EPBC Act referral

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Title of proposal	2021/9115 - Dendrobium Mine Extension Project

Section 1

Summary of your proposed action

1.1 Project industry type Mining

1.2 Provide a detailed description of the proposed action, including all proposed activities

The Dendrobium Mine is an underground coal mine in the Southern Coalfield of NSW, 8 km west of Wollongong. Dendrobium Coal Pty Ltd, a subsidiary of Illawarra Coal Holdings Pty Ltd, a subsidiary of South32, is the owner/operator of the Dendrobium Mine. The Dendrobium Mine, Appin Mine and supporting operations are managed by IMC. Development Consent DA 60-03-2001 for the Dendrobium Mine was granted by the NSW Minister for Urban Affairs and Planning under the EP&A Act. The Dendrobium Mine extracts coal from the Wongawilli Seam (also known as the No 3 Seam) within CCL 768 using underground longwall mining methods. The Dendrobium Mine includes 5 approved underground mining domains, named Areas 1, 2, 3A, 3B and 3C. Longwall mining is currently being undertaken in Area 3B, with extraction largely complete in Areas 1, 2 and 3A. The Dendrobium Mine has an approved operational capacity of up to 5.2 Mtpa of ROM coal until 31 December 2030.

South32 is seeking approval from the NSW Minister for Planning under Part 5 of the EP&A Act for the Dendrobium Mine Extension Project (the Project), which would support the extraction of approximately 31 Mt of ROM coal from Area 5, within CCL 768. The Action includes longwall mining in Area 5 up to approximately 2035. The Action would include the following activities:

-longwall mining of the Bulli Seam in a new underground mining area (Area 5);

-development of new surface infrastructure associated with mine ventilation and gas management and abatement required to mine Area 5, water management and other ancillary infrastructure, including development of electricity tranmission line (ETL) to Ventilation Shaft Site 5A;

-development of carpark facilities at the Dendrobium Pit Top and Cordeaux Dam Access Road;

-development of sumps, pumps, pipelines, water storages and other water management infrastructure associated with Area 5 and Ventilation Shaft Site 5A; and

-monitoring, rehabilitation and remediation of subsidence and other mining effects associated with Area 5.

It also includes other infrastructure, plant, equipment and activities associated with the above.

Underground Mining

Longwall mining involves the extraction of rectangular panels of coal defined by underground roadways constructed around each longwall. As each slice of coal is removed, the hydraulic roof supports are moved forward, allowing the roof and a section of the overlying strata to fall behind the longwall (referred to as forming the ‘goaf’). Extraction of coal by longwall mining methods results in the vertical and horizontal movement of the land surface. The land surface movements are referred to as subsidence effects. The type and magnitude of subsidence effects are dependent on a range of variables which include the mine geometry and topography, the depth of mining, the number of seams mined, the coal recovery from each seam, the nature of overlying strata and other geological factors. The subsidence impacts pertinent to the Action include non-conventional movements and systematic subsidence movements. As part of the Action, underground mining activities would be undertaken on a continuous basis (24 hours per day, seven days per week). Over the life of the Action, the mining layout would vary to account for factors that include: localised geological features; mine economics; coal market demand; detailed mine design considerations; and adaptive management.

Surface infrastructure and activities that would support the Action include:

-development of two ventilation shafts and associated infrastructure, including development of additional construction carpark facilities at the Dendrobium Pit Top and Cordeaux Dam Access Road, ETL, water supply infrastructure for Ventilation Shaft Site 5A (e.g. water pipelines from either a borehole to underground workings or pumping station at Cordeaux River);

-development of surface infrastructure associated with gas management and abatement to support the Action underground mining activities within Ventilation Shaft Site 5A; and

-monitoring, rehabilitation and remediation of subsidence and other mining effects of the Action underground mining area.

These form part of the Action. Based on the current understanding of the Action, this is anticipated to be approximately 20 hectares (ha) of surface disturbance (e.g. vegetation clearing, stripping and excavation). Ventilation Shaft Site 5A and associated infrastructure would be developed as part of the Action to support underground mining activities. The ventilation shafts include an upcast shaft (including installation of fans) and a downcast shaft. The ventilation shafts would also require access roads, security (e.g. fencing), electrical infrastructure, water management and other associated ancillary infrastructure. Gas management infrastructure would be required to support the Action for mine safety reasons (i.e. to maintain gas levels and compositions in the underground mine at safe levels). The Action also includes construction of additional car parking facilities, south of the Dendrobium Pit Top including additional intersection with and access from Cordeaux Road, and the temporary carpark at Cordeaux Dam Access Road. The extent of surface disturbance related to the Action will be refined through mine planning, environmental assessment outcomes and consideration of alternatives.

Activities Not Included in the Action

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The Action would use existing infrastructure associated with the existing Dendrobium Mine. However, the Action does not include any existing or approved infrastructure or activity. The Action, the subject of this referral, does not include aspects of the operations at the Dendrobium Mine (including any approved land disturbance activities within the Action underground mining area) that would remain consistent with any of the following:

-actions approved under NSW Development Consent DA 60-03-2001 (as modified);

-activities carried out in accordance with Part 5 of the EP&A Act such as WaterNSW access and activity approvals and exploration activities approved under mining and exploration tenements issued under the NSW Mining Act 1992, including CCL 768, AUTH 143 and AUTH 338; and

-activities that form part of the approved Controlled Actions under the EPBC Act (EPBC 2001/214 and EPBC 2010/5350).

For the avoidance of doubt, and without limiting the above, the Dendrobium Mine operations which are not the subject of this referral include (but are not limited to):

-approved underground mining operations in the Wongawilli Seam at the Dendrobium Mine and associated surface activities (such as monitoring and remediation);

-approved and continued operation of the Dendrobium Pit Top, Kemira Valley Coal Loading Facility, Kemira Valley Rail Line, Dendrobium CPP and Dendrobium Shafts No. 1, 2 and 3;

-approved and continued development and use of the West Cliff Stage 3 and Stage 4 Coal Wash Emplacement (approved under EPBC 2001/214 and EPBC 2010/5350, respectively);

-non-subsiding underground roadways and development which would be used to access the Action underground mining areas; and

-ongoing exploration and assessment activities at the Dendrobium Mine.

Activities within existing disturbed areas do not form part of the Action.

Employment

The Action would facilitate continued employment of the existing workforce, as well as an additional 50 personnel for the Action at full development and an additional 100 personnel for construction activities.

1.3 What is the extent and location of your proposed action?

See Appendix B

1.5 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for off-shore actions, shortest distance to mainland)

The underground mining for the Action is located west of Wollongong in the Southern Coalfield, NSW (Figure 1 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 1). The Action is located within CCL 768, which is a mining tenement under the NSW Mining Act 1992. The underground mining area for the Action is also located within the catchments of the Avon and Cordeaux Rivers, which are part of Greater Sydney's water supply system. These catchments are situated within the Metropolitan Special Area declared under the Water NSW Act 2014 (Figure 1 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 1). There is a long history of longwall mining in the water catchments, including the Dendrobium Mine that commenced longwall mining in 2005. Surface infrastructure for the Action is predominantly located within CCL 768 (Figures 2 and 3 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Pages 2 and 3), with the proposed carpark located to the south of the existing Dendrobium Pit Top.

1.6 What is the size of the proposed action area development footprint (or work area) including disturbance footprint and avoidance footprint (if relevant)?

