



DENDROBIUM MINE LANDSCAPE MANAGEMENT PLAN

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DOCUMENT REVISION LOG

Persons authorising this Plan

NAME	TITLE	DATE
Chris Schultz	Superintendent Environment	August 2021

Document Revisions

REVISION	DESCRIPTION OF CHANGES	DATE
1.0	Original Document	April 2003
2.0	Migrated to Documentum	
3.0	Review as required by the revised Development consent (issued 8 December 2008)	April 2009
3.1	Incorporation of comments from the Dept. of Planning	September 2009
4.0	Reviewed and updated to include contaminated land, land classification (freshwater and marine areas, protected areas and high conservation areas) and threatened species.	September 2011
5.0	Triennial Review as required by the revised Development Consent	March 2012
6.0	The following changes have been made: <ul style="list-style-type: none"> - Updated Roles and Responsibilities - References to parent company - References to documents update - Inclusion of reference to the <i>"Managing Urban Stormwater: Soils and Construction Manual"</i> 	January 2018
6.1	Incorporation of comments from Department of Planning & Environment	August 2018
7.0	Updated to new format and general update of content. Incorporation of comments from consultation.	August 2021

Persons involved in the review of this Plan

NAME	TITLE	COMPANY	EXP (YRS)	DATE
Chris Schultz	Superintendent Environment	South32 IMC	26	August 2021
Tom McMahon	Specialist Environment	South32 IMC	3	June 2021
Jasmine Gale	Principal Closure Plans and Studies	South32	13	August 2021

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1. INTRODUCTION

Dendrobium Mine is an underground mine which commenced construction in January 2002 following approval from the Minister of the then Department of Urban Affairs and Planning on 20 November 2001. Longwall mining commenced at Dendrobium in April 2005. The mine is owned and operated by Dendrobium Coal Pty Ltd, a subsidiary of Illawarra Coal Holdings Pty Ltd (ICHPL), which is a wholly owned subsidiary of South32 Limited. The mine operates on a continuous basis, 24 hours a day and 7 days a week.

The mining operations are located immediately adjacent to Mt Kembla, approximately 8 km west of Wollongong, NSW, on the Illawarra escarpment (refer to Plan 1). Mt Kembla village, located within 500 m of the Pit Top site, has close historical links with coal mining.

Dendrobium produces predominately metallurgical coal from the Wongawilli Seam (Areas 1, 2 and 3) and is approved to produce up to 5.2 million tonnes of run of mine (RoM) coal per annum. The BlueScope Steel Port Kembla Steel Works (PKSW) and Liberty Primary Steel (Whyalla) are major customers. In addition to these Australian based customers, coal is exported via the Port Kembla Coal Terminal (PKCT) to international customers.

Approval for mining in Areas 1, 2 and 3 was granted under DA 60-03-2001, as modified (the Consent).

Dendrobium Mine, Cordeaux Colliery and Appin Mine (and associated facilities) collectively operate as South32 Illawarra Metallurgical Coal (IMC).

This Landscape Management Plan (LMP) has been prepared to detail the rehabilitation and mine closure requirements relating to the surface facilities. This LMP has been prepared to satisfy Conditions 19, 20 and 21 of Schedule 4 of the Consent for the Landscape Management Plan, which includes the Rehabilitation Management Plan and Mine Closure Plan.

1.1 Objectives

The objectives of the LMP are to:

- outline processes to comply with the Consent and other legislation with regards to land and vegetation management, rehabilitation and closure;
- minimise land clearing and disturbance footprints;
- maximise opportunities for progressive rehabilitation;
- provide preliminary criteria and standards for site closure; and
- describe a monitoring, auditing and reporting system to measure performance against the land management objectives during the operation of Dendrobium Mine.

1.2 Scope

The scope of the LMP applies to all existing and future activities related to Dendrobium Mine including:

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- Dendrobium Pit Top - consists of administration buildings, workshop, machinery and equipment storage areas, personnel and materials access to the underground workings via the Dendrobium Tunnel, sediment pond and water treatment facility.
- Kemira Valley Coal Loading Facility (KVCLF) – receives coal from underground via the Kemira Valley Tunnel. Run of Mine (RoM) coal is transported from underground to KVCLF via an extensive coal clearance system. The coal is then fed into a rill tower and deposited onto a 140,000 tonne stockpile from which it is loaded into trains via an enclosed rail-loading chute. Sediment ponds are in place.
- Dendrobium Coal Preparation Plant (DCPP) – located within the PKSW, the DCPP receives and washes RoM coal from the underground operations.
- Kemira Valley Rail Line (KVRL) – used to transport the coal from KVCLF to the DCPP.
- Ventilation Shaft (VS) 1 - located within the Metropolitan Special Area (MSA) administered by WaterNSW, operates as a downcast shaft (i.e. drawing fresh air into the underground workings). VS1 is located on land owned by IMC.
- VS2 and VS3 – located within the MSA and within Mining Lease ML 1566. VS2 operates as an additional downcast shaft whilst VS3 operates as an upcast shaft (i.e. drawing air out of the underground workings).

Refer to Plan 1 for locations of the above.

Land management and rehabilitation associated with the underground workings is addressed in the relevant Subsidence Management Plan (SMP).

1.3 Environmental Management System

IMC has a comprehensive Environmental Management System (EMS) in place to minimise the impact of its operations on the local environment and community. The LMP is a component of the EMS which is certified to ISO 14001.

1.4 Consultation

Consultation has been undertaken as part of this review of the LMP with the Resources Regulator, Biodiversity and Conservation Science Directorate¹ (BCS) and WaterNSW. The comments from the consultation process have been incorporated into this version of the LMP.

Appendix 2 outlines comments from the relevant government agencies following consultation and the IMC response.

Consultation with agencies as stated in Condition 19 of Schedule 4 of the Consent will only be undertaken where there is a material change to the LMP or if specifically requested by DPIE. Administrative or descriptive changes do not constitute a material change.

¹ Previously Office of Environment and Heritage (OEH)

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2. ROLES AND RESPONSIBILITIES

Roles and responsibilities associated with environmental management at Dendrobium Mine are defined in the Environmental Management Strategy. Table 1 outlines the roles and responsibilities associated with the implementation and periodic review of the LMP.

Table 1: Roles and Responsibilities

Role	Responsibilities
Superintendent Environment	Implementation and periodic review of the LMP. Liaise with government regulators and IMC senior leadership team in relation to rehabilitation and mine closure issues.
Specialist Environment	Advise, coach and mentor IMC operations with respect to meeting the standards and requirements of the LMP. Monitor and review compliance against these requirements. Assess and issue Permits to Disturb. Supervise on-site rehabilitation work.
Engineer Projects	Coordinate and supervise legacy projects work.
Manager Approvals General Manager Dendrobium Mine	Provide the necessary resources and systems to ensure that requirements of the LMP are met.
External Affairs Team	Meet the commitments contained within the LMP for stakeholder engagement and landowner notifications.
Principal Closure Plans and Studies	Review and maintain the Dendrobium Mine and Cordeaux Colliery Closure Plan. Maintain closure provision.



3. LEGISLATION AND PLANNING

3.1 Consent Conditions

Rehabilitation and mine closure requirements associated with Dendrobium Mine were assessed during the preparation of the Dendrobium Project Environmental Impact Statement (EIS) 2001. The EIS was assessed and approved under the *Environmental Planning and Assessment Act 1979 (EP&A Act)* and associated Regulations.

All activities carried out at Dendrobium Mine will be in accordance with the conditions of Consent and generally in accordance with the EIS.

Appendix 1 outlines the land management requirements of the Consent and cross references where the requirements have been addressed within the LMP.

3.2 Environment Protection Licence Requirements

Environment Protection Licence No. 3241 (EPL 3241) applies to Dendrobium Mine and associated activities. A copy of the licence can be accessed at the Environment Protection Authority (EPA) website:

<http://www.epa.nsw.gov.au/prpoeoapp/>.

3.3 Mining Leases

Dendrobium Mine operates in accordance with the following mining leases:

- Consolidated Coal Lease (CCL) 768.
- Mining Lease (ML) 1510 (covers the KVCLF).
- ML 1566 (covers VS2 and 3).

Condition 3 of CCL 768 states:

The lease holder must comply with an approved Mining Operations Plan (MOP) in carrying out any significant surface disturbing activities, including mining operations, mining purposes and prospecting. The Lease holder must apply to the Minister for approval of a MOP. An approved MOP must be in place prior to commencing any significant surface disturbing activities, including mining operations, mining purposes and prospecting.

3.4 Relevant Legislation

Key regulatory and LMP obligations applicable to Dendrobium Mine are managed via an obligations management database. The obligations are allocated to responsible personnel. This process is detailed in the Environmental Compliance/Conformance Assessment and Reporting Procedure.

