



**NSW  
Resources  
Regulator**

FWP0001125

# **MUSWELLBROOK COAL FORWARD PROGRAM**

1 January 2023 to 31 December 2025



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## Summary

### DETAIL

<b>Mine</b>	Muswellbrook Coal
<b>Reference</b>	FWP0001125
<b>Forward program commencement date</b>	1 January 2023
<b>Forward program end date</b>	31 December 2025
<b>Forward program revision (if applicable)</b>	
<b>Contact</b>	Julie Thomas
<b>Mining leases</b>	ML 1304 (1992), CCL 713 (1973), ML 1562 (1992)
<b>Project location</b>	Muswellbrook Coal Company Limited
<b>Date of submission</b>	Monday 17 April 2023

## Important

The department may make the information in your program and any supporting information available for inspection by members of the public, including by publication on its website or by displaying the information at any of its offices. If you consider any part of your program to be confidential, please communicate this to the department via the message function on this submission within the NSW Resources Regulator Portal.

# Three-year forecast – surface disturbance activities

## Project description

Muswellbrook Coal Company Limited (MCC) operates the Muswellbrook Open Cut Coal Mine (the site), located approximately three kilometres (km) to the north-east of Muswellbrook in the Hunter Valley of New South Wales. MCC is a wholly owned subsidiary of Idemitsu Australia Pty Limited (IA).

On 1 September 2003, Development Consent for DA 205/2002 was granted by Muswellbrook Shire Council (MSC) to extend the former MCC No.1 Open Cut. The No.1 Open Cut Extension commenced operations in March 2005 and has a capacity to produce up to 2,000,000 tonnes coal per annum with mining operations approved until end of 2022. Rehabilitation activities will progress past this date.

The current mine life at MCC is zero years. Mining operations ceased in 2022, with coal storage, handling and transport continuing until the end of March 2023.

## Description of surface disturbance activities

### Exploration activities

No further exploration is proposed by MCC at the site during the next three years.

### Construction activities

No construction is proposed by MCC at the site during the next three years.

### Mining schedule

Mining development method and sequencing and general mine features.

No further coal mining is proposed by MCC.

Areas identified for emplacements, the sequencing of emplacements, construction, and management.

Historically, both coarse and fine rejects were trucked back to the pit for disposal and managed as carbonaceous material. Overburden has been dumped sequentially into the Open Cut 1 and Open Cut 2 voids with consideration being given to carbonaceous content and liability to spontaneous combustion. Selective stockpiling of inert materials with no carbonaceous content

has been undertaken for use as cover material in the final voids to aid in the prevention of potential spontaneous combustion. The location and approximate volume of material in the stockpile is recorded.

#### Processing infrastructure activities and the location of tailings facilities and schedule for emplacement

Decommissioning of the Coal Handling and Preparation Plant (CHPP) will be undertaken in Year 1 of the FP (2023). All work will be completed in accordance with consent and lease conditions.

There are no tailings storage facilities onsite.

#### Waste disposal and materials handling operations.

Waste is currently segregated and taken offsite to either be recycled or disposed of at landfill by licenced contractors. This process will continue throughout the decommissioning process. All waste will be disposed of in accordance with EPA Guidelines.

Where possible, all identified sources of contamination will be remediated during the operational phase of the mine. In some cases, however, this may not be possible (for example, under existing slabs and workshops) and in these circumstances the remediation will be undertaken during decommissioning.

A preliminary investigation into potential sources of contamination, including some Phase 1 sampling and analysis, has been undertaken around the CHPP and MIA, as well as any other areas on site with the potential for contamination such as dams with diesel pumps, laydown areas etc. This Phase 1 review identified Areas of Environmental Concern that need further investigation and management. MCC commenced the Phase 2 of the assessment in 2022 to further define the extent of contamination across the site. The findings from the Phase 2 assessment will be obtained in Year 1 of the FP (2023) and will be incorporated into the rehabilitation activities on site.

**Key production milestones**

<b>MATERIAL</b>	<b>UNIT</b>	<b>YEAR 1</b>	<b>YEAR 2</b>	<b>YEAR 3</b>
<b>Stripped topsoil</b> <small>(if applicable)</small>	(m <sup>3</sup> )	0	0	0
<b>Rock/overburden</b>	(m <sup>3</sup> )	0	0	0
<b>Ore</b>	(Mt)	0	0	0
<b>Reject material<sup>1</sup></b>	(Mt)	0	0	0
<b>Product</b>	(Mt)	0	0	0

<sup>1</sup> This includes coarse rejects, tailings and any other wastes resulting from beneficiation.