The Action would be located wholly within the Action Area shown in Figure 2 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 2. The surface area located directly above the proposed longwalls and the chain pillars between the longwalls in Area 5 (the Action underground mining area) is approximately 800 ha. The extent of surface disturbance related to the Action will be refined through detailed mine planning, environmental assessment outcomes and consideration of alternatives. Based on the current understanding of the Action, this is anticipated to be approximately 20 ha of surface disturbance (Figure 2 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 2).

1.7 Proposed action location

Lot - Lot 14/DP1233164

1.8 Primary jurisdiction New South Wales

1.9 Has the person proposing to take the action received any Australian Government grant funding to undertake this project?

☐ Yes ☑ No

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1.10 Is the proposed action subject to local government planning approval?

☐ Yes ☑ No

1.11 Provide an estimated start and estimated end date for the proposed action	Start Date	03/10/2022
	End Date	31/12/2041

1.12 Provide details of the context, planning framework and state and/or local Government requirements

NSW Environmental Planning and Assessment Act 1979

The Environmental Planning and Assessment Act 1979 (EP&A Act) and NSW Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) generally set the framework for planning and environmental assessment in NSW.

The Project was declared State Significant Infrastructure (SSI) under Section 5.12 of Part 5 of the EP&A Act by the NSW Minister for Planning in December 2021. Approval for the Project would be sought under the SSI provisions (i.e. Division 5.2) under Part 5 of the EP&A Act.

Other Leases, Licence and Approvals

Relevant leases, licences or approvals required under other NSW legislation would also be varied and/or obtained for the Action as required.

Under the NSW Mining Act 1992, environmental protection and rehabilitation are regulated by conditions included in all mining leases, including requirements for the regular submission of a Mining Operations Plan, submission of Annual Environmental Management Reports and submission of Extraction Plans to reduce and manage potential impacts of subsidence.

1.13 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders

IMC regularly engages with the community in regard to the Dendrobium Mine through the following mechanisms:

- a dedicated website (https://www.south32.net/our-operations/australia/illawarra-coal);
- Dendrobium CCC meetings (with meeting minutes provided on the website and emailed direct to interested stakeholders);
- DCEP (a dedicated community based social investment program to benefit the communities surrounding the Dendrobium Mine);
- community information sheets and letter box drops;
- media releases and other media activities;
- general community surveys and reports;
- Dendrobium News (an IMC publication for the communities surrounding the Mine);
- landholder relations program; and
- information days and mine open days.

A stakeholder engagement program has been developed for the Action. Key objectives of this program are to:

- engage with government and public stakeholders about the Action;
- seek input from key stakeholders on the elements of the Action;
- recognise and respond to local interest or concerns regarding the Action; and
- continue the ongoing dialogue between IMC and its key stakeholders.

The consultation previously undertaken for the Dendrobium Mine and for the EIS would include, but not necessarily be limited to, the following government agencies and authorities:

- DPIE;
- DPIE – Water;
- Natural Resources Access Regulator;
- WaterNSW;
- DPIE – BCD;
- Dams Safety NSW;
- Heritage NSW;
- NSW EPA;
- Department of Regional NSW – Mining Exploration and Geoscience;
- Transport for NSW (including Roads and Maritime Services);
- Wollongong City Council;
- Wingecarribee Shire Council;
- Wollondilly Shire Council;
- NSW Rural Fire Service; and
- Commonwealth Department of Agriculture, Water and the Environment.

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The stakeholder engagement program also recognises other key stakeholders including:
•mine employees;
•BlueScope Steel;
•Dendrobium CCC;
•Mount Kembla, Cordeaux Heights and Unanderra communities;
•the Aboriginal community;
•local, State and Federal elected representatives;
•interested non-Government organisations;
•infrastructure owners; and
•local customers and suppliers.
The EIS engagement program will include the use of a variety of consultation mechanisms such as:
•public availability of key documents;
•existing community information mechanisms, including:
-regular updates to the Dendrobium CCC;
-community information sheets and letter box drops;
-updates in the Dendrobium News;
-provision of information on the website (https://www.south32.net/our-operations/australia/illawarra-coal); and
-information days;
•consultation with the Aboriginal community in consideration of the requirements of the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (NSW DECCW, 2010); and
•meetings with government agencies and other stakeholders.
Consultation with Indigenous stakeholders will be conducted in accordance with the requirements of the Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW, 2010) that involves:
•identifying, notifying and registering Indigenous stakeholders that hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the area of the NSW SSI Application;
•informing registered Indigenous stakeholders about the NSW SSI Application and the proposed cultural heritage assessment process;
•facilitating a process to understand what might be present in the landscape and its cultural significance;
•determining the potential impacts and the proposed strategies to deal with them; and
•preparing an Aboriginal cultural heritage assessment (ACHA) report with input from registered Indigenous stakeholders (DECCW, 2010).
Thirty Registered Aboriginal Parties (RAPs) have registered for formal consultation for the ACHA for the EIS with approximately fifteen of these participating in field surveys.

1.14 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project

An EIS will be prepared to accompany the application for approval pursuant to Division 5.2 of Part 5 of the EP&A Act. The EIS will consider the potential impacts of the Action by addressing the Secretary's Environmental Assessment Requirements (SEARs) to be issued by the DPIE.

1.15 Is this action part of a staged development (or a component of a larger project)?

☐ Yes ☑ No

1.16 Is the proposed action related to other actions or proposals in the region?

☑ Yes ☐ No

1.16.1 Identify the nature/scope and location of the related action (Including under the relevant legislation)

The Action is an extension to the underground mining area at the Dendrobium Mine to gain access to permit mining of an additional area (i.e. Area 5), within CCL 768 and related surface infrastructure and activities.
The Dendrobium Mine, incorporating extraction of the Wongawilli Seam from an area north of the former Elouera Mine, Woronora Plateau and associated works, was determined to be a Controlled Action (EPBC 2001/214) and was subsequently approved on 20 December 2001.
Coal wash associated with the Dendrobium Mine (including the Action) may continue to be emplaced at the West Cliff Stage 3 Coal Wash Emplacement (approved under EPBC 2001/214) and the West Cliff Stage 4 Coal Wash Emplacement (approved under EPBC 2010/5350).
No modification to the conditions of EPBC 2001/214 or EPBC 2010/5350 would be required to facilitate the Action.

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Section 2

Matters of national environmental significance

2.1 Is the proposed action likely to have any direct or indirect impact on the values of any World Heritage properties?

☐ Yes ☑ No

2.2 Is the proposed action likely to have any direct or indirect impact on the values of any National Heritage places?

☐ Yes ☑ No

2.3 Is the proposed action likely to have any direct or indirect impact on the ecological character of a Ramsar wetland?

☐ Yes ☑ No

2.4 Is the proposed action likely to have any direct or indirect impact on the members of any listed species or any threatened ecological community, or their habitat?

☑ Yes ☐ No

Species or threatened ecological community

Coastal Upland Swamps in the Sydney Basin Bioregion Endangered Ecological Community

Impact

Coastal Upland Swamp Endangered Ecological Community (EEC) is generally associated with soils that are acidic and vary from yellow or grey mineral sandy loams with a shallow organic horizon to highly organic spongy black peats with pallid subsoils. They vary in depth from a few centimetres (cm) to at least 4 m. The vegetation is dominated by sclerophyll shrubs and/or sedges, with dynamic mosaics of structural forms that may include tall scrub, open heath and/or sedgeland. Although typically treeless, Coastal Upland Swamp may include scattered trees. In NSW, all sites are within the Sydney Basin Bioregion. Coastal Upland Swamps EEC is known to occur within Area 5 for the Action.