Legislation that may be applicable to landscape management includes but is not limited to:

- *Protection of the Environment Operations Act 1997 (POEO Act)*;
- *Environmental Planning and Assessment Act 1979 (EP&A Act)*;
- *Mining Act (1992)*;

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- *Mining Amendment (Standard Conditions of Mining Leases - Rehabilitation) Regulation 2020*;
- *Heritage Act (1977)*; and
- *Contaminated Land Management Act (1997)*.

3.5 Guidelines and Standards

This LMP has been developed to be consistent with the principles of the following:

- ISO 14001:2015 Environmental Management Systems;
- South32 Sustainability Policy;
- South32 Closure Standard; and
- South32 Environment Standard.

Other relevant guidelines for rehabilitation and closure include:

- ESG3 Mining Operations Plan (MOP) Guidelines (September 2013);
- EDG01 Borehole Sealing Requirements on Land: Coal Exploration (2012);
- EDG02 Borehole Sealing Requirements on the Beds of Water bodies: Coal Exploration (1997);
- Integrated Mine Closure: Good Practice Guide (2nd edition 2019);
- Managing Urban Stormwater: Soils and Construction Manual (Landcom 2004, or its latest version) (the Blue Book);
- MDG6001 Guidelines for the Permanent Filling and Capping of Surface Entries to Coal Seams (NSW Division of Resources & Energy, 2012);
- National standards for the practice of ecological restoration in Australia:
<http://www.seraustralasia.com/standards/National%20Restoration%20Standards%202nd%20Edition.pdf>;
- Mine Closure and Completion – Leading Practice Sustainable Development Program for the Mining Industry (Department of industry, Tourism and Resources 2006); and
- Strategic Framework for Mine Closure (Australian and New Zealand Minerals and Energy Council, and the Minerals Council of Australia).

4. REHABILITATION MANAGEMENT PLAN

The MOP has been developed as the comprehensive Rehabilitation Management Plan for the Dendrobium operations. The current MOP is for the period 1 July 2015 to 30 June 2022, and is available on the South32 website using [this link](#).

Legislative reform is currently underway. In late 2020, the Resources Regulator sought feedback on the *Mining Amendment (Standard Conditions of Mining Leases - Rehabilitation) Regulation 2020* and associated mandatory requirements. Feedback has been received and legislative amendments are being progressed. These reforms will require the review of the MOP and its conversion to a Rehabilitation Management Plan

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(RMP). It is proposed that the LMP will also be reviewed as part of this process, which may result in the incorporation of requirements of the LMP into the RMP.

This section provides a summary of the requirements for rehabilitation as detailed in the current MOP.

Progressive rehabilitation will be undertaken where possible. The learnings from the progressive rehabilitation program will be applied to rehabilitation and closure at the end of mine life.

Surface facilities sites² are required to be rehabilitated to the satisfaction of the Resources Regulator. Surface facilities sites in the MSA are also required to be rehabilitated to the satisfaction of WaterNSW. All surface facilities as defined by the Consent are still operational.

4.1 Dendrobium Mine and KVCLF

4.1.1 Location

Dendrobium Mine Pit Top is located west of Mt Kembla at an elevation of 300 metres. Entry to the site is from Cordeaux Road east of the Harry Graham Drive intersection. Upper American Creek passes around the site on its south western, southern and eastern sides and flows down through Mt Kembla to join Brandy and Water Creek.

Site topography consists of terraces and embankments within and at edges to the site. The area around the mine is vegetated with predominantly native plant types, often with a strong understory of lantana and other weed growth where the tree canopy has been disturbed. The area of disturbance at the Pit Top is approximately seven hectares.

The KVCLF is located in a small valley at the end of Stones Road, Mt Kembla approximately 2 km northeast of Dendrobium Mine and north of Mt Kembla Village. Brandy and Water Creek flows through and around the site. The area of disturbance at the KVCLF is approximately nine hectares.

4.1.2 Management Strategies

Strategies and controls utilised at the Pit Top and KVCLF to retain vegetation, minimise the risk of erosion and sediment issues and maximise the success of rehabilitation include:

- Minimise disturbance of land to reduce the risk of soil erosion and sediment loss to American Creek and Brandy and Water Creek.
- Revegetate/stabilise disturbed areas as soon as practical with suitable species using one or more of the following methods:
 - Tube stock: Where planted, tube stock will be protected by tree guards (if required) and endemic species will be used (where available).

² Surface facilities are defined in the Consent as pit top facilities, mine access drift portal, conveyors, three ventilation shafts and fans, ROM coal stockpile, KVCLF, KVRL, access roads and associated development allowed to be constructed under the Consent.

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- Hydromulch or direct seeding: Seed mixes will be dependent on the area of disturbance, however will generally include grass, shrub and/or tree seeds. Seeds will preferentially be sourced from within a radius of 10 kilometres from the site, however seeds of endemic species collected elsewhere may be used where local seed is not available.
- Brush matting and transferring of leaf litter or pugs of topsoil (where suitable material is available).
- Natural regeneration: May be suitable in some areas where the erosion risk is negligible and rehabilitation works may result in greater areas of disturbance.
- Retain heritage listed trees (except where there is a threat to infrastructure or personnel).
- Undertake weed control to actively control/eradicate noxious weeds (or mitigate the risk of new weeds being introduced into the area) and progressively control other weeds present on site in accordance with accepted bush regeneration and landscape methods.
- Manage vegetation to provide vegetative screening between the site and the local community (where possible).
- Undertake supplementary plantings in suitable areas where feedback has been received from members of the community.
- Complete bushfire hazard reduction works, including the removal of trees and undergrowth, as required to reduce the risk to site infrastructure from bushfire. A qualified arborist will be utilised for tree removal.
- Utilise the Permit to Disturb process for vegetation removal.
- Trim or remove trees following storm events where there is a risk of harm to personnel, infrastructure or equipment.
- Require Lessees to manage properties leased for the grazing of cattle as required by their licence and maintain fences to ensure stock remain off the road and do not cause damage to adjoining tree plantings. Sustainable grazing is encouraged.
- Regularly inspect operational areas to identify any areas of site contamination or unauthorised land clearing. Investigations will occur immediately where soil contamination or unauthorised land clearing is identified.
- Undertake measures as required to reduce the impact of abandoned mine workings on stored waters and dams, including the sealing of old mine workings where applicable.

Where new large-scale construction activities are undertaken, a Construction Management Plan will be developed which will include specific land and vegetation practices to be complied with during the development. It will be a requirement to minimise the disturbance footprint and maximise retention of remnant vegetation. Any construction activities will be designed to be consistent with the requirements of the Managing Urban Stormwater: Soils and Construction Manual (Landcom 2004, or its latest version).

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4.1.3 Short, Medium and Long-Term Rehabilitation Measures

Rehabilitation of legacy sites is being progressed. Infrastructure that has been recently removed includes a switch yard in Figtree, old power lines and poles, a transformer near Mt Keira, a switchyard/substation at the Pit Top and a pumphouse near the Mt Kembla Motocross Track. Opportunities to continue the removal of legacy infrastructure continue to be reviewed.

There are currently no plans for short or medium term rehabilitation of the Dendrobium Pit Top or KVCLF. The disturbed areas are being utilised for operational activities. Vegetation management will continue as described in Section 6.

The long-term rehabilitation measures for these sites are dependent on the final land use selected in consultation with the community and relevant regulatory agencies.

Rehabilitation measures will address:

- Site stability – site to be left in a stable condition to reduce the risk of erosion and sediment run off from the site and reduced risk of land slippage.
- Species diversity – rehabilitated areas to be revegetated with species endemic to the surrounding area and weed species abundance to be minimised.
- Site contamination – contaminated, redundant and waste material and equipment to be removed from site.
- Heritage – heritage values to be maintained where appropriate (taking into account public safety, future use, maintenance and regulatory requirements).
- Public safety – site structures to be appropriately safeguarded, hazards to be identified and controlled and asset protection zones to be maintained.

As noted in Section 5.5, there are a range of post closure land uses available, including the option of land redevelopment. The land use selection will have a significant influence on the rehabilitation measures applicable for the site.

4.1.4 Performance and Completion Criteria

Performance and completion criteria are yet to be defined as the final land use for the site has not been designated. Dependent on the agreed post closure land use, performance and completion criteria may include:

- All non-heritage listed buildings and site infrastructure removed.
- Water quality contaminants within relevant guidelines.
- Surface water management infrastructure designed in line with the approved management plan.
- Soil contaminants within relevant guidelines. Contaminated material that does not meet relevant guidelines to be treated on site or removed from site to the satisfaction of the relevant regulatory agencies.
- Portals and mine entrances sealed in accordance with relevant guidelines.
- Site re-profiled to meet final landform design.

