NSW GOVERNMENT

NSW Resources Regulator

FWP0001584

INVINCIBLE COLLIERY FORWARD PROGRAM

Wednesday 1 January 2025 to Friday 31 December 2027

Summary

DETAIL	
Mine	Invincible Colliery
Reference	FWP0001584
Forward program commencement date	Wednesday 1 January 2025
Forward program end date	Friday 31 December 2027
Forward program revision (if applicable)	
Contact	William Olson
Mining leases	ML 1638 (1992), CCL 702 (1973), ML 1635 (1992), ML 1859 (1992), ML 1860 (1992), ML 1844 (1992)
Project location	Shoalhaven Coal Pty Ltd
Date of submission	Monday 31 March 2025

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

Invincible Colliery (Invincible) is located approximately 25 km north-west of Lithgow and is owned and managed by Shoalhaven Coal Pty Ltd (T/A Castlereagh Coal). PA 07_0127 was originally granted on 4 December 2008 and has been modified on five occasions at the date of this Forward Program. Approval is held for truck and excavator open cut operations to continue into the Southern Extension Area at Invincible until 31 December 2025, recovering thermal coal down to the Lithgow Seam at a rate of up to 1.2Mt of product coal per year. Invincible entered care and maintenance in 2013 before reopening by Castlereagh Coal in July of 2023. Product coal is approved for transport from the site by road to the Mount Piper Power Station or other domestic destinations. Final rehabilitation of the site will contain no final void and revegetated with locally endemic woodland and forest communities.

Description of surface disturbance activities

Exploration activities

No plans for future exploration work are currently in place at Invincible. However, Shoalhaven Coal will continue to sample overburden materials as required to verify the inherent qualities of the material and to identify required management measures for handing. All exploration activities conducted at Invincible will be subject to rehabilitation which will ensure all drill holes are sealed in accordance with the Borehole Sealing Guideline (DTI – Resources and Energy, 2012) and any exploration disturbance is rehabilitated in accordance with the Exploration Code of Practice: Rehabilitation (DRG, July 2015). Disturbance for exploration activities will be kept to a minimum and rehabilitation works will be undertaken as soon as practicable following the completion of drilling activities as required.

Construction activities

Existing and approved mine infrastructure and facilities will be utilised over the life of mining at Invincible. However, the following construction activities are also planned during the term of the Forward Program: • Completion of new sediment dam. • Additional internal roads or water management structures as required.

Mining schedule

Mining development method and sequencing and general mine features.

Invincible is located to the east of the Castlereagh Highway and is generally bound to the east by the steeply sloping terrain. The eastern boundary associated with the Southern Extension Area at Invincible has been specifically restricted from mining the steeply sloping terrain to protect the landscape and conservation values associated with the surrounding pagoda landscape within the Ben Bullen State Forest. Mining operations over the term of the Forward Program will continue operations in the Southern Extension Area, targeting the coal resources within the Irondale, Lidsdale and Lithgow Seams. Mining operations will continue to advance from the north to the south in the Southern Extension Area. Topsoil and any materials identified during the pre-clearing inspections will be salvaged and stockpiles for later use. A new sediment dam is under construction and is expected to be completed in 2025. Overburden materials initially extracted to be utilised to infill the void areas of the former mining operations. Blasting is not approved at Invincible so truck and excavator operations will be undertaken to uncover and extract ROM coal, which will be transported to the onsite coal processing facility prior to loading of product coal to road trucks for transport.

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

Overburden materials extracted during the mining process are used to backfill previously mined areas or to develop Overburden Emplacement Areas (OEAs). OEAs will continue to be progressively developed, shaped and rehabilitated to minimise visual impacts, dust generation and prevent erosion. Overburden material from the mining operations within the Southern Extension Area will be loaded onto trucks by excavators and hauled to active emplacement areas. Overburden may also be pushed directly by dozer to areas behind the active mining area rather than being hauled via truck. The sequence of mining and emplacement of overburden has been designed to allow early and progressive rehabilitation of the previously mined areas. Any carbonaceous materials will be emplaced well below the height of the final landform to avoid the potential for spontaneous combustion. Similarly, any materials with problematic geochemical constraints will be selectively handled and emplaced deep within the mining area and covered with inert materials. Access to the Northern Void will be maintained to allow access to water stored in the historic underground workings and voids. Following the cessation of mining, the final void in the Southern Extension Area and the Northern Void will be backfilled and shaped. Existing voids will be shaped to generally align with surrounding topography. No voids will remain in the final landform.

