



**NSW
Resources
Regulator**

FWP0001345

TARRAWONGA COAL MINE FORWARD PROGRAM

Monday 1 January 2024 to Thursday 31 December 2026

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Summary

DETAIL

Mine	Tarrawonga Coal Mine
Reference	FWP0001345
Forward program commencement date	Monday 1 January 2024
Forward program end date	Thursday 31 December 2026
Forward program revision (if applicable)	
Contact	Daryl Robinson
Mining leases	ML 1693 (1992), ML 1579 (1992), ML 1749 (1992), ML 1685 (1992)
Project location	Whitehaven Coal Mining Limited
Date of submission	Thursday 29 February 2024

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

Tarrawonga Coal Mine (Tarrawonga) (formerly known as East Boggabri Coal Mine) is an open cut coal mine owned and operated by Tarrawonga Coal Pty Limited, a wholly owned subsidiary of Whitehaven Coal Limited (Whitehaven) located approximately 15 kilometres (km) north-east of Boggabri and 42 km north-northwest of Gunnedah, NSW. Tarrawonga is approved under PA 11_0047 to carry out mining operations at a maximum rate of 3.5 million tonnes per annum (Mtpa) using truck and excavator method until the end of December 2030. Coal is hauled by road to the Gunnedah CHPP approximately 4km NW of Gunnedah town and then railed to the Port of Newcastle on the Mungindi-Werris Creek railway.

Description of surface disturbance activities

Exploration activities

Drillholes to further inform/refine the geological model will be completed in areas already disturbed but not mined in front of the advancing pit. Some drilling may be undertaken in 2024 depending on rig availability. Exploration activities will be undertaken in accordance with the requirements of the Exploration Code of Practice: Rehabilitation. Disturbance from previous exploration activities will be rehabilitated prior to mine closure. All exploration drill holes will be sealed in accordance with relevant RR DRG guidelines at the time.

Construction activities

A mine water dam will be continue construction within the mine footprint in 2024. Water management infrastructure such as drains will be constructed as needed as the mining footprint progresses as per the data submitted.

Mining schedule

Mining development method and sequencing and general mine features.

Mining of the Maules Creek Formation will progress in the TN pit and TC pit. In 2024 clearing will commence for the TE pit which is the final area to be mined in the Life of Mine plan at Tarrawonga. ROM coal production will be up to 3.5Mt. The overburden mined will be placed in the northern and southern overburden emplacement areas (NEA and SEA). The emplacement areas progress towards the east as mining progresses. In pit facilities such as crib huts and

go-lines will be moved and re-established as the overburden emplacement areas progress. Progressive development of new haul roads, stockpiles, laydown areas and gravel/borrow areas will also occur in the next three years.

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

The NEA and SEA will progress to the east as overburden is emplaced in these areas backfilling the void. The emplacement areas are all active and will be progressed concurrently. The TN and TC pit are mined concurrently so each OEA will be utilised and be active at the same time. The Northern Emplacement will be constructed with three elevated catchment areas to approximately 370 m AHD with areas up to approximately 376 m AHD to introduce micro-relief. The top surface of the northern extent of the emplacement would remain approximately 1,500m wide. Water management structures would be installed to facilitate a free draining landform, directing water from the top surface to sediment basins at the base of the emplacement. The elevated areas of the Northern Emplacement and the open cut infill area to the east of the Northern Emplacement will be revegetated to integrate with the Leard State Forest. During rehabilitation, the final height of the Southern Emplacement would remain at approximately 370 m AHD and will be integrated with the Northern Emplacement. Water management structures would be installed to facilitate a free draining landform, directing water from the top surface to sediment basins at the base of the emplacement. The Southern Emplacement would be constructed predominantly with batter slopes of 10 degrees or shallower.

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

Tarrawonga's coal is processed at the CHPP in Gunnedah which is not part of this mine site. Rejects (coarse and fine) from the CHPP are brought back along the same haulage route for emplacement via co-disposal with overburden in the final landform.

Waste disposal and materials handling operations.

Wastes produced at the Tarrawonga Coal Mine comprise of:

- General domestic-type wastes from on-site buildings and routine maintenance consumables;
- Oils and grease; and
- Sewage.