Surface disturbance of Coastal Upland Swamps EEC would be restricted to environmental and subsidence monitoring and management activities (Figures 4 and 5 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Pages 4 and 5).

Indirect disturbance can occur through subsidence. Subsidence can cause changes in swamp hydrology through two broad mechanisms (NSW Department of Planning and Environment, 2015):

-the bedrock below the swamp fractures as a consequence of strains and, as a result, shallow perched groundwater (whether permanent or ephemeral) drains more readily; and/or

-tilting, cracking, desiccation and/or changes in vegetation health result in concentration of runoff and erosion which alters water distribution in the swamp.

The likelihood of these changes in Coastal Upland Swamps EEC above the Action underground mining area and the significance of any impacts can only be determined following the environmental studies for the EIS (in particular subsidence predictions, water studies and biodiversity assessments).

Species or threatened ecological community

Shale Sandstone Transition Forest of the Sydney Basin Bioregion Critically Endangered Ecological Community

Impact

The Action may involve direct disturbance to Shale Sandstone Transition Forest Critically Endangered Ecological Community (CEEC). There may be surface disturbance associated with environmental and subsidence monitoring and management activities (Figures 4 and 5 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Pages 4 and 5).

Slope and ridgeline vegetation communities such as the Shale Sandstone Transition Forest CEEC are not considered dependent on groundwater. Therefore, it is considered that the Shale Sandstone Transition Forest CEEC is unlikely to be

impacted by subsidence due to the Action. This is consistent with observations and data from mining at the Dendrobium Mine to date (over more than 10 years) in similar terrain and vegetation.

The likelihood of these changes in Shale Sandstone Transition Forest CEEC above the Action underground mining area and the significance of any impacts can only be determined following the environmental studies for the EIS (in particular subsidence predictions, water studies and biodiversity assessments).

Species or threatened ecological community

Acacia bynoeana (Bynoe's Wattle)

Impact

Not likely to be a significant impact.

Grows mainly in heath and dry sclerophyll forest in sandy soils. Mainly south of Dora Creek-Morisset area to Berrima and the Illawarra region, west to the Blue Mountains, also recorded from near Kurri Kurri in the Hunter Valley and from Morton National Park. This species was not detected during field survey but has a high likelihood of occurrence in the Action area as suitable habitat is present.

The Action is not likely to significantly impact this species as known records of this species are avoided by the proposed surface disturbance areas for the Action (Figure 6 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 6). Subsidence is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, however this would be confirmed following the environmental studies for the EIS (in particular subsidence predictions and biodiversity assessments).

Species or threatened ecological community

Grevillea parviflora subsp. parviflora (Small-flower Grevillea)

Impact

Not likely to be a significant impact.

Grows in heathy associations or shrubby woodland, in sandy or light clay soils usually over shale substrates. Occurs west and south of Sydney from west of Prospect (where now almost certainly extinct), Kemps Creek and lower Georges River south to Camden, Appin, and Cordeaux Dam, with disjunct northern populations south of Putty and near Cessnock and Cooranbong, possibly also south of Moss Vale. This species was not detected during field survey but has a high likelihood of occurrence in the Action area as suitable habitat is present.

The Action is not likely to significantly impact this species the species was not detected in the proposed surface disturbance areas for the Action (Figure 6 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 6). Subsidence is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, however this would be confirmed following the environmental studies for the EIS (in particular subsidence predictions and biodiversity assessments).

Species or threatened ecological community

Leucopogon exolasius (Woronora Beard-heath)

Impact

Not likely to be a significant impact.

Grows in woodland on sandstone. Restricted to the Woronora and Grose Rivers and Stokes Creek, Royal National Park. This species is known to occur in the Action area, however it was not detected in the proposed surface disturbance areas for the Action (Figure 6 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 6).

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Species or threatened ecological community

Melaleuca deanei (Deane's Melaleuca, Deane's Paperbark)

Impact

Not likely to be a significant impact.

Grows in wet heath on sandstone in coastal districts from Berowra to Nowra. This species was not detected during field

survey but has a low to moderate likelihood of occurrence in the Action area, however it was not detected in the proposed surface disturbance areas for the Action (Figure 6 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 6).

The Action is not likely to significantly impact this species the species was not detected in the proposed surface disturbance areas for the Action (Figure 6 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 6). Subsidence is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, however this would be confirmed following the environmental studies for the EIS (in particular subsidence predictions and biodiversity assessments).

Species or threatened ecological community

Persoonia hirsuta (Hairy Geebung)

Impact

Not likely to be a significant impact.

The Hairy Geebung is found in sandy soils in dry sclerophyll open forest, woodland, and heath on sandstone. This species was not detected during field survey but has a moderate likelihood of occurrence in the Action area due to the presence of suitable habitat, however it was not detected in the proposed surface disturbance areas for the Action.

The Action is not likely to significantly impact this species the species was not detected in the proposed surface disturbance areas for the Action. Subsidence is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, however this would be confirmed following the environmental studies for the EIS (in particular subsidence predictions and biodiversity assessments).

Species or threatened ecological community

Pomaderris brunnea (Rufous Pomaderris, Brown Pomaderris)

Impact

Not likely to be a significant impact.

Rufous Pomaderris grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines in association with Eucalyptus amplifolia, Angophora floribunda, Acacia parramattensis, Bursaria spinosa and Kunzea ambigua. This species was not detected during field survey but has a moderate likelihood of occurrence in the Action area, however it was not detected in the proposed surface disturbance areas for the Action (Figure 6 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 6).

The Action is not likely to significantly impact this species the species was not detected in the proposed surface disturbance areas for the Action (Figure 6 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 6). Subsidence is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, however this would be confirmed following the environmental studies for the EIS (in particular subsidence predictions and biodiversity assessments).

Species or threatened ecological community

Pultenaea aristata (Prickly Bush-pea)

Impact

Not likely to be a significant impact.

Grows in moist, dry sclerophyll woodland to heath on sandstone, specifically the drier areas of Coastal Upland Swamps. Restricted to the Woronora Plateau, a small area between Helensburgh, south of Sydney, and Mt Keira above Wollongong. This species was not detected during field survey but has a high likelihood of occurrence in the Action area, however it was not detected in the proposed surface disturbance areas for the Action (Figure 6 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 6).

The Action is not likely to significantly impact this species. The species was not detected in the proposed surface disturbance areas for the Action (Figure 6 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 6). Subsidence is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, however this would be confirmed following the environmental studies for the EIS (in particular subsidence predictions and biodiversity assessments).

Species or threatened ecological community

Macquaria australasica (Macquarie Perch)

Impact

Not likely to be a significant impact.
The Action would avoid direct subsidence impacts on the watercourses where the Macquarie Perch has been recorded (Avon River, Cordeaux River, Lake Cordeaux and Wongawilli Creek). In addition, the Action would incorporate measures to have a net neutral or beneficial effect on water quality in the Avon Dam and Cordeaux Dam catchments. Therefore, the flow and water quality in the watercourses where this species has been recorded are unlikely to be materially affected to the extent that it would reduce the area of occupancy of this species, adversely affect habitat critical to the survival of this species or disrupt the breeding cycle.
The Action is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline.

