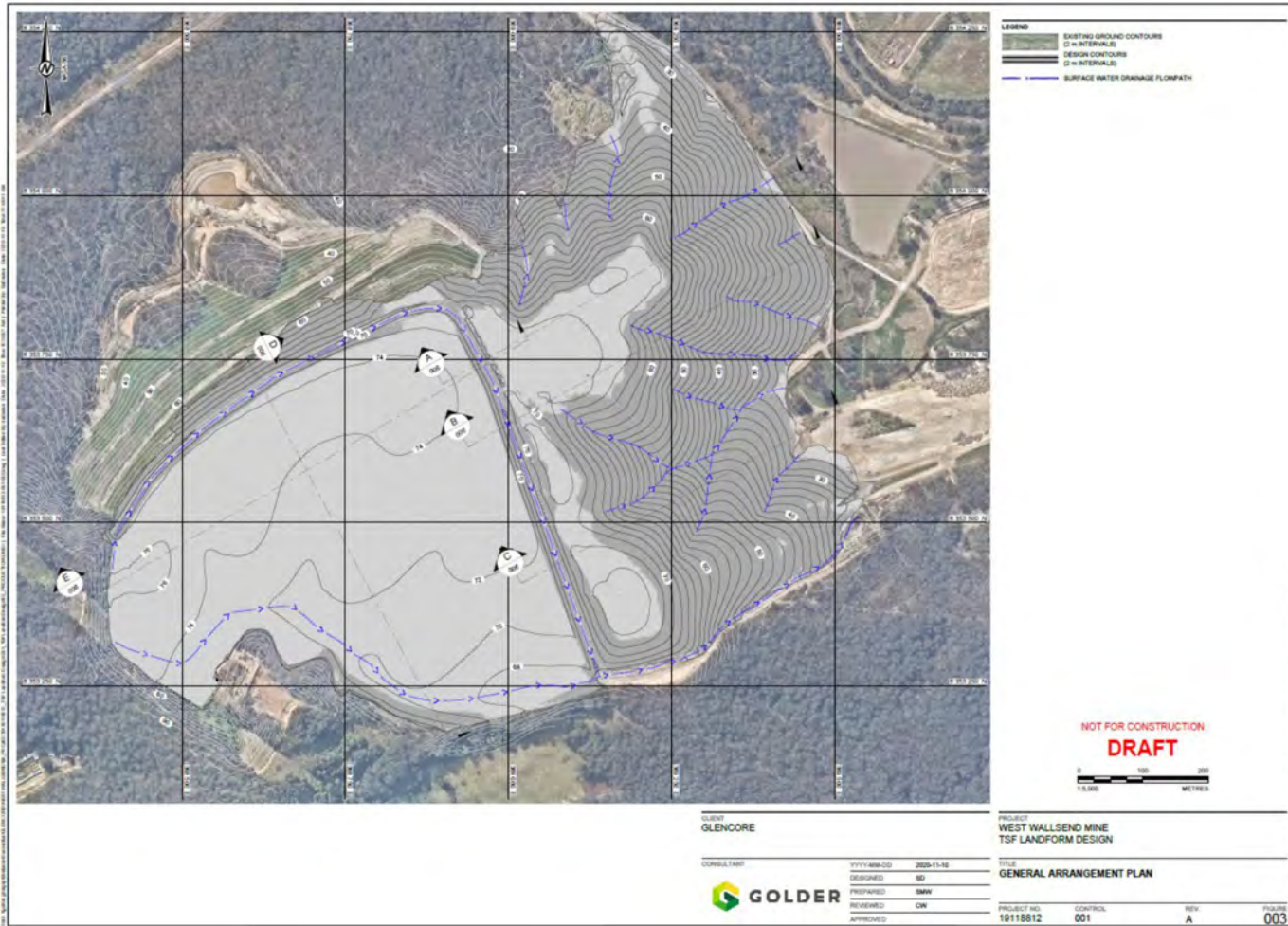
Several geotechnical studies were completed to determine the final landform. The most recent study was undertaken by Golder (2020) which determined that the final landform consist of the upper surface being shaped to ensure majority of the drainage occurs towards the south-east (the existing spillway overflow channel). The landform has minimum slopes of around 2% with the average slope of 2.3%. A small proportion of the outer surface will drain towards the outer edges and a drainage channel has been provided on the existing wall (where settlements are expected to be minimal) to collect run-off flowing towards the outer edges and direct it to the exiting spillway overflow channel.

An overall erosion risk for the landform has been assessed using the relationship between catchment area and slope and compared to generic values for erosion risk in the Hunter Valley and surrounds. This assessment indicates a low risk of erosion outside of the drainage lines on the REA eastern embankment with rock armouring to be included in the drainage lines on the eastern embankment (Golder, 2020).

