NSW GOVERNMENT

NSW Resources Regulator

FWP0001176

MURRAWOMBIE COPPER MINE FORWARD PROGRAM

Sunday 6 August 2023 to Wednesday 5 August 2026

Contents

Summary

DETAIL	
Mine	Murrawombie Copper Mine
Reference	FWP0001176
Forward program commencement date	Sunday 6 August 2023
Forward program end date	Wednesday 5 August 2026
Forward program revision (if applicable)	
Contact	Quinton Bruwer
Mining leases	MPL 294 (1973), MPL 295 (1973), ML 1280 (1973)
Project location	TRITTON RESOURCES PTY LTD
Date of submission	Wednesday 4 October 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

The Mine is located approximately 3.5km west of the village of Girilambone within the Bogan Local Government Area (LGA) in central west NSW. The Mine is owned and operated by Tritton Resources Pty Ltd (the "Company"), a wholly owned subsidiary of Aeris Resources Limited. Operations at the Mine commenced under Development Application (DA) 1/91 and Mining Lease (ML) 1280 in 1992. DA 1/91 was issued by Bogan Shire Council and does not contain an expiry date.

The Mine operation comprises of an open cut pit, a box cut decline portal to the Murrawombie underground mine, a heap leach copper extraction circuit and maintenance and administrative activities. The ore extracted from the underground operation is transported to the run of mine (ROM) pad at the surface where it is stored prior to being hauled to the Tritton Mine for processing via Yarrandale Road. Open cut operations have ceased in the short term and underground extraction activities are ongoing.

Description of surface disturbance activities

Exploration activities

The Company will undertake underground exploration and infill drilling within ML 1280 in the Forward Program Period.

Construction activities

No approved construction activities are planned in the Forward Program Period. Should a pending modification to DA 1/91 be approved, additional site infrastructure would be constructed. However, all construction works would occur on land previously disturbed for mining.

Mining schedule

Mining development method and sequencing and general mine features.

Open cut mining at the Mine is expected to resume in late-2025 (Year 2) as part of the Murrawombie Open Cut Extension. The extension of the open cut will involve the following.

- Extension of the open cut to the north, northeast and southeast
- Deepening of the existing open cut by 45m.
- Extension of the existing Waste Rock Emplacement (southern extension).

• Relocation of the ROM Pad.

Waste rock and ore will be mined using conventional drill and blast methods. Waste rock will be either stored on the Waste Rock Emplacement (WRE) or transported underground to be used as backfill.

Underground mining will continue at the Mine during the Forward Program Period.

The anticipated material production schedule predicted during the Forward Program Period is presented in the table below.

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

Waste rock stored on the southern extension of the WRE that potentially includes some PAF material is currently being used as backfill in underground workings as needed. However, NAF waste rock generated from the open cut extension will be used to encapsulate the southern extension of the WRE as well as to provide fill material for the rehabilitation of the Heap Leach Pads (HLPs). PAF waste rock will be used as backfill in underground workings, or temporarily stored on the WRE until cessation of mining, where it will be placed at the base of the open cut (Okane Consultants, 2022).

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

Ore generated from mining operations at the Mine Site will be transported to the Tritton Mine for processing.

The HLPs will remain operational during the Forward Program Period. It should be noted that no material is being actively placed on the heap leach pads. The current operations involve the processing of liquor that leaches from the existing heap leach pads.

Waste disposal and materials handling operations.

The principal wastes that will be generated can be categorised as production and non-production wastes. Production waste includes waste rock / overburden. Non-production wastes may include:

• greases, oils, filters, tyres and batteries from maintenance of vehicles and equipment;

• bulk scrap metal and plastics from discarded equipment;

• general office wastes e.g. paper;

• general waste generated by employees– e.g. food scraps, paper, cardboard, aluminium and steel cans; and

• wastewater from ablution facilities.

All hydrocarbon wastes will be stored in specified areas on site within a bunded area until collected by a licensed contractor. Worn tyres will be temporarily stored and removed from site regularly.