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

There are no planned coal beneficiation processing activities proposed to be undertaken at Invincible during the term of this Forward Program other than crushing and sizing of the ROM coal. Therefore, no residues and tailings will be produced. ROM coal is hauled to the ROM stockpile at the Invincible Mine Infrastructure Area for processing (via crushing to meet the sizing requirements of end users), where it is able to be loaded directly into road-registered

trucks for transport to external domestic destinations. Beneficiation of coal utilising the existing washery at Invincible has been decommissioned. The tailings storage facility (TSF) onsite is in a dry condition and maintained with water management structures. No new tailings will be emplaced in the TSF over the term of this forward program, and it will be investigated for the feasibility of mining remnant coal resources.

Waste disposal and materials handling operations.

Waste disposal undertaken on site is typically undertaken by a contractor. All sewage from the crib huts/office areas is directed to septic systems which are pumped out by a licensed waste contractor on an as-needs basis. Any maintenance works required on equipment during the term of this Forward Program will be undertaken within existing bunded areas at the Mine Infrastructure Area. Waste oils and grease from these areas including the workshop, is pumped or gravity flows to an oil-water separator and is cleaned on an as needs basis by a licenced waste contractor. Under emergency circumstances, i.e. breakdowns in the pit area, oils and grease will be pumped from the equipment to a tank on the service truck using an evacuation pump and any such waste will subsequently be transferred to the waste oil storage tank at the Mine Infrastructure Area. All other workshop waste streams (i.e. parts, packaging) will also be collected and transferred to the waste bins located Mine Infrastructure Area for disposal or for future recycling. Waste oils and grease stored at the maintenance workshop are collected by a licensed waste recycling contractor on an as needs basis. All paper and general wastes originating from the offices will be disposed of in garbage bins collected by a licenced waste collector as needed. Contaminated land from hydrocarbon or chemical spills is either removed from the site by a licenced waste contractor (where practicable) or flagged for later remediation.

Key production milestones

MATERIAL	UNIT	YEAR 1	YEAR 2	YEAR 3
Stripped topsoil (if applicable)	(m^3)	35,000	0	0
Rock/overburden	(m^3)	1,443,000	1,443,000	702,000
Ore	(Mt)	0.34	0.34	0.13
Reject material[1]	(Mt)	0	0	0
Product	(Mt)	0.34	0.34	0.13

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

Three-year rehabilitation forecast

Rehabilitation planning schedule

Rehabilitation planning schedule

The program of mining proposed during the term of the Forward Program includes the recovery of coal resources remaining within the Southern Extension Area. Mining of the coal from within this area will assist in the implementation of rehabilitation of existing disturbance and in development of the conceptual final landform identified in the Project Approval. Planning for rehabilitation activities has been undertaken as part of the mine planning process to mine the residual coal resource in the Southern Extension Area. Rehabilitation is scheduled to be undertaken progressively within the Eastern Void as overburden emplacement areas reach the final landform heights and are no longer required for operations. As noted previously, the final void in the Southern Extension Area and the Northern Void will be backfilled and shaped following the cessation of mining. A Rehabilitation Risk Assessment was undertaken in May 2022 to identify the key risks to rehabilitation activities achieving the rehabilitation objectives and final land uses for Invincible and Cullen Valley Mine (also operated by Castlereagh Coal). Key controls identified are described in the Rehabilitation Management Plan.

Stakeholder consultation

Castlereagh Coal has a Community Consultative Committee (CCC) that assists community discussion and feedback on its operations. Community representatives act as the point of contact to provide feedback between the mine and the community. Castlereagh Coal has informed the community members that they may contact the site at any time to enquire regarding mining operations. Castlereagh Coal will continue to liaise with the Resources Regulator and other relevant authorities.

Rehabilitation studies, risk assessments and/or design work

Castlereagh Coal has implemented a monitoring program that assesses rehabilitation performance across the site. The monitoring program utilises a range of mechanisms (e.g. correspondence, records, visual inspection records, expert monitoring reports, photographs, etc), to provide feedback on the status of rehabilitated areas and its progression towards achieving biodiversity target levels. These mechanisms provide evidence to document and demonstrate compliance with performance indicators and can be used to demonstrate changes over time as rehabilitation develops. The ecological rehabilitation monitoring commences during the Ecosystem and Landuse Establishment phase and involves: • Annual Walkover Inspection; and • Detailed Ecological Monitoring (contingent upon rehabilitation age). The monitoring methodology adopted for the above can be replicated

over any vegetation community or rehabilitation area and allows results to be compared to the analogue sites. These monitoring methods are discussed further in the Rehabiltation Management Plan.