Figure 1-1 shows the final proposed landform for the Tailings Storage Facility.

Once the Tailings Dam has been capped and the growth media placed at 0.5 m, contour banks will be constructed on the final landform to predominantly convey runoff to the spillway channel. These contour tanks will have a minimum base width of 3.0 m, a minimum depth of 0.7 m (including 500 mm of freeboard) and a longitudinal grade of 0.5%. A small proportion of the capped area will report to the proposed contour banks on the REA buttress. By the time this occurs, it is expected that the vegetation will be established on the buttress landform and the runoff from the small capping area will be allowed to flow into the contour banks.

Figure 1-1: Final Proposed Landform for the Tailings Storage Facility



1.1.1 Northern Saddle Dam Buttress

A buttress on the Northern Saddle Dam wall was determined to be necessary following additional engineering works and piezometer installation. The downstream buttress was constructed of track-rolled coarse rejects and attained a final design gradient of 5.4:1 (h:v).

Technical works have deemed the buttress to be sufficient. Long-term stability monitoring was peer reviewed by Golder and has been approved and signed-off by Dam Safety NSW. Final rehabilitation on this wall has been completed.

1.1.2 Tailings Dam Spillway

A spillway has been constructed at the Tailings Dam to address flood water management concerns during the construction of the initial capping layer. As the available storage within the dam has been progressively filled, flood storage capacity has been reduced. The catchment area reporting to this spillway includes the Tailings Dam itself and an area immediately to the south of the Tailings Dam.

Given the size and risk associated with the overflows from the Tailings Dam, the spillway has been designed to safely convey runoff from a 10,000 year Annual Recurrence Interval (ARI) rainfall event, including a concrete plinth, and in accordance with the *Best Practice Erosion and Sediments Control Book 2* (IECA, 2008). This calculation included adjusting the spillway base width until at least 0.5 m of freeboard remained between the maximum water level during a 10,000 year ARI event and the dam crest level.

Cross-sectional dimensions, design parameters and results of the Tailings Dam spillway are shown in **Table 1-1**. As the Tailings Dam would be full of water during overflow events, it was modelled as being 100% impervious and the peak flow rate estimated using XP-RAFTS.

Table 1-1 Tailings Dam Conceptual Spillway Design Parameters and Results

Catchment Area (ha)	10,000 Year ARI Peak Flow Rate (m ³ /s)	Minimum Base Width (m)	Side Slopes (H:V)	Water Depth (m)	Depth Required Including 0.5 m Freeboard (m)	Lining
42.094	32.435	17	3:1	0.99	1.5	Rip Rap (D50 = 150 mm)

The velocity, shear stresses and general potential for scouring to occur downslope of the spillway was also considered in the design. Ultimately, this spillway flows to Catch Dam 1 through an overflow channel.

1.2 Tailings Dam Capping

A cap is defined as the initial placement of at least one engineered layer of suitable material(s) to provide a safe and stable cover over the entire tailings surface, which is capable of supporting earthmoving equipment for the construction of the final landform.

Prior to commencing the capping of the tailings dam, several studies were undertaken by SLR, Golder and ATC Williams to review the options for capping and rehabilitation strategies. For closure, the Complex utilised an efficient capping construction methodology of ‘placing capping layers (without reinforcement)’.

ATC Williams undertook engineered an initial capping layer methodology which had been used successfully on coal tailings storage where significant drying of the tailings had taken place. The key to this method was to satisfy the stability/bearing capacity requirements for the:

- Layer thickness required to provide local support for the spreading equipment; and
- Effect of global instability of the tailings which will develop under the same layer thickness.

1.2.1 Consolidation and Settlement

The accuracy of long-term settlement estimates is unknown and it is believed that consolidation will occur differentially. However, long-term consolidation modelling does suggest a significant amount of tailings will be consolidated due to the weight of material being placed on the dams. Therefore, long-term maintenance of the capped surface to maintain a free-draining landform will be required. Settlement estimates will be calibrated and refined as the tailings surface is capped and loaded with material. Post-capping a consolidation model will be re-done to further inform the final capping procedure and design.

1.2.2 Shear Strength

Shear strength profiles were not investigated as part of the Phase 1 study and Conceptual Closure Plan. It is intended that this will be completed when the surface of the Tailings Dam is sufficiently dried out to allow safe access. A back-calculation was undertaken to determine the minimum required tailings strength parameters for the upper tailings layer (top 5.0 m) to satisfy geotechnical stability based on the proposed construction methodology for the initial capping layer.

The stability results have indicated that the proposed “economically efficient” capping methodology is appropriate for the tailings shear strength profile as summarised in Table 1-2.

