Our ref: MAAG0007113
LETT0004566

Mt Arthur Coal Pty Limited
PRIVATE MAIL BAG NO 8
MUSWELLBROOK NSW 2333
Attn: Luke Neil

Dear Luke Neil

CL 229 (1973), EL 5965 (1992), ML 1487 (1992), ML 1655 (1992), ML 1548 (1992), AUTH 171 (1973), AUTH 437 (1973), CCL 744 (1973), ML 1739 (1992), ML 1593 (1992), ML 1358 (1992), ML 1757 (1992), MPL 263 (1973), CL 396 (1973), Mt Arthur Coal Pty Limited
Approval of Mining Operations Plan

NOTICE OF APPROVAL

Pursuant to the relevant Condition of CL 229 (1973), EL 5965 (1992), ML 1487 (1992), ML 1655 (1992), ML 1548 (1992), AUTH 171 (1973), AUTH 437 (1973), CCL 744 (1973), ML 1739 (1992), ML 1593 (1992), ML 1358 (1992), ML 1757 (1992), MPL 263 (1973), CL 396 (1973), the Mining Operations Plan (MOP) that was submitted to the Resources Regulator on 15 May 2020 (Department Reference: MAAG0007113) is approved for the period from the date of this approval until 30 June 2023.

It is the responsibility of the Authorisation Holder to ensure that all mining and mining related operations described in this MOP are as approved within the relevant Project Approval or Development Consent and all necessary approvals, consents or permits required under the relevant NSW or Commonwealth regulations have been obtained prior to carrying out the operations.

It is the responsibility of the Authorisation Holder to fulfil their obligations and commitments to the rehabilitation outcomes and performance standards as approved by the relevant consent authority to ensure the rehabilitation outcomes identified are achieved.

ASSESSED DEPOSIT

Approval of this MOP has triggered a review of the assessment of the security deposit required to secure funding for the fulfilment of rehabilitation obligations under the listed Mining Authorisation Number(s).

Notice of the change in the security deposit condition related to this MOP approval will be provided separately.

DEFINITIONS

In this letter, words have the meaning given to those terms in the *Mining Act 1992*, unless otherwise specified below.

Authorisation Holder means the holder of the relevant authorisation(s).

Mining Operations Plan means the project, mining and mining related operations described in the Rehabilitation Management Plan Mt Arthur Coal May 2020 and MAC-ENC-MTP-052 Mt Arthur Coal: Forward Program prepared by Hunter Valley Energy Coal Pty Ltd.

If you require additional information, please contact the Resources Regulator on 1300 814 609 (Option 2, then 5), or via email at nswresourcesregulator@service-now.com.

Yours sincerely,

Christine Fawcett
Manager Environmental Operations
Mining Act Inspectorate
Resources Regulator

26 June 2020

Signed under delegation from the Secretary Department of Regional NSW

MAC-ENC-MTP-052

BHP

Mt Arthur Coal: Forward Program

Brief description

The purpose of the Mine Operations Plan (MOP) is to provide the next 3-year mining and rehabilitation schedule, a summary of the spatial progression of rehabilitation (rehabilitation phase), and is the basis for calculation of the rehabilitation cost estimate (RCE). From this point on, the MOP will be referred to as the Annual Forward Program (AFP) and the Rehabilitation Management Plan (RMP). The Mt Arthur Coal Annual Forward Program meets requirements of Part 4 of the Code of Practice: Annual Rehabilitation Report and Forward Program for Large Mines.

Mt Arthur Coal Mining Operations Plan Lease Block	
Name of Mine	Mt Arthur Coal
Commencement Date	1 July 2020
Completion Date	30 June 2023
Mining Authorisations (Lease/License No.):	CCL 744, CL 396, ML 1358, ML 1487, ML 1548, ML 1593, ML 1655, MPL 263, A 171, A 437, EL 5965, CL 229, CL 335, ML1757, ML1739
Name of Authorisation Holder	Hunter Valley Energy Coal Pty Ltd
Name of Authorisation / Title Holder(s):	Hunter Valley Energy Coal Pty Ltd
Name of Mine Operator:	Hunter Valley Energy Coal Pty Ltd
Name and Contact Details of the Mine Manager (or equivalent):	Adam Lancey, General Manager Mt Arthur Coal Thomas Mitchell Drive Muswellbrook NSW 2333 Ph: 02 65445566 Email: Adam.Lancey@bhpbilliton.com
Name and Contact Details of Environmental Representative:	Kris Sheehan, Superintendent HSE, Mt Arthur Coal Thomas Mitchell Drive Muswellbrook NSW 2333Email: Kris.Sheehan@BHP.com
The information provided in this document is true and correct. Name of Representative(s) of the Authorisation Holder(s): Adam Lancey	
Title:	General Manager Mt Arthur Coal
Signature:	
Date:	14/05/20
Version 3.0 – June 2020	Mt Arthur Coal - Forward Program FY21 – FY23

Key contact

Action	Person	Title
Rehabilitation Planning	Damien Perkins	Manager Schedule Planning
Rehabilitation Governance	Kris Sheehan	Superintendent Health Safety and Environment
Document Owner	Rob Pascoe	Superintendent Tactical Planning
Document Approver	Adam Lancey	General Manager

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Intent

The intent of this Mining Operations Plan (Annual Forward Program (AFP)) is to allow continued mining operations at Mt Arthur Coal, for the Mt Arthur Coal Modification Project PA 09_0062 MOD 1. This AFP provides information pertaining to operating philosophy, mining method, rehabilitation management and reporting, water management and environmental management associated with current operations.

Other consents, approvals or permissions may be required depending on the nature and scale of the activities, the location and the associated environmental risks. These may include, but are not limited to:

- an environment protection licence under the Protection of the Environment Operations Act 1997 regulating noise, air, water and waste;
- licences or approvals under the Water Management Act 2000 or the Water Act 1912, for activities or works that take, divert or use water; and
- approvals for actions likely to have a significant impact on a matter of national environmental significance under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.

The lease holder remains responsible for ensuring that all operations, including the rehabilitation of the Land, are completed in compliance with the conditions of the mining lease, as well as the conditions of other relevant approvals such as the development consent.

Mining, overburden emplacement and infrastructure areas may be brought forward from any year during the Forward Program period, dependant on mine schedule requirements. Actual disturbance and rehabilitation is reported annually in the Annual Environmental Management Review.

Application

This Plan applies to the following Mt Arthur Coal representatives:

- All BHP employees and contract staff
- All Partnering contractor company representatives
- All Subcontractor company representatives.

Abbreviations

AFP	Annual Forward Program
AEMR	Annual Environmental Management Report
AHMP	Aboriginal Heritage Management Plan
BCM	Bank cubic metres
BMP	Biodiversity Management Plan
CCC	Community Consultative Committee
CCL	Consolidated coal lease
CHBI	Central Hunter Box – Ironbark Woodland
CHISG	Central Hunter Ironbark – Spotted Gum Grey-Gum Box Forest
CHPP	Coal handling preparation plant
CL	Coal lease
DA	Development approval
DoEE	Federal Department of the Environment and Energy
DP&E	NSW Department of Planning and Environment
DRG	NSW Department of Planning and Environment - Division of Resources and Geoscience
EA	Environmental Assessment
EL	Exploration licence
ELA	Exploration Licence Authorisation

EPA	NSW Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1979
EPBC	Environment Protection and Biodiversity Conservation
EPL	Environment Protection Licence
EMS	Environmental Management System
ESCP	Erosion and Sediment Control Plan
FLDP	Future Landscapes Design Project
FY	Financial year
HA	Hectares
HFRG	Hunter Floodplain Red Gum Woodland Complex
HRSTS	Hunter River Salinity Trading Scheme
HSE	Health, Safety and Environment
HVEC	Hunter valley Energy Coal (MT Arthur Coal)
ISO	International Standards Organisation
ITP	Inspection and test plan
LGA	Local government area
ML	Mining lease
MOP	Mining Operations Plan
MPL	Mining purpose lease
MSC	Muswellbrook Shire Council
Mtpa	Million tonnes per annum
NGO	Non-government organisation
NOW	NSW Office of Water
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
PIRMP	Pollution Incident Response Management Procedure
ROM	Run of mine
RAP	Remedial Action Plan
UHWB	Upper Hunter White Box – Ironbark Grassy Woodland

Definitions

- **Hunter Valley Energy Coal Pty Ltd -** operates the Mt Arthur Coal Complex which consists of the approved open cut mining operations, a rail loop and associated rail loading facilities (PA 09_0062) and the Mt Arthur Underground Project (PA 06_0091),
- **The Project Approval -** Project Approval 09_0062 MOD 1 Mt Arthur Coal Mine – Open Cut Modification Project dated 26 September 2014.
- **Mine Operations Plan –** The combination of the Annual Forward Program and the Rehabilitation Management Plan
- **The Annual Forward Program -** is prepared in accordance with the mandatory requirements of Part 4 of the Code of Practice: Annual Rehabilitation Report and Forward Program for Large Mines.
- **Rehabilitation Management Plan (RMP) -** The Rehabilitation Management Plan meets the requirements of Condition 44 of the Mt Arthur Coal Modification Project PA 09_0062 MOD 1 under Section 75W of the Environmental Planning and Assessment Act 1979 (EP&A Act). Condition 44 requires the project proponent to prepare and implement a Rehabilitation Management Plan for the Project. The RMP also meets the requirements for Code of Practice: Rehabilitation Management Plan for Large Mines.

1 Three year mining activities forecast

1.1 Project Description

Hunter Valley Energy Coal Pty Ltd (HVEC) operates Mt Arthur Coal, which consists of an approved open cut and underground mining operation, a rail loop and associated rail loading facilities. The Mt Arthur Coal Mine is located approximately 5 kilometres south west of Muswellbrook within the Muswellbrook Shire Local Government Area (LGA) in the Upper Hunter Valley of NSW. The location of Mt Arthur Coal is shown in Plan 1A.

Mt Arthur Coal is an open cut coal mine operating with trucks and shovels to extract up to 32Mtpa of ROM coal. The majority of coal is crushed and washed, prior to export markets. Mt Arthur has development consent approval to operate until 30 June 2026. The general sequence and staging of mining operations over the life of the operation will be consistent with the methods described in Section 1.2.3.

In 2013, Mt Arthur Coal lodged an application to modify the Project Approval 09_0062 under section 75W of the EP&A Act (the Mt Arthur Coal Open Cut Modification [the Modification]). The application was approved by the Planning Assessment Commission (as delegate of the Minister for Planning) on 26 September 2014 (Project Approval 09_0062 MOD 1). The Modification includes the continuation of open cut mining operations at the Mt Arthur Coal Mine for an additional operational life of four years from 2022 to 2026 at the maximum rate of 32 Mtpa, an increase in open cut disturbance areas, additional overburden emplacement areas, duplication of the existing rail loop and various additional infrastructure changes. The Modification Project Approval can be found at the following website http://www.bhpbilliton.com/environment/regulatory-information.

1.2 Description of Activities

1.2.1 Exploration

Exploration activities will include a combination of airborne electromagnetic (EM) survey, Envirovibe – seismic surveys and exploration drilling. Envirovibe – seismic surveys are a minor ground disturbing activity, unlike traditional seismic exploration. This type of survey does not require vegetation removal or blasting. The vibration levels generated are significantly below Mt Arthur Coal's current vibration approval limits. The Envirovibe - seismic exploration is done by driving a soft wheeled vibration vehicle across the ground, and hand placed geophones are used on the surface to collect data. The Envirovibe process has been discussed with the Resource Regulator to ensure that there is understanding of the non-invasive manner of this process.

An exploration drilling program will be undertaken on a campaign basis and subject to operational requirements throughout this AFP period. All exploration boreholes will be drilled following ecological and cultural heritage (Aboriginal and European) due diligence inspections. A program to monitor and rehabilitate existing boreholes will continue during this AFP period. Boreholes that are yet to be rehabilitated will be capped progressively.

1.2.2 Construction

Construction of infrastructure to support the open cut development will continue during this AFP period. The major construction and demolition activities proposed during this AFP period include:

- The new overburden emplacement area (Conveyor Corridor Overburden Emplacement Area) will continue its progression throughout this AFP period.
- The installation of sediment control structures required for the operation of the Conveyor Corridor Overburden Emplacement Area.
- The realignment of power lines and substations. This includes both power lines owned by AusGrid and Mt Arthur Coal.
- The relocation of the explosives facility to the west of the pit highwall.
- The construction of a deployment facility to the western side of the main pit which including carparks, change rooms, crib huts, ablutions and office buildings.
- The Edderton Road construction pad, currently located adjacent to the Windmill/Huon Pit high wall, will be relocated to the South. A new access road off Edderton Road.

- A new overburden emplacement area (OP1N), relevant haul road and sediment dams will be constructed in this AFP period. The installation of sediment control structures to support this emplacement area.
- The continuation of the construction of the Tailings Storage Facility (TSF) lift. MAC TSF Stage 2 Phase B project, we are raising the south west valley tailing dam, and relocating and infrastructure that is in the way of the dam raise.
- The demolition of the disused Bayswater Infrastructure Area, dependent on the need for tailings expansion.
- Additional water pipelines, pumps and tracks for LV inspections to support ongoing water management strategies.
- Upgrades to existing telecommunications infrastructure on-lease and off-lease.
- Additional fixed and mobile telecommunications infrastructure.
- The approved realignment of Edderton Road and its intersection with Denman Road, which includes the extension of the existing alluvial cut off wall, the relocation of power lines, water infrastructure and the construction of water/sedimentation dams.
- Additional mine infrastructure as part of ongoing upgrades consisting with existing approvals including fill stands and maintenance pads.
- Upgrading of haul road infrastructure around the coal export stockpile to allow for separation of heavy and light vehicles.
- The drilling of additional groundwater monitoring bores and the installation of monitoring equipment in advance of mining and for monitoring of tailings. Once data has been collected for sufficient time the TARP will be updated to include these bores.
    - The Works near Saddlers Creek for monitoring of West Cut and South West Valley consist of the installation of five new groundwater monitoring bores at three Sites. Each Site will consist of one shallow monitoring bore screened in the alluvium/regolith and one deep bore targeting the first unweathered coal seam below the alluvium. The timing for these is to be completed before the end of FY20.
    - The bores for North Cut TSF closure additional groundwater monitoring infrastructure to monitor for groundwater level and quality in the vicinity of the North Cut Tailings Storage Facility (TSF). These bores are to be installed in the first quarter of FY21. This Scope of Works (SOW) describes the drilling and installation requirements for 8 new monitoring bores at 4 sites. Development of a TARP for the new monitoring bores approximately 2 years after the bores have been installed. The TARP development will also be dependent on review by a suitably qualified hydrogeologist.
- The installation of additional mine infrastructure to improve tailings deposition and TSF future rehabilitation works.
- Tailings Storage Facility Population At Risk Mitigation – which may include a bund wall and the relocation of infrastructure.
- The installation of additional and/or upgraded mine infrastructure for noise, dust and water monitoring will occur on-lease and off-lease.
- The installation of additional mine infrastructure to eliminate the need for future TSF's is planned to commence.
- Closure and capping of the North cut tailings dam as a project combined with Main dam (Decommissioning of the Main Dam) and Dam 4 will continue in the AFP period. The Project is for closure and rehabilitation of the North Cut Tailings Storage Facility (TSF), Main Dam, and Dam 4, an area spanning 51.5 hectares. With the aim to:
    - Enable Main Dam to be de-prescribed in accordance with the NSW Dam Safety Committee (DSC) guidelines.
    - Cap the North Cut TSF
    - Manage potential acid forming (PAF) and spontaneous combustion materials to reduce health, safety and environmental risks
    - Rehabilitate the site to create a safe, stable, non-polluting and sustainable landscape that achieves the intended final land uses and supports sustained vegetation growth

- The final landform design for North Cut TSF includes:
    - A geomorphic design in accordance with Project Approvals, namely, a safe, stable and non-polluting final landform designed to incorporate natural micro-relief and natural drainage lines to integrate with surrounding landforms
    - A minimum final surface grade of 4%-5% to counter the anticipated settlement so site remains free-draining post-settlement.
    - Surface drains on TSF capping surface to direct runoff from capped area towards the northern and southern ends to reduce drainage length
    - Incorporation of the adjacent waste dump into TSF capping bulk fill to provide stable long-term batter slope and reduce imported fill demand
    - Providing sediment ponds at the outlet of surface drains to treat water at source (capping area is likely to produce highest sediment load until the vegetation cover has been established)
    - Minimisation of bulk fill requirements due to restrictions on Mine Operations to carry out bulk filling operations (Mine Operations to provide Mine Material to stockpile within Dam 4 and Civil Contractor to place material into works)
    - Stabilising the existing North Cut TSF western embankment with outer buttress
    - Decommissioning the existing emergency spillway over the earthen embankment
    - Encapsulation of the area of potential spontaneous combustions with extension of compacted clay
- The Northcut closure activity time frames are dependent on the drying and consolidation process outcomes. Below are key milestones for the project. These milestones are a guide, as during the project, actual data will be used to modify and update the project:
    - drying and consolidation underway to enable for construction –end of FY21
    - capping construction commence – early FY22
    - topsoiling and seeding commence – mid FY23

1.2.3 Mining Operations

During FY20, mining occurred in the Macleans, Windmill, Huon, Calool, Roxburgh, Ayredale and Saddler pits. Overburden was placed on the conveyor corridor, CD areas, VD areas, Macleans, Saddlers North, Belmont and OP1N emplacement areas.

During this three year term, approximately 76 million tonnes of ROM coal has been identified for recovery using truck and shovel and/or excavator mining method for an equivalent 56 million tonnes of product coal. This method is consistent with current and previous site open cut operations.

The disturbance proposed for this AFP period is located within the EA disturbance boundary, as approved under the Mt Arthur Coal Open Cut Modification Project Approval 09_0062 MOD 1. During this AFP period, mining is proposed to continue within the extended pit shells of North Pit. North Pit is an amalgam of constituent pits, consisting of:

- Windmill Pit;
- Huon Pit;
- Calool Pit;
- Roxburgh Pit; and
- Ayredale Pit.

During this AFP period, coal will be mined from the Arrowfield, Bowfield, Warkworth, Mount Arthur, Piercefield, Vaux, Broonie, Bayswater, Wynn, Edderton, Clanricard, Bengalla, Edinglassie, Transitional, and Ramrod Creek coal seams. Beyond this AFP term, open cut coal reserves still remain at the Saddlers Pit and North Pit areas.

The mine design has maximised the recovery of open cut resources from available areas. Future mining potential of underground resources is not adversely affected by activities proposed as part of this AFP. Open cut mining activities proposed under this AFP have been planned in conjunction with the long term engineers to maximise both the net present economic value of both open cut and potential underground resources and the recovery of open cut and underground marketable reserves into the future. An underground exploration adit was mined during previous AFP periods. The adit has been sealed and no coal recovery via underground mining methods will be undertaken during this AFP period.

Prior to excavation of a new open cut strip, pre-stripping operations ensure that natural resources such as vegetation and topsoil are cleared and, where appropriate, recovered for subsequent use in post-mining rehabilitation. Rock strata overlying coal resources (overburden) is drilled and blasted to fracture the rock and facilitate overburden excavation. Hydraulic excavators and electric rope shovels then excavate and load blasted overburden into large haul trucks of nominal 350-tonne and 206-tonne capacities. These trucks transport the overburden material to designated emplacement areas.

After removing the overburden, the exposed coal seam is mined using hydraulic excavators and loaders with the assistance of dozers and front-end-loaders. The ROM coal extracted is delivered by haul trucks of nominal 157-tonne capacity to either the hopper bins that feed into the CHPP or to the ROM coal stockpiles. After crushing to size and processing to remove impurities, coal is stockpiled prior to transport from site by rail.

The general sequence of mining used at Mt Arthur Coal is shown in Figure 1.

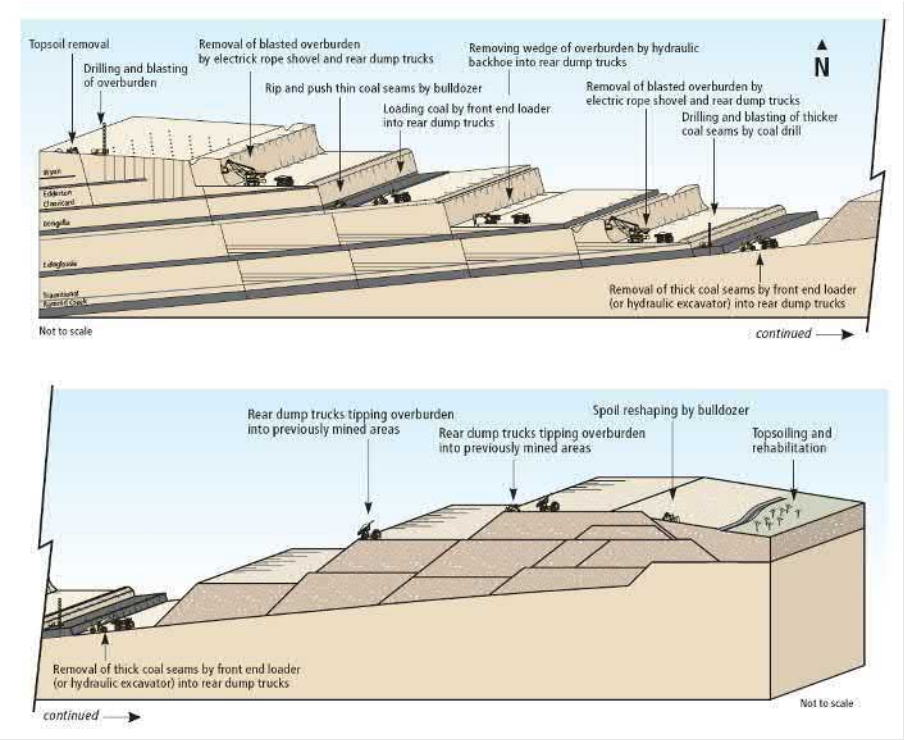


Figure 1: Mining sequence from topsoil removal to rehabilitation

1.2.4 Overburden Emplacement

During this three year term approximately 404 million bank cubic metres of overburden has been identified for transportation and placement by rear dump trucks. Emplacement areas are generally located within the open cut pit shell on the low wall side of the active pit. However there will be movement to HW (Belmont, OP1N and SDn) dumps. Overburden emplacement areas that will be utilised during this AFP period include:

- Visual Dumps 1 – 5 (VD1-5);
- Contingency Dumps 1 – 5 (CD1-5);
- Saddlers Dump 1-3 (SD1-3);
- Out of Pit Dump 1N (OP1N) (Previously known as southwest Overburden emplacement area)
- Tailings Emplacement Expansion walls;
- Conveyor Corridor Overburden Emplacement Area;
- Drayton Void Overburden Emplacement Area; and

In-pit overburden placement may occur in the Ayredale Pit during this Forward Program period.

With the exception of the tailings emplacement expansion walls, these emplacement areas are designed by mine planning engineers. The extended tailings emplacement walls were designed by an external consultant. Survey control during emplacement is undertaken by Mt Arthur surveyors, under the direction of mine planners. Operational management of the emplacements is undertaken by mine Open Cut Examiners (OCE), who supervise overburden placement.

Overburden emplacement design incorporates considerations such as capacity, access, shape and lift height, as well as safety and environmental constraints. Emplacement areas are constructed with positive drainage to ensure emplacements shed water away from the active pit. North Pit emplacements (VD1-5 and CD1-5) emplacements approximate level of RL 375m to create visual relief. Emplacement design and construction also incorporates hostile material management considerations.

1.2.5 Processing Residues and Tailings

Coal handling and processing is undertaken within the centralised coal handling and preparation plant (CHPP) located within Mining Lease ML1487. ROM coal extracted by the approved open cut operations is delivered by truck to either the ROM coal bins or the CHPP ROM coal stockpile. Following processing at the CHPP, coal is loaded onto trains via the rail loading facility for delivery to the export market.

Approximately 20 million tonnes of reject material will be produced from the CHPP during this AFP period. Coarse reject material will continue to be co-disposed within overburden emplacement areas or utilised in the construction of stockpile pads, road or other infrastructure. Fines (tailings) will continue to be pumped from the CHPP to the existing West Cut Tailings Dam (WCTD) for approximately 12 months. Pumping of tailings into a void to the east of the dam, known as East Pit commenced in 2013. Tailings deposition in East Pit and WCTS will continue for this AFP period. These tailings emplacements are shown in Plan 2 and are planned to be expanded in the second half of this AFP period as discussed in Section 2.

In February 2012, Mt Arthur Coal received approval from the DRG for the expansion of the existing tailings storage facility to an elevation of RL 280m AHD for the continued emplacement of tailings. The tailings dam expansion project involves the construction of two cross-valley embankments and a series of rim embankments. Cross-valley embankment design incorporates a compacted weathered layer, backed by an overburden layer, to ensure required levels of permeability as per relevant DRG approval.

Construction commenced in 2012 and will be completed in four stages over a 20-30 year period. Stage 1 (raising dam to RL 235m) involved the placement of 4,000,000 m3 of material and was finalised in 2013. Construction of Stage 2 is planned for this AFP with Stages 3 & 4 being constructed subsequently outside this AFP time frame.

MAC is planning to commence the implementation of actions to prepare for the future capping of the TSF's as soon as practically possible using flocculation and multiple deposition points. MAC is currently working with Engineering Consultants in the Identification phase to examine pipeline extension to provide multiple deposition points for South West Valley and West Cut Void. The higher density of the tailings maximises the remaining volume and capacity of TSFs. The flocculation also provides immediate benefits by accelerating the release of water during deposition. This water would be decanted using new decant pumps (recently installed) to return water to the main process water storage at Drayton Void. This will contribute to the mitigation of the current risk of water shortages at MAC as a result of recent drought conditions. The tailings flocculation infrastructure includes the following items:

- Flocculant Dosing Plant
- Tailings distribution and placement network
- Diesel decant pumps

The proposed Flocculant Project activities and timeframe are:

- Current identification and selection phase until July 2020
- Design and engineering July – September 2020
- Procurement and supply actions September – December
- Project execution post December 2020

1.2.6 Waste Management

Mt Arthur Coal's waste management system has been designed to minimise the generation of waste, maximise reuse and recycling, and meet regulatory requirements. This system consolidates the disposal, tracking and reporting of all waste generated on site. Waste generated as part of Mt Arthur Coal's mining activities is sent off site for management. Recycled waste, represents approximately 80 per cent of total waste generated.

All hydrocarbon handling and storage areas (i.e. diesel storage areas and fill points) are appropriately designed and constructed, incorporating sealed concrete surfaces, bunding and oily water separators, where required. The Contaminated Land Management procedure also outlines the requirements for investigating, reporting, handling and treating contaminated land. Small volumes of hydrocarbon contaminated material are recovered and disposed of via the regulated waste management system or remediated at the onsite bioremediation facility.

1.2.7 Material Production Schedule during Forward Program Term

The indicative material production schedule during this Forward Program period is presented in Table 1. Material movement can vary depending on efficiency of mining and production constraints.

Table 1: Material production schedule during the AFP term

Material	Unit	Current FY20 (July 2019 – June 2020)	Year 1 FY21 (July 2020 – June 2021)	Year 2 FY22 (July 20201– June 2022)	Year 3 FY23 (July 2022 – June 2023)
Topsoil Stripping	kBCM	746	876	316	195
Prime Rock/ Overburden	kBCM	120,100	142,300	137,500	145,100
ROM Coal	Mt	21.4	24.3	26.1	25.7
Reject Material	Mt	5.2	6.9	6.2	7.0
Product	Mt	16.2	17.4	19.9	18.6

1.2.8 Water Management

Existing structures will be maintained to support the segregation and diversion of clean water, and control sediment-laden run-off prior to release. Existing sediment control structures may also require modification or upgrade as open cut mining progresses within the AFP disturbance boundary in accordance with the Mt Arthur Erosion and Sediment Control Plan (ESCP).

Prior to the current AFP period, a risk evaluation was completed for the Main Dam, which was the main component of the site water network. Following this review it was decided to decommission the dam and re-route mine water to the CHPP Dirty Water dam. The Drayton Void, along with Ayredale, Belmont and MacDonalds and Saddler's pits would also be used as remote or alternate mine water storages (refer to Plan 2) to provide a flexible water network system for maximum practical capacity and water security. The Main Dam decommissioning project will continue during this AFP period.

1.2.9 Decommissioning and Demolition Activities

As part of the tailings dam expansion project, the footprint of the expanded dam will extend over the existing tailings dams SP1, SP2 and SP3. Tailings dams SP1, SP2 and SP3 have been decommissioned and capped, and will be further covered by the expanded footprint of the tailings dam expansion project. The North Cut Tailings Dam has been decommissioned and capping of the dam is expected to commence during this AFP period. Capping design is currently being completed by an experienced tailings consultant, and capping project timings will be scheduled following design finalisation.

The new reduced foot print of Stage 2 of the tailings dam will not remove the Bayswater No.2 facilities, however some minor demolition / removal of old dispatch buildings and car parks not associated with the main workshops and plant area will still occur. Removal of the Bayswater No.2 facilities will likely occur at stage 3 of tailings expansion. The footprint of the expanded tailings dam will engulf the complete area of the decommissioned facilities area during stage 3. A remedial action plan (RAP) has been completed and approved by the DP&E as required in PA 09_0062 MOD 1.

Decommissioning of the Main Dam, Dam 4 and Northcut Tailings Dam will continue during this AFP period.

2 Three Year Rehabilitation Forecast

2.1 Rehabilitation Planning Activities

During this three year period, Mt Arthur Coal will continue to implement the programs contained in the site Rehabilitation Strategy, Rehabilitation Management Plan, Rehabilitation and Ecological Monitoring Procedure (REMP) and Biodiversity Management Plan (BMP).

Supplementary planting of existing pasture rehabilitated areas with native woodland species, to expand the area of woodland rehabilitation. The supplementary woodland areas will focus on steep areas less suitable for grazing. General rehabilitation, land management and biodiversity enhancement activities will also continue over previously rehabilitated areas, including:

- Rehabilitation and ecological monitoring;
- Detailed soil assessments of existing rehab to track the development of soil profiles and feed into understanding of what rehab has been successful;
- Weed assessments to enable more targeted weed control. Trials in advanced weed assessment using aerial imagery;
- Weed control trials to investigate the efficacy of slashing and burning off to control exotic grasses;
- Pest animal control programs including kangaroo harvesting and rabbit baiting/trapping;
- Supplementary tubestock planting during suitable weather;
- Habitat enhancement through placement of stag trees and piling of thinned timber;
- Trials in the use of surface stabilisation (mulch) to reduce short term erosion risks; and
- Application of ameliorants (fertiliser and gypsum).

2.2 Rehabilitation Schedule

Over the next three years Rehabilitation activities focus on the out of pit dumps in the southern portion of the operation. This will be re-establishing rehabilitated land that will be disturbed in an effort to minimise the time period of this disturbance. In addition there is forecast rehabilitation of the Main Dam and North Cut tailings dam in the north of the operation. This area is dependent on the development of a safe crust on the tailings to commence the project. VD5 adjacent to Denman Road continues to have area rehabilitated and some further areas on the CD2 dump near the centre of the operation.

The estimated schedule for existing rehabilitation maintenance and ongoing improvement works are detailed and tracked in the Mt Arthur Annual Environmental Management Review. Although all these activities are planned to be completed, they are dependent on weather and completion of emplacements to be ready for rehabilitation and therefore should be used as a guide. Actual rehabilitation is provided in the AEMR

All studies, stakeholder consultation and final landform details are presented in the RMP.

2.3 Subsidence Remediation for Underground Operations

Although Mt Arthur Coal is located within the Muswellbrook Mine Subsidence district, there is no recent history of mine subsidence within Mt Arthur Coal mine leases. As a result, subsidence is not predicted to impact on mining or rehabilitation activities.

2.4 Temporary Stabilisation

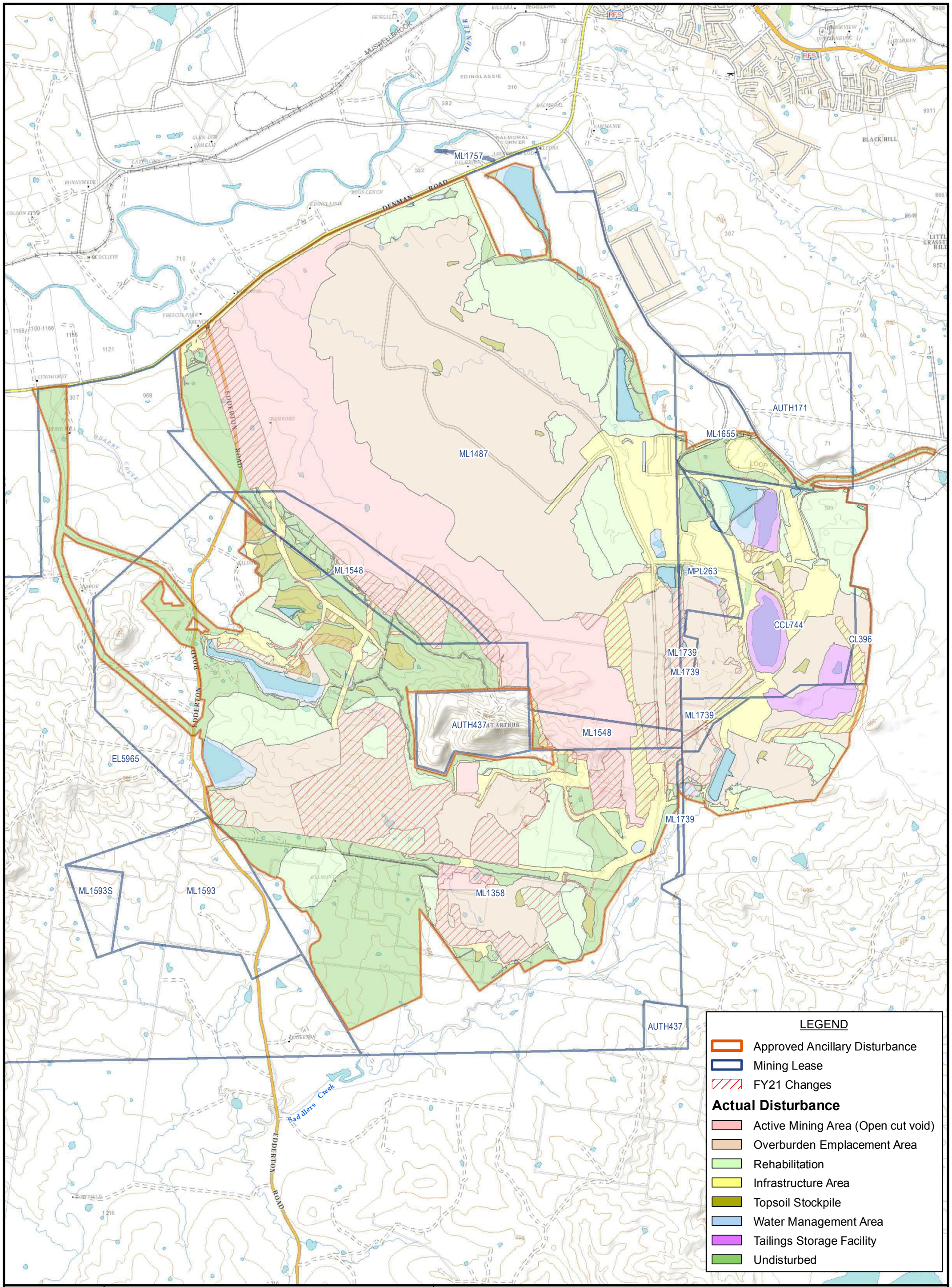
Temporary stabilisation activities include the aerial seeding of long-term overburden emplacement areas for dust-suppression purposes.

Emplacement surfaces targeted as part of the aerial seeding program are those most susceptible to prevailing winds, and not available for final rehabilitation in the short to medium term. A pasture seed and fertiliser mix is aerially applied to the targeted emplacement surfaces. Approximately 600 ha of aerial seeding is proposed during this AFP period for temporary stabilisation.

An alternative temporary stabilisation option is being investigated for new rehabilitation.

3 Plan 2 – Mining and Rehabilitation 3 Yearly Forecast

The following figures show the progression of mining and rehabilitation for Mt Arthur Coal for the period FY21, FY22 and FY23. Mining, overburden emplacement and infrastructure areas may be brought forward from any year during the Forward Program period, dependant on mine schedule requirements. Actual disturbance and rehabilitation is reported annually in the Annual Environmental Management Review.



BHP

Mapping Services Brisbane

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Transverse Mercator Projection.
MGA Zone 56. GDA94 Datum.

MOUNT ARTHUR COAL

FY21 MINING AND REHABILITATION FORECAST

Drawn: B. Kleinschmidt	Checked: K. Brake	Date: 13/05/2020	Revision: 3	Filename: MAC_FowardProgram2A	Plan 2A

ML1757
AUTH171
ML1655
ML1487
ML1548
MPL263
CCL744
CL396
ML1739
ML1739
ML1739
ML1739
AUTH437
ML1548
EL5965
ML1593S
ML1593
ML1358
AUTH437

LEGEND

- Approved Ancillary Disturbance
- Mining Lease
- FY22 Changes

Actual Disturbance

- Active Mining Area (Open cut void)
- Overburden Emplacement Area
- Rehabilitation
- Infrastructure Area
- Topsoil Stockpile
- Water Management Area
- Tailings Storage Facility
- Undisturbed

BHP
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Transverse Mercator Projection.
MGA Zone 56. GDA94 Datum.

MOUNT ARTHUR COAL

FY22 MINING AND REHABILITATION FORECAST

Drawn: B. Kleinschmidt	Checked: K. Brake	Date: 13/05/2020	Revision: 3	Filename: MAC_FowardProgram2B	Plan 2B

ML1757

AUTH171

ML1655

ML1487

ML1548

MPL263

CCL744

CL396

ML1739

ML1739

ML1739

ML1739

AUTH437

ML1548

EL5965

ML1593S

ML1593

ML1358

AUTH437

MUSWELLBROOK

HUNTER

DENMAN ROAD

EDDERTON ROAD

EDDERTON ROAD

Saddlers Creek

EDINGLASSIE

BALMORAL

BLACK HILL

RFS

RFS

LEGEND

Approved Ancillary Disturbance

Mining Lease

FY23 Changes

Actual Disturbance

Active Mining Area (Open cut void)

Overburden Emplacement Area

Rehabilitation

Infrastructure Area

Topsoil Stockpile

Water Management Area

Tailings Storage Facility

Undisturbed

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0 500 1,000 1,500 2,000 m

Transverse Mercator Projection.
MGA Zone 56. GDA94 Datum.

MOUNT ARTHUR COAL

FY23 MINING AND REHABILITATION FORECAST

Drawn: B. Kleinschmidt	Checked: K. Brake	Date: 13/05/2020	Revision: 3	Filename: MAC_FowardProgram2C	Plan 2C

4 Progressive Mining and Rehabilitation Statistics

4.1 Three Yearly Forecast Cumulative Disturbance and Rehabilitation Progression

During this AFP period, Mt Arthur Coal will continue to implement the rehabilitation programs contained in the site Rehabilitation Strategy. This will include the reshaping and seeding of 290 ha. Disturbance and rehabilitation progression during the three year term is presented in Table 2: . Mining, overburden emplacement and infrastructure areas may be brought forward from any year during the Forward Program period, dependant on mine schedule requirements. Actual disturbance and rehabilitation is reported annually in the Annual Environmental Management Review.

Table 2: Predicted cumulative disturbance and rehabilitation progression during the next 3-year term

Year	Total Disturbance Footprint - Surface Disturbance	Underground mining area	Total Active Disturbance	Rehabilitation Land Preparation	Ecosystem & Land Use Establishment
End FY21 (30 Jun 2021)	5609	0	4662	73	73
End FY22 (30 Jun 2022)	5788	0	4776	81	81
End AFP (30 Jun 2023)	5801	0	4705	160	160

4.2 Rehabilitation Key Performance Indicators

The rehabilitation to disturbance ration is presented in Table 3. As described in the RMP, MAC dig and dump has been constrained at the northern end. As a result this has slowed the advancement of the northern emplacement and pushed mining intensity to the southern areas of the main pit. MAC has been through a comprehensive opportunity assessment to determine the most effective plan for rehabilitation and mining to deal with this constraint. The most recent inclusion is the main pit realignment to reduce the obtuse angle between the endwall (north) and advancing highwall to transition back to 90 degrees. By doing this, the northern emplacement adjacent to Denman Road will be accelerated and rehabilitation will be released more consistently across the years.

The eastern and southern areas of the main northern emplacement are not available for rehabilitation consistently in the near term due to the size and height of the final dump and the time to take to reach its outer limits. The tailings dam is also a hard constraint on the eastern perimeter of the mine. Additionally, the two south west out of pit emplacements are being placed in a way that will maximise rehabilitation and minimise the amount of time an open face would be visible from off the mine site (south west direction).

Table 3: Progressive rehabilitation key performance indicators during the 3 year term

Year	Total New Active Disturbance Area (annual)	Area of Land Proposed for Active Rehabilitation (annual)	Rehabilitation to Disturbance Ratio (annual)
End FY 21 (30 Jun 2021)	493	73	0.15
End FY22 (30 Jun 2022)	196	81	0.41
End AFP (30 Jun 2023)	88	160	1.81

Appendix 1: Document Control Authorisation

Business Process Owner Endorser Authorisation			
Position	**Name**	**Date**	**Signature**
Superintendent HSE Business Partnership	Kris Sheehan	14/5/20	
Manager Production Planning	Damien Perkins	14/5/20	
Superintendent Tactical Planning	Rob Pascoe	14/05/20	

Approver Authorisation			
Position	**Name**	**Date**	**Signature**
General Manager	Adam Lancey	14/05/20	

Amendment History			
Date	**Version**	**Page**	**Details**
May 2017	1.0	All	New two year MOP for FY18 and FY19
November 2017	1.1	13, 17, 43, 49, 108	Amendment to include Conveyor corridor dump, Saddlers Mining and Ayredale infrastructure. MOP Plans 3A – E and Plan 4 have been updated.
August 2018	1.2	1, 8, 9, 18, 44, 46, 50, 109	Amendment to include dump area at Saddlers, conveyor corridor and sublease. Also to include mining in Saddlers, Ayredale and Roxburgh
June 2019	2.0	All	Format change following Annual Forward Program Guideline FY 20-22
December 2019	2.1		Dewatering of tailings trial addition
May 2020	3.0	All	Update to mine plans. Minor text additions. Tailings information added in response to Targeted Tailings Assessment by the resources regulator.