# Three-year rehabilitation forecast

## Rehabilitation planning schedule

### Rehabilitation planning schedule

Detailed mine planning is completed annually to determine proposed mining/disturbance and rehabilitation to be undertaken in the following year.

Mine closure studies are ongoing for the site to address potential closure related knowledge gaps relating to lease relinquishment. Any outcomes that affect rehabilitation of the site will be incorporated into this document.

### Stakeholder consultation

Consultation undertaken to date is included in Section 4.2 of the RMP and the Annual Rehabilitation Report. A Stakeholder Engagement Plan has been developed for implementation during mine closure.

### Rehabilitation studies, risk assessments and/or design work

Design works will be undertaken to determine the material handling required each year to achieve the approved final landform. A detailed design of water management structures will be prepared prior to construction.

A Rehabilitation Risk Assessment was undertaken in January 2022 to identify and 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.

Of the 83 potential risks that were identified across the six phases of rehabilitation from active mining to ecosystem and land use development, 25 risks were deemed residual. Further details are included in Section 3.0 of the RMP. The Rehabilitation Risk Assessment will be reviewed in accordance with the guideline.

## Rehabilitation research and trials

RRT NUMBER	PROJECT/TRIAL NAME	OBJECTIVE OF TRIAL/PROJECT	METHODOLOGY	EXPECTED DATE OF COMPLETION	STATUS
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FWP0001125

## Rehabilitation maintenance and corrective actions

Maintenance activities will be conducted in accordance with the requirements of Section 6.2.6 of the Rehabilitation Management Plan.

Intervention and adaptive management will be conducted in accordance with the requirements of Section 10.0 of the Rehabilitation Management Plan.

Management and mitigation responses will be conducted in accordance with the requirements of Section 10.0 of the Rehabilitation Management Plan.

The Trigger Action Response Plan included in Section 10.0 of the Rehabilitation Management Plan identifies the proposed contingency strategies in the event of unexpected variations or impacts to rehabilitation outcomes. The TARP outlines the key identified risks, their trigger and proposed mitigation measures to reduce the identified risks.

## Rehabilitation schedule

The status of areas still to be rehabilitated and decommissioned along with the proposed timing for completion of rehabilitation and decommissioning are shown below.

- Coal Handling and Preparation Plant
  - o Removal of coal from stockpiles – Q1 2023
  - o Demolition of infrastructure – Q2 2023
  - o Removal of coal stockpiles – Q4 2023
  - o Reshaping of landform – Q4 2023
  - o Application of growth medium and seeding – Q1 2024
- Mine Infrastructure Area
  - o Demolition of infrastructure – Q2 2026
  - o Reshaping of landform – Q3 2026
  - o Application of growth medium and seeding – Q4 2026
- Open Cut 1

- o Reshaping of landform – Q3 2026
- o Installation of water control structures– Q3 2026
- o Application of growth medium and seeding – Q4 2026
- Open Cut 2
- o Reshaping of landform – Q3 2022
- o Installation of water control structures– Q2 2023
- o Application of growth medium and seeding – Q3 2023

This schedule addresses the remaining rehabilitation activities at the site in a timeframe that is reasonably practicable.

## **Subsidence remediation for underground operations**

Subsidence is not expected to impact on areas of rehabilitation. Historical bord and pillar underground mining has been undertaken at the site, which typically results in minimal subsidence therefore the risk of impact to rehabilitation is considered very low. No subsidence monitoring is required by MCC.

## Progressive mining and rehabilitation statistics

### Three-yearly forecast cumulative disturbance and rehabilitation progression

FORECAST	UNIT	YEAR 1	YEAR 2	YEAR 3
A Total surface disturbance footprint	(ha)	618.07	618.07	618.07
B Total active disturbance	(ha)	137.23	109.15	57.05
C Land prepared for rehabilitation	(ha)	82.29	110.37	162.47
D Ecosystem and land use establishment	(ha)	0	0	0

### Rehabilitation key performance indicators (KPIs)

FORECAST	UNIT	YEAR 1	YEAR 2	YEAR 3
O Total new active disturbance area	(ha)			
P Area proposed for active rehabilitation	(ha)	82.29	28.08	52.1
Q Annual rehabilitation to disturbance ratio				