Table 1-2 MCPP Tailings Dam Shear Strength Profile

Layer	Depth (m)	Undrained Shear Strength, Su (kPa)
Surface Crust	0.0 – 0.5	Su = 10 kPa
Soft Tailings	0.5 – 5.0	Su = 7.5 kPa
Aged Tailings	Below 5.0	Su = 7.5 kPa + 2.0 kPa/m

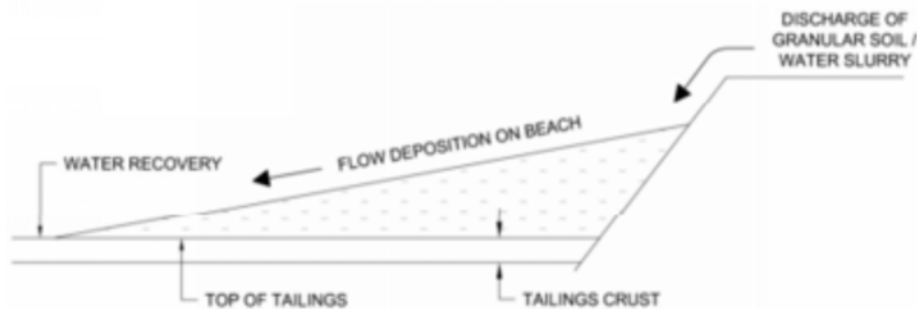
1.2.3 Coal Ash Use in Initial Capping Layer

Investigations undertaken by ATC Williams have identified that tailings within Zone 2A and 2B have dried slower than initially predicted, having only a crust ranging from 50 mm to 200 mm with no strength gain below the crust. It was concluded that the crust will only have developed to a depth of approximately 0.5 to 0.6 m (previously estimated at 0.7 m) by 2026. Therefore, the potential for the crust to have developed sufficient strength gains in Zone 2A and 2B to support conventional capping techniques within the next 5 to 7 years is unlikely.

The preferred alternative capping method is the use of coal ash from the Eraring Power Station, as it provides a safe method for placement of an initial capping layer without any need to traffic over the tailings until the layer is complete. This method has been used successfully at other mine sites throughout the Hunter Valley and can be more cost efficient compared to other alternatives. The re-use of coal is also exempt from the *Protection of the Environment Operations (Waste) Regulation 2014* list under the *Coal Ash Exemption Order 2014*.

The coal ash alternative involves placing a layer of granular fill using hydraulic placement methods (i.e. beaching) as shown in **Figure 1-2**.

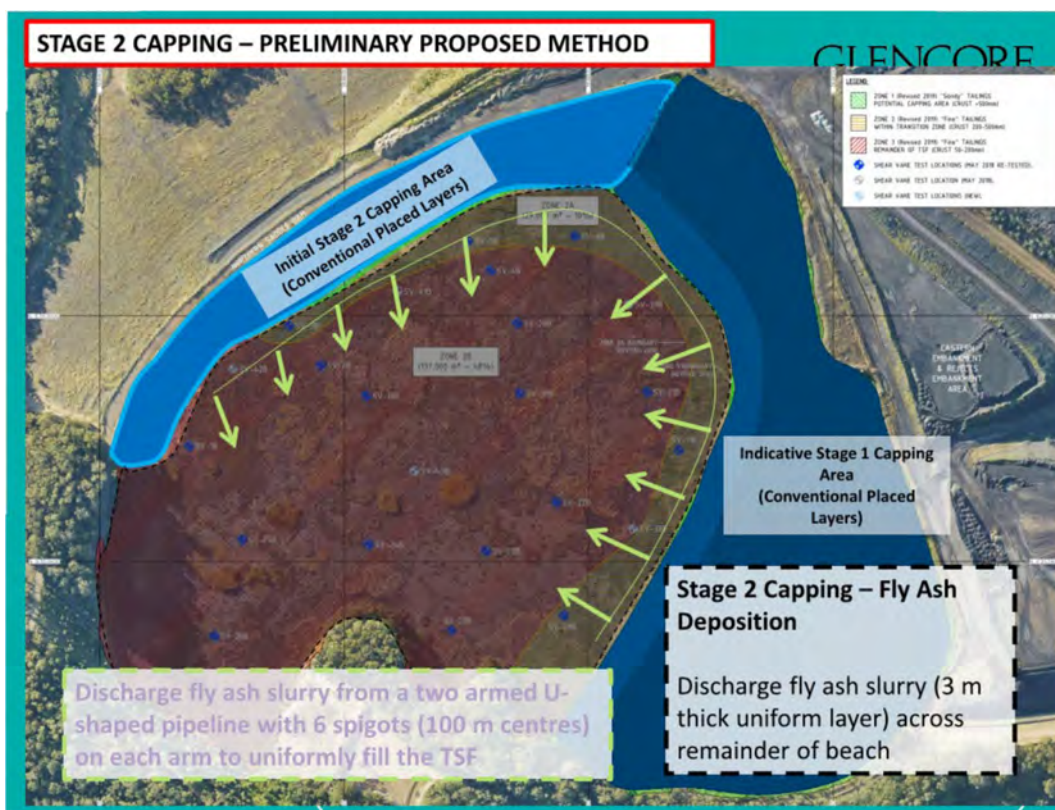
Figure 1-2 Conceptual Diagram for Beached Capping