Appendix 2: References

Reference	Publication
Grigg et al	Grigg, A., Emmerton, B.R. and McCallum, N.J. ACARP Project C8038: Completion Criteria for Pasture Based Rehabilitation in the Bowen Basin. CMLR, University of Queensland. August 2001.
Rawlings et al	Rawlings, K.; Freudenberger, D.; and Carr, D.; A Guide to Managing Box Gum Grassy Woodlands. Department of the Environment, Water, Heritage and the Arts, 2010.
2009 EA	Hansen Bailey (2009) Mt Arthur Coal Consolidation Project Environmental Assessment
2013 EA	Resource Strategies (2013) Mt Arthur Coal Open Cut Modification Environmental Assessment
Blue Book Vol 2E	Managing Urban Stormwater Guidelines: Volume 2E Mines and Quarries. NSW EPA, 2008.
PA 09_0062 MOD 1	Project Approval 09_0062 MOD 1. Mt Arthur Coal Mine – Open Cut Modification Project, NSW Department of Planning and Environment, September 2014.
EPBC	Environmental Protection and Biodiversity Conservation Act Approval 2011/5866. Department of Sustainability, Environment, Water, Population and Communities, April 2012.
BMP/OMP	Biodiversity Management Plan and Offset Management Program for Onsite and Near site Offset Areas. In prep. Umwelt, 2013.
Closure Plan	Mt Arthur Coal Mine, Hunter Valley, NSW. Development of a Conceptual Mine Closure Plan and Outline of the Methodology behind the Closure Cost Provision and Valuation. GSSE, July 2011.
EMS	Mt Arthur Coal Environmental Management System
EPL	Environment Protection Licence No. 11457
DSC	NSW Dam Safety Committee approval conditions
SWMP	Surface Water Management Plan
Dump Standard	Standard for Design, Construction and Maintenance of Dump Areas
Agronomist	Report prepared by consulting agronomist on grazing potential on Mt Arthur Coal pasture rehabilitation. In preparation.
Elliot & Veness	After Elliot, G.L. and Veness, R.A. Selection of Topdressing Material for Rehabilitation of Disturbed Areas in the Hunter Valley. J.Soil Cons, NSW 37 37-40, 1981.
Hazelton & Murphy	Hazelton, P.A. & Murphy, B.W. Interpreting Soil Test Results: What do all the numbers mean? (2nd ed.). CSIRO, 2007.

BHP

Rehabilitation Management Plan
Mt Arthur Coal

May 2020

Mt Arthur Lease Block

Mt Arthur Coal Lease Block	
Name of Mine	Mt Arthur Coal
Rehabilitation management Plan Commencement Date	31 July 2019
Rehabilitation management Plan Completion Date	30 June 2024
Mining Authorisations (Lease/License No.):	CCL 744, CL 396, ML 1358, ML 1487, ML 1548, ML 1593, ML 1655, MPL 263, A 171, A 437, EL 5965, CL 229, CL 335, ML1757, ML1739
Name of Authorisation / lease Holder	Hunter Valley Energy Coal Pty Ltd
Name of Mine Operator:	Hunter Valley Energy Coal Pty Ltd
Name and Contact Details of the Manager (or equivalent):	Adam Lancey, General Manager Mt Arthur Coal Thomas Mitchell Drive Muswellbrook NSW 2333 Ph: 02 65445566 Email: Adam.Lancey@BHP.com
Name and Contact Details of Environmental Representative:	Kris Sheehan, Superintendent HSE, Mt Arthur Coal Thomas Mitchell Drive Muswellbrook NSW 2333 Email: Kris.Sheehan@BHP.com
The information provided in this document is true and correct.	
Title:	General Manager Mt Arthur Coal
Signature:	Adam Lancey
Date:	14/05/20
Version – 2.0	Rehabilitation Management Plan

Document Developer – Environment Specialist - Business Partnership
Document Owner – Superintendent HSE Business Partnership
Document Approver – General Manager
Document Authorisation is located in Appendix 1.

Table of Contents

1. General

The Rehabilitation Management Plan (RMP) satisfies the requirement for condition 44 of the Project Approval as required by the Department of Planning, Industry and Environment (DPI&E).The RMP also satisfies the Code of Practice RMP for Large Mines to management of mining and rehabilitation activities across the life of a mine. The overall regulatory objective for mine rehabilitation is to achieve progressive rehabilitation that will sustain final land use outcomes. The RMP provides a process of measurable criteria that demonstrates rehabilitation objectives are achievable and realistic within a given timeframe.

1.1 Application

This Plan applies to the following:

- All BHP employees and contract staff
- All Partnering contractor company representatives
- All Subcontractor company representatives.

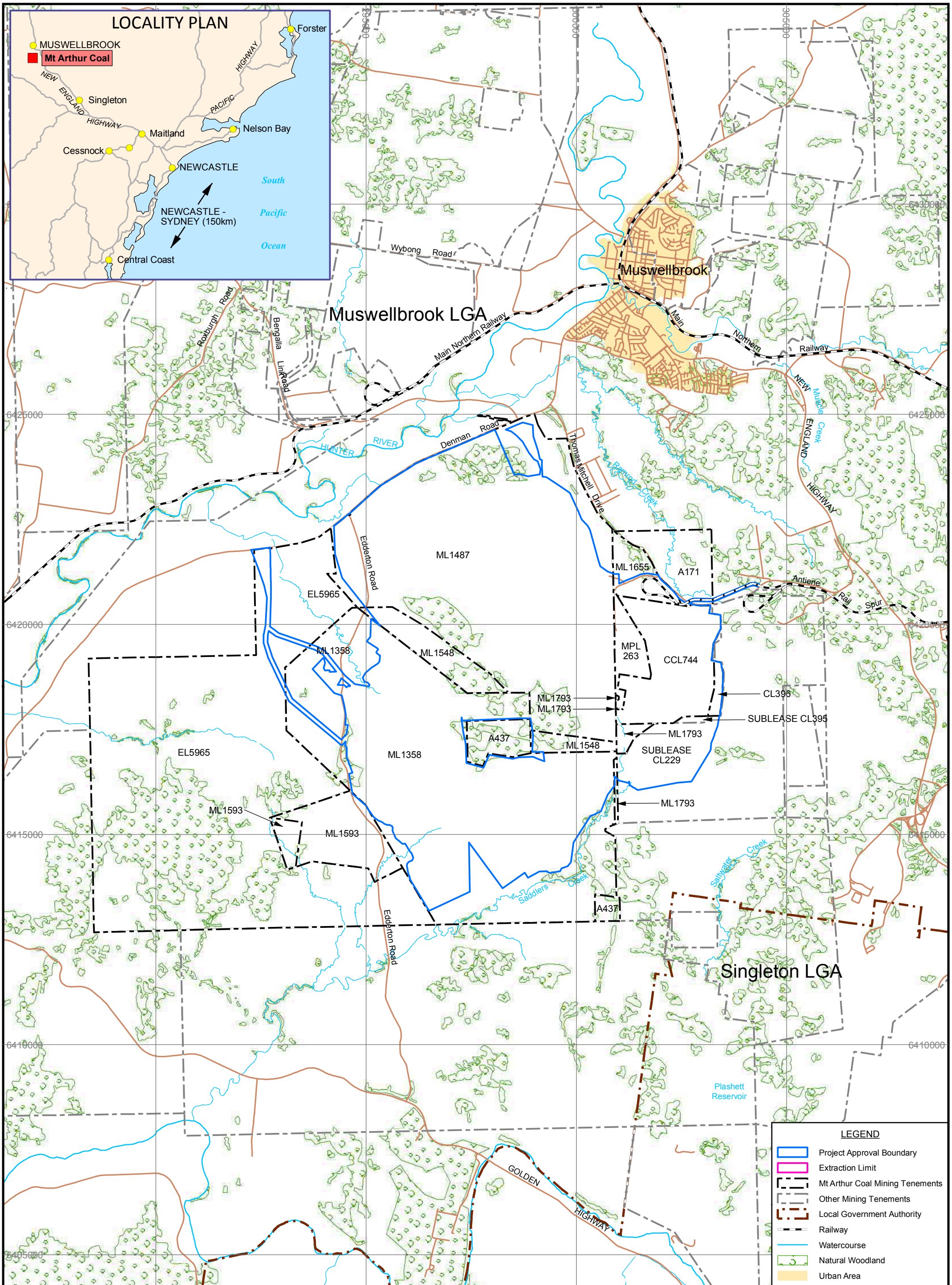
1.2 Abbreviations

AFP	Annual Forward Program
AHMP	Aboriginal Heritage Management Plan
BCM	Bank cubic metres
BIOMP	Biodiversity Management Plan
BRMP	Biodiversity and Rehabilitation Management Plan
CCC	Community Consultative Committee
CCL	Consolidated coal lease
CHBI	Central Hunter Box – Ironbark Woodland
CHISG	Central Hunter Ironbark – Spotted Gum Grey-Gum Box Forest
CHPP	Coal handling preparation plant
CL	Coal lease
DoEE	Federal Department of the Environment and Energy
DPI&E	NSW Department of Planning, Industry and Environment
DSC	NSW Dam Safety Committee approval conditions
EA	Environmental assessment
EL	Exploration licence
EPA	NSW Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1979
EPBC	Environment Protection and Biodiversity Conservation
EPL	Environment Protection Licence
EMS	Environmental management system
FLDP	Future Landscapes Design Project
FY	Financial year
HA	Hectares
HFRG	Hunter Floodplain Red Gum Woodland Complex
HRSTS	Hunter River Salinity Trading Scheme
HSE	Health, Safety and Environment
HVEC	Hunter valley Energy Coal (MT Arthur Coal)
ISO	International Standards Organisation
ITP	Inspection and test plan
LGA	Local government area
MAC	Mt Arthur Coal
MACT	Mt Arthur Coal Terminal
MAC GPA	Mt Arthur Coal Ground Pasture Assessment
ML	Mining lease
MOP	Mining Operations Plan
MPL	Mining purpose lease

MSC	Muswellbrook Shire Council
Mtpa	Million tonnes per annum
NFSB	Narrabeen Footslopes Slaty Box Woodland
NGER	National Greenhouse and Energy Reporting Act 2007
NGO	Non-government organisation
NOW	NSW Office of Water
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
PIRMP	Pollution Incident Response Management Procedure
ROM	Run of mine
RR	Resources Regulator (division of Department of Planning Industry and Environment)
RAP	Remedial Action Plan
UHWB	Upper Hunter White Box – Ironbark Grassy Woodland

1.3 Definitions

- **Hunter Valley Energy Coal Pty Ltd -** operates the Mt Arthur Coal Complex which consists of the approved open cut mining operations, a rail loop and associated rail loading facilities (PA 09_0062) and the Mt Arthur Underground Project (PA 06_0091),
- **Future Landscapes Design Project -** The FLDP was a project undertaken to research a landform approach that would align with community expectations and improvements in landform design techniques. A report by Landloch Pty Ltd (2014) was written to capture the findings of the project which have now been incorporated into the Applied Geofluvial landform.
- **Geomorphic Landform Design -** The Adaption of the Geofluvial approach used at Mt Arthur Coal, uses the characteristics of stable natural alluvial landforms as an analogue on which to base the design of mine overburden landforms. Importantly, the approach does not replicate existing landforms, but rather uses the key characteristics that make these landforms stable in the design.
- **The Project Approval -** Project Approval 09_0062 MOD 1 Mt Arthur Coal Mine – Open Cut Modification Project dated 26 September 2014.
- **Annual Forward Program (AFP)** – The Annual Forward Program meets the requirements of a Mining Operations Plan (MOP) as required by Mt Arthur Coals various Mining and Coal Leases.
- **Rehabilitation Management Plan (RMP) -** The Rehabilitation Management Plan meets the requirements of Condition 44 of the Mt Arthur Coal Modification Project PA 09_0062 MOD 1 under Section 75W of the Environmental Planning and Assessment Act 1979 (EP&A Act). Condition 44 requires the project proponent to prepare and implement a Rehabilitation Management Plan for the Project.
- **Approval Objective** – The objective of the mine closure process developed in Mt Arthur Coal Mine – Open Cut Modification Project (PA 09_0062 MOD 1).
- **Closure Objective** – More detailed objectives designed to facilitate the alignment of Approval Objectives and detailed SMART Closure Criteria.


LOCALITY PLAN
MUSWELLBROOK
Mt Arthur Coal
Forster
Singleton
Maitland
Nelson Bay
Cessnock
NEWCASTLE
NEWCASTLE - SYDNEY (150km)
Central Coast
NEW ENGLAND HIGHWAY
PACIFIC HIGHWAY
South Pacific Ocean
Muswellbrook LGA
Singleton LGA
Muswellbrook
Wybong Road
Roxburgh Road
Bengalla Link Road
Main Northern Railway
Denman Road
HUNTER RIVER
Thomas Mitchell Drive
Barnard Creek
NEW ENGLAND HIGHWAY
Muscle Creek
Eddertton Road
ML1487
ML1655
A171
Antiene Rail Spur
EL5965
ML1358
ML1548
MPL 263
CCL744
CL396
SUBLEASE CL395
ML1793
A437
SUBLEASE CL229
ML1593
Saddlers Creek
Saltwater Creek
Plashett Reservoir
GOLDEN HIGHWAY
6425000
6420000
6415000
6410000
6405000
LEGEND
Project Approval Boundary
Extraction Limit
Mt Arthur Coal Mining Tenements
Other Mining Tenements
Local Government Authority
Railway
Watercourse
Natural Woodland
Urban Area
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Transverse Mercator Projection.
MGA Zone 56. GDA84 Datum.
BHP
Spatial Data Team
Brisbane
MT ARTHUR
MINING OPERATIONS PLAN
Pre-Mining Environment - Project Locality
Drawn: P. Watts
Checked: L. Neil
Date: 1/04/2020
Revision: 0
Filename: MOP Plan 1A
Figure 1

2. Introduction to Mining Project

Hunter Valley Energy Coal Pty Ltd (HVEC) operates Mt Arthur Coal, which consists of an approved open cut and underground mining operation, a rail loop and associated rail loading facilities. The Mt Arthur Coal Mine is located approximately 5 kilometres south west of Muswellbrook within the Muswellbrook Shire Local Government Area (LGA) in the Upper Hunter Valley of NSW. The location of Mt Arthur Coal is shown in **Figure 1**.

This RMP meets the requirements of Condition 44 of the Mt Arthur Coal Modification Project PA 09_0062 MOD 1 under Section 75W of the Environmental Planning and Assessment Act 1979 (EP&A Act). Condition 44 requires the project proponent to prepare and implement a Rehabilitation Management Plan for the Project.

2.1 History of Operations

Coal mine development at Mt Arthur Coal commenced in the early 1960s in the Bayswater No. 2 Open Cut mining area. Coal production progressively increased and approval to extract coal from the Bayswater No. 3 Open Cut was granted in 1994. To support the expanding development at Bayswater No. 3 and cease coal transport by public road, approval was obtained in November 2000 for the construction and operation of the rail loading facility and spur line. This allows export coal to be transported directly to Newcastle via the Main Northern Railway.

In May 2001, the Mt Arthur North Open Cut operation was approved to extract up to 15 million tonnes of run-of-mine (ROM) coal per annum. The approval also allowed for the construction and use of associated infrastructure and facilities.

Between 2003 and 2006, Saddlers Pit (located in the southern portion of the mine lease area) was maintained on a care and maintenance regime, when mining operations at Bayswater No 3 were effectively suspended. The majority of the work undertaken during the following period involved reshaping and final rehabilitation of several hundred hectares in the vicinity of the Bayswater No 3 open cut operations.

In March 2006, Mt Arthur Coal lodged an application to extend the Mt Arthur North South Pit. The application was approved by the Minister for Planning on 9 January 2008. In September 2006 mining resumed in Saddlers Pit, with overburden removal initially being undertaken by contract miners and coal extraction by Mt Arthur Coal. Mt Arthur Coal assumed responsibility for overburden removal in March 2012.

Also in March 2006, Mt Arthur Coal lodged an application to commence underground mining operations at Mt Arthur Coal Mine. The application was approved by the Minister for Planning on 2 December 2008 (Project Approval 06_0091). The Mt Arthur Underground Project is approved up to 8 million tonnes per annum (Mtpa). Saddlers Pit was utilised for construction of an underground adit associated with that project. The underground project is currently on care and maintenance.

In 2009, Mt Arthur Coal lodged an application under Part 3A of the New South Wales Environment Planning and Assessment Act, 1979 (EP&A Act) to extend open cut operations and consolidate existing approvals for open cut mining operations and surface infrastructure. The application was approved by the Minister for Planning on 24 September 2010 (Project Approval 09_0062). The Project Approval 09_0062 permitted the extraction of up to 32 Mtpa of ROM coal from the open cut.

In accordance with Project Approval 09_0062, a number of project approvals were surrendered by Mt Arthur Coal in 2011 including Mt Arthur North, the Rail Loading Facility and the South Pit Extension and the Bayswater Coal Preparation Plant. The surrender of the Bayswater No. 3 development consent (210/93) was accepted by the Department of Planning & Environment (now DPIE) on 20 May 2013.

In 2013, Mt Arthur Coal lodged an application to modify the Project Approval 09_0062 under section 75W of the EP&A Act (the Mt Arthur Coal Open Cut Modification [the Modification]). The application was approved by the Planning Assessment Commission (as delegate of the Minister for Planning) on 26 September 2014 (Project Approval 09_0062 MOD 1). The Modification includes the continuation of open cut mining operations at the Mt Arthur Coal Mine for an additional operational life of four years from 2022 to 2026 at the maximum rate of 32 Mtpa, an increase in open cut disturbance areas, additional overburden emplacement areas, duplication of the existing rail loop and various additional infrastructure changes. The Modification Project Approval can be found at http://www.bhpbilliton.com/environment/regulatory-information.

On 2 December 2016, EPBC approval 2014/7377 was granted for the Modification project, aligning the date with the modification approval life to 2026.

2.2 Current Consents, Leases and Licences

Extract from the code. Under the mining lease conditions, the lease holder must have the following components of the Rehabilitation Management Plan approved by the Minister: the Rehabilitation Objectives and Completion Criteria (Part 5); and, the Final Landform and Rehabilitation Plan (Part 6). The remaining components of the Rehabilitation Management Plan do not require approval but must still be provided as they comprise essential context for assessing the Rehabilitation Objectives and Completion Criteria, and the Final Landform and Rehabilitation Plan. The remaining components must be prepared to the satisfaction of the Minister.

Details on Mt Arthur Coal's existing statutory approvals as at March 2020 are provided in Table 1.

The Modification Project includes the following key components:

- a four year continuation of the open cut mine life from 2022 to 2026 at the currently approved maximum rate of 32 Mtpa;
- an increase in open cut disturbance areas;
- use of the existing conveyor corridor between Mt Arthur Coal and Maxwell Infrastructure for overburden emplacement;
- duplication of the existing rail loop;
- an increase in the maximum number of train movements per day from 24 to 30;
- the relocation of the load point for the overland conveyor which delivers coal to Macquarie Generation's Bayswater Power Station;
- the relocation and upgrade of the explosives storage, magazine and associated facilities; and
- the construction of additional offices, a control room and a small extension to the ROM coal stockpile footprint.

2.2.1 Mining Tenements

Mt Arthur Coal currently holds 14 mining and exploration leases and licences including two subleases (Maxwell Infrastructure (formerly Drayton) subleases CL 395 and CL 229). Mining tenement details are provided in **Table 1** and **Figure 2**.

2.2.2 Environment Protection Licence

Mt Arthur Coal currently holds one Environment Protection Licence (EPL), EPL No. 11457, for the following scheduled activities:

- Chemical Storage, 5 to 100 tonnes generated or stored;
- Coal Works, > 500,000 tonnes handled; and
- Mining for Coal, > 5,000,000 tonnes produced.

2.2.3 Environment Protection and Biodiversity Conservation Approval

On 30 April 2012 Department of Environment (DoE) granted Mt Arthur Coal conditional approval EPBC 2011/5866 to undertake a controlled action (development of five new open cut extension areas) within the designated areas. The controlled action was commenced on 21 May 2012, with approximately one hectare of vegetation cleared for the construction of a dual substation facility. The EPBC referral for the Modification project was lodged in late 2014 and was determined a Controlled Action in 2015. On the 2 December 2016, EPBC approval 2014/7377 was granted for the Modification project.

Table 1 Mt Arthur Coal's existing statutory approvals as at April 2020

Description	Issue date	Expiry date
Development consents or project approvals issued by the DPIE		
Mt Arthur Coal Mine – Open Cut Modification Project (PA 09_0062 MOD 1)*	26/09/2014	30/06/2026
Mt Arthur Coal Mine – Underground Project	02/12/2008	31/12/2030
Mining leases and exploration licences issued by the Resources Regulator		
CCL 744	03/07/1989	21/01/2028
CL 396	23/06/1992	03/02/2024
ML 1358	21/09/1994	21/09/2036
ML 1487	13/06/2001	12/06/2022
ML 1548	31/05/2004	30/05/2025
ML 1593	30/04/2007	29/04/2028
ML 1655	03/03/2011	03/03/2032
MPL 263	17/10/1990	17/10/2032
A 171	18/10/1979	25/11/2020
A 437	04/03/1991	04/03/2020
EL 5965	15/07/2002	14/07/2017
ML1739	25/07/2016	25/07/2037
ML 1757	7/07/2017	7/07/2038
CL 229	03/02/1982	02/02/2024
CL 395	23/06/1992	21/01/2029
EPL issued by the EPA		
EPL 11457	09/10/2001 (last updated on 8/04/2020)	Not specified
EPBC approval issued by the DoE		
EPBC 2011/5866	30/04/2012	30/06/2026
EPBC 2014/7377	05/12/2016	30/06/2026

For the purposes of this RMP, the Mt Arthur Coal Mine is considered to be classified as a Level 1 mine (in accordance with the RMP guidelines) due to the project being a large coal mine that was previously approved (PA 09_0062) under Part 3A of the EP&A Act.

BHP

Spatial Data Team
Brisbane

Scale 1:50,000 @ A3

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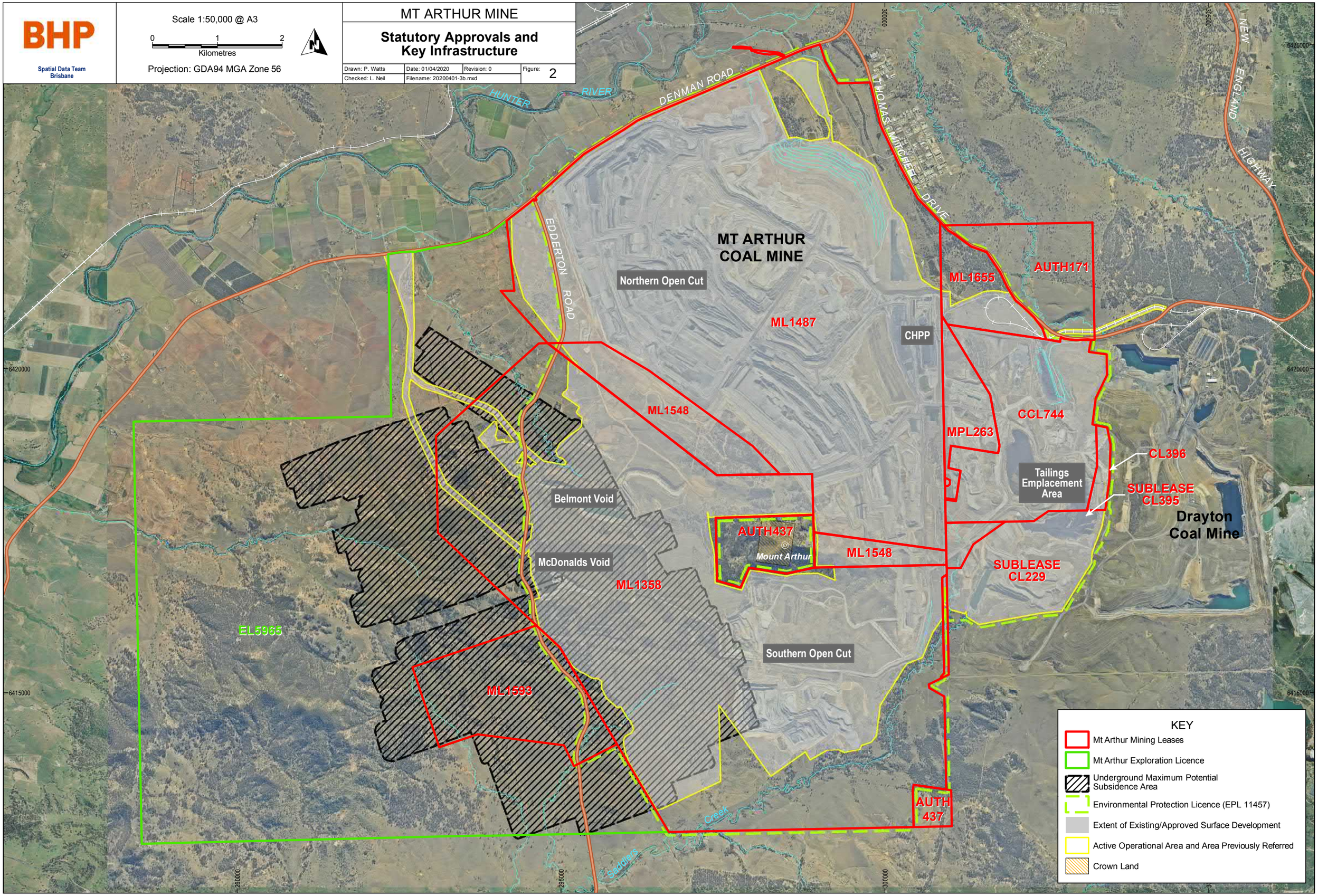
Kilometres

Projection: GDA94 MGA Zone 56

MT ARTHUR MINE

Statutory Approvals and Key Infrastructure

Drawn: P. Watts	Date: 01/04/2020	Revision: 0	Figure: 2
Checked: L. Neil	Filename: 20200401-3b.mxd		



KEY

- Mt Arthur Mining Leases
- Mt Arthur Exploration Licence
- Underground Maximum Potential Subsidence Area
- Environmental Protection Licence (EPL 11457)
- Extent of Existing/Approved Surface Development
- Active Operational Area and Area Previously Referred
- Crown Land

2.2.4 Land Ownership and Land Use

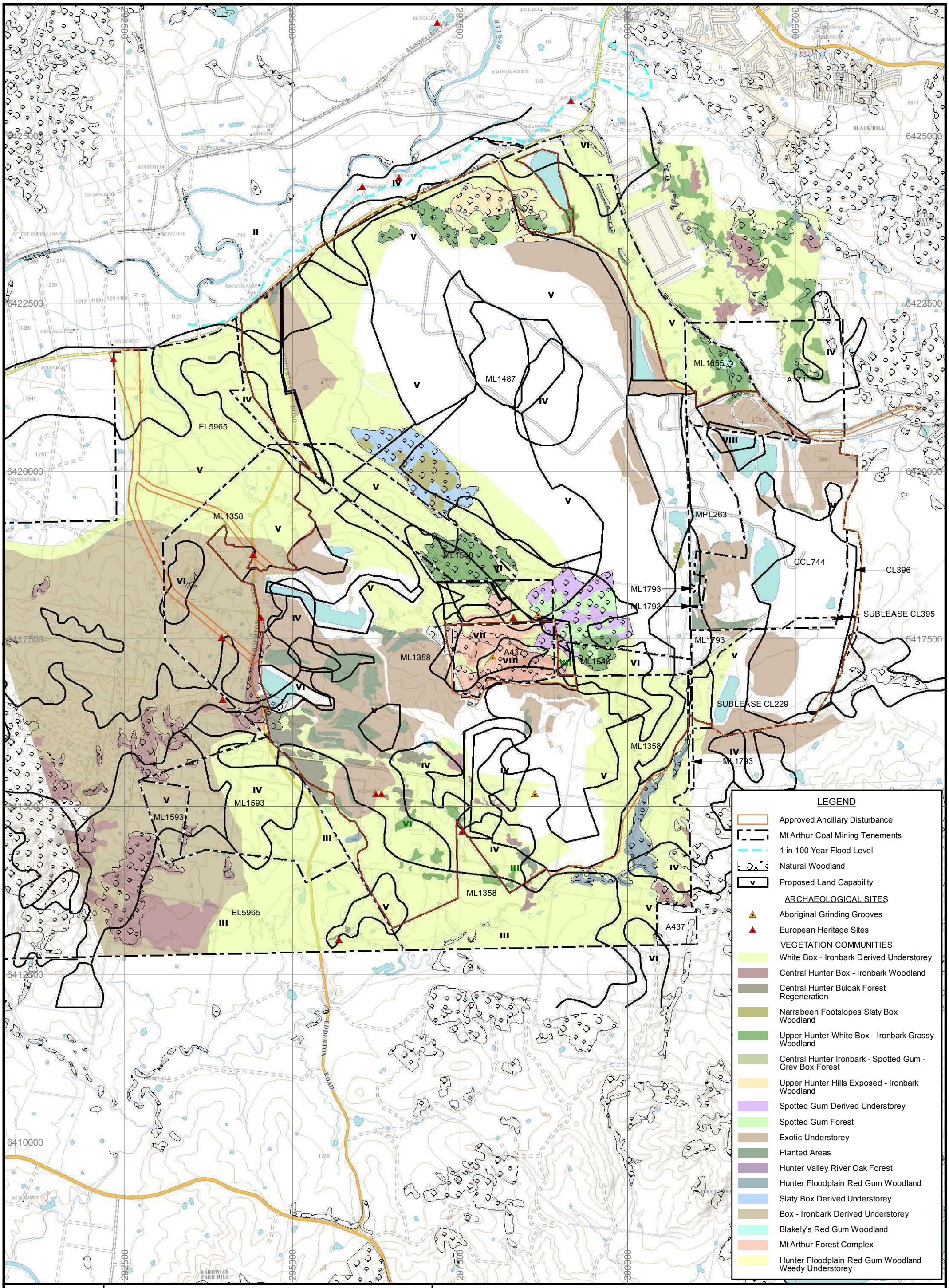
With the exception of small areas of Crown land, road reserves and private freehold property, Mt Arthur Coal and its subsidiaries own all the land within the Mt Arthur Coal mining tenements. Mt Arthur Coal also owns adjacent properties to the north-east, north and west, which are maintained as buffer land or biodiversity offset areas. With the exception of the Maxwell Infrastructure Sub-lease Area in the south east of the mine site, the operational areas at Mt Arthur Coal are located entirely within the land owned or managed by Mt Arthur Coal. A number of Crown and Council road reserves are located within the Lease areas, and these road reserves will be impacted by the proposed mining operations.

Maxwell infrastructure Pty Ltd owns the majority of land to the immediate east and south of Mt Arthur Coal mining tenements, including the Maxwell Infrastructure (Drayton) Sub-Lease Area, with land further to the south east owned by Macquarie Generation. The majority of the land owned by Anglo Coal is subject to mining tenements. The Bengalla Joint Venture owns the land on which Bengalla Mine operates and to which its mining tenements apply, to the immediate north of the Mt Arthur Coal.

The topography surrounding the Mt Arthur Coal Mine is gently undulating to hilly, dominated by Mount Arthur (482 m AHD), located within the mine operational area, and Mount Ogilvie (468 m AHD), located to the west of the Mt Arthur Coal Mine. The north of the Mt Arthur Coal Mine gently slopes up from the alluvial flats of the Hunter River at an elevation of approximately 120 m AHD, rising to approximately 230 m AHD at MacLeans Hill and becoming progressively steeper in the vicinity of Mount Arthur and Mount Ogilvie. From Mount Ogilvie, the southern portion of the Mt Arthur Coal Mine slopes down to form part of the Saddlers Creek floodplain. On-site, the Mt Arthur Coal Mine is characterised by mine landforms and infrastructure associated with current and historic mining operations.

The Mt Arthur Coal Mine is situated within the Upper Hunter region which has a long history of rural land use for a variety of agricultural and industrial activities, predominantly livestock grazing and coal mining. Mt Arthur Coal is located within lands that have been largely disturbed by previous agricultural activities, particularly cultivation and grazing. Agriculture has occurred on nearby land since the 1800s.Muswellbrook region was first inhabited by European settlers in 1824, resulting in a landscape largely dominated by grassland and scattered woody vegetation interspersed with small denser stands of remnant woodland vegetation.

The current dominant land uses within and adjacent to the existing mining lease boundaries include open cut coal mining, power generation and industrial activities, agriculture, rural residential and residential areas. Other land uses include equine industries and viticulture. Where possible, rehabilitation planning at Mt Arthur Coal Mine will attempt to maximise opportunities for a diverse post-mining landscape and range of land uses. It is proposed that final land uses will include pastoral, commercial forestry, recreation and/or wildlife habitat opportunities. Land ownership and landuse information is found in Figure 1, Figure 3 and Figure 4.



BHP

Mapping Services Brisbane

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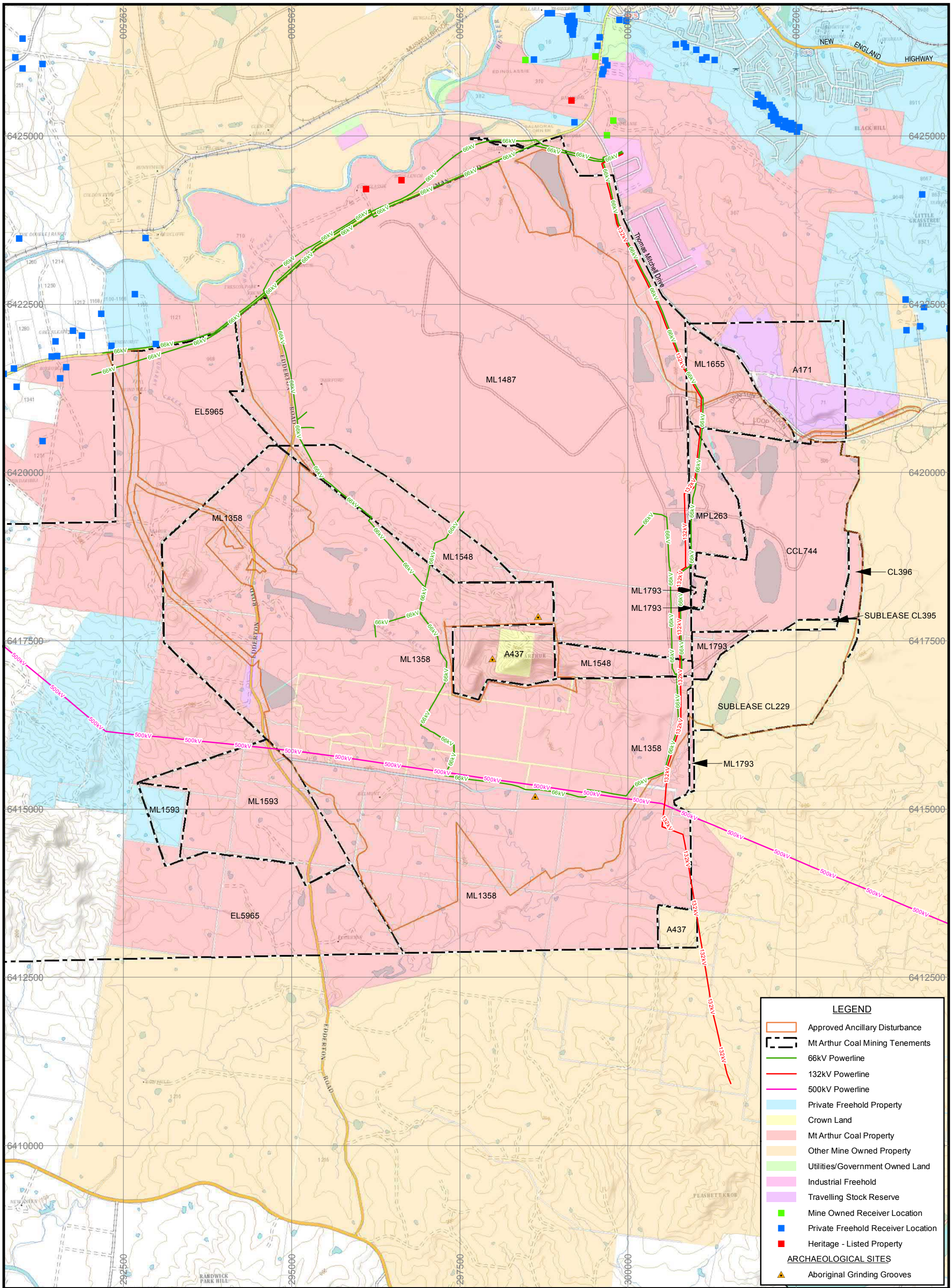
Transverse Mercator Projection.
MGA Zone 56. GDA84 Datum.

MOUNT ARTHUR COAL

Pre-Mining Environment - Natural Environment

Drawn: B. Kleinschmidt	Checked: L. Neil	Date: 15/07/2019	Revision: 0	Filename: MAC_RehabPlan_1B	Figure 3



BHP
Mapping Services Brisbane

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Transverse Mercator Projection.
MGA Zone 56. GDA84 Datum.

MOUNT ARTHUR COAL

Pre-Mining Environment - Built

Drawn: B. Kleinschmidt	Checked: L. Neil	Date: 5/06/2019	Revision: 0	Filename: MAC_RehabPlan_1C

Figure 4

3. Final Land Use

3.1 Regulatory Requirements for Rehabilitation

Conditions relating to rehabilitation and progress towards the post-mining land use are contained in:

- Project Approval (09_0062 MOD 1)[1];
- EPBC Approval 2014/7377; and
- Key Mining Tenements

Those conditions that specifically affect the post mining land use, landscape and rehabilitation outcomes management are contained in **Table 2**.

Table 2 Regulatory Requirements Related to Rehabilitation

Document	Condition/ Section	Requirement	Summary of Status
Project Approval (09_0062 MOD 1)	Schedule 2, Condition 5	Mining operations for the project may take place until 30 June 2026.	Mining operations continuing.
	Schedule 3, Condition 36	The Proponent shall implement the biodiversity offset strategy as outlined in Table 13 and as generally described in the EA (and shown in Appendix 7), to the satisfaction of the Secretary.	The current approved Rehabilitation Strategy incorporates rehabilitation for 1915ha of woody vegetation (including 500ha of Box Gum woodland). This was revised in September 2015 to incorporate 2642ha of woody vegetation as outlined in PA 09_0062 MOD 1. The current Rehabilitation Strategy was revised and submitted to DPI&E for approval in June 2018.
	Schedule 3, Condition 38	The Proponent shall ensure that the offset strategy and/or rehabilitation strategy is focused on the re-establishment of: (a) significant and/or threatened plant communities, including: • Upper Hunter White Box – Ironbark Grassy Woodland; • Central Hunter Box – Ironbark Woodland; • Central Hunter Ironbark – Spotted Gum - Grey Box Forest; • Narrabeen Footslopes Slaty Box Woodland; • Hunter Floodplain Red Gum Woodland Complex; • White Box Yellow Box Blakely's Red Gum Woodland; • Hunter Lowlands Red Gum Forest; and (b) significant and/or threatened plant species, including: • River Red Gum (*Eucalyptus camaldulensis*); • Pine Donkey Orchid (*Diuris tricolor*); • Tiger Orchid (*Cymbidium canaliculatum*); • Weeping Myall (*Acacia pendula*); and (c) habitat for significant and/or threatened animal species.	Native vegetation seed mixes and tubestock planting species composition reflects the communities mentioned in Condition 38(a). Relocation of habitat trees, have been incorporated into rehabilitation design to enhance habitat value.

Document	Condition/ Section	Requirement	Summary of Status
	Schedule 3, Condition 40	Biodiversity Management Plan The Proponent shall prepare and implement a Biodiversity Management Plan for the project to the satisfaction of the Secretary. This plan must: (a) be prepared in consultation with OEH and Council, and be submitted to the Secretary for approval by the end of March 2015, unless otherwise agreed with the Secretary; (b) describe how the implementation of the offset strategy would be integrated with the overall rehabilitation of the site (see below); (c) include: (i) a description of the short, medium, and long term measures that would be implemented to: • implement the offset strategy; and • manage the remnant vegetation and habitat on the site and in the offset areas; (ii) detailed performance and completion criteria for the implementation of the offset strategy; (iii) a detailed description of the measures that would be implemented over the next 3 years, including the procedures to be implemented for: • implementing revegetation and regeneration within the disturbance areas and offset areas, including establishment of canopy, sub-canopy (if relevant), understorey and ground strata; • protecting vegetation and soil outside the disturbance areas; • rehabilitating creeks and drainage lines that occur on the site, both inside and outside the disturbance areas (such as the White's Creek Diversion), to ensure no net loss of aquatic habitat; • managing salinity; • conserving and reusing topsoil; • undertaking pre-clearance surveys; • managing impacts on fauna;	The current Biodiversity Management Plan was revised and approved to DPI&E in May 2019 and the Department of the Environment and Energy in June 2019.

Document	Condition/ Section	Requirement	Summary of Status
		• landscaping the site and along public roads (including Thomas Mitchell Drive, Denman Road, Edderton Road and Roxburgh Road) to minimise visual and lighting impacts; • collecting and propagating seed; • salvaging and reusing material from the site for habitat enhancement; • salvaging, transplanting and/or propagating threatened flora and native grassland, in accordance with the Guidelines for the Translocation of Threatened Plants in Australia (Vallee et al., 2004); • controlling weeds and feral pests; • managing grazing and agriculture; • controlling access; and • bushfire management; (iv) a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria; (v) a description of the potential risks to successful revegetation, and a description of the contingency measures that would be implemented to mitigate these risks; and (vi) details of who would be responsible for monitoring, reviewing, and implementing the plan.	
	Schedule 3, Condition 41A	The Proponent shall rehabilitate the site to the satisfaction of the DRE. The rehabilitation must comply with the objectives in Table 14, and be consistent with the rehabilitation plan shown in Appendix 7 and the final landform plan shown in Appendix 8.	Rehabilitation objectives are outlined in Section 4 of this RMP. The current Rehabilitation Strategy was revised and submitted to DPI&E for approval in June 2018.
	Schedule 3, Condition 42	The Proponent shall prepare a revised Rehabilitation Strategy for the Mt Arthur mine complex to the satisfaction of the Secretary. This strategy must: (a) be prepared in consultation with the DRE and Council, and be submitted to the Secretary for approval by the end of September 2015, unless otherwise agreed with the Secretary; (b) investigate options for:	The current Rehabilitation Strategy was revised and submitted to DPI&E for approval in June 2018.

Document	Condition/ Section	Requirement	Summary of Status
		• increasing the area to be rehabilitated to woodland on the site; • reducing the size of final voids on site; and • beneficial future land use of disturbed areas, including voids; (c) describe and justify the proposed rehabilitation plan for the site, including the final landform and land use; and (d) include detailed rehabilitation objectives for the site that comply with and build on the objectives in Table 14. Note: The strategy should build on the rehabilitation plan in Appendix 7.	
	Schedule 3, Condition 43	The Proponent shall carry out rehabilitation progressively, that is, as soon as reasonably practicable following disturbance (particularly on the face of emplacements that are visible off-site). Interim stabilisation measures must be implemented where reasonable and feasible to control dust emissions in disturbed areas that are not active and which are not ready for final rehabilitation. Note: It is accepted that parts of the site that are progressively rehabilitated may be subject to further disturbance in future.	Rehabilitation is being carried out progressively, as detailed in Section 7 of this RMP. Completion of the rehabilitation and temporary stabilisation activities proposed are understood to demonstrate compliance with Condition 43(b).
	Schedule 3, Condition 44	The Proponent shall prepare and implement a Rehabilitation Management Plan for the Mt Arthur mine complex to the satisfaction of the DRE. This plan must: • be submitted to NSW Trade & Investment for approval by 30 September 2015; • be prepared in consultation with the Department, NOW, OEH and Council; • be prepared in accordance with relevant NSW Trade & Investment guidelines; • describe how the rehabilitation of the site would be integrated with the implementation of the biodiversity offset strategy; • include detailed performance and completion criteria for evaluating the performance of the rehabilitation of the site, and triggering remedial action (if necessary);	DRG confirmed in a letter dated 15 September 2015 that the Mining Operations Plan, developed in accordance with the Department's MOP Guidelines, was acceptable to satisfy the requirements for a Rehabilitation Management Plan under Schedule 3 Condition 44 of the Mt Arthur Coal Modification Project Approval (PA 09_0062 MOD 1). This RMP complies with the new RMP for large Mines guidelines from the Resource Regulator (previously DRE).