## Attachment 1 – Reporting Definitions

REPORTING CATEGORY	DEFINITION
<p><b>A</b> Total disturbance footprint – surface disturbance</p>	<p>All areas within a mining lease that either have at some point in time or continue to pose a rehabilitation liability due to surface disturbance activities.</p> <p>The total disturbance footprint is the sum of the total active disturbance, decommissioning, landform establishment, growth medium development, ecosystem and land use establishment, ecosystem and land use development and rehabilitation completion (see definitions below).</p> <p>Underground mining operations should not include the footprint of underground mining areas/subsidence management areas in the total disturbance footprint.</p>
<p><b>B</b> Total active disturbance</p>	<p>Includes on-lease exploration areas, stripped areas ahead of mining, infrastructure areas, water management infrastructure, sewage treatment facilities, topsoil stockpile areas, access tracks and haul roads, active mining areas, waste rock emplacements (active/unshaped/in or out-of-pit), tailings dams (active/unshaped/uncapped) and temporary stabilised areas (e.g. areas sown with temporary cover crops for dust mitigation and temporary rehabilitation).</p>
<p><b>C</b> Rehabilitation – land preparation</p>	<p>Includes the sum of all disturbed land within a mining lease that have commenced any, or all, of the following phases of rehabilitation – decommissioning, landform establishment and growth medium development.</p> <p>Refer to the glossary of terms in this document for the definition of these phases of rehabilitation.</p>
<p><b>D</b> Ecosystem and land use establishment</p>	<p>Includes the area which has been seeded/planted with the target vegetation species for the intended final land use. However, vegetation has not matured to a stage where it can be demonstrated that it will be sustainable for the long term and or require only a maintenance regime consistent with target reference/analogue sites.</p> <p>Typically, rehabilitation areas would be in this phase for at least two years (and usually more) before rehabilitation can be classified as being in the ecosystem and land use development phase. This phase does not apply to infrastructure areas that are being retained as part of final land use for the site.</p>

REPORTING CATEGORY	DEFINITION
O	The area of any new active disturbance that will be created during the next three years, as defined under definition A1 (definition A1 Table 5).
P	The sum of any new rehabilitation to be commenced in the next three years. These areas may be in the phases “Rehabilitation - Land Preparation” or the “Ecosystem & Land Use Establishment” (definitions C & D in Table 5).
Q	The rehabilitation to disturbance ratio (S / R) indicates how many hectares of new rehabilitation are undertaken for each hectare of land disturbed during the three years. A ratio of 1/1 indicates that the area of new rehabilitation and disturbance in that period are the same.

## Attachment 2 – Definitions

WORD	DEFINITION
<b>Active</b>	In the context of rehabilitation, land associated with mining domains is considered ‘active’ for the period following disturbance until the commencement of rehabilitation.
<b>Active mining phase of rehabilitation</b>	In the context of rehabilitation, the active mining phase of rehabilitation constitutes the rehabilitation activities undertaken during mining operations such as salvaging and managing soil resources, salvaging habitat resources, and native seed collection. This phase also includes management actions taken during operations to manage risks to rehabilitation and enhance rehabilitation outcomes such as selective handling of waste rock and management of tailings emplacements.
<b>Analogue site</b>	In the context of rehabilitation, an analogue site is a ‘reference site’ that represents an example of the defining characteristics (such as vegetation composition and structure or agricultural productivity) of the final land use. Characteristics of analogue sites can be assessed to develop the rehabilitation objectives and completion criteria for final land use domains.
<b>Annual rehabilitation report and forward program</b>	As described in the Mining Regulation 2016.
<b>Annual reporting period</b>	As defined in the Mining Regulation 2016.
<b>Closure</b>	A whole-of-mine-life process, which typically culminates in the relinquishment of the mining lease. It includes decommissioning and rehabilitation to achieve the approved final land use(s).
<b>Decommissioning</b>	The process of removing mining infrastructure and removing contaminants and hazardous materials.
<b>Decommissioning Phase of Rehabilitation</b>	Activities associated with the removal of mining infrastructure and removal and/or remediation of contaminants and hazardous materials. In the context of the rehabilitation management plan 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.