Slurry formed by a mixture of coal ash and water is discharged across the surface of the tailings. The solids settle to form a sloping beach, with water being recovered and recycled. Once a full cover of beached material is achieved, the aim will be to construct a final capping layer over the top using earthmoving machinery. It is proposed that beach slopes will be controlled to create a level capping surface by progressing the spigot discharge points from the east to the west. The proposed methodology is shown in **Figure 1-3**.

This method could be further enhanced by controlling the sequence and rate of ash distribution to maximise drying and consolidation and thus, shear strength development. Geotextile trials will commence in 2022 which will add strength to the tailings crust and allow fly ash placement and conventional capping to take place.

Figure 1-3 Conceptual Coal Ash Capping Methodology



2. Reject Emplacement Area Background

Consent to establish the REA was granted by the then NSW Department of Urban Affairs and Planning on 21 Jul 1981 as part of the Stockton Borehole Colliery re-development. The consent was modified in 1991 to allow an extension of raw coal stockpiles into an area previously designated for coarse reject emplacement.

The REA is constructed adjacent to and over the TSF Eastern Embankment downstream slope, resulting in an emplacement area similar to the TSF. The REA was progressively constructed by dumping, spreading and track-rolling in lifts effectively making the Eastern Embankment and the REA effectively a merged structure, with a wide crest and gently graded downstream slopes. Based on construction materials, it is expected that seepage, emanating from the TSF, will have established a phreatic surface through the Eastern Embankment into the REA.

The Northern Saddle Dam is situated on the north-west side of the TSF and to the north-east of the Eastern-Embankment. It commenced in 1993 to facilitate the continued utilisation of the TSF impoundment.

Since 2009 the Northern Saddle Dam downstream slope has been augmented by the creation of an additional coarse reject emplacement area at the toe and over the slope, forming a stabilising berm. To increase coarse reject storage capacity, the downstream face was flattened from 2:1 (h:v) to 4:1 (h:v) by the construction of a track-rolled coarse reject buttress.

A phreatic surface passes from the TSF to the Eastern Embankment and into the REA. Seepage was observed daylighting from the Northern Saddle Dam downstream embankment slope approximately on quarter of the way up from the toe. Erosion rilling is present on the REA (up to 1 m in depth), as well as some unassisted vegetation volunteering on the surface of the rejects directly.

Initially, a spillway overflow channel was proposed to convey runoff from the Tailings Dam spillway to Catch Dam 1. This, along with the Northern Conveyance Channel, have been determined to be no longer required as there is no longer the need for a borrow pit. This area was designed to provide material if 2 m of inert capping was required. However, it is has been determined that only 0.5 m of capping will be sufficient.

No active rehabilitation has been undertaken in this area yet.

2.1 Eastern Embankment Stability

The Eastern Embankment forms the primary tailings retaining structure on the eastern side of the tailings dam. Several studies have been undertaken by ATC Williams, SLR and Golder to review the capping, rehabilitation, and final landform design for the REA.

ATC Williams completed an assessment of the total quantity of coarse rejects within the REA that are potentially available for re-use in the Tailings Dam and REA closure. The basis for this was the maintenance of the Eastern Embankment integrity by retaining a stable downstream slope. The embankment is overlain on the downstream side and is effectively integrated with the REA.

The Eastern Embankment of the REA has been shaped to an average slope of nearly 6:1 (h:v) to suit the maximum cut in the Eastern Embankment as determined by the stability assessment undertaken by ATC Williams. The design uses dendritic drainage with runoff being directed to a series of lined creeks embedded in the landform. The volume of cut from the Eastern Embankment matches the volume of fill required for the upper capping taking account of the coal ash fill being imported.

2.2 Northern REA Contour Banks

Due to the relatively steep slopes of the proposed Tailings Dam buttress (approximately 18.5%), several contour banks will be installed to reduce the slope length and minimise the potential for scouring. Several of the proposed contour banks will discharge into existing vegetated drainage depressions on relatively steep slopes. These established drainage areas will be stable enough to accept the additional flows, and they will be monitored for a period after the contour bank construction to verify this. Additionally, two contour banks will discharge to the existing inlet channel of the REA dam.