Document	Condition/ Section	Requirement	Summary of Status
		• describe the measures that would be implemented to ensure compliance with the relevant conditions of this approval, and address all aspects of rehabilitation including mine closure, final landform including final voids, and final land use; • include interim rehabilitation where necessary to minimise the area exposed for dust generation; • include a research program that seeks to improve the understanding and application of rehabilitation techniques and methods in the Hunter Valley; • include a program to monitor, independently audit and report on the effectiveness of the measures, and progress against the detailed performance and completion criteria; and • build to the maximum extent practicable on other management plans required under this approval.	
EPBC Approval 2011/5688,	Condition 4	The person taking the action must commence progressive regeneration of 1915 ha of woodland and forest communities, including 299.20 ha of Box Gum Woodland identified in Table 1, as described in the Preliminary Documentation within 1 year of commencement of construction. (Table 1 indicates 500 ha of Box Gum Woodland, and 1415 ha Rehabilitation Corridors).	Progressive regeneration of woodland and forest communities at Mt Arthur Coal commenced in the mid-1990s. The current approved Rehabilitation Strategy incorporates rehabilitation for 1915ha of woody vegetation (including 500ha of Box Gum woodland). This was revised in September 2015 to incorporate 2642ha of woody vegetation as outlined in PA 09_0062 MOD 1. The current Rehabilitation Strategy was revised and submitted to DPI&E for approval in June 2018.
	Condition 5	Biodiversity Management Plan The person taking the action must submit for the Ministers approval the Biodiversity Management Plan (BIOMP) for the project by 30 June 2013. The BIOMP must reflect the proposed Mt Arthur Coal Complex Biodiversity Offset Strategy as outlined in Table 1 and as generally described in the Preliminary Documentation and focus on the reestablishment and protection of a minimum of 707.7 ha of Box Gum Woodland and a minimum of 738.7 ha of suitable habitat for Regent Honeyeater and Swift Parrot. The approved BIOMP must be implemented.	The BIOMP was submitted to Mr Shane Gaddes, Assistant Secretary of the Compliance and Enforcement Branch, Environment Assessment and Compliance Division of the Department of Sustainability, Environment, Water, Population and Communities on the 28th of June 2013. The current Biodiversity Management Plan was approved by DPI&E in May 2019 and the Department of the Environment and Energy in June 2019.

Document	Condition/ Section	Requirement	Summary of Status
	Condition 7	The BIOMP must include, but not be limited to, the following information: a. a text description and map to clearly define the location, boundaries and size of the conservation and offset areas and the regeneration area and rehabilitation corridors. This must be accompanied with the offset attributes and a shape file; b. details of the mechanisms, legal instrument, steps and timing for registering a legally binding conservation covenant that provides enduring protection over each nominated conservation and offset area; c. a detailed description of the current condition of the extant vegetation of each conservation and offset area prior to any management activities. This will provide a baseline description of the vegetation condition for the purpose of monitoring; d. details of vegetation communities to be re-established to achieve the 500 ha regeneration area and 1415 ha of rehabilitated corridors: i. timing of progressive regeneration; ii. criteria to determine success of re-establishment of the Box Gum Woodland and other woodland and forest communities iii. documentation including mapping of current environmental values relevant to MNES of the area; iv. where revegetation through planting seedlings and/or seeds is intended details of appropriate species and ratios of species relevant to historically occurring listed migratory and listed threatened species habitat and the White Box Yellow Box Blakelys Red Gum Grassy Woodland and Derived Native Grassland Ecological Community; and the source and provenance of the seed and/or seedlings which will be used. e. details of measures to offset the impacts to the MNES described in conditions 3 and 4 including details of management actions that will improve the condition of a minimum of 707.7 ha within the conservation and offset areas	The current Biodiversity Management Plan was approved by DPI&E in May 2019 and the Department of the Environment and Energy in June 2019.

Document	Condition/ Section	Requirement	Summary of Status
		and 299.2 ha regeneration area to state 1 consistent with the state and transition model for Box Gum Woodland (Rawlings et al, 2010) and listing advice for the White Box Yellow Box Blakelys Red Gum Grassy Woodland and Derived Native Grassland Ecological Community; ii. management schedules for all conservation and offset areas, the regeneration area and the rehabilitation corridors identifying targeted actions for specific areas to protect and enhance the extent and condition of habitat values of the offset areas, a map showing areas to be managed; iii. type of actions for each conservation and offset area, the regeneration area and rehabilitation corridors and details of methods to be used; iv. timing of management actions for each area; v. performance criteria for each action; vi. a detailed monitoring plan for each action including, but not limited to, control sites, periodic ecological surveys to be undertaken by a qualified ecologist, as agreed to in writing by the Minister, and consistent with survey guidelines for nationally threatened species and communities, to assess the success of the management actions measured against identified milestones and objectives; vii. contingency measures to be implemented if performance criteria are not met; viii. a process to report, to the Department, the progress of management actions undertaken in the conservation and offset areas, regeneration area and rehabilitation corridors and the outcome of those actions, including identifying any need for improved management and actions to undertake such improvement; and ix. details of the various parties responsible for management, monitoring and implementing the management activities, including their position or status as a separate contractor.	

Document	Condition/ Section	Requirement	Summary of Status
Mining Tenement ML1358	2	Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.	The intent of this RMP is to enable compliance with condition 2. No directives consistent with Conditions 6 or 19 are currently in force. Any such future directives will be incorporated into Section 7. Planned activities to meet conditions 16 (a), 16(b), 27, 30 and 33 are incorporated into Section 7 of this RMP. Conditions 20 and 34 are met in the proposed final rehabilitation/ closure plan, as shown in **Figure 5**. Conditions 32 and 35 are addressed by the measures presented in the site Erosion and Sediment Control Plan and Land Management procedure, which are summarised in Section 6 of this RMP. Topsoil stockpile locations are shown in the Annual Forward Program (previously a MOP).
	6	The lease holder shall comply with any direction, given or which may be given by the Inspector regarding the stabilisation and revegetation of any coal, minerals, mine residues, tailings or overburden situated on the subject area.	
	16	Subject to any specific condition of this authority providing for rehabilitation of any particular part of the subject area affected by mining or activities associated therewith, the lease holder shall: a) shape and revegetate to the satisfaction of the Minister, any part of the subject area that may, in the opinion of the Minister have been damaged or deleteriously affected by mining operations and ensure such areas are permanently stabilised, and, b) reinstate and make safe, including sealing and/or fencing, any excavation within the subject area.	
	19	If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister and within such time as may be allowed by the Minister any lands within the subject area which may have been disturbed by the lease holder.	
	20	Upon completion of operations on the surface of the subject area or upon the expiry or sooner determination of this authority or any renewal thereof, the lease holder shall remove from such surface such buildings, machinery, plant, equipment, constructions and works as may be directed by the Minister and such surface shall be rehabilitated and left in a clean, tidy and safe condition to the satisfaction of the Minister.	
	27	The lease holder shall plant such grasses, trees or shrubs or such other vegetation as may be required by the Minister and care for same during the currency of this authority or any renewal thereof, to the satisfaction of the Minister.	

Document	Condition/ Section	Requirement	Summary of Status
	30	The lease holder shall cover with top dressing material, to the Minister's satisfaction, such parts of the subject area as may be stipulated by the Minister and shall plant and maintain, to the Minister's satisfaction, such grasses, trees or shrubs or such other vegetation as may be required by the Minister.	
	32	The lease holder shall conduct operations in such a manner as not to cause or aggravate soil erosion and the lease holder shall observe and perform any instructions given or which may be given by the Minister with a view to minimising or preventing soil erosion.	
	33	The lease holder shall ensure that any topsoil or other material suitable for topdressing purposes which may be disturbed during operations shall be removed separately for replacement as far as may be practicable and the lease holder shall plant or sow such grasses, shrubs or trees in the replaced surface material as may be considered necessary by the Minister to control or prevent soil erosion.	
	34	In the event of any excavations being made the lease holder shall ensure that such are refilled and the topsoil previously removed is replaced and levelled. All such refilling and levelling shall be done to the satisfaction of the Minister.	
	35	The lease holder shall ensure that the run off from any disturbed area including the overflow from any depression or ponded area is discharged in such a manner that it will not cause erosion	
Mining Tenement ML1487	15	The lease holder shall comply with any direction, given or which may be given by the Inspector regarding the dumping, depositing or removal of material extracted as well as the stabilisation and revegetation of any emplacements of coal, minerals, mine residues, tailings or overburden situated on the subject area or the associated colliery holding. If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister any lands within the subject area which may have been disturbed by the lease holder.	No directives consistent with Condition 15 are currently in force. Any such future directives will be incorporated into Section 7. Planned activities to meet conditions 21, 23 are incorporated into Section 7 of this RMP. Condition 22 is met in the proposed final rehabilitation/ closure plan, as shown in **Figure 5**.

Document	Condition/ Section	Requirement	Summary of Status
	21	If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister any lands within the subject area which may have been disturbed by the lease holder.	Conditions 25 and 30 are addressed by the measures presented in the site Water Management Plan, Erosion and Sediment Control Plan and Land Management procedure, which are summarised in Section **6** of this RMP.
	22	Upon completion of operations on the surface of the subject area or upon the expiry or sooner determination of this authority or any renewal thereof, the lease holder shall remove from such surface such buildings, machinery, plant, equipment, constructions and works as may be directed by the Minister and such surface shall be rehabilitated and left in a clean, tidy and safe condition to the satisfaction of the Minister.	
	23	If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister and within such time as may be allowed by the Minister any lands within the subject area which may have been disturbed by mining or prospecting operations whether such operations were or were not carried out by the lease holder.	
	25	The lease holder shall provide and maintain to the satisfaction of the Minister efficient means to prevent contamination, pollution, erosion or siltation of any river, stream, creek, tributary, lake, dam, reservoir, watercourse, groundwater or catchment area or any undue interference to fish or their environment and shall observe any instruction given or which may be given by the Minister with a view to preventing or minimising the contamination, pollution, erosion or siltation of any river, stream, creek, tributary, lake, dam, reservoir, watercourse, groundwater, or catchment area or any undue interference to fish or their environment.	
	30	The lease holder shall conduct operations in such a manner as not to cause or aggravate soil erosion and the lease holder shall observe and perform any instructions given or which may be given by the Minister with a view to minimising or preventing soil erosion.	

Document	Condition/ Section	Requirement	Summary of Status
Mining Tenement ML 1548	13	(a) Land disturbed must be rehabilitated to a stable and permanent form suitable for a subsequent land use acceptable to the Director-General and in accordance with the Mining Operations Plan so that;- • there is no adverse environmental effect outside the disturbed area and that the land is properly drained and protected from soil erosion. • the state of the land is compatible with the surrounding land and land use requirements. • the landforms, soils, hydrology and flora require no greater maintenance than that in the surrounding land. • in cases where vegetation is required and native vegetation is removed or damaged, the original species must be re-established with close reference to the flora survey included in the Mining Operations Plan. If the appropriate vegetation was not native, ant re-established vegetation must be appropriate to the area and at an acceptable density. The land does not pose a threat to public safety. (b) Any topsoil that is removed must be stored and maintained in a manner acceptable to the Director-General.	Activities to meet condition 13(a) are incorporated into Section 7 of this RMP. Activities to meet condition 13(b) are incorporated into Land Management procedure, and summarised in Section 7 of this RMP. No directives consistent with Condition 14 are currently in force. Any such future directives will be incorporated into Section 7. The requirements of Condition 16 are addressed by the measures presented in the site Air Quality and Greenhouse Gas Management Plan, Water Management Plan, Erosion and Sediment Control Plan and Land Management procedure, which are summarised in Section 7 of this RMP.
	14	The lease holder must comply with any direction given by the Director-General regarding the stabilisation and revegetation of any mine residues, tailings or overburden dumps situated on the lease area	

Document	Condition/ Section	Requirement	Summary of Status
	16	Operations must be carried out in a manner that does not cause or aggravate air pollution, water pollution (including sedimentation), or soil contamination or erosion, unless otherwise authorised by a relevant approval, and in accordance with an accepted Mining Operations Plan. For the purpose of this condition, water shall be taken to include any watercourse, waterbody or ground waters. The lease holder must observe and perform any instructions given by the Director-General in this regard.	
Mining Tenement CCL 744	7	Disturbed land must be rehabilitated to a sustainable/agreed end use to the satisfaction of the Director-General.	Activities to meet condition 7 are incorporated into Section 7 of this RMP. The requirements of Condition 18 are addressed by the measures presented in the site Air Quality and Greenhouse Gas Management Plan, Water Management Plan, Erosion and Sediment Control Plan and Land Management procedure, which are summarised in Section 7 of this RMP.
	18	Operations must be carried out in a manner that does not cause or aggravate air pollution, water pollution (including sedimentation) or soil contamination or erosion, unless otherwise authorised by a relevant approval, and in accordance with an accepted Mining Operations Plan. For the purpose of this condition, water shall be taken to include any watercourse, waterbody or ground waters. The lease holder must observe and perform any instructions given by the Director-General in this regard.	
Mining Tenement CL 396	15	The lease holder shall comply with any direction, given or which may be given by the Inspector regarding the dumping, depositing or removal of material extracted as well as the stabilisation and revegetation of any dumps of coal, minerals, mine residues, tailings or overburden situated on the subject area or the associated colliery holding.	No directives consistent with Conditions 15 and 23 are currently in force. Any such future directives will be incorporated into Section 7. Activities to meet condition 22 are incorporated into Section 3 of this RMP. The requirements of Condition 25 are addressed by the measures presented in the site Air Quality and Greenhouse Gas Management Plan, Water Management Plan, Erosion and Sediment Control Plan and Land Management procedure, which are summarised in Section 7 of this RMP.
	22	Upon completion of operations on the surface of the subject area or upon the expiry or sooner determination of this authority or any renewal thereof, the lease holder shall remove from such surface such buildings, machinery, plant, equipment, constructions and works as may be directed by the Minister and such surface shall be rehabilitated and left in a clean, tidy and safe condition to the satisfaction of the Minister.	

Document	Condition/ Section	Requirement	Summary of Status
	23	If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister any lands within the subject area which may have been disturbed by the lease holder.	
	25	The lease holder shall provide and maintain to the satisfaction of the Minister efficient means to prevent contamination, pollution, erosion or siltation of any river, stream, creek, tributary, lake, dam, reservoir, watercourse or catchment area or any undue interference to fish or their environment and shall observe any instruction given or which may be given by the Minister with a view to preventing or minimising the contamination, pollution, erosion or siltation of any river, stream, creek, tributary, lake, dam, reservoir, watercourse or catchment area or any undue interference to fish or their environment.	
Mining Tenement ML1655	7	Any disturbance as result of activities under this lease must be rehabilitated to the satisfaction of the Director-General.	The intent of this RMP is to enable compliance with these conditions.
Mining Tenement ML1739	2	Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.	
Mining Tenement ML1757	2	Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.	
Mining Tenement MPL263	2	Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.	

3.2 Final Land Use Statement

Final land use is described in the Project Approval 09_0062 MOD 1 and is a combination of native woodland, grazing and water management areas. The final land use is depicted spatially on the Final Landform and Rehabilitation Plan found at **Figure 5.**

Final voids are identified as either backfilled and achieving native woodland or grazing, or as a water management area for water storage or a groundwater sink.

- There are 3 proposed final voids and the approximate dimensions are:
  - Northern Void, surface area 1013ha and 281m below ground level
  - Belmont void, 40ha and 28m below ground level
  - McDonald void, 32ha and 57m below ground level

Final void dimensions may change as the mine plan develops and the completion criteria will be adjusted accordingly.

3.3 Justification of the Proposed Final Land Use

The proposed final land use has been approved in the Project Approval, as approved by the Planning Assessment Commission (as delegate of the Minister for Planning) on 26 September 2014 (Project Approval 09_0062 MOD 1).

Through the Project approval process the final land use was consulted upon with Community and Government, with the final land uses of grazing and native woodlands prevailing. Native woodlands provide a corridor for enhancement of native flora and fauna for the Hunter Valley. The grazing is commensurate with previous and surrounding land use. Further detail on these land uses can be found in the 2013 Environmental Assessment documentation. HVEC continues to study opportunities for land use and final void use and will continue to discuss these with the community and Government.

3.4 Stakeholder Consultation

The following stakeholders were consulted regarding the Project Approval 09_0062 MOD 1:

- Department of Planning, Industry and Environment (DPIE); Resource Assessments
- Department of Planning, Industry and Environment (DPIE); Water
- Office of Environment and Heritage (OEH);
- Muswellbrook Shire Council (MSC);
- Mt Arthur Coal Community Consultative Committee (CCC); and
- Neighbouring mining operations.
- Neighbouring community

3.4.1 General Consultation

Mt Arthur Coal regularly engages with local stakeholders regarding proposed operations, including community engagement programs and opportunities. This engagement includes:

- The operation of a 24-hour free call community response line to allow the community to contact the operation directly (1800 882 044)
- Access to information including approval documents, environmental assessments, management plans, environmental audits and environmental management and monitoring reports on a publicly accessible website, at: https://www.bhp.com/environment/regulatory-information/;
- Regular CCC meetings to provide an interface between the community, mine management and the relevant government departments. The community representatives on the CCC are able to share information from CCC meetings with the wider community and to report back on community issues at CCC meetings;

- Regular community contact with local Aboriginal stakeholders and stakeholder groups in relation to Aboriginal archaeology and cultural heritage;
- The Mt Arthur Coal Community Investment Fund which provides financial and in-kind support to local not-for-profit organisations and partners with community development programs;
- Regular attendance at monthly meetings of Muswellbrook Chamber of Commerce and Industry Inc, of which Mt Arthur Coal is an active member, to support local business houses and industry; and
- Participation in the Upper Hunter Mining Dialogue (UHMD), coordinated by the NSW Minerals Council to address cumulative impacts from mining in the Upper Hunter and identify opportunities for improved management and innovation.
- Consultation specific to this document version is provided in Appendix 3.

3.4.2 Rehabilitation and Post-mining Land Use Consultation

An outcome of consultation was Mt Arthur Coal's commitment to investigate improved rehabilitation and landform design options, resulting in the Future Landscapes Design Project (FLDP). The FLDP was an initiative to investigate, develop and deliver an integrated landform that is compatible with the surrounding natural landscape. Phase 1 of this project was concluded in May 2014, satisfying the commitment made within the Mt Arthur Coal Modification Project Environmental Assessment. Phase 1 of the project delivered a final landform design.

As a result of the FLDP investigation and consistent with the requirements of the Mt Arthur Coal Modification Project PA 09_0062 MOD 1, the final landform plan as submitted in this RMP was able to be refined, providing an alternative final landform option that reflects the surrounding natural landscape and maintains stability for selected emplacements. Further study and assessment of the Geomorphological design will continue to meet stability, land use, safety and cost requirements.

3.5 Final land Use and Mining Domains

3.5.1 Final Land Use Domains

Primary domains are final land use domains post-mining land management units characterised by similar land use.

Secondary domains are defined as operational or functional land management units within the mine site, usually with unique purpose and therefore similar geophysical characteristics and rehabilitation treatment requirements.

Domains will require a different rehabilitation methodology to achieve the intended post-mining land use. Domains for Mt Arthur Coal have been determined in consideration of the specific requirements of the mining location and local environment. The key domains for Mt Arthur Coal, as shown in Plan 2, are outlined in Table 3.

Primary domains are what will be the final land form and land use. Secondary domains are the present domain while the mine is active.

Table 3 Mt Arthur Coal Primary and Secondary Domains

Secondary Domain	Code	Primary Domain	Code
Open Cut Void (Active Mining Area)	1	Final Void	A
Water Management Area	2	Water Management Area	B
Infrastructure Area	3	Rehabilitation Area - Pasture	C
Existing Rehabilitation	4	Rehabilitation Area – Native Woodland	D
Tailings Storage Facility	5	Rehabilitation Area – Box Gum Woodland	E
Overburden Emplacements	6	Onsite Conservation and Offset areas	F
Onsite Conservation and Offset areas	7		

3.6 Asset Register

A register of major assets (including buildings, fixed plant and other infrastructure), categorised by primary domain, is presented in Table 4. The asset register also outlines the activities required to demolish and remove the assets during decommissioning.

Table 4 Asset Register

Domain	Assets	Decommissioning/ rehabilitation requirements
Primary Domains		
Open Cut Voids (active mining)	Crib rooms and remote sewerage tanks; Truck fill points; Sediment dams and open drains; Mobile fuel storage containers; Noise testing facility; Magazine facility; Coal stockpiles; Water management pumps and polylines.	Infrastructure demolition and/or removal. Flushing and removal of water pipelines. Management of contaminated materials. Dams reinstated or decontaminated and converted to clean water dams. Open drains reinstated. Rehabilitation works (hardstands/roads/tracks, high-wall and low-wall treatment, topsoiling and revegetation).
Water Management Areas	Whites Creek diversion; Environmental Dam; CHPP Dam; Main Dam; Dam walls; Pumps and pump housings; Polylines; Open drains and spillways; Access tracks; Powerlines; Alluvial Cut Off Wall and Levee	Whites Creek diversion partially retained and integrated into post-mine landscape. Redundant section reinstated and rehabilitated. All three dams will be removed. Pumps and pump housing structures removed; Powerlines isolated and removed; Polylines will be flushed and removed; Dam walls, spillways and other water management earthworks will be dozed and reshaped; The dam floor will be assessed for contamination; final trimmed, rock raked and deep ripped; and Topsoil and revegetation works will be completed.

Domain	Assets	Decommissioning/ rehabilitation requirements
Infrastructure Areas	Main workshop; Wash-down bay and mobile plant park-up areas; CHPP (including structure, equipment and associated buildings); Coal stockpile areas, including export stockpile; Electricity sub stations; Powerlines and light towers; Fuel farm; Truck fill Points; Water treatment plant and potable tanks; Water pipelines; Septic tanks; Conveyor to Bayswater Power station; Conveyor from CHPP to export stockpile; Rail loading bin and infrastructure; Rail loop; Visual and noise barriers (fencing) along the rail line; Overpass bridges (2 over Thomas Mitchell Drive and 1 over The New England Highway). Main administration building and bath house; Projects Offices and portable buildings; Powerlines and light towers; and Sealed roads and car parks.	All services, including power, water and communications, would be disconnected and terminated and removed or sealed underground. All buildings, sheds, tanks and fixed plant would be demolished and removed from the site. Reclaim tunnels would be exposed, the conveyor from CHPP to export stockpile removed and then collapsed. The conveyor to Bayswater Power station will be decommissioned and buried by overburden emplacement. All fixed plant that contains oil would be de-oiled, and oil would be disposed of by an approved waste oil collection contractor. Substations would also be decommissioned, demolished and removed from the site. Concrete footings, pads/slabs and vehicle parking areas would be demolished and, where at final surface will be removed to at least 1.5 m below the ground Tank farms and fuel fill points will be decontaminated prior to demolition and disposal. Where hydrocarbon contamination is identified and a potential impact to sensitive receptors identified, bioremediation would be conducted on site or the material would be transported to an approved and engineered landfill site for disposal. Residual surface material would be scalped from hardstand areas and unsealed access roads and disposed of in a suitable location to remove the heavily compacted or contaminated material. Access tracks may be left in place as required for maintenance of the rehabilitation works. Coal stockpile areas would have approximately 0.5 m of material scalped from the surface to ensure all carbonaceous material is removed. The Rail load-out facility will be decommissioned and rehabilitated at the cessation of operations in 2081. Due to the planned duration of operations at Mt Arthur Coal, BHP Billiton has assumed responsibility for the infrastructure. The road overpass structures will be removed and the rail alignment will be dozer pushed to an angle of approximately 10 degrees. Disturbed areas final trimmed, top soiled and revegetated.
Existing Rehabilitation	Rehabilitated pasture and woodland	Ongoing monitoring, maintenance and (where required) remedial activities.

Domain	Assets	Decommissioning/ rehabilitation requirements
Tailings Storage Facility	Tailings Storage Facility (walls and tailings); Pumps and pump housing; Access tracks; Powerlines; Tailings pipelines under the tailings storage facility	A detailed tailings dam dewatering and capping methodology will be developed by suitable specialists and technical experts as part of the tailings management strategy. Infrastructure such as pumps and powerlines removed. The tailings dam will be required to be capped and rehabilitated at closure. The average thickness of the proposed cap will be a minimum of 3m. The area will be reshaped to integrate with adjacent landforms, unnecessary access tracks removed, and the area top soiled and revegetated.
Overburden Emplacements	Access tracks; Ramps and haul roads; Powerlines; Open drains, sediment dams and polylines.	Powerlines and access tracks removed, except as required for post-mining land use. Ramps and haul roads backfilled or reshaped with adjacent emplacements. Polylines flushed back to open cut and removed from site. Remaining sediment dams integrated into surrounding catchment and drainage lines. Other open drains and sediment dams reinstated to surface level, final trimmed, top soiled and revegetated.
Conservation Areas	Access tracks; Powerlines; Perimeter and internal fencing; Cattle yards; and Subsidiary dams.	Access tracks may be required for post closure management, however where possible all roads and tracks will be rehabilitated. Remaining dams will be decontaminated and converted to clean water structures. The requirements for maintaining powerlines, cattle yards, internal or perimeter fencing will be determined during detailed closure planning. Redundant infrastructure will be removed.

4. Rehabilitation Objectives and Completion Criteria

4.1 Objectives and Criteria

Mt Arthur Coal will rehabilitate mining generated landforms (waste emplacements) to establish a non-polluting, structurally stable landscape to maximise opportunities for a diverse post-mining landscape and range of land uses. It is proposed that final land uses should remain flexible and could include pastoral, commercial forestry, recreation, wildlife habitat corridors and/or other opportunities.

Completion Objectives, Performance Indicators and Rehabilitation Objectives for the primary and secondary domains identified in Section 3 are presented in **Table 5**. More detailed and SMART Rehabilitation Objectives (i.e. specific, measurable, achievable, realistic, and time-bound) are in development; however, the criteria had not been finalised in time for the update of the Mt Arthur Coal RMP for public consultation.

High level linkages between approval features, objective of rehabilitation as presented during the approval process, performance indicators and completion criteria of the Mt Arthur Coal rehabilitation program are detailed in MAC-ENC-MTP-047 Rehabilitation Strategy.

4.2 Stakeholder Consultation

The following stakeholders were consulted regarding the development of the Rehabilitation Objectives and Completion Criteria as part of the review of this RMP:

- DPIE Resource Assessments;
- OEH;
- DPIE Water;
- MSC;
- Mt Arthur Coal CCC (community); and
- Neighbouring mining operations.

Consultation relevant to this version of the RMP is provided in the appendices.

Table 5 Rehabilitation Objectives Measuring Performance against Rehabilitation Objectives

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
Phase – 1. Decommissioning							
Domain – 1. Open Cut Voids							
Mining voids that remain in the rehabilitated post-mining landscape will be safe, stable and non-polluting.	Final voids designs assessed against hydrological modelling.	Hydrologist Report	Actual final void dimensions align with hydrological modelling requirements.	2009 EA 2013 EA	No	N/A	Initial modelling undertaken as part of 2009 EA and further developed in 2013 EA.
	Hazardous material assessment undertaken and constituents of concern at acceptable concentrations	Hazardous Material Assessment	Hostile geological strata (i.e. carbonaceous, acid generating or spontaneously combustible) covered/sealed before closure. Contaminants less than the assessment criteria.	2009 EA 2013 EA ML 1487, ML 1548, CCL 744, CL 396	No	yes	Assessment underway, with results expected in 2020.
	Risk assessment conducted to document security controls to minimise risk of unauthorised access and implementation of risk controls.	Risk Assessment Inspection report	Safety risks associated with remaining voids identified and appropriately managed	CCL 744, CL 396, ML 1358, ML 1487, ML 1548, ML 1593, ML 1655, MPL 263, A 171, A 437, ML1739, ML 1757, CL 229, CL 395	No	yes	Annual
Domain – 2. Water Management Structures							
Existing water storage facilities decommissioned and remediated	Major dams (CHPP Dam, Main Dam and Environmental Dam) decommissioned	Inspection Report	Infrastructure removed.	Closure Plan ML1358, ML1487, CL 396	No	N/A	Decommissioning of the main dam and Dam 4 is in progress with completion subject to the capping of the North Cut Tailings dam.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
							The rehabilitation timing is captured in this AFP period. Others not commenced.
		Inspection Report	Dams de-watered and ground surface areas remediated (scalped or capped).	Closure Plan	No	N/A	Timing for decommissioning of main dam and dam 4 is listed in the AFP.
	Sediment dams decommissioned subject to risk assessment and post-closure requirements.	Risk Assessment Inspection Report	Sediment dams which assist in the water flow from the final rehabilitation surface will be retained following mine closure. Some dams to be retained to provide water sources for fauna. Other dams will be removed and drainage paths re-established.	Closure Plan	No	N/A	Not commenced
	Drainage paths re-instated where not part of wider landform reshaping program.	Inspection Report	Minor, or remote, dams and open drains back-filled to ensure unimpeded landform drainage and seamless integration with surrounding topography.	Closure Plan	No	Yes	Not commenced
	Risk assessment and implementation of risk controls.	Inspection Report	Safety risks associated with remaining infrastructure identified and appropriately managed.	Closure Plan CCL 744, CL 396, ML 1358, ML 1487, ML 1548, ML 1593, ML 1655, MPL 263, A 171, A 437,	No	Yes	

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
				ML1739, ML 1757, CL 229, CL 395			
Domain – 3. Infrastructure Areas							
Infrastructure areas decommissioned and demolished, resulting in safe, stable and non-polluting landscape. (Ex-Infrastructure areas will be rehabilitated as per Rehabilitation – Pasture or Rehabilitation – Native Woodland for subsequent rehabilitation phases).	Status of retained infrastructure legally confirmed.	Legal instruments	Legal instruments established to prove transfer of ownership to another entity, or agreement to acquire, operate and manage retained infrastructure post mine closure.	Closure Plan	No	N/A	Not commenced
	Mine infrastructure areas decommissioned and cleared of surface infrastructure.	Inspection Report	Surface structures, buildings, roads and rail infrastructure not required for post mining land use have services disconnected and terminated and are demolished and removed.	Closure Plan ML1358, ML1487, CL 396	No	Yes	Commenced for Bayswater No. 2 Infrastructure Area and the Power Station conveyor.
	Hazardous material assessment undertaken and constituents of concern at acceptable concentrations. Secure and safe containment, remediation and/or removal of waste substances to meet criteria for the proposed final land use in accordance with the relevant contaminated land guidelines.	Hazardous Material Assessment Report	Contaminated materials removed from site, treated or capped.	EPL ML 1487, ML 1548, CCL 744, CL 396	No	Yes	Not commenced
		Site Contamination Assessment / Remedial Action Plan		EPL PA 09_0062 MOD 1 ML 1487, ML 1548, CCL 744, CL 396	No	Yes	A remedial action plan has been completed for the Bayswater No. 2 Infrastructure Area. PCB and asbestos register maintained .

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
				National Environmental Protection (Assessment of Site Contamination) Measure 1999			
	Risk assessment conducted to document security controls to minimise risk of unauthorised access and implementation of risk controls.	Risk Assessment Inspection Report	Safety risks associated with remaining infrastructure identified and appropriately managed.	Closure Plan CCL 744, CL 396, ML 1358, ML 1487, ML 1548, ML 1593, ML 1655, MPL 263, A 171, A 437, ML1739, ML 1757, CL 229, CL 395	No	Yes	
Domain – 4. Existing Rehabilitation							
As per relevant Secondary Domain	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Domain – 5. Tailings Storage Facility (TSF)							
TSF capped to ensure long-term containment of emplaced material, with minimal potential for external impact. (Ex-TSF areas will be reshaped and rehabilitated	Assessment for potential acid generation, and incorporation of findings into capping design	As constructed reports	Capping of tailings.	2009 EA 2013 EA EPL	Yes	Yes	Geochemical assessment completed (2000). Further study underway.
	Capping/ treatment of facilities will be appropriately designed and constructed so as to ensure geotechnical stability and successful	As constructed reports	Construction of capping layer as per independent consultant's design, or minimum of 3m capping layer of inert material.	2009 EA Closure Plan 2013 EA	No	Yes	Completed for SP1, SP2 & SP3.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
as per Overburden Emplacements for subsequent rehabilitation phases).	containment of tailings material and hazardous leachate drainage or seepage.	Monitoring Reports	Monitoring regime established for downstream waters.	EPL 2009 EA 2013 EA	Yes	N/A	Monitoring regime established. SWMP approved by DPI&E.
		Monitoring Reports	Monitoring indicates no evidence of capping instability or environmental harm.	DSC	No	Yes	SP1, SP2 and SP3 capped. No other dams have been capped. North Cut Tailings Dam will be capped as defined in the AFP.
		Dam Safety Report	Sign off from the Dam Safety Committee that TSF wall integrity is satisfactory based on assessment by a suitably qualified geotechnical engineer.	Closure Plan	No	Yes	
	Risk assessment conducted to document security controls to minimise risk of unauthorised access and implementation of risk controls.	Risk Assessment	Safety risks associated with remaining infrastructure identified and appropriately managed.	Closure Plan	No	Yes	Annual
Domain – 7. Onsite Conservation and Offset areas							
All onsite biodiversity offset and conservation	Long-term protection of biodiversity conservation areas.	Legal Instruments	Appropriate legal instruments in place to provide long-term protection to onsite biodiversity offset and conservation areas.	PA 09_0062 MOD 1 EPBC	No	N/A	Conservation Agreements in place

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
areas will be managed to increase their biodiversity and habitat value, in accordance with the requirements of PA 09_0062 MOD 1, EPBC Approval 2011/5688, and the site Biodiversity Management Plan.	Conservation areas free of unnecessary infrastructure that may pose risk to biodiversity values.	Inspection Report	No unnecessary infrastructure in place.	BIOMP	No	Yes	In progress.
		Inspection Report	Infrastructure have services disconnected and terminated and are demolished and removed.	BIOMP	No	N/A	In progress.
Phase – 2. Landform Establishment							
Domain – 1. Open Cut Voids							
Mining voids that remain in the rehabilitated post-mining landscape will be safe, stable and non-polluting.	Final void walls will be treated to ensure human and animal safety and geotechnical stability.	As constructed designs	Void low walls are to be reshaped with slopes of approximately 18 degrees.	2009 EA, 2013 EA, MOP	No	Yes	Not commenced
		As constructed designs	Void high walls reshaped to approximately 37 degrees and, if required, protected with berm and trench, or fencing and signage, depending on risk.	2009 EA	No	Yes	Not commenced
		Geotechnical report	Final voids have been inspected by a qualified geotechnical engineer to validate that it is stable and poses acceptable safety risk.	2009 EA	No	Yes	Not commenced
	Final void does not cause harmful impact on downstream waters	Hydrological report Inspection report	Implementation of management measures from hydrological report.	2009 EA	No	N/A	Initial modelling undertaken as part of 2009 EA.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
	(surface or groundwater).	Monitoring reports	Monitoring regime established for downstream waters.	EPL, SWMP	Yes	N/A	Monitoring regime established
		Monitoring reports	Monitoring indicates no evidence of harmful impact on downstream waters.	EPL, SWMP	Yes	Yes	Monitoring in progress
Domain – 2. Water Management Structures							
Decommissioned mine water management facilities re-habilitated to stable and non-eroding landforms and/ or watercourses.	Drainage paths re-established to achieve stable and non-polluting landscape.	As constructed report	Drainage lines re-instated.	2009 EA Closure plan 2013 EA	No	Yes	Not commenced. Study starting in FY20.
		As constructed report	Adjacent disturbed area reshaped, to maximise sheet flow.	2009 EA Closure plan 2013 EA	No	Yes	Not commenced
Long-term stability of remaining water management structures.	External engineer's assessment report, indicating that the flood levee is stable and flood-proof, with no evidence of slumping, and continued function and stability of sub-surface cut off wall.	External engineer's assessment report	Demonstrated long-term stability and function of Hunter River alluvials cut-off wall and flood levee.	Controlled Activity Approval	No	Yes	Alluvial wall & flood levee completed. Regular inspections of area completed by Civil Engineer to ensure stability.
Domain – 6. Overburden Emplacements							
Overburden emplacements will be reshaped to stable, free draining, non-polluting landforms, compatible with	Reshaped overburden emplacements will be geotechnically stable.	Field monitoring and Survey Data Analysis	Field monitoring and/or survey data analysis indicates reshaped landforms will continue to shed water as per Final Landform design	2009 EA 2013 EA BHP 2017 Dump Standard	No	Yes	Completed annually for established rehabilitated areas.
		Inspection report	Field monitoring of surface drainage infrastructure	2009 EA 2013 EA	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
surrounding landforms and selected post-mining landuses. (Reshaped Overburden Emplacements will be rehabilitated as per Rehabilitation – Pasture, Rehabilitation – Native Woodland or Rehabilitation – Box Gum Woodland for subsequent rehabilitation phases).			demonstrates that constructed drainage features are functioning as designed with no significant failures.				
		As constructed report	Emplacement outer slopes will generally have an overall slope angle of 10 degrees, and up to a maximum slope of 18 degrees, with Resources Regulator approval and appropriate management.	2009 EA 2013 EA Dump Standard	No	Yes	Completed for established rehabilitated areas.
	Reshaped overburden emplacements will be non-polluting.	As constructed report	Potentially high risk materials (coarse rejects, potentially acid-generating or spontaneously combustible) placed in overburden emplacements will be capped by a minimum of 5m of benign material.	2009 EA 2013 EA BHP 2017 Dump Standard BHP AMD Standard	No	Yes	Geochemical assessment completed (2000). In progress.
		Inspection report	Absence of hazardous carbonaceous material on the surface of the rehabilitation.	2009 EA 2013 EA Dump Standard	No	Yes	In progress.
		Inspection/Monitoring report	No active spontaneous combustion areas, as evidenced through established monitoring program.	2009 EA 2013 EA Dump Standard	No	Yes	In progress.
	Reshaped overburden emplacements will be compatible with surrounding landforms (mined and non-mined)	Survey report	Emplacements will have a maximum average height of RL 360m, with limited features allowed to RL 375m to provide positive visual relief.	2009 EA 2013 EA Dump Standard	No	N/A	In progress. No emplacements exceeding 360m to date.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
	and selected post-mining landuses.	Visual Assessments	Shaped overburden emplacements are consistent with micro relief	2009 EA 2013 EA FLDP	No	N/A	In progress
Phase – 3. Growing Media Development							
Domain – B. Water Management Areas							
Decommissioned mine water management facilities re-habilitated to stable and non-eroding landforms and/ or watercourses. (Re-instated drainage lines will be rehabilitated as per Rehabilitation – Native Woodland or Rehabilitation – Box Gum Woodland for subsequent rehabilitation phases).	Reshaped or re-instated drainage will be topsoiled and rehabilitated to promote stable and non-polluting landscape.	As constructed report	Topsoil or topsoil alternative will be placed to a minimum depth of 100mm across all disturbed ground. Topsoil substitutes (e.g. mulch or protective matting) may be used to reduce sediment potential. Drainage lines will be appropriately armoured to facilitate a final landform that is safe stable and non-polluting.	2009 EA 2013 EA Elliot & Veness Blue Book Vol2E BHP MAN	No	Yes	In progress
Domain – C. Rehabilitation - Pasture							
Rehabilitated pasture landscapes will	Pasture rehabilitation land will demonstrate appropriate soil	Inspection report	Topsoil or topsoil alternative placed at a minimum depth of 100 mm.	MAC GPA	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
support a financially viable and environmentally sustainable livestock grazing operation.	properties so as to support sustainable livestock grazing.	Sampling results	Topsoil will have the following properties, as demonstrated through field survey and analytical testing (including re-rehabilitation stockpile testing). Physical Texture typically: Silty clay loam to sandy loam, with clay content < 30% Structured soils - not massive (heavy clay) or single grained (sand) Sub-optimal soils treated with gypsum Other growth media materials (e.g. biosolids or organic mulch) integrated with subsoil/spoil material as per relevant guidelines.	Elliot & Veness	No	Yes	In progress.
		Sampling Results	Chemical pH:4.5-9 EC (1:5 ratio) of <0.15 uS/cm Cation exchange capacity (CEC) >14 Cmol+/kg	MAC GPA, Grigg et al, Blue Book Vol 2E BHP MAN	No	Yes	In progress.
		Sampling Results	Erosion Potential Emerson Aggregate Test Class of 3 (1), 3(2), 4, 5 or 6. Or exchangeable sodium capacity (ESP) <5%	Blue Book Vol 2E, Hazelton & Murphy BHP MAN	No	Yes	In progress.
		Sampling Results	Nutrients Organic carbon levels (>4.0%)	MAC GPA Blue Book Vol 2E,	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
			Soil Phosphorous (Colwell P) levels 14-20 mg/kg Fertiliser requirement comparable to similar non-mined grazing land	Hazelton & Murphy			
		Agricultural Impact Statement Analysis Reports	Rehabilitated landscapes will be of the land capability class comparable to that of pre-mining as outlined in the Agricultural Impact Statement.	2009 EA 2013 EA	No	Yes	In progress
Domain – D. Rehabilitation – Native Woodland & Domain – E. Rehabilitation – Box Gum Woodland							
Rehabilitated areas will be able to support an open native woodland vegetation community to enhance biodiversity and habitat values.	Soils/ growth medium demonstrates physical and chemical properties suited to native woodland vegetation.	Inspection report	Topsoil or topsoil alternative placed at a minimum depth of 100 mm. Other growth media materials (i.e. biosolids or organic mulch) integrated with subsoil/spoil material as per relevant guidelines.	Grigg et al,	No	Yes	In progress.
		Sampling Results	Topsoil will have the following properties, as indicated through field monitoring. Clay content < 30% and not massive (heavy clay) or single grained (sand) pH:4.5-9 EC (1:5 ratio) of <0.15 uS/cm Soil Carbon, Nitrogen and Phosphorous levels to be comparable with reference sites.	Hazelton & Murphy, Elliot & Veness, Rawlings et al	No	Yes	In progress.
Phase – 4. Ecosystem and Landuse Establishment							

