SOUTH32 Illawarra Metallurgical Coal

REHABILITATION MANAGEMENT PLAN
APPIN MINE

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DOCUMENT REVISION LOG

Persons authorising this plan

Name	Title	Date
Chris Schultz	Superintendent Environment	15 September 2023

Revision History

Revision	Description of Changes	Date
1.0	Conversion of MOP to RMP as required by NSW Resources Regulator.	30 June 2022
1.1	Update of ROBJ and FLRP following feedback from Resources Regulator. Update to final land uses. General update.	30 June 2023
2.0	Inclusion of approved Rehabilitation Objectives	15 September 2023

Persons involved in the review of this Plan

Name	Title	Company	Exp (yrs)	Date
Chris Schultz	Superintendent Environment	South32	26	15 September 2023
David Gregory	Senior Specialist Biodiversity and Conservation	South32	13	30 June 2023

SUMMARY TABLE

Table 1: Summary Table

Name of Mine	Appin Mine. This incorporates the Appin operations, West Cliff Coal Preparation Plant (WCCPP), North Cliff and Bulli Ventilation Shafts.
Rehabilitation Management Plan commencement date	3 July 2022
Rehabilitation Management Plan revision dates and version numbers	Version 1.0 (New Plan), dated 30 June 2022 Version 1.1, dated 30 June 2023 Version 2.0, dated 15 September 2023
Mining leases (lease number(s) and expiry date(s))	CCL 767, CCL 724, CL 381, CL 388, ML 1382, ML 1433, ML 1473, ML 1574, ML 1678, ML 1698, ML 1832, ML 1847, MPL 200, MPL 201. (Refer to Table 3 for expiry dates)
Name of lease holder(s)	Endeavour Coal Pty Ltd
Date of Submission	15 September 2023

1. PART 1 – INTRODUCTION TO MINING PROJECT

This Rehabilitation Management Plan (RMP) has been prepared in accordance with the requirements of Condition 10 of Schedule 8A of the *Mining Regulation 2016*(the Regulation). The Regulation includes standard mining lease conditions which require the preparation and implementation of a RMP for the life of the mine.

The NSW Government granted Project Approval 08_0150[1] (the Project Approval) for the Bulli Seam Operations (BSO) Project in December 2011. The RMP also addresses the requirement to develop and implement an RMP for Appin Mine in accordance with Condition 33 of Schedule 4 of the Project Approval.

Appin Mine is classified as a Large Mine in accordance with the Regulation.

1.1 History of operations

Appin Mine consists of the merged Appin, Tower, and West Cliff collieries. Appin Mine is owned and operated by Endeavour Coal Pty Ltd, a subsidiary company of Illawarra Coal Holdings Pty Ltd, which is 100% owned by South32 Limited. Key areas associated with the current Appin operations include the Appin North Pit Top site, Appin West Pit Top site, the Appin East Pit Top site, the Appin East Ventilation Shaft 1/2 and 3 sites, the Appin West Ventilation Shaft 6 and Ventilation Shaft 7/8 (Appin Mine Ventilation and Access (AMVA) Project) sites, the Douglas North Substation site, the West Cliff Coal Preparation Plant (WCCPP), the Coal Wash Emplacement Area (CWEA) and the North Cliff Mine site.

Appin Colliery – East (located at Appin and referred to as Appin East) commenced operations in 1962 and Tower Colliery (located at Douglas Park) commenced operation in 1978. The underground infrastructure, roadways, conveyor and ventilation systems were joined in 2003 to become Appin Mine. Appin East is located adjacent to Appin Village, approximately 37 kilometres northwest of Wollongong. Longwall mining was introduced in 1969.

Tower Colliery (now Appin Colliery – West, referred to as Appin West) was officially opened in November 1978. Following the sinking of the access and ventilation shafts, underground development of the mine was undertaken from 1978 through to 1988 when longwall operations were introduced. Tower Colliery completed extraction of 20 longwall blocks between 1988 and September 2002. The mine was redeveloped underground to establish mining operations in the current longwall Area 7 and Area 9 mining domains.

Appin Colliery - North (formerly West Cliff Mine) is located 26 km northwest of Wollongong, NSW. Construction of the mine commenced in 1973 and operations commenced in 1976. South32 IMC has conducted underground coal mining operations at Appin Colliery – North (Appin North) since 1997. Prior to this, Appin North was operated by Kembla Coal and Coke Pty Limited (KCC). Longwall mining is no longer occurring at Appin North, however

[1] As modified by MOD 1 (2015), MOD 2 (2016) and MOD 3 (2022)

underground infrastructure (pumps, coal conveyors, etc) remains in place and continues to be utilised. Key areas of Appin North include the Pit Top, the CWEA and the WCCPP.

The redundant North Cliff Mine site is located within CCL 724 and is surrounded by the Dharawal National Park.

Four non-operational and redundant ventilation shaft sites (from the Old Bulli Mine) have been transferred to CCL 767 and are also addressed in this RMP. The shafts are located in the south-east of CCL 767 in the Special Area, managed by WaterNSW. All four shafts were sealed to the standards of the day in the late 1980s and much of the sites have re-vegetated naturally. The Bulli No. 1 and No. 2 Shafts have been assessed as having regional heritage significance. The Bulli No. 3 Shaft has some infrastructure remaining. The Bulli No. 4 Shaft rehabilitation has been undertaken. None of these sites currently pose a safety risk to the public or potential harm to the environment as there is restricted access into the Special Area.

1.2 Current Development Consents, Leases and Licences

Current approval and consent documents related to Appin Mine are listed in the following tables. The Project Approval was issued under the *Environmental Planning and Assessment Act 1979* in December 2011 and modified in April 2015, October 2016 and April 2022. The Project Approval supersedes other project approvals or development consents for Appin Mine. The Project Approval (both State and Federal) are available on the IMC website via the following link: https://www.south32.net/what-we-do/our-locations/australia/illawarra-metallurgical-coal/documents.

The approvals issued for Appin Mine are listed in Table 2.

Table 2: Approvals associated with Appin Mine for the RMP

Date Granted	Document	Issued by	Expiry Date
11/2009	Appin Gas Drainage Project – Initial	NSW Department of Planning	N/A
Dec 2010	Appin Gas Drainage Project – 2010	NSW Department of Planning	N/A
Feb 2012	Appin Gas Drainage Project – 2012	NSW Department of Planning	N/A
1 April 2011	Appin Mine Ventilation Shaft No. 6 Approval 2010/5722 (*EPBC Act*)[2]	Department of Sustainability, Environment, Water, Population and Community	01/04/2041

[2] *Environment Protection and Biodiversity Conservation Act 1999*.

Date Granted	Document	Issued by	Expiry Date
22 Dec 2011	Bulli Seam Operations Project Approval (NSW Government)	NSW Department of Planning and Infrastructure	31/12/2041
4 May 2011	No. 6 Ventilation Shaft (NSW Government)	NSW Department of Planning	Consolidated into the Appin Mine Approval
15 May 2012	Bulli Seam Operations Project Approval 2010/5350 (*EPBC Act*)	Department of the Environment and Energy	15/05/2042
2 April 2015	Bulli Seam Operations Project Approval Modification 1 (MOD 1)	NSW Department of Planning and Environment (DPE)	31/12/2041
28 Oct 2016	S75W Modification (MOD 2) to Project Approval	DPE	31/12/2041
12 April 2022	S4.55(2) Modification (MOD 3) to Project Approval	DPE	31/12/2041

The mining leases issued for Appin Mine are listed in Table 3.

Table 3: Mining leases associated with Appin Mine

Mining Lease/Sub Lease	Number	Issued by	Issue Date	Expiry Date
Consolidated Coal Lease	724	Minister for Natural Resources (NSW)	04/07/1991	18/12/2031
Consolidated Coal Lease	767	Minister for Natural Resources (NSW)	29/10/1991	08/07/2029
Coal Lease	381	Minister for Natural Resources (NSW)	24/10/1991	24/10/2033
Coal Lease	388	Minister for Natural Resources (NSW)	22/01/1992	22/01/2034
Mining Purposes Lease	200	Minister for Natural Resources (NSW)	13/01/1982	13/01/2024
Mining Purposes Lease	201	Minister for Natural Resources (NSW)	13/01/1982	13/01/2024
Mining Lease	1382	Minister for Natural Resources (NSW)	20/12/1995	20/12/2037
Mining Lease	1433	Minister for Natural Resources (NSW)	24/07/1998	20/12/2037

Mining Lease/Sub Lease	Number	Issued by	Issue Date	Expiry Date
Mining Lease	1473	Minister for Natural Resources (NSW)	20/11/2000	19/11/2042
Mining Lease	1574	Minister for Natural Resources (NSW)	09/07/2008	30/12/2023
Mining Lease	1678	Minister for Natural Resources (NSW)	27/09/2012	26/09/2033
Mining Lease	1698	Minister for Natural Resources (NSW)	26/06/2014	25/06/2035
Mining Lease	1832	Minister for Regional NSW	9/08/2022	9/08/2043
Mining Lease	1847	Minister for Regional NSW	28/02/2023	28/02/2044

The exploration licences issued for Appin Mine are listed in Table 4.