NSW Resources Regulator

Rehabilitation research and trials

RRT NUMBER	PROJECT/TRIAL NAME	OBJECTIVE OF TRIAL/PROJECT	METHODOLOGY	EXPECTED DATE OF COMPLETION	STATUS
FWP0001584					

Rehabilitation maintenance and corrective actions

Rehabilitation maintenance and monitoring will continue to be undertaken across the rehabilitated areas and will be reported on in the Annual Rehabilitation Report (ARR). This maintenance and monitoring program may identify emerging issues or knowledge gaps which will require further corrective action to rectify and mitigate these issues from achieving the desired rehabilitation outcomes. Based on the rehabilitation monitoring information provided in the ARR, the RMP will be reviewed and updated on an annual basis to address any changes that may be required. The main maintenance actions which have been implemented in the rehabilitation areas to date are ecological monitoring, weed control, erosional feature management and soil management. These are described within the Rehabilitation Management Plan.

Rehabilitation schedule

Truck and excavator operations will continue within the Southern Extension Area during the term of this Forward Program targeting coal resources within the Irondale, Lidsdale and Lithgow Seams. All coal mining activities at Invincible will occur in accordance with that currently approved under PA 07_0127. Overburden materials extracted from the Southern Extension Area will initially be emplaced in the Eastern Void OEA, before progressing south to prepare existing Invincible disturbance areas for rehabilitation. Once areas become available for rehabilitation, the surface is bulk shaped using dozers to the final landform design prior to application of the growth medium and rehabilitation activities being undertaken. Planned land preparation and rehabilitation activities during the term of the Forward Program term are shown in Plan 2.

Completion of rehabilitation

Nil

Subsidence remediation for underground operations

There are currently no underground mining operations or approvals for underground mining at Invincible. Existing extraction areas and mining subsidence impacts have been identified in the SEA from the historic Ivanhoe Colliery underground operations. These subsidence impacts will be eliminated during open cut mining in the SEA prior to the area being prepared for rehabilitation to a stable landform. No further subsidence has been identified within Project Approval mining areas that required remediation during the term of the Forward Program.

Progressive mining and rehabilitation statistics

Three-yearly forecast cumulative disturbance and rehabilitation progression

	FORECAST	UNIT	YEAR 1	YEAR 2	YEAR 3
A1	Total disturbance footprint - surface disturbance	(ha)	188.36	188.36	188.36
B	Total active disturbance	(ha)	116.36	116.36	101.55
P	Total new area of land proposed for active rehabilitation	(ha)	10.07	10.07	24.88

Rehabilitation key performance indicators (KPIs)

	FORECAST	UNIT	YEAR 1	YEAR 2	YEAR 3
O	Total new disturbance area during reporting period	(ha)	6.49		
P	Total new area of land proposed for rehabilitation during the reporting period	(ha)	10.07		14.82
Q	Annual rehabilitation to disturbance ratio		1.55		

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.