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
Domain – A. Final Voids							
Mining voids remaining in the rehabilitated post-mining landscape will be safe, stable and non-polluting.	Vegetative cover promotes landform stability and assists with water quality maintenance.	Inspection Report	Reshaped low wall rehabilitated as pasture or woodland vegetation (see relevant domain for detailed performance indicators).	See relevant domain C, D or E	-	-	-
	Landforms and water storages safe for humans, livestock and native wildlife, and non-polluting.	Inspection Report & Risk Assessments	Steep void walls and water storages isolated by berm and bench, or fencing and signage (depending on risk profile) to prevent unintentional vehicle, pedestrian and livestock access.	2009 EA 2013 EA	No	Yes	Not commenced
		Water Monitoring Results	Water monitoring indicates no harmful impact on surrounding surface and groundwater and is consistent with hydrological modelling predictions.	EPL 2009 EA 2013 EA	No	Yes	Sitewide surface water and groundwater monitoring in progress.
Domain – C. Rehabilitation - Pasture							
Rehabilitated pasture landscapes will support a financially viable and environmentally sustainable livestock grazing operation.	Establish landscape and land-surface suitable for grazing operations.	Inspection report	70 percent of vegetation established and maintained.	Blue Book Vol2E, Grigg et al	No	Yes	In progress.
		Inspection Report	Land surfaces within grazing areas are free of obstacles or hazardous terrain.	AFP	No	N/A	In progress.
		Inspection report	Appropriate infrastructure such access roads, fencing, and a water supply plan completed.	MAC GPA, AFP	No	N/A	Not commenced.
Post-mining landuses will be consistent with	Land management measures implemented to control grazing	Weed assessment reports	Weed distribution comparable to local remnant vegetation.	2009 EA 2013 EA MAC GPA	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
surrounding landuses, and not impact on biodiversity values of adjacent woodland and conservation areas.	related risks to onsite grazing, neighbouring land and adjacent biodiversity areas.	Fire Management Plan	Program implemented for fuel load assessment and reduction, with advice from NSW Rural Fire Service.	Bushfire Prevention Procedure	No	Yes	In progress.
		Assessment reports	Pest animal infestation comparable to local remnant vegetation.	2009 EA 2013 EA	No	Yes	In progress
		Inspection report	No gullies greater than 20cm depth over transects.	2009 EA 2013 EA	No	Yes	In progress.
		Inspection report	Major rehabilitated watercourses and adjacent conservation areas fenced off to prevent livestock access.	2009 EA BIOMP 2013 EA	No	N/A	In progress.
	Soil substrate and pasture cover is able to support grazing.	Inspection report	Erosion comparable to surrounding non-mined landforms of similar topography.	2009 EA 2013 EA Blue Book Vol 2E	No	Yes	In progress.
Domain – D. Rehabilitation – Native Woodland							
Rehabilitation will establish at least 2142ha of native woodland vegetation community (excluding 500 ha Box Gum Woodland).	An area equivalent to 2142 ha will be established as native woodland.	Rehabilitation assessment report	All areas shown as Native Woodland vegetation community in Plan 4, planted with a native species mix (seed or tubestock) targeted at establishing an open grassy woodland vegetation community.	PA 09_0062 MOD 1, EPBC Approval	No	Yes	In progress.
	Rehabilitated native woodland will be focussed on establishing the	Rehabilitation Assessment Report	Rehabilitation species composition (seed mix or tubestock) drawn from the species list in **Section 7**	PA 09_0062 MOD 1 BIOMP RMP	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
	vegetation communities as required in of the Project Approval.	Rehabilitation Assessment Report	All structural dominant species represented compared with analogue site.	PA 09_0062 MOD 1 EPBC Approval	No	Yes	In progress.
		Rehabilitation Assessment Report	The diversity, percentage and density of shrubs and juvenile trees with a stem diameter <5cm is comparable to that of the local remnant vegetation.	PA 09_0062 MOD 1 EPBC Approval	No	Yes	In progress.
		Rehabilitation Assessment Report	The total number of native plant species is comparable to the local remnant vegetation.	PA 09_0062 MOD 1 EPBC Approval	No	Yes	In progress.
		Rehabilitation Assessment Report	The number of tree, shrub and sub-shrub species is comparable to that of the local remnant vegetation.	PA 09_0062 MOD 1 EPBC Approval	No	Yes	In progress.
	Rehabilitated native woodland will enhance habitat and biodiversity values.	Rehabilitation Assessment Report	Species composition for revegetation will be aimed at establishing a complex community structure consisting of groundcover, understory and canopy according to **Table 7**.	PA 09_0062 MOD 1 BIOMP	No	Yes	In progress.
		Biodiversity Plan	Nesting boxes (various bird, squirrel glider, possum and bat) and natural habitat features (including large rocks, logs/coarse woody debris, hollow bearing timber) are placed in established native woodland rehabilitation.	PA 09_0062 MOD 1 BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Number of weed species and surface area comparable to local remnant vegetation.	2009 EA 2013 EA	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
		Fire Management Plan	Program implemented for fuel load assessment and reduction, with advice from NSW Rural Fire Service.	Bushfire Prevention Procedure	No	Yes	In progress.
		Rehabilitation assessment reports	Pest animal infestation comparable to reference sites.	2009 EA 2013 EA	No	Yes	In progress
		Inspection Report	Where adjacent to selected grazing or operational mining land, adequate fencing and signage is installed and maintained to prevent unintentional vehicle and livestock access.	2009 EA BIOMP 2013 EA	No	N/A	In progress.
	Rehabilitated native woodland vegetation will provide faunal habitat and movement corridors by linking existing vegetation communities within and surrounding the mine boundary.	Rehabilitation assessment reports	Rehabilitated native vegetation distribution will link areas of onsite and near-site native vegetation, and be consistent with the biodiversity corridors consistent with the latest version of the Resources Regulator Synoptic Plan.	2009 EA BIOMP 2013 EA Resources Regulator Synoptic Plan	No	N/A	In progress – corridors planned.
	Soils/ growth medium displays physical and chemical properties suited to native woodland vegetation.	Inspection report	Erosion comparable to surrounding non-mined landforms of similar topography.	2009 EA 2013 EA Blue Book Vol 2E	No	Yes	In progress.
Domain – E. Rehabilitation – Box Gum Woodland							
Rehabilitation areas will include at least 500 ha of re-established	A minimum area of 500 ha rehabilitation will be	Rehabilitation assessment reports	The Box-Gum re-establishment area based on the north-eastern slope of Visual Dump 1, and shown on	PA 09_0062 MOD 1 EPBC Approval	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
Box Gum Woodland.	established as Box Gum Woodland.		Plan 4, will be established with a species mix (seed or tubestock) drawn from the species list presented in Section 7 for Central Hunter Box - Ironbark Woodland or Central Hunter Ironbark - Spotted Gum – Grey Box Forest.				
		Rehabilitation Assessment Report	All structural dominant species represented compared with analogue site	PA 09_0062 MOD 1 EPBC Approval	No	Yes	In progress.
		Rehabilitation Assessment Report	The diversity, percentage and density of shrubs and juvenile trees with a stem diameter <5cm is comparable to that of the local remnant vegetation	PA 09_0062 MOD 1 EPBC Approval	No	Yes	In progress.
		Rehabilitation Assessment Report	The total number of live native plant species is comparable to the local remnant vegetation	PA 09_0062 MOD 1 EPBC Approval	No	Yes	In progress.
		Rehabilitation Assessment Report	The number of tree, shrub and sub-shrub species is comparable to that of the local remnant vegetation	PA 09_0062 MOD 1 EPBC Approval	No	Yes	In progress.
	Rehabilitated Box Gum Woodland will enhance habitat and biodiversity values.	Rehabilitation Assessment Report	Establishment of groundcover, understory and canopy according to **Table 7**.	PA 09_0062 MOD 1 BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Fauna monitoring of natural and introduced habitat indicates colonisation by native species.	PA 09_0062 MOD 1 BIOMP	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
		Rehabilitation Assessment Report	Number of weed species and surface area comparable to reference sites.	2009 EA 2013 EA	No	Yes	In progress.
		Fire Management Plan	Program implemented for fuel load assessment and reduction, with advice from NSW Rural Fire Service.	Bushfire Prevention Procedure	No	Yes	In progress.
		Rehabilitation Assessment Report	Pest animal infestation comparable to reference sites.	2009 EA 2013 EA	No	Yes	In progress
	Soils/ growth medium displays physical and chemical properties suited to b woodland vegetation.	Inspection report	Erosion comparable to surrounding non-mined landforms of similar topography.	2009 EA 2013 EA Blue Book Vol 2E	No	Yes	In progress.
Domain – F. Onsite Conservation and Offset areas							
All onsite biodiversity offset and conservation areas will be managed to increase their biodiversity and habitat value, and meet regulatory requirements.	Rehabilitation operations are completed in accordance with the biodiversity and rehabilitation management requirements of PA 09_0062 MOD 1 and EPBC Approval 2011/5688, and the site Biodiversity Management Plan.	Biodiversity Management Plan	Compliance with management actions presented in the site Biodiversity Management Plan, as evidenced through the most recent Independent Environmental Audit and/or Biodiversity Audit.	PA 09_0062 MOD 1 EPBC Approval BIOMP	No	N/A	Independent audits completed.
Phase – 5. Ecosystem and Landuse Sustainability							
Domain – A. Final Voids							
Mining voids remaining in the	Vegetative cover promotes landform	Rehabilitation Assessment Report	Established pasture or woodland vegetation (see	See relevant domain	-	-	-

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
rehabilitated post-mining landscape will be safe, stable and non-polluting.	stability and assists with water quality maintenance.		relevant domain for detailed performance indicators).				
	Landforms and water storages safe for humans, livestock and native wildlife, and non-polluting	Inspection Report and Risk Assessment	Steep void walls and water storages isolated by berm and bench, or fencing and signage (depending on risk profile) to prevent unintentional vehicle, pedestrian and livestock access.	2009 EA 2013 EA	No	Yes	Not commenced.
		Rehabilitation Assessment Report	Water monitoring indicates contaminants within acceptable limits.	EPL 2009 EA 2013 EA	No	Yes	Site wide surface water and groundwater monitoring in progress.
Domain – C. Rehabilitation - Pasture							
Rehabilitated pasture landscapes will support a financially viable and environmentally sustainable livestock grazing operation.	Landscape and land-surface suitable for grazing operations.	Grazing Potential Assessment Report	Established vegetation as described in Table 6.	Blue Book Vol2E, Grigg et al	No	Yes	In progress.
		Inspection Report	Land surfaces within grazing areas free of obstacles or hazardous terrain.	MOP	No	N/A	In progress.
		Agricultural Impact Statement Analysis Report	Rehabilitated landscapes will be of the land capability class comparable to that of pre-mining as outlined in the Agricultural Impact Statement.	2009 EA 2013 EA	No	Yes	In progress.
		Inspection Report	Appropriate infrastructure such access roads and fencing, including fencing along drainage lines and adjacent woodland areas, maintained and functional.	BIOMP	No	N/A	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
	Soil substrate and pasture cover that will support grazing.	Grazing Potential Assessment Report	Pasture grass cover established.	Agronomist	No	Yes	In progress.
		Grazing Potential Assessment Report	Carrying capacity (DSE/ha), crude protein (%), digestibility (%), green dry matter content (kg green DMA/ha) comparable to reference sites.	Agronomist	No	Yes	In progress.
		Grazing Potential Assessment Report	Number of weed species and surface area comparable to reference sites.	2009 EA 2013 EA Agronomist	No	Yes	In progress.
		Fire Management Plan	Program implemented for fuel load assessment and reduction, with advice from NSW Rural Fire Service.	Bushfire Prevention Procedure	No	Yes	In progress.
		Monitoring Report	Pest animal infestation comparable to reference sites.	2009 EA 2013 EA	No	Yes	In progress
		Inspection Report	No gullies greater than 20 cm depth over transects.	2009 EA 2013 EA	No	Yes	In progress.
		Inspection Report	Major rehabilitated watercourses and adjacent conservation areas fenced off to prevent livestock access.	2009 EA BIOMP 2013 EA	No	N/A	In progress.
		Sample Results	Soil assessment as part of site monitoring program indicates: Minimum topsoil depth 100 mm, with further development of A horizon. minimal land degradation; no accelerated or concentrated erosion; pH:4.5-9	Blue Book Vol 2E, Hazelton & Murphy, Elliot & Veness, Grigg et al	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
			EC (1:5 ratio) of <0.15 uS/cm cation exchange capacity (CEC) >14 Cmol+/kg Emerson Aggregate Test Class of 3 (1), 3(2), 4, 5 or 6, or exchangeable sodium capacity (ESP) <5% Organic carbon levels (>4.0%) Soil Phosphorous (Colwell P) levels 14-20 mg/kg				
Post-mining landuses will be consistent with surrounding landuses, and not impact on biodiversity values of adjacent woodland and conservation areas.	Land management measures implemented to control grazing related risks to onsite grazing, neighbouring land and adjacent biodiversity areas.	Rehabilitation Assessment Report	Weed distribution comparable to reference sites.	2009 EA 2013 EA Agronomist	No	Yes	In progress.
		Fire Management Plan	Program implemented for fuel load assessment and reduction, with advice from NSW Rural Fire Service.	Bushfire Prevention Procedure	No	Yes	In progress.
		Rehabilitation Assessment Report	Pest animal infestation comparable to reference sites, with ongoing control.	2009 EA 2013 EA	No	Yes	In progress
		Inspection Report	No gullies greater than 20 cm depth over transects.	2009 EA 2013 EA	No	Yes	In progress.
		Monitoring Results	Monitoring of drainage lines indicates no significant concentrated/ accelerated erosion, and no downstream sedimentation or other degradation impacts.	2009 EA BIOMP 2013 EA	No	Yes	In progress.
Domain – D. Rehabilitation – Native Woodland							
Rehabilitation will establish at least 2142ha of	An area equivalent to 2142 ha will be	Rehabilitation Assessment Report	All areas shown as Native Woodland vegetation community in Plan 4, planted	PA 09_0062 MOD 1	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
native woodland vegetation community (excluding 500 ha Box Gum Woodland).	maintained as native woodland.		with a native species mix (seed or tubestock) targeted at establishing an open grassy woodland vegetation community have been established.	EPBC			
	Rehabilitated native woodland will be focussed on establishing the vegetation communities as required in Project Approval.	Rehabilitation Assessment Report	The developing vegetation community will include key species listed in Section 7.2 for Central Hunter Box - Ironbark Woodland or Central Hunter Ironbark - Spotted Gum – Grey Box Forest.	PA 09_0062 MOD 1 EPBC BIOMP	No	Yes	In progress.
	Rehabilitated native woodland will enhance habitat and biodiversity values.	Rehabilitation Assessment Report	The development of a multi-layered community structure is evident, and (for communities > 10 years) consists of canopy, understory and groundcover comparable with reference sites.	PA 09_0062 MOD 1 BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Density and diversity of developing tree and shrub species within rehabilitated community is comparable to that of reference sites.	BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Vegetation health: Age < 10 years - survival of 75% of key species and no evidence of significant vegetation stress (i.e. weed dominance, disease, water stress, premature die-back);	BIOMP	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
			Age > 10 years – vegetation health indicators comparable to that of reference sites.				
		Rehabilitation Assessment Report	Observations indicating reproduction (seeding, flowering or second generation plants) recorded at multiple locations within rehabilitated vegetation area.	BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Observations indicating nutrient recycling (development of consistent litter layer, litter layer decomposition and cryptogam presence) recorded at multiple locations within rehabilitated vegetation area.	BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Fauna monitoring of natural and introduced habitat features (i.e. nesting boxes large rocks, logs/coarse woody debris, hollow bearing timber) indicates colonisation by native species.	PA, BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Weed trends comparable to reference sites.	2013 EA 2009 EA BIOMP	No	Yes	In progress.
		Inspection Report	Where adjacent to selected grazing or operational mining land, adequate fencing and signage is installed and maintained to prevent unintentional vehicle and livestock access.	2013 EA 2009 EA BIOMP	No	N/A	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
	Rehabilitated native woodland vegetation will provide faunal habitat and movement corridors by linking existing vegetation communities within and surrounding the mine boundary.	Rehabilitation Assessment Report	Rehabilitated native vegetation distribution will link areas of onsite and near-site native vegetation, and be consistent with the biodiversity corridors consistent with the latest version of the Resources Regulator Synoptic Plan.	2009 EA 2013 EA Resources Regulator Synoptic Plan	No	N/A	In progress.
	Soils/ growth medium displays physical and chemical properties suited to native woodland vegetation.	Sampling Results	Field monitoring indicates: Topsoil minimum depth of 100 mm, with further development of A horizon evident; no accelerated or concentrated erosion pH:4.5-9 EC (1:5 ratio) of <0.15 uS/cm Soil Carbon, Nitrogen and Phosphorous levels comparable with reference sites.	Blue Book Vol 2E, Hazelton & Murphy, Elliot & Veness, Rawling et al	No	Yes	In progress.
Domain – E. Rehabilitation – Box Gum Woodland							
Rehabilitation areas will include at least 500 ha of re-established Box Gum Woodland.	A minimum area of 500 ha rehabilitation will be maintained as Box Gum Woodland.	Rehabilitation Assessment Report	The Box-Gum re-establishment area as shown on Plan 4, has been established with species presented in Section 7.2 for Central Hunter Box - Ironbark Woodland or Central Hunter Ironbark - Spotted Gum – Grey Box Forest.	PA 09_0062 MOD 1 EPBC	No	Yes	In progress.
	Rehabilitated Box Gum Woodland will enhance	Rehabilitation Assessment Report	The development of a multi-layered community structure is evident, and (for communities	PA 09_0062 MOD 1	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
	habitat and biodiversity values.		> 10 years) consists of canopy, understory and groundcover comparable with reference sites.	BIOMP			
		Rehabilitation Assessment Report	Density and diversity of developing tree and shrub species within rehabilitated community is comparable to that of reference sites.	BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Vegetation health: Age < 10 years - survival of 75% of key species and no evidence of significant vegetation stress (i.e. weed dominance, disease, water stress, premature die-back); Age > 10 years – vegetation health indicators comparable to that of reference sites.	BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Observations indicating reproduction (seeding, flowering or second generation plants) recorded at multiple locations within rehabilitated vegetation area.	BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Observations indicating nutrient recycling (development of consistent litter layer, litter layer decomposition and cryptogam presence) recorded at multiple locations within rehabilitated vegetation area.	BIOMP	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
		Rehabilitation Assessment Report	Colonisation by native species comparable with local remnant vegetation.	PA 09_0062 MOD 1 BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Weed presence is comparable to remnant vegetation.	2009 EA 2013 EA BIOMP	No	Yes	In progress.
		Inspection Report	Where adjacent to selected grazing or operational mining land, adequate fencing and signage is installed and maintained to prevent unintentional vehicle and livestock access.	2009 EA 2013 EA BIOMP	No	N/A	In progress.
	Soils/ growth medium displays physical and chemical properties suited to native woodland vegetation.	Inspection Report & Monitoring Results	Field monitoring indicates: Topsoil minimum depth of 100 mm, with further development of A horizon evident; no accelerated or concentrated erosion pH:4.5-9 EC (1:5 ratio) of <0.15 uS/cm Soil Carbon, Nitrogen and Phosphorous levels comparable with reference sites.	Blue Book Vol 2E, Hazelton & Murphy, Elliot & Veness, Rawling et al	No	Yes	In progress.
Domain – F. Onsite Conservation and Offset areas							
All onsite biodiversity offset and conservation areas will be managed to	Rehabilitation operations are completed in accordance with the biodiversity and rehabilitation	Biodiversity Management Plan	Compliance with management actions presented in the site Biodiversity Management Plan, as evidenced through the most recent Independent	PA 09_0062 MOD 1 EPBC Approval BIOMP	No	N/A	Independent audits completed.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
increase their biodiversity and habitat value, and meet regulatory requirements.	management requirements of PA 09_0062 MOD 1 and EPBC Approval 2011/5688, and the site Biodiversity Management Plan.		Environmental Audit and/or Biodiversity Audit.				
Phase – 6. Relinquishment							
Domain – A. Final Voids							
Mining voids remaining in the rehabilitated post-mining landscape will be safe, stable and non-polluting.	Vegetative cover promotes landform stability and assists with water quality maintenance.	Rehabilitation Assessment Report	Reshaped low wall areas rehabilitated as pasture or woodland vegetation meet relevant completion criteria for the relevant secondary domain.	See relevant Domain	-	-	-
	Landforms and water storages safe for humans, livestock and native wildlife, and non-polluting	Risk assessment & Inspection Report	Steep void walls and water storages isolated by berm and bench, or fencing and signage (depending on risk profile) to prevent unintentional vehicle, pedestrian and livestock access.	2009 EA 2013 EA	No	Yes	Not commenced.
		Inspection Report	Geotechnical inspections of residual steep landforms completed by independent engineer identifying: • no areas of existing or immanent landform failure; and • no potential long-term and/or high risk landform stability issues.	2009 EA 2013 EA	No	N/A	Not commenced.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
		Water Monitoring report	Water monitoring indicates contaminants within acceptable limits.	EPL SWMP	No	Yes	Sitewide ground & surface water monitoring in progress and approved by DPI&E.
Domain – B. Water Management							
Rehabilitated water management features will be re-instated and managed as stable, non-eroding and non-polluting landform features that either hold water (i.e. dams) or allow the unimpeded flow of water (i.e. drainage lines and watercourses) as designed.	Water management features will be stable and non-polluting	Water Monitoring Report	Water leaving site is monitored in accordance with the relevant EPL (until EPL is surrendered).	EPL	Yes	Yes	Monitoring in progress.
		Water Monitoring Report	Discharged water quality is in the range of receiving watercourse background water quality.	EPL	Yes	Yes	Monitoring in progress.
		Rehabilitation Assessment Report	No concentrated or accelerated erosion in drainage lines compared to nearby non-mining disturbed drainage lines.	2009 EA 2013 EA	No	Yes	In progress.
		Rehabilitation Assessment Report	Rehabilitated drainage lines revegetated	See relevant Domain	-	-	-
		Inspection report	Appropriately fenced and signed to prevent unintended livestock and vehicle access.	2009 EA 2013 EA BIOMP	No	N/A	In progress.
Domain – C. Rehabilitation - Pasture							
Rehabilitated pasture landscapes will	Landscape and land-surface suitable for grazing operations.	Grazing Potential Assessment Report	At least 70 percent established and maintained.	Blue Book Vol2E, Grigg et al	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
support a financially viable and environmentally sustainable livestock grazing operation.		Inspection Report	Land surfaces within grazing areas free of obstacles or hazardous terrain.	MOP	No	N/A	In progress.
		Grazing Potential Assessment Report	Rehabilitate at least 33 ha of Class II agricultural capability land in the area identified in the Project Approval.	2009 EA 2013 EA PA 09_0062 MOD 1	No	Yes	In progress.
		Inspection report	Appropriate infrastructure such access roads and fencing, including fencing along drainage lines and adjacent woodland areas, maintained and functional.	2009 EA 2013 EA Agronomist	No No	N/A N/A	In progress. Not commenced.
	Soil substrate and pasture cover is able to support grazing.	Grazing Potential Assessment Report	Pasture cover species composition suited to beef cattle grazing, with trends in pasture health and composition comparable with non-mined grazing reference sites.	Agronomist	No	Yes	In progress.
		Monitoring Results	Soil assessment as part of site monitoring program indicates: Minimum topsoil depth 100 mm, with well-developed A horizon present. minimal evidence of active land degradation processes; no evidence of accelerated or concentrated erosion; Rootzone soil pH:4.5-9 Rootzone soil EC (1:5 ratio) of <0.15 uS/cm	Blue Book Vol 2E, Hazelton & Murphy, Elliot & Veness, Grigg et al BHP MAN	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
			Rootzone soil cation exchange capacity (CEC) >14 Cmol+/kg Exchangeable sodium capacity (ESP) <5% Rootzone organic carbon levels (>4.0%) Rootzone soil phosphorous (Colwell P) levels 14-20 mg/kg				
Post-mining landuses will be consistent with surrounding landuses, and not impact on biodiversity values of adjacent woodland and conservation areas.	Land management measures implemented to control grazing related risks to onsite grazing, neighbouring land and adjacent biodiversity areas.	Grazing Potential Assessment Report	Weed distribution comparable to reference sites.	2009 EA 2013 EA MAC GPA	No	Yes	In progress.
		Fire Management Plan	Program implemented for fuel load assessment and reduction, with advice from NSW Rural Fire Service.	Bushfire Prevention Procedure	No	Yes	In progress.
		Monitoring Report	Pest animal infestation comparable to reference sites, with ongoing control program in place.	2009 EA 2013 EA	No	Yes	In progress
		Inspection Report	No gullies greater than 20cm depth over transects.	2009 EA 2013 EA	No	Yes	In progress.
		Monitoring Results	Monitoring of drainage lines indicates no significant concentrated/ accelerated erosion, and no downstream sedimentation or other degradation impacts.	2009 EA BIOMP 2013 EA	No	Yes	In progress.
Domain – D. Rehabilitation – Native Woodland							
Rehabilitation will establish at least 2142ha of native woodland	An area equivalent to 2142 ha will be maintained as	Rehabilitation Assessment Report Independent Report	All areas shown as Native Woodland vegetation community in Plan 4 have been established as open	PA 09_0062 MOD 1	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
vegetation community (excluding 500 ha Box Gum Woodland).	established native woodland.		grassy woodland vegetation community. Verified by independent audit.				
	Rehabilitated native woodland will be focussed on establishing the vegetation communities as required in Project Approval.	Rehabilitation Assessment Report	Rehabilitated native woodland vegetation communities will include key species listed in Section 7.2 for Central Hunter Box - Ironbark Woodland or Central Hunter Ironbark - Spotted Gum – Grey Box Forest.	PA 09_0062 MOD 1 BIOMP	No	Yes	In progress.
	Rehabilitated native woodland will enhance habitat and biodiversity values.	Rehabilitation Assessment Report	The development of a multi-layered community structure is evident, and (for communities > 10 years) consists of canopy, understory and groundcover comparable with reference sites.	PA 09_0062 MOD 1 BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Density and diversity of developing tree and shrub species within rehabilitated community is comparable to that of reference sites.	BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Vegetation health indicators i.e. weed dominance, disease, water stress, premature die-back) comparable to that of reference sites.	BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Observations indicating reproduction (seeding and flowering in second generation plants) recorded at multiple locations within rehabilitated vegetation area.	BIOMP	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
		Rehabilitation Assessment Report	Observations indicating nutrient recycling (development of consistent litter layer, litter layer decomposition and cryptogam presence) recorded at multiple locations within rehabilitated vegetation area.	BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Fauna monitoring indicates patterns of native fauna colonisation and distribution comparable with non-mined native woodland reference sites.	PA 09_0062 MOD 1 BIOMP Rehabilitation Strategy	No	Yes	In progress.
		Rehabilitation Assessment Report	Overall weed trends comparable to reference sites.	2009 EA, BIOMP Rehabilitation Strategy	No	Yes	In progress.
		Inspection Report	Where adjacent to proposed grazing land, adequate fencing and signage is installed and maintained to prevent unintentional vehicle and livestock access.	2009 EA, BIOMP	No	N/A	In progress.
	Rehabilitated native woodland vegetation will provide faunal habitat and movement corridors by linking existing vegetation communities within and surrounding the mine boundary.	Rehabilitation Assessment Report	Rehabilitated native vegetation distribution will link areas of onsite and near-site native vegetation, and be consistent with the biodiversity corridors presented in the latest version of the Resources Regulator Synoptic Plan (or equivalent).	2009 EA, Resources Regulator Synoptic Plan	No	N/A	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
	Soils/ growth medium displays physical and chemical properties suited to native woodland vegetation.	Field Monitoring	Field monitoring indicates: Topsoil minimum depth of 100 mm, with well-developed A horizon evident; no accelerated or concentrated erosion pH:4.5-9 EC (1:5 ratio) of <0.15 uS/cm Soil Carbon, Nitrogen and Phosphorous levels comparable with reference sites.	Blue Book Vol 2E, Hazelton & Murphy, Elliot & Veness, Rawling et al	No	Yes	In progress.
The rehabilitated post-mining landscape will be compliant with relevant regulatory and corporate requirements.	The rehabilitated native woodland areas will be established and managed in accordance with the biodiversity and rehabilitation requirements of the EPBC approval, Project Approval and site Biodiversity Management Plan.	Audit Report	An independent audit of compliance with the biodiversity and rehabilitation requirements of the EPBC approval, Project Approval and site Biodiversity Management Plan will be undertaken within three years of planned mine closure, with all non-compliances addressed before final closure.	PA 09_0062 MOD 1 EPBC Approval	No	N/A	Not commenced.
Domain – E. Rehabilitation – Box Gum Woodland							
Rehabilitation areas will include at least 500 ha of re-established Box Gum Woodland.	A minimum area of 500 ha rehabilitation will be maintained as established Box Gum Woodland.	Rehabilitation Assessment Report	The 500 ha Box-Gum woodland area consists of the key species in the strata listed in Section 7.2 for Central Hunter Box - Ironbark Woodland or Central Hunter Ironbark - Spotted Gum – Grey Box Forest.	PA 09_0062 MOD 1 EPBC Approval Rehabilitation Strategy	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
	Rehabilitated Box Gum Woodland will enhance habitat and biodiversity values.	Rehabilitation Assessment Report	The development of a multi-layered community structure is evident, and (for communities > 10 years) consists of canopy, understory and groundcover comparable with reference sites.	PA 09_0062 MOD 1 EPBC Approval Rehabilitation Strategy BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Density and diversity of developing tree and shrub species within rehabilitated community is comparable to that of reference sites.	BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Vegetation health indicators (i.e. weed dominance, disease, water stress, premature die-back) comparable to that of reference sites.	BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Observations indicating reproduction (seeding and flowering in second generation plants) recorded at multiple locations within rehabilitated vegetation area.	BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Observations indicating nutrient recycling (development of consistent litter layer, litter layer decomposition and cryptogam presence) recorded at multiple locations within rehabilitated vegetation area.	BIOMP	No	Yes	In progress.
		Rehabilitation Assessment Report	Fauna monitoring indicates patterns of native fauna colonisation and distribution	PA 09_0062 MOD 1 BIOMP	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
			comparable with non-mined native woodland reference sites.				
		Rehabilitation Assessment Report	Overall weed trends comparable to reference sites.	2009 EA, BIOMP 2013 EA	No	Yes	In progress.
		Rehabilitation Assessment Report	Weed density within Box Gum Woodland rehabilitation area is similar to that of State 1 areas as described in the Baseline Ecological Study of Mt Arthur Coal Biodiversity Offset and Conservation Areas (Umwelt, 2013).	BIOMP, Rawling et al	No	Yes	In progress.
		Inspection Report	Where adjacent to proposed grazing land, adequate fencing and signage is installed and maintained to prevent unintentional vehicle and livestock access.	2009 EA, MOP, BIOMP	No	N/A	In progress.
	Soils/ growth medium displays physical and chemical properties suited to native woodland vegetation.	Independent Field Monitoring Report	Field monitoring indicates: Topsoil minimum depth of 100 mm, with well-developed A horizon; no accelerated or concentrated erosion pH:4.5-9 EC (1:5 ratio) of <0.15 uS/cm Soil Carbon, Nitrogen and Phosphorous levels comparable with reference sites.	Blue Book Vol 2E, Hazelton & Murphy, Elliot & Veness, Rawling et al	No	Yes	In progress.

Closure Objective	Performance Indicator	Performance Measure / Justification	Rehabilitation Objectives	Source	Complete Yes/No	Link to TARP	Progress at Start of RMP
The rehabilitated post-mining landscape will be compliant with relevant regulatory and corporate requirements.	The rehabilitated native woodland areas will be established and managed in accordance with the biodiversity and rehabilitation requirements of the EPBC approval, Project Approval and site Biodiversity Management Plan.	Audit Report	An independent audit of compliance with the biodiversity and rehabilitation requirements of the EPBC approval, Project Approval and site Biodiversity Management Plan will be undertaken within three years of planned mine closure, with all non-compliances addressed before final closure.	PA 09_0062 MOD 1 EPBC	No	N/A	Not commenced
Domain – F. Onsite Conservation and Offset areas							
All onsite biodiversity offset and conservation areas will be managed to increase their biodiversity and habitat value, and meet regulatory requirements.	Rehabilitation operations are completed in accordance with the biodiversity and rehabilitation management requirements of PA 09_0062 and EPBC Approval 2011/5688, and the site Biodiversity Management Plan.	Audit Report	Compliance with management actions presented in the site Biodiversity Management Plan, as evidenced through the most recent Independent Environmental Audit and/or Biodiversity Audit.	PA 09_0062 MOD 1 EPBC BIOMP	No	N/A	Independent audits completed, but future audits required.

Table 6 Indicative composition of pasture areas to achieve sustainable livestock production

	Low (less than)	Ideal	Comment
Ground cover	70%	90-100%	Ground cover includes higher slopes 80% cover
Perennial grass component of pasture	Minimum 40%	60-80%	Provides stable grassland base, must maintain some diversity
Dominant grass (% of total pasture cover)	> 40% of total cover	<40%	Lack of diversity, often the least palatable grass dominates
Herbage mass (kg DM/ha) cattle	1000kg (4-5 cm)	2000kg (10cm)	Low herbage mass limits animal production /health, reduces groundcover and litter formation

Table 7 Indicative composition and community structure for targeted vegetation communities.

Proposed Rehabilitation Vegetation Planned Vegetation Community	Target Condition Canopy	Understorey	Ground Cover
Central Hunter Box - Ironbark Woodland	10-40% cover containing target species as described in Table 11 Mt Arthur Coal native woodland species list.	1-10% cover containing target species as described in Table 11 Mt Arthur Coal native woodland species list.	Up to 85% cover and between 0.1 to 1m in height and containing target species as described in Table 11 Mt Arthur Coal native woodland species list.
Central Hunter Ironbark - Spotted Gum – Grey Box Forest	Up to 30% cover comprising containing target species as described in Table 11 Mt Arthur Coal native woodland species list.	1-10% cover containing target species as described in Table 11 Mt Arthur Coal native woodland species list.	Up to 70% cover between 0.1 to 1m in height and containing target species as described in Table 11 Mt Arthur Coal native woodland species list

5. Final Landform and Rehabilitation Plan

The final landform and rehabilitation plan in **Figure 5** shows the location of proposed land uses including the location of the final voids. Work is continuing to find additional areas for woodland across the site and these areas will tie into the existing woodland corridors.

Lease holders must submit the Final Landform and Rehabilitation Plan electronically in accordance with Guideline 5: Rehabilitation GIS Portal - Spatial Data (GIS) Guidelines (NSW Department of Planning and Environment, for approval. The plan will be submitted electronically and will be attached to the RMP when submitted for approval to the NSW Resources Regulator.

5.1 Final Landform and Rehabilitation Plan Submission

5.1.1 Electronic Submission via the Rehabilitation GIS Portal

Lease holders must submit the Final Landform and Rehabilitation Plan electronically in accordance with Guideline 5: Rehabilitation GIS Portal - Spatial Data (GIS) Guidelines (NSW Department of Planning and Environment, for approval. The plan will be submitted electronically and will be included in the RMP at **Figure 5** when submitted for approval to the NSW Resources Regulator.

5.1.2 Hardcopy Submission in the Rehabilitation Management Plan

The Final Landform and Rehabilitation Plan are included in Part 6 of the Rehabilitation Management Plan shown in **Figure 5**.

5.2 Final Landform and Rehabilitation Plan – cross sections

Unless otherwise directed by the Resources Regulator, sections at right angles to the direction of mining, at intervals of 1000 metres are considered appropriate for open cut coal mines. Cross section locations are shown in **Figure 6**.

Denman Road

Thomas Mitchell Drive

Northern Void

McDonalds Void

Belmont Void

Edderton Road

HUNTER RIVER

Whites Creek

Quarry Creek

Ramrod Creek

Fullers Creek

LEGEND

- Railways
- Roads
- Watercourses
- Approved Ancillary Disturbance
- Travelling Stock Reserve
- Drayton Wildlife Refuge Area
- Box Woodland Establishment Area
- Remnant Woodland

Domain

- Post-Mined Lands - Pasture
- Post-Mined Lands - Woodland
- Water Storage
- Offset Areas

BHP

Mapping Services Brisbane

0 500 1,000 1,500 2,000 m

Transverse Mercator Projection.
MGA Zone 56. GDA84 Datum.

MOUNT ARTHUR COAL

FINAL LANDFORM AND REHABILITATION PLAN

Drawn: B. Kleinschmidt	Checked: L. Neil	Date: 4/7/2019	Revision: 0	Filename: MAC_FowardProgram4	Figure 5

BHP

Mapping Services, Brisbane

1:50,000

0 1 2

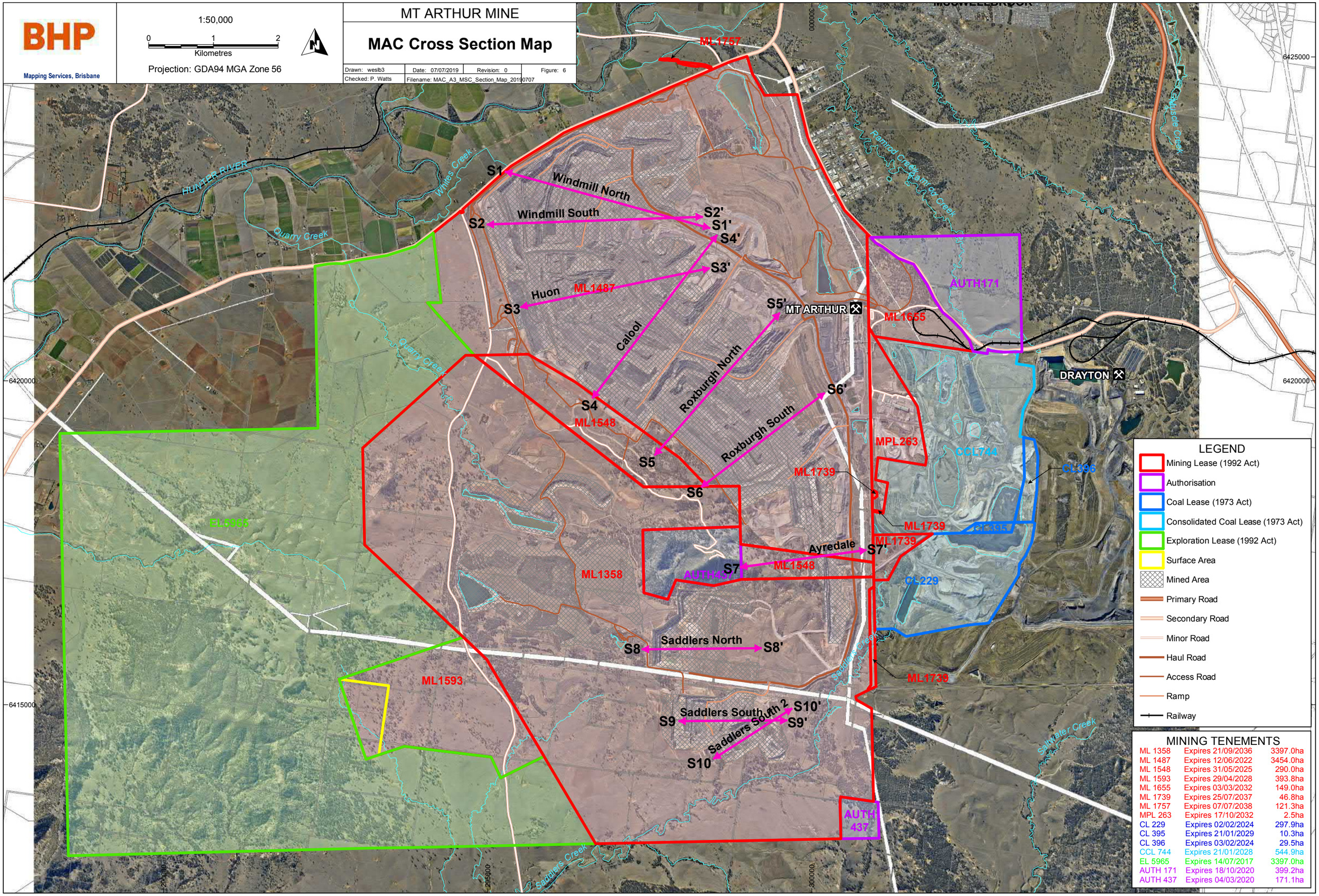
Kilometres

Projection: GDA94 MGA Zone 56

MT ARTHUR MINE

MAC Cross Section Map

Drawn: weslb3	Date: 07/07/2019	Revision: 0	Figure: 6
Checked: P. Watts	Filename: MAC_A3_MSC_Section_Map_20190707		



LEGEND

- Mining Lease (1992 Act)
- Authorisation
- Coal Lease (1973 Act)
- Consolidated Coal Lease (1973 Act)
- Exploration Lease (1992 Act)
- Surface Area
- Mined Area
- Primary Road
- Secondary Road
- Minor Road
- Haul Road
- Access Road
- Ramp
- Railway

MINING TENEMENTS

ML 1358	Expires 21/09/2036	3397.0ha
ML 1487	Expires 12/06/2022	3454.0ha
ML 1548	Expires 31/05/2025	290.0ha
ML 1593	Expires 29/04/2028	393.8ha
ML 1655	Expires 03/03/2032	149.0ha
ML 1739	Expires 25/07/2037	46.8ha
ML 1757	Expires 07/07/2038	121.3ha
MPL 263	Expires 17/10/2032	2.5ha
CL 229	Expires 02/02/2024	297.9ha
CL 395	Expires 21/01/2029	10.3ha
CL 396	Expires 03/02/2024	29.5ha
CCL 744	Expires 21/01/2028	544.9ha
EL 5965	Expires 14/07/2017	3397.0ha
AUTH 171	Expires 18/10/2020	399.2ha
AUTH 437	Expires 04/03/2020	171.1ha