Species or threatened ecological community

Heleioporus australiacus (Giant Burrowing Frog)

Impact

The Giant Burrowing Frog has been recorded breeding in a range of water bodies associated with sandy environments of the coast and adjacent ranges from the Sydney Basin to south of eastern Victoria. It breeds in hanging swamps, perennial non-flooding creeks and occasionally permanent pools, but permanent water must be present to allow its large tadpoles time to reach metamorphosis.
This species is known to occur within the Action area (Figure 7 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 7) and the significance of any impacts on the habitat for this species (in particular upland swamp and riparian habitat) can only be determined following completion of the environmental studies for the EIS (in particular subsidence predictions, water studies and biodiversity assessments).

Species or threatened ecological community

Litoria littlejohni (Littlejohn's Tree Frog)

Impact

Occurs in wet and dry sclerophyll forests and heathland associated with sandstone outcrops on the eastern slopes of the Great Dividing Range from the Central Coast down into Victoria. Individuals have been collected from a wide range of water bodies that includes semi-permanent dams, permanent ponds, temporary pools, and permanent streams, with calling occurring from fringing vegetation or on the banks. Individuals have been observed sheltering under rocks on high exposed ridges during summer and within deep leaf litter adjacent to the breeding site.
This species is known to occur within the Action area (Figure 7 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 7) and the significance of any impacts on the habitat for this species (in particular upland swamp and riparian habitat) can only be determined following completion of the environmental studies for the EIS (in particular subsidence predictions, water studies and biodiversity assessments).

Species or threatened ecological community

Hoplocephalus bungaroides (Broad-headed Snake)

Impact

Occurs almost exclusively in association with communities occurring on Triassic sandstone within the Sydney Basin. Typically found among exposed sandstone outcrops with vegetation types ranging from woodland to heath. Within these habitats they spend most of the year sheltering in and under rock crevices and exfoliating rock. However, some individuals will migrate to tree hollows to find shelter during hotter parts of summer.
The species was not recorded within the proposed surface disturbance areas for the Action (Figure 7 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 7). Clearing of foraging habitat associated with surface infrastructure may occur, however is not at such an extent that it would lead to fragmentation of habitat or lead to the creation of two or more populations, or significantly limit the amount of potential foraging habitat.
This species is often found in rocky outcrops. Given the predicted low incidence of rock falls, it is considered that rock falls resulting from mine subsidence would likely have only small impacts, if any, on potential shelter or retreat sites for the Broad-headed Snake. The Action would not lead to a long term decrease in the size or area of occupancy of an important population of this species.

Species or threatened ecological community

Dasyurus maculatus maculatus (Spotted-tailed Quoll) (SE Mainland Population)

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Impact

Not likely to be a significant impact.
The species was not recorded within the area proposed for surface infrastructure (Figure 7 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 7). Clearing of foraging habitat associated with surface infrastructure would occur, however is not at such an extent that it would lead to fragmentation of habitat or lead to the creation of two or more populations, or significantly limit the amount of potential foraging habitat.
This species uses multiple dens and usually moves between them every 1-4 days. Recorded den sites include rock crevices, hollow logs, hollow tree buttresses, tree hollows, windrows, clumps of vegetation, caves and boulder tumbles, under buildings and underground burrows
Subsidence is unlikely to have a significant, broad-scale, long-term impact on the extensive habitat for this species in the Action area and surrounds and therefore is unlikely to lead to a material long-term decrease in the size or area of occupancy of this species.

Species or threatened ecological community

Petauroides volans (Greater Glider)

Impact

This species is an arboreal nocturnal marsupial, largely restricted to eucalypt forests and woodlands. It is primarily folivorous, with a diet mostly comprising eucalypt leaves, and occasionally flowers. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. The distribution may be patchy even in suitable habitat. This species favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species.
The species was recorded within a small patch of Sandstone Transition Forest within the underground mining area for the Action (Figure 7 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 7), and would likely be concentrated within this area and additional adjoining pockets of taller moist vegetation communities. This species is known to occur within the Action area and therefore the significance of any impacts on the habitat for this species (in particular upland swamp and riparian habitat) can only be determined following completion of the environmental studies for the EIS (in particular subsidence predictions and biodiversity assessments).

Species or threatened ecological community

Phascolarctos cinereus (Koala) (Combined Population of Qld, NSW and the ACT)

Impact

Inhabits eucalypt forests and woodlands. The suitability of these forests for habitation depends on the size and species of trees present, soil nutrients, climate, and rainfall.
The species was recorded adjacent to existing Fire Roads within the Action area (Figure 7 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 7), and within Shale Sandstone Transition Forest in the Action area. This species is known to occur within the Action area and therefore the significance of any impacts on the habitat for this species (in particular upland swamp and riparian habitat) can only be determined following completion of the environmental studies for the EIS (in particular subsidence predictions and biodiversity assessments).

Species or threatened ecological community

Pteropus poliocephalus (Grey-headed Flying-Fox)

Impact

This species is a canopy-feeding frugivore and nectarivore of rainforests, open forests, woodlands, melaleuca swamps and banksia woodlands. Bats commute daily to foraging areas, usually within 15 km of the day roost although some individuals may travel up to 70 km.
This species is known to occur in the Action area (Figure 7 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 7) and therefore the significance of any impacts on the habitat for this species (in particular upland swamp and riparian habitat) can only be determined following completion of the environmental studies for the EIS (in particular subsidence predictions and biodiversity assessments).

Species or threatened ecological community

Please refer to the Attachment 'DMEP_EPBC_Act_Referral_Sections_2.4_and_2.5' and Attachment 'DMEP_EPBC_Act_Referral_Figures' for the consideration of the remaining species and threatened ecological communities.

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Impact

As described in the Attachment 'DMEP_EPBC_Act_Referral_Sections_2.4_and_2.5' and Attachment 'DMEP_EPBC_Act_Referral_Figures', the Action is not likely to be a significant impact to the remaining species and threatened ecological communities.

2.4.2 Do you consider this impact to be significant?

☑ Yes ☐ No

2.5 Is the proposed action likely to have any direct or indirect impact on the members of any listed migratory species or their habitat?

☑ Yes ☐ No

Migratory species

Please refer to the Attachment 'DMEP_EPBC_Act_Referral_Sections_2.4_and_2.5' for the consideration of migratory species.

Impact

As described in the Attachment 'DMEP_EPBC_Act_Referral_Sections_2.4_and_2.5', the Action is not likely to be a significant impact to migratory species.

2.5.2 Do you consider this impact to be significant?

☐ Yes ☑ No

2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?

☐ Yes ☑ No

2.7 Is the proposed action likely to be taken on or near Commonwealth land?

☐ Yes ☑ No

2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?

☐ Yes ☑ No

2.9 Is the proposed action likely to have any direct or indirect impact on a water resource from coal seam gas or large coal mining development?

☑ Yes ☐ No

Water resource

Groundwater

Impact

The Action is located in the Southern Coalfield of NSW in the southern part of the Sydney Basin, which consists of sedimentary rocks of Permian age (<270 million years ago) and of Triassic age (<225 million years ago), with a regional dip of approximately 2° north-west.