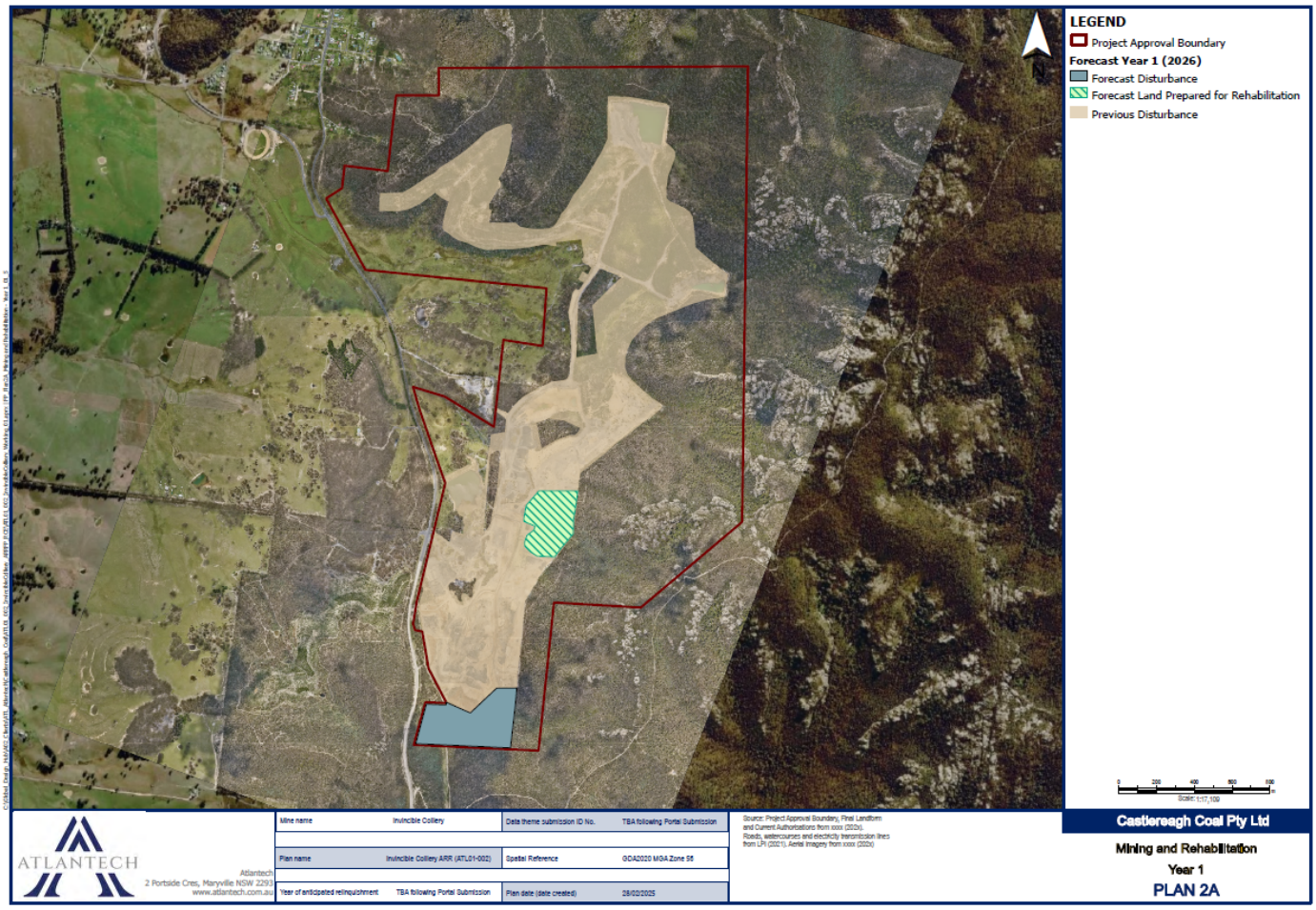
WORD	DEFINITION
Life of mine	The timeframe of how long a mine is approved to mine, from commencement to closure.
Mine rehabilitation portal	Means the NSW Resources Regulator's online portal that lease holders must use (via a registered account) to: ■ upload rehabilitation geographical information system (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.