All general waste materials will be stored in covered bins or skip bins and collected regularly by a licenced contractor for disposal. Paper, cardboard, steel and aluminium will be stored separately from non-recyclable wastes.

All wastewater generated on the site will continue to be treated through the approved on-site septic tank system.

Key production milestones

MATERIAL	UNIT	YEAR 1	YEAR 2	YEAR 3
Stripped topsoil (if applicable)	(m^3)	0	0	0
Rock/overburden	(m^3)	0	49,250	2,055,000
Ore	(Mt)	0.3	0.1	0
Reject material[1]	(Mt)	0	0	0
Product	(Mt)	0	0	0

[1] This includes coarse rejects, tailings and any other wastes resulting from beneficiation.

Three-year rehabilitation forecast

Rehabilitation planning schedule

Rehabilitation planning schedule

Year 1 - Detailed biennial rehabilitation monitoring campaign

Seed Balance and Procurement Strategy

Waste Rock Characterisation – geochemical analysis of emplaced waste rock for rehabilitation planning

Waste Rock Emplacement Revegetation Works – review of vegetation condition and additional or supplementary planting (ongoing)

Hydromulching Study – research program on hydromulching application on waste rock emplacements (completed Year 2)

HLP Closure Planning – long term heap leach material consolidation study (completed Year 2)

Post Closure Water Management Strategy– site-wide water balance study (completed Year 3)

Year 2 - Landform Evolution Modelling - covering high risk landforms at all mine sites (completed Year 2)

Hydromulching Study – research program on hydromulching application on waste rock emplacements (completed Year 2)

Waste Rock Emplacement Revegetation Works – review of vegetation condition and additional or supplementary planting (ongoing)

HLP Closure Planning – detailed design for HLP capping and closure (completed Year 2)

Post Closure Water Management Strategy – post-mining surface water management (completed Year 3)

Year 3 - Detailed biennial rehabilitation monitoring campaign (completed Year 3)

Waste Rock Emplacement Revegetation Works – review of vegetation condition and additional or supplementary planting (ongoing)

Post Closure Water Management Strategy– groundwater modelling (completed Year 3)

Stakeholder consultation

The Company has undertaken consultation with relevant stakeholders during preparation of the Rehabilitation Management Plan for the Mine. The following government agencies and community stakeholders were contacted in November 2022.

- Bogan Shire Council
- Nyngan Local Aboriginal Land Council
- Crown Lands
- Environmental Protection Authority
- NSW Resources Regulator
- Department of Planning and Environment
- Department of Planning and Environment – Water
- Department of Regional NSW – Minerals, Exploration and Geoscience
- Heritage NSW
- Department of Planning and Environment - Biodiversity Conservation Division

Where a response has been received from the above stakeholders it has been to indicate that no comments would be provided (EPA and BCD). Feedback received from DPE Water identified priorities for post-closure water management. The DPE Water feedback will be addressed during the preparation of a Post-Closure Water Management Strategy (discussed in more detail in Section 2.2.4). The Rehabilitation Management Plan will be updated based on the feedback received during ongoing consultation.

No further stakeholder consultation is planned in relation to rehabilitation planning or scheduling over the Forward Program Period, excluding regular updates presented to the local community at meetings during the period.

Rehabilitation studies, risk assessments and/or design work

Between 2017 and 2020, RGS Environmental Pty Ltd (RGS) completed geochemical assessment work on the Heap Leach Pad (HLP) material. RGS found that there is a wide-ranging concentration and distribution of the metal(loids) and major ions, and in the forms and distribution of acidity in the HLP material. Soda Ash Brine (SAB), an alkaline concentrate, has been shown to have the potential to neutralise the acid of the HLP material and significantly improve the geochemistry of the heap leach material to achieve a geochemically viable final land use.

Laboratory scale tests have shown the Soda Ash Brine (SAB) to be suitable as an alkaline solution to flush the heap leach material and shut down the acid leach process. In August 2021, the Environment Protection Licence (EPL) 4501 was amended to allow for a large-scale trial use of the SAB within the HLPs. The trial commenced in November 2021 and is continuing.