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- Bare or stripped areas topsoiled, considering factors including desired vegetation, quality and quantity of surface and subsoil available and the nature of the underlying material.
- Revegetation to meet the approved final LMP/RMP utilising local species (where available).
- Trajectory analysis indicates selected biometric indicators (species richness and vegetation cover) are on track to achieve like that of pre-determined reference benchmarks.
- Weed species abundance to be less than or equal to abundance of weed species in surrounding areas after five years (based on assessment at time of closure).
- Asset Protection Zone maintained for bushfire protection for remaining structures, Mt Kembla and Kembla Heights.
- Appropriate barriers and fencing in place for public safety.

Performance and completion criteria will be reviewed over the life of the operation, taking into account community and regulatory expectations and leading closure practice within the mining industry.

4.1.5 **Monitoring**

Following site closure and the finalisation of rehabilitation works, the following monitoring will be undertaken for at least five years after works have been completed:

- Weed assessments will be undertaken annually to assess the abundance and species of weeds on site and recommend appropriate control strategies.
- Tube stock plantings and direct seeding areas (where applicable) will be reviewed annually to assess growth and determine whether additional plantings are required.
- Water quality monitoring will be undertaken every two months for the first year and then at least annually (or as required).
- Drainage structures will be inspected every two months for the first year and then at least annually (or as required).
- Erosion and sediment controls will be inspected every two months or after significant rainfall events until a satisfactory vegetation cover has been established.
- Fencing and other safety measures will be inspected at least annually and as required.

Monitoring requirements will be reviewed over the life of the operation, taking into account community and regulatory expectations and leading closure practice within the mining industry.

4.2 **KVRL**

4.2.1 **Location**

Coal extracted from Dendrobium Mine is transported by rail from the KVCLF to the DCPD at the PKSW along a railway corridor owned by IMC.

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4.2.2 Management Strategies

Strategies and controls utilised along the KVRL to ensure the retention of vegetation, minimise the risk of erosion and sediment issues and maximise the success of rehabilitation include:

- Minimise disturbance to reduce the risk of soil erosion and sediment loss.
- Undertake weed control to target noxious weeds (or mitigate the risk of new weeds being introduced into the area) and progressively control other weeds present on site in accordance with accepted bush regeneration and landscape methods.
- Manage vegetation where possible to provide vegetative screening between the rail line and the local community.
- Undertake supplementary planting in suitable areas where feedback has been received from members of the community.

4.2.3 Short, Medium and Long-Term Rehabilitation Measures

There are currently no plans for short or medium-term rehabilitation of the KVRL as the line is operational. Vegetation along the railway line is maintained to provide a clearway for the safe passage of trains.

The long-term rehabilitation measures for this area are dependent on the final land use selected in consultation with the community and relevant regulatory agencies.

Rehabilitation measures will address:

- Site stability – site to be left in a stable condition to reduce the risk of erosion and sediment run off from the site.
- Species diversity – rehabilitated areas to be revegetated with species endemic to the surrounding area and weed species abundance to be minimised.
- Site contamination – contaminated, redundant and waste material and equipment to be removed from site.
- Heritage – heritage values to be maintained where appropriate (taking into account public safety, future use, maintenance and regulatory requirements).
- Public safety – public safety hazards to be removed.

The use of the KVRL may continue post mine closure. The land use selection will have a significant influence on the rehabilitation measures applicable for the site.

4.2.4 Performance and Completion Criteria

There are currently no plans for short or medium term rehabilitation of the KVRL. The disturbed areas are being utilised for operational activities. Vegetation management will continue as listed in Section 4.2.2.

Long term performance criteria have not been established as the final land use for the KVRL has not been designated. Post closure land use will be determined after consultation with government and other relevant stakeholders.

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Performance and completion criteria will be reviewed over the life of the operation, taking into account community and regulatory expectations and leading closure practice within the mining industry.

4.2.5 **Monitoring**

Following site closure and completion of rehabilitation works, the following monitoring will be undertaken for at least five years after works have been completed:

- Weed assessments will be completed annually to assess the abundance and species of weeds on site and recommend appropriate control strategies.
- Tube stock plantings and direct seeding areas (where applicable) will be reviewed annually to assess growth and determine whether additional plantings are required.
- Drainage and sediment control structures will be inspected every two months for the first year and then at least annually (and as required).
- Fencing and other safety measures will be inspected at least annually and as required.

Monitoring requirements will be reviewed over the life of the operation, taking into account community and regulatory expectations and leading closure practice within the mining industry.

4.3 **VS1**

4.3.1 **Location**

VS1 is located approximately 375 m west of Harry Graham Drive and Morans Road Junction at Mt Kembla. Two hectares of land was disturbed however grasses and shrubs have re-established (revegetated) over the majority of the site. The access road and pad remain disturbed to allow access to the site.

4.3.2 **Management Strategies**

Strategies and controls utilised at VS1 to retain vegetation, minimise the risk of erosion and sediment issues and maximise the success of rehabilitation include:

- Minimise disturbance of land (with the exception of the 20 metre asset protection zone).
- Maintain Asset Protection Zones to reduce the bushfire hazard.

Weed control will be undertaken to control and where possible eradicate noxious weeds (or mitigate the risk of new weeds being introduced into the area) and progressively control other weeds present on site in accordance with accepted bush regeneration and landscape methods.

4.3.3 **Short, Medium and Long-Term Rehabilitation Measures**

There are currently no plans for short or medium-term rehabilitation of VS1 as it continues to operate as a downcast shaft for Dendrobium Mine. The site was previously an upcast shaft with two fans installed, however these fans and the associated infrastructure have now been removed and relocated to VS3.

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The long-term rehabilitation measures for this site will include:

- Site stability – site to be left in a stable condition to reduce the risk of erosion and sediment run off from the site.
- Species diversity – rehabilitated areas to be revegetated with species endemic to the surrounding area and weed species abundance to be minimised.
- Site contamination – contaminated, redundant and waste material and equipment to be removed from site.
- Public safety – site structures to be appropriately safeguarded and hazards to be identified and controlled.

4.3.4 Performance and Completion Criteria

Long term performance criteria include:

- Shaft sealing to be undertaken in accordance with regulatory requirements.
- Site re-profiled to meet final landform design.
- Bare or stripped areas topsoiled, considering factors including desired vegetation, quality and quantity of surface and subsoil available and the nature of the underlying material.
- Water quality contaminants within relevant guidelines.
- Surface water management infrastructure designed in line with the approved management plan.
- Appropriate barriers and fencing in place for public safety.
- Removal of infrastructure and equipment from the site.
- Revegetation to meet the approved final LMP/RMP utilising local species (where available).
- Trajectory analysis indicates selected biometric indicators (species richness and vegetation cover) are on track to achieve like that of pre-determined reference benchmarks.
- Weed species abundance to be at a minimum equal to abundance of weed species in surrounding areas after five years (based on assessment at time of closure).

Performance and completion criteria will be reviewed over the life of the operation, taking into account community and regulatory expectations and leading closure practice within the mining industry.

4.3.5 Monitoring

Following site closure and the finalisation of rehabilitation works, the following monitoring will be undertaken for at least five years after works have been completed:

- Weed assessments will be undertaken annually to assess the abundance and species of weeds on site and recommend appropriate control strategies.
- Tube stock plantings and direct seeding areas (where applicable) will be reviewed annually to assess growth and determine whether additional plantings are required.

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- Fencing and other safety measures will be inspected at least annually and as required.

Monitoring requirements will be reviewed over the life of the operation, taking into account community and regulatory expectations and leading closure practice within the mining industry.

4.4 VS 2/3

4.4.1 Location

The VS 2/3 site is located in the WaterNSW MSA near the southern arm of Lake Cordeaux. The area of land disturbed at this site is 5.262 hectares. Tube stock planting and direct seeding was completed in 2008.

4.4.2 Management Strategies

Strategies and controls utilised at VS 2/3 to retain vegetation, minimise the risk of erosion and sediment issues and maximise the success of rehabilitation include:

- Minimising land disturbance to reduce the risk of soil erosion and sediment loss.
- Replanting of disturbed areas with suitable species:
 - Use of tube stock across the site and in the powerline corridor.
 - Direct seeding with seeds that were sourced from within a 10-kilometre radius of the site.
- Installation of sediment ponds for erosion control.
- Maintenance of tracks following rainfall events.
- Undertaking weed control as required for weeds present on site in accordance with accepted bush regeneration and landscape methods.

4.4.3 Short, Medium and Long-Term Rehabilitation Measures

No additional rehabilitation of this site is planned for the short or medium term. This site will continue to be an operational site for the life of Dendrobium Mine.

The long-term rehabilitation measures for this site will include:

- Site stability – site to be left in a stable condition to reduce the risk of erosion and sediment run off from the site.
- Species diversity – rehabilitated areas to be revegetated with species endemic to the surrounding area and weed species abundance to be minimised.
- Site contamination – contaminated, redundant and waste material and equipment to be removed from site.
- Public safety – site structures to be appropriately safeguarded and hazards to be identified and controlled.