Table 4: Exploration Licences associated with Appin Mine

Exploration Authorisation	Appin Mine Area	Issued by	Issue Date	Expiry Date
AUTH 199	Area 7, Appin and West Cliff	Minister for Natural Resources (NSW)	27/06/1980	27/06/2024
AUTH 201	Area 3 and Appin		27/06/1980	27/06/2024
AUTH 248	Area 7, 9 and Macarthur		13/05/1981	13/05/2026
AUTH 306	Area 3		19/07/1983	19/07/2025
AUTH 312	Area 7, 8, 9 and West Cliff		10/08/1983	10/08/2025
AUTH 370	Area 3 and Appin		08/05/1986	08/05/2025
AUTH 395	Area 3 and Appin		23/11/1987	23/11/2025
AUTH 396	Area 3, 8, Appin and West Cliff		28/06/1988	27/06/2024
AUTH 397	Appin and West Cliff		04/08/1987	27/06/2024
AUTH 432	West Cliff		12/02/1991	12/02/2025
EL 4470	Area 7 and Macarthur		05/01/1993	5/01/2026

Exploration Authorisation	Appin Mine Area	Issued by	Issue Date	Expiry Date
EL 8972	Area 9		29/04/2020	29/04/2026

The extraction plan approvals issued for Appin Mine are listed in Table 5.

Table 5: Extraction Plan Approvals associated with Appin Mine

Current Mining Approvals	Number	Issued by	Issue Date	Expiry Date
Appin Area 5 Longwalls 37 and 38 SMP Approval	13/1879	Department of Trade and Investment, Regional Infrastructure and Services	28/03/2014	-
Appin Area 7 Longwalls 707 - 710 SMP Approval	11/3329	Department of Regional NSW - Resources Regulator	17/04/2020	1/12/2024
Appin Area 9 Longwalls 901-904 EP Approval	08_0150	DPE	10/09/2014	-
Appin Longwalls 709-711 and 905	08_0150	DPE	29/07/2022	-

The licenses issued for Appin Mine are listed in Table 6.

Table 6: Licences applicable to Appin Mine

Licence	Number	Issued by	Issue Date	Expiry Date
Environment Protection Licence (EPL)	2504	NSW EPA	27/06/2011	N/A
Radiation Licence WCCPP and Appin East	5061052	NSW EPA	Renewed annually	Renewed annually
Licence to divert Brennans Creek around Stage 3 of refuse area	10WA103794	Department of Primary Industries – Water	01/07/2011	30/06/2024

Licence	Number	Issued by	Issue Date	Expiry Date
Nepean River Extraction Across from VS 6. Douglas North pump (Nepean River).	10WA117285	NSW Department of Industry	15/11/2011	14/11/2026
WCCPP Water Usage BCD. BCD UG Supply and BCD Recycled.	10WA117999	NSW Department of Industry	15/11/2012	14/11/2028
Appin Mine Underground Groundwater Extraction	10WA118778	NSW Department of Industry	01/07/2013	18/02/2028
West Cliff Mine Groundwater Extraction	10WA118766	NSW Department of Industry	01/07/2013	26/03/2028
Licence to Operate an STP	101.2010.00000059.009 101.2010.00000060.008	Wollondilly Shire Council	Renewed annually	Renewed annually
Groundwater Access Licence – West Cliff	36481	WaterNSW	N/A	N/A
Groundwater Access Licence – Appin	36477	WaterNSW	N/A	N/A
Groundwater Access Licence – Appin	37464	WaterNSW	N/A	N/A
Surface Water Access Licence – Brennans Creek Dam	35519	WaterNSW	N/A	N/A
Surface Water Access Licence – Mountbatten	30145	WaterNSW	N/A	N/A

Licence	Number	Issued by	Issue Date	Expiry Date
Appin - Explosives Licence to Store	XSTR100106 – Appin East XSTR100127 – Appin West	SafeWork NSW	N/A	23/03/2027 21/04/2027

1.3 Land Ownership and Land Use

Land ownership across Appin Mine underground domains and associated surface facilities includes private, commercial, and public bodies. The underlying tenure for each surface facility is summarised in Table 7.

Table 7: Underlying Land Tenure / Ownership

Site	Crown Land (Lease)	Crown Land (Conservation Area)	IMC Freehold	3rd Party Freehold	WaterNSW (Special Area)	National Park
Domain 1: WCCPP (Except CWEA)	✓					
Domain 2: Appin North Pit Top	✓					
Domain 3: Appin East Pit Top			✓			
Domain 4: Appin West Pit Top			✓			
Domain 5: North Cliff	✓					
Domain 6: Appin No. 1 and 2 Ventilation Shafts			✓			
Domain 7: Appin No. 3 Ventilation Shaft			✓			
Domain 8: Appin No. 6 Ventilation Shaft			✓			

Site	Crown Land (Lease)	Crown Land (Conservation Area)	IMC Freehold	3rd Party Freehold	WaterNSW (Special Area)	National Park
Domain 9: Bulli Shafts Sites					✓	
Domain 10: Mine Safety Gas Drainage			✓	✓		
Domain 11: CWEA	✓					
Domain 12: Brennans Creek Dam	✓					
Domain 13: Mine Subsidence Impacts		✓				
Domain 14: Douglas North Substation			✓			
Domain 15: Powerlines and Cables between WCCPP and North Cliff						✓
Domain 16: Appin No. 7 and 8 Ventilation Shafts			✓			

A schedule of land over the Appin Mine area is provided in Appendix 1, of the Project Approval: available here.

1.3.1 Land Ownership and Land Use Figure

Figure 1 shows the land ownership and land use across Appin Mine.

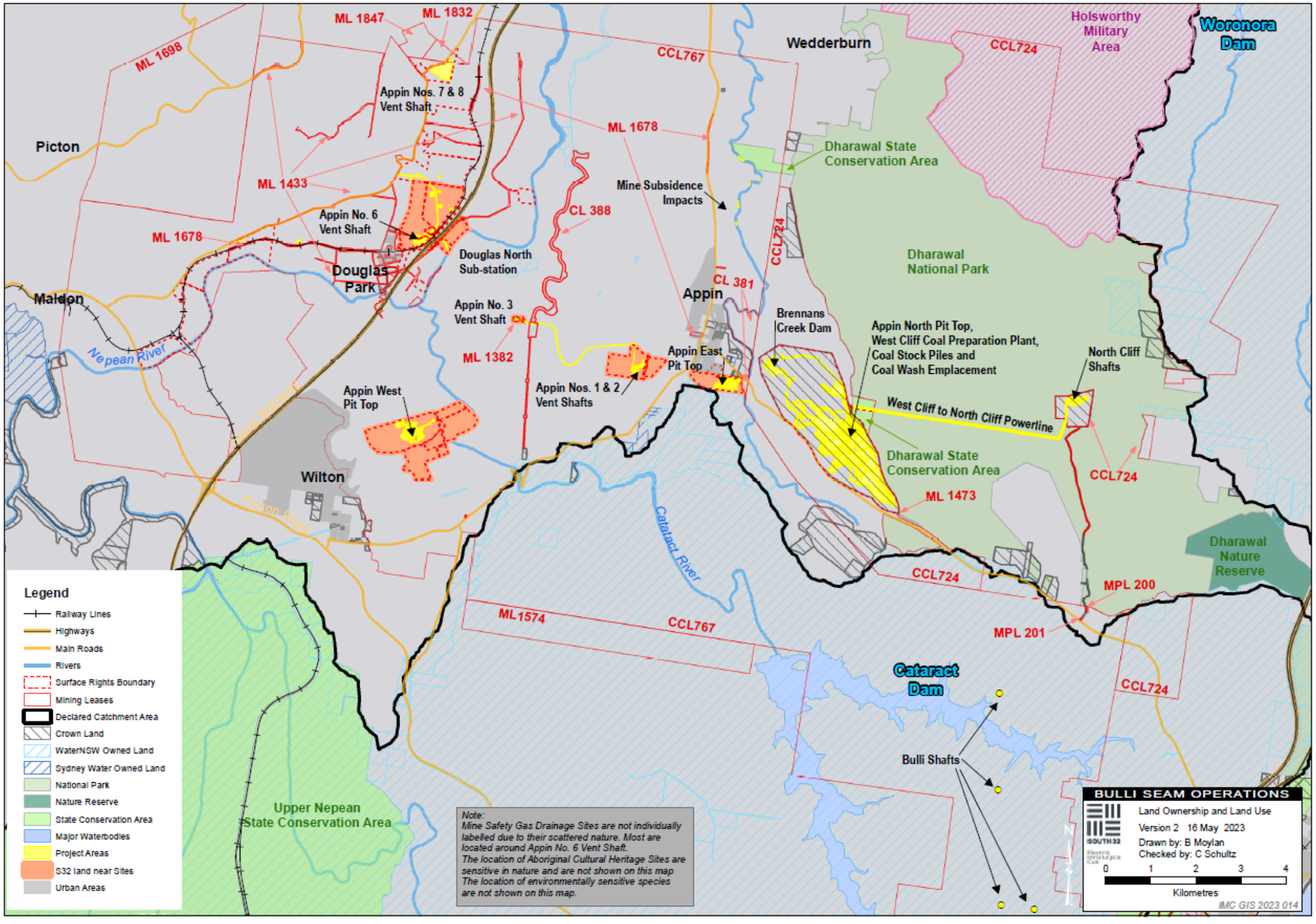


Figure 1: Land Ownership and Land use across Appin Mine

2. PART 2 – FINAL LAND USE

2.1 Regulatory Requirements for Rehabilitation

Rehabilitation commitments and post mining land use objectives are established as part of the project approval phase of a mining operation and approved by a determining authority such as DPE or a local council under the *Environment Planning & Assessment Act 1979*.