The Late Permian Illawarra Coal Measures contain a number of workable seams throughout the Southern Coalfield. Above the Illawarra Coal Measures, the stratigraphy of the area consists of a sequence of sandstone, shale and claystone units within the Narrabeen Group, which are in turn, overlain by the Hawkesbury Sandstone.

The Action would involve extraction from the Bulli Seam within Area 5, which forms part of the Illawarra Coal Measures.

Three distinct groundwater systems have been identified in the Action area:

- perched groundwater system associated with upland swamps and shallow sandstone;
- shallow groundwater system within the Hawkesbury Sandstone; and
- deeper groundwater system within the Narrabeen Group and Illawarra Coal Measures.

The Coastal Upland Swamps EEC is associated with perched groundwater systems. The extent of this community as mapped by the NSW National Parks and Wildlife Service (NPWS) (2003) and Niche (pers. comms.) is provided on Figures 4 and 5 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Pages 4 and 5. The extent and characteristics of upland swamps above the Action underground mining area has been refined based on baseline surveys undertaken for the previous application for the Dendrobium Mine (Niche, 2019) and for the EIS.

It is considered that topographic relief drives vertical groundwater flow near the ground surface in the shallow groundwater system, but at depth the alternation of aquifers and aquitards promotes horizontal groundwater flow at the base of permeable units (HydroSimulations, 2016). Along the Illawarra Escarpment south-east of the Dendrobium Mine, groundwater discharges as seeps in cliff faces, particularly at the boundaries of geological formations with contrasting permeability (HydroSimulations, 2016).

The groundwater flow is predominantly in a northerly direction, similar to stratigraphic dip, toward the centre of the Sydney Basin. However, some groundwater close to the Illawarra Escarpment flows east to become spring flow or be evapo-

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transpired along the escarpment or flowing to the sea. (HydroSimulations, 2019). As a general pattern, the elevation of the regional water table is a subdued reflection of the topography, with mounding beneath hills and ridgelines, and depressions adjacent to zones of discharge such as incised streams and cliff lines.

IMC operates an extensive groundwater monitoring network across the Dendrobium Mine tenements with some bores in Area 5 monitored for over 5 years (HydroSimulations, 2019). Further baseline information on groundwater resources will be collected as part of the EIS, including groundwater level monitoring.

Completion of the environmental studies for the EIS is required to reach a conclusion regarding the significance of impacts on water resources. The environmental studies for the EIS would consider:

- depressurisation of aquifers as a result of mine subsidence and dewatering of the coal seam to facilitate underground mining, leading to potential effects on overlying groundwater system;
- potential depressurisation of shallow and perched groundwater systems, including upland swamps;
- potential for erosion/scour and/or altered water distribution in upland swamps; and
- potential impacts on surface water regimes, including localised effects on water quality and/or persistence of flows.

The Groundwater Assessment and Surface Water Assessment for the EIS would include the following:

- Numerical groundwater modelling based on the Australian Groundwater Modelling Guidelines (Barnett et al., 2012).
- Assessment of the impacts of the Action on the quantity and quality of the region's water resources, connectivity between water sources, water-dependent assets and water-related infrastructure, including cumulative impacts.
- Risk assessment approach to consideration of potential subsidence impacts and environmental consequences to streams and swamps.
- Detailed site water balance incorporating all sources of water inflow and development of a water management strategy for the life of the Action.
- Investigation of measures to avoid, mitigate, remediate, monitor and/or offset the potential impacts of the Action.
- Assessment against the Neutral or Beneficial Effect on Water Quality Assessment Guideline 2015 (Sydney Catchment Authority, 2015).
- Expert peer reviews of the assessments.

Water resource

Surface Water

Impact

The Action area is located within the catchments of the Avon and Cordeaux Rivers, which are part of the upper Nepean River catchment.

The Avon River and Cordeaux River are dammed and form part of Sydney's and Wollongong's water supply. The full supply levels of Lake Cordeaux and Lake Avon are located at 303.9 metres Australian Height Datum (mAHD) and 320.04 mAHD, respectively. The Action underground mining area would not directly longwall mine below the full supply level of the Avon and Cordeaux Reservoirs.

Unnamed first and second order streams drain the area directly above the proposed longwalls at Area 5. Area 5 drains west and north-west to Lake Avon and the Avon River downstream, and east to Donalds Castle Creek (Hydro Engineering & Consulting Pty Ltd, 2019).

Further baseline information on surface water resources will be collected as part of the EIS.

Completion of the environmental studies for the EIS is required to reach a conclusion regarding the significance of impacts on water resources. Considerations for the environmental studies for the EIS are outlined above, along with the scopes of the Groundwater Assessment and Surface Water Assessment.

2.9.2 Do you consider this impact to be significant?

☑ Yes ☐ No

2.10 Is the proposed action a nuclear action?

☐ Yes ☑ No

2.11 Is the proposed action to be taken by a Commonwealth agency?

☐ Yes ☑ No

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage place overseas?

☐ Yes ☑ No

2.13 Is the proposed action likely to have any direct or indirect impact on any part of the environment in the Commonwealth marine area?

☐ Yes ☑ No

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 3

Description of the project area

3.1 Describe the flora and fauna relevant to the project area

The Action area lies in Sydney Basin Bioregion as defined originally by Thackway and Cresswell (1995). The Sydney Catchment Authority (now WaterNSW) and the NPWS surveyed and mapped the flora communities of the Woronora, O' Hares and Metropolitan Special Areas, including the Action area (NPWS, 2003).

Niche have supplemented the existing vegetation mapping through extensive field verification of the native vegetation and associated habitat types present in the Action area.

The Plant Community Types (PCTs) identified by Niche that occur within the Action area include the following:

- Non native/cleared;
- PCT 978 - Needlebush - banksia wet heath on sandstone plateaux of the Sydney Basin Bioregion;
- PCT 1083 - Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux, Sydney Basin Bioregion;
- PCT 1181 - Smooth-barked Apple - Red Bloodwood - Sydney Peppermint heathy open forest on slopes of dry sandstone gullies of western and southern Sydney, Sydney Basin Bioregion;
- PCT 1245 - Sydney Blue Gum - Bangalay - Lilly Pilly moist forest in gullies and on sheltered slopes, southern Sydney Basin Bioregion;
- PCT 1250 - Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion;
- PCT 1395 - Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin Bioregion; and
- PCT 1804 - Needlebush - banksia wet heath swamps on coastal sandstone plateaus of the Sydney Basin.

The underground mining component of the Action area consists predominantly of native vegetation and habitat types which have not been exposed to human disturbance. The proposed surface disturbance component of the Action area associated with supporting infrastructure and activities also consists of some native vegetation and some cleared areas associated with existing fire tracks. As supported by the flora plot collection and associated surveys completed by Niche, the Action area and surrounds support a high level of native species diversity. During the field campaigns 241 flora were recorded across 59 families.

Fauna habitats in these areas include Tall Open Forests, Heaths and Swamps, along with the scrubby Sandstone Woodland and Forest. During field campaigns completed within the Action area and general locality over the past 5 years 116 fauna species were recorded.

3.2 Describe the hydrology relevant to the project area (including water flows)

The Action area (including both the underground mining and supporting surface infrastructure components) is generally located within the catchments of the Avon and Cordeaux Rivers. The Action underground mining area would not directly longwall mine below the full supply level of the Avon and Cordeaux Reservoirs, or third order and above streams.

Water resources in proximity to the Action are considered in detail in Section 2.9 of this EPBC Act Referral.