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4.4.4 Performance and Completion Criteria

Long term performance criteria will include:

- Shaft sealing to be undertaken in accordance with regulatory requirements.
- Appropriate barriers and fencing in place for public safety.
- Site re-profiled to meet final landform design.
- Bare or stripped areas topsoiled, considering factors including desired vegetation, quality and quantity of surface and subsoil available and the nature of the underlying material.
- Water quality contaminants within relevant guidelines.
- Surface water management infrastructure designed in line with the approved management plan.
- Removal of infrastructure and equipment from the site.
- Trajectory analysis indicates selected biometric indicators (species richness and vegetation cover) are on track to achieve like that of pre-determined reference benchmarks.
- Weed species abundance to be at a minimum equal to abundance of weed species in surrounding areas after five years (based on assessment at time of closure).

Performance and completion criteria will be reviewed over the life of the operation, taking into account community and regulatory expectations and leading closure practice within the mining industry.

4.4.5 Monitoring

Rehabilitation monitoring at the site was undertaken every six months for a period of three years post revegetation (completed in 2008). A photographic record was also maintained. Rehabilitation of the non-operational area has been successful and will continue to be monitored on an as needed basis.

Following site closure and the finalisation of rehabilitation works, the following monitoring will be undertaken for at least five years after works have been completed:

- Weed assessments will be undertaken annually to assess the abundance and species of weeds on site and recommend appropriate control strategies.
- Tube stock plantings and direct seeding areas (where applicable) will be reviewed annually to assess growth and determine whether additional plantings are required.
- Drainage lines and erosion and sediment controls will be nominally inspected every quarter or after significant rainfall events until a satisfactory vegetation cover has been established.
- Fencing and other safety measures will be inspected at least annually and as required.

Monitoring requirements will be reviewed over the life of the operation, taking into account community and regulatory expectations and leading closure practice within the mining industry.

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4.5 DCP

The DCP is located within the PKSW. The DCP area is leased to IMC by BlueScope Steel. The demolition of these assets and remediation of the leased areas of land are the subject of agreements between BlueScope Steel and South32.

4.6 Unplanned Land Surface Failures

4.6.1 Management Strategies

Strategies and controls to be utilised in the event of an unplanned land surface failure will be considered on a case by case basis, but all will address any safety concerns relating to the site, maximise retention of native vegetation, minimise the risk of erosion and sediment issues and maximise the success of rehabilitation. These practices include:

- Securing the site from public access (where possible).
- Minimising land disturbance to reduce the risk of soil erosion and sediment loss.
- Replanting or seeding disturbed areas with suitable species:
 - Tube stock planting across the site (where appropriate).
 - Direct seeding using seeds sourced from within a 10 kilometre radius of the site (where available).
 - Natural regeneration may be suitable in some areas where the erosion risk is negligible and the area of disturbance is small.
- Undertaking weed control as required for weeds present on site in accordance with accepted bush regeneration and landscape methods.

4.6.2 Monitoring

Monitoring frequency of the site will be determined on a case by case basis.

4.7 Stored Waters and Dams

The potential impacts of mining operations on stored waters and dams is assessed as part of the EIS, EA and SMPs. The measures that have been implemented to ensure abandoned mine workings³ do not impact on stored waters and dams include setbacks and monitoring.

Setbacks from this infrastructure are determined during the application and approval process to minimise the risk of subsidence impacts from mining activities. This infrastructure is monitored during and after longwall panel extraction. Impacts are not likely after the conclusion of the active subsidence period.

³ It is noted that Dendrobium Mine is an operational mine and no mine workings under the Development Consent are currently 'abandoned'. Setbacks will address long term potential impacts. Monitoring during and post longwall extraction confirms the effectiveness of these setbacks.

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Monthly reporting under the Dams Safety Act is undertaken. The water balance at Dendrobium mine is reviewed on a monthly basis and is reported through to site management and Dams Safety NSW, DPIE and WaterNSW.

Modelling of stored water in underground workings following the cessation of mining has been undertaken and will be addressed in the closure plan when submitted.

5. MINE CLOSURE PLAN

Mine closure requirements are detailed in the Dendrobium Mine and Cordeaux Colliery Closure Plan dated December 2020. While the Closure Plan meets some of the requirements of Condition 21 of Schedule 4 of the Consent, it has been prepared internally and has not been prepared in consultation with the affected Councils and Community Consultative Committee (CCC).

As noted in Condition 19 of Schedule 4 of the Consent, the Mine Closure Plan may be submitted at a date agreed by the Secretary, provided that this date is at least two years prior to the planned cessation of mining at the site. The approved Life of Mine is 31 December 2030, and therefore the Mine Closure Plan is not being submitted as part of this revision of the LMP.

A summary of the Mine Closure Plan is provided in the following sections.

5.1 Objectives

The overarching closure and rehabilitation objective for Dendrobium Mine and associated sites is to create a post-mining landform appropriate for the proposed post-mining land use or, if that use is not yet known, as similar as possible in form and function to the pre-mining landscape of the area, and consistent with surrounding land uses.

Specific objectives for all sites are that the final rehabilitated landform must be:

- safe;
- stable;
- non-polluting; and
- consistent with key stakeholder expectations and surrounding lands.

For all sites except the KVRL and DCP, additional objectives (based on the final land use of natural bushland) are:

- the ecosystem function should be restored with local native plant species; and
- the ecosystem must be self-sustaining.

Based on the assumed land use of rural/residential land, an additional objective for the KVRL is access, landscaping and land surfaces (i.e. safety, geotechnical stability and drainage) should be suitable for rural/residential development.

5.2 Closure Requirements

A general description of closure requirements for each of the facilities associated with the Dendrobium operations is provided below.

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5.2.1 Pit Top, KVCLF and KVRL

Works proposed will include:

- remove salvageable underground infrastructure such as mining equipment and service infrastructure;
- hold auctions or transfer underground equipment to other IMC sites;
- demolish and remove major building infrastructure (pending assessment of heritage considerations);
- remove retired underground equipment, discarded conveyor belts, pipes, hoses, cables etc. from storage and scrap areas;
- remove any contaminated soil and backfill with clean material;
- remediate any contaminated soil by removal, encapsulation or landfarming on/off site;
- remove infrastructure related to water release points and stabilise discharge points and drainage lines appropriately to minimise erosion;
- fill and seal portals in accordance with regulatory requirements;
- demolish and remove concrete slabs and bitumen surfaces;
- demolish and remove redundant pipelines and services;
- demolish and remove redundant power lines;
- re-profile the site as per the approved final landform design to reduce the slope lengths by constructing contour banks and armouring channels to minimise erosion;
- topsoil bare or stripped areas;
- revegetate the site using local species (where available);
- rip and seed bare or stripped areas using an appropriate method (e.g. hydroseeding/hydromulching); and
- develop and implement ongoing maintenance management plans.

5.2.2 Ventilation Shaft Sites

Works proposed will include:

- demolish and remove major infrastructure;
- remove roadways, hardstand and foundations;
- remediate contaminated soil by removal, encapsulation or landfarming on/off site (noting that there are no currently identified contaminated sites);
- fill and seal the shaft to meet regulatory requirements;
- re-profile the site to reduce the slope lengths by constructing contour banks and armouring channels to minimise erosion;
- maintain or reconstruct drainage infrastructure, including sediment ponds, where required for sediment control;

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- topsoil bare or stripped areas;
- revegetate the site using local species (where available);
- rip and seed bare or stripped areas using an appropriate method (e.g. hydroseeding/hydromulching); and
- develop and implement ongoing maintenance management plans.

5.2.3 DCP

The DCP is located within the PKSW. The DCP area is leased to IMC by BlueScope Steel. The demolition of these assets and remediation of the leased areas of land are the subject of agreements between BlueScope Steel and South32.

5.3 Investigations and Documentation

The following investigations/documentation will be required prior to implementing major rehabilitation works:

- geotechnical investigations;
- contamination investigations;
- hazardous materials investigations;
- flora and fauna studies;
- European and Aboriginal heritage studies;
- risk assessments;
- detailed rehabilitation plans; and
- detailed engineering design and construction drawings.

Additional investigations/studies will be undertaken as determined through consultation with regulatory agencies and community stakeholders.

5.4 Stakeholder Consultation

Stakeholder consultation required for the Closure Plan has not been undertaken as Dendrobium is not expected to close in the next two years. Stakeholder consultation is recognised as an important objective under the South32 Closure Standard and a stakeholder consultation process will be developed at an appropriate time during the closure execution process as outlined in the standard. The nature of this process will be guided by the intended future of the sites.

External stakeholders may include but not be limited to:

- DPIE;
- DCCC;
- Subsidence Advisory;
- EPA;
- BCS;

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- WaterNSW;
- Wingecarribee Shire Council;
- Wollondilly Shire Council;
- Wollongong City Council; and
- Local community groups including Registered Aboriginal Parties (RAPs).

Dendrobium has a well-established stakeholder consultation process, which includes government agencies, environmental groups, RAPs and the local community.