Domestic-type wastes will be collected and disposed of by a licensed waste disposal contractor, with recyclable materials separated, where possible. Waste oils from maintenance activities are pumped from equipment to bunded storage tanks and removed from site by a service truck. Sewage is managed via onsite facilities serviced by licensed contractors. Prior to decommissioning, Phase 1 and 2 Assessments will be undertaken to identify potential land contamination. Should contamination be identified, consideration will be given to the remediation and management of contaminated soil onsite.

Key production milestones

MATERIAL	UNIT	YEAR 1	YEAR 2	YEAR 3
Stripped topsoil <small>(if applicable)</small>	(m ³)	103,000	45,000	45,000
Rock/overburden	(m ³)	24,500,000	24,500,000	24,500,000
Ore	(Mt)	0	0	0
Reject material¹	(Mt)	0.7	0.7	0.7
Product	(Mt)	2.1	2.1	2.1

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

Three-year rehabilitation forecast

Rehabilitation planning schedule

Rehabilitation planning schedule

Outcomes of monitoring results (as described in Section 8.3.1 to 8.3.2 of the RMP) are incorporated within the Annual Site Rehabilitation Plan which is developed every year by the end of June to align with the budget period. The Annual Site Rehabilitation Plan provides additional specific detail, maps and statistics on planned rehabilitation activities and schedules for the next 12-month period. Notwithstanding this, planned activities are consistent with those in the Forward Program/LOM Plans. The Annual Site Rehabilitation Plan will provision for rehabilitation activities depending on the phase of rehabilitation at a particular area. The Annual Site Rehabilitation Plan will be the key document for tracking the progress of rehabilitation through rehabilitation phases. Any issue identified during rehabilitation inspection and documented in the annual rehabilitation monitoring report is actioned in the Annual Site Rehabilitation Plan.

Stakeholder consultation

Consultation will continue with stakeholders during the life of mine, in accordance with the SEP. Table 18 presents a summary of the proposed future consultation activities key stakeholders. This is as follows: RR - Ongoing revisions of the RMP (Condition 64, Schedule 3 of PA11_0047) -Submission of the Annual Review and Annual Rehabilitation Report - Detailed Mine Closure Planning DPE - Annual Reviews -Ongoing revisions of the RMP (Condition 64, Schedule 3 of PA11_0047) -Submission of the Annual Review and Annual Rehabilitation Report -Detailed Mine Closure Planning CCC -Quarterly meetings -Annual Reviews -Ongoing revisions of the RMP (Condition 64, Schedule 3 of PA11_0047) BTM Complex -BTM Complex Meetings Registered Aboriginal Parties -Detailed Mine Closure Planning

Rehabilitation studies, risk assessments and/or design work

Multiple risk assessments have been completed historically for the rehabilitation works associated with Tarrawonga. Table 8 of the RMP summarises the completed rehabilitation risk assessments. The risk assessment has been used to inform the preparation of the RMP. The objectives of the risk assessment were to:

- Identify the risks associated with rehabilitation and closure of Tarrawonga to achieve the approved post mining land uses;
- Identify knowledge gaps in Whitehaven's current understanding of the risks to rehabilitation;
- Identify the investigations/controls/action plans necessary to effectively mitigate risks and/or realise opportunities and to close any identified knowledge gaps;
- Inform the development of this RMP, to provide a basis to determine additional investigations and/or project works to

be undertaken; and

- Provide the framework to satisfy relevant internal and government guidelines, requiring implementation of a risk-based approach to closure. The risk workshop assessed a total of 59 key rehabilitation risks, which are summarised as:
- 13 risks were ranked as not applicable;
- 22 risks were ranked as low;
- 21 risks were ranked as moderate;
- 0 risks were ranked as significant;
- 3 risks were ranked as high; and
- 0 risks were ranked as extreme. Rehabilitation risks, controls and proposed controls will regularly be reviewed and revised (as required).