3.3 Describe the soil and vegetation characteristics relevant to the project area

Soil landscapes in the Action area and surrounds have been mapped by the former Soil Conservation Service of NSW as described in the Soil Landscapes of the Wollongong-Port Hacking 1:100 000 Sheet (Hazelton and Tille, 1990).

The soil landscape units mapped by Hazelton and Tille (1990) that dominate the Action area are the Lucas Heights Residual Soil Landscape and the Hawkesbury Colluvial Soil Landscape. Areas of Illawarra Escarpment Colluvial Soil Landscape, Volcanic Residual Soil Landscape and Maddens Plains Residual Soil Landscape have also been mapped (Hazelton and Tille, 1990).

The Lucas Heights Residual Soil Landscape is associated with the gently undulating crests, ridge and plateau surfaces of the Woronora Plateau (Hazelton and Tille, 1990). The soils are derived from shale and fine-grained sandstones and are characterised by stoniness, hard-setting surfaces and low soil fertility (Hazelton and Tille, 1990). This soil landscape is generally associated with Eucalypt low open-forest and Eucalypt low woodland with sclerophyllous shrub understorey (Hazelton and Tille, 1990).

The steep, rugged slopes of the Avon and Cordeaux catchments are associated with the Hawkesbury Colluvial Soil Landscape (Hazelton and Tille, 1990). These areas have shallow discontinuous soils with rock outcrops, surface boulders

and cobbles derived from the Hawkesbury Sandstone (Hazelton and Tille, 1990). These soils support mostly woodland and open-forest with pockets of tall open-forest and occasional closed-forest in sheltered gullies (Hazelton and Tille, 1990).

Coastal Upland Swamps are associated with periodically waterlogged soils where the lateral transportation and deposition of sediment by overland flow has lead to choking of headwater valleys (NSW Scientific Committee, 2012). These soils vary in depth from a few centimetres to at least 4 metres, are acidic and vary from yellow or grey mineral sandy loams with a shallow organic horizon to highly organic spongy black peats with pallid subsoils (NSW Scientific Committee, 2012).

Vegetation mapped in the Action area is described in Section 2.4 of this EPBC Act Referral and shown on Figure 4 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 4.

3.4 Describe any outstanding natural features and/or any other important or unique values relevant to the project area

The sandstone of the Woronora Plateau is characterised by narrow and often steep sandstone gullies that have formed steep blocky valleys and cliff lines that contain sandstone overhangs. These sandstone formations provide habitat for vertebrate fauna and have aesthetic values.

Upland swamps are also present in the Action area and are described in Sections 3.1 and 3.3 of this EPBC Act Referral.

The Upper Nepean State Conservation Area is located immediately to the west and north of Area 5 (Figure 2 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 2). The Illawarra Escarpment State Conservation Area is located approximately 12 km south-east of Area 5 (Figure 2 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 2).

3.5 Describe the status of native vegetation relevant to the project area

The PCTs that occur within the Action area have been detailed in Section 3.1 of this EPBC Act Referral. Of the PCTs recorded, two are associated with Threatened Ecological Communities listed on the EPBC Act (Figure 4 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 4):

- PCT 1395 is associated with Shale Sandstone Transition Forest, which is listed as CEEC.
- Portions of PCT 978 and PCT 1804 align to 'Coastal Upland Swamps of the Sydney Basin Bioregion', which is listed as an EEC.

3.6 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area

The Action area is generally situated on the Woronora Plateau, which includes the upper catchments of the Cataract River and Nepean River. The Woronora Plateau forms part of the southern rim of the Sydney Basin and dips gently north-west towards the Cumberland Plain away from the abrupt edge formed by the Illawarra Escarpment (NPWS, 2006).

The Woronora Plateau is characterised by incised watercourses that have formed steep blocky valleys and cliff lines that contain sandstone overhangs. Open sections of exposed sandstone occur along ridge tops and plateau caps.

Elevations in the Action area range from approximately 300 to 400 mAHD.

3.7 Describe the current condition of the environment relevant to the project area

As described in Section 3.3 of this EPBC Act Referral, remnant native vegetation remains over most of the underground mining component of the Action area. An assessment by Biosis Research (2007a) of the adjoining Area 3 at the Dendrobium Mine found the vegetation was generally in good condition, with high native species diversity and all structural layers intact. The vegetation condition is expected to be similar in the underground mining component of the Action area. The supporting surface infrastructure component of the Action area also consists of some native vegetation and some cleared areas associated with existing fire tracks.

3.8 Describe any Commonwealth Heritage places or other places recognised as having heritage values relevant to the project

The closest Commonwealth Heritage place to the Action is the Cubbitch Barta National Estate Area (also known as the Holsworthy Military Training Area), which is located approximately 18 km north-northeast of the Action. The Cubbitch Barta National Estate Area is listed as an indigenous site, describing a diversity of Aboriginal occupation and art sites and their relationship to the natural environment as some of the principal sources of significance.

The Cubbitch Barta National Estate Area is a considerable distance from the area of any potential direct or indirect impacts of the Action.

3.9 Describe any Indigenous heritage values relevant to the project area

The traditional Wodi Wodi land extended from around Stanwell Park to the Shoalhaven River, and as far in-land as Picton, Moss Vale and Marulan (Biosis Research, 2007b) and includes the Action area. The Wodi Wodi spoke the Dharawal language, however Dharawal (Tharawal) was not a word they had heard of or used themselves (Biosis Research, 2007b).

The Woronora Plateau has been relatively well covered by systematic archaeological survey, primarily by the Illawarra Prehistory Group, as well as more contemporary surveys for the Dendrobium Mine.

The geology of the Woronora Plateau has strongly influenced the distribution and types of Aboriginal sites (NPWS, 2006). The Hawkesbury sandstone has weathered forming numerous rock shelters and large, flat expanses favoured for art, rock engravings, and for stone axe grinding grooves (NPWS, 2006).

An Aboriginal Cultural Heritage Assessment would be prepared for the NSW SSI Application (incorporating the Action), as a component of the EIS. This assessment would include surveys of the Action area and would be prepared in consultation with Indigenous stakeholders (Section 1.13 of this EPBC Act Referral).

3.10 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area

The Action is located within CCL 768, which is a mining tenement under the NSW Mining Act 1992.

The tenure of the Action is shown on Figure 3 of Attachment 'DMEP_EPBC_Act_Referral_Figures', Page 3. The Action is located within the Metropolitan Special Area, which is a declared 'Special Area' under the Water NSW Act 2014. Special Areas are jointly managed by WaterNSW and the NPWS (on behalf of the Minister for the Environment).

3.11 Describe any existing or any proposed uses relevant to the project area

The existing Dendrobium Mine and the Action area are located within the catchments of the Avon and Cordeaux Rivers. These catchments are situated within the Metropolitan Special Area declared under the Water NSW Act 2014. The Action underground mining area would not directly longwall mine below the full supply level of the Avon and Cordeaux Reservoirs.

Mines in the vicinity of the Dendrobium Mine include:

- Appin Mine, including the previous West Cliff Colliery mine workings (South32 owned);
- Cordeaux Colliery (South32 owned, under care and maintenance);
- Russell Vale Colliery (Wollongong Coal owned); and
- Wongawilli Colliery (Wollongong Coal-owned, under care and maintenance).