BHP

Mapping Services, Brisbane

1:10,000

0 0.2 0.4

Kilometres

300% Vertical Exaggeration

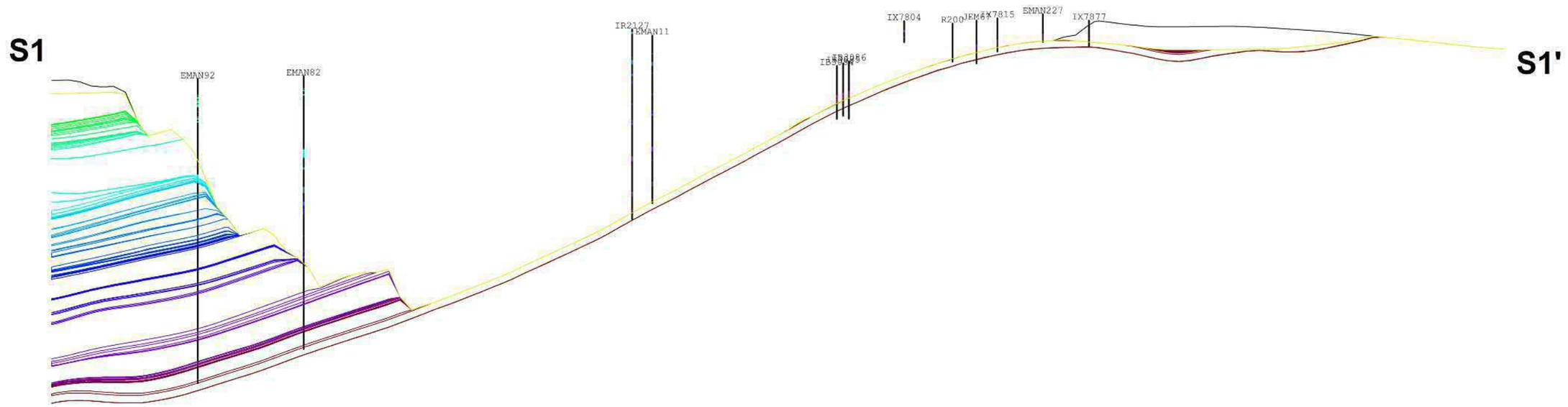
MT ARTHUR MINE

MAC Cross Sections

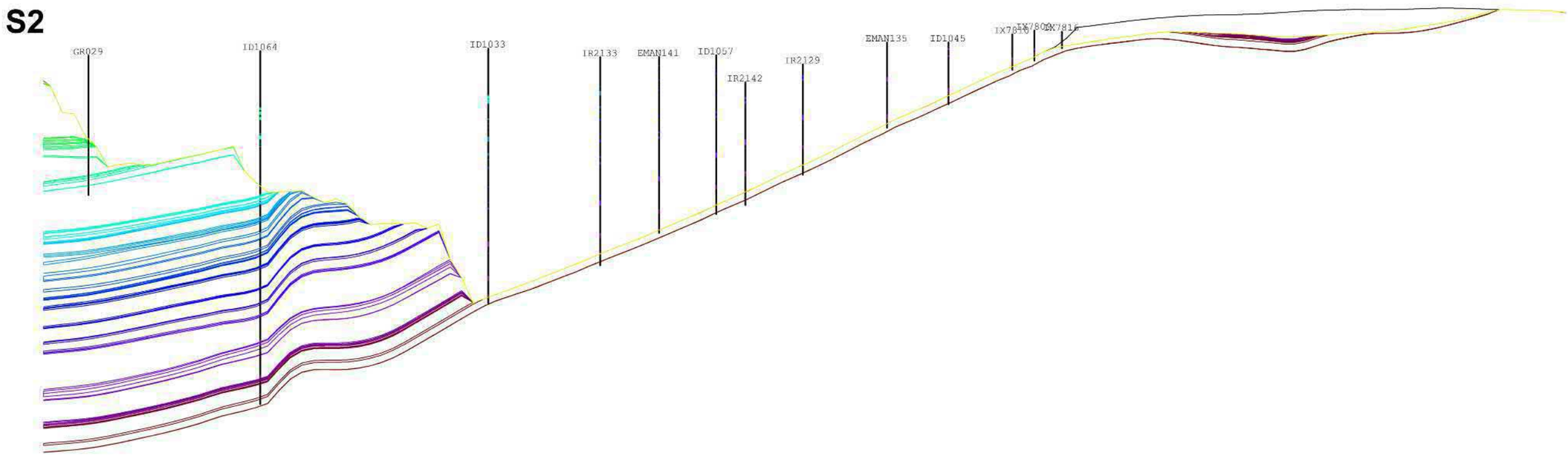
Drawn: weslb3	Date: 07/07/2019	Revision: 0	Figure:
	Filename: MAC_A3_MSC_Sections_20190707		

Topographic Surface from 23-06-2019 Prime
Base of Weathering Grid from Feb-2017
F-section Grids from model MAC_1017

WINDMILL NORTH PIT



WINDMILL SOUTH PIT



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AF1A AF1B FAF FAF2 FBF1 FBF2 FBF3 FWW0 FWW1 FWW2 FWW3 FMUU FMUT FMU FMMT FMMB FMLT FMLB FML3 FUNC FPU1 FPU PUA PUB

FPL1 FPL FUNI FVU1 FVU FVM1 FVM VL1A VL1B VL2 FVL FBR1 FBR FBR3 FBU FBM FBL FBL2 FWU FWM FWL FWL2 FEU FET FEB FCT

FCB FBNU FBAU FBA FBB FBC FUNE FEG1 FEG23 FT FR1 FR2A FR2B FR3A FR3B FR3C FR4 FR56

BHP

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Kilometres

300% Vertical Exaggeration

MT ARTHUR MINE

MAC Cross Sections

Drawn: weslb3	Date: 07/07/2019	Revision: 0	Figure:
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Topographic Surface from 23-06-2019 Prime
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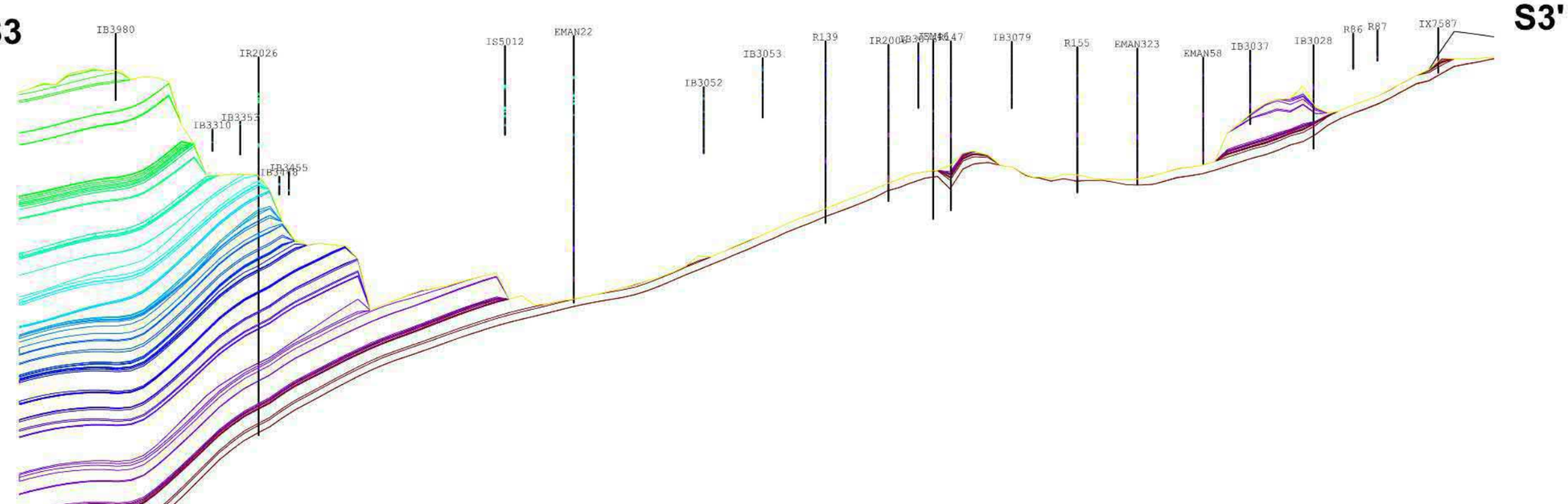
HUON PIT

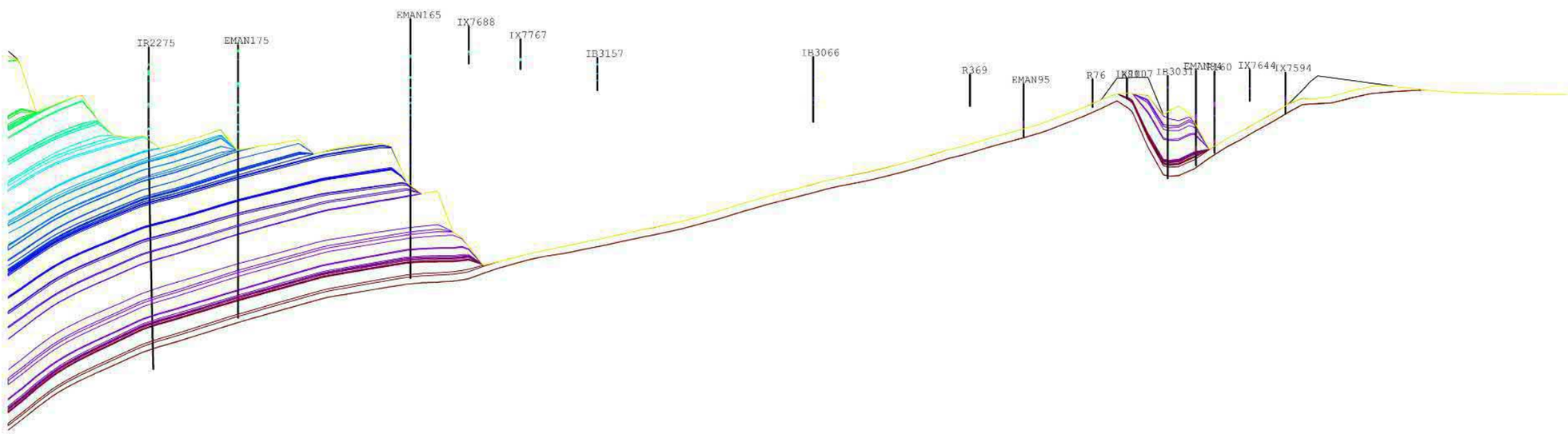
S3



S3'

CALOOL PIT

S4



S4'

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RBM	FAF2	FVU1	FBA
RBL	FBF1	FVU	FBB
WBU	FBF2	FVM1	FBC
WBL	FBF3	FVM	FUNE
WHN	FWW0	VL1A	FEG1
FBK1	FWW1	VL1B	FEG23
FBK2	FWW2	VL2	FT
FBK3	FWW3	FVL	FR1
FUNA	FMUU	FBR1	FR2A
FGM1	FMUT	FBR	FR2B
FGM2	FMU	FBR3	FR3A
FGM3	FMMT	FBU	FR3B
FGM4	FMMB	FBM	FR3C
FWH1A	FMLT	FBL	FR4
FWH1B	FMLB	FBL2	FR56
FWH1C	FML3	FWU	
FWH1	FUNC	FWM	
FWH2	FPU1	FWL	
FWH3	FPU	FWL2	
FWH4	PUA	FEU	
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		FCT	

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MT ARTHUR MINE

MAC Cross Sections

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Topographic Surface from 23-06-2019 Prime
Base of Weathering Grid from Feb-2017
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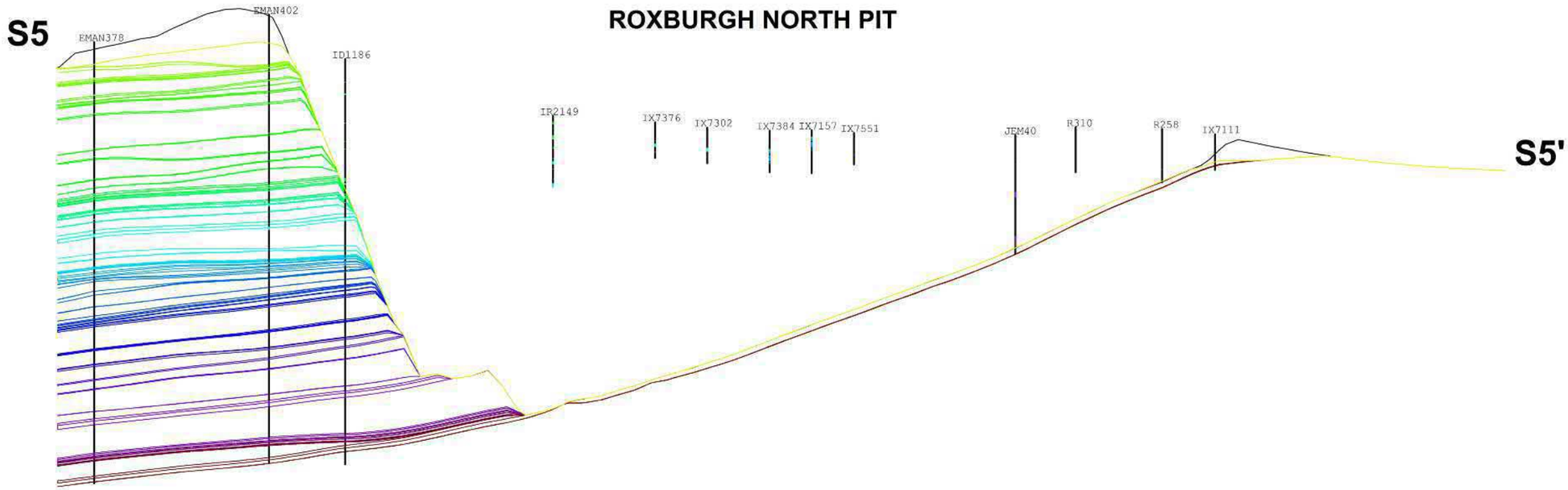
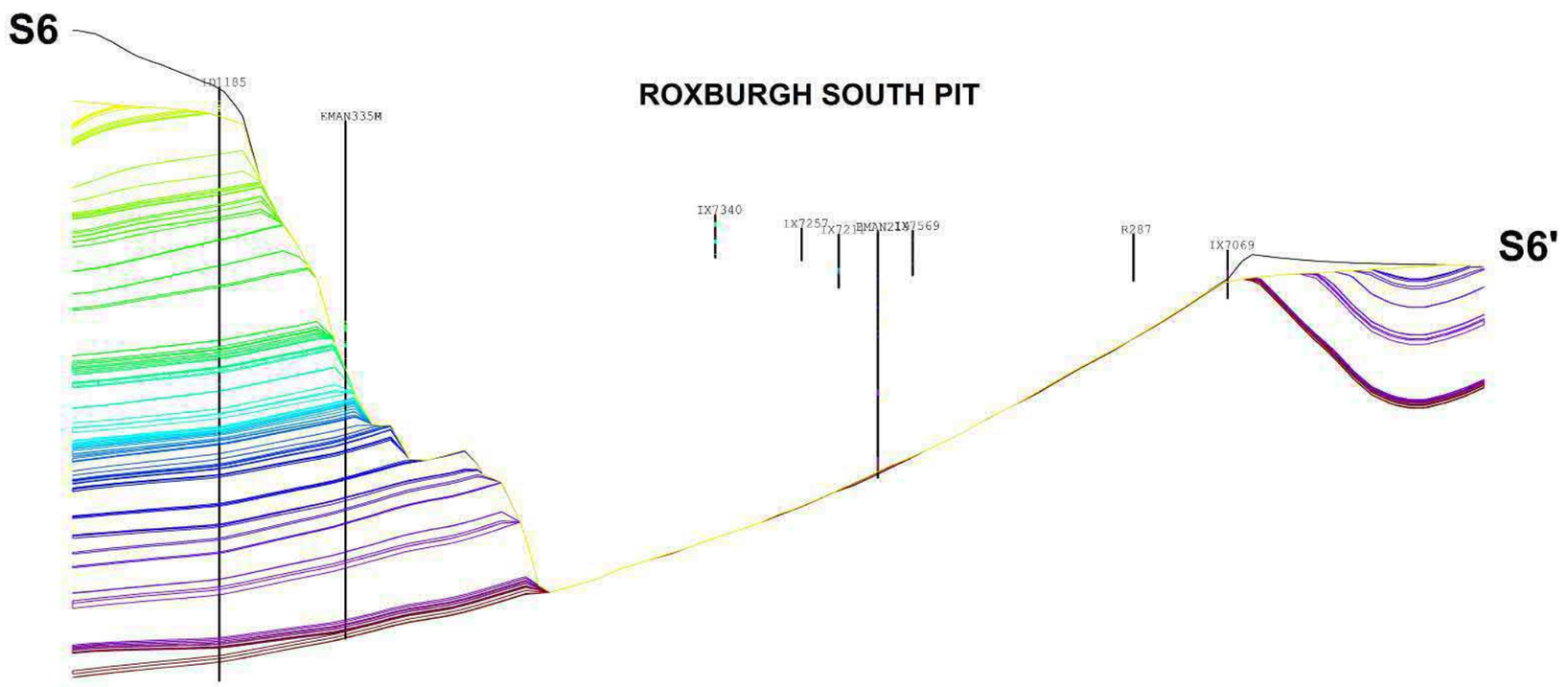
ROXBURGH NORTH PIT



ROXBURGH SOUTH PIT



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RBM	FAF2	FVU1	FBA
RBL	FBF1	FVU	FBB
WBU	FBF2	FVM1	FBC
WBL	FBF3	FVM	FUNF
WHN	FWW0	VL1A	FEG1
FBK1	FWW1	VL1B	FEG23
FBK2	FWW2	VL2	FT
FBK3	FWW3	FVL	FR1
FUNA	FMUU	FBR1	FR2A
FGM1	FMUT	FBR	FR2B
FGM2	FMU	FBR3	FR3A
FGM3	FMMT	FBU	FR3B
FGM4	FMMB	FBM	FR3C
FWH1A	FMLT	FBL	FR4
FWH1B	FMLB	FBL2	FR56
FWH1C	FML3	FWU	
FWH1	FUNC	FWM	
FWH2	FPU1	FWL	
FWH3	FPU	FWL2	
FWH4	PUA	FEU	
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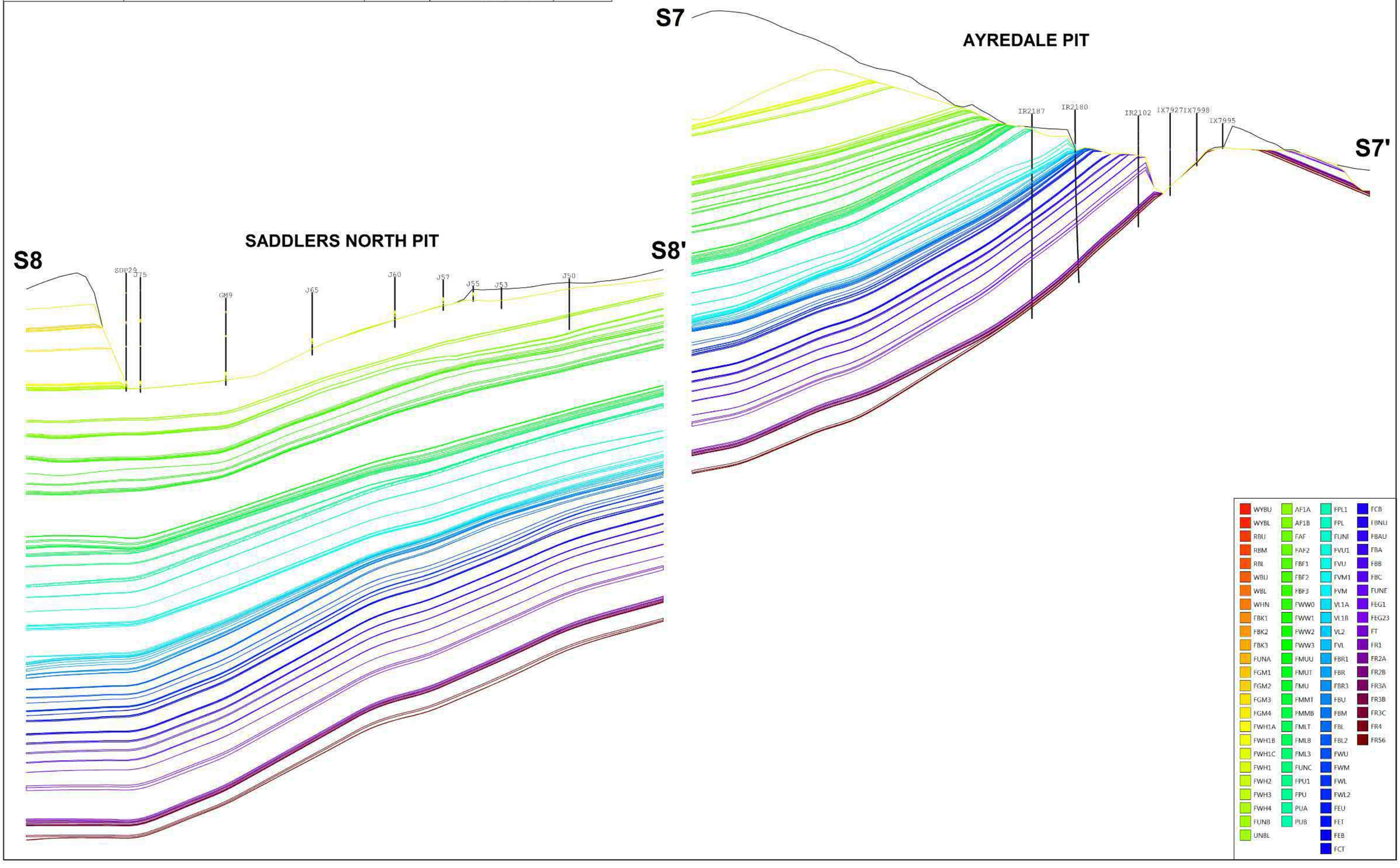

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MT ARTHUR MINE

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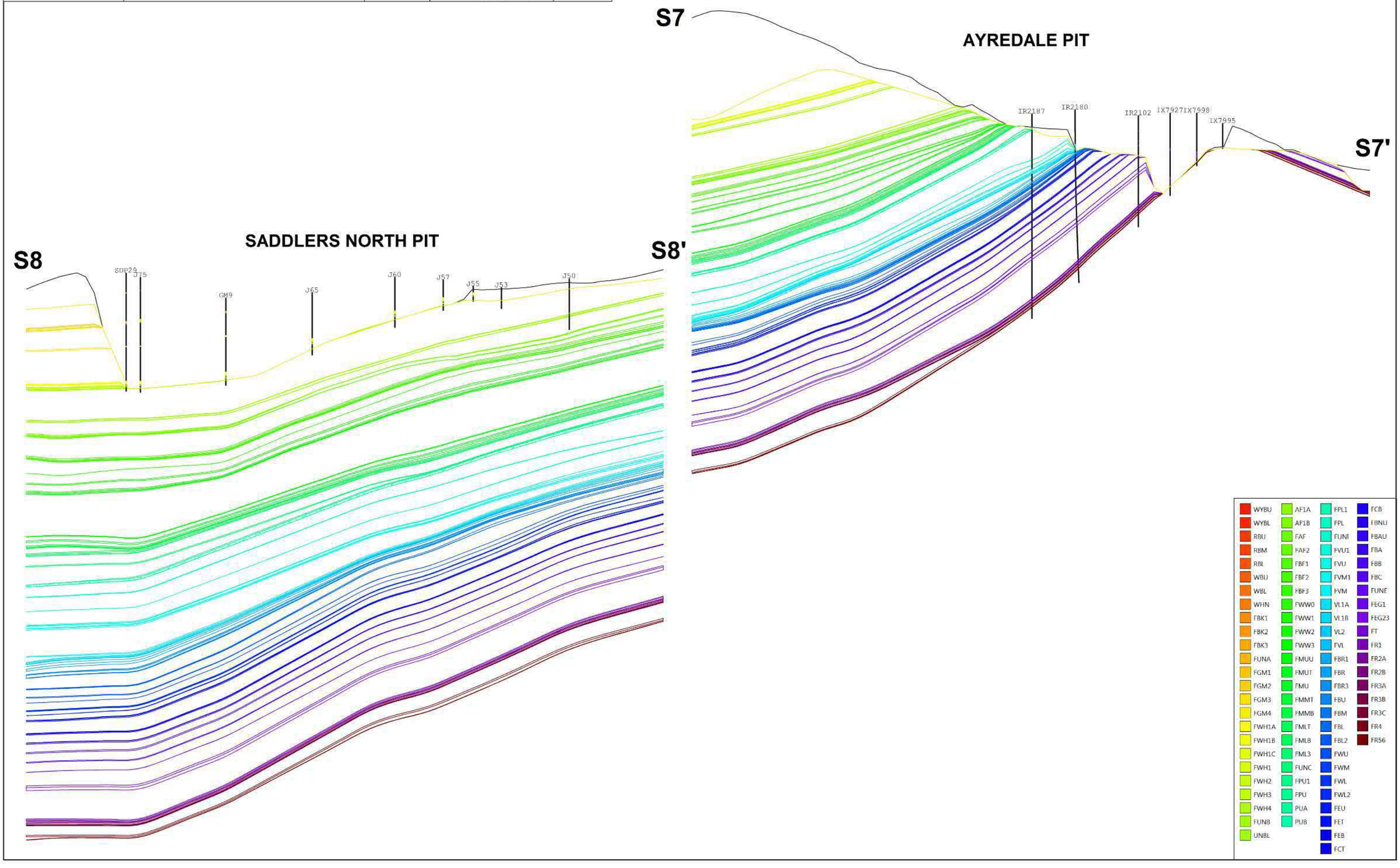

6. Rehabilitation Risk Assessment

6.1 Project Approval Risk Assessment

An assessment of environmental risks associated with the operation was undertaken as part of the Modification Project Environmental Assessment. The risk assessment process conducted by the team was aligned with AS/NZS 31000:2009 Risk Management – Principles & Guidelines. A summary of the relevant rehabilitation risks are presented in

A detailed assessment of the following key potential environment aspects were addressed in the Modification Project Environmental Assessment and the supporting specialist's reports included as appendices to the Environmental Assessment:

- Agricultural Impact Statement;
- Groundwater Impact Assessment;
- Surface Water Assessment;
- Ecological Assessment;
- Aboriginal and Non-Indigenous Cultural Heritage Assessment;
- Air Quality and Greenhouse Gas Assessment;
- Noise and Blasting Assessment;
- Landscape and Visual Impact Assessment;
- Geochemistry Assessment of Overburden and Interburden;
- Socio-Economic Assessment; and
- Road Transport Assessment.

Table 8 Project approval risk assessment summary

Issue / Aspect	Exploration	Land clearance	Mining / production	Landform establishment	Growth medium development	Ecosystem establishment	Ecosystem and land use development	Decommissioning
Erosion and Sedimentation	Mod	Mod	Low	Mod	Low	Mod	Low	Low
Water management	Low	Mod	Mod	Mod	Low	Mod	Mod	Low
Contaminated Land / Hazardous Substances	Low	Mod	Mod	Low	Mod	Mod	Mod	Low
Acid Mine Drainage	Low	Low	Low	Low	Low	Low	Low	Low
Flora and Fauna impact	Low	High	Low	Low	Mod	Low	Low	Low
Weeds and Pests	Low	Low	Low	Low	Mod	Low	Low	Low
Spontaneous Combustion	Low	Low	Low	Low	Low	Low	Low	Low
Bushfire	Mod	Mod	Low	Low	Low	Low	Low	Low

Issue / Aspect	Exploration	Land clearance	Mining / production	Landform establishment	Growth medium development	Ecosystem establishment	Ecosystem and land use development	Decommissioning
Mine Subsidence	Low	Low	Low	Low	Low	Low	Low	Low
Geotechnical issues (eg landform instability)	Low	Mod	Mod	Low	Low	Low	Low	Low
Inadequate or unavailable resources	Mod	Mod	Low	Low	Low	Low	Low	Low

6.2 Rehabilitation Risk Assessment

A risk base approach is used for managing environmental issues at Mt Arthur Coal. Risk assessment prioritises resources and controls to manage the identified risks and to achieve the overarching goals and objectives as shown in **Section 4**. Detailed risk assessments have been completed for rehabilitation risks at Mt Arthur Coal and are reviewed and updated annually through the environmental management system process and compiled in the Mt Arthur Risk Register. The rehabilitation elements captured in the Risk Register are summarised in **Table 9**.

Table 9 Rehabilitation Risk Assessment

Risk Event (Unplanned/unwanted event)	CAUSES (related to risk event)	MFL Impact Level	Maximum Foreseeavle Loss (MFL) Basis (Absolute worst case scenario, with no controls in place)	Highest MFL Level	Mitigating Controls (Note: Not as per MFL severity impact line, outline each mitigation control for RISK EVENT, can't have mitigating controls for Causes)	Preventative Controls (Note: Not per MFL impact line, outline each preventative control relevant to each CAUSE)	Severity Impact Level (with mitigating controls only)	RMP Reference
1. Final landform (including rehabilitation) fails to meet expectations of internal and external stakeholders (community, regulator, BHP)	**1. Stakeholder Expectations -** Relationships with external or internal stakeholders not maintained or consultation is ineffective resulting in rehab not meeting expectations.	3	Environment: Delay to eco systems recovery and impact on environmental values. 1. Delaying rehab and therefore delaying the development and recovery of the eco system for that parcel of land within the prescribed period of time. 2. Failure of existing rehabilitation impacting on off site environmental values (e.g. sediment discharge into creeks, dust, discharge onto grasslands and impacting existing eco systems, rehab expected to manage salinity fails resulting in discharge).		Active engagement in policy and regulation change to manage new policy requirements	Include rehabilitation and landform updates in the CCC Agenda. Ensure that relevant documents (MOP/FP, Rehab Mgmt. Plan) are provided for consultation in appropriate timeframes.	2	Section 4.4
					Targeted stakeholder engagement	BHP corporate affairs supporting operations and maintaining relationships		
					Rehab monitoring and Rehab TARP	SME support by internal resources - Rehab Specialist and Environment A&I		
					Adequate maintenance works	Effective consultation of Forward Plan (MOP) with internal stakeholders.		
					Dedicated site resource - Rehabilitation Specialist	Closure Strategy - consultation with external stakeholders		
						Rehabilitation and Closure RACI		
						Completion and Relinquishment criteria are 'SMART'		
	2. Closure & Rehab Strategies - Failure to develop and manage Rehabilitation and Closure Strategy for the Asset that delivers a plan to achieve closure and decommissioning or inform the short term rehab requirements.	4			Material sampling	Closure provision funding model	1	Section 4 Section 6 Section 8
						BHP Coal Landform Design Guidelines		
						Tailings closure design in accordance with ANCOLD guidelines		
						Rehabilitation plan and design aligns with available resources e.g. competent material and topsoil		
						Creek geomorphology assessment		
						Geotechnical review		
						Rehabilitation Management Plan, Rehabilitation Strategy		
						BHP Rehabilitation Manual		
						Preliminary closure flood assessments, including climate change		
	3. Planning - Insufficient budget available to achieve required outcome or insufficient resource planning. (e.g. number of dozers on site).	3				Closure Provision funding model	1	Section 8
						Adequate resources as defined by mine plan - equipment and personnel		
	4. Planning - Insufficient or failure of planning integration between long/med plan to short term plans. Resource pressure resulting in overburden removal and coal mining prioritised over final landform works Insufficient consultation to ensure the plan is achievable, capture changes etc.	3			Permit to Disturb	Life of Asset and Closure Plan renewed annually as part of 5-year planning cycle	1	Section 8
					Compliance to plan review	RACI to define roles and ensure input from appropriate stakeholders		
						Annual Forward Program - 1 to 3 year look ahead. Includes rehab requirements. Reviewed by Short Term Manager as accurate and possible and ensures integration.		
						Rehabilitation design needs included as part of planning process		
						BHP Target Environmental Outcomes		
						Coal Land Form Design Guidelines		
	5. Planning - Insufficient landform design, material availability & quality mgmt. e.g. unsuitable topsoil, existing contaminated sites, materials assessment to prevent contamination / Spon Com /AMD / salinity, species selection. Not planning / designing for what we have or what we need on site. Stockpiling material etc. Insufficient habitat structures and water resources structures incorporated into Plan/Strategy.	3			Material sampling	Site Topsoil Stockpile Database	1	Section 8
						MAC Dump Standard		
						Contaminated Land Procedure		
						Spontaneous Combustion Control Program		
						Permit to Disturb		
						MAC Dump Standard		
						Waste Handling and Disposal Procedure		
						BHP's Global AMD Management Standard		
						Land Management Procedure		

Risk Event (Unplanned/unwanted event)	CAUSES (related to risk event)	MFL Impact Level	Maximum Foreseeavle Loss (MFL) Basis (Absolute worst case scenario, with no controls in place)	Highest MFL Level	Mitigating Controls (Note: Not as per MFL severity impact line, outline each mitigation control for RISK EVENT, can't have mitigating controls for Causes)	Preventative Controls (Note: Not per MFL impact line, outline each preventative control relevant to each CAUSE)	Severity Impact Level (with mitigating controls only)	RMP Reference
	6. Execution - Non Compliance to Mine Plan (pre-bulk shaping) - Failure to comply with the mine plan that delivers dump volumes, completion timing. Compliance to Design.	2	Community: Delay to handover of land back to the community. Under the approvals (PRCPs) we have to commit to milestone of the land use being achieved and the land being handed back to the land owner. If this is not achieved because progressive rehabilitation has not been achieved then this could delay handover which could take years to correct. Reputation: Social licence, legal compliance and stakeholder impact. If progressive rehabilitation is not achieved in line with the milestones identified in the existing approvals we will be seen to be in breach of our legislative requirements. The impact of this will be to compromise our ability to obtain approvals for ML going forward. Potential for these INs to progress to litigation. NSWEC has been involved in litigation. Financial: Per site cost estimate. Cost category: Additional closure holding costs (extending our closure period to allow us to be able to relinquish). Holding costs approx. $3m per year up to 10 years of additional holding. Productive backfill of voids, rehandle of spoil material to achieve landforms are currently assumed in the calculation of the closure planning provision. These additional costs would therefore have be a direct cost to site at the point in time of when the costs were incurred. H&S: No impact. Legal: Regulator fines and directives	4	Scanning of dumps to identify non-compliances	Permit to Disturb	1	Section 8 Section 9
						Compliance to Plan - TARP requires that noncompliance are rectified.		
						Target Environmental Outcomes - includes rehab targets.		
						Survey controls /delineators		
						OCE and Production Coordinators execute plans.		
						Equipment GPS modules which include mine plan requirements. Dozers on the dumps.		
	7. Execution - Non Compliance to rehab strategy or design (growth medium development - bulk shaping, ripping, topsoil application, drain establishment) landform design - drains, bulk shape to geofluv. Biodiversity / ecosystem development does not establish in line with design. Topsoil is inappropriately stored.	3			Material sampling	Site Topsoil Stockpile Database	1	Section 8 Section 9 Section 10
					Use of alternate materials e.g. compost to substitute for topsoil			
						Monitoring program to verify development & effectiveness of ecological systems		
						Equipment fit for purpose - Dozer GPS for bulk shape and ripping accuracy along contours.		
						Equipment fit for purpose - Seeding application and ameliorant application		
						Trained personnel / operators - understand rehab design requirements and best practice methods.		
						Seeding at an appropriate time of year		
						Compliance to Final Landform design inspections and reviews		
						LIDAR scans by Survey Team of bulk shaping areas to identify cut / fill issues.		
						Weekly site inspections involving Rehab Specialist, Mine Services, Planning. To identify issues and inspect quality.		
	8. Ecosystem establishment (topsoil in place, seed is applied) & monitoring against Closure Criteria - Ecosystem services are not re-established during rehabilitation. Failure to carry out monitoring to determine performance against closure criteria that leads to a failure to take action on issues such as erosion and sediment failure, seed germination rates, stem density, biodiversity - weeds & pests, seasonal weather impacts.	3			Erosion controls and soil ameliorants such as mulch and compost	Seed mix developed (in consultation with an ecologist) to ensure we reach target ecological communities.	1	Section 8 Section 9 Section 10
					Landform stability monitoring	Seed application timing to provide greatest opportunity of success		
					Revegetation inspections	Dedicated MAC Rehab Specialist Role and other expert advice from independent parties on rehab methodology.		
					Seed viability testing	Pest & weed management program and monitoring to prevent biodiversity loss.		
						Monitoring program to verify development & effectiveness of ecological systems against closure criteria.		
						Install habitat structures on rehabilitated areas to drive increase in biodiversity (water availability, rock structures, stag trees).		
						Spatial database of monitoring results and methodology used over time to inform future decision making and best practice. In developemnt.		
						Completion and Relinquishment criteria are 'SMART'. In development.		

Risk Event (Unplanned/unwanted event)	CAUSES (related to risk event)	MFL Impact Level	Maximum Foreseeavle Loss (MFL) Basis (Absolute worst case scenario, with no controls in place)	Highest MFL Level	Mitigating Controls (Note: Not as per MFL severity impact line, outline each mitigation control for RISK EVENT, can't have mitigating controls for Causes)	Preventative Controls (Note: Not per MFL impact line, outline each preventative control relevant to each CAUSE)	Severity Impact Level (with mitigating controls only)	RMP Reference
	9. Maintenance - Failure to execute required maintenance activities to ensure trajectory is maintained or rectify trajectory (as identified during rehab monitoring).	3				Pest control program - Land Management Procedure		
						Maintenance Plan - Rehab monitoring and Rehab TARP to inform level / type of maintenance required in order to bring rehab back in line with expectations / obligations.	1	Section 8 Section 9 Section 10
						Maintenance Plan - Skilled operators and adequate contractors to carry out maintenance works on rehab areas not meeting expectations.		
2. Disturbance or clearing which impacts biodiversity, sensitives properties or established rehabilitation areas.	1. Unauthorised access to areas where disturbance / clearing is restricted or not allowed	3	Environment - Level 2 Community - Level 3 impact on receiving Multiple complaints once exceedance is released. 2-6 months of impact on Community Legal & Regulatory - Level 3 Impact based substantial impact to company reputation, many exceedances could result in civil proceedings with claimants which triggers national media attention. Significant scrutiny from Regulator.		BHP corporate affairs supporting operations and maintaining relationships with stakeholders	Permit to Disturb		
					Aerial disturbance mapping	Mid Term Planning to plan with MAC Boundaries Package and Forward Plan		Section 8
						Survey pegging and boundary demarcation		
						Environmental awareness training		
3. Poor rehabilitation resulting in water impacts within the area of influence	1. Uncontrolled discharge of low quality water to receiving environment from rehab areas	2	Environment - Level 1 - Based on minor, temporary impact to the environment, where the ecosystem recovers with little intervention Reputation, Legal & Regulatory - Level 2 - Based on impact to company reputation, legal rights or compliance, or social value proposition at a local level		Surface Water Monitoring of level and quality which informs response to impacted environment.	MAC Site Water Balance includes the management of mine affected and clean water. Predictive assessment of water management requirements.		
					Real time HRSTS Monitoring equipment in line with Obligations to achieve dilution factors.	Surface water monitoring program to identify trends and to analyse.		
						Discharge only where compliant to HRSTS		
						Ensure water infrastructure are maintained and calibrated		
						Mine water storage capacity monitored and maintained to meet operational demand and prevent overflow.	1	Section 8
						Permit to Disturb		
						Erosion and Sediment Control Plan - Identification of sediment control structures and dams. Informed by Blue Book.		
						Creek geomorphology assessment		
						Water Team SME support and appropriately qualified water engineer		
	2. Impacted groundwater seeping to surface water receiver	2	Environment - Level 1 - Based on minor, temporary impact to the environment, where the ecosystem recovers with little intervention Reputation, Legal & Regulatory - Level 2 - Based on impact to company reputation, legal rights or compliance, or social value proposition at a local level		Groundwater Monitoring of level and quality which informs response to impacted environment.	Closure Management Plan which identifies high level measures for the management mine material - location / placement.		
						Dumping standard		
						Waste Management Procedure for the correct disposal of tyres.	1	Section 8
						Spon com - monitoring, reject placement (Dumping Procedure and Legislation)		
						Water Team SME support and appropriately qualified water engineer - interpret trends and gaps		
4. Mining activities contribution to visual amenity in area of influence fails to meet internal and external stakeholder expectations, including legal obligations.	1. Failure to assess / identify operational activities (landforms) that are visible from external vantage points or have the potential to impact amenity	1	Reputation, Legal & Regulatory - Level 1 - Based on impact to company reputation, legal rights or compliance, or social value proposition at a local level			Visual Amenity inspections of assessment points to be included in Rehab Monitoring program.		
						Visual Impact risk to be considered during 5YR planning process.		
						BHP corporate affairs supporting operations and maintaining relationships with stakeholders - identification of community concerns	1	Section 8
						3rd Party visual assessments within the EIS which informed the Approvals and therefore the mine plan.		
						Preventative measures such visual screening for near neighbours.		

Risk Event (Unplanned/unwanted event)	CAUSES (related to risk event)	MFL Impact Level	Maximum Foreseeavle Loss (MFL) Basis (Absolute worst case scenario, with no controls in place)	Highest MFL Level	Mitigating Controls (Note: Not as per MFL severity impact line, outline each mitigation control for RISK EVENT, can't have mitigating controls for Causes)	Preventative Controls (Note: Not per MFL impact line, outline each preventative control relevant to each CAUSE)	Severity Impact Level (with mitigating controls only)	RMP Reference
	2. Failure to moderate / prevent amenity impact where practicable - e.g. failure of rehab or rehab maintenance	1	Reputation, Legal & Regulatory - Level 1 - Based on impact to company reputation, legal rights or compliance, or social value proposition at a local level		Refer to 1.9 Maintenance			

7. Rehabilitation Implementation

7.1 Life of Mine Progressive Rehabilitation Schedule

Mt Arthur Coal dig and dump has been constrained at the northern end. As a result this has slowed the advancement of the northern emplacement and pushed mining intensity to the southern areas of the main pit. Over the past 2 years, Mt Arthur Coal has been through a comprehensive opportunity assessment to determine the most effective plan for rehabilitation and mining to deal with this constraint. The most recent inclusion is the main pit realignment to reduce the obtuse angle between the endwall (north) and advancing highwall to transition back to 90 degrees. By doing this, the northern emplacement adjacent to Denman Road will be accelerated and rehabilitation will be released more consistently across the years.

The eastern and southern areas of the main emplacement are not available for rehabilitation consistently in the near term due to the size and height of the final dump and the time to take to reach its outer limits. The tailings dam is also a hard constraint on the eastern perimeter of the mine. Additionally, the two south west out of pit emplacements are being placed in a way that will maximise rehabilitation and minimise the amount of time an open face would be visible from off the mine site (south west direction). Rehabilitation at Mt Arthur Coal out to 2026 can be seen in **Figure 12**.

ML1757
AUTH171
ML1655
ML1487
ML1548
MPL263
CCL744
CL396
ML1739
ML1739
ML1739
AUTH437
ML1548
EL5965
ML1739
ML1593S
ML1593
ML1358
AUTH437

LEGEND

Current Rehabilitation

FY20

Planned Rehabilitation

FY21
FY22
FY23
FY24
FY25
FY26

BHP
Mapping Services Brisbane

0 500 1,000 1,500 2,000 m

Transverse Mercator Projection.
MGA Zone 56. GDA94 Datum.

MOUNT ARTHUR COAL

REHABILITATION PLAN TO FY26

Drawn: B. Kleinschmidt	Checked: K. Brake	Date: 13/05/2020	Revision: 1	Filename: MAC_RehabPlanFY26	Figure 12

7.2 Rehabilitation phases and general methods

As management domains progress from active or operational domains through to rehabilitated final or post-mining domains, they will progress through a series of Rehabilitation Phases. As well as the Operational phase, which precedes rehabilitation and accounts for all of the domains outlined in this RMP, the phases nominated for the Mt Arthur Coal closure planning process consist of:

- **Active Mining** – Activities undertaken during operations to enhance rehabilitation
- **Decommissioning –** the process of removing mining infrastructure and removing contaminants and hazardous materials.
- **Landform Establishment** – incorporates gradient, slope, aspect, drainage, substrate material characterisation and capping of hostile materials;
- **Growing Media Development** – incorporates physical, chemical and biological components of the growing media and ameliorants that are used to optimise the potential of the media in terms of the preferred vegetative cover;
- **Ecosystem and Land use Establishment** – incorporates revegetated lands and habitat augmentation; species selection, species presence and growth together with weed and pest animal control / management and establishment of flora;
- **Ecosystem and Land use Sustainability** – incorporates components of floristic structure, nutrient cycling recruitment and recovery, community structure and function which are the key elements of a sustainable landscape; and
- **Relinquishment** – land use and landscape is deemed as suitable to be relinquished from the Mining Lease.

By dividing the temporal progression of rehabilitation into these phases, and allocating progress indicators and relinquishment criteria (as discussed in Section 4). Mt Arthur Coal is able to track the development of rehabilitation to final completion and relinquishment. Not all rehabilitation phases are relevant to each management domain. Table 5 shows the relationship between the management domains adopted for the Mt Arthur Coal closure and rehabilitation planning process, and the applicable rehabilitation phase for that domain.