All contour banks were sized to safely convey runoff from a 20 year ARI rainfall event. Based on hydraulic modelling, it was determined that the last 85 m of one of the contour banks be lined with jute mesh to minimise the potential for scouring.

Construction of 0.7 m high bunds will be undertaken on the western side of the Tailings Dam embankment to contain all sediment laden runoff and re-direct it to the contour banks. One area of the embankment on the north-west side cannot be directed into the REA dam. Given the relatively small size of this disturbance area, (approximately 0.7 ha) the area will be hydro-mulched and sediment fences installed downslope to manage sediment laden runoff from this area.

Appendix E - Asset Register (2022)

Asset Number	Asset description	Capitalized on	Asset Type	Plant No.	Description	Comment on Equipment	Main Location: WWSURF WWUG MCP	Specific Location on the Surface	Potential Sale (Y/N)	Comment on Potential Sale
102089	Auxillary Fan # F61	1/12/2012	Auxiliary Fans	F61	Auxiliary Fan - 21.5 M3/s	21.5 M3/S, 1000V, 160kw motor, 600/650CY, April-12	WWSURF	13.5.19	Y	ADR_170037. Sale cancelled by Integra - Still available
	No asset match found - Goes with Caddy Drive Asse		Belt Starter	BS125	Substation / Belt starter. 11kv / 415 volt. Specific Belt Starter for the Caddy Drive system	Goes with Caddy drive	WWSURF	13.5.19	Y	
	No asset match found		CHP	Basket	VM1400 Basket	Spare in Store at \$4,000 Price offered by Tahmoor CHP	MCP	Outside Store 29.3.17	Y	
	No asset match found		Coal Clearance	A7465	Metso screen. July-14 Model: SD LOWHEAD Size: 2.1x4.8	New unit as spare Serial Number A7465	MCP	13.5.19	Y	Could be used in a Wash Plant
102098	Caddy Dual 160Kw	1/03/2013	Coal Clearance	Caddy - Drive Assembly	Conveyor Caddy Drive	Includes BS125 Belt starter, Jib, LTU Bays, Winch	WWSURF	13.5.19	Y	Would also include BS125 Belt starter, Jib, LTU Bays, Winch
	No asset match found		Coal Clearance	AC4	32kw Conveyor VF Drive Air Conditioning unit.	Nepean Power. Drg 08044-10-160 & 161	WWSURF	Surf belt	Y	In motor shed
	No asset match found		Coal Clearance	BE?	1600mm Boot End. Nepean Job No 10043. 05/2009			13.5.19	Y	
102140	Magnet Starter BM1 415V	1/12/2013	Coal Clearance	BMS1	Magnet electrical control panel	Ser No MS-001. ACE Job No CS160 Drg No WWE 90095-100 to	WWSURF	13.5.19	Y	415 volt Steinert Gill Electromagnet control panel
100477	Conveyor Structure 1400Mm	1/06/2012	Coal Clearance	Legs	1400mm Structure legs	No stringers or rollers	WWSURF	13.5.19	Y	Ask Darryl if these have been scrapped or moved
100477	Conveyor Structure 1400Mm	1/03/2013	Coal Clearance	Legs	1400mm Structure legs	No stringers or rollers	WWSURF	13.5.19	Y	Ask Darryl if these have been scrapped or moved
	No asset match found		Coal Clearance	SW3	2 x 500kw Torque arms	SW3 conv still installed U/G. Would need labour & machines to recover.	WWSURF	Top Yard	Y	
	No asset match found		Coal Clearance	TA-1	Conveyor Torque Arm	335kw, 415v, 1490rpm, direct drive to Flender reduction, 300kw,	WWSURF	13.5.19	Y	
	No asset match found		Coal Clearance	TA-2	Conveyor Torque Arm	335kw, 415v, 1490rpm, direct drive to Flender reduction, 300kw,	WWSURF	13.5.19	Y	
	No asset match found		Coal Clearance	TA-4	Conveyor Torque Arm	ABB, 500kw, 415v, 1491rpm, direct drive to SEW reduction, 500kw,	WWSURF	13.5.19	Y	
	No asset match found		Coal Clearance	TA-5	Conveyor Torque Arm	ABB, 500kw, 415v, 1491rpm, direct drive to SEW reduction, 500kw,	WWSURF	13.5.19	Y	
	No asset match found		Coal Clearance	VWnn	LTU Winch VF Drive. No Plant number. New Overhauled spare.	Nepean. Ex SW3. Toshiba 45kw 415V, 980rpm, D250M.	WWSURF	13.5.19	Y	