<b>WORD</b>	<b>DEFINITION</b>
<b>Department</b>	The Department of Regional NSW.
<b>Disturbance</b>	See Surface Disturbance.
<b>Disturbance area</b>	<p>An area that has been disturbed and that requires rehabilitation.</p> <p>This may include areas such as on-licence exploration areas, stripped areas ahead of mining, infrastructure areas, water management infrastructure, sewage treatment facilities, topsoil stockpile areas, access tracks and haul roads, active mining areas, waste emplacements (active/unshaped/in or out-of-pit), tailings dams (active/unshaped/uncapped), and areas requiring rehabilitation that are temporarily stabilised (i.e. managed to minimise dust generation and/or erosion).</p>
<b>Domain</b>	<p>An area (or areas) of the land that has been disturbed by mining and has a specific operational use (mining domain) or specific final land use (final land use domain). Land within a domain typically has similar geochemical and/or geophysical characteristics and therefore requires specific rehabilitation activities to achieve the associated final land use.</p>
<b>Ecosystem and Land Use Development</b>	<p>This phase of rehabilitation consists of the activities to manage maturing rehabilitation areas on a trajectory to achieving the approved rehabilitation objectives and completion criteria.</p> <p>For vegetated land uses this phase may include processes to develop characteristics of functional self-sustaining ecosystems, such as nutrient recycling, vegetation flowering and reproduction, and increasing habitat complexity, and development of a productive, self-sustaining soil profile.</p> <p>This phase of rehabilitation may include specific vegetation management strategies and maintenance such as tree thinning, supplementary plantings and weed management.</p>
<b>Ecosystem and Land Use Establishment</b>	<p>This phase of rehabilitation consists of the processes to establish the approved final land use following construction of the final landform.</p> <p>For vegetated land uses this rehabilitation phase includes establishing the desired vegetation community and implementing land management activities such as weed control. This phase of rehabilitation may also include habitat augmentation such as installation of nest boxes.</p>
<b>Exploration</b>	Has the same meaning as that term under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

WORD	DEFINITION
<b>Final landform and rehabilitation plan</b>	As defined in the Mining Regulation 2016.
<b>Final land use</b>	As defined in the Mining Regulation 2016.
<b>Form and way</b>	Means the form and way approved by the Secretary. Approved form and way documents are available on the Department’s website.
<b>Growth Medium Development</b>	<p>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).</p> <p>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.</p>
<b>Habitat</b>	Has the same meaning as that term under the <i>Biodiversity Conservation Act 2016</i> and the <i>Fisheries Management Act 1994</i> (as relevant).
<b>Indicator</b>	An attribute of the biophysical environment (e.g. pH, topsoil depth, biomass) that can be used to approximate the progression of a biophysical process. It can be measured and audited to demonstrate (and track) the progress of an aspect of rehabilitation towards a desired completion criterion (i.e. defined end point). It may be aligned to an established protocol and used to evaluate changes in a system.
<b>Land</b>	As defined in the <i>Mining Act 1992</i> .
<b>Landform Establishment</b>	<p>This phase of rehabilitation consists of the processes and activities required to construct the final landform.</p> <p>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 (e.g. rock raking or ameliorating sodic materials).</p>
<b>Large mine</b>	As defined in the Mining Regulation 2016.
<b>Lease holder</b>	The holder of a mining lease.

WORD	DEFINITION
<b>Life of mine</b>	The timeframe of how long a mine is approved to mine, from commencement to closure.
<b>Mine rehabilitation portal</b>	<p>Means the NSW Resources Regulator’s online portal that lease holders must use (via a registered account) to:</p> <ul style="list-style-type: none"> <li>■ upload rehabilitation geographical information system (GIS) spatial data</li> <li>■ develop rehabilitation GIS spatial data (using online tracing functions)</li> <li>■ generate rehabilitation plans and rehabilitation statistics using the map viewer and Rehabilitation Key Performance Indicator functionalities.</li> </ul> <p>Data submitted to the mine rehabilitation portal is collated in a centralised geodatabase for use by the NSW Resources Regulator to regulate rehabilitation performance of lease holders.</p>
<b>Mining area</b>	As defined in the <i>Mining Act 1992</i> .
<b>Mining domain</b>	A land management unit 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).
<b>Mining land</b>	As defined in the <i>Mining Act 1992</i> .
<b>Native vegetation</b>	Has the same meaning as that term under section 60B of the <i>Local Land Services Act 2013</i> .
<b>Overburden</b>	Material overlying coal or a mineral deposit.
<b>Performance indicator</b>	An attribute of the biophysical environment (for example pH, slope, topsoil depth, biomass) that can be used to demonstrate achievement of a rehabilitation objective. It can be measured and audited to demonstrate (and track) the progress of an aspect of rehabilitation towards a desired completion criterion, that is, a defined end point. It may be aligned to an established protocol and used to evaluate changes in a system.