Under the *Mining Act 1992*, rehabilitation activities are regulated by DPE and the Resources Regulator to ensure compliance with:

- the conditions of project approvals issued under the *Environment Planning & Assessment Act 1979*; and
- conditions of Mining Leases issued under the *Mining Act 1992*.

Any activities associated with the closure or rehabilitation of mine sites must also be undertaken with due regard to all other relevant legislation. The following acts may apply to some activities at Appin Operations:

- *Mining Act 1992* (NSW).
- *Mining Regulation 2016* (NSW).
- *Biodiversity Conservation Act 2016* (NSW).
- *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999* (Cth).
- *Environmental Planning and Assessment Act 1979* (NSW).
- *Heritage Act 1977* (NSW).
- *National Parks & Wildlife Act (NPW) Act 1974* (NSW).
- *Protection of the Environment Operations Act 1997* (NSW).
- *Water Act 1912* (NSW).
- *Water Management Act 2000* (NSW).
- *Water NSW Act 2014.*
- *Dams Safety Act 2015*.
- *Coal Mine Subsidence Compensation Act 2017.*

The rehabilitation requirements for Appin Mine are outlined in Conditions 31 to 33 of Schedule 4 of the Project Approval, which includes the preparation of a RMP (Condition 33). Copies of the Project Approval and EPBC Approval 2010/5350 are available on the South32 Illawarra Metallurgical Coal website under Bulli Seam Operations Project/Approvals using this link.

A list of regulatory requirements relevant to closure and rehabilitation under the Project Approval is provided in the following sections.

2.1.1 Project Approval Requirements

Project Approval (08_0150), as modified, was issued for the BSO Project, under the *Environmental Planning and Assessment Act 1979* in 2011 and modified in April 2015, October 2016 and April 2022. This approval supersedes other project approvals or development consents for the Appin Operations. Table 8 summarises the conditions of Project Approval 08_150 that are relevant to closure and rehabilitation. In addition to the conditions summarised in Table 8, the Project Approval requires that Extraction Plans be prepared for each mining area under Condition 5 of Schedule 3.

Table 8: Summary of Project Approval 08_0150 Conditions Relevant to Closure & Rehabilitation

Schedule	Condition No	Condition
2	11	**Demolition** Ensure that all demolition work is carried out in accordance with Australian Standard AS 2601-2001: The Demolition of Structures, or its latest version.
2	14	**Strategic Biodiversity Offsets** Make suitable arrangements to provide appropriate long-term security for the biodiversity offset area(s) accepted under this condition.
3	1	**Subsidence – Performance Measures – Natural and Heritage Features etc.** Ensure that the project does not cause any exceedances of the performance measures
3	10	Prepare and implement a research program to improve the prediction, assessment, remediation and / or avoidance of subsidence impacts and environmental consequences on significant natural features in the Project Area.
4	14	**Compensatory Water** Provide a compensatory water supply to any owner of privately-owned land whose water supply is adversely impacted (other than an impact that is negligible) as a result of the project, or if this is not possible, provide alternative compensation.
4	17	**West Cliff Coal Wash Emplacement Area Management Plan** Prepare a West Cliff Coal Wash Emplacement Area Management Plan for the project to the satisfaction of the Secretary. This plan must include: • Management strategies to ensure no impacts to Aboriginal heritage site 52-2-3505 other than negligible impacts, including consideration of potential staged development of the emplacement and / or buffer areas; • Management strategies for the protection and conservation of *Persoonia hirsuta*; • Management strategies for the protection and conservation of the Broad-headed Snake and the Southern Brown Bandicoot; • A comprehensive water monitoring program for the emplacement; • Provide for progressive rehabilitation of the emplacement area, including through: ○ maximising opportunities for natural regeneration;

Schedule	Condition No	Condition
		○ maximising retention of suitable habitat species; ○ appropriate weed and pest control strategies; and ○ planting only endemic species in habitat mixes appropriate for soil, slope and aspect.
4	17A	Implement the West Cliff Coal Wash Emplacement Area Management Plan.
4	19	**West Cliff Coal Wash Emplacement Area Biodiversity Offset Strategy** The Proponent shall make suitable arrangements to provide appropriate long-term security for the offset areas.
4	21	**Gas Drainage Management Plan** Prepare a Gas Drainage Management Plan [including inter alia]: • Rehabilitation of disturbed sites.
4	21A	Implement the Gas Drainage Management Plan.
4	22	**Surface Activities Management Plan** Prepare a Surface Activities Management Plan which must include [inter alia]: • Measures for the rehabilitation of disturbance.
4	22A	Implement the Surface Activities Management Plan.
4	23B	**Upper Canal** Following the completion of construction of the Appin East Mine Gas Safety Management Project, the Proponent shall: • undertake a dilapidation survey of the Upper Canal in consultation with WaterNSW and the Heritage Division; and • repair, or pay the full costs associated with repairing, any damage to the Upper Canal caused by the project in consultation with WaterNSW and the Heritage Division, to the satisfaction of the Secretary.
4	31	**Rehabilitation objectives** The Proponent shall rehabilitate the site in accordance with the conditions imposed on the mining lease(s) associated with the project under the *Mining Act 1992*. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EA and the PPR, and comply with the objectives in Table 10.

Table 10: Rehabilitation Objectives *(from Project Approval).*

Feature	Objective
Mine site (as a whole)	Safe, stable & non-polluting.
Project Surface infrastructure	To be decommissioned and removed, unless the Resources Regulator agrees otherwise.
Portals and ventilation shafts	To be decommissioned and made safe and stable. Retain habitat for threatened species (e.g. bats), where practicable.
Watercourses of 3rd order or above subject to subsidence impacts	Restore pre-mining surface flow and pool holding capacity as soon as reasonably practicable. Hydraulically and geomorphologically stable, with riparian vegetation that is the same or better than prior to mining.
Other watercourses subject to subsidence impacts	Hydraulically and geomorphologically stable, with riparian vegetation that is the same or better than prior to mining.
Cliffs	No additional risk to public safety compared to prior to mining.
Other land affected by the project	Restore ecosystem function, including maintaining or establishing self-sustaining eco-systems comprised of: local native plant species (unless the Resources Regulator agrees otherwise); and a landform consistent with the surrounding environment.
Built features damaged by mining operations	Repair to pre-mining condition or equivalent unless: the owner agrees otherwise; or the damage is fully restored, repaired or compensated for under the Mine Subsidence Compensation Act 1961.
Community	Ensure public safety. Minimise the adverse socio-economic effects associated with mine closure.
Notes: *1) These rehabilitation objectives apply to all subsidence impacts and environmental consequences caused by mining taking place after the date of this approval; and to all project surface infrastructure part of the project, whether constructed prior to or following the date of this approval.* *2) Rehabilitation of subsidence impacts, and environmental consequences caused by mining which took place prior to the date of this approval may be subject to the requirements of other approvals (e.g. under a mining lease or a Subsidence Management Plan approval) or the Proponent's commitments.* 3) *In the case of the West Cliff Coal Wash Emplacement area, final landform may be significantly different from that existing prior to mining, but must still be safe, stable and non-polluting and generally consistent with the surrounding landforms.*	
4	32 **Progressive Rehabilitation**

		The proponent shall carry out the rehabilitation of the site progressively, that is, as soon as reasonably practicable following disturbance.
4	33	**Rehabilitation Management Plan** The Proponent shall prepare and implement a Rehabilitation Management Plan for the project in accordance with the conditions imposed on the mining lease(s) associated with the project under the Mining Act 1992, with specific reference to all surface facilities sites. This plan must be prepared in consultation with BCD, DPE Water, WCC, WSC and the CCC. *Note: The Rehabilitation Management Plan should address all land impacted by the project, whether prior to or following the date of this approval.*
4	35	**Ventilation Shaft 6** Prepare and implement a biodiversity offset strategy to compensate for the impact of Ventilation Shaft No. 6 on Cumberland Plain Woodland. The offset strategy must [*inter alia*]: Make suitable arrangements to protect and manage this offset area in perpetuity.
4	35A	**Appin Mine Ventilation and Access Site** Within six months of the commencement of the project early works, unless otherwise agreed with the Planning Secretary, two ecosystem credits for the clearing of Plant Community Type (PCT) 849 must be retired.