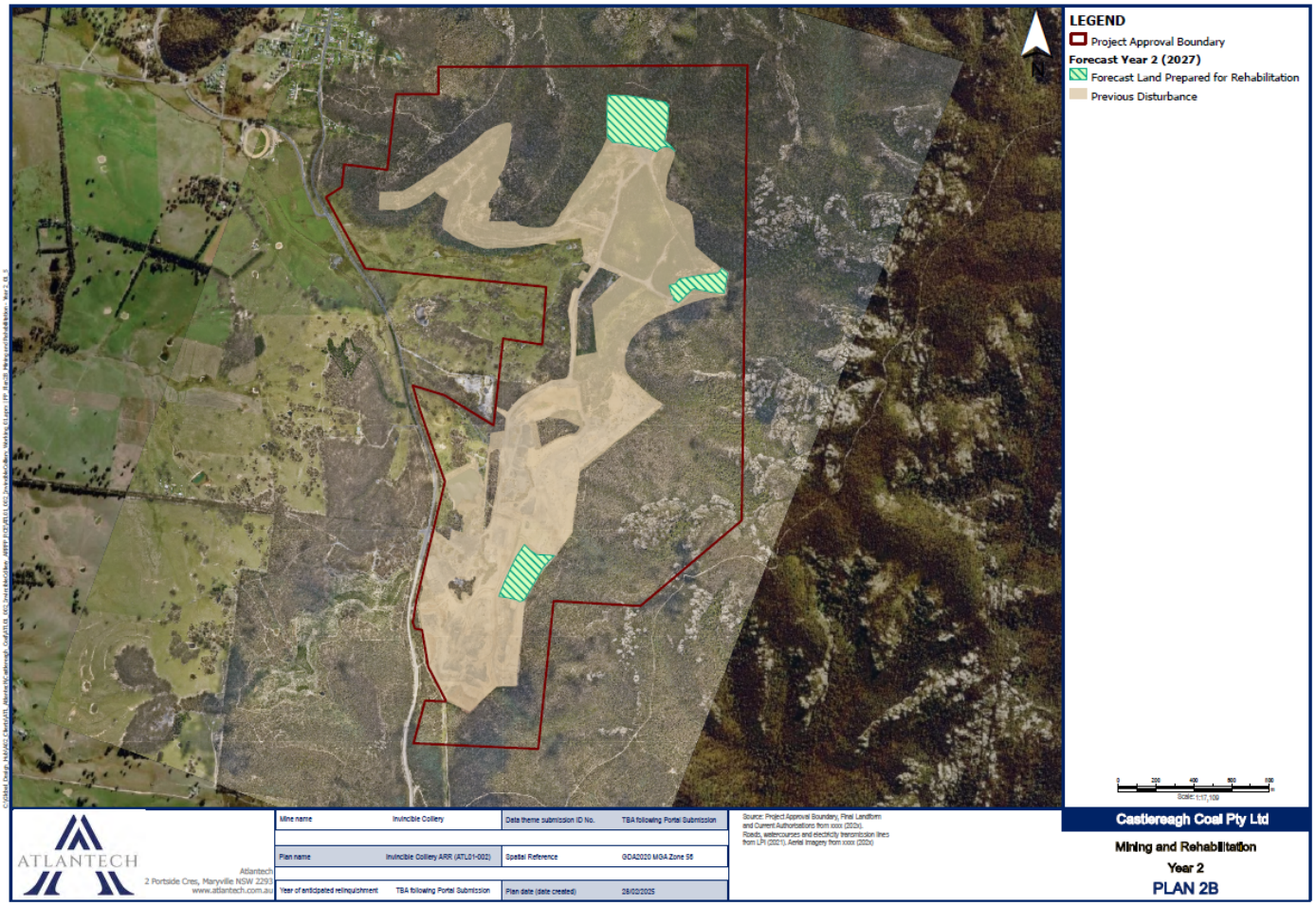
WORD	DEFINITION
Phases of rehabilitation	The stages and sequences of actions required to rehabilitate disturbed land to achieve the final land use. The phases of rehabilitation are: ■ active mining ■ decommissioning ■ landform Establishment ■ growth medium development ■ ecosystem and land use establishment ■ 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.