Asset Number	Asset description	Capitalized on	Asset Type	Plant No.	Description	Comment on Equipment	Main Location: WWSURF WWUG MCP	Specific Location on the Surface	Potential Sale (Y/N)	Comment on Potential Sale
101134	Air Compressor - Champion	1/06/2003	Compressed Air	Air Compressor - C1	Sullair CSX160. Manuf 2000. Running OK at 25/8/16.	Assumed this compressor is this asset. 1000cfm Sullair	WWSURF	13.5.19	Y	Interest from Integra UG Lawrence Moburg (MIC)
101189	Air Compressor Number C5	30/06/2005	Compressed Air	Air Compressor - C5	Sullair VOC185. Ser No 21337. Manuf. 2010. Off as at 25/8/16. Trips on Over Temp	1000cfm Sullair	WWSURF	13.5.19	Y	Interest from Integra UG Lawrence Moburg (MIC)
101189	Air Compressor Number C5	30/06/2005	Compressed Air	Air Compressor - C5	Sullair VOC185. Ser No 21337. Manuf. 2010. Off as at 25/8/16. Trips on Over Temp	1000cfm Sullair	WWSURF	13.5.19	Y	
101189	Air Compressor Number C5	30/06/2005	Compressed Air	Air Compressor - C5	Sullair VOC185. Ser No 21337. Manuf. 2010. Off as at 25/8/16. Trips on Over Temp	1000cfm Sullair	WWSURF	13.5.19	Y	
	No asset match found		Compressed Air	P3361	Sullair CSX90 Air Compressor	600cfm Sullair	MCP	13.5.19	Y	
	No asset match found		DCB	LC10	1000V, 6 Outlet, 2 x 425A, 4 x 150A		WWSURF	13.5.19	Y	
	No asset match found		DCB	LC9	1000V, 6 Outlet, 2 x 425A, 4 x 150A		WWSURF	13.5.19	Y	
	No asset match found		Fork Lift	41322 789	Jib for the Volvo fork lift		WWSURF	Yard	Y	
102178	Forklift 3.5 Tonne Toyota	1/12/2014	Fork Lift	FK04	Toyota Fork Lift	Will continue to be used for some time yet.	WWSURF	Surface	Y	
	No asset match found		Fork Lift	FKJIB	Fork Lift Jib attachment		WWSURF	Yard 22.3.17	Y	
	No asset match found		Fork Lift	Fork Bucket	Fork Lift bucket for the Volvo Fork lift		WWSURF	Yard	Y	
	No asset match found		Fork Lift	Fork Jib	Fork Jib	No ID Plate	WWSURF	Yard 22.3.17	Y	
	No asset match found		Fork Lift	VFOK04	Forks - Volvo	Forks for the Volvo	WWSURF	Yard 22.3.17	Y	Being used at the moment. Goes with Volvo fork lift
	No asset match found		Fork Lift	VOFK01	Forks - Volvo	Forks for the Volvo	WWSURF	Yard 22.3.17	Y	Being used at the moment. Goes with Volvo fork lift
	No asset match found		Fork Lift	VOFK02	Forks - Volvo	Forks for the Volvo	WWSURF	Yard 22.3.17	Y	Being used at the moment. Goes with Volvo fork lift
	No asset match found		Fork Lift	VOFK03	Fork Lift Tynes		WWSURF	Yard 22.3.17	Y	
	No asset match found		Fork Lift	VOLH01	Fork Lift - Model L70F - S-631 85 Eskiltuna Sweeden.	Volvo. KW109	WWSURF	Surface 5.11.18	Y	
	No asset match found		Fork Pod	PTCB05	Gear Oil Pod	Fork tynes to lift	WWSURF	Yard 22.3.17	Y	