4	36	**Biodiversity Management Plan**
		Prepare a Biodiversity Management Plan for the Appin East Mine Gas Safety Management Project and Ventilation Shaft No. 6, to the satisfaction of the Planning Secretary. The plan must [*inter alia*]:
		• Describe how the implementation of offsets would be integrated with the overall rehabilitation of the site;
		• Provide a description of the measures that would be implemented in ongoing 5-year periods, including the procedures to be implemented to:
		  ○ implement revegetation and regeneration within disturbed areas;
		  ○ control weeds and feral pests;
		  ○ manage grazing and agriculture on site; and
		  ○ control unauthorised access.
		• Provide a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria.

4	36A	Implement the Biodiversity Management Plan.
6	3	**Adaptive Management**

		The Proponent must assess and manage project-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedules 3 and 4. Any exceedance of these criteria and/or performance measures constitutes a breach of this approval and may be subject to penalty or offence provisions under the *EP&A Act* or *EP&A Regulation.* Where any exceedance of these criteria and / or performance measures has occurred, the Proponent must, at the earliest opportunity: a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur; b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and c) implement remediation measures as directed by the Planning Secretary, to the satisfaction of the Planning Secretary.
6	4	**Annual Review** By 30 September 2012, and annually thereafter, the Proponent shall review the environmental performance of the project to the satisfaction of the Planning Secretary. This review must: • Describe the development (including any rehabilitation) that was carried out in the past financial year, and the development that is proposed to be carried out over the next year.
Appendix 6 Statement of Commitments		**Rehabilitation** Illawarra Coal [now IMC] will undertake rehabilitation of any areas disturbed by the project to ensure the environment is returned as close as possible to pre-project condition and / or to meet landowner specific requirements. De-commissioning of boreholes and shafts will be undertaken in accordance with the requirements of the relevant government department/s.

2.1.2 Mining Lease Requirements

The instruments of variation to mining leases issued in 2022 removed all conditions relating to closure and rehabilitation. The mining leases require the lease holder to provide and maintain a security deposit to secure funding for the fulfilment of obligations under the mining leases covered by the group security deposit, including obligations under each mining lease that may arise in the future.

Mining Regulation (2016)

The government has clear requirements for rehabilitation in NSW and there are standard conditions across all mining leases in NSW set out in Schedule 8A of the *Mining Regulation 2016*.

Lease holders are required to:

- prevent or minimise harm to the environment;
- rehabilitate land and water as soon as reasonably practicable after disturbance occurs;
- achieve the approved final land use for the mining area as set out in the:
  - rehabilitation objectives statement;
  - rehabilitation completion criteria statement; and
  - final landform and rehabilitation spatial plan;
- undertake a rehabilitation risk assessment and implement measures to eliminate, minimise or mitigate risks to achieving the final land use;
- prepare and implement a rehabilitation management plan;
- prepare an annual rehabilitation report which describes the progress of rehabilitation over the annual reporting period; and
- prepare a forward program which includes the schedule of mining and rehabilitation activities for the next three years demonstrating how rehabilitation will occur as soon as reasonably practicable after disturbance.

2.1.3 EPBC Act Approvals

IMC holds two approvals issued under the *EPBC Act* (2010 / 5350 and 2010 / 5722). Table 9 provides a summary of the conditions within these approvals that are relevant to closure and rehabilitation.

Table 9: Summary of EPBC Approvals Conditions Relevant to Closure and Rehabilitation

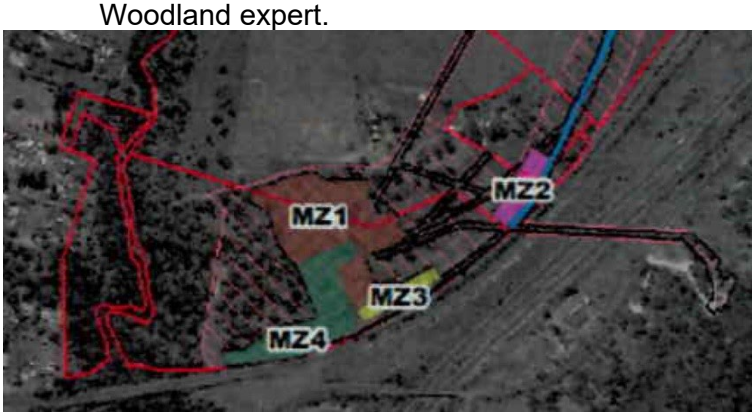
Condition No	Condition	Area to Which Applicable
EPBC 2010/5350		
1	Provide a *Persoonia hirsuta* offset including, as a minimum, an area of suitable habitat to support populations of *Persoonia hirsuta* plants totaling at least 150 individual plants, including the core population.	Appin Operations

Condition No	Condition	Area to Which Applicable
	The *Persoonia hirsuta* offset must be legally secured in perpetuity	
2	Provide a plan for the management of the *Persoonia hirsuta* offset including: • mitigation measures to ensure operation of the action, including fire management and specifically the emplacement of coal wash, does not impact on any of the *Persoonia hirsuta* plants protected under this plan. This includes but is not limited to impacts associated with dust, shading, sedimentation, erosion or unrestricted access to areas containing *Persoonia hirsuta* plants;	Appin Operations
4	Provide a Shale / Sandstone Transition Forest Offset and protect in perpetuity.	Appin Operations
5	Provide a plan for the management of the Shale / Sandstone Transition Forest Offset including but not be limited to: • measures to control weed species, pest animals, public access; • measures for annual monitoring of the ongoing quality (as measured against the ecological survey information referred to at Conditions 4 a) of the Shale / Sandstone Transition Forest Offset and the effectiveness of management actions. Reports containing the monitoring results must be submitted to the department within 30 days of every 12-month anniversary of the date the Shale / Sandstone Transition Forest Offset is protected in perpetuity; and • corrective actions and contingency measures to be implemented should monitoring indicate a decrease in the quality of the Shale / Sandstone Transition Forest conservation offset.	Appin Operations
6	Provide a Coal Wash Emplacement Staging and Rehabilitation Plan (the Staging Plan) for the stage 4 coal wash emplacement area to the Minister for approval. Clearing of native vegetation for stage 4 coal wash emplacement area must not occur until the Staging Plan has been approved by the Minister. The Staging Plan must include, but not be limited to: • provision for the progressive staging of coal wash emplacement to ensure at all times a minimum 100 m wide habitat corridor is maintained linking the *Persoonia hirsuta* core population with habitat	Appin Operations

Condition No	Condition	Area to Which Applicable

	adjacent to the stage 4 coal wash emplacement area;
	• measures to ensure that, if the corridor is to include land previously used as emplacement areas (either in whole or in part), native re-vegetation is established to the extent that it facilitates the movement of pollination vectors for *Persoonia hirsuta*;
	• provision for progressive rehabilitation of the emplacement area, including through:
	  ○ staged clearing of native vegetation within the stage 4 coal wash emplacement area;
	  ○ maximising opportunities for natural regeneration, including through salvage, storage and re-use of site topsoil and maximising the retention time of suitable habitat species within the stage 4 coal wash emplacement area adjacent to active emplacement areas to assist re- colonisation of native species to rehabilitated areas;
	  ○ key performance objectives for site rehabilitation, including indicative timelines, performance measures, management actions and responsibilities and accountabilities;
	  ○ planting only endemic species in habitat mixes appropriate for the local surrounding environment, soil, slope and aspect, in accordance with relevant published guidelines; and
	  ○ appropriate weed and pest control strategies;
	• monitoring of rehabilitation actions including, but not limited to, measures to assess the success of management actions, natural regeneration and revegetation. The reporting of monitoring results must be submitted to the department within 30 days of every 12-month anniversary of the implementation date of the Staging Plan; and
	• unless otherwise agreed to in writing by the Minister, the Staging Plan must be implemented and remain implemented for a minimum period of 10 years at which point a revised plan taking into account the monitoring referred to above must be submitted to and approved by the Minister.	