The Company will undertake a Hydromulching Study on completed areas of the Waste Rock Emplacement that will examine the opportunities and limits of applying hydromulching in arid environments where topsoil availability is limited. The objectives of the study are to test the application of a hydromulch matrix to bind and fertilise the surface and promote plant growth.

The outcomes of the rehabilitation studies described in Section 2.2.1.2 may include recommendations for rehabilitation-specific trials for research programs.

Rehabilitation research and trials

RRT NUMBER	PROJECT/TRIAL NAME	OBJECTIVE OF TRIAL/PROJECT	METHODOLOGY	EXPECTED DATE OF COMPLETION	STATUS
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Rehabilitation maintenance and corrective actions

As this is the first Forward Program for the Mine and an Annual Rehabilitation Report has not yet been prepared, no rehabilitation performance issues, or knowledge gaps identified in an Annual Rehabilitation Report are noted. However, the Company is aware of revegetation failures within the waste rock emplacements that would be investigated in 2023 with a plan for remedial action implemented over the remainder of the Forward Program Period.

Rehabilitation schedule

Rehabilitation in the next Forward Program Period will be focused on the completion of the research and studies described in Table 2 and Section 2.2.2. The WRE will be subject to a remediation investigation to correct revegetation issues identified during monitoring in 2020. As indicated on Plans 2A to 2C, the Waste Rock Emplacement has been prepared for rehabilitation with growth medium establishment and ecosystem establishment commenced on these landforms. The Company has labelled these domains as Forecast Land Prepared for Rehabilitation on Plans 2A to 2C to outline that remedial works may be required and the appropriate studies are planned to take place.

Key mining activities during the next Forward Program Period will focus on the open cut extension, continued underground operations and the operation of the Heap Leach Facility. Although it is likely that progressive closure of sections of the Heap Leach Pads will occur coincidentally.

Subsidence remediation for underground operations

No subsidence monitoring is planned in the next Forward Program Period as no incidences of mine subsidence have been identified as occurring within the Mine Site or as a result of mining operations associated with the Mine. All open stopes will be backfilled with PAF material to prevent the occurrence of subsidence. Subsidence represents a low risk to rehabilitation at the Mine Site and as such, no specific subsidence-related management and maintenance programs are required at the Mine.

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)	226.81	226.81	226.81
B	**Total active disturbance**	(ha)	226.81	226.81	226.81
P	**Total new area of land proposed for active rehabilitation**	(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	**Total new area of land proposed for active rehabilitation during the reporting period**	(ha)			
Q	**Annual rehabilitation to disturbance ratio**				

Attachment 1 – Reporting Definitions

REPORTING CATEGORY		DEFINITION
A	Total disturbance footprint – surface disturbance	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. 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). Underground mining operations should not include the footprint of underground mining areas/subsidence management areas in the total disturbance footprint.
B	Total active disturbance	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).
C	Rehabilitation – land preparation	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. Refer to the glossary of terms in this document for the definition of these phases of rehabilitation.
D	Ecosystem and land use establishment	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. 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.

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
Active	In the context of rehabilitation, land associated with mining domains is considered 'active' for the period following disturbance until the commencement of rehabilitation.
Active mining phase of rehabilitation	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.
Analogue site	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.
Annual rehabilitation report and forward program	As described in the Mining Regulation 2016.
Annual reporting period	As defined in the Mining Regulation 2016.
Closure	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).
Decommissioning	The process of removing mining infrastructure and removing contaminants and hazardous materials.
Decommissioning Phase of Rehabilitation	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.