Asset Number	Asset description	Capitalized on	Asset Type	Plant No.	Description	Comment on Equipment	Main Location: WWSURF WWUG MCPP	Specific Location on the Surface	Potential Sale (Y/N)	Comment on Potential Sale
102204	CAP Lamp Messaging Communicat	1/12/2014	Monitoring & Communications	NLT	NLT Cap Lamp system	Cap lamps and chargers still available. All U/G NLT nodes sold	WWSURF	13.5.19	Y	Price for remaining cap lamp system (19 x 20 Lamp Racks and 303 cap lamps)
	No asset match found		Motor	8109	Toshiba, 365kw, 1000v, 1475rpm, D315L		WWSURF	Motor Shed 7.4.17	Y	
	No asset match found		Motor	90144124	Toshiba, 250kw, 1000v, 1485rpm, 355M/L100		WWSURF	Motor Shed 7.4.17	Y	
	No asset match found		Motor	1008200605	WEG 150kw, 1000v, 1485rpm, 315S/M	Mounted on full conveyor torque arm with reduction ratio	WWSURF	Motor Shed 13.4.17	Y	
	No asset match found		Motor	1008200805	Pope 200kw, 1000v, 1481rpm, Flange Mount		WWSURF	Motor Shed 7.4.17	Y	
	No asset match found		Motor	3641	Western Electric, 112kw, 1000v, 1485rpm, E280M	Flange mount motor fitted to Hauhenco Hydraulic Pump	WWSURF	Motor Shed 7.4.17	Y	Includes Hauhenco pump
	No asset match found		Motor	5241	Toshiba 37/15kw, 1000v, 730/1460rpm, E250S	Flange mount 2 speed (breaker feeder) motor. Star/Delta	WWSURF	Motor Shed 7.4.17	Y	
	No asset match found		Motor	3468746	ABB, 500kw, 415v, 1490rpm	Missing Aux fan motor	WWSURF	Motor Shed 7.4.17	Y	
	No asset match found		Motor	3468747	ABB, 500kw, 415v, 1490rpm, 355M/L100	Conveyor torque arm motor	WWSURF	Motor Shed 7.4.17	Y	
	No asset match found		Motor	4049882	EIM, 7.5kw, 1000v	Submersible pump	WWSURF	Motor Shed 7.4.17	Y	
	No asset match found		Motor	9520973	CMG 335kw, 415v, stator	Stator only	WWSURF	Motor Shed 7.4.17	Y	
	No asset match found		Motor	13001004	ABB 500kw, 415v, 1490rpm, VF Drive	Spare conveyor motor for torque arm	WWSURF	Motor Shed 7.4.17	Y	
	No asset match found		Motor	29000283	Toshiba, 200kw, 3.3kv, 4 pole, D355LS	Flange fitted to Hauhenco LW pump	WWSURF	Outside motor Shed 7.4.17	Y	
	No asset match found		Motor	82139195	Toshiba, 355kw, 1000v, 1485rpm, D355LL		WWSURF	Motor Shed 7.4.17	Y	
	No asset match found		Motor	99000070	Toshiba, 200kw, 3.3kv, 1480rpm, D355LS	Secondary resistance motor	WWSURF	Motor Shed 7.4.17	Y	
	No asset match found		Motor	1018274080	WEG, 160kw, 415v, 1490rpm, 315S/M	Spare motor for the CADDY Conveyor drive	WWSURF	Motor Shed 7.4.17	Y	Spare for the Caddt Drive
	No asset match found		Motor	43/9611	Toshiba, 110kw, 2960rpm, E280M	Aux Fan Spare	WWSURF	Motor Shed 7.4.17	Y	
	No asset match found		Motor	50024432200010000	ABB, 415V, 500kw VF Drive motor	New Motor. Used on Conveyor torque arm.	WWSURF	Motor Shed 7.4.17	Y	

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	No asset match found		Motor	Joy37kwtraction	Joy, 37kw, DC Traction motor		WWSURF	Motor Shed 7.4.17	Y	
	No asset match found		Motor	T34751172	Toshiba, 55kw, 1000v, 1475rpm, D250MD	Fitted to Eddy Current Winch	WWSURF	Motor Shed 7.4.17	Y	Includes Eddy Current Winch
	No asset match found		Motor	V1205185011	Joy 60HP motor		WWSURF	Motor Shed 7.4.17	Y	
	No asset match found		Motor	XJ324005AIL-LV	Joy 40/40HP, 1000v Traction Motor		WWSURF	Motor Shed 7.4.17	Y	
101211	Ritz Multistage Pumpset	1/12/2005	Pumping	P351	Ritz pump and 250kw, 2 pole 1000V motor. Model 4912A-05BM3N	Looks new but probably needs some O/Haul.	WWSURF	Yard 22.3.17	Y	
101213	Submersible Borehole Pump	1/12/2005	Pumping	Pleuger 1	Pleuger Pump	Removed from LW11 borehole in Dec-16. This original asset number would	WWSURF	13.5.19	Y	Was operating when removed from borehole
101874	Submersible Pump Pleuger	1/06/2012	Pumping	Pleuger 2	Spare Pleuger Pump	Overhauled pump - spare Pleuger	WWSURF	13.5.19	Y	
101132	Pump - Sykes Hh150 X 125	1/06/2003	Pumping	SP022	Diesel Sykes Pump	Was used at MCP	MCP	Yard 22.3.17	Y	
101212	Sykes Hh150SS Pumpset	1/12/2005	Pumping	SP024	Diesel Sykes Pump	Was used at MCP	MCP	Yard 22.3.17	Y	
100587	Auger Drive Unit To Fit Eimco	1/04/1996	QDS	QDAU01	QDS Auger attachment for Eimco	Returned from Beltor 17.3.17	WWSURF	13.5.19	Y	
101854	Flinger Duster # QDF-DO4	1/06/2012	QDS	QDFD04	Flinger Duster	Locked - New - Requires site acceptance		13.5.19	Y	
102202	QDS Bootend	1/12/2014	QDS	QDSBE3	1400mm Boot end	Macquarie Manufacturing. Ulan West looked at this Boot end on 27/9/16 for	WWSURF	13.5.19	Y	
101383	No asset match found		QDS	QDSC1	QDSC2	We only had two can grabs (QDSC1 and QDSC2)	WWSURF	13.5.19	Y	Purchase for \$30k each
101629	QDS Ejector Bucket 2.6	1/08/2011	QDS	QDSCB1	Coal Bucket		WWSURF	29/07/2020	Y	
	No asset match found		QDS	QDSCB3	Coal Bucket	QDS LHD bucket.	WWSURF	29/07/2020	Y	
	No asset match found		QDS	QDSCB4	Coal Bucket		WWSURF	29/07/2020	Y	
	No asset match found		QDS	QDSM1	Material trailer	Marked X For Scrap 29.3.17	WWSURF	13.5.19	Y	
	No asset match found		QDS	QDSM17	Material Pod	2 bay. Jaxam - Due Oct-15	WWSURF	Top Hardstand 5.11.18	Y	