WORD	DEFINITION
<b>Phases of rehabilitation</b>	The stages and sequences of actions required to rehabilitate disturbed land to achieve the final land use. The phases of rehabilitation are: <ul style="list-style-type: none"> <li>■ active mining</li> <li>■ decommissioning</li> <li>■ landform Establishment</li> <li>■ growth medium development</li> <li>■ ecosystem and land use establishment</li> <li>■ ecosystem and land use development.</li> </ul>
<b>Progressive rehabilitation</b>	The progress of rehabilitation towards achieving the approved rehabilitation completion criteria. This may be described in terms of domains, phases, performance indicators and rehabilitation completion criteria.
<b>Rehabilitation Completion</b>	The final phase of rehabilitation when a rehabilitation area has achieved the approved rehabilitation objectives and rehabilitation completion criteria for the final land use. Rehabilitation areas may be classified as complete when the NSW Resources Regulator has determined in writing that the relevant rehabilitation obligations have been fulfilled following submission of <i>Form ESF2 Rehabilitation completion and/or review of rehabilitation cost estimate</i> application by the lease holder.
<b>Rehabilitation Completion criteria</b>	As defined in the Mining Regulation 2016.
<b>Rehabilitation cost estimate</b>	As defined in the Mining Regulation 2016.
<b>Rehabilitation management plan</b>	As defined in the Mining Regulation 2016.
<b>Rehabilitation objectives</b>	As defined in the Mining Regulation 2016.
<b>Rehabilitation risk assessment</b>	As defined in the Mining Regulation 2016.
<b>Rehabilitation schedule</b>	The defined timeframes for progressive rehabilitation set out in the forward program.

WORD	DEFINITION
<b>Relevant stakeholders</b>	Means any persons or bodies who may be affected by the mining operations, including rehabilitation, carried out on the lease land, and includes: <ul style="list-style-type: none"> <li>■ the relevant development consent authority</li> <li>■ the local council</li> <li>■ the relevant landholder(s)</li> <li>■ community consultative committee (if required under the development consent) or equivalent consultative group</li> <li>■ affected land holder(s)</li> <li>■ government agencies relevant to the final land use</li> <li>■ affected infrastructure authorities (electricity, telecommunications, water, pipeline, road, rail authorities)</li> <li>■ local Aboriginal communities, and</li> <li>■ any other person or body determined by the Minister to be a relevant stakeholder in relation to a mining lease.</li> </ul>
<b>Risk</b>	The effect of uncertainty on objectives. It is measured in terms of consequences and likelihood (AS/NZS ISO 31000:2009).
<b>Secretary</b>	The Secretary of the Department.
<b>Security deposit</b>	An amount that a mining lease holder is required to provide and maintain under a mining lease condition, to secure funding for the fulfilment of obligations under the lease (including obligations that may arise in the future).
<b>Surface disturbance</b>	Includes activities that disturb the surface of the mining area, including mining operations, ancillary mining activities and exploration.
<b>Tailings</b>	A combination of the fine-grained solid material remaining after the recoverable metals and minerals have been extracted from the mined ore, and any process water <sup>2</sup> .
<b>Waste</b>	Has the same meaning as that term under the <i>Protection of the Environment Operations Act 1997</i> .

<sup>2</sup> Commonwealth of Australia (DITR), 2007. *Tailings Management*.