Consultation with external stakeholders will include an investigation of ways to minimise the adverse socio-economic effects associated with mine closure, including a reduction in local and regional employment.

5.5 Post Closure Land Use Objectives

Consistent with the objectives of South32 and government requirements, it is intended to achieve sustainable land-use conditions as agreed with the applicable government regulators and affected communities.

The final land use objectives are to:

- comply with relevant or applicable legislative requirements;
- protect public and employee health, safety and welfare;
- limit or mitigate adverse environmental effects;
- protect indigenous values; and
- achieve sustainable land-use as agreed with the applicable government regulator and affected communities.

It is assumed that the potential end land uses of the Dendrobium Mine sites may be diverse, and will be investigated in detail closer to mine closure.

Potential final land uses for the Pit Top include:

- Residential development
- Light industry.
- Bushland.
- Tourist/historical mine.
- Commercial development or office accommodation.
- Field study facility.

Potential final land uses for the KVCLF include:

- Bushland - green corridor between the escarpment and coastal plain.
- Tourist/historical mine site or rail terminus for tourist activity.
- Light industrial complex.

The management and use of heritage listed buildings post closure will be determined in consultation with relevant stakeholders. Potential uses may include ongoing use as offices,

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conversion to mining heritage museum or a community space. It is preferred that an ongoing use is identified to preserve the integrity of the buildings in the long term.

There are no potential future land uses for the Ventilation Shaft sites. These areas will be rehabilitated to native bushland and remain part of the WaterNSW MSA.

The future use of land on which the DCP is located will be determined by BlueScope Steel.

5.6 Completion Criteria

It is a requirement of South32 that systems are in place and Key Performance Indicators (KPIs) are aligned to ensure that those parts of an operation that are available for closure and/or rehabilitation are completed efficiently and without delay or deferral.

Where relevant, the Closure Plan will need to outline the completion criteria (as determined through consultation with key government and community stakeholders), an implementation timetable, and KPIs for closure execution. Due to the expected continued operation of Dendrobium Mine in the medium term, a closure plan timetable has not been developed for this plan.

Current completion criteria are provided in Section 6 of the MOP, available [here](#).

5.7 Post Closure Monitoring

Post closure monitoring for the rehabilitated and decommissioned site is expected to include:

- Documentation of the rehabilitation activities carried out.
- Initial closure monitoring for a period of one to two years post closure.
- Ongoing monitoring (less frequently) from two years post mining until lease relinquishment.
- Use of adaptive management techniques and facilitate research trials where appropriate.

Post-closure monitoring will focus on achieving the stated outcomes in terms of:

- Revegetation.
- Contamination remediation.
- Gas management.
- Water management.
- Land stability (geotechnical).
- Site safety and security.

5.8 Contingency Planning

A Trigger Action Response Plan (TARP) is provided in Section 9.2 of the MOP. The TARP identifies the actions that will be taken if rehabilitation and closure completion criteria are unable to be met.

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6. BIODIVERSITY MANAGEMENT

Baseline assessments on biodiversity and land use are included in the following documents:

- Environmental Impact Statement for the Dendrobium Coal Project;
- Environmental Assessment for Modification to Dendrobium Area 3;
- Environmental Assessment for the No.2 and 3 Ventilation Shaft Construction Project; and
- SMPs for mining domains.

Potential impacts on biodiversity and land use are assessed on an ongoing basis through:

- SMPs, developed for individual longwalls;
- Review of Environmental Factors (for exploration areas); and
- Permits to Disturb.

Areas of planned disturbance will be assessed for biodiversity value as a component of the approval process. Small on-site disturbance is managed through the Permit to Disturb process.

No surface activities associated with Dendrobium Mine are undertaken within the boundaries of World Heritage properties or International Union for the Conservation of Nature (IUCN) Protected Areas Categories I-IV, or where impacts would result in the extinction of species listed by the IUCN as being threatened with extinction. The Dendrobium Mining Area is located under the WaterNSW Metropolitan Special Area - Schedule 1 Protected Lands and the Illawarra Escarpment State Conservation Area.

A plan showing the designated protected areas and areas of high conservation value within the operational areas is shown in Plan 2. A summary of the threatened species list from the Dendrobium EIS is provided in Appendix 3.

Biodiversity offsets will be identified where appropriate and in consultation with the relevant regulatory agencies. Monitoring of impacts in these areas is undertaken under the relevant SMP.

Vermin, noxious weeds and feral animals on sites associated with Dendrobium Mine will be controlled in consultation with the relevant regulatory agencies as appropriate and in accordance with legislative and business requirements.

7. CONTAMINATED LAND

A Preliminary Contamination Assessment of Dendrobium Mine and KVCLF was undertaken by Basix Environmental Solutions in 2010. The assessment involved a review of site activities and history, other relevant data, and a site inspection to look for indicators of contamination. It also included a Risk Assessment conducted with site staff.

Information relating to the management of potentially contaminated sites associated with the Dendrobium operations, as identified in the preliminary assessment, is recorded in the Dendrobium Mine Contaminated Sites Register. The register contains information on the type of contamination, the likely impacted area and the current management action for each identified site. The register is reviewed periodically.

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8. COMPLAINTS AND NON-COMPLIANCE MANAGEMENT

8.1 Complaints and Dispute Resolution

IMC has a 24 hour, free community call line (1800 102 210) and email address (illawarracomunity@south32.net) which is displayed at IMC Projects and Mine Sites, and included in newsletters, letters and other correspondence. The call line is for all complaints and general enquiries regarding environmental or community issues associated with IMC's operations.

Community complaints and enquiries may also be received in person by any employee of IMC, with details to be immediately shared with the External Affairs Team for investigation. All rehabilitation and land management complaints received in relation to Dendrobium Mine will be managed in accordance with the Handling Community Complaints, Enquiries and Disputes Procedure.

Upon receipt of a community complaint, preliminary investigations will commence as soon as practicable to determine the likely cause of the complaint. An initial response will be provided to the complainant within 24 hours of the complaint being made, with a follow up response being provided as soon as practicable once a more detailed investigation is complete.

Where rehabilitation or land management issues are raised by an affected landowner or community member and the affected landowner or community member requests feedback in relation the issue raised, the landowner or community member will be provided with the investigation results and proposed course of corrective action.

A summary of all complaints received during the reporting year will be provided as part of the Annual Review. A log of complaints is also maintained on the IMC website at:

<https://www.south32.net/our-business/australia/illawarra-metallurgical-coal/documents>.

8.2 Events, Non-Compliance, Corrective Action and Preventative Action

Events, non-compliances, corrective actions and preventative actions are managed in accordance with the Reporting and Investigation Standard and Environmental Compliance/Conformance Assessment and Reporting Procedure. These procedures, which relate to all IMC operations, detail the processes to be utilised with respect to event and hazard reporting, investigation and corrective action identification. The key elements of the process include:

- identification of events, non-conformances and/or non-compliances;
- recording of the event, non-conformance and/or non-compliance in the event management system (G360);
- investigation/evaluation of the event, non-conformance and/or non-compliance to determine specific corrective and preventative actions;
- assigning corrective and preventative actions to responsible persons in G360; and
- review of corrective actions to ensure the status and effectiveness of the actions.

Non-compliances or incidents will be reported to all relevant agencies as detailed in Section 9.2.

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9. REPORTING AND REVIEW

9.1 Annual Review

IMC will report on the performance of the LMP in the Annual Review.

The Annual Review will include:

- complaints or incidents relating to rehabilitation and land management and management/mitigation measures undertaken;
- actions taken to address identified areas of land contamination; and
- a description of disturbance and rehabilitation activities undertaken during the reporting period.

The Annual Review is prepared in accordance with Condition 5 of Schedule 8 of the Consent and is submitted to relevant agencies in September each year. Annual Reviews are made available to the general public via the South32 website.

9.2 Incident Notifications

In accordance with Condition 3 and 4 of Schedule 8 of the Consent, the Department and any other relevant agencies will be notified immediately⁴ by IMC after becoming aware of an incident⁵. The notification will be in writing and submitted to compliance@planning.nsw.gov.au and identify the development and set out the location and nature of the incident.

9.3 Review of LMP

In accordance with Condition 2A of Schedule 8 of the Consent, the LMP will be reviewed, and if necessary revised, within three months, of:

- a) the submission of an incident report;
- b) the submission of an Annual Review;
- c) the submission of an Independent Environmental Audit (IEA) report; or
- d) the approval of any modification of the conditions of the Consent (unless the conditions require otherwise).

Outcomes from each review will be documented in the Management Plan Review Log. The LMP will only be revised where a material change to site operations or environmental management has occurred, or in accordance with the review period on the LMP. Administrative or descriptive changes do not constitute a material change.

Where a review triggers a revision of the LMP, the LMP will be revised and submitted to the Secretary for approval. The updated LMP will be implemented.