Existing land uses would continue to occur above the underground mining component of the Action area during and following mining. The supporting surface infrastructure component of the Action area would also allow existing land uses to continue (e.g. use of the fire tracks within the surface infrastructure corridor).

There are no other known proposed changes to the land uses in the Action area.

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 4

Measures to avoid or reduce impacts

4.1 Describe the measures you will undertake to avoid or reduce impact from your proposed action

IMC has reviewed the mine plan for the Action and proposes a significantly different mine plan in comparison to the previous application for the Dendrobium Mine. The Action addresses concerns and significantly reduces potential environmental impacts on the Sydney drinking water catchment through:

- approximately 60% reduction in longwall mining area;
- approximately 60% reduction in surface water losses (from the previous application);
- no predicted connective fracturing from the seam-to-surface when using the Tammetta equation;
- no longwall mining beneath 3rd, 4th and 5th order (or above) streams;
- approximately 50% reduction in the length of 1st and 2nd order streams longwall mined beneath;
- approximately 40% reduction in the number of swamps (listed as threatened) longwall mined beneath;
- commitment to avoid longwall mining beneath identified key stream features;
- reduction in number of previously identified Aboriginal heritage sites directly mined under from 22 to six sites (with the likelihood of direct impacts to these six sites expected to be approximately 1 in 10 based on extensive monitoring of subsidence related impacts to heritage sites);
- no longwall mining beneath previously identified high archaeological significance Aboriginal heritage sites;
- increased longwall mining setback distance (at least 400 m) from the Avon River, Cordeaux River and Donalds Castle Creek;
- minimum longwall mining setback distance of 300 m from the Full Supply Level of the Avon Dam;
- minimum longwall mining setback distance of 1,000 m from dam walls; and
- use of existing infrastructure (namely the Dendrobium Pit Top, Kemira Valley Coal Loading Facility, Kemira Valley Rail Line, Dendrobium CPP, Shaft Sites Nos 1, 2 and 3 and the West Cliff Stage 3 Coal Wash Emplacement) which would reduce the requirement for additional disturbance.

IMC proposes to continue the management approach at the existing Dendrobium Mine for the Action. Strategies to address potential impacts on matters protected by the EPBC Act that are likely to be affected by the Action would include:

- Consideration of environmental assessment outcomes during detailed mine planning (e.g. including minimisation of vegetation disturbance [particularly disturbance of areas with higher ecological value] and development of subsidence performance measures).
- Surface disturbance protocols (including pre-clearance surveys).
- Development of a rehabilitation and remediation strategy for the Action.
- Weed and feral animal control measures.
- Groundwater and surface water monitoring networks.
- Erosion and sediment control during construction and operation.
- Licensing in accordance with the legislative requirements of the NSW Water Management Act 2000, including any relevant water sharing plans (i.e. state water resource plans).
- Development and implementation of Extraction Plans to mitigate, monitor, remediate and manage potential impacts on ecology and water resources.
- Offset and compensatory measures to maintain or improve the biodiversity values of the surrounding region in the medium to long-term.

These strategies would be developed and refined through the environmental assessment process. Detail on the proposed measures would be presented in the EIS.

4.2 For matters protected by the EPBC Act that may be affected by the proposed action, describe the proposed environmental outcomes to be achieved

An EIS would be prepared to support an application for approval and would include a detailed description of the likely environmental outcomes that will be achieved for the matters protected by the EPBC Act that are likely to be affected by the Action. The EIS would be prepared in consideration of:

- the existing environment, based on analysis of sufficient baseline data collected during the preparation of the EIS;
- potential impacts of all stages of the Action including relevant cumulative impacts;
- measures that could be implemented to avoid, mitigate, rehabilitate/remediate, monitor and/or offset the potential impacts of the Action; and
- contingency plans and/or adaptive management for managing any potentially significant residual risks to the environment.

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 5

Conclusion on the likelihood of significant impacts

5.1 You indicated the below ticked items to be of significant impact and therefore you consider the action to be a controlled action

- ☐ World Heritage properties
- ☐ National Heritage places
- ☐ Wetlands of international importance (declared Ramsar wetlands)
- ☑ Listed threatened species or any threatened ecological community
- ☐ Listed migratory species
- ☐ Marine environment outside Commonwealth marine areas
- ☐ Protection of the environment from actions involving Commonwealth land
- ☐ Great Barrier Reef Marine Park
- ☑ A water resource, in relation to coal seam gas development and large coal mining development
- ☐ Protection of the environment from nuclear actions
- ☐ Protection of the environment from Commonwealth actions
- ☐ Commonwealth Heritage places overseas
- ☐ Commonwealth marine areas

5.2 If no significant matters are identified, provide the key reasons why you think the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act and therefore not a controlled action

N/A

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 6

Environmental record of the person proposing to take the action

6.1 Does the person taking the action have a satisfactory record of responsible environmental management? Explain in further detail

Aware of the sensitive environment in which it operates, IMC has a history of designing its mine plans to avoid significant impacts to key environmental features in the area such as Avon and Cordeaux Reservoirs, Sandy Creek, Sandy Creek Waterfall, Wongawilli Creek Waterfall and Wongawilli Creek. An IEA of the Dendrobium Mine (available on the IMC website) in November 2020, stated: “An audit of Conditions of Approval, Environmental Protection Licence, Consolidated Coal Lease and Mining Leases conditions has been completed as well as a check against commitments made in the management plans developed as part of CoA [Conditions of Approval] conditions for the site. Overall, compliance was generally achieved with the audit documents that were reviewed.” IMC undertakes open discussion with the community and other stakeholders on issues directly relating to the mine’s operations, environmental performance and community relations, and keeps the community informed on these matters.

6.2 Provide details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against either (a) the person proposing to take the action or, (b) if a permit has been applied for in relation to the action – the person making the application

In 2012, civil enforcement proceedings were commenced in the Land and Environment Court against Endeavour Coal Pty Ltd and Illawarra Coal Holdings Pty Ltd. The proceedings related to the alleged discharge of arsenic, zinc, copper, aluminium and nickel into the Georges River from the West Cliff Colliery via Brennans Creek.

The proceedings were discontinued at the initiation of the EPA, and by agreement of the parties on the basis that in 2013 the EPA issued a licence variation notice that permitted the pollution alleged in the case. Accordingly, no conviction was made against either entity in this case.

6.3 If it is a corporation undertaking the action will the action be taken in accordance with the corporation’s environmental policy and framework?

☑ Yes ☐ No

6.3.1 If the person taking the action is a corporation, provide details of the corporation's environmental policy and planning framework

The Action would be undertaken in accordance with South32’s Sustainability Policy (Attachment 'South32_Sustainability_Policy') and Environmental Standard (Attachment 'South32_Environment_Standard').

In summary, this includes the following:

- South32’s environmental commitments protect the environment in a way that demonstrates our values and are aligned with the International Council on Mining and Metals (ICMM) commitments for mining and protected areas (ICCM, 2003).
- Environmental aspects within South32’s area of influence are managed to minimise adverse impacts and promote enduring environmental benefits.
- Greenhouse gas emissions are minimised to reduce South32’s contribution to climate change.

6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

☑ Yes ☐ No

6.4.1 EPBC Act No and/or Name of Proposal

Dendrobium Coal Mining Project (EPBC 2001/214) determined to be a Controlled Action and approved on 20 December 2001.