7.3 Rehabilitation Risk Management

Mt Arthur Coal is committed to delivering high standards of environmental performance to meet or exceed legal and other requirements. The following sub-sections present a summary of the management measures implemented at Mt Arthur Coal to address key rehabilitation risks presented in Table 9. The Rehabilitation and Ecological Monitoring Procedure specifies the required management of rehabilitation from monitoring to maintenance.

7.3.1 Active Mining

Mine Planning

Rehabilitation is integrated into the mine planning process in the following ways:

- Inclusion of Landform Establishment and Growth Medium Development timeframes in mine plan.
- 5 Year Planning Cycle includes rehabilitation areas and is updated annually; and
- Defined accountabilities agreed to by internal stakeholders.

Relevant BHP and Mt Arthur Coal documents providing detailed guidance in the mine planning process include:

- BHP Coal Landform Design Guidelines
- MAC-PRD-STD-003 Design Construction and Maintenance of Dump Areas
- NEC-HSE-PRO-001 Permit to Disturb Procedure
- MAC-ENC-MTP-047 Rehabilitation Strategy
- MAC-ENC-MTP-052 Mt Arthur Coal Mining Operations Plan (now Annual Forward Plan)
- MAC Closure Management Plan

- Coal Rehabilitation RACI (Responsible, Accountable, Consult and Inform)
- BHP Target Environmental Outcomes (Our Requirements for Environment and Climate Change)

Topsoil Retention

Soil and land capability assessments conducted as part of the Mt Arthur Coal Open Cut Consolidation Project EA (2009) and the Mt Arthur Coal Open Cut Modification Project EA (2013) have identified topsoil resources, suitable for recovery and use as a growth medium in post-mining rehabilitation, across the majority of the highwall areas. Recommended topsoil recovery depths are 100 – 300mm, based on the presence of a moderately to strongly structured sandy to silty loam A horizon. Duplex soils are common, and stripping of heavy clay subsoils is to be avoided. Some soils also displayed sodic subsoil properties and measures have been implemented to ensure these materials do not contaminate topsoil resources.

Prior to topsoil stripping, a pre-stripping assessment is made. This assessment will ground-truth the broad scale stripping recommendations presented in the relevant soil stripping plan and delineate local topographical and drainage variations to topsoil depth. The final stripping plan will be modified appropriately to ensure all suitable topsoil material is recovered, without contamination by subsoils.

Relevant BHP and Mt Arthur Coal documents providing detailed management of topsoil include:

- MAC-ENC-PRO-012 Land Management Procedure;
- NEC-HSE-PRO-001 Permit to Disturb Procedure; and
- BHP Coal Rehabilitation Manual.

Rehabilitation Enhancement

Practices to enhance rehabilitation at Mt Arthur Coal include retention of habitat structures and collection of native seed as part of pre-strip activities.

Where practicable Mt Arthur collects hollow bearing trees, rock piles, tree stumps and wood piles for re-use

Mt Arthur Coal will, where practicable, continue a program of native seed harvesting from remnant native vegetation located on Mt Arthur Coal owned land. This seed will be used in rehabilitation direct-seeding, or to develop tubestock for planting in rehabilitation and regeneration activities.

Relevant BHP and Mt Arthur Coal documents providing detailed management of rehabilitation enhancement activities include:

- MAC-ENC-PRO-012 Land Management;
- MAC-ENC-MTP-050 Biodiversity Management Plan; and
- NEC-HSE-PRO-001 Permit to Disturb Procedure.

Visual Amenity

A visual impact of mining operations was undertaken as part of the Mt Arthur Coal Open Cut Modification Project EA, and overburden emplacement design incorporates measures to minimise visual impact. Management measures designed to reduce visual impact include:

- The integration of tree corridors on overburden emplacements as part of progressive rehabilitation;
- The retention of the eastern flank of MacLean’s Hill to assist in creating landscape diversity at the foot of overburden emplacements;
- Modifying final void high walls and low wall slopes to minimise final disturbance;
- Incorporating micro relief features throughout overburden emplacements to provide an enhanced naturally appearing landform and fauna habitat;
- The practical consideration of geomorphic type designs on emplacements to sustainably manage water and create a natural looking and stable landform;

- The strategic design and rehabilitation of overburden emplacements for increased visual shielding of operations;
- Establishing visual and ecological planting patterns of native trees to achieve landscape patterns that complement the existing spatial distribution of tree and grass cover in a grazing landscape; and
- Minimising exposure of work areas to sensitive receivers where possible, largely through the timely rehabilitation of visible overburden emplacements.

Relevant BHP and Mt Arthur Coal documents providing detailed management of visual amenity include

- MAC-ENC-MTP-050 Biodiversity Management Plan;
- MAC-ENC-MTP-047 Rehabilitation Strategy;
- NEC-HSE-PRO-001 Permit to Disturb Procedure; and
- MAC-ENC-PRO-080 Rehabilitation and Ecological Monitoring.

Weed and Pest Management

Weed management at Mt Arthur Coal (including offset areas) consists of two major programs: the weed assessment program and weed treatment program.

The assessment program consists of the periodic inspection of all Mt Arthur Coal owned land (except operational areas such as open cut pits). This supplements data collected during ecological development monitoring. This is in turn supported by regular inspections conducted by Mt Arthur Coal staff and feedback from mining personnel, contractors and lessees to identify areas of weed infestation. A trial using high resolution aerial imagery to assess weeds in rehabilitation areas is currently being undertaken. The treatment program involves the seasonal treatment, mainly through chemical spraying, of the highest priority weed infestations.

The aim of the vertebrate pest management program is to target wild dogs and foxes that represent a threat to biodiversity values on site (including offset areas) and to adjacent grazing operations. A minimum of one feral animal control program is conducted across Mt Arthur Coal owned land each year, targeting those areas where dogs and foxes have been reported by employees, contractors and landowners. Pest management programs are conducted in accordance with the Pesticide Control Order 2010 (1080 Liquid Concentrate and Bait Products) and, where possible, in conjunction with wider regional control programs. Other pest vertebrate pest management programs conducted include rabbit and hare control, using baits and trapping, and kangaroo harvesting will occur as required.

Relevant BHP and Mt Arthur Coal documents providing detailed management of weeds and pest animals include:

- MAC-HSE-PRO-002 Pest Animal Management Procedure;
- MAC-ENC-PRO-012 Land Management;
- NEC-HSE-PRO-001 Permit to Disturb Procedure; and
- MAC-ENC-MTP-050 Biodiversity Management Plan.

Bushfire

Specific bushfire prevention and fire suppression control measures are implemented in order to protect remnant vegetation communities as well as Mt Arthur Coal fixed and mobile infrastructure.

Prevention and control measures to reduce the risk of bushfire ignition on Mt Arthur Coal owned land, and to protect the operations from bushfire include fuel load assessment and reduction programs, the establishment and maintenance of fire breaks and the prevention of ignition sources. Fire suppression and control is achieved through on-site firefighting equipment, including a rescue truck and water carts, facilitated by a network of roads and vehicle access trails, which provide access to all areas of Mt Arthur Coal owned land. Mt Arthur Coal also maintains a trained emergency response team on each shift, and fire extinguishers are fitted in all vehicles and buildings.

Relevant BHP and Mt Arthur Coal documents providing detailed management of bushfire include:

- MAC-ENC-PRO-076 Bushfire Prevention Procedure
- MAC-STE-PRO-010 Emergency Procedure - Bushfires

Spontaneous Combustion

Spontaneous combustion at Mt Arthur Coal is predominantly confined to old mining areas in the Bayswater No. 2 and the Maxwell Infrastructure (Drayton) sublease area. This is a result of the higher levels of sulphuric material in the coal seams mined from the Greta measures, compared to those mined in the former Bayswater No. 3 and Mt Arthur North mining areas (Wittingham measures). Management of spontaneous combustion include:

- Monitoring for signs spontaneous combustion;
- Remedial action of spontaneous combustion; and
- Overburden emplacement and coal stockpile designed to minimise Spontaneous combustion potential

Relevant BHP and Mt Arthur Coal documents providing detailed management of spontaneous combustion include:

- MAC-PRD-STD-003 Design Construction and Maintenance of Dump Areas;
- MAC-ENC-PRG-002 Spontaneous Combustion Control Program;
- MAC-CPP-PRO-016 Management of CHPP Product Coal Stockpiles; and
- MAC-PRD-PRO-149 ROM Coal Stockpile Procedure.

Mine Subsidence

Although Mt Arthur Coal is located within the Muswellbrook Mine Subsidence district, there is no recent history of mine subsidence within Mt Arthur Coal mine leases. As a result, subsidence is not predicted to impact on mining or rehabilitation activities within this AFP period.

Other Controls

Management practices for erosion and sedimentation risks are presented in **Section 7.3.4.** Geotechnical controls are presented in **Section 7.3.3**.

7.3.2 Decommissioning

Infrastructure is to be removed unless otherwise approved by the Resources Regulator. The primary risks to rehabilitation associated with infrastructure removal is contamination from hazardous building materials and fuel and chemical storage. Mt Arthur Coal implements the following practices to mitigate such risks:

- Maintenance of a contaminated sites register
- Maintenance of a hazardous buildings materials register, primarily asbestos
- Prior to removal:
  - Areas are to be assessed for site contamination
  - All areas to be remediated to a standard that is acceptable under NSW State legislation.

Relevant BHP and Mt Arthur Coal documents providing detailed management of hazardous materials and contaminated sites include:

- MAC-ENC-PRO-074 Contaminated Land Management
- MAC-STE-PRO-013 Hazardous Materials Management Procedure

The decommissioning of tailings facilities will have closure design in accordance with ANCOLD guidelines. Capping/ treatment of facilities will be appropriately designed and constructed so as to ensure geotechnical stability and successful containment of tailings material and hazardous leachate drainage or seepage. The closure of will require sign off from the Dam Safety Committee that TSF wall integrity is satisfactory based on assessment by a suitably qualified geotechnical engineer.

7.3.3 Landform Establishment

Geotechnical / Geochemical

An adaptive design approach to wall stability will be applied to the final voids, with experience and learnings gained throughout the mining operation combined with consideration of long term issues such as erosion, surface degradation and effects of stored void water. This approach is particularly suited to the complex structural geology at Mt Arthur Coal, with pit walls continually intersecting various faults and dykes at different angles. It will also allow HVEC to adopt leading practice at the time of closure, for example Probability of Failure (PoF) – a focus of ongoing research and development - as a design criterion, instead of the more deterministic Factor of Safety.

There are two different types of stability that HVEC considers for final voids. Firstly, there is rock mass failure risk that would pose a safety risk to those nearby and could change how the void and adjacent land is used. Secondly, there is erosional stability around the crest of the final void. The coal mining industry is currently funding research to better understand and predict erosion around landforms including final voids. When this work has progressed sufficiently, testing and erosion modelling will be considered to optimise void designs for Mt Arthur.

A geochemical assessment of overburden material, completed as part of the Mt Arthur North Coal Project Environmental Impact Statement (Coal Operations Australia Limited, April 2000), indicated that the non-coal associated rock strata (95% of the overburden to be removed) represented a low risk of acid generation, that no selective handling was required, and that containment of leachate or runoff was not required (for AMD purposes). The assessment was also completed in the FLDP.

The geomorphic design method used is an adaptation of the Geofluv™ approach and is currently being used on several emplacements across Mt Arthur Coal. The Geofluv™ approach uses the characteristics of stable natural alluvial landforms in the local environment as an analogue on which to base the design of overburden landforms. Importantly, the approach does not replicate existing landforms, but rather uses the key characteristics that make these landforms stable in a new design. Natural landforms in alluvial materials are characterised by an integrated network of drainage channel, typically with slopes initially convex close to ridge lines, becoming concave and progressively flattening with increasing catchment area. Not all landforms will have Geofluv™, as there are places where it may not be practical to implement due to safety, stability, or land use.

While the site has committed to building these new geomorphological based landform designs, it is important to emphasise that the design will require the refinement and optimisation of the landforms as construction experience is obtained at Mt Arthur Coal. This will include evaluating the performance of the rocky materials selected for erosion protection in the drainage lines, revegetation strategies in and around the drainage lines and on the general slopes, and evaluation of the performance of the different soil types in varying slope and catchment area configurations. Monitoring will inform continual improvement of the design including limitations on where it can be implemented. Study of the location and suitability of the design will be made annually to inform where further design will occur.

Coal-associated strata includes some material that indicated a potential for acid generation. Therefore, all coal-associated overburden (and coarse rejects) requires selective handling and burying at depths greater than 5m. This is reflected in the emplacement design and construction requirements contained in the Mt Arthur Coal Dump Standard.

The geochemical assessment also analysed overburden material for potential sodicity, and determined a moderate to high potential for sodic spoil to be uncovered during mining. Soil management measures are detailed further in the Soil Types and Suitability section, below.

- The construction of the final landform design includes the following components:
  - on the steeper outer slopes such as MacLeans overburden emplacement area, material will be placed in benches and then dozed into place, while on the upper surface such as for Main overburden emplacement area, the material can be placed and shaped using GPS equipment;
  - steeper drainage lines are armoured appropriately, not as a highly engineered drop structures, but rather as an integrated surface in the manner of a typical valley creek; and
  - the design approach moves away from specifying maximum slopes, since it is not the steepness of the slope alone that represents an erosion risk, but rather a combination of the catchment area and slope.

- BHP's Global AMD Management Standard is a recently developed internal BHP standard that aims to develop a consistent simple, and sustainable global AMD management approach. BHP are in the process of implementing this new Standard across the business and will have completed a gap assessment for Mt Arthur Coal by end of FY20.

Relevant BHP and Mt Arthur Coal documents providing detailed management of geotechnical and geochemical risk with regards to rehabilitation include:

- MAC-ENC-PRG-002 Spontaneous Combustion Control Program;
- MAC-ENC-PRO-033 Waste Handling and Disposal;
- MAC-ENC-PRO-060 Erosion and Sediment Control Plan;
- MAC-ENC-PRO-061 Surface Water Monitoring Program;
- MAC-ENC-PRO-062 Groundwater Monitoring Program;
- MAC-ENC-PRO-074 Contaminated Land Management;
- MAC-PRD-STD-003Design Construction and Maintenance of Dump Areas;
- BHP Coal Rehabilitation Manual;
- BHP Coal Landform Design Guidelines; and
- BHP Acid and Metalliferous Drainage Management Standard.

7.3.4 Growth Medium Development

Erosion and Sediment Control

The primary site-wide management measures for erosion and sediment is the control of initial ground disturbance and timely land rehabilitation following disturbance. With regards to rehabilitation planning, the primary erosion control is rapid establishment of a vegetative cover. To achieve this, rapidly establishing sterile cover crop species are included in both the pasture and native vegetation seed mixes. These species (Shirohie Millet in Summer and Coolibah Oats in Winter) provide initial erosion control via establishment of a surface vegetative cover and subsurface root system, which remains even after the grass has died off, allowing the slower growing but more permanent plant species to emerge. Due to ongoing drought conditions limiting growth of ground cover temporary stabilisation using mulch across placed topsoil is being trialled. A seed mix update will also be trailed using native species that establish in disturbed areas such as species of salt bush (refer to Section 10).

Reshaped emplacement slopes also incorporate appropriate surface run-off management structures to reduce erosion potential until adequate vegetation cover is established. These structures generally consist of contour drains, mulching and rock placement. Sediment ponds, designed in accordance with the Managing Urban Stormwater Guidelines (Landcom (2004) [Blue Book]), are integrated into landform drainage plans to intercept and reduce sediment load from surface runoff until rehabilitation is established.

Relevant BHP and Mt Arthur Coal documents providing detailed management of erosion and include:

- MAC-ENC-PRO-012 Land Management Procedure;
- MAC-ENC-PRO-060 Erosion and Sediment Control Plan; and
- BHP Coal Rehabilitation Manual.

Topsoil Management

A pre-rehabilitation topsoil stockpile inspection and testing program has also been implemented to characterise stockpiled material, identify suitability for the specific proposed rehabilitation, and identify any requirement for soil ameliorants such as gypsum.

Topsoil is sourced from nearby stockpiles, or directly placed from stripping operations. Due to the age and variable quality of stockpiled soil, it is tested before placement to determine suitability and identify amelioration requirements. The material is then placed and spread to an approximate depth of 150 - 300 millimetres. Ameliorants (i.e. gypsum), if required, are applied and integrated, and the topsoil surface is contour cultivated prior

to seeding to provide suitable micro-environments that shelters seed and encourages water infiltration. The landscape being constructed will also include extensive use of trees and rock scarp for visual relief.

Relevant BHP and Mt Arthur Coal documents providing detailed management of topsoil include:

- MAC-ENC-PRO-012 Land Management Procedure;
- NEC-HSE-PRO-001 Permit to Disturb Procedure; and
- BHP Coal Rehabilitation Manual.

7.3.5 Ecosystem and Land Use Establishment

Native Flora and Fauna

Mt Arthur Coal has a management strategy in place to manage or mitigate mining impacts on native flora, fauna and habitat in the vicinity of operational mining areas. Pre-project ecological assessments and control of disturbance during vegetation clearing are the main protection measures.

From a rehabilitation planning perspective, the major strategies are to ensure that, in accordance with the Mt Arthur Coal EPBC Approval (EPBC 2011/5866) and Project Approval 09_0062 MOD 1, rehabilitation planning incorporates the return of:

- 500 ha of box-gum grassy woodland/ winter bird habitat; and
- An additional 2142 ha of woody native vegetation community.

To meet the requirements of the Project Approval 09_0062 MOD 1, rehabilitated woody vegetation communities are also to focus on the re-establishment of:

- significant and/or threatened plant communities, including:
  - Upper Hunter White Box – Ironbark Grassy Woodland;
  - Central Hunter Box – Ironbark Woodland;
  - Central Hunter Ironbark – Spotted Grey-Gum Box Forest;
  - Narrabeen Footslopes Slaty Box Woodland;
  - Hunter Floodplain Red Gum Woodland Complex
  - White Box Yellow Box Blakely's Red Gum Forest
  - Hunter Lowlands Red Gum Forest; and
- habitat for significant and/or threatened animal species

Re-establishing, or increasing, the habitat value of rehabilitated woodland vegetation communities, by the placement of recovered habitat features such as hollow-bearing logs, large wooden debris and rocks will be a key rehabilitation initiative. Large surface rocks raked clear during overburden emplacement rehabilitation will be placed in piles as habitat features amongst or adjacent to remnant vegetation where possible.

Mt Arthur Coal has an integrated ecological and rehabilitation monitoring program which, as well as assessing mining impact on nearby remnant native vegetation, also assesses the ecological development of rehabilitation areas against the remnant communities and rehabilitation progress criteria. This program is discussed further in Section 7.2.

Relevant BHP and Mt Arthur Coal documents providing detailed management of native flora and fauna include:

- MAC-ENC-MTP-050 Biodiversity Management Plan
- MAC-ENC-MTP-047 Rehabilitation Strategy
- MAC-HSE-PRO-002 Pest Animal Management Procedure
- MAC-ENC-PRO-012 Land Management
- NEC-HSE-PRO-001 Permit to Disturb Procedure

- MAC-ENC-PRO-076 Bushfire Prevention Procedure
- MAC-ENC-PRO-080 Rehabilitation and Ecological Monitoring

Seed Mix and Tube Stock

Native vegetation seed mixes have been adopted that target the re-establishment of the required ironbark-box-gum communities. Tubestock planting programs also target the establishment of box-gum woodland and fauna habitat. Biodiversity and habitat values within woody rehabilitation areas are also enhanced by the incorporation of habitat structures such as nesting/roosting boxes, hollow bearing trees recovered during vegetation clearing, woody debris and rock piles. The diversity of structure improves the potential biodiversity capability.

The native woodland vegetation seeded before July 2012 was a generic native tree and shrub mix based on species common to native vegetation communities of the Upper Hunter Valley floor. Following consultation with ecological consultants, the seed mix used to establish woodland rehabilitation at Mt Arthur Coal was modified during 2013 and more recently in 2018 to better reflect the species composition of Upper Hunter White Box – Ironbark Grassy Woodland. This seed mix was also modified to include mainly native grass species, along with a sterile exotic cover crop, for groundcover. Mt Arthur Coal is conducting trials into mulit-pass seeding, focussing on cover crop and early coloniser species in the initial seeding pass with follow up seeding and tubestock of upper and mid storey species. This is to ensure that a valuable isn't wasted due to adverse conditions.

In the past, pasture rehabilitation has largely been established by broadcast seeding of a pasture seed mix, based heavily on exotic grass species such as rhodes grass (*Chloris gayana*), kikuyu (*Pennisetum clandestinum*) and green panic (*Panicum maximum*). The actual composition of the pasture seed mix has varied substantially, with the most significant change being the reduction and eventual removal of rhodes grass due to its observed dominance in pasture rehabilitation.

The major modification to rehabilitation method across all domains is the change in vegetation establishment to encourage the development of specific box gum woodland communities.

Species used for developing seed mixes each year are presented in **Table 10** to **Table 12**. Species selected may vary year to year based on availability, characteristics of the landform to be established and based on trials of different phases of seeding (refer to Section 10 for more information on phased seeding). Acronyms presented in **Table 11** and **Table 12** are described in **Table** 13.

Table 10 Mt Arthur Coal pasture seed mix

Common name	Species name	Seed mix kg/ha
Couch	*Cynodon dactylon*	10
Lucerne	*Medicago Sativa*	3
Green Panic	*Panicum Coloratum*	3
Seaton Park Sub-clover	*Trifolium Subterranean*	3
Haifa White Clover	*Trifolium Repens*	3
Kikuyu	*Pennisetum Clandestinum*	3
Wimmera Rye	*Lolium Rigidum*	7
Perennial Rye	*Lolium Perenne*	7
Phalaris	*Phalaris Aquatica*	5
Shirohie Millet (summer)	*Echinochloa Esculenta*	10
Oats (winter)	*Avena Sativa*	10

Table 11 Mt Arthur Coal native woodland species list

Species and Category	Common name	Features
Trees		
Allocasuarina luehmannii	Buloke	EC
Angophora floribunda	Rough barked apple	LT
Brachychiton populneus	Kurrajong	LT
Eucalyptus albens	White Box	LT
Eucalyptus blakelyi	Blakely's Red Gum	LT
Eucalyptus camaldulensis	River red gum	LT
Eucalyptus crebra	Narrow-leaved Ironbark	LT
Eucalyptus fibrosa	Broad-leaved Ironbark	LT
Eucalyptus maculata	Spotted gum	LT
Eucalyptus moluccana	Grey Box	LT
Eucalyptus punctata	Grey gum	LT
Eucalyptus tereticornis	Forest red gum	LT
Indicative kg/ha: 1		
Shrubs		
Acacia amblygona	Fan Wattle	NF
Acacia decora	Western silver wattle	NF, EC
Acacia falcata	Sickle Wattle	NF, EC
Acacia longifolia	Golden wattle	NF, EC, SL
Acacia paradoxa	Kangaroo thorn	NF, EC
Acacia parvipinnula	Silver stemmed wattle	NF, EC
Acacia salicina	Cooba	NF, EC
Breynia oblongifolia	Coffee Bush	LT
Bursaria spinosa	Blackthorn	EC
Cassinia arcuata	Sifton bush	EC
Daviesia ulicifolia* subsp. *ulicifolia	Gorse Bitter Pea	NF

Species and Category	Common name	Features
Dodonaea viscosa	Sticky Hop-bush	LT
Hakea sericea	Needle Hakea	LT
Hibbertia obtusifolia	Hoary Guinea Flower	SL
Indigofera australis	Australian Indigo	NF
Lissanthe strigosa	Peach Heath	LT
Myoporum montanum	Western Boobialla	EC
Notelaea microcarpa* var. *microcarpa	Native olive	LT
Ozothamnus diosmifolius	Dogwood	SL
Psydrax odorata	Shiny-leaved Canthium	LT
Pultenaea spinosa	Grey Bush Pea	NF
Sclerolaena birchii	Galvanised Burr	EC
Sclerolaena muricata	Black Roly Poly	EC
Indicative kg/ha: 2.5		
Groundcover (non-grasses)		
Arthropodium milleflorum		LT
Ajuga australis	Austral Bugle	LT
Asperula conferta	Common Woodruff	LT
Brunoniella australis	Blue Trumpet	LT
Calotis cuneifolia	Purple Burr-daisy	SL
Calotis lappulacea	Yellow Burr-daisy	SL
Chrysocephalum apiculatum	Common Everlasting	SL
Carex inversa	Knob Sedge	SL
Cyperus gracilis	Slender Flat-sedge	SL
Desmodium varians	Slender Tick-trefoil	NF
Dianella longifolia	Blueberry Lily	LT
Dianella revoluta	Blueberry Lily	LT
Dichondra repens	Kidney Weed	LT
Einadia nutans	Climbing Saltbush	EC
Eremophila debilis	Winter Apple	LT
Glossocardia bidens	Cobbler's Tack	SL
Goodenia hederacea* subsp. *hederacea	Forest Goodenia	LT
Glycine clandestina	Twining Glycine	NF
Glycine microphylla	Small-leaf Glycine	NF
Glycine tabacina		NF
Euchiton sphaericus		LT
Hardenbergia violacea	Purple Coral Pea	NF
Hypericum gramineum	Native St John's Wort	LTST
Laxmannia gracilis	Slender Wire Lily	LT
Lobelia purpurascens	Whiteroot	LTST
Lomandra filiformis	Wattle Mat-rush	LT
Lomandra multiflora	Mat Rush	LT
Opercularia diphylla		LTST
Oxytes brachypoda	Large Tick-trefoil	NF
Phyllanthus virgatus		LT

Species and Category	Common name	Features
Sida corrugata	Corrugated Sida	LT
Solanum cinereum	Narrawa Burr	EC
Solanum prinophyllum	Forest Nightshade	LTST
Stackhousia viminea	Slender Stackhousia	LT
Phyllanthus virgatus	Leafy Templetonia	LT
Vittadinia cuneata	Fuzzweed	EC, SL
Wahlenbergia gracilis	Sprawling Bluebell	EC, SL
Wahlenbergia communis	Tufted Bluebell	EC, SL
Veronica plebeia	Trailing Speedwell	LTST
Zornia dyctiocarpa		LT
Indicative kg/ha: 1.5		
Groundcover grasses - indicative only		
Aristida ramosa	Purple Wire Grass	EC/LT
Aristida vagans	Threeawn Grass	LTST
Austrodanthonia spp.	Wallaby grasses	
Austrostipa scabra	Rough spear grass	
Austrostipa verticillata	Slender bamboo grass	LTST
Bothriochloa decipiens* var. *decipiens	Pitted Bluegrass	EC
Bothriochloa macra	Redleg Grass	EC
Chloris truncata	Windmill grass	EC
Chloris ventricosa	Plump Windmill Grass	EC/LT
Cymbopogon refractus	Barbed wire grass	EC/LT
Dichanthium sericeum	Queensland bluegrass	EC
Dichelachne micrantha	Short Hair Plume Grass	LT
Digitaria ramularis		LT
Echinopogon caespitosus* var. *caespitosus	Tufted Hedgehog Grass	LTST
Echinopogon ovatus	Forest Hedgehog Grass	LTST
Entolasia marginata	Bordered Panic	LTST
Entolasia stricta	Wiry Panic	LT
Elymus scaber	Common wheat grass	LT
Eragrostis brownii	Brown's Lovegrass	SL
Eragrostis leptostachya	Paddock Lovegrass	LT
Microlaena stipoides* var. *stipoides	Weeping grass	EC, LTST
Oplismenus aemulus	Basket Grass	LTST
Panicum effusum	Hairy panic	EC
Paspalidium distans		EC
Poa sieberiana	Snowgrass	EC/LT
Poa labillardierei* var. *labillardierei	Tussock Grass	LTST
Rytidosperma bipartitum	Wallaby Grass	LT
Rytidosperma racemosa	Wallaby Grass	LT
Sporobolus creber	Slender Rat's Tail Grass	EC/LT
Sporobolus elongatus	Slender Rat's Tail Grass	EC/LT
Themeda australis	Kangaroo Grass	EC/LT

Species and Category	Common name	Features
Indicative kg/ha: 12		
Cover Crop/First Phase		
Avena sativa	Coolabah Oats	
Echinochloa esculenta	Japanese Millet	
Native Alternatives/Additions for Cover Crop		
Chloris truncata	Windmill Grass	
Microlaena stipoides* var. *stipoides	Weeping Grass	
Indicative kg/ha: up to 100		

Table 12 Mt Arthur Coal box gum woodland species list

Species and Category	Common name	Features
Trees		
Brachychiton populneus	Kurrajong	LT
Eucalyptus albens	White Box	LT
Eucalyptus blakelyi	Blakely's Red Gum	LT
Eucalyptus crebra	Narrow-leaved Ironbark	LT
Eucalyptus moluccana	Grey Box	LT
Eucalyptus melliodora	Yellow Box	LT
Eucalyptus albens x moluccana	White Box - Grey Box Intergrade	LT
Indicative kg/ha: 1		
Shrubs		
Acacia decora	Western silver wattle	NF
Acacia falcata	Sickle wattle	NF, EC
Acacia implexa	Hickory Wattle	NF, EC
Acacia paradoxa	Kangaroo thorn	NF, EC
Acacia parvipinnula	Silver stemmed wattle	NF, EC
Bursaria spinosa	Blackthorn	EC
Cassinia arcuata	Sifton bush	EC
Dodonaea viscosa	Sticky Hop-bush	
Olearia viscidula		
Maireana microphylla	Bluebush	EC
Sclerolaena birchii	Galvanised Burr	EC
Sclerolaena muricata	Black Roly Poly	EC
Indicative kg/ha: 2.5		
Groundcover (non-grasses)		
Ajuga australis	Austral Bugle	
Asperula conferta	Common Woodruff	
Boerhavia dominii	Tarvine	
Brunoniella australis	Blue Trumpet	
Carex inversa	Knob Sedge	
Calotis lappulacea	Yellow Burr-daisy	SL
Chrysocephalum apiculatum	Common Everlasting	SL
Cyperus gracilis	Slender Flat-sedge	SL

Species and Category	Common name	Features
Desmodium varians	Slender Tick-trefoil	NF
Dichondra repens	Kidney Weed	
Dianella longifolia	Blueberry Lily	
Dianella revoluta	Blueberry Lily	
Einadia nutans	Climbing Saltbush	EC
Eremophila debilis	Winter Apple	
Glycine clandestina	Twining Glycine	NF
Glycine microphylla	Small-leaf Glycine	NF
Glycine tabacina		NF
Geranium solanderi	Native Geranium	LTST
Lomandra filiformis	Wattle Mat-rush	
Lomandra multiflora	Mat Rush	
Phyllanthus virgatus		
Plantago debilis		LTST
Plantago gaudichaudii	Narrow Plantain	LTST
Oxalis perennans		
Oxytes brachypoda	Large Tick-trefoil	NF
Rostellularia adscendens		LTST
Sida corrugata	Corrugated Sida	
Stackhousia viminea	Slender Stackhousia	
Solanum cinereum	Narrawa Burr	EC
Swainsona galegifolia	Smooth Darling Pea	NF, LTST
Templetonia stenophylla	Leafy Templetonia	NF
Vittadinia cuneata	Fuzzweed	EC
Wahlenbergia communis	Tufted Bluebell	EC
Indicative kg/ha: 1.5		
Groundcover grasses - indicative only		
Aristida ramosa	Purple Wire Grass	EC
Aristida vagans	Threeawn Grass	LTST
Austrostipa scabra	Rough spear grass	EC
Austrostipa verticillata	Slender bamboo grass	LTST
Bothriochloa decipiens* var. *decipiens	Pitted Blue Grass	EC
Bothriochloa macra	Redleg Grass	EC
Chloris truncata	Windmill grass	EC
Chloris ventricosa	Plump Windmill Grass	EC/LT
Cymbopogon refractus	Barbed wire grass	EC/LT
Dichanthium sericeum	Queensland bluegrass	EC
Dichelachne micrantha	Short Hair Plume Grass	LT
Digitaria diffusa	Open Summer Grass	LT
Digitaria brownii	Cotton Panic Grass	LT
Digitaria ramularis		LT
Elymus scaber	Common wheat grass	LT
Eragrostis brownii	Brown's Lovegrass	SL
Eragrostis leptostachya	Paddock Lovegrass	LT

Species and Category	Common name	Features
Microlaena stipoides* var. *stipoides	Weeping grass	EC, LTST
Panicum effusum	Hairy panic	EC
Poa sieberiana	Snowgrass	EC/LT
Poa labillardierei* var. *labillardierei	Tussock Grass	LTST
Rytidosperma bipartitum	Wallaby Grass	LT
Rytidosperma racemosa	Wallaby Grass	LT
Sporobolus creber	Slender Rat's Tail Grass	EC/LT
Sporobolus elongatus	Slender Rat's Tail Grass	EC/LT
Themeda australis	Kangaroo Grass	EC/LT
Indicative kg/ha: 12		
Cover Crop/First Phase		
Exotic (Sterile)		
Avena sativa	Coolabah Oats	X
Echinochloa esculenta	Shirohie millet	X
Native Alternatives/Additions for Cover Crop		
Chloris truncata	Windmill Grass	X
Microlaena stipoides* var. *stipoides	Weeping Grass	X
Indicative kg/ha: up to 100		

Table 13 Woodland species feature key.

KEY	
NF	Nitrogen Fixer
EC	Early Colonisers/Pioneer Species
SL	Short Lived
LT	Long Term
LTST	Long Term Shade Tolerant

Other Controls

Management practices for the following risks to rehabilitation are discussed in Section 7.3.1:

- Geotechnical / Geochemical;
- Weed and pest animal;
- Visual amenity; and
- Bushfire.

Management of erosion and sedimentation are discussed in Section 7.3.4.

7.3.6 Ecosystem and Land Use Development

Ecosystem and Land Use Development management practices align closely Ecosystem and Land Use Establishment practices. Work is focused on remedial action based on monitoring results and aligned with responses outlined in the TARP in Section 11.

7.3.7 Rehabilitation Completion

Rehabilitation Completion is a verification phase that the Rehabilitation Objectives and Closure Criteria (refer to **Section 4**). Mt Arthur Coal is in the process of developing more detailed and SMART Rehabilitation; however, the criteria had not been finalised in time for the update of the My Arthur Coal RMP for public consultation.

8. Rehabilitation Quality Assurance Process

The monitoring program requirements will be audited as part of BHPs Assurance Audit Program against the BHP Our Requirements for Closure and Our Requirements for Environment and Climate Change. Rehabilitation will also form part of the Project Approval 09_0062 MOD 1 Schedule 5 Condition 9.

The performance of rehabilitation will be reviewed as part of the Annual Review as per Project Approval 09_0062 MOD 1 Schedule 5 Condition 3. The monitoring program will subsequently be reviewed as per Project Approval 09_0062 MOD 1 Schedule 5 Condition 4.

Field monitoring programs will be supervised by a dedicated Rehabilitation Specialist to ensure they are being undertaken in accordance with this procedure and the Mt Arthur Coal Health and Safety System.

Routine inspections of the rehabilitant will be undertaken by the Rehabilitation Specialist on a weekly basis to a select rehabilitation areas based on any concerns or work being completed. The inspection is to identify:

- Erosion and landform stability issues;
- Weed infestation; and
- Failure of target vegetation.

Visual impact inspections to review visual amenity impacts are completed annually to identify issues with:

- Surface vegetation
- Screening

The following are additional quality assurance practices in the Mt Arthur Coal:

- Mt Arthur Coal maintains a topsoil stockpile database;
- Bulk shaping will be completed by GPS enabled dozers;
- Dumps for rehabilitation are verified compliant to design by the use of LIDAR; and
- Supplied seed will be verified for viability species.

9. Rehabilitation Monitoring Program

9.1 Rehabilitation Monitoring

Mt Arthur Coal rehabilitation monitoring programs have been implemented to achieve the following objectives:

- assess the condition and development of rehabilitated/regenerated vegetation;
- assess the stability of land surface, landforms and related engineering structures;
- allow for the comparison of rehabilitated/regenerated areas with relevant baseline information, reference sites;
- progress indicators and completion criteria as listed in the Mt Arthur Coal Rehabilitation Management Plan (RMP);
- identify requirements for maintenance or remedial treatment; and
- meet statutory and corporate requirements relating to rehabilitation and ecological monitoring.

The following monitoring programs have been implemented, at Mt Arthur Coal as part of the Rehabilitation and Ecological Monitoring Procedure (REMP):

- Rehabilitation Completion
- Landform Stability Monitoring
- Revegetation Inspections
- Ecological Development
- Grazing Potential

9.1.1 Rehabilitation completion monitoring

Rehabilitation completion monitoring is undertaken during rehabilitation projects to ensure the rehabilitation method used to complete the rehabilitation is recorded, and meets the standards adopted by Mt Arthur Coal. The monitoring requires the rehabilitation contractor and Mt Arthur Coal representative to inspect the works after each key phase and sign-off that the completed work meets the specifications for rehabilitation included in the contract. An inspection checklist is completed to show compliance.

9.1.2 Landform stability monitoring

Landform stability monitoring program consists of an inspection regime or remote sensing analysis for all rehabilitated areas, buffer land, final voids and offset and conservation areas to monitor long-term stability of rehabilitated and modified natural lands. The aim of this program is to:

- show that all post-mining landforms are vegetated, stable and represent minimal risk of failure;
- identify areas of significant active erosion across Mt Arthur Coal owned land (except operational and infrastructure areas), and evaluate potential for environmental impact. Locations to target erosion assessment are identified using aerial photography; and
- determine the requirement for maintenance, remedial treatment or modification of rehabilitation measures.

9.1.3 Revegetation Inspection

The intent of revegetation inspections is to assess actively revegetated areas to assess the germination of seed, survival and establishment of tubestock, identify potential issues (i.e. poor germination rates, tubestock mortality or predation, water stress or weed infestation) and identify any requirement for maintenance or remedial management.

9.1.4 Ecological development monitoring

Ecological development monitoring program consists of annual flora and fauna assessments (including reference sites), post-regeneration inspections and weed assessments for woodland rehabilitation areas and conservation areas, in order to:

- show that areas designated as providing biodiversity value in the post-mining landscape are trending towards the selected vegetation community composition and structure (as described in closure criteria);
- identify requirements for maintenance activities, remedial action, or modification to rehabilitation, regeneration or land management programs;
- reporting on General health of vegetation;
- evidence of natural regeneration;
- occurrence and abundance of weed species
- evidence of feral animals; and
- revegetation success.

9.1.5 Grazing Potential

The Grazing Potential monitoring program consists of periodic ground and pasture assessments and grazing trials on those areas of pasture rehabilitation and buffer land that are designated as potential post-mining grazing areas. The aims of the program are to show that proposed grazing pasture displays the landscape, soil and pasture characteristics suitable for supporting sustainable beef cattle grazing, and identify maintenance and remedial requirements.

9.2 Measuring Performance

Current performance against Completion Criteria is presented in Table 5. Further discussion on performance is provided in the Annual Review (formerly Annual Environmental Management Review, AEMR). The Annual Review is the reporting mechanism for rehabilitation.

10. Research, Rehabilitation Trials and Use of Analogue Sites

10.1 Research

A final void investigation is underway, with the intent to better understand the options available to residual voids and the benefits that could be available to communities or the environment. The void investigation will be communicated to the Resources Regulator and the community throughout its development. This work will complement the NSWMC void work that is currently underway.

Study continues into additional areas for woodland across the site and these areas will tie into the existing woodland corridors. The focus of this work is to align woodlands with areas that would not be as suitable for grazing, for example steep or rocky areas and waterways.

BHP is investigating a partnership with the Royal Botanical Garden Sydney (RBGS) associated with the RBGS Restore and Renew program. The Program will assist BHP to understand what the gaps are in Hunter Valley Woodland rehabilitation processes and to put together a comprehensive restoration manual that will be able to be used by BHP and others in NSW.

10.1.1 Acid Mine Drainage Standard

BHP's Global AMD Management Standard is a recently released internal BHP standard that aims to develop a consistent simple, and sustainable global AMD management approach. BHP are in the process of implementing this new Standard across the business and will have done the gap assessment for MAC by end of FY20.

10.1.2 Creek Diversions

Work will be commenced in FY20 for developing creek diversion, reinstatement and realignments to better understand:

- Incorporation of erosion control measures based on vegetation and engineering;
- incorporation of structures for aquatic habitat (including geomorphic and vegetation); and
- revegetate with suitable native species.
- As stated in the BIOMP HVEC will:
  - define a process for decision making on the approach for creek reinstatement (using the current mine plan),
  - develop a set of creek design principles; and
  - develop further designs for creek reinstatement, revegetation and replacement.

10.1.3 Tailings Dewatering Trial

A dry tailings pilot trial will assess water recycling, tailings chemistry and physical properties to understand if a full-scale dewatered tailings system can be permanently implemented at MAC, ultimately removing the need for future tailings dams. Beneficial outcomes include improved water use efficiency and reduction of safety and environmental risk.

Pilot trial (filter) activities will be completed within the confines of the West Cut Void Tailings Storage Facility (WCV TSF), with no potential to spill outside of these areas. The site installation will begin in early 2020 and will have an operational period of approximately 6 months, after which the infrastructure will be removed. The pilot plant will only use a portion of the tailings produced (which would have been deposited in the TSF) with the remainder of tailings flowing into the TSF as per normal operation. The maximum quantity of filter cake produced by the trial would be approximately 72,000 tonnes. The filter cake will likely be locally stockpiled at the pilot plant location and then rehandled for disposal in the TSF. Dewatered tailings will be denser and potentially occupy less space than prior to pilot plant processing. Based on the results of this work a full scale plant would be built and operated.

10.1.4 Species list

MAC is in the process of further updates to the seed the applied seed mix to increase success of rehabilitation. The objectives of the update include:

- Staged application of seed to mimic natural ecological development;
- Utilising the properties of species to help with growth medium development;
- Utilising the properties of species to species diversity by ensuring niches within the landscape are filled as they develop;
- Utilise early colonisers to increase early colonisers to ameliorate and stabilise soils; and
- Identification of species showing increased success from seeding to focus resources to these species and allow for planning of infill planting.

10.1.5 Monitoring

The REMP will be updated to include the use of the Biodiversity Assessment Methodology (BAM). A trial was conducted to assess the improvement over the older Vegetation Community Assessments and Fauna Survey techniques.

MAC is currently investigate the use of remote sensing to replace and enhance field inspections. Currently MAC is undertaking a trial using high resolution aerial imagery to quantitatively determine weed populations and enable improved weed treatment practices.

In addition to weed monitoring remote sensing will be used to assess:

- Vegetation health;
- Ground cover;
- Vegetation mix; and
- Erosion rates.

Further work will review the potential for Land Scape Function Analysis as presented in CSIRO Tongway and Hindley 2004.

10.2 Rehabilitation Trials

Further field trials into the establishment of box gum grassy woodlands (especially groundcover and understoreys) in existing pasture rehabilitation have been developed. These trials will specifically investigate methods to reduce the dominance of exotic grass species, increase the proportion of native grass species, and control weed proliferation, when modifying existing pasture rehabilitation. Where possible Mt Arthur Coal will also look to utilise the results of other research initiatives completed in the Hunter Valley to help develop and inform establishment of box gum woodland.