WORD	DEFINITION
Department	The Department of Regional NSW.
Disturbance	See Surface Disturbance.
Disturbance area	An area that has been disturbed and that requires rehabilitation. 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).
Domain	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.
Ecosystem and Land Use Development	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. 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. This phase of rehabilitation may include specific vegetation management strategies and maintenance such as tree thinning, supplementary plantings and weed management.
Ecosystem and Land Use Establishment	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 and implementing land management activities such as weed control. This phase of rehabilitation may also include habitat augmentation such as installation of nest boxes.
Exploration	Has the same meaning as that term under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

WORD	DEFINITION
Final landform and rehabilitation plan	As defined in the Mining Regulation 2016.
Final land use	As defined in the Mining Regulation 2016.
Form and way	Means the form and way approved by the Secretary. Approved form and way documents are available on the Department's website.
Growth Medium Development	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.
Habitat	Has the same meaning as that term under the *Biodiversity Conservation Act 2016* and the *Fisheries Management Act 1994* (as relevant).
Indicator	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.
Land	As defined in the *Mining Act 1992.*
Landform Establishment	This phase of rehabilitation consists of the processes and activities required to construct the final landform. 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).
Large mine	As defined in the Mining Regulation 2016.
Lease holder	The holder of a mining lease.

WORD	DEFINITION
Life of mine	The timeframe of how long a mine is approved to mine, from commencement to closure.
Mine rehabilitation portal	Means the NSW Resources Regulator's online portal that lease holders must use (via a registered account) to: ■ upload rehabilitation geographical information system (GIS) spatial data ■ develop rehabilitation GIS spatial data (using online tracing functions) ■ generate rehabilitation plans and rehabilitation statistics using the map viewer and Rehabilitation Key Performance Indicator functionalities. 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.
Mining area	As defined in the *Mining Act 1992*.
Mining domain	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).
Mining land	As defined in the *Mining Act 1992.*
Native vegetation	Has the same meaning as that term under section 60B of the *Local Land Services Act 2013.*
Overburden	Material overlying coal or a mineral deposit.
Performance indicator	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
Phases of rehabilitation	The stages and sequences of actions required to rehabilitate disturbed land to achieve the final land use. The phases of rehabilitation are: ■ active mining ■ decommissioning ■ landform Establishment ■ growth medium development ■ ecosystem and land use establishment ■ ecosystem and land use development.
Progressive rehabilitation	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.
Rehabilitation Completion	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 *Form ESF2 Rehabilitation completion and/or review of rehabilitation cost estimate* application by the lease holder.
Rehabilitation Completion criteria	As defined in the Mining Regulation 2016.
Rehabilitation cost estimate	As defined in the Mining Regulation 2016.
Rehabilitation management plan	As defined in the Mining Regulation 2016.
Rehabilitation objectives	As defined in the Mining Regulation 2016.
Rehabilitation risk assessment	As defined in the Mining Regulation 2016.
Rehabilitation schedule	The defined timeframes for progressive rehabilitation set out in the forward program.

WORD	DEFINITION
Relevant stakeholders	Means any persons or bodies who may be affected by the mining operations, including rehabilitation, carried out on the lease land, and includes: ■ the relevant development consent authority ■ the local council ■ the relevant landholder(s) ■ community consultative committee (if required under the development consent) or equivalent consultative group ■ affected land holder(s) ■ government agencies relevant to the final land use ■ affected infrastructure authorities (electricity, telecommunications, water, pipeline, road, rail authorities) ■ local Aboriginal communities, and ■ any other person or body determined by the Minister to be a relevant stakeholder in relation to a mining lease.
Risk	The effect of uncertainty on objectives. It is measured in terms of consequences and likelihood (AS/NZS ISO 31000:2009).
Secretary	The Secretary of the Department.
Security deposit	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).
Surface disturbance	Includes activities that disturb the surface of the mining area, including mining operations, ancillary mining activities and exploration.
Tailings	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[2].
Waste	Has the same meaning as that term under the *Protection of the Environment Operations Act 1997*.

[2] Commonwealth of Australia (DITR), 2007. *Tailings Management.*

Attachment 3 – Plans

Plan 2A attachment not provided.

Plan 2B attachment not provided.

Plan 2C attachment not provided.