Bulli Seam Operations Expansion (EPBC 2010/5350) determined to be a Controlled Action and approved on 15 May 2012.

Dendrobium Mine Extension (EPBC 2017/7855) determined to be a Controlled Action on 6 March 2017. State approval for the Development Application for State Significant Development (SSD) 8194 associated with Dendrobium Mine Extension (EPBC 2017/7855) was refused by the Independent Planning Commission in February 2021. However, this application is currently under judicial review and, if successful, SSD 8194 would become active again. Notwithstanding, IMC would only proceed with one application for the Project (and one associated Action) to be confirmed subject to the outcomes of the judicial review.

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 7

Information sources

Reference source

Barnett, B., Townley, L.R., Post, V., Evans, R.E., Hunt, R.J., Peeters, L., Richardson, S., Werner, A.D., Knapton, A. and Boronkay, A. (2012) Australian Groundwater Modelling Guidelines. Waterlines report 82, National Water Commission, Canberra.

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Reliability

These reference sources are reliable.

Uncertainties

These reference sources have limited uncertainties.

Reference source

Hazelton, P.A. and Tille, P.J. (1990) Soil Landscapes of the Wollongong-Port Hacking 1:100 000 Sheet. Soil Conservation Service of NSW, Sydney.

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Website: http://www.icmm.com/en-gb/members/member-commitments/position-statements/mining-and-protected-areas-position-statement

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Website: http://www.environment.nsw.gov.au/resources/nature/surveys/030143VegWoronoraOHaresCatchmts.pdf

Reliability

These reference sources are reliable.

Uncertainties

These reference sources have limited uncertainties.

Reference source

National Parks and Wildlife Service (2006) Dharawal Nature Reserve and Dharawal State Conservation Area Plan of Management.
Website: http://www.environment.nsw.gov.au/resources/parks/dharawalMgmtplan.pdf

Niche Environment and Heritage (2019) Biodiversity Assessment Report for Dendrobium: Plan for the Future Project – Coal for Steelmaking.

NSW Scientific Committee (2012) Coastal Upland Swamp in the Sydney Basin Bioregion - endangered ecological community listing. NSW Scientific Committee - final determination.
Website: http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=20261

Sydney Catchment Authority (2015) Neutral or Beneficial Effect on Water Quality Assessment Guideline 2015.

Thackway, R. and Cresswell, I.D. (Eds) (1995). An Interim Biogeographic Regionalisation for Australia: a framework for establishing the national system of reserves. Version 4.0. Australian Nature Conservation Agency: Canberra.

Reliability

These reference sources are reliable.

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Uncertainties

These reference sources have limited uncertainties.

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Section 8

Proposed alternatives

Do you have any feasible alternatives to taking the proposed action?

Yes ☑ No

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 9

Person proposing the action

9.1.1 Is the person proposing the action an organisation or business?

☑ Yes ☐ No

Organisation

Organisation name (as registered for ABN/ACN)	ILLAWARRA COAL HOLDINGS PTY LTD
Business name	
ABN	69093857286
ACN	
Business address	Post Office Box 514, Unanderra, 2526, NSW, Australia
Postal address	
Main Phone number	+61 2 4286 3318
Fax	
Primary email address	Gary.M.Brassington@south32.net
Secondary email address	

9.1.2 I qualify for exemption from fees under Regulation 5.23(1)(ii) of the EPBC Regulations because I am:

☐ Small business
☑ Not applicable

9.1.2.2 I would like to apply for a waiver of full or partial fees under Regulation 5.21A of the EPBC Regulations

☐ Yes ☑ No

9.1.3 Contact (for an organisation - the contact details of the person authorised to sign on behalf of the organisation)

First name	Gary
Last name	Brassington
Job title	Manager Approvals
Phone	+61 2 4286 3318
Mobile	0438042897
Fax	
Email	Gary.M.Brassington@south32.net
Primary address	Post Office Box 514, Unanderra, 2526, NSW, Australia
Address	

Declaration: Person proposing the action (To be signed by the person at 9.1.3)

I, Gary Brassington **, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf or for the benefit of any other person or entity.**

Signature: J.Brassington **Date:** 06/12/21

I, Gary Brassington **, the person proposing the action, consent to the designation of** _____ **as the proponent for the purposes of the action described in this EPBC Act Referral.**

Signature: J.Brassington **Date:** 06/12/21

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Proposed designated proponent

9.2.1 Is the proposed designated proponent an organisation or business?

☑ Yes ☐ No

Organisation

Organisation name (as registered for ABN/ACN)	ILLAWARRA COAL HOLDINGS PTY LTD
Business name	
ABN	69093857286
ACN	
Business address	Post Office Box 514, Unanderra, 2526, NSW, Australia
Postal address	
Main Phone number	0438042897
Fax	
Primary email address	Gary.M.Brassington@south32.net
Secondary email address	

9.2.2 Contact (for an organisation - the contact details of the person authorised to sign on behalf of the organisation)

First name	Gary
Last name	Brassington
Job title	Manager Approvals
Phone	+61 2 4286 3318
Mobile	0438042897
Fax	
Email	Gary.M.Brassington@south32.net
Primary address	Post Office Box 514, Unanderra, 2526, NSW, Australia
Address	

Declaration: Proposed Designated Proponent

I, Gary Brassington **, the proposed designated proponent, consent to the designation of myself as the proponent for the purposes of the action described in this EPBC Act Referral.**

Signature: J. Brassington **Date:** 06/12/21

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Referring party (person preparing the information)

9.3.1 Is the referring party an organisation or a business?

☑ Yes ☐ No

Organisation

Organisation name (as registered for ABN/ACN)	ILLAWARRA COAL HOLDINGS PTY LTD
Business name	
ABN	69093857286
ACN	
Business address	Post Office Box 514, Unanderra, 2526, NSW, Australia
Postal address	
Main Phone number	+61 2 4286 3318
Fax	
Primary email address	Gary.M.Brassington@south32.net
Secondary email address	

9.3.2 Contact (for an organisation - the contact details of the person authorised to sign on behalf of the organisation)

First name	Gary
Last name	Brassington
Job title	Manager Approvals
Phone	+61 2 4286 3318
Mobile	
Fax	
Email	Gary.M.Brassington@south32.net
Primary address	Post Office Box 514, Unanderra, 2526, NSW, Australia
Address	

Declaration: Referring party (person preparing the information)

I, Gary Brassington **, declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence.**

Signature: ..... **Date:** 06/12/21 .....

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Appendix A

Attachment

Document Type	File Name
action_area_images	DMEP_EPBC_Act_Referral_Figures.pdf
supporting_tech_reports	DMEP_EPBC_Act_Referral_Sections_2.4_and_2.5.pdf
corp_env_policy_docs	South32_Sustainability_Policy.pdf
corp_env_policy_docs	South32_Environment_Standard.pdf

Appendix B

Coordinates

Area 1
-34.381092215328,150.64194771194
-34.385329123286,150.68552155944
-34.337298671584,150.78832045312
-34.30563263173,150.79230792564
-34.301434298824,150.71878760209
-34.341062021471,150.71019793928
-34.332446529548,150.65253851365
-34.381092215328,150.64194771194

Area 2
-34.433505417501,150.81023002019
-34.433531917956,150.81108029314
-34.432708551406,150.81138231233
-34.432707779455,150.81126994043
-34.432951708795,150.81024255342
-34.433505417501,150.81023002019