Condition No	Condition	Area to Which Applicable
8	Provide a Surface and Ground Water Quality Monitoring and Adaptive Management Plan (the Water Plan) which: • provides a monitoring and adaptive management framework that will identify potential water related impacts of the action on EPBC Act listed species and their habitat; • details strategies and actions for maintaining, enhancing, and if required, restoring ecological assets, functions and habitats, for dependent EPBC Act listed species and their habitat including but not limited to the Macquarie Perch in Brennans Creek and the Georges and Nepean Rivers	Appin Operations
9	No less than 3 years prior to the date of expected closure of the mine, the person taking the action must submit to the Minister for approval an environmental management plan that sets out any required actions and responsibilities to ensure the closure of the mine does not result in on-going adverse impacts (post-closure) to EPBC Act listed species. The approved plan must be implemented until the person taking action can provide evidence that no further actions are required, and cessation is agreed to in writing to the Minister.	Appin Operations
10	At the cessation of mining activities, all portals and ventilation shafts are to be closed, decommissioned or capped in a manner that prevents the death or injury of EPBC listed bats	Appin Operations
EPBC 2010/5722		
2	The person taking the action must submit a Biodiversity Offset Strategy to the Minister for approval. The strategy must address the following requirements: a) The conservation of at least 8.7 hectares of land containing medium to high quality CPW (Annexure A) b) In addition to land pertaining to 2(a) [Cumberland Plain Shale Woodlands offset], that land will be managed and revegetated to greater quality to that removed; and c) The land referred to in 2(a) must be protected by a legal instrument under relevant nature conservation legislation that ensures the land is conserved in perpetuity.	No. 6 Ventilation Shaft
3	Submit a Vegetation Management Plan to the Minister for approval. The plan must address the following requirements [*inter alia*]:	No. 6 Ventilation Shaft

Condition No	Condition	Area to Which Applicable
	• Rehabilitate MZ2, MZ3 and MZ4 using appropriate native species with input from a Cumberland Plains Woodland expert. 	

2.1.4 Extraction (Subsidence Management) Plan Approvals

Subsidence can impact watercourses (e.g., hydrology and water quality), swamps (e.g. hydrology and ecological function) and the landscape in general (e.g., surface cracks which can lead to erosion and rock falls).

The Project Approval was issued in 2011; this supersedes previous project approvals or development consents for the Appin Operations. A requirement of the Project Approval is for Extraction Plans for each mining area (Schedule 3 Condition 5) to be developed and approved prior to mining. These plans detail the monitoring and management of subsidence impacts and contain Trigger Action Response Plans (TARPs) that identify when mitigation or remedial measures are required. The Extraction Plans prescribe the remedial options to be implemented, if required under the TARPs.

This section summarises relevant excerpts of key conditions from the Extraction and Subsidence Management Plans for Appin Areas 5, 7 and 9 that contain implications for progressive rehabilitation and closure. Area 5 has a Subsidence Management Plan and Area 9 and 5 Extraction Plans. Other Appin Areas (eg. Areas 1 – 4 and Tower) do not have approved Extraction Plans as these areas are not actively mined.

<u>Approval for Appin Area 7 (Longwalls 707 to 710)</u>

Condition 13 of the SMP Approval for Longwalls 707 to 710 states:
The leaseholder must not operate other than in accordance with an Environmental Management Plan (EMP) approved by the Director Environmental Sustainability & Land Use. This plan must address subsidence impacts above and include:
a) trigger levels for subsidence impacts that require actions and responses.
b) the procedures that would be followed in the event that the monitoring indicates an exceedance of trigger levels; and
c) measures to mitigate, remediate and / or compensate any identified impacts.

The leaseholders shall ensure that underground mining does not cause the following performance measures to be exceeded (see Table 10*).*

Table 10: Performance measures

Watercourses	
Nepean River	Negligible environmental consequences including: • negligible diversion of flows or changes in the natural drainage behaviour of pools; • negligible gas releases and iron staining; and • negligible increase in water cloudiness.
Other watercourses	No greater subsidence impact or environmental consequences than predicted in the EA [Environmental Assessment] or SMP [Subsidence Management Plan].
Land	
Cliffs flanking the Nepean River	Negligible environmental consequences (that is occasional rockfalls, displacement or dislodgement of boulders or slabs, or fracturing, that in total do not impact more than 0.5% of the total face area of such cliffs within any longwall mining domain)
Cliffs of "special significance" (i.e. cliffs longer than 200 m and / or higher than 40 m; and cliff-like rock faces higher than 5 m that constitute waterfalls	Negligible environmental consequences (that is occasional rockfalls, displacement or dislodgement of boulders or slabs, or fracturing, that in total do not impact more than 0.5% of the total face area of such cliffs within any longwall mining domain).
Other cliffs	Minor environmental consequences (that is occasional rockfalls, displacement or dislodgement of boulders or slabs, or fracturing, that in total do not impact more than 3% of the total face area of such cliffs within any longwall mining domain).
Biodiversity	
Threatened species, threatened populations, or endangered ecological communities	Negligible environmental consequences
Aboriginal heritage	

Sites determined to hold "special significance"	Negligible impact or environmental consequence
Sites determined to hold high or moderate significance	Less than 10% of such sites across the mining area are affected by subsidence impacts (other than negligible impacts or environmental consequence).
Other Aboriginal heritage sites	Less than 10% of such sites (or 1 such site, whichever is the greater) within any longwall mining domain are / is affected by subsidence impacts (other than minor impacts or environmental consequence).
Historic heritage	
St Mary's Tower (Douglas Park)	Negligible impact on structural integrity or external fabric.
Other buildings or structures of State or National heritage significance	Negligible loss of heritage value. Negligible impact on structural integrity or external fabric unless the owner of the feature agrees otherwise in writing.

Approval for Appin (formerly West Cliff) Area 5 (Longwalls 37 and 38)

The leaseholder must not operate other than in accordance with an EMP approved by the Director Environmental Sustainability. This plan must include:

a) trigger levels for subsidence impacts that require actions and responses;
b) the procedures that would be followed in the event that the monitoring indicates an exceedance of trigger levels;
c) measures to mitigate, remediate and / or compensate any identified impacts.

Approval for Appin Area 9 (Longwalls 901-904)

Approval for the Appin Area 9 Extraction Plan for Longwalls 901-904 was issued in September 2014. Performance measures are as detailed in Tables 1 and 2 in Schedule 3 of the Project Approval.

Approval for Longwalls 905 and 709 – 711

Conditional approval for Longwalls 905 and 709-711 was provided on 29 July 2022. Approval of Variation 1 was provided on 15 March 2023. Performance measures are as detailed in Tables 1 and 2 in Schedule 3 of the Project Approval.

2.1.5 Environment Protection Licence

The Environment Protection Authority (EPA) administers and regulates EPLs under the *Protection of the Environment Operations Act 1997*. IMC holds licence EPL 2504 which covers the whole Appin Operation.

Apart from operational conditions relating to air, dust, water and effluent emissions that need to be considered during closure, there are no specific requirements in this licence that relate to mine closure. It is noted that EPL 2504 includes water quality concentration limits for water discharged from Brennans Creek Dam that will likely need to be met by closure activities, which may include dewatering Brennans Creek Dam prior to decommissioning, removal of the dam and development of a final landform.

In addition to the discharge limits, IMC is currently required to provide a minimum flow to the Georges River of 1.5 ML/day to mitigate subsidence impacts, maintain amenity and substitute natural flows. There is a plan to remediate these impacts (Section 8.4.1) and consequently IMC expects that this discharge will be reviewed once successful remediation has been demonstrated and pool levels are maintained.

2.1.6 Diversion Channel Licence

Approval number 10WA103794 issued by WaterNSW licenses Brennans Creek Diversion. The following conditions are relevant to closure:

- When a water supply work authorised by this approval is to be abandoned or replaced, the approval holder must contact WaterNSW in writing to verify whether the work must be decommissioned.
- The work is to be decommissioned unless the approval holder receives notice from the Minister not to do so. Within sixty (60) days of decommissioning, the approval holder must notify WaterNSW in writing that the work has been decommissioned.
- The diversion channel shall be constructed in accordance with the plans in the report prepared by Cardno, Forbes and Rigby (2007).
- The Brennans Creek Diversion Channel must be progressively rehabilitated to provide natural stream features including pools, riffles, sandstone boulders for energy dissipation and riparian vegetation. Where it does not conflict with the safe conveying of the 1:100 year design storm flood flow rate, natural stream features should be incorporated into the construction of the Brennans Creek Diversion Channel.

2.1.7 Dam Safety NSW Requirements

Dams Safety NSW (previously the Dams Safety Committee (DSC)) declared Brennans Creek Dam a prescribed dam under the *Dams Safety Act 1978*. Dams Safety NSW is required to “formulate measures to ensure the safety of dams” in NSW. It “prescribes" those dams with a potential for failure that could threaten downstream life, cause extensive property or environmental damage, or have a severe impact on the public welfare. For prescribed dams, Dams Safety NSW adopts a regulatory role to ensure the owners of those dams and third parties (e.g. mining companies) undertaking activities near their storages, conform to appropriate safety requirements.

In the context of closure, this relates to the requirement for mining operations within the notification area to be approved and managed via a management plan which assesses the risks associated with any interaction of the dam and underground workings and to identify appropriate closure measures. It also means that in the event that a dam is to be decommissioned and removed, Dams Safety NSW must be consulted (Table 11).