Grazing trials on rehabilitated land south of MacDonalds Pit will continue, with a reference site established on adjacent non-mined grazing land. This trial area forms part of an industry-wide rehabilitation grazing trial being coordinated by NSW Mining, as part of the Upper Hunter Mining Dialogue.

Mulch will be trialled as a temporary erosion control measure while in the ecosystem establishment phase.

Monitoring of the rehabilitation progress through the rehabilitation phases has been ongoing at MAC. The Monitoring is proposed to be increased and expanded as the rehabilitation increases across site. MAC is working with a consultant to update and improve the monitoring program across MAC.

Drought affected areas have impacted progress for some woodland rehabilitation over the life of Mt Arthur Coal. Pasture has been planted on an interim basis to prevent wind and water erosion. Recently, in agreement with DPE, tube stock have been planted on the VD1 drought affected areas with little success. Irrigation is proposed in some areas to understand if it will improve success. This remedial process is captured by monitoring following the Rehabilitation and Ecological Monitoring Procedure requirements and implementation activities as per the TARP in

Section 11. subsequent assessment has identified trial options for VD1 and these are explained in the research and trial section of the RMP.

10.3 Analogue Sites

Reference sites have been and will be established in the appropriate vegetation community for each community type being established, to provide an analogue site for comparison. Analogue (reference) along with other monitoring sites are listed in appendix 4 of the REMP and shown below in Figure 13. Analogue sites may be added from time to time, dependent on the mining and rehabilitation progression and access to relevant sites.

Pasture Assessment, using Department of Primary Industry (DPI)-approved methodology and non-mined pasture reference sites for comparison. Pasture Assessment involves visually estimating the quantity and quality of available pasture by visually estimating the botanical composition and ground cover in the area.

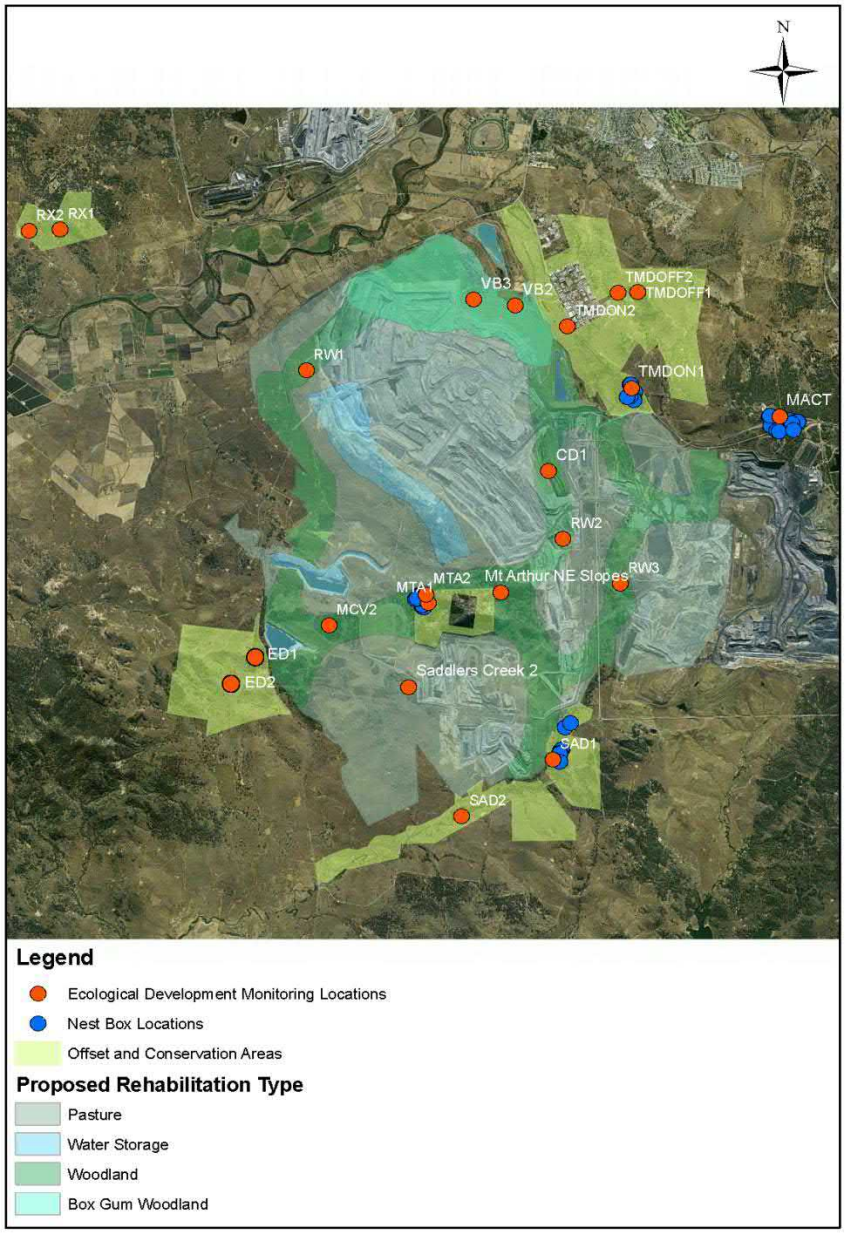

Figure 13. Ecological Development Monitoring sites

11. Intervention and Adaptive Management

11.1 Threats to Rehabilitation

Section 7 discusses operational management of environmental risks specifically relating to rehabilitation. Building on the risks and issues discussed in **Section 6**, the major threats to the achievement of rehabilitation performance indicators and/or successful post-mining land use are summarised below. As discussed in **Section 9**, monitoring programs have been implemented to assess rehabilitation progress towards post-mining land use and identify potential threats that may impede that progress. The earlier these threats are identified, the greater the opportunity to introduce effective management actions to negate those threats. Such actions may include the implementation of remedial strategies to address realised impacts, or the modification of existing management processes to prevent impacts developing or worsening (i.e. adaptive management). A TARP has been developed to provide guidance on appropriate and timely response, if these threats should be identified or predicted.

11.1.1 Soils, Geology & Erosion

- Poor quality or insufficient topsoil due to natural deficiency or poor management, leading to inability to establish vegetation desired for ecological communities or grazing;
- Surface (wind or water) erosion leading to degradation of growth medium and rehabilitation quality;
- Major geotechnical failure of overburden emplacement, such as slumping or subsidence;
- Geotechnical failure of final void residual walls, leading to an unstable and potentially polluting landscape;
- Spontaneous combustion of near-surface waste material generating pollution, destabilising land surface and impeding vegetation establishment;
- Sodicity and/or salinity of spoils/soils leading to accelerated erosion and preventing successful vegetation establishment;
- Failure of water management structures (or natural drainage lines), leading to erosion, unstable landform and potential pollution; and
- Targeted land capability class not met by rehabilitated landform and soils.

11.1.2 Biological factors

- Insufficient, poor quality or incorrect species seed/seedlings leading to poor vegetation establishment;
- Inadequate weed control, leading to extreme weed competition preventing establishment of desired species;
- Continued dominance of exotic tropical grass species, preventing successful establishment of native grass groundcover;
- Inadequate vertebrate pest animal control leading to predation of juvenile vegetation and poor biodiversity (habitat) outcomes;
- Ecosystem processes (i.e. reproduction, nitrogen fixing and nutrient recycling) not re-established, leading to sterile unsustainable ecosystem;
- Insect attack, disease infestation causing premature vegetation die-back; and
- Poor vegetation development leading to simplified, non-stratified community structure of poor habitat value.

11.1.3 Environmental Factors

- Severe and/or prolonged drought leading to widespread failure of revegetation;
- Uncontrolled bush fire events leading to widespread failure of revegetation areas;
- Major Storm event resulting in flooding, geotechnical instability, major erosion and/or widespread damage to rehabilitation areas; and
- Unintended seasonal landform inundation or waterlogging preventing vegetation establishment or causing die-back of established vegetation.

11.1.4 Pollution Issues

- Soil/ overburden geochemistry leading to continuous offsite release of contaminants from mined materials/ waste material requiring long-term management or treatment;
- Unsatisfactory water quality of final void waters leading to environmental impacts, and failed post-mining void use; and
- Unexpected contaminated land (i.e. undisclosed asbestos or hazardous waste disposal areas), leading to costly treatment and disposal, and delayed relinquishment.

11.1.5 Management/ Organisational

- Poor systems implementation, leading to inadequate rehabilitation monitoring and maintenance;
- Inadequate resources lodged/ provisioned to successfully rehabilitate mine areas at closure;
- Evolving regulatory requirements, conflicting community expectations and district land uses leading to difficulties negotiating or attaining relinquishment criteria for older rehabilitation; and
- Pasture areas subjected to prolonged/ uncontrolled overgrazing by livestock, leading to loss of vegetative cover, erosion and land degradation.

11.2 Trigger Action Response Plan

A TARP (**Table 14**) has been developed that identifies potential post-rehabilitation trigger events or indicators, and the appropriate response strategies to be implemented should those triggers be realised. Accurate identification of trigger events provides for early responses to emerging rehabilitation risks. As well as identifying the initial trigger for response, Mt Arthur Coal's rehabilitation and ecological monitoring program shall be the primary means to monitor the effectiveness of the response actions.

As conditions on a mine change, new major hazards may be identified and added to the TARP. Mt Arthur Coal will regularly review its risks and update the TARP as required.

Table 14 Trigger Action Response Plan for Rehabilitation

Risk and Level for Response	Monitoring & Measurement Process	Trigger	Proposed Response Action and Mitigation Measures	Responsible Person
Soils, Geology & Erosion				
Poor quality/ insufficient topsoil impeding vegetation establishment for ecological communities or grazing.	Monitoring programs: Landform Stability; Grazing Potential, Topsoil Monitoring.	Trigger: Progress indicators: Growth Medium Development, Ecosystem/Land use Establishment; Ecosystem/Land use Sustainability.	Utilisation of subsoils/ spoil materials, with appropriate soil supplements and ameliorants, as alternates to topsoil.	Superintendent HSE Superintendent Tactical Planning
			Appropriate delineation and recovery of all suitable topsoil resources and topsoil management in accordance with Land Management Procedure to ensure maximum available resource.	
			Review post-mining land use selection to reduce topsoil intensive uses.	
Surface (wind or water) erosion leading to degradation of growth medium and rehabilitation/offset quality.	Monitoring programs: Landform Stability.	Trigger: Progress indicators: Growth Medium Development, Ecosystem/Land use Establishment; Ecosystem/Land use Sustainability.	Ensure up-catchment reshaping minimises slopes >10° or incorporates appropriate drainage management.	Superintendent HSE Superintendent Schedule Planning
			Review rehabilitation methods and monitoring/maintenance regime to identify root cause of erosion.	
			Remediation of concentrated erosion impacts (if possible).	
			Rapidly stabilise up-catchment substrate and increase organic matter using sterile cover crops and sow with appropriate ground cover species.	
Major geotechnical failure of overburden emplacement, such as slumping or subsidence.	Monitoring programs: Landform Stability.	Trigger: Progress indicators: Landform Establishment.	Ensure emplacement reshaping minimises slopes >10° or incorporates appropriate drainage management.	Manager Production Superintendent HSE Superintendent Schedule Planning
			Review emplacement design, dumping methods and monitoring/maintenance regime to identify root cause of failure.	
			Review impacts on proposed post-mine land use in affected area.	

Risk and Level for Response	Monitoring & Measurement Process	Trigger	Proposed Response Action and Mitigation Measures	Responsible Person
			Remedial earthworks and/or rehabilitation, as required.	Principal Geotechnical Engineer
Targeted land capability class not met by rehabilitated landform and soils.	Monitoring programs: Landform Stability; Grazing Potential.	Trigger: Progress indicators: Landform Establishment; Growth Medium Development.	Review landform design, rehabilitation planning and reshaping operational controls to identify root cause of incorrect land capability class establishment.	Superintendent HSE
			Identify future rehabilitation for potential increase of land capability class area to compensate for current loss of area.	Superintendent Schedule Planning
			Investigate impact on proposed post-mining land use, to identify appropriate remedial strategies, or modification of post-mining land use options.	
Failure of water management structures (or natural drainage lines), leading to erosion, unstable landform and potential pollution.	Monitoring programs: Landform Stability.	Trigger: Progress indicators: Landform Establishment; Growth Medium Development; Ecosystem/ land use Establishment.	Review landform design and reshaping operational controls to identify root cause of poor drainage performance.	Superintendent HSE
			Develop remedial plan that repairs immediate failure and downstream impacts, improves up-catchment infiltration or drainage diversion.	Superintendent Schedule Planning
Sodicity and/or salinity of spoils/soils leading to accelerated erosion and preventing successful vegetation establishment.	Monitoring processes/ programs: Materials geochemical assessment during project planning. Landform Stability.	Trigger: Progress indicators: Landform Establishment; Growth Medium Development.	Conduct soil characterisation sampling and review current rehabilitation practices to identify root cause of erosion/dispersion.	Superintendent HSE
			Develop remedial plan that modifies existing process of soil characterisation and selection and rehabilitation to prevent recurrence, and treats and repairs immediate failure and downstream impacts (i.e. topdressing, gypsum application).	
			Revise proposed post-mining land use to ensure still appropriate for soil type, and identify long-term management requirements.	
Spontaneous combustion of near-surface waste material generating pollution, destabilising land surface and	Monitoring processes/ programs: Materials geochemical assessment during project planning;	Trigger: Significant or continued spontaneous combustion surface impacts.	Characterisation of spontaneous combustion risk and adoption of standard combustion prevention measures.	Overburden Superintendent Survey Superintendent
			Targeted monitoring program in vicinity of impacts.	

Risk and Level for Response	Monitoring & Measurement Process	Trigger	Proposed Response Action and Mitigation Measures	Responsible Person
impeding vegetation establishment.	Spontaneous combustion; Landform Stability.		Remedial treatment (i.e. capping) as per Spontaneous Combustion Procedure. Remedial surface rehabilitation, if required.	
Geotechnical failure of final void residual walls, leading to an unstable and potentially polluting landscape.	Monitoring processes/ programs: Geotechnical assessment of void walls during void treatment design; Landform Stability.	Trigger: Actual or predicted significant void wall failure.	Conduct geotechnical assessment of failed area, and review void treatment design to identify root cause of failure. Develop remedial plan that mitigates and makes safe the immediate failed area, addresses all associated impacts (i.e. reduced void storage capacity, water quality impacts). Review proposed post-mining void use to determine whether still achievable, and identify long-term management measures.	Principal Geotechnical Engineer
Biological Factors				
Insufficient, poor quality or incorrect species seed/seedlings leading to poor vegetation establishment.	Monitoring programs: Ecological Development; Grazing Potential.	Trigger: Progress indicators: Ecosystem/Land use Establishment; Ecosystem/Land use Sustainability.	Review ecological monitoring results and, if required, seed viability testing to determine if seed/seedling quality is contributing to poor vegetation establishment. Identify required modifications to rehabilitation design or seed sourcing, and complete remedial planting works for areas of poor vegetation establishment. Establish a broad supply base of seed to mitigate supply limitations, and a broad species base to mitigate undersupply and climatic variation.	Superintendent HSE

Risk and Level for Response	Monitoring & Measurement Process	Trigger	Proposed Response Action and Mitigation Measures	Responsible Person
Poor vegetation development leading to simplified, non-stratified community structure of poor habitat value.	Monitoring programs: Ecological Development.	Trigger: Progress indicators: Ecosystem/Land use Sustainability.	Review ecological monitoring results to determine likely causes of non-development of vegetation stratum (i.e. species selection, seed/seedling quality, vegetation establishment practices or site conditions) and identify remedial treatment options (i.e. remedial planting, modification of species selection and establishment method or additional ground treatment)	Superintendent HSE
			Conduct remedial treatment, as selected, and review rehabilitation practices to incorporate new measures.	
			Ensure species mix used in rehabilitation programs are aligned to the floristic structure of the targeted plant community/ reference sites.	
Inadequate weed control, leading to extreme weed competition preventing establishment of desired species.	Monitoring programs: Landform Stability; Ecological Development; Grazing Potential.	Trigger: Progress indicators: Growth Medium Development, Ecosystem/Land use Establishment; Ecosystem/Land use Sustainability.	Implement remedial treatment program to control weeds (i.e. chemical weed control, encourage rapid establishment of ground cover, scalping of surface layer, topdressing).	Superintendent HSE
			Weed control undertaken in accordance with the requirements of the Noxious Weeds Act 1993 by competent operators.	
			Weed species density and distribution monitored.	
			Topsoil supply treated for weeds prior to stripping, if required.	
Continued dominance of exotic tropical grass species, preventing successful establishment of native grass groundcover.	Monitoring programs: Ecological Development.	Trigger: Progress indicators: Ecosystem/Land use Establishment; Ecosystem/Land use Sustainability.	Review of ecological monitoring results to identify species of concern, and most appropriate treatment (including cost/benefit analysis on starting rehabilitation again).	Superintendent HSE
			Identify best treatment options, which may include chemical spraying, slashing, cultivating, burning or grazing existing groundcover, and vegetation establishment, which may include tubestock planting or direct drilling seed.	

Risk and Level for Response	Monitoring & Measurement Process	Trigger	Proposed Response Action and Mitigation Measures	Responsible Person
			Ensure intensified monitoring during re-establishment of remedially treated rehabilitation, and review ongoing monitoring/ maintenance regime to ensure adequate.	
Inadequate vertebrate pest animal control leading to predation of juvenile vegetation and poor biodiversity (habitat) outcomes.	Monitoring programs: Ecological development; feral animal register; community consultation.	Trigger: Progress indicators: Ecosystem/Land use Sustainability.	Review of ecological monitoring results and feral animal register to identify species of concern (rabbit, deer, wild dog fox, pig, goat, etc), damage from pest animal species, and most appropriate treatment regime. Implement control program and intensified monitoring program to determine program success. Pest animal control undertaken by competent/ licenced operators.	Superintendent HSE
		Increasing presence of feral animals.	Consult with neighbouring/ district landowners to coordinate control programs.	
Ecosystem processes (i.e. reproduction, nitrogen fixing and nutrient recycling) not re-established, leading to sterile unsustainable ecosystem.	Monitoring programs: Landform Stability; Ecological Development; Grazing Potential.	Trigger: Progress indicators: Growth Medium Development, Ecosystem/Land use Establishment; Ecosystem/Land use Sustainability.	Review ecological monitoring results and, if required, conduct targeted sampling to determine likely causes of non-development of processes (i.e. oversupply or undersupply of nutrients, species selection, soil properties or climatic contributors) and identify remedial treatment options (i.e. mulches, composts, biosolids, inoculants, remedial planting, species selection, etc).	Superintendent HSE
			Conduct remedial treatment and/or review rehabilitation planning and practice to incorporate new treatment measures.	
			Review monitoring program to more accurately detect the presence/ absence of process indicators.	
Insect attack, disease infestation causing premature vegetation die-back.	Monitoring programs: Ecological Development.	Trigger: Progress indicators: Ecosystem/Land use Establishment;	Review ecological monitoring results and, if required, conduct targeted sampling to determine likely causes of infection/ infestation) and identify remedial treatment options.	Superintendent HSE

Risk and Level for Response	Monitoring & Measurement Process	Trigger	Proposed Response Action and Mitigation Measures	Responsible Person
		Ecosystem/Land use Sustainability.	Conduct remedial treatment, if required, and review rehabilitation maintenance practices to incorporate new treatment measures.	
			Review monitoring program to more accurately detect the presence/ absence of disease indicators. Aim to encourage diversity within the vegetation (i.e. colonisation by spiders, insects, frogs, lizards and insectivorous birds) by providing suitable habitat features and vegetation complexity.	
Environmental Factors				
Unintended seasonal landform inundation or waterlogging preventing vegetation establishment or causing die-back.	Monitoring programs: Landform Stability; Ecological Development; Grazing Potential.	Trigger: Progress indicators: Landform Establishment; Growth Medium Development, Ecosystem/Land use Establishment; Ecosystem/Land use Sustainability.	Conduct geotechnical/ hydrological assessment of impacted area, to identify root cause of seasonal inundation (i.e. landform settlement, poor drainage design/ construction) and develop remedial plan that may involve remedial drainage works, remedial planting, or modification of species selection.	Superintendent HSE
			Review proposed post-mining land use for the area to determine whether still achievable, or whether area might be best suited to new purpose (i.e. seasonal wetland/ habitat) and identify long-term management/ mitigation measures.	
Major storm event resulting in flooding, geotechnical instability, major erosion and/or	Monitoring programs: Landform Stability; Ecological Development.	Trigger: Progress indicators: Growth Medium Development,	Review landform planning and design, and rehabilitation practices, to identify root cause of poor drainage/ rehabilitation performance.	Superintendent HSE

Risk and Level for Response	Monitoring & Measurement Process	Trigger	Proposed Response Action and Mitigation Measures	Responsible Person
widespread damage to rehabilitation areas.		Ecosystem/Land use Establishment; Ecosystem/Land use Sustainability.	Implement remedial plan that repairs or reinstates the immediate area of rehabilitation and water management structure failure, and all associated downstream impacts, improves catchment infiltration, and drainage design (i.e. improves vegetative cover). All final landforms should be designed in accordance with Blue Book Volume 2E, to cope with major storm events (1 in 20 year ARI). Adopting more stringent design criteria may be warranted, if failure is common or widespread, or storms are frequent.	Superintendent Schedule Planning
Severe and/or prolonged drought leading to widespread failure of revegetation.	Monitoring programs: Landform Stability; Ecological Development; Grazing Potential.	Trigger: Progress indicators: Ecosystem/Land use Establishment; Ecosystem/Land use Sustainability.	Review rehabilitation practices, to identify any opportunities for drought-proofing rehabilitated areas (i.e. provide internally draining areas, temporary survival irrigation until establishment, or appropriate species selection). Ensure intensified monitoring is undertaken during and after drought to observe rehabilitation performance and resilience. All assessment should be relative to monitored performance of reference sites, to determine whether impacts are rehabilitation specific. Plans should be prepared for post-drought remedial revegetation, if required. Include updates to government during annual reporting on remedial measures. Remedial tree planting and	Superintendent HSE
Uncontrolled bush fire events leading to widespread failure of revegetation areas.	Monitoring programs: Landform Stability; Ecological Development; Grazing Potential.	Trigger: Progress indicators: Ecosystem/Land use Establishment;	Attempts should be made, within the capabilities of site resources and the RFS, to prevent uncontrolled fires reaching newly rehabilitated areas.	Superintendent HSE

Risk and Level for Response	Monitoring & Measurement Process	Trigger	Proposed Response Action and Mitigation Measures	Responsible Person
		Ecosystem/Land use Sustainability.	Review fire control and incident response practices, including consultation with local RFS, to identify the root cause for fire initiation and spread into rehabilitated areas, and modify site procedures to reduce the potential for recurrence.	
			Ensure intensified monitoring is undertaken after fire to record fire impact, and observe rehabilitation resilience during recovery.	
			Plans should be prepared for post-fire remedial revegetation, if required.	
Pollution Issues				
Release of leachate/ contaminants from mined materials/ waste material requiring long-term management or treatment.	Monitoring programs: Landform Stability	Trigger: Progress indicators: Decommissioning; Landform Establishment.	Response will be in accordance with the Groundwater and Surface Water Response Plan, and will involve the confirmation of laboratory results, investigation of cause, proposal of remedial options, then implementation of remedial strategy.	Superintendent HSE
	Monitoring programs: Water monitoring/ modelling.	Trigger: discharge/ seepage from emplacements exceeds EPL/ Water Management Plan water quality criteria.	Water monitoring will be ongoing to determine impact of remedial strategy. Overall monitoring program should be reviewed to ensure continued suitability, in light of investigation findings.	
Unsatisfactory water quality of final void waters leading to environmental impacts, and failed post-mining void use.	Monitoring programs: Landform Stability	Trigger: Progress indicators: Decommissioning; Landform Establishment; Growth Medium Development.	Response will be in accordance with the Groundwater and Surface Water Response Plan, and will involve the clarification of monitoring data, investigation of cause, proposal of remedial options, then implementation of remedial strategy.	Superintendent HSE
	Monitoring programs: Water monitoring/ modelling.	Trigger: void water quality exceeds EPL/ Water Management Plan water quality criteria.	Water monitoring will be ongoing to determine impact of remedial strategy. Overall monitoring program should be reviewed to ensure continued suitability, in light of investigation findings. If required, the decommissioning, rehabilitation and final-use strategies for final voids should also be reviewed to determine ongoing suitability.	

Risk and Level for Response	Monitoring & Measurement Process	Trigger	Proposed Response Action and Mitigation Measures	Responsible Person
Unexpected contaminated land, leading to costly treatment and disposal, and delayed relinquishment.	Monitoring programs: Waste disposal management contract. Asbestos register. Contaminated Site Register.	Trigger: Progress indicators: Decommissioning; Landform Establishment.	Works to be halted or relocated, and site appropriately isolated until declared safe for human access.	Superintendent HSE Superintendent Health & Hygiene
		Trigger: project specific contamination investigation criteria exceeded, or asbestos in path of proposed disturbance.	Site contamination assessment, remediation and clean-up by qualified consultant, as required.	
			Appropriate notifications made to EPA and other regulators.	
			Maintain the asbestos and contaminated land registers via regular reviews.	
Management and Organisational Factors				
Inadequate resources lodged/ provisioned to successfully rehabilitate mine areas a closure.	Monitoring processes:	Trigger: Internal rehabilitation provisioning does not cover liability at start of final AFP period.	Use qualified personnel to review rehabilitation liability calculations and address any shortfalls identified.	Superintendent HSE Manager Strategic Planning Manager Closure Planning
	RCE calculations and progress indicators		Investigate opportunities for accelerated decommissioning and rehabilitation while mine still operating.	
	Rehabilitation provisioning		Review Mine Closure Plan to identify opportunities for streamlining the closure process, while still meeting Relinquishment criteria	
Poor systems implementation, leading to inadequate rehabilitation monitoring and maintenance.	Monitoring; completion of all Ecological and Rehabilitation monitoring programs.	Trigger; non-achievement of actions and measures committed to in RMP and OMPs	Appropriate resourcing to ensure all monitoring and management actions are completed as required in RMP or OMPs.	Superintendent HSE
Evolving regulatory requirements, community expectations and district landuses leading to difficulties	Monitoring Process: Project Approvals and stakeholder consultation processes.	Trigger: DA lodgement for non-mining/ non-rural landuses adjacent to mine/ mine rehab.	Monitor trends and developments in legislation and changes to community expectations.	Superintendent HSE Manager
			Make submissions to incompatible development applications in proximity of site rehabilitated areas.	

Risk and Level for Response	Monitoring & Measurement Process	Trigger	Proposed Response Action and Mitigation Measures	Responsible Person
attaining rehabilitation completion			Continue to regularly consult with stakeholders to gain acceptance of completion criteria.	Environment Analysis and Improvement
Pasture areas subjected to prolonged/ uncontrolled overgrazing by livestock, leading to loss of vegetative cover, erosion and land degradation.	Monitoring Program: Grazing Potential	Trigger; Progress Indicators for Growth Medium Development; Landuse Establishment;	Destock degraded paddocks until adequately recovered.	Superintendent HSE
		Landuse Sustainability	Increase frequency of Ground and Pasture Assessments, and closely monitor recovery trends.	
			Review contractual arrangements with grazier to include mechanism for preventing de-stocking, and review monitoring frequency.	

12. Review and Implementation of the RMP

12.1 Review of the RMP

The mining lease conditions require that a Rehabilitation Management Plan must be prepared and submitted to the Department at the following times:

- Consultation Draft Code of Practice: Rehabilitation Management Plan for Large Mines
- before commencing surface disturbance;
- every 5 years from the date of approval of the lease holder's first Rehabilitation Management
- at least 3 months before the final cessation of the extraction;
- concurrently with the submission of an extraction management plan (if required by the Development Consent in relation to some underground mines);
- within 30 days of suspending operations (i.e. going into care and maintenance following written consent from the Minister under clause 7A of Schedule 1B of the Mining Act); and
- as otherwise directed by the Minister.

Implementation

Title	Responsibility
General Mine Manager	Provide resources required to undertake mine and rehabilitation planning, and implement RMP commitments. Internally approve RMP
Manager Production Planning/ Manager Closure planning	Assist, where relevant, to implement the strategies and commitments presented in this RMP. Oversee and facilitate the mine planning required for the RMP. Provide mine planning, mining progression and disturbance information for reporting in the Annual Review.
Head of Health Safety and Environment	Supervise the preparation of the RMP. Implement, monitor and review the programs and commitments contained in this RMP and supporting procedures. Consult with regulatory authorities as required. Provide for the engagement of external assistance as required. Report the progress of mine disturbance, rehabilitation and monitoring in the Annual Review.
Superintendent HSE Business Partnership	Provide support for the implementation Health Safety and Environment responsibilities. Assist in RMP preparation
Mine Surveyor	Assist with preparation of RMP Plans. Verification of RMP Plans for submission to Resource Regulator and DPE.
Principal Corporate Affairs	Ensure RMP is communicated to community via CCC.

Appendix 1 Document Authorisation

Business Process Owner Endorser Authorisation			
Position	**Name**	**Date**	**Signature**
Superintendent HSE Business Partnership	Kris Sheehan	14/5/20	
Superintendent Tactical Planning	Rob Pascoe	14/05/20	
Manager Production Planning	Damien Perkins	14/5/20	

Approver Authorisation			
Position	**Name**	**Date**	**Signature**
General Manager	Adam Lancey	14/5/20	

Amendment History			
Date	**Version**	**Page**	**Details**
June 2019	Version 1.0	All	New RMP format and separated from the Mine Operations Plan as per the new Resource Regulator Guidelines.
April 2020	Version 2.0	All	Update RMP for submission with Annual Forward Plan, to align with Resource Regulator guidelines

Appendix 2 References

Site Reference	Title	Rehabilitation Objectives Reference
	Project Approval 09_0062 MOD 1. Mt Arthur Coal Mine – Open Cut Modification Project, NSW Department of Planning and Environment, September 2014.	PA 09_0062 MOD 1
	Environmental Protection and Biodiversity Conservation Act Approval 2011/5866. Department of Sustainability, Environment, Water, Population and Communities, April 2012.	EPBC Approval
	Environment Protection Licence No. 11457	EPL
	Our Requirements for Environment and Climate Change	
	Our Requirements for Closure	
MAC-CPP-PRO-016	Management of CHPP Product Coal Stockpiles	
MAC-ENC-MTP-034	Site Water Management Plan	SWMP
MAC-ENC-MTP-040	Air Quality Management Plan	
MAC-ENC-MTP-042	Aboriginal Heritage Management Plan	
MAC-ENC-MTP-047	Rehabilitation Strategy	Rehabilitation Strategy
MAC-ENC-MTP-050	Biodiversity Management Plan	BIOMP
MAC-ENC-MTP-052	Mt Arthur Coal Mining Operations Plan (now Annual Forward Program)	
MAC-ENC-PRG-002	Spontaneous Combustion Control Program	
MAC-ENC-PRO-012	Land Management	
MAC-ENC-PRO-029	Spill Response Procedure	
MAC-ENC-PRO-033	Waste Handling and Disposal	
MAC-ENC-PRO-059	Site Water Balance	
MAC-ENC-PRO-060	Erosion and Sediment Control Plan	
MAC-ENC-PRO-061	Surface Water Monitoring Program	
MAC-ENC-PRO-062	Groundwater Monitoring Program	
MAC-ENC-PRO-063	Surface and Ground Water Response Plan	
MAC-ENC-PRO-073	Hunter River Water Discharge Procedure	
MAC-ENC-PRO-074	Contaminated Land Management	
MAC-ENC-PRO-076	Bushfire Prevention Procedure	Bushfire Prevention Procedure
MAC-ENC-PRO-080	Rehabilitation and Ecological Monitoring	

Site Reference	Title	Rehabilitation Objectives Reference
MAC-HSE-PRO-002	Pest Animal Management Procedure	
MAC-PRD-PRO-149	ROM Coal Stockpile Procedure	
MAC-PRD-STD-003	Design Construction and Maintenance of Dump Areas	Dump Standard
MAC-STE-PRO-010	Emergency Procedure - Bushfires	
MAC-STE-PRO-013	Hazardous Materials Management Procedure	
NEC-HSE-PRO-001	Permit to Disturb Procedure	
NEC-STE-MTP-009	Pollution Incident Management Response Plan	
TBD	Rehabilitation Management Plan	RMP
BHP 2017	BHP Coal Landform Design Guidelines	BHP 2017
BHP MAN	BHP Coal Rehabilitation Manual	BHP MAN
096370	BHP Acid and Metalliferous Drainage Management Standard	BHP AMD Standard
MAC GPA	Mt Arthur Coal Ground and Pasture Assessment (Emergent Ecology, 2016)	MAC GPA
	Rawlings, K.; Freudenberger, D.; and Carr, D.; A Guide to Managing Box Gum Grassy Woodlands. Department of the Environment, Water, Heritage and the Arts, 2010.	Rawlings et al
	NSW Dam Safety Committee approval conditions	DSC
	Hansen Bailey (2009) Mt Arthur Coal Consolidation Project Environmental Assessment	2009 EA
	Resource Strategies (2013) Mt Arthur Coal Open Cut Modification Environmental Assessment	2013 EA
N/A	Managing Urban Stormwater Guidelines: Volume 2E Mines and Quarries. NSW EPA, 2008.	Blue Book Vol 2E
	Grigg, A., Emmerton, B.R. and McCallum, N.J. ACARP Project C8038: Completion Criteria for Pasture Based Rehabilitation in the Bowen Basin. CMLR, University of Queensland. August 2001.	Grigg et al
	Andrews, N, (1999) Synoptic Plan – Integrated Landscapes for Coal Mine Rehabilitation in the Hunter Valley of New South Wales, Prepared for the NSW Department of Mineral Resources.	Resources Regulator Synoptic Plan
	Elliot, G.L. and Veness, R.A. Selection of Topdressing Material for Rehabilitation of Disturbed Areas in the Hunter Valley. J.Soil Cons, NSW 37 37-40, 1981.	Elliot & Veness
	Hazelton, P.A. & Murphy, B.W. Interpreting Soil Test Results: What do all the numbers mean? (2nd ed.). CSIRO, 2007.	Hazelton & Murphy

Appendix 3 Consultation

Consultation correspondence is provided with the Mine Operations Plan. Consultation will be added to this section with the final version posted on the BHP website.

Hunter Valley Energy Coal Pty ltd
Mt Arthur Coal
Thomas Mitchell Drive
Muswellbrook NSW 2333 Australia
Private Mail Bag No. 8
Muswellbrook NSW 2333 Australia
Tel +61 2 6544 5800 Fax +61 2 6544 5801
bhpbilliton.com

22 April 2020

Matthew Sprott
Director Resource Assessments
Department Planning, Industry and Environment
Locked Bag 5022
Parramatta NSW 2124

Mt Arthur Coal Mine Operations Plan FY21 – FY23:

Dear Matthew,

Hunter Valley Energy Coal Pty Ltd (HVEC) will be submitting an amendment of the Mine Operations Plan (MOP) for the Period FY21 – FY23 (July 2020 – June 2023) to the Department of Planning, Industry and Environment Resources Regulator. The MOP similarly satisfies the requirement of Condition 44 of the Project Approval No. 09_0062 (as modified on 26 September 2014) (Project Approval) for a Rehabilitation Management Plan. We are pleased to provide the amended MOP and associated plans to maintain communication and updates regarding mining activities at Mt Arthur Coal.

The format of the MOP is now updated to align with the draft Rehabilitation Code of Practice released by the NSW Resources Regulator. This means there are now two main sections for this MOP submission. Section 1 aligns to the Guidelines for Code of Practice Annual Rehabilitation Report and Forward Program for Large Mines. The second section aligns to the Code of Practice: Rehabilitation Management Plan for Large Mines.

The consultation extends to all relevant teams within DPIE, including but not limited to Water and Environment Energy and Science.

The MOP amendment documentation includes:

- Mt Arthur Coal Annual Forward Program FY21 - FY23;
- Mt Arthur Coal Rehabilitation Management Plan.

Rehabilitation Management Plan Amendment Scope
The RMP format is now modified to align with the Code of Practice: Rehabilitation Management Plan. The content of the RMP is largely unchanged with the main addition of an updated Risk Assessment. The RMP will require update from time to time with changes to rehabilitation processes and consultation input from stakeholders.

Annual Forward Program Amendment Scope
The Annual Forward Program (AFP) disturbance is located within the Mt Arthur Coal Project Approval Project 09_0062 MOD 1 (Project Approval) extent of approved surface development (Ancillary Disturbance Boundary) Furthermore, the AFP is aligned with the Conditions and Environmental Assessment of the Project Approval.

The changes proposed for the AFP have arisen due to identification of opportunities for increasing the efficiency of current operations. The opportunity assessment is undertaken on an annual basis and recent assessment has identified areas for rehabilitation, overburden and mining not currently in the FY20-21 AFP. These options were already considered within the Project Approval, and have been assessed for community and environmental aspects.

Rehabilitation progression
HVEC has been through a comprehensive opportunity assessment to determine the most effective plan for rehabilitation and mining. The most recent inclusion is the main pit realignment to reduce the obtuse angle between the endwall (north) and advancing highwall to transition back to 90 degrees. By doing this, the northern emplacement adjacent to Denman Road will be accelerated and rehabilitation will be released more consistently across the years in this area.

The two south west out of pit emplacements are being placed in a way that will maximise rehabilitation and minimise the amount of time an open face would be visible from off the mine site (south west direction).
Temporary stabilisation activities proposed for this AFP period include the aerial seeding of long-term overburden emplacement areas for dust-suppression purposes.
Emplacement surfaces targeted as part of the aerial seeding program are those most susceptible to prevailing winds, and not available for final rehabilitation in the short to medium term. A pasture seed and fertiliser mix is aerially applied to the targeted emplacement surfaces. Approximately 600 ha of aerial seeding is proposed during the three year AFP period for temporary stabilisation.
Discussion is encouraged on all aspects of rehabilitation in the MOP (AFP and RMP).

Management Plans
No updates will be required to any other management plans, as no significant additional changes are expected to result from the proposed updates to the MOP. HVEC will also be discussing the amendment with other stakeholders before submission to the NSW Resources Regulator.

Please reply in writing to this letter by 8 May 2019 with any questions or comments regarding the specified MOP amendment, so that we can appropriately address these, and that we can provide correspondence to the NSW Resources Regulator along with the MOP submission.

Please do not hesitate to contact me on [redacted] or at luke.l.neil@bhp.com.

Regards,

Luke Neil
Principal Environment Analysis and Improvement
BHP Minerals Australia

From: Neil, Luke
Sent: Wednesday, 22 April 2020 4:27 PM
To: matthew.sprott@planning.nsw.gov.au; melissa.anderson@planning.nsw.gov.au; genevieve.seed@planning.nsw.gov.au
Cc: Nixon, James; Harris, Robert; Perkins, Damien; Scheepers, Leah; Peter Ainsworth
Subject: Mt Arthur Coal - Mine Operations Plan consultation
Attachments: 20190527 - Mt Arthur Coal MOP consultation draft - DPIE Resource Assessments.pdf; Draft - Mt Arthur Coal Mine Rehabilitation Forward Program (consultation version).pdf; Draft - Mt Arthur Coal Mine Rehabilitation Management Plan (Consultation version).pdf

Dear Matt,
Please find attached updated Mine Operations Plan for your departments consultation. We request that you provide any comment by 7 May 2020 to allow time for HVEC to make updates and to provide to the Resources Regulator for the Approval process.

If you have any questions please give me a call.
Regards Luke

BHP

Dr Luke Neil
Principal Environment Analysis and Improvement

Minerals Australia HSE
Luke.l.Neil@bhp.com
M [redacted]
480 Queen St
Brisbane QLD 4000 Australia

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Tel +61 2 6544 5800 Fax +61 2 6544 5801
bhpbilliton.com

6 June 2019

Water
Department Planning, Industry and Environment
Locked Bag 5022
Parramatta NSW 2124

Mt Arthur Coal Mine Operations Plan FY21 – FY23:

Dear Water team,

Hunter Valley Energy Coal Pty Ltd (HVEC) will be submitting an amendment of the Mine Operations Plan (MOP) for the Period FY21 – FY23 (July 2020 – June 2023) to the Department of Planning, Industry and Environment Resources Regulator. The MOP similarly satisfies the requirement of Condition 44 of the Project Approval No. 09_0062 (as modified on 26 September 2014) (Project Approval) for a Rehabilitation Management Plan. We are pleased to provide the amended MOP and associated plans to maintain communication and updates regarding mining activities at Mt Arthur Coal.

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Please reply in writing to this letter by 8 May 2019 with any questions or comments regarding the specified MOP amendment, so that we can appropriately address these, and that we can provide correspondence to the NSW Resources Regulator along with the MOP submission.

Please do not hesitate to contact me on [redacted] or at luke.l.neil@bhp.com.

Regards,

Luke Neil
Principal Environment Analysis and Improvement
BHP Minerals Australia

From: Neil, Luke
Sent: Thursday, 23 April 2020 3:35 PM
To: 'landuse.enquiries@dpi.nsw.gov.au'
Subject: Mt Arthur Coal - Mine Operations Plan consultation
Attachments: Draft - Mt Arthur Coal Mine Rehabilitation Management Plan (Consultation version).pdf; Draft - Mt Arthur Coal Mine Rehabilitation Forward Program (consultation version).pdf; 20200422 - Mt Arthur Coal MOP consultation draft - DPIE Water.pdf

Please find attached the Mine operations Plan for Mt Arthur Coal for your comment.
We request comments by the 7 May so that we can provide the final version to the Resources Regulator for approval.
Please call me if you have any questions.
Cheers Luke

Dr Luke Neil
Principal Environment Analysis and Improvement
Minerals Australia HSE
Luke.l.Neil@bhp.com
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Brisbane QLD 4000 Australia

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bhpbilliton.com

22 April 2020

Environment Energy and Science
Department Planning, Industry and Environment
Locked Bag 5022
Parramatta NSW 2124

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Please do not hesitate to contact me on [redacted] or at luke.l.neil@bhp.com.