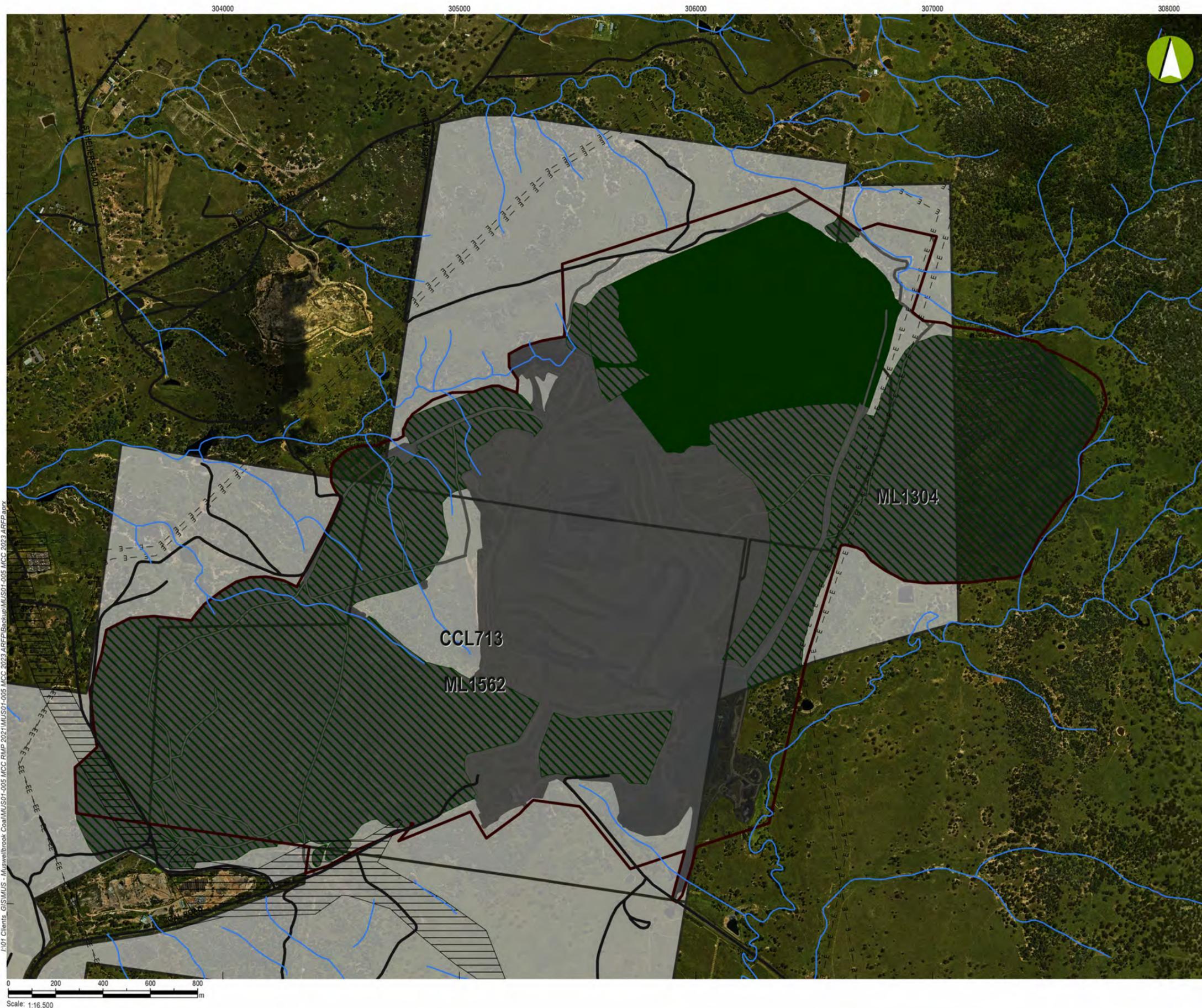
## Attachment 3 – Plans

Forward Program Year 1 2023.pdf

Forward Program Year 2 2024.pdf

Forward Program Year 3 2025.pdf

Forward Program (LARGE MINE) v2.1



## LEGEND

- Project Approval Boundary
- Waterways
- Road
- Electricity Transmission Line
- Land Zone**
- Bypass Zoning
- Current Authorisations**
- Coal - Current Titles
- Previous Rehabilitation
- Previous Disturbance
- Forecast Land Prepared for Rehabilitation (2023)