Table 11: Interaction with DS NSW over Dam Life Cycle

Phase	Interaction
Operation	DS NSW requires regular surveillance and reporting DS NSW conducts random audits DS NSW requires regular surveillance and reporting (usually 5 yearly) DS NSW requires Safety Reviews at regular intervals (usually 10 yearly)
Decommissioning	DS NSW reviews proposal DS NSW requires decommissioning report

2.1.8 Coal Wash Emplacement Area

The CWEA, also referred to as the dry rejects emplacement area (DREA) is classified as a Tailings Dam under South32's Dam Management Standard, and therefore must comply with relevant tailings standards including the Global Industry Standard on Tailings Management (GISTM). South32 is currently reviewing the emplacement design in accordance with Forward Work Program No. 8 (Table 20).

2.1.9 Third Party Agreements

Agreements with EDL

The power stations at Appin No. 1 and 2 Shaft site and the Appin West Pit Top are owned and operated by EDL. Under Clauses 3.3 and 4.3 of EDL's contract with South32, responsibility lies with EDL for decommissioning and rehabilitation of the power stations and remediation of any contamination caused by EDL or its representatives.

Land Access Agreements

IMC holds several land access agreements with third parties. These agreements contain various conditions relating to rehabilitation and closure which must be met prior to termination of the agreement. IMC holds a register of these agreements, but the details of the agreements are not outlined in this plan for confidentiality reasons.

2.1.10 Relevant Guidelines

There are several specific technical guidelines that have been referred to in the development of this RMP:

- EDG01 Borehole Sealing Requirements on Land: Coal Exploration (NSW Division of Resources & Energy, 2012b) – under review

  (http://www.resourcesandenergy.nsw.gov.au/__data/assets/pdf_file/0005/427019/EDG01-borehole-sealing-land-23-April-2012.pdf).

- EDG02 Borehole Sealing Requirements on the Beds of Water bodies: Coal Exploration (NSW Division of Resources & Energy, 1997) – under review

  (http://www.resourcesandenergy.nsw.gov.au/__data/assets/pdf_file/0015/427020/edg02_borehole_sealing_water.pdf)

- MDG6001 Guidelines for the permanent Filling and Capping of Surface Entries to Coal Seams (NSW Division of Resources & Energy, 2012a)

  (http://www.resourcesandenergy.nsw.gov.au/__data/assets/pdf_file/0018/420516/MDG-6001-sealing-guidelines.pdf).

- NSW Resource Regulator (2021) Form and Way: Rehabilitation Management Plan for Large Mines.
- NSW Resource Regulator (2021) Form and Way: Annual Rehabilitation Report and Forward Program for Large Mines.
- NSW Resource Regulator (2023) Form and Way: Rehabilitation Objectives and Rehabilitation Completion Criteria.
- NSW Resource Regulator (2021) Form and Way: Mine Rehabilitation Portal.
- South32 Closure Standard.
- South32 Dam Management Standard.

2.2 Final Land Use Options Assessment

The post-closure land uses of all areas of the mine are influenced by the strategic context of the mine and stakeholder requirements, future surrounding land uses and strategic land use plans for the area is likely to have a key influence on the post-mining land use decision.

The key vision for all sites is to rehabilitate them to a standard suitable for return to the pre-mining natural environment or rehabilitated to meet future rural or development needs as agreed with relevant stakeholders and agencies. The BSO Project EA indicates that:

- the Appin North Colliery and WCCPP are located on leased Crown Land adjacent to a Water NSW Special Area and the Dharawal National Park, and the final land use proposed for the site is bushland.
- the final land use of residential development is proposed for the Appin East and Appin West Pit Tops; and
- in recognition of the location and setting of these areas and the potential benefits of alternative uses such as light industrial or other employment generating activities, the proposed final land uses will be reviewed over the mine life in consultation with government and community stakeholders.

It is noted that the land zoning at each site is as follows:

- Zone RU2 – Rural Landscape – Appin West Pit Top, Appin East Pit Top, Ventilation Shaft 1, 2, 3, 6, 7 and 8 and Douglas North Sub-station; and
- Zone E2 – Environmental Conservation – Appin North Pit Top, WCCPP and CWEA.

As there is no development consent in place for residential sub-divisions at this stage, the final land use will default to agricultural-grazing or native ecosystem (as applicable) until an alternative land use is approved.

Large areas of land surrounding the sites are being purchased by developers for subdivision. It is anticipated that this will continue. It is also anticipated that employment lands will need to be identified for local industry. Areas that are currently cleared for infrastructure (including the Appin North Pit Top and WCCPP) may be suitable for light industrial in the future, although current land zoning would prohibit this land use, and would require the land to be rezoned. For Appin North Pit Top and the WCCPP, this process would need to be facilitated by Crown Lands. Given the current land zoning, the post mining land use is listed as returned to natural bushland.

It is understood that on expiry of CCL 724 that the Crown land affected will be subject to Aboriginal Land Claims: ALC 3526 by the Tharawal Local Aboriginal Land Council and ALC 42484 by the NSW Local Aboriginal Land Council. A land transfer to another organisation or a new licence/lease agreement may need to be established to take over from CCL 724 to address future land tenure. The likely default situation would be that control of the Crown Land will revert to management of the Local Aboriginal Land Councils.

Forward Work Program Item No. 5 commits to a Post-closure Land Use Study (Table 20). At this stage, the post-closure land use options outlined in Table 12 form the basis of internal closure plans and strategies outlined in this document; however, pending the outcomes the Land Use Study, options will be re-evaluated and updated where required in this plan, and during the development of detailed rehabilitation plans for each site once they reach closure.

2.3 Final Land Use Statement

The key vision for all sites is to rehabilitate them to a standard suitable for return to the pre-mining natural environment or rehabilitated to meet future rural or development needs as agreed with relevant stakeholders and agencies. The proposed Final Land Uses for Appin Mine sites upon completion of operations are summarised in Table 12. Given the expectant long life of operations, these may be subject to change.

Table 12: Final Land Use Options Summary

Mining Domain Name	Final Land Use Domains[3]	Additional Information
Domain 1: WCCPP (Except CWEA)	Native Ecosystem	Return to natural bushland similar to surrounding vegetation.
Domain 2: Appin North Pit Top	Native Ecosystem	Return to natural bushland similar to surrounding vegetation.
Domain 3: Appin East Pit Top	Native Ecosystem	This site will be suitable for residential or light industrial land (subject to future land zoning and approval).
Domain 4: Appin West Pit Top	Native Ecosystem	This site will be suitable for residential land (subject to future land zoning and approval).
Domain 5: North Cliff	Native Ecosystem	Return to natural bushland similar to surrounding vegetation. Surface water pond will be retained until rehabilitation has been established or as agreed with NPWS.
Domain 6: Appin No. 1 and 2 Ventilation Shafts	Agricultural - Grazing	This site will be suitable for residential land (subject to future land zoning and approval).
Domain 7: Appin No. 3 Ventilation Shaft	Agricultural - Grazing	This site will be suitable for residential land (subject to future land zoning and approval).
Domain 8: Appin No. 6 Ventilation Shaft	Agricultural - Grazing	This site will be suitable for residential land and community infrastructure (subject to future land zoning and approval).
	Native Ecosystem	Area to the south of the Ventilation Shaft Infrastructure to be returned to Native Ecosystem in accordance with EPBC Approval 2010/5722

[3] As defined by the Resources Regulator Form and Way Documents

Mining Domain Name	Final Land Use Domains[3]	Additional Information
	Rehabilitation Biodiversity Offset Area[4]	The existing VS6 Biodiversity Offset land will remain as natural bushland.
	Heritage Area[5]	Mountbatten House will remain as heritage infrastructure (listed as a local heritage item in the Wollondilly Shire Council Local Environmental Plan 2011).
Domain 9: Bulli Shafts Sites	Native Ecosystem	Return to natural bushland similar to surrounding vegetation. It is planned for items of heritage significance to be made safe, remain in situ. Bulli No. 1 and Bulli No. 2 shafts are heritage listed.
Domain 10: Mine Safety Gas Drainage	Agricultural - Grazing	Return to pre-disturbance environment.
Domain 11: CWEA	Native Ecosystem	Return to natural bushland similar to surrounding vegetation as per Coal Wash Emplacement Area Management Plan.
	Rehabilitation Biodiversity Offset Area[6]	The existing *Persoonia hirsuta* Offset Area will remain as natural bushland.
	Water Management Area	Brennans Creek diversion around CWEA.
Domain 12: Brennans Creek Dam	Native Ecosystem	Remove dam and reinstate ephemeral creekline. Restore flows.

[5] Not included in spatial dataset as area is not disturbed. Relevant to identify that an Offset Area is located on the property associated with disturbance.
[5] Not included in spatial dataset as Mountbatten House is not included in disturbance area. Adjacent to the area disturbed for the ventilation shaft.
[6] Not included in spatial dataset as area is not disturbed.