Regards,

Luke Neil
Principal Environment Analysis and Improvement
BHP Minerals Australia

From: Neil, Luke
Sent: Thursday, 23 April 2020 3:36 PM
To: planning.matters@environment.nsw.gov.au
Subject: Mt Arthur Coal - Mine Operations Plan consultation
Attachments: 20200422 - Mt Arthur Coal MOP consultation draft - EES.pdf; Draf - Mt Arthur Coal Mine Rehabilitation Management Plan (Consultation version).pdf; Draft - Mt Arthur Coal Mine Rehabilitation Forward Program (consultation version).pdf

Please find attached the Mine operations Plan for Mt Arthur Coal for your comment.
We request comments by the 7 May so that we can provide the final version to the Resources Regulator for approval.
Please call me if you have any questions.
Cheers Luke

Dr Luke Neil
Principal Environment Analysis and Improvement
Minerals Australia HSE
Luke.I.Neil@bhp.com
M [redacted]
480 Queen St
Brisbane QLD 4000 Australia

From: Melissa Anderson <Melissa.Anderson@planning.nsw.gov.au>
Sent: Friday, 24 April 2020 1:00 PM
To: Neil, Luke
Subject: RE: Mt Arthur Coal - Mine Operations Plan consultation

Hi Luke,

I have just received further clarification about the EES / BCD contact:

Requests for document reviews from Hunter Valley mining proponents should be sent to the Hunter Central Coast, Biodiversity and Conservation Division, regional mail box rog.hcc@environment.nsw.gov.au

Kind regards
Melissa

From: Neil, Luke <luke.l.neil@bhp.com>
Sent: Thursday, 23 April 2020 2:40 PM
To: Melissa Anderson <Melissa.Anderson@planning.nsw.gov.au>
Cc: Matthew Sprott <Matthew.Sprott@planning.nsw.gov.au>
Subject: RE: Mt Arthur Coal - Mine Operations Plan consultation

Hi Melissa,
Thanks for that information.
Cheers Luke

From: Melissa Anderson <Melissa.Anderson@planning.nsw.gov.au>
Sent: Thursday, 23 April 2020 2:20 PM
To: Neil, Luke <luke.l.neil@bhp.com>
Cc: Matthew Sprott <Matthew.Sprott@planning.nsw.gov.au>
Subject: RE: Mt Arthur Coal - Mine Operations Plan consultation

Hi Luke,

The current contact email addresses you requested are:

DPIE Water Group: landuse.enquiries@dpi.nsw.gov.au

Environment Energy and Science (Biodiversity and Conservation Division): planning.matters@environment.nsw.gov.au

Kind regards
Melissa

From: Neil, Luke <luke.l.neil@bhp.com>
Sent: Thursday, 23 April 2020 1:11 PM
To: Matthew Sprott <Matthew.Sprott@planning.nsw.gov.au>; Melissa Anderson <Melissa.Anderson@planning.nsw.gov.au>
Subject: RE: Mt Arthur Coal - Mine Operations Plan consultation

Hi Matt,

As discussed today would you be able to either provide us contact details or pass on the MOP documents to the Water and the Environment Energy and Science teams within DPIE, so that they can provide comment on the documents.

Regards Luke

From: Neil, Luke
Sent: Wednesday, 22 April 2020 4:27 PM
To: matthew.sprott@planning.nsw.gov.au; melissa.anderson@planning.nsw.gov.au; genevieve.seed@planning.nsw.gov.au
Cc: Nixon, James <james.nixon@bhp.com>; Harris, Robert <robert.harris4@bhp.com>; Perkins, Damien <damien.perkins1@bhp.com>; Scheepers, Leah <leah.scheepers@bhp.com>; Peter Ainsworth <peter.ainsworth@planning.nsw.gov.au>
Subject: Mt Arthur Coal - Mine Operations Plan consultation

Dear Matt,

Please find attached updated Mine Operations Plan for your departments consultation. We request that you provide any comment by 7 May 2020 to allow time for HVEC to make updates and to provide to the Resources Regulator for the Approval process.

If you have any questions please give me a call.
Regards Luke

Dr Luke Neil
Principal Environment Analysis and Improvement
Minerals Australia HSE
Luke.I.Neil@bhp.com
M [redacted]
480 Queen St
Brisbane QLD 4000 Australia

bhp.com

From: Neil, Luke
Sent: Friday, 24 April 2020 2:48 PM
To: rog.hcc@environment.nsw.gov.au
Subject: Mt Arthur Coal - Mine Operations Plan consultation
Attachments: Draft - Mt Arthur Coal Mine Rehabilitation Management Plan (Consultation version).pdf; Draft - Mt Arthur Coal Mine Rehabilitation Forward Program (consultation version).pdf; 20200422 - Mt Arthur Coal MOP consultation draft - DPIE Water.pdf; 20200422 - Mt Arthur Coal MOP consultation draft - EES.pdf

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Please call me if you have any questions.
Cheers Luke

BHP

Dr Luke Neil
Principal Environment Analysis and Improvement
Minerals Australia HSE

M [redacted]
480 Queen St
Brisbane QLD 4000 Australia

bhp.com

From: Neil, Luke
Sent: Wednesday, 22 April 2020 4:16 PM
To: Fiona Plesman; council@muswellbrook.nsw.gov.au
Cc: Nixon, James; Scheepers, Leah; Pascoe, Rob; Perkins, Damien
Subject: Mt Arthur Coal - Mine Operations Plan Consultation
Attachments: Draft - Mt Arthur Coal Mine Rehabilitation Management Plan (Consultation version).pdf; Draft - Mt Arthur Coal Mine Rehabilitation Forward Program (consultation version).pdf; 2020422 - Mt Arthur Coal MOP consultation draft - MSC.pdf

Dear Fiona,
Please find attached updated Mine Operations Plan for Mt Arthur Coal. We would be pleased to have your comment on the attached documents by Friday 8 May 2020, so that we can make any changes before submission to the Resources Regulator.

Regards
Luke Neil

BHP

Dr Luke Neil
Principal Environment Analysis and Improvement
Minerals Australia HSE
Luke.l.Neil@bhp.com

M [redacted]
480 Queen St
Brisbane QLD 4000 Australia

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Thomas Mitchell Drive
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Tel +61 2 6544 5800 Fax +61 2 6544 5801
bhpbilliton.com

14 May 2020

Fiona Plesman
General Manager
Muswellbrook Shire Council
PO Box 122
Muswellbrook
NSW 2333

Mt Arthur Coal Mine Operations Plan FY21 – FY23 response to MSC comments:

Dear Fiona,

Thankyou for providing comment on the Mt Arthur Coal Mine Operations Plan (MOP) for the Period FY21 – FY23 (July 2020 – June 2023). Please see our response to the comments provided by Muswellbrook Shire Council letter dated 11 May 2020. The response has been provided in a table with along with the MSC comments.

Muswellbrook Shire Council comment	HVEC response
1. Versions (2.0 to 3.0) have been changed but not the title (i.e. FY20-FY22 in the Annual Forward Program (AFP)). The AFP refers to actions that will be undertaken for FY20-FY23 e.g. Table 1. Your letter says this will become the AFP for FY21-FY23 and that this consultation is due to an amendment. If the period has been changed does this not mean that this is a new AFP and requires consultation accordingly?	HVEC note the year error and have changed this to FY21 – FY23. Amendment of timeframe does not necessitate that the document is a new MOP. The document has been provided for consultation as HVEC consider that comment and feedback from the Council will improve the document and ultimately outcomes related to the document.
2. No explanation has been provided for the removal of Table 2 from the AFP compared to the current approved AFP. Council requests that this be returned as it provides a line of sight to what Mt Arthur Coal Mine is proposing for the follow period.	Table 2 information was removed and will be presented and reported on in the Annual Review
3. Council notes that there is a significant increase in the Annual Total Disturbance Area (Table 2) of the AFP. From 687 to 4565 ha for FY21, 353 to 4665 ha for FY22, and 240 to 4610 ha for FY 23. The figures and cover letter don't demonstrate why and where this significant increase is occurring. Mt Arthur Mine needs to provide a better explanation as to why and where this is occurring.	The data submitted in the previous AFP was annual total disturbance. The data presented in this amendment is cumulative. The title of the table and the columns have been modified to be more clearly presented.
4. Regarding the Rehabilitation Management Plan (RMP), Council requests clarification as to why Table 5 could not remain even if it is a	The content is an identical reproduction of the table in the Rehabilitation Strategy. The intent is to reduce administrative burden on HVEC and the Government by not needing to submit several

duplicate. Confirmation that the content is in fact identical to the content within the Rehabilitation Strategy would be appreciated.	documents when a change is made to one item within a document.
5. Figure 12 of the RMP shows considerable differences in proposed rehab. Changes to Table 8 are supported due to increases in the diversity of species to be included within rehabilitation planting.	Figure 12 and Table 8 comment noted. Note that further work on the species listed for inclusion in seed mixes has had further review by an independent ecologist since the RMP was released for public comment.
6. Council would like to know why Table 10, section 10.1.4 and Table 11 have been removed as part of the amendment. Both these sections are critical to understanding what the goals of the RMP and should be reinstated.	The details of monitoring are presented in the Rehabilitation and Ecological Monitoring Program which is currently undergoing a major update. Tables 10 and 11 were removed to streamline presentation of closure criteria which are presented in table 5. Note that the closure criteria are currently under review to provide 'SMART' goals. Both tables have been re-inserted (as Table 6 and 7 respectively) to facilitate understanding of the current RMP.
7. It is not clear why the monitoring sites were removed from Section 10.3 (section 11.3 in previous MOP) as again these are critical to understanding what Mt Arthur Coal is intending as it relates to mine rehabilitation. Council requests that this figure is retained and updated if necessary.	The monitoring sites are presented in the Rehabilitation and Ecological Monitoring Program which is currently undergoing a major update. The program is subject to change based on: New monitoring techniques Areas that reach stages of the rehabilitation process that allow for monitoring The areas monitored in a monitoring period (a financial year) are presented in the Annual Review.

Hunter Valley Energy Coal Pty Ltd (HVEC) will be submitting the amended document to the Department of Planning, Industry and Environment Resources Regulator.

Please do not hesitate to contact me on [redacted] or at luke.l.neil@bhp.com.

Regards,

Luke Neil
Principal Environment Analysis and Improvement
BHP Minerals Australia

From: Neil, Luke
Sent: Tuesday, 28 April 2020 4:34 PM
To: Ziggy Andersons
Cc: Fiona Plesman; Sharon Pope
Subject: RE: Mt Arthur Coal - Mine Operations Plan Consultation
Attachments: Mt Arthur Coal Mine Operations Plan FY20 - FY22 (Final 20 Dec 2019).pdf

Hi Ziggy,
Sorry we don't have a version that shows all minor changes. I have attached the current approved version which may assist.
Please see below the main sections that have been updated since the approved version:
Forward Program

- Section 1.2.2
- Table 1 updated
- The rehabilitation schedule (originally Table 2 in the current version) has been removed
- Plans 2a,b,c have been updated with changes highlighted in red hatching
- Table 2 and Table 3

Rehabilitation Management Plan

- Table 2 summary of status column
- Table 5 was a duplication of the rehabilitation objectives table in the Rehabilitation Strategy and has been removed.
- The updated table 5 contains rehabilitation objectives and performance against these objectives
- The rehabilitation risk assessment has been added to page 83
- Figure 12 is updated
- Table 8 is updated
- Figure showing monitoring sites removed from section 10.3

I hope this helps.
Happy to discuss over the phone if required.
Cheers Luke
[redacted]

From: Ziggy Andersons <Ziggy.Andersons@muswellbrook.nsw.gov.au>
Sent: Tuesday, 28 April 2020 3:19 PM
To: Neil, Luke <luke.l.neil@bhp.com>

Cc: Fiona Plesman <Fiona.Plesman@muswellbrook.nsw.gov.au>; Sharon Pope <Sharon.Pope@muswellbrook.nsw.gov.au>
Subject: RE: Mt Arthur Coal - Mine Operations Plan Consultation

Hi Neil,

Would you be able to send through a document that shows what changes have been made to assist with my review? Something that has tracked changes or additions highlighted and omissions struck through would be consistent with what we usually receive when requested to comment.

Regards,

Ziggy

Kind Regards,

Ziggy Andersons (Tues – Friday)
Biodiversity and Sustainability Team Leader

When sending invoices or quotes please send to council@muswellbrook.nsw.gov.au

Ph: 02 6549 3783
www.muswellbrook.nsw.gov.au

"Meeting the needs of the present without compromising the needs of the future"
I respectfully acknowledge the local Aboriginal people who are the Traditional Owners and Custodians of the land on which I work.

From: Neil, Luke [mailto:luke.l.neil@bhp.com]
Sent: Wednesday, 22 April 2020 4:16 PM
To: Fiona Plesman; Muswellbrook Shire Council
Cc: Nixon, James; Scheepers, Leah; Pascoe, Rob; Perkins, Damien
Subject: Mt Arthur Coal - Mine Operations Plan Consultation

Dear Fiona,
Please find attached updated Mine Operations Plan for Mt Arthur Coal. We would be pleased to have your comment on the attached documents by Friday 8 May 2020, so that we can make any changes before submission to the Resources Regulator.

Regards
Luke Neil

Dr Luke Neil
Principal Environment Analysis and Improvement
Minerals Australia HSE
Luke.l.Neil@bhp.com
M [redacted]
480 Queen St
Brisbane QLD 4000 Australia

bhp.com

service.
For more information please visit http://www.symanteccloud.com

---

Hunter Valley Energy Coal Pty ltd
Mt Arthur Coal
Thomas Mitchell Drive
Muswellbrook NSW 2333 Australia
Private Mail Bag No. 8
Muswellbrook NSW 2333 Australia
Tel +61 2 6544 5800 Fax +61 2 6544 5801
bhpbilliton.com

22 April 2020

Fiona Plesman
General Manager
Muswellbrook Shire Council
PO Box 122
Muswellbrook
NSW 2333

Mt Arthur Coal Mine Operations Plan FY21 – FY23:

Dear Fiona,

Hunter Valley Energy Coal Pty Ltd (HVEC) will be submitting an amendment of the Mine Operations Plan (MOP) for the Period FY21 – FY23 (July 2020 – June 2023) to the Department of Planning, Industry and Environment Resources Regulator. The MOP similarly satisfies the requirement of Condition 44 of the Project Approval No. 09_0062 (as modified on 26 September 2014) (Project Approval) for a Rehabilitation Management Plan. We are pleased to provide the amended MOP and associated plans to maintain communication and updates regarding mining activities at Mt Arthur Coal.

The format of the MOP has been updated to align with the draft Rehabilitation Code of Practice released by the NSW Resources Regulator. This means there are now two main sections for this MOP submission. Section 1 aligns to the Guidelines for Code of Practice Annual Rehabilitation Report and Forward Program for Large Mines. The second section aligns to the Code of Practice: Rehabilitation Management Plan for Large Mines.

The MOP amendment documentation includes:

- Mt Arthur Coal Annual Forward Program FY21 - FY23;
- Mt Arthur Coal Rehabilitation Management Plan.

Rehabilitation Management Plan Amendment Scope
The RMP format has been modified to align with the Code of Practice: Rehabilitation Management Plan. The content of the RMP is largely unchanged with the main addition of an updated Risk Assessment. The RMP will require update from time to time with changes to rehabilitation processes and consultation input from stakeholders.

Annual Forward Program Amendment Scope
The Annual Forward Program (AFP) disturbance is located within the Mt Arthur Coal Project Approval Project 09_0062 MOD 1 (Project Approval) extent of approved surface development (Ancillary Disturbance Boundary) Furthermore, the AFP is aligned with the Conditions and Environmental Assessment of the Project Approval.

The changes proposed for the AFP have arisen due to identification of opportunities for increasing the efficiency of current operations. The opportunity assessment is undertaken on an annual basis and recent assessment has identified areas for rehabilitation, overburden and mining not currently in the FY20-21 AFP. These options were already considered within the Project Approval, and have been assessed for community and environmental aspects.

Rehabilitation progression
HVEC has been through a comprehensive opportunity assessment to determine the most effective plan for rehabilitation and mining. The most recent inclusion is the main pit realignment to reduce the obtuse angle between the endwall (north) and advancing highwall to transition back to 90 degrees. By doing this, the northern emplacement adjacent to Denman Road will be accelerated and rehabilitation will be released more consistently across the years in this area.
The two south west out of pit emplacements are being placed in a way that will maximise rehabilitation and minimise the amount of time an open face would be visible from off the mine site (south west direction).

Temporary stabilisation activities proposed for this AFP period include the aerial seeding of long-term overburden emplacement areas for dust-suppression purposes.
Emplacement surfaces targeted as part of the aerial seeding program are those most susceptible to prevailing winds, and not available for final rehabilitation in the short to medium term. A pasture seed and fertiliser mix is aerially applied to the targeted emplacement surfaces. Approximately 600 ha of aerial seeding is proposed during the three year AFP period for temporary stabilisation.
Discussion is encouraged on all aspects of rehabilitation in the MOP (AFP and RMP).

Management Plans
No updates will be required to any other management plans, as no significant additional changes are expected to result from the proposed updates to the MOP. HVEC will also be discussing the amendment with other stakeholders before submission to the NSW Resources Regulator.

Please reply in writing to this letter by 8 May 2019 with any questions or comments regarding the specified MOP amendment, so that we can appropriately address these, and that we can provide correspondence to the NSW Resources Regulator along with the MOP submission.

Please do not hesitate to contact me on [redacted] or at luke.l.neil@bhp.com.

Regards,

Luke Neil
Principal Environment Analysis and Improvement
BHP Minerals Australia

Hunter Valley Energy Coal Pty ltd
Mt Arthur Coal
Thomas Mitchell Drive
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bhp.com

14 May 2020

Fiona Plesman
General Manager
Muswellbrook Shire Council
PO Box 122
Muswellbrook NSW 2333

Mt Arthur Coal Mine Operations Plan FY21 – FY23 response to Muswellbrook Shire Council comments

Dear Fiona,

Thank you for providing comment on the Mt Arthur Coal Mine Operations Plan (MOP) for the period FY21 – FY23 (July 2020 – June 2023).

Please see our responses to the comments provided by Muswellbrook Shire Council (MSC) letter dated 11 May 2020, in the table below.

Muswellbrook Shire Council comment	**HVEC response**
1. Versions (2.0 to 3.0) have been changed but not the title (i.e. FY20-FY22 in the Annual Forward Program (AFP)). The AFP refers to actions that will be undertaken for FY20-FY23 e.g. Table 1. Your letter says this will become the AFP for FY21-FY23 and that this consultation is due to an amendment. If the period has been changed does this not mean that this is a new AFP and requires consultation accordingly?	HVEC note the year error and have amended this to FY21 – FY23. Amendment of timeframe does not necessitate that the document is a new MOP. The document has been provided for consultation, as HVEC consider that comment and feedback from the Council will improve the document and ultimately outcomes related to the document.
2. No explanation has been provided for the removal of Table 2 from the AFP compared to the current approved AFP. Council requests that this be returned as it provides a line of sight to what Mt Arthur Coal Mine is proposing for the follow period.	Table 2 information was removed and will be presented and reported on in the Annual Review.
3. Council notes that there is a significant increase in the Annual Total Disturbance Area (Table 2) of the AFP. From 687 to 4565 ha for FY21, 353 to 4665 ha for FY22, and 240 to 4610 ha for FY 23. The figures and cover letter don't demonstrate why and where this significant increase is occurring. Mt Arthur Mine needs to provide a better explanation as to why and where this is occurring.	The data submitted in the previous AFP was annual total disturbance. The data presented in this amendment is cumulative. The title of the table and the columns have been modified to be more clearly presented.
4. Regarding the Rehabilitation Management Plan (RMP), Council requests clarification as to why Table 5 could not remain even if it is a duplicate. Confirmation that the content is in fact identical to the content within the Rehabilitation Strategy would be appreciated.	The content is an identical reproduction of the table in the Rehabilitation Strategy. The intent is to reduce administrative burden on HVEC and the Government by not needing to submit several documents when a change is made to one item within a document.
5. Figure 12 of the RMP shows considerable differences in proposed rehab. Changes to Table 8 are supported due to increases in the diversity of species to be included within rehabilitation planting.	Figure 12 and Table 8 comment noted. Note that further work on the species listed for inclusion in seed mixes has had further review by an independent ecologist since the RMP was released for public comment.

6. Council would like to know why Table 10, section 10.1.4 and Table 11 have been removed as part of the amendment. Both these sections are critical to understanding what the goals of the RMP and should be reinstated.	The details of monitoring are presented in the Rehabilitation and Ecological Monitoring Program which is currently undergoing a major update. Tables 10 and 11 were removed to streamline presentation of closure criteria which is presented in Table 5. Note that the closure criteria is currently under review to provide 'SMART' goals. Both Tables have been re-inserted (as Table 6 and 7 respectively) to facilitate understanding of the current RMP.
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Hunter Valley Energy Coal Pty Ltd (HVEC) will be submitting the amended document to the Department of Planning, Industry and Environment Resources Regulator.

Should you have any further questions, please contact me on [redacted] or at luke.l.neil@bhp.com.

Regards,

Luke Neil
Principal Environment Analysis and Improvement
BHP Minerals Australia

From: Neil, Luke
Sent: Friday, 15 May 2020 10:24 AM
To: Sharon Pope
Cc: Scheepers, Leah; Nixon, James
Subject: RE: Mt Arthur Coal - Mine Operations Plan Consultation
Attachments: 2020515 - Mt Arthur Coal MOP consultation HVEC reply - MSC.pdf

Hi Sharon,
Please find HVEC responses to your comment on the Mt Arthur Coal Mine Operations Plan.
Regards Luke

From: Sharon Pope <Sharon.Pope@muswellbrook.nsw.gov.au>
Sent: Monday, 11 May 2020 3:45 PM
To: Neil, Luke <luke.l.neil@bhp.com>
Subject: RE: Mt Arthur Coal - Mine Operations Plan Consultation

Hello Luke

Council staff have compiled some comments which are provided in the attached letter.

Regards

Sharon Pope| Executive Manager Environmental and Planning Services
muswellbrook shire council
P: (02) 6549 3868
PO Box 122, Muswellbrook NSW 2333
Sharon.Pope@muswellbrook.nsw.gov.au
www.muswellbrook.nsw.gov.au

From: Neil, Luke <luke.l.neil@bhp.com>
Sent: Wednesday, 22 April 2020 4:16 PM
To: Fiona Plesman <Fiona.Plesman@muswellbrook.nsw.gov.au>; Muswellbrook Shire Council <council@muswellbrook.nsw.gov.au>
Cc: Nixon, James <james.nixon@bhp.com>; Scheepers, Leah <leah.scheepers@bhp.com>; Pascoe, Rob <robert.pascoe2@bhp.com>; Perkins, Damien <damien.perkins1@bhp.com>
Subject: Mt Arthur Coal - Mine Operations Plan Consultation

Dear Fiona,
Please find attached updated Mine Operations Plan for Mt Arthur Coal. We would be pleased to have your comment on the attached documents by Friday 8 May 2020, so that we can make any changes before submission to the Resources Regulator.

Regards
Luke Neil

Dr Luke Neil
Principal Environment Analysis and Improvement
Minerals Australia HSE
Luke.l.Neil@bhp.com
M [redacted]
480 Queen St
Brisbane QLD 4000 Australia

bhp.com

From: Neil, Luke
Sent: Wednesday, 22 April 2020 4:38 PM
To: Donna McLaughlin
Subject: Mt Arthur Coal - Mine Operations Plan consultation
Attachments: Draft - Mt Arthur Coal Mine Rehabilitation Management Plan (Consultation version).pdf; Draft - Mt Arthur Coal Mine Rehabilitation Forward Program (consultation version).pdf

Hi Donna,
Please find attached Mt Arthur Coal Mine Operations Plan. The MOP is provided as two sections, Annual Forward Program, and the Rehabilitation Management Plan.
This draft has been provided to various stakeholders for comment and will be supplied to the Resources Regulator in May for Approval
Any comment or feedback is welcome.
Cheers Luke

Dr Luke Neil
Principal Environment Analysis and Improvement
Minerals Australia HSE
Luke.I.Neil@bhp.com
M [redacted]
480 Queen St
Brisbane QLD 4000 Australia

From: Neil, Luke
Sent: Wednesday, 22 April 2020 4:42 PM
To: craig.white@bengalla.com.au
Subject: Mt Arthur Coal - Mine Operations Plan consultation
Attachments: Draft - Mt Arthur Coal Mine Rehabilitation Management Plan (Consultation version).pdf; Draft - Mt Arthur Coal Mine Rehabilitation Forward Program (consultation version).pdf

Hi Craig,
Please find attached Mt Arthur Coal Mine Operations Plan. The MOP is provided as two sections, Annual Forward Program, and the Rehabilitation Management Plan.
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Any comment or feedback is welcome.
Cheers Luke

Dr Luke Neil
Principal Environment Analysis and Improvement
Minerals Australia HSE
Luke.I.Neil@bhp.com
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22 April 2020

Mt Arthur Coal
Community Consultative Committee

Mt Arthur Coal Mine Operations Plan FY20 – FY22:

Dear CCC,

Hunter Valley Energy Coal Pty Ltd (HVEC) will be submitting an amendment of the Mine Operations Plan (MOP) for the Period FY21 – FY23 (July 2020 – June 2023) to the Department of Planning, Industry and Environment Resources Regulator. The MOP similarly satisfies the requirement of Condition 44 of the Project Approval No. 09_0062 (as modified on 26 September 2014) (Project Approval) for a Rehabilitation Management Plan. We are pleased to provide the amended MOP and associated plans to maintain communication and updates regarding mining activities at Mt Arthur Coal.

The format of the MOP has been updated to align with the draft Rehabilitation Code of Practice released by the NSW Resources Regulator. This means there are now two main sections for this MOP submission. Section 1 aligns to the Guidelines for Code of Practice Annual Rehabilitation Report and Forward Program for Large Mines. The second section aligns to the Code of Practice: Rehabilitation Management Plan for Large Mines.

The MOP amendment documentation includes:

- Mt Arthur Coal Annual Forward Program FY21 - FY23;
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The RMP format has been modified to align with the Code of Practice: Rehabilitation Management Plan. The content of the RMP is largely unchanged with the main addition of an updated Risk Assessment. The RMP will require update from time to time with changes to rehabilitation processes and consultation input from stakeholders.

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The Annual Forward Program (AFP) disturbance is located within the Mt Arthur Coal Project Approval Project 09_0062 MOD 1 (Project Approval) extent of approved surface development (Ancillary Disturbance Boundary) Furthermore, the AFP is aligned with the Conditions and Environmental Assessment of the Project Approval.

The changes proposed for the AFP have arisen due to identification of opportunities for increasing the efficiency of current operations. The opportunity assessment is undertaken on an annual basis and recent assessment has identified areas for rehabilitation, overburden and mining not currently in the FY20-21 AFP. These options were already considered within the Project Approval, and have been assessed for community and environmental aspects.

Rehabilitation progression
HVEC has been through a comprehensive opportunity assessment to determine the most effective plan for rehabilitation and mining. The most recent inclusion is the main pit realignment to reduce the obtuse angle between the endwall (north) and advancing highwall to transition back to 90 degrees. By doing this, the northern emplacement adjacent to Denman Road will be accelerated and rehabilitation will be released more consistently across the years in this area.
The two south west out of pit emplacements are being placed in a way that will maximise rehabilitation and minimise the amount of time an open face would be visible from off the mine site (south west direction).
Temporary stabilisation activities proposed for this AFP period include the aerial seeding of long-term overburden emplacement areas for dust-suppression purposes.

Emplacement surfaces targeted as part of the aerial seeding program are those most susceptible to prevailing winds, and not available for final rehabilitation in the short to medium term. A pasture seed and fertiliser mix is aerially applied to the targeted emplacement surfaces. Approximately 600 ha of aerial seeding is proposed during the three year AFP period for temporary stabilisation.
Discussion is encouraged on all aspects of rehabilitation in the MOP (AFP and RMP).

Management Plans
No updates will be required to any other management plans, as no significant additional changes are expected to result from the proposed updates to the MOP. HVEC will also be discussing the amendment with other stakeholders before submission to the NSW Resources Regulator.

Please reply in writing to this letter by 8 May 2019 with any questions or comments regarding the specified MOP amendment, so that we can appropriately address these, and that we can provide correspondence to the NSW Resources Regulator along with the MOP submission.

Please do not hesitate to contact me on [redacted] or at luke.l.neil@bhp.com.

Regards,

Luke Neil
Principal Environment Analysis and Improvement
BHP Minerals Australia

From: Scheepers, Leah
Sent: Friday, 24 April 2020 2:04 PM
To: Wej Paradice (w.paradice@icloud.com); John Bancroft; Di Gee; Tony Lonergan; Jennifer Lecky
Cc: Neil, Luke; Brooke York (brooke@finalformregen.com); Nixon, James; Perkins, Damien; Carlson, Kim
Subject: Mine Operations Plan for CCC consultation
Attachments: 20190527 - Mt Arthur Coal MOP consultation draft - CCC.pdf; Draft - Mt Arthur Coal Mine Rehabilitation Management Plan (Consultation version).pdf; Draft - Mt Arthur Coal Mine Rehabilitation Forward Program (consultation version).pdf

Dear MAC CCC

Mine Operations Plan for consultation

Hunter Valley Energy Coal Pty Ltd (HVEC) will be submitting an amendment of the Mine Operations Plan (MOP) for the Period FY21 FY23 (July 2020 – June 2023) to the Department of Planning, Industry and Environment Resources Regulator. The MOP similarly satisfies the requirement of Condition 44 of the Project Approval No. 09_006 (as modified on 26 September 2014) (Project Approval) for a Rehabilitation Management Plan.

to maintain communication and updates regarding mining activities at Mt Arthur Coal.

Please reply in writing to this letter by **Friday 8 May 2019** with any questions or comments regarding the specified MOP amendment, so that we can appropriately address these, and so that we can provide correspondence to the NSW Resources Regulator along with the MO submission.

Should you require further information, contact **Luke Neil** on (
1 or via email at luke.l.neil@bhp.com

Kind regards
Leah

Leah Scheepers
Specialist Corporate Affairs - Community
Operations Australia
leah.scheepers@bhp.com
M
Private Mail Bag 8, Thomas Mitchell Drive
Muswellbrook NSW 2333 Australia

bhp.com

From: Chris Rudens <chris.rudens@planning.nsw.gov.au>
Sent: Monday, 27 April 2020 11:00 AM
To: Neil, Luke; Peter Ainsworth; Matthew Newton
Subject: RE: Mt Arthur Coal - Mine Operations Plan

Hi Luke,

Comments below relate to tailings management coming out of the Tailings TAP, I'll let Peter and Matthew provide comments relating to other aspects, if required.

I'll aim to complete the Tailings Targeted Assessment for Mt Arthur this week, which may have some implications for the MOP. However, based on review of assessment to date, nothing significant relating to tailings management, just need to ensure all the work to be undertaken to close North Cut is clearly articulated in MOP, including timeframes. I also note the following should be addressed in MOP:

- Project to improve consolidation/settlement under consideration 'Secondary flocculation project', – understood likely implementation December 2020
- Information on the 10 additional groundwater quality bores in vicinity of tailings, including TARPs.

Thanks
Chris

Chris Rudens
Manager Environmental Projects

NSW Resources Regulator | Department of Regional NSW
[redacted]
E chris.rudens@planning.nsw.gov.au
Level 3, Block F | 84 Crown St | Wollongong NSW 2500
PO Box 674 | Wollongong NSW 2500

NSW GOVERNMENT | Regional NSW

The Department of Regional New South Wales acknowledges that it stands on Country which always was and always will be Aboriginal land. We acknowledge the Traditional Custodians of the land and waters, and we show our respect for Elders past, present and emerging. We are committed to providing places in which Aboriginal people are included socially, culturally and economically through thoughtful and collaborative

approaches to our work.

From: Neil, Luke <luke.l.neil@bhp.com>
Sent: Monday, 20 April 2020 3:31 PM
To: Peter Ainsworth <peter.ainsworth@planning.nsw.gov.au>; Chris Rudens <chris.rudens@planning.nsw.gov.au>; Matthew Newton <matthew.newton@planning.nsw.gov.au>
Subject: Mt Arthur Coal - Mine Operations Plan

Hi Guys,
I hope you are safe and well during this Covid 19 period. I just wanted to check in and see if there will be any issues or delays to assessing an update to the Mt Arthur Coal Mine Operations Plan. We intend on submitting the MOP Annual update in early May with the intent of the Plan being approved before 1 July 2020.
Do you foresee any issues with this?
Cheers Luke

Dr Luke Neil
Principal Environment Analysis and Improvement
Minerals Australia HSE
Luke.l.Neil@bhp.com
M [redacted]
480 Queen St
Brisbane QLD 4000 Australia

bhp.com

Our ref: ASMT0009100
LETT0004286

Mt Arthur Coal Pty Limited
PMB 8
MUSWELLBROOK NSW 2333
Attn: Luke Neil

Dear Luke Neil

Mt Arthur Coal Pty Limited (Hunter Valley Energy Coal Pty Ltd) ML 1757 (1992), CL 396 (1973), ML 1655 (1992), CCL 744 (1973), ML 1487 (1992), ML 1548 (1992), ML 1358 (1992), ML 1757 (1992), MPL 263 (1973), ML 1593 (1992), ML1739 (1992).

Mt Arthur Coal Tailings Assessment Program
Assessment date: 17 March 2020

Overview

The NSW Resources Regulator within the Department of Planning, Industry and Environment ('the Regulator') is responsible for the administration and enforcement of the Mining Act 1992 (the Act) and associated Regulations. The Regulator performs a variety of proactive assessments to monitor compliance and performance of the Act and associated Regulations.

On 17 March 2020, an inspection of the Mt Arthur Mine Tailings Storage Facilities was undertaken by the Regulator's Environmental Inspectors Chris Rudens and Jennifer Warner. The Regulator's Mine Safety inspector also in attendance was Tim Martin.

Scope of Assessment

The assessment focused on tailing management performance as part of the Regulator's Targeted Assessment Program. Targeted assessments form part of the Regulator's compliance priorities and further information can be found at https://www.resourcesregulator.nsw.gov.au/compliance-and-enforcement

Information provided as part of this assessment outcome relate to rehabilitation matters associated with the requirements under the Act. Any issues relating to safety considerations relevant to the Work Health and Safety (Mine and Petroleum) Act 2013 will be communicated separately.

Please note that the observations apply to the activities and operations as they existed at the time of the inspection and from information provided to the Regulator by site personnel. The observations are not an official endorsement of compliance or otherwise with the Act.

Inspection Observations

As a result of the assessment, the Regulator makes the following observations:

Currently, the tailings deposition management strategy to maximise consolidation for current tailings deposition area 'West Cut' is deficient. It is noted that a project referred to as

‘Secondary flocculation project’ is under consideration with implementation likely December 2020.

Risk: Deficient deposition management strategies can result in poorly consolidated tailings, presenting a risk that the tailings facility cannot be accessed for decommissioning activities (placement of capping) for extended periods of time.

An improvement to the groundwater quality monitoring network in the vicinity of the tailings facilities is proposed, with an additional 10 groundwater quality bores and the development of associated response plan for testing (such as a TARP).

Action Required

The Regulator understands that you are currently seeking an amendment to the currently approved Mining Operations Plan (MOP). As part of this MOP amendment, we request that you provide a commitment to address the issues above. Where further studies or research are required to be undertaken, the MOP will need to include details of the scope as well as specific milestones for when these studies are scheduled for completion.

It is recommended the MOP includes summary information on the tailings storage facility closure and rehabilitation strategy for both the North Cut and West Cut, and references the relevant reports/management plans as appendices.

If you require additional information, please contact the Resources Regulator on 1300 814 609 (Option 2, then 5), or via email at nswresourcesregulator@service-now.com.

Yours sincerely,

Christopher Rudens
Manager Environmental Projects
Mining Act Inspectorate
Resources Regulator

7 May 2020

From: Neil, Luke
Sent: Friday, 8 May 2020 9:19 AM
To: 'Resources Regulator'; chris.rudens@planning.nsw.gov.au
Subject: RE: Letter LETT0004286: PP0001464 | Planned Inspection Program | Tailings management - Generic letter

Hi Chris,
I have provided the letter to the relevant people at MAC. The MOP will be submitted in May with additional content as requested.
Regards Luke

From: Resources Regulator <nswresourcesregulator@service-now.com>
Sent: Thursday, 7 May 2020 1:30 PM
To: Neil, Luke <luke.l.neil@bhp.com>; chris.rudens@planning.nsw.gov.au
Subject: Letter LETT0004286: PP0001464 | Planned Inspection Program | Tailings management - Generic letter

Dear Luke Neil,

Please refer to attached correspondence and reply to this email to acknowledge receipt.

Regards,
Christopher Rudens
Resources Regulator

When corresponding with the Regulator about this matter, please reply to this email. For new matters please email nswresourcesregulator@service-now.com citing any relevant task number in the subject line followed by a space and any other text (eg: MAAG0001234 Response to XXX).

Ref:MSG0219583_c277A49IktXVg9YWpFHU

From: Neil, Luke
Sent: Friday, 15 May 2020 8:04 AM
To: Resources Regulator; chris.rudens@planning.nsw.gov.au
Cc: Carlson, Ross; Nixon, James; Peter Ainsworth
Subject: RE: Letter LETT0004286: PP0001464 | Planned Inspection Program | Tailings management - Generic letter
Attachments: 20200514 - Mt Arthur Coal Targeted Tailings Assessement HVEC Response.pdf

Hi Chris,
Please find attached response to the Resources Regulator letter dated 27 May 2020.
As requested the information contained in the response will also be submitted in the Mine Operations Plan FY21 – FY23.
Please call me if you have any questions.
Regards Luke

From: Resources Regulator <nswresourcesregulator@service-now.com>
Sent: Thursday, 7 May 2020 1:30 PM
To: Neil, Luke <luke.l.neil@bhp.com>; chris.rudens@planning.nsw.gov.au
Subject: Letter LETT0004286: PP0001464 | Planned Inspection Program | Tailings management - Generic letter

Dear Luke Neil,

Please refer to attached correspondence and reply to this email to acknowledge receipt.

Regards,
Christopher Rudens
Resources Regulator

When corresponding with the Regulator about this matter, please reply to this email. For new matters please email nswresourcesregulator@service-now.com citing any relevant task number in the subject line followed by a space and any other text (eg: MAAG0001234 Response to XXX).

Ref:MSG0219583_c277A49IktXVg9YWpFHU

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Tel +61 2 6544 5800 Fax +61 2 6544 5801
bhpbilliton.com

14 May 2020

Chris Rudens
Manager Environmental Projects
Resources Regulator | Department of Regional NSW
PO Box 674
Wollongong NSW 2500

Mt Arthur Coal Mine Operations Plan FY18 & FY19 amendment:

Dear Chris,

Hunter Valley Energy Coal Pty Ltd (HVEC) will be submitting an amendment of the Mining Operations Plan (MOP) for the Period FY21 & FY23 to the Resources Regulator. On 17 March 2020, an inspection of the Mt Arthur Mine Tailings Storage Facilities was undertaken by the Regulator's Environmental Inspectors Chris Rudens and Jennifer Warner. The Regulator's Mine Safety inspector also in attendance was Tim Martin. HVEC provide comment below in relation to the Tailings Targeted Assessment letter dated 27 April 2020.

Resources Regulator Observation	HVEC Response
Currently, the tailings deposition management strategy to maximise consolidation for current tailings deposition area 'West Cut' is deficient. It is noted that a project referred to as 'Secondary flocculation project' is under consideration with implementation likely December 2020. Risk: Deficient deposition management strategies can result in poorly consolidated tailings, presenting a risk that the tailings facility cannot be accessed for decommissioning activities (placement of capping) for extended periods of time.	MAC is expected to commence the implementation of actions to prepare for the future capping of the TSF's as soon as practically possible using flocculation and multiple deposition points. MAC is currently working with AECOM and ATC Williams in the Identification phase to examine pipeline extension to provide multiple deposition points for South West Valley and West Cut Void. The higher density of the tailings maximises the remaining volume and capacity of TSFs. The flocculation also provides immediate benefits by accelerating the release of water during deposition. This water would be decanted using new decant pumps (already installed) to return water to the main process water storage at Drayton Void. This will contribute to the mitigation of the current risk of water shortages at MAC as a result of recent drought conditions. The tailings flocculation infrastructure includes the following items: • Flocculant Dosing Plant • Tailings distribution and placement network • Diesel decant pumps The proposed Flocculant Project activities and timeframe are: • Current identification and selection phase until July / August 2020 • Design and engineering July – September 2020 • Procurement and supply actions September – December 2020 • Project execution post December 2020
An improvement to the groundwater quality monitoring network in the vicinity of the tailings facilities is proposed, with an additional 10 groundwater quality bores and the development of associated response plan for testing (such as a TARP).	The drilling of additional groundwater monitoring bores and the installation of monitoring equipment in advance of mining and for monitoring of tailings. Once data has been collected for sufficient time (two years) the TARP will be updated to include these bores. • The Works near Saddlers Creek for monitoring of West Cut and South West Valley consist of the installation of five new groundwater monitoring bores at three Sites.

	Each Site will consist of one shallow monitoring bore screened in the alluvium/regolith and one deep bore targeting the first unweathered coal seam below the alluvium. The timing for these is to be completed before the end of FY20. The bores for North Cut TSF closure additional groundwater monitoring infrastructure to monitor for groundwater level and quality in the vicinity of the North Cut Tailings Storage Facility (TSF). These bores are to be installed in the first quarter of FY21. This Scope of Works (SOW) describes the drilling and installation requirements for 8 new standpipe monitoring bores at 4 sites. Development of a TARP for the new monitoring bores approximately 2 years after the bores have been installed. The TARP development will also be dependent on review by a suitably qualified hydrogeologist.
It is recommended the MOP includes summary information on the tailings storage facility closure and rehabilitation strategy for both the North Cut and West Cut, and references the relevant reports/management plans as appendices.	Closure and capping of the North cut tailings dam as a project combined with Main dam (Decommissioning of the Main Dam) and Dam 4 will continue in the AFP period. The Project is for closure and rehabilitation of the North Cut Tailings Storage Facility (TSF), Main Dam, and Dam 4, an area spanning 51.5 hectares. With the aim to: • Enable Main Dam to be de-prescribed in accordance with the NSW Dam Safety Committee (DSC) guidelines. • Cap the North Cut TSF • Manage potential acid forming (PAF) and spontaneous combustion materials to reduce health, safety and environmental risks • Rehabilitate the site to create a safe, stable, non-polluting and sustainable landscape that achieves the intended final land uses and supports sustained vegetation growth The final landform design for North Cut TSF includes: • A geomorphic design in accordance with Project Approvals, namely, a safe, stable and non-polluting final landform designed to incorporate natural micro-relief and natural drainage lines to integrate with surrounding landforms • A minimum final surface grade of 4%-5% to counter the anticipated settlement so site remains free-draining post-settlement. • Surface drains on TSF capping surface to direct runoff from capped area towards the northern and southern ends to reduce drainage length • Incorporation of the adjacent waste dump into TSF capping bulk fill to provide stable long-term batter slope and reduce imported fill demand • Providing sediment ponds at the outlet of surface drains to treat water at source (capping area is likely to produce highest sediment load until the vegetation cover has been established) • Minimisation of bulk fill requirements due to restrictions on Mine Operations to carry out bulk filling operations (Mine Operations to provide Mine Material to stockpile within Dam 4 and Civil Contractor to place material into works) • Stabilising the existing North Cut TSF western embankment with outer buttress • Decommissioning the existing emergency spillway over the earthen embankment • Encapsulation of the area of potential spontaneous combustions with extension of compacted clay The Northcut closure activity time frames are dependent on the drying and consolidation process outcomes. Below are key milestones for the project. These milestones are a guide, as during the project, actual data will be used to modify and update

	the project: • drying and consolidation underway to enable for construction –end of FY21 • capping construction commence – early FY22 • topsoiling and seeding commence – mid FY23

Also provided along with this letter are The Main Dam and North Cut TSF Closure Design Report and the Monitoring Bore Drilling Specifications. These documents are written specifically for HVEC to execute the projects and are not attached to the MOP as they have not been produced for the public. The summary provided in the MOP is considered sufficient for both regulation and community information.

Please do not hesitate to contact Luke Neil on [redacted] or at luke.l.neil@bhpbilliton.com.

Regards,

Ross Carlson
Mining Engineering Manager
Mt Arthur Coal