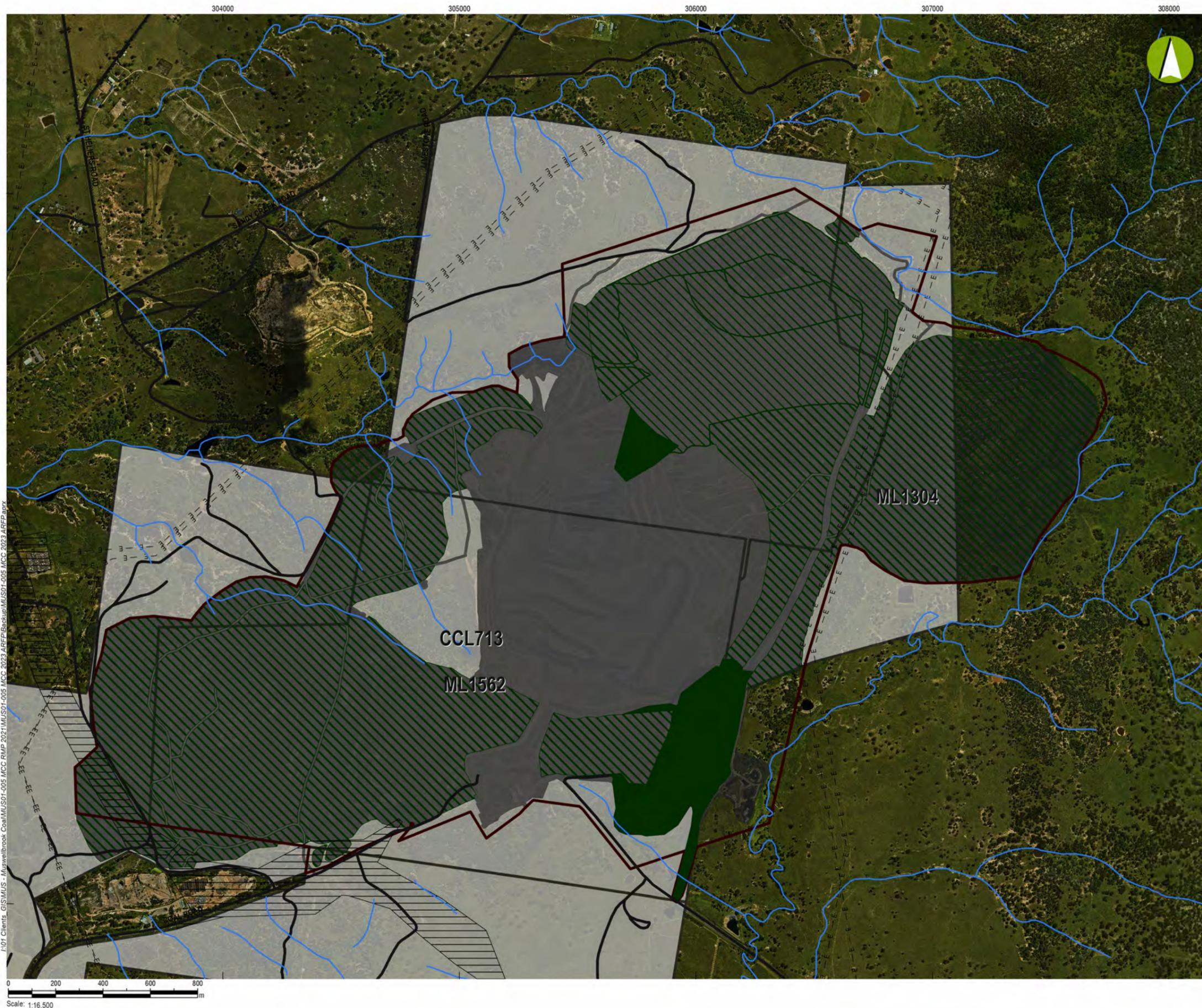
## Muswellbrook Coal Forward Program

### Mining and Rehabilitation Year 1 - 2023

#### PLAN 2A

Mine name	Muswellbrook Coal
Plan name	Muswellbrook Coal Forward Program 2023
Year of anticipated relinquishment	2050
Data theme submission ID No.	3956
Spatial Reference	GDA 1994 MGA Zone 56
Plan date (date created)	20/02/2023

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**LEGEND**

- Project Approval Boundary
- Road
- Electricity Transmission Line
- Waterways
- Current Authorisations**
- Coal - Current Titles
- Land Zone**
- Bypass Zoning
- Previous Rehabilitation
- Previous Disturbance
- Forecast Land Prepared for Rehabilitation (2024)
- MUS\_ARRFP\_Forecast\_Data\_Year1\_2023

**Muswellbrook Coal Forward Program**

**Mining and Rehabilitation  
Year 2 - 2024**

**PLAN 2B**

Mine name	Muswellbrook Coal
Plan name	Muswellbrook Coal Forward Program 2023
Year of anticipated relinquishment	2050
Data theme submission ID No.	3957
Spatial Reference	GDA 1994 MGA Zone 55
Plan date (date created)	20/02/2023

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Source: Project approval boundary, rehabilitation, disturbance, watercourses, current authorisations and aerial imagery from Muswellbrook Coal (2022).