Mining Domain Name	Final Land Use Domains[3]	Additional Information
Domain 13: Mine Subsidence Impacts	Native Ecosystem	Restore pre-mining surface flow and pool holding capacity (Upper Georges River).
Domain 14: Douglas North Substation	Agricultural - Grazing	This site will be suitable for residential land (subject to future land zoning and approval).
Domain 15: Powerlines and Cables between WCCPP and North Cliff	Native Ecosystem	Remove power poles and lines (subject to NPWS approval).
Domain 16: Appin No. 7 and 8 Ventilation Shafts	Agricultural - Grazing	Return to pre-disturbance environment.

2.4 Final Land Use and Mining Domains

2.4.1 Final Land Use Domains

The following Final Land Use Domains have been selected for the purposes of this RMP. Refer to Table 13 for additional context.

Table 13: Final Land Use Domains for Appin Mine

Mining Domain Name	Final Land Use Domains [7]
Domain 1: WCCPP (Except CWEA)	Native Ecosystem
Domain 2: Appin North Pit Top	Native Ecosystem
Domain 3: Appin East Pit Top	Native Ecosystem
Domain 4: Appin West Pit Top	Native Ecosystem
Domain 5: North Cliff	Native Ecosystem
Domain 6: Appin No. 1 and 2 Ventilation Shafts	Agricultural - Grazing
Domain 7: Appin No. 3 Ventilation Shaft	Agricultural - Grazing
Domain 8: Appin No. 6 Ventilation Shaft	Native Ecosystem Agricultural - Grazing
Domain 9: Bulli Shafts Sites	Native Ecosystem
Domain 10: Mine Safety Gas Drainage	Agricultural - Grazing
Domain 11: CWEA	Native Ecosystem Water Management Area
Domain 12: Brennans Creek Dam	Native Ecosystem
Domain 13: Mine Subsidence Impacts	Native Ecosystem
Domain 14: Douglas North Substation	Agricultural - Grazing
Domain 15: Powerlines and Cables between WCCPP and North Cliff	Native Ecosystem
Domain 16: Appin No. 7 and 8 Ventilation Shafts	Agricultural – Grazing

2.4.2 Mining Domains

The Mining Domains as outlined in Table 14 apply to the various sites across Appin for the purposes of this RMP.

[7] As defined by the Resources Regulator Form and Way Documents

Table 14: Mining Domains for Appin Mine

Mining Domain Name	Mining Domain Types[8]
Domain 1: WCCPP (except CWEA)	Infrastructure area Water Management Area
Domain 2: Appin North Pit Top	Infrastructure area Water Management Area
Domain 3: Appin East Pit Top	Infrastructure Area Water Management Area
Domain 4: Appin West Pit Top	Infrastructure Area Water Management Area
Domain 5: North Cliff	Infrastructure Area Water Management Area Overburden Emplacement Area
Domain 6: Appin No. 1 and 2 Ventilation Shafts	Infrastructure Area Water Management Area
Domain 7: Appin No. 3 Ventilation Shafts	Infrastructure Area Water Management Area
Domain 8: Appin No. 6 Ventilation Shaft	Infrastructure Area Water Management Area
Domain 9: Bulli Shafts Sites	Infrastructure Area
Domain 10: Mine Safety Gas Drainage	Infrastructure Area
Domain 11: CWEA	Infrastructure Area Water Management Area Overburden Emplacement Area
Domain 12: Brennans Creek Dam	Infrastructure Water Management Area
Domain 13: Mine Subsidence Impacts	Underground Mining Area (SMP)
Domain 14: Douglas North Substation	Infrastructure Area
Domain 15: Powerlines and Cables between WCCPP and North Cliff	Infrastructure Area
Domain 16: Appin No. 7 and 8 Ventilation Shafts	Infrastructure Area Water Management Area

[8] As defined by the Resources Regulator Form and Way Documents

3. PART 3 - REHABILITATION RISK ASSESSMENT

Risk assessment forms a key component of the adaptive management approach to rehabilitation and closure at Appin Operations. The risks of rehabilitation have been assessed to help guide the closure improvement program, and to maintain a focus on developing and improving rehabilitation designs and actions for those risks that, without controls, would pose the highest risk. The closure and rehabilitation risks for Appin Operations were assessed in 2021 by a multi-disciplinary team. The material risks and risks with a current Residual Risk Rating ≥100 identified in the risk assessment are summarised in Table 15. The risks have been ranked in accordance with IMC's Risk Management Standard.

The Risk Assessment identifies the key studies required to enable future detailed closure and rehabilitation plans and South32 has developed a Forward Work Program (Table 20). As new information becomes available from the studies identified in the Forward Work Program, IMC will reassess the closure risks and review closure designs and plans to address those risks.

The risks will generally be reviewed every three years in accordance with South32's closure planning cycle.

Table 15: Assessment of risks related to closure and rehabilitation across Appin Mine (2021)

Risk ID	Risk Event Title	Risk Description (Risk Articulation)	Causes	Impact Detail	Inherent Risk Assessment			Controls: Currently in Operation	Residual Risk Assessment			
					Likelihood	Impact Level	Risk		Likelihood	Impact Level	Risk	Controls: Proposed
R6	Coal Wash Emplacement Area Does not meet stakeholder requirements for natural bushland	TECHNICAL Does not meet stakeholder requirements for natural bushland	Inadequate consultation Lack of topsoil and subsoil Compaction Landform not stable Weed invasion Poor seed selection	COST and REPUTATION Impact to reputation Costs for rework	Almost Certain	3	100	Progressive rehabilitation program Weed control / maintenance program Selection of seed with a suitable provenance appropriate to post-mining land use and compatible with surrounding environment Coal Wash Emplacement Management Plan Alternate use of coal wash	Possible	1	1	Vehicle hygiene program Progressive signoff with regulators Underground emplacement trials Materials balance and stockpile strategy Import suitable topsoil if required
R12	Mining Areas Reduced surface water flows / water availability in streams	TECHNICAL Reduced surface water flows / water availability in streams	Subsidence impacts including cracking, changes to groundwater inflows. A number of impacts have been detected in Georges River which warrant remediation. These impacts are associated with draining or lowering of water levels in the pools in the Georges River	ENVIRONMENTAL Impacts to flora and fauna Breach of regulation	Almost Certain	3	100		Possible	2	3	Subsidence management plan including predictions, monitoring and mitigation according to the trigger action response plan. Swamp rehabilitation research plan. Georges River rehabilitation plan.
R21	Coal Wash Emplacement Area Contamination soil, groundwater and adjacent creek line	TECHNICAL Contamination soil, groundwater and adjacent creek line	Contaminated (first flush) run-off or seepage Erosion of rehabilitated surface releasing sediment into Brennans Creek	ENVIRONMENTAL and REPUTATION Impacts to water quality and aquatic biota in Brennans Creek Reputation	Almost Certain	3	100		Unlikely	2	0.9	Coal Wash Emplacement Area Management Plan Cover with subsoil and topsoil Drainage design and provision for treatment post closure, if required.
R35	All Domains Closure provision is under-estimated	PROJECT Closure provision is under-estimated	Poor closure planning. Uncertainties in costs (e.g. post-closure groundwater costs). Unplanned costs. Poor cost estimation.	COST and REPUTATION	Possible	5	100		Possible	4	30	Closure planning standard Closure cost estimates are reviewed every 6 months and capture rises in costs (e.g. consumer price index) Closure cost estimates are reviewed by KPMG Range analysis and risk assessment to capture uncertainty

4. PART 4 – REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA

The overarching closure and rehabilitation objective for IMC's mine sites is to create a post-mining landform appropriate for the proposed post-mining land use or (if the post-mining land 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. The rehabilitation objectives from Schedule 4, Condition 31 of Project Approval 08_150 are outlined below in Table 16.

Table 16: Rehabilitation Objectives from Condition 31 of Project Approval

Feature	Objective
Mine site (as a whole)	Safe, stable and non-polluting
Project surface infrastructure	To be decommissioned and removed, unless the Resources Regulator agrees otherwise
Portals and vent shafts	To be decommissioned and made safe and stable. Retain habitat for threatened species (eg bats), where practicable
Watercourses of 3rd order or above subject to subsidence impacts	Restore pre-mining surface flow and pool holding capacity as soon as reasonably practicable. Hydraulically and geomorphologically stable, with riparian vegetation that is the same or better than prior to mining
Other watercourses subject to subsidence impacts	Hydraulically and geomorphologically stable, with riparian vegetation that is the same or better than prior to mining
Cliffs	No additional risk to public safety compared to prior to mining
Other land affected by the project	Restore ecosystem function, including maintaining or establishing self-sustaining eco-systems comprised of: local native plant species (unless the Resources Regulator agrees otherwise); and a landform consistent with the surrounding environment [9]
Built features damaged by mining operations	Repair to pre-mining condition or equivalent unless the owner agrees otherwise; or

[9] In the case of the CWEA, final landform may be significantly different from that existing prior to mining, but must still be safe, stable, and non-polluting and generally consistent with the surrounding landforms.