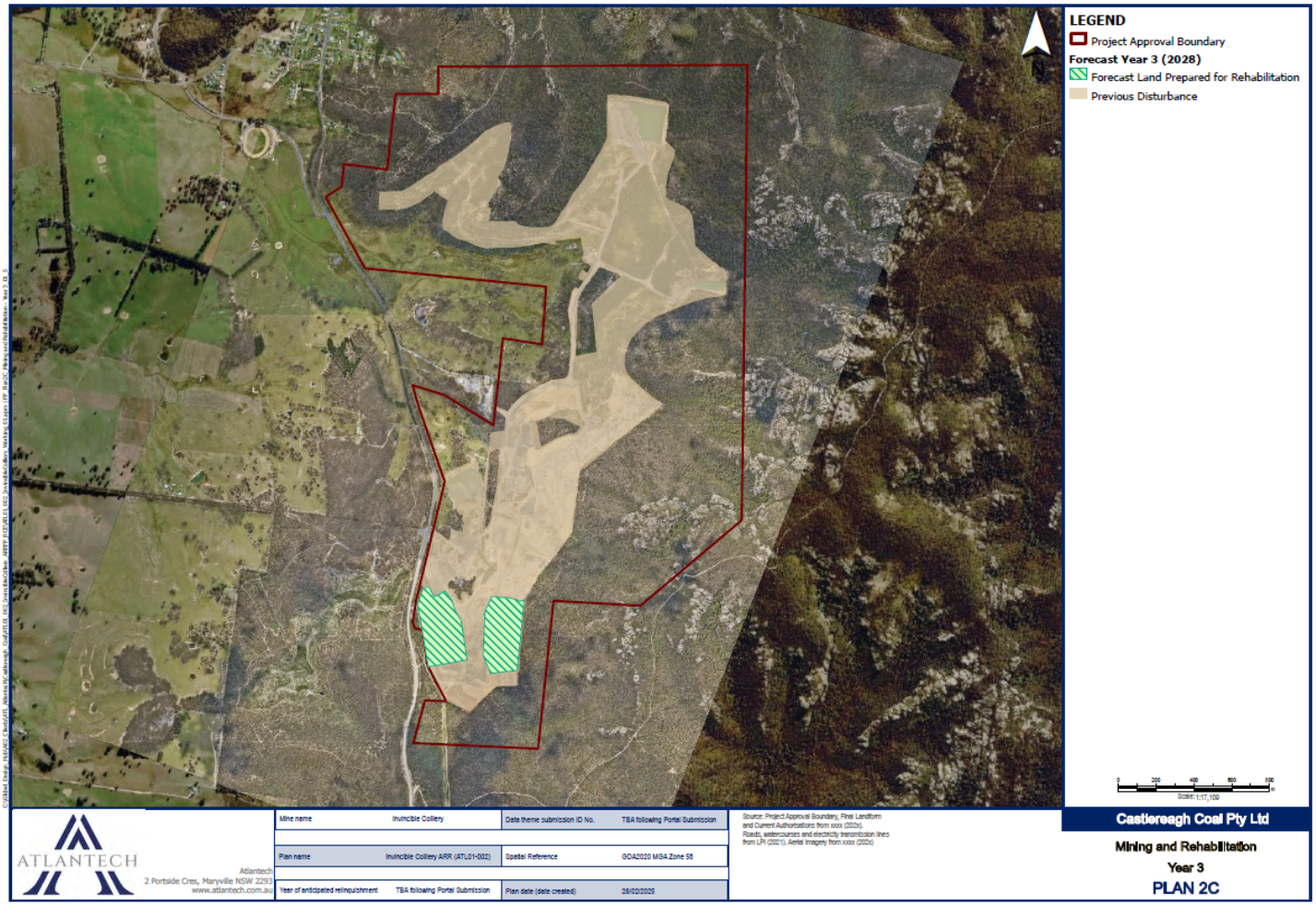
WORD	DEFINITION
Relevant stakeholders	Means any persons or bodies who may be affected by the mining operations, including rehabilitation, carried out on the lease land, and includes: ■ the relevant development consent authority ■ the local council ■ the relevant landholder(s) ■ community consultative 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




LEGEND
Project Approval Boundary
Forecast Year 2 (2027)
Forecast Land Prepared for Rehabilitation
Previous Disturbance
N
Castlereagh Coal Pty Ltd
Mining and Rehabilitation
Year 2
PLAN 2B
Mine name
Invincible Colliery
Data theme submission ID No.
TBA following Portal Submission
Plan name
Invincible Colliery ARR (ATL01-002)
Spatial Reference
GDA2020 MGA Zone 56
Year of anticipated relinquishment
TBA following Portal Submission
Plan date (date created)
28/02/2025
ATLANTECH


LEGEND
Project Approval Boundary
Forecast Year 3 (2028)
Forecast Land Prepared for Rehabilitation
Previous Disturbance
N
Scale: 1:17,100
Castlereagh Coal Pty Ltd
Mining and Rehabilitation
Year 3
PLAN 2C
ATLANTECH
Atlantech
2 Portside Cres, Maryville NSW 2293
www.atlantech.com.au
Mine name
Invincible Colliery
Data theme submission ID No.
TBA following Portal Submission
Plan name
Invincible Colliery ARR (ATL01-002)
Spatial Reference
GDA2020 MGA Zone 56
Year of anticipated relinquishment
TBA following Portal Submission
Plan date (date created)
28/02/2025
Source: Project Approval Boundary, Final Landform and Current Authorisations from xxxx (202x).
Roads, watercourses and electricity transmission lines from LPI (2021), Aerial Imagery from xxxx (202x)