⁴ Notification within 24 hours is required under the Consent. Notification is required immediately after the person becomes aware of the incident under EPL 3241.

⁵ An incident is defined as an occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance.

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9.4 Audits

9.4.1 IEA

In accordance with Condition 6 of Schedule 8 of the Consent, an IEA shall be commissioned every three years, that will include a review of the LMP. The report is required to be submitted to the Secretary within three months of commencing the IEA⁶, in accordance with Condition 7 of Schedule 8.

IEAs have been conducted every three years since 2008, with the last IEA being conducted in 2020 and the next IEA to be conducted in 2023. Recommendations from the IEA will be incorporated into the LMP where appropriate.

9.4.2 ISO 14001

As part of the ISO 14001 certification, IMC maintains an environmental auditing and governance program across all of its operational sites. The program, which includes the use of competent internal and accredited external auditors, is an integral part of maintaining certification under the ISO 14001 standard.

External surveillance audits are undertaken on an annual basis, with recertification audits undertaken every three years.

Internal Governance Reviews of the LMP are nominally undertaken on a two yearly basis.

⁶ The date of commencing the IEA is defined as the first day of the site inspection.

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10. SUMMARY OF COMMITMENTS

Commitment	Section in LMP
IMC will provide personnel and resources to implement the LMP.	Section 2
IMC will comply with the conditions of Consent and relevant legislation.	Section 3
IMC will implement management strategies to retain vegetation, minimise the risk of erosion and sediment issues and maximise the success of rehabilitation.	Sections 4.1.2, 4.2.2, 4.3.2, 4.4.2 and 4.6.1
A Construction Management Plan will be developed for new large scale construction activities.	Section 4.1.2
Construction activities will be designed to be consistent with the requirements of the Blue Book.	Section 4.1.2
IMC will implement short, medium and long term rehabilitation measures.	Sections 4.1.3, 4.2.3, 4.3.3 and 4.4.3
IMC will continue to review opportunities for the removal of legacy infrastructure.	Section 4.1.3
Rehabilitation activities will be progressively undertaken (where possible) to progress towards meeting the agreed performance and completion criteria.	Sections 4.1.4, 4.2.4, 4.3.4, 4.4.4 and 5.5
Performance and completion criteria will be reviewed over the life of the operation.	Sections 4.1.4, 4.2.4, 4.3.4 and 4.4.4
Monitoring will be undertaken following the completion of rehabilitation and/or closure.	Sections 4.1.5, 4.2.5, 4.3.5, 4.4.5, 4.6.2 and 5.7
A Mine Closure Plan will be submitted at least two years prior to the planned cessation of mining at Dendrobium	Section 5
IMC will manage the disturbance of vegetation on site through the Permit to Disturb process.	Section 6
A Contaminated Sites Register will be maintained.	Section 7
IMC will report and investigate complaints and incidents as required, and identify and implement corrective actions.	Section 8
IMC will undertake reporting as required.	Section 9
IMC will review the LMP as required.	Section 9.3
IMC will undertake audits as required.	Section 9.4

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11. ACRONYMS

Term	Definition
BCS	Biodiversity and Conservation Science Directorate
CCC	Community Consultative Committee
CCL	Consolidated Coal Lease
DCPP	Dendrobium Coal Preparation Plant
DPIE	Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
EMS	Environmental Management System
EPA	Environment Protection Authority
<i>EP&A Act</i>	<i>Environmental Planning and Assessment Act</i>
EPL	Environment Protection Licence
G360	IMC event reporting system
ICHPL	Illawarra Coal Holdings Pty Ltd
IEA	Independent Environmental Audit
IMC	Illawarra Metallurgical Coal
IUCN	International Union for Conservation of Nature
KVCLF	Kemira Valley Coal Loading Facility
KVRL	Kemira Valley Rail Line
LMP	Landscape Management Plan
ML	Mining Lease
MOP	Mining Operations Plan
MSA	Metropolitan Special Area
PKCT	Port Kembla Coal Terminal
<i>POEO Act</i>	<i>Protection of the Environment Operations Act</i>
RAP	Registered Aboriginal Party

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RMP	Rehabilitation Management Plan
SMP	Subsidence Management Plan
RoM	Run of Mine
TARP	Trigger Action Response Plan
VS	Ventilation Shaft

12. REFERENCES

- DA 60-03-2001, as modified
- Dendrobium Coal Project EIS
- Environmental Assessment for Modification to Dendrobium Area 3
- Handling Community Complaints, Enquiries and Disputes Procedure (IHP0112)
- Reporting and Investigation Standard (IMCSTD0069)
- Environmental Compliance/Conformance Assessment and Reporting Procedure (IMCP0186)
- ISO 14001:2015 Environmental Management Systems Standard
- Dendrobium Mine and Cordeaux Colliery Closure Plan 2020
- Managing Urban Stormwater: Soils and Construction Manual (Landcom 2004)
- BASIX (2010) Preliminary Contamination Assessment of Dendrobium Mine and Kemira Valley Coal Loading Facility (KVCLF). March 2010

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13. PLANS

Plan 1: Dendrobium Mine Locality Plan

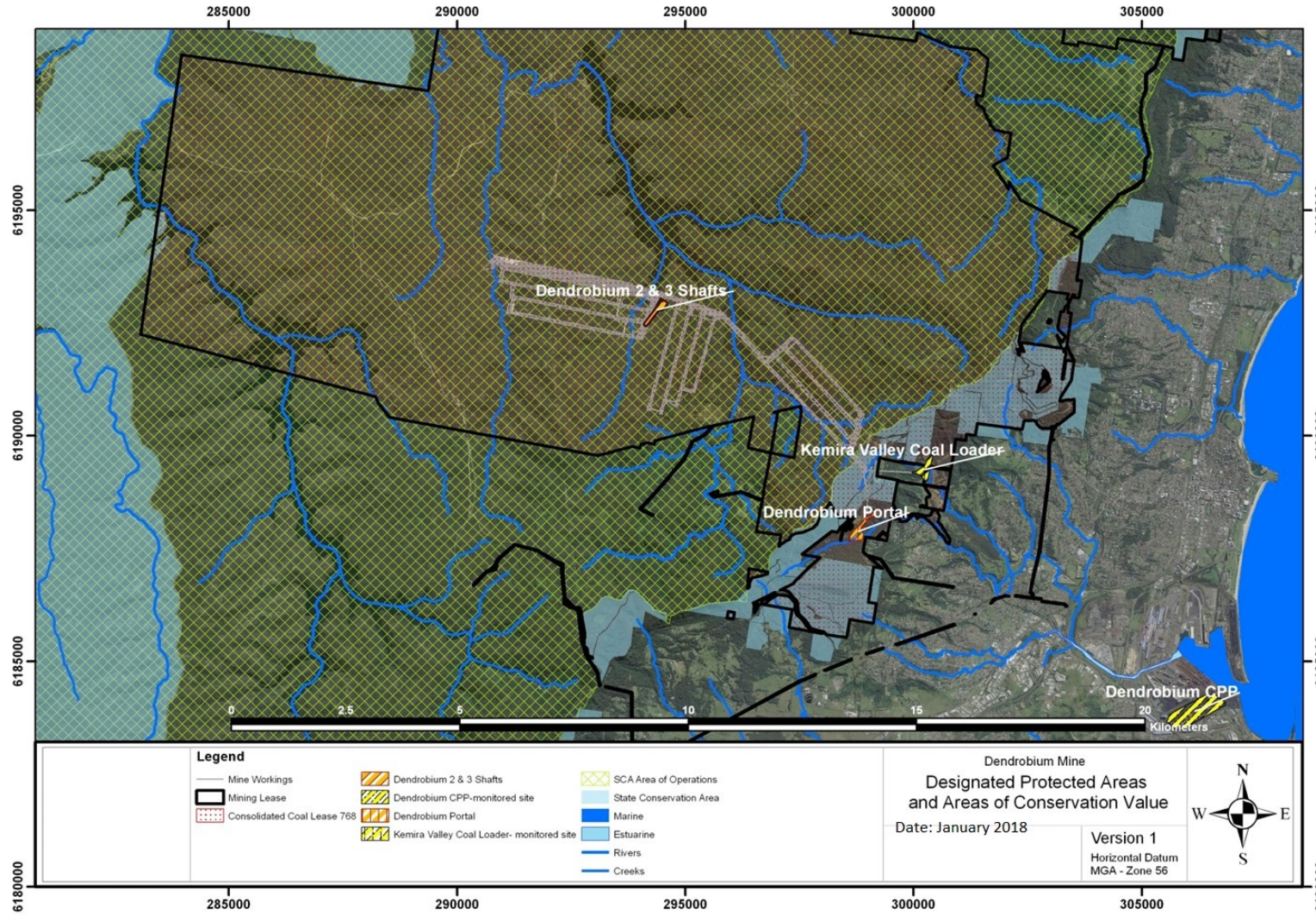


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Plan 2: Designated Protected Areas and Areas of High Conservation Value within the Dendrobium Mine operational areas