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

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: -Ongoing environmental management to minimise risks to rehabilitation; -Comparing specific ecosystem characteristics such as soil profile development, floristic composition and structure, faunal diversity and abundance with the characteristics of appropriate analogue sites; and -Undertaking adaptive management and remedial works where characteristics of the rehabilitation are not trending toward desired outcomes.

Rehabilitation monitoring will be undertaken throughout the ecosystem and land use development phase until it can be demonstrated that rehabilitation areas have met completion criteria and all conditions for relinquishment. Rehabilitation maintenance activities will be identified by rehabilitation monitoring and ongoing requirements will be reported annually in the Annual Rehabilitation Report and Forward Program.

Rehabilitation schedule

-The Northern Emplacement will be progressively constructed to a maximum height of 370 m AHD to integrate with the southern extent of the Boggabri waste rock emplacement. Localised areas of the Northern Emplacement will be constructed up to approximately 376 m AHD to introduce micro-relief. - The Southern Emplacement will be progressively constructed to a maximum height of approximately 370 m AHD. -Outer batter slopes for the Northern and Southern Emplacements will be predominantly constructed at 10 degrees or shallower. -Final outer surfaces of overburden emplacements will be constructed with non-sodic or low sodicity and/or will be treated with gypsum. -The elevated areas of the Northern Emplacement, Southern Emplacement and the open cut infill area to the east of the Northern Emplacement would be revegetated with native tree, shrub and grass species to achieve a native woodland/forest post-mining land use. Species selection and planting densities will vary to enhance integration with adjacent Leard State Forest and Boggabri waste emplacement area. - Backfilled areas of the open cut in-fill areas (approximately 285 m AHD) will be rehabilitated with selected topsoil resources suitable for sustainable and managed livestock grazing. The mine facilities area and former stockpile areas would also be revegetated to an agricultural post-mining land use suitable for grazing.

Subsidence remediation for underground operations

Tarrawonga is located in an area where no historic underground mining has been undertaken. Subsequently, mine subsidence is not applicable to Tarrawonga.

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)	852.73	865.62	877.62
B Total active disturbance	(ha)	790.64	739.43	679.45
P Total new area of land proposed for active rehabilitation	(ha)	62.09	126.19	198.17

Rehabilitation key performance indicators (KPIs)

FORECAST	UNIT	YEAR 1	YEAR 2	YEAR 3
O Total new active disturbance area	(ha)	20.64	12.89	12
P Total new area of land proposed for active rehabilitation during the reporting period	(ha)	62.09	64.1	71.98
Q Annual rehabilitation to disturbance ratio		3.01	4.97	6

Rehabilitation Cost Estimate

The rehabilitation cost estimate (RCE) for Tarrawonga Coal Mine was prepared in accordance with the NSW Resources Regulator's Rehabilitation Cost Estimation Tool. The total RCE calculated for Tarrawonga is \$59,550,000 based on a snapshot of disturbance as of 30th November 2023.

Attachment 1 – Reporting Definitions

REPORTING CATEGORY	DEFINITION
<p>A 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 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>C 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>D 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
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	<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>
Domain	<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>
Ecosystem and Land Use Development	<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>
Ecosystem and Land Use Establishment	<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>
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	<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>
Habitat	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).
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 <i>Mining Act 1992</i> .
Landform Establishment	<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>
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	<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"> ■ 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. <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>
Mining area	As defined in the <i>Mining Act 1992</i> .
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 <i>Mining Act 1992</i> .
Native vegetation	Has the same meaning as that term under section 60B of the <i>Local Land Services Act 2013</i> .
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: <ul style="list-style-type: none"> ■ 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 <i>Form ESF2 Rehabilitation completion and/or review of rehabilitation cost estimate</i> 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	<p>Means any persons or bodies who may be affected by the mining operations, including rehabilitation, carried out on the lease land, and includes:</p> <ul style="list-style-type: none"> ■ 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 <i>Protection of the Environment Operations Act 1997</i> .

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

Attachment 3 – Plans

Plan 2A Mining and Rehabilitation Year 1 2024.pdf

Plan 2B Mining and Rehabilitation Year 2 2025.pdf

Plan 2C Mining and Rehabilitation Year 3 2026.pdf

Forward Program (LARGE MINE) v2.1