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	No asset match found		QDS	QDSM2	Material pod		WWSURF	13.5.19	Y	
	No asset match found		QDS	QDSP05	Structure pod	Last NDT Sep-13	WWSURF	13.5.19	Y	
	No asset match found		QDS	QDSP11	Structure pod	Last NDT Dec-14	WWSURF	13.5.19	Y	
	No asset match found		QDS	QDSP12	Structure pod	Last NDT Dec-14	WWSURF	13.5.19	Y	
	No asset match found		QDS	QDSSB1	Stone Bucket		WWSURF	29/07/2020	Y	
	No asset match found		QDS	QDSTB1	Tool Box Pod		WWSURF	13.5.19	Y	
	No asset match found		QDS	QDSTB5	Tool box pod	Bits & pieces	WWSURF	13.5.19	Y	
	No asset match found		Services	DB10	Splicing power supply	Auxiliary power supply for splicers - 415 volt.	WWSURF	13.5.19	Y	
	No asset match found		Services	DB11	Splicing power supply	Disconnected - ready for transport in LHD bucket	WWSURF	13.5.19	Y	
	No asset match found		Services	DB9	Power supply for splicers	415 / 240 volt power supply on skid base	WWSURF	13.5.19	Y	
101548	Mobile Lighting Tower	1/09/2010	Services				MCP		Y	On a trailer
101939	Shipping Containers (2)	1/06/2012	Services		Shipping containers	In Yard. Available for disposal	WWSURF	Bottom yard	Y	
101392	Shuttle Car No. 2294	1/12/2009	Shuttle Cars	2294	Waracar - 56" Suspension.	Out of compliance circa 2016	WWSURF	13.5.19	Y	
101393	Shuttle Car No. 2295	1/12/2009	Shuttle Cars	2295	Waracar - 56" Suspension.	Out of compliance circa 2016	WWSURF	13.5.19	Y	
101469	Shuttle Car No. 2296	1/06/2010	Shuttle Cars	2296	Waracar - 56" Suspension.	Out of compliance circa 2016	WWSURF	13.5.19	Y	
101502	Shuttle Car No. 2297	1/09/2010	Shuttle Cars	2297	Waracar - 56" Suspension.	Out of compliance circa 2016	WWSURF	13.5.19	Y	
102081	Shuttle Car No. 2298	1/12/2012	Shuttle Cars	2298	Waracar - 56" Suspension.	Out of compliance circa 2016	WWSURF	13.5.19	Y	
102082	Shuttle Car No. 2299	1/12/2012	Shuttle Cars	2299	Waracar - 56" Suspension.	Out of compliance circa 2016	WWSURF	13.5.19	Y	

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No asset match found			Shuttle Cars	5166-1	Waracar Cable Reel	Spare cable reel O/Haul 6/08	WWSURF	13.5.19	Y	
No asset match found			Shuttle Cars	7566-11	Waracar Cable Reel	Spare cable reel. O/haul 6/15	WWSURF	13.5.19	Y	
No asset match found			Transformer	6-300	11/415v, 250kw transformer tank	Power King, overhauled, Spare	WWSURF	Motor Shed 7.4.17	Y	