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14. APPENDICES

Appendix 1: Consent Conditions: Landscape Management

Condition	Requirement	Section
Condition 18 of Schedule 4	The Applicant shall rehabilitate the surface facilities sites to the satisfaction of DRE. For rehabilitation works within the Metropolitan Special Area, the Applicant shall also ensure that these works are carried out to the satisfaction of SCA.	Section 4
Condition 19 of Schedule 4	<p>Landscape Management Plan</p> <p>The Applicant must prepare a Landscape Management Plan for the surface facilities to the satisfaction of the Secretary and the DRG. This plan must:</p> <p>(a) be submitted for approval by 30 April 2009;</p> <p>(b) be prepared by suitably qualified expert/s whose appointment/s have been endorsed by the Secretary;</p> <p>(c) be prepared in consultation with OEH and WaterNSW; and</p> <p>(d) include a:</p> <ul style="list-style-type: none"> • Rehabilitation Management Plan; and • Mine Closure Plan. <p>The Applicant must implement the Landscape Management Plan as approved by the Secretary.</p> <p><i>Note: The Mine Closure Plan may be submitted at a date agreed by the Secretary, provided that this date is at least 2 years prior to the planned cessation of mining at the site.</i></p>	<p>This Plan</p> <p>Date is in the past</p> <p>Appendix 1</p> <p>Appendix 2</p> <p>Section 4</p> <p>Section 5</p>
Condition 20 of Schedule 4	<p>Rehabilitation Management Plan</p> <p>The Rehabilitation Management Plan must include:</p> <p>(a) the rehabilitation objectives for the surface facilities sites;</p> <p>(b) a general description of the short, medium and long term measures that would be implemented to rehabilitate these sites;</p> <p>(c) performance and completion criteria for the rehabilitation of these sites;</p> <p>(d) a description of how the performance of the rehabilitation works would be monitored over time to achieve the stated objectives and against the relevant performance and completion criteria;</p>	<p>Section 4</p> <p>Sections 4.1.3, 4.2.3, 4.3.3 and 4.4.3</p> <p>Sections 4.1.4, 4.2.4, 4.3.4 and 4.4.4</p> <p>Sections 4.1.5, 4.2.5,</p>

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Condition	Requirement	Section
	<p>(e) any measures necessary to ensure that abandoned mine workings do not impact on stored waters or dams; and</p> <p>(f) details of who is responsible for monitoring, reviewing and implementing the plan.</p>	<p>4.3.5 and 4.4.5</p> <p>Section 4.7</p> <p>Section 2</p>
<p>Condition 21 of Schedule 4</p>	<p>Mine Closure Plan</p> <p>The Mine Closure Plan must:</p> <p>(a) be prepared in consultation with the affected councils and CCC;</p> <p>(b) define the objectives and criteria for mine closure;</p> <p>(c) investigate options for the future use of the surface facilities sites;</p> <p>(d) include the proposed management and use of any heritage-listed buildings;</p> <p>(e) investigate ways to minimise the adverse socio-economic effects associated with mine closure, including reduction in local and regional employment;</p> <p>(f) describe the measures that would be implemented to minimise or manage the on-going environmental effects of the development; and</p> <p>(g) describe how the performance of these measures would be monitored over time.</p>	<p>Not yet required</p> <p>Section 5.1</p> <p>Section 5.5</p> <p>Section 5.5</p> <p>Section 5.4</p> <p>Section 5.2</p> <p>Section 5.7</p>
<p>Condition 2 of Schedule 8</p>	<p>Management Plan Requirements</p> <p>Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:</p> <p>(a) a summary of relevant background or baseline data;</p> <p>(b) details of:</p> <p>(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);</p> <p>(ii) any relevant limits or performance measures and criteria; and</p> <p>(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;</p> <p>(c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;</p>	<p>Section 6</p> <p>Section 3</p> <p>Section 4.1.4, 4.2.4, 4.3.4, 4.4.4 and 5.6</p>

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Condition	Requirement	Section
	<p>(d) a program to monitor and report on the:</p> <p>(i) impacts and environmental performance of the development; and</p> <p>(ii) effectiveness of the management measures set out pursuant to condition 2(c);</p> <p>(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;</p> <p>(f) a program to investigate and implement ways to improve the environmental performance of the development over time;</p> <p>(g) a protocol for managing and reporting any:</p> <p>(i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria);</p> <p>(ii) complaint;</p> <p>(iii) failure to comply with statutory requirements; and</p> <p>(h) a protocol for periodic review of the plan.</p>	<p>Section 4.1.5, 4.2.5, 4.3.5, 4.4.5, 4.6.2 and 5.7</p> <p>Section 5.8</p> <p>Section 4</p> <p>Section 9</p> <p>Section 8</p> <p>Section 9.3</p>

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Appendix 2: Agency Consultation

Agency Comments	IMC Response
Resources Regulator	
<p><u>Response received 20 July 2021</u></p> <p>Assessment</p> <p>Based on the review Landscape Management Plan (LMP), the Resources Regulator advises that it has no specific comments regarding mine safety in relation to the plan.</p> <p>In relation to mine rehabilitation the Regulator notes that this is an update of the LMP with no major changes relevant to rehabilitation and has no objections to its approval by DPIE.</p> <p>The Regulator notes that there is an approved Mining Operations Plan (MOP) in place for the site which sets out the rehabilitation commitments to meet the requirements of the Mining Act 1992 and the obligations imposed by the mining leases.</p> <p>The LMP should be consistent with the MOP and should also be reviewed and updated in association with the commencement of the Rehabilitation Reforms.</p>	<p>Noted.</p>
BCD	
<p><u>Response received 15 July 2021</u></p> <p>Nil response from BCD</p>	<p>Noted.</p>
WaterNSW	
<p><u>Response received 8 July 2021</u></p> <p>WaterNSW has reviewed the updated Dendrobium Landscape Management Plan (LMP) which discusses the processes put in place by IMC with regards to land and vegetation management, rehabilitation and closure to comply with requirements set in the Dendrobium Development Consent and other legislation.</p> <p>It is noted that the Resource Regulator is currently carrying out legislative reform which when finalized (by 2022) will result in the Mining Operations Plan being redrafted as an operational Rehabilitation Management Plan (RMP). The LMP is expected to become part of the Mine's operational RMP.</p>	<p>Noted.</p> <p>The National standards for the practice of ecological restoration in Australia: http://www.seraustralasia.com/standards/National%20Restoration%20Standards%202nd%20Edition.pdf has been noted in Section 3.5.</p>

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<p>WaterNSW has an interest in the LMP with regards to the three ventilation shaft sites (shaft 1, 2 and 3) within the Metropolitan Special Areas (MSA) and any surface land impacted by subsidence or exploration activities by Dendrobium Mine within the MSA. Subsidence and exploration activity impacts are addressed through development consent, SMP and mining lease approval requirements as well as requirements under the EP&A Act (e.g. Part 5 exploration approvals by WaterNSW).</p> <p>The LMP cites the three ventilation shaft sites within the MSA to be operational and as such the only rehabilitation considered at these sites is regarding soil and erosion control and maintenance of necessary vegetation in this regard. No medium or long term rehabilitation of these sites has been discussed or considered as yet in the LMP for these sites.</p> <p>It is likely that once the legislative reform on rehabilitation currently being undertaken by the RR is completed, the required operational RMP and any revised LMP will need to address the medium and long term rehabilitation of these sites and define clear final rehabilitation outcomes and criteria in this regard.</p> <p>WaterNSW recommends that the following be considered in defining the rehabilitation outcomes for the ventilation shaft sites at the time the operation RMP is being developed:</p> <ul style="list-style-type: none"> • The Society for Ecological Restoration Australasia (SERA) has published the National standards for the practice of ecological restoration in Australia: http://www.seraustralasia.com/standards/National%20Restoration%20Standards%202nd%20Edition.pdf. <p>The report discusses appropriate standards for both restoration and rehabilitation in various management sectors in Australia including mining. The study recommends that: “Where mining is undertaken in natural areas, the highest standard of ecological restoration is expected by society as exemplified in the regulatory process. This means that a five-star recovery should be the goal of any restoration project involving a natural area”.</p> <p>The highest standard of ecological restoration for land and water must be considered within Special Areas and therefore to all three Dendrobium ventilation shaft sites within the MSA.</p>	
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DPIE	
<p><u>Response received 4 August 2021</u></p> <p><i>18. The Applicant shall rehabilitate the surface facilities sites to the satisfaction of DRE. For rehabilitation works within the Metropolitan Special Area, the Applicant shall also ensure that these works are carried out to the satisfaction of SCA.</i></p> <p>LMP does not include details if this was completed.</p> <p>Include details to confirm that RR and SCA were satisfied on rehabilitation of the surface facilities site.</p>	<p>No surface facilities under the Consent have been rehabilitated. All sites are operational.</p> <p>Rehabilitation works of surface facilities under the Consent in the Metropolitan Special Area are temporary in nature (e.g. Ventilation Shaft 2/3 shaft spoil). Areas that are rehabilitated may need to be reclaimed to backfill the ventilation shafts.</p> <p>Relinquishment of sites under the Consent has not been sought from the Resources Regulator or WaterNSW.</p>
<p><i>20 (e) any measures necessary to ensure that abandoned mine workings do not impact on stored waters or dams; and</i></p> <p>Sections 4.7 describes an assessment completed to address stored waters and dams. However, there are no measures describing the measures to be implemented.</p> <p>Include a summary of measures from the assessment completed to address stored waters and dams.</p>	<p>Clarification has been provided in Section 4.7.</p>
<p><i>21 (d) include the proposed management and use of any heritage-listed buildings;</i></p> <p>Section 5.5 discusses that management and potential future uses will be determined in consultation with relevant stakeholders.</p> <p>There are no details on what is proposed for any heritage listed building.</p> <p>Include a discussion what the development will propose to the relevant stakeholders on how heritage list buildings will be managed.</p>	<p>Clarification has been provided in Section 5.5.</p>