Feature	Objective
	the damage is fully restored, repaired or compensated for under the Mine Subsidence Compensation Act 1961.
Community	Ensure public safety Minimise the adverse socio-economic effects associated with mine closure

4.1 Rehabilitation Objectives and Completion Criteria

The Rehabilitation Objectives for Appin Mine, approved by the Resources Regulator on 4 September 2023, are provided in Appendix 1.

Rehabilitation criteria are currently under development[10] and will be submitted to the Resources Regulator portal for approval when the format and process for submission has been agreed with the Resources Regulator.

4.2 Rehabilitation Objectives and Rehabilitation Completion Criteria – Stakeholder Consultation

A list of the relevant internal and external stakeholders for the rehabilitation of the various surface facilities associated with the Appin Operations is provided in Table 17. This list will be updated as mine closure planning progresses.

Table 17: Relevant stakeholders for rehabilitation across Appin Mine

Stakeholder	Operation to Which Stakeholder is Applicable				
	WCCPP	Appin North	Appin West & East[11]	North Cliff	Bulli Shafts
Internal Stakeholders					
IMC Operations	✓	✓	✓	✓	✓
South32 Global Functions (HSE, P&D, HR)	✓	✓	✓	✓	✓
External Stakeholders					
NSW DPE	✓	✓	✓	✓	✓
DPE Water Group					
Resources Regulator	✓	✓	✓	✓	✓
Crown Lands	✓	✓		✓	
WaterNSW				✓	✓

[10] As at 15 September 2023.
[11] Also relevant to Ventilation Shafts 1/2, 3, 6, 7/8 and Douglas North Substation.

Stakeholder	Operation to Which Stakeholder is Applicable				
	WCCPP	Appin North	Appin West & East[11]	North Cliff	Bulli Shafts
NSW National Parks and Wildlife Service (NPWS)	✓	✓		✓	
Natural Resource Access Regulator	✓	✓	✓	✓	
EPA	✓	✓	✓	✓	✓
Biodiversity and Conservation Division					
Wollondilly Shire Council	✓	✓	✓	✓	✓
Wollongong City Council (WCC)	✓	✓	✓	✓	✓
Campbelltown City Council	✓	✓	✓	✓	✓
Roads and Maritime Services	✓	✓	✓	✓	✓
Dams Safety NSW	✓				
Tharawal Local Aboriginal Lands Council	✓	✓	✓	✓	✓
Illawarra Local Aboriginal Lands Council	✓	✓		✓	✓
NSW Heritage Council	✓	✓	✓	✓	✓
Local Businesses	✓	✓	✓		
Community Consultative Committee (CCC)	✓	✓	✓	✓	
Menangle Advisory Panel (MAP)			✓[12]		
The broader community (as required)	✓	✓	✓	✓	✓

4.2.1 Stakeholder Engagement

Community Consultation Forums

Appin surface infrastructure and underground mining operations are near the townships of Appin, Menangle and Douglas Park and there is strong community interest in the operations. IMC maintains a range of methods to liaise with the local community:

[12] Interest in existing sites is primarily confined to Ventilation Shaft 7/8.

- Appin Mine Community Consultative Committee (ACCC) and Menangle Advisory Panel (MAP); that are designed to facilitate discussions with the local community relating to IMC's continuing operations in the area.
- Content repository on the South32 Website, which is updated regularly and provides links to a range of documents related to the operation of the mine (including the approval, licences, and management plans, as well as up to date environmental monitoring data and community consultation information, such as ACCC meeting minutes).
- Community complaints and enquiries through the Community Call Line, a free-call, 24-hour call line and email address (illawarracommunity@south32.net). The call line and email address are for general enquiries, or complaints regarding community or environmental issues associated with IMC's operations. All complaints are recorded and reported in accordance with consent requirements. Community complaints are forwarded to the appropriate IMC representative for investigation and action.
- Regular newsletters, community information sheets, letters and media releases provide residents and other key stakeholders with up-to-date information regarding mining and other activities.
- Individual meetings with concerned residents and other stakeholders, as required.

Due to the anticipated long life of the Appin Mine there has been limited consultation with the community in relation to mine closure. However, consultation was conducted as part of the Bulli Seam Operations Environmental Assessment (EA), in relation to the rehabilitation of Bulli Shaft No. 4, as part of the Mining Operations Plan (MOP) review in 2020 and when developing this RMP (refer to section below for more detail).

Previous Stakeholder Engagements

Community Perception Survey

A community perception survey was conducted in 2016 (Ipsos, 2016), and a further on-line survey occurred as part of a social baseline assessment and social impact and opportunities assessment undertaken in 2018 (Umwelt, 2018). While these surveys did not focus on closure and rehabilitation specifically, several key themes which may be relevant to closure and rehabilitation were captured. Key concerns and areas of interest raised by communities were:

- potential impacts to water catchments, local waterways, rivers, and the environment;
- impact of subsidence;
- conservation and rehabilitation; and
- job losses and impacts on local businesses.

A Community Perception Survey was undertaken in FY22.

Engagements Related to Detailed Rehabilitation Planning

Several state agencies and the community have been consulted in relation to rehabilitation activities (Table 18).

Table 18: Recent consultation conducted relating to Rehabilitation Planning

Rehabilitated Area	Consultation Conducted
Bulli Shaft No. 4	Comments were sought from the following agencies and were incorporated into the Rehabilitation Plan: • WCC • NPWS • Environment Protection Authority • Sydney Catchment Authority (now WaterNSW) • Roads and Traffic Authority (now Roads & Maritime Services) Annex E of the Rehabilitation Plan (Cardno, 2010) contains details of agency responses. Community consultation included: • Stakeholder group presentations / information sessions (e.g. inter-agency meetings) • Targeted consultation with relevant landholders and those who may be significantly affected by the proposed works, such as those potentially affected by helicopter noise • Appin Area Community Working Group update
Bulli Shafts more generally	Water NSW (March 2022) seeking specifications for remediation. Site inspection undertaken in June 2022 (Shafts 2 and 3) and March 2023 (Shaft 1) with WaterNSW and Resources Regulator.
All Appin sites/Domains included in the MOP (2020).	As required by the *then* Condition 33 of Schedule 4 of the Project Approval, the former MOP was provided to DPE, EPA, CCC, Campbelltown City Council, Wollondilly Shire Council and Camden Council. The MOP was updated in response to feedback received where applicable.
All sites	In June 2022, the RMP and draft Rehabilitation Objectives and Completion Criteria were provided to the following agencies for consultation: • Resources Regulator • BCD • CCC • DPE Water • WCC • WSC Where comments were received, they have been or will be incorporated into this or future versions of this plan as well as the rehabilitation objectives and criteria.

Rehabilitated Area	Consultation Conducted
North Cliff	Rehabilitation Execution Plan submitted to following agencies for consultation in March 2023: - DPE* - Resources Regulator* - DPE Water - EPA - NPWS* - BCD* - Crown Lands* *Site inspection undertaken on 3 May 2023 with agencies marked *.* Rehabilitation Execution Plan summary distributed and discussed with ACCC in April 2023. Rehabilitation Execution Plan summary distributed to Tharawal Local Aboriginal Land Council in April 2023 and site inspection undertaken in May 2023. Consultation undertaken with NPWS regarding power line removal between North Cliff and Appin North.

Engagements Proposed

Table 19 outlines the preliminary stakeholder engagement program to be implemented during the next closure planning period (within the next three years) to inform detailed closure planning and rehabilitation for sites forming part of IMC's redundant infrastructure decommissioning and rehabilitation program.

Table 19: Stakeholder Engagement Activities Proposed over the Next Closure Plan cycle (3 years from implementing this RMP)

Site	Stakeholder	Consultation
Bulli Shafts	WaterNSW	Completion criteria for Bulli Shaft sites No. 1 to 3. Management / safety of heritage structures at Bulli Shaft sites No. 1 and 2. Inspection of decommissioning and rehabilitation works at Bulli Shaft No. 1 to 4 sites and sign-off.
	Heritage NSW	Protection / safety of heritage structures at Bulli Shaft sites No. 1 and 2.

Site	Stakeholder	Consultation
	Resources Regulator	Completion criteria for Bulli Shaft sites No. 1 to 3. Inspection of decommissioning and rehabilitation works at Bulli Shaft No. 1 to 4 sites and application for title and security relinquishment.
North Cliff	NPWS	Post-closure land use and associated completion criteria. Inspection of decommissioning and rehabilitation works and sign-off.
	CCC	Possible post-closure land uses.
	Resources Regulator	Post-closure land use and associated completion criteria. Inspection of decommissioning and rehabilitation works and application for title and security relinquishment.
	Crown Lands	Post-closure land use and associated completion criteria.
PED Cable Appin