Appendix 3: Threatened Species

The threatened species in this appendix are listed from Director-General's requirements and likely impacts for the Dendrobium Environmental Impact Statement (EIS). The full Species impact statement is available in the EIS.

Species name	Common name	Potential habitat present (✓) or absent (✗) ¹							Possible impact	Reason for exclusion ³	IUCN Red List Classification
		TSC Status ²	West Cliff (emplacement)	Area 1	Area 2	Area 3	Nebo	Kemira			
Amphibians											
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	V	✗	✗	✓	✗	✗	✗	Yes		Vulnerable
<i>Litoria aurea</i>	Green and Golden Bell-frog	E	✗	✗	✗	✗	✗	✗	No	1	Vulnerable
<i>Litoria littlejohni</i>	Littlejohn's Tree Frog	V	✗	✗	✗	✗	✗	✗	No	1	Least concern
<i>Mixophyes balbus</i>	Stuttering Frog	V	✗	✗	✗	✗	✓	✗	No	2	Vulnerable
<i>Pseudophryne australis</i>	Red-crowned Toadlet	V	✓	✗	✓R	✗	✗	✗	Yes		Vulnerable
Reptiles											
<i>Hoplocephalus bungaroides</i>	Broad-headed Snake	E	✓R	✗	✗	✗	✗	✗	Yes		Vulnerable
<i>Varanus rosenbergi</i>	Rosenberg's Goanna	V	✓	✗	✓R	✓	✗	✗	No	2	Least concern
Birds											
<i>Botaurus poiciloptilus</i>	Australian Bittern	V	✗	✗	✗	✗	✗	✗	No	1	Endangered
<i>Burhinus grallarius</i>	Bush Stone-curlew	E	✗	✗	✗	✗	✗	✗	No	1	Near threatened
<i>Calyptorhynchus lathami</i>	Glossy-black Cockatoo	V	✓	✗	✗	✗	✗	✗	Yes		Least concern
<i>Ixobrychus flavicollis</i>	Black Bittern	V	✗	✗	✗	✗	✗	✗	No	1	Least concern
<i>Lathamus discolor</i>	Swift Parrot	E	✓	✓	✓	✓	✓	✓	No	2	Endangered
<i>Neophema pulchella</i>	Turquoise Parrot	V	✓	✓	✓	✓	✓	✓	Yes		Least concern
<i>Ninox strenua</i>	Powerful Owl	V	✓R	✓	✓	✓R	✓	✓	Yes		Least concern
<i>Pachycephala olivacea</i>	Olive Whistler	V	✗	✗	✗	✗	✗	✗	No	1	Least concern
<i>Ptilinopus superbus</i>	Superb Fruit-dove	V	✗	✓	✗	✗	✓	✓	No	2	Least concern
<i>Rostratula benghalensis</i>	Painted Snipe	V	✗	✗	✗	✗	✗	✗	No	1	Least concern
<i>Tyto novaehollandiae</i>	Masked Owl	V	✓	✓	✓	✓	✓	✓	Yes		Least concern
<i>Tyto tenebricosa</i>	Sooty Owl	V	✓	✓	✓	✓	✓	✓	Yes		Least concern
<i>Xanthomyza phrygia</i>	Regent Honeyeater	E	✓	✓	✓	✓	✗	✗	No	2	Endangered

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Species name	Common name	Potential habitat present (✓) or absent (✗) ¹							Possible impact	Reason for exclusion ³	IUCN Red List Classification
		TSC Status ²	West Cliff (emplacement)	Area 1	Area 2	Area 3	Nebo	Kemira			
Mammals											
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	P	✓	✗	✓	✓	✗	✗	Yes		Least concern
<i>Myotis adversus</i>	Large-footed Myotis	V	✓	✗	✓	✗	✗	✗	Yes		Least concern
<i>Petaurus australis</i>	Yellow-bellied Glider	V	✗	✗	✗	✗	✗	✗	No	1	Least concern
<i>Petaurus norfolcensis</i>	Squirrel Glider	V	✓	✗	✗	✗	✗	✗	Yes		Least concern
<i>Petrogale pencillata</i>	Brush-tailed Rock Wallaby	V	✓	✗	✗	✗	✗	✗	No	2	Not listed
<i>Phascolarctos cinereus</i>	Koala	V	✓	✓	✓	✓	✗	✗	No	2	Least concern
<i>Potorous tridactylus</i>	Long-nosed Potoroo	V	✗	✗	✗	✗	✗	✗	No	1	Least concern
<i>Scoteanax ruepellii</i>	Broad-nosed Bat	V	✓	✓	✓	✓	✓	✓	Yes		Least concern
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	✓	✓	✓	✓	✓	✗	No	2	Near threatened
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V	✓	✗	✗	✗	✗	✗	No	2	Near threatened
<i>Isoodon obesulus</i>	Southern Brown Bandicoot	E	✗	✓	✗	✗	✗	✗	No	2	Least concern
<i>Pteropus poliocephalus</i>	Grey-headed Flying Fox	P	✓R	✓	✓	✓	✓	✓	No	2	Vulnerable
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	✓	✓	✓	✓	✗	✗	Yes		Least concern
<i>Miniopterus schreibersii</i>	Large Bentwing-bat	V	✓	✓	✓	✓	✓	✓	No	2	Near threatened
<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	V	✓	✓	✓	✓	✓	✓	Yes	2	Vulnerable

1 -“R”: Species actually recorded during survey work;

2 – E = endangered, V = vulnerable, P = preliminary listing as vulnerable;

3 - Reason for exclusion: 1 = no suitable habitat, 2 = unlikely to be affected by proposal even though suitable habitat exists

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Appendix 4: Endorsement of Experts



Chris Schultz
Superintendent
Innovation Campus Enterprise 1
Building Level 3 Squires Way
North Wollongong, NSW 2500

18/06/2021

Dear Mr Schultz

**Dendrobium Mine – (DA60-03-2001-PA-85)
Endorsement of Expert – Landscape Management Plan**

I refer to your request (DA60-03-2001-PA-85) for the Planning Secretary's approval of suitably qualified persons to revise the existing Dendrobium Landscape Management Plan (version 6.1) for the Dendrobium Mine (DA60-03-2001-PA-85).

The Department has reviewed the nominations and information you have provided and advises that the Planning Secretary approves the appointment of Chris Schultz and Jasmine Gale to prepare minor and administrative changes to the Landscaping and Management Plan. If there are significant changes to technical aspects of the management plan, the Department would require Dendrobium to seek additional approval.

If you wish to discuss the matter further, please contact Charissa Pillay on 02 99955944.

Yours sincerely

Stephen O'Donoghue
Director
Resource Assessments

As nominee of the Planning Secretary

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Appendix 5: Management Plan Approval



Mr Chris Schultz
Lead Environment
Illawarra Coal Holdings PTY LTD
Innovation Campus Enterprise
1 Building Level 3 Squires Way
North Wollongong New South Wales 2500

10/08/2021

Dear Mr Schultz

**Dendrobium Mine (DA60-03-2001)
Landscape Management Plan**

I refer to the Landscape Management Plan which was submitted in accordance with Condition 18 of Schedule 4 of the condition of consent for the Dendrobium Mine (DA60-03-2001-PA94).

The Department has carefully reviewed the revised document and is satisfied that it generally meets the requirement of the condition.

Accordingly, the Secretary has approved the revised Landscape Management Plan (Revision 7, dated August 2021). Please ensure that the approved plan is placed on the project website at the earliest convenience.

If you wish to discuss the matter further, please contact Charissa Pillay on 02 99955944.

Yours sincerely

Stephen O'Donoghue
Director
Resource Assessments
As nominee of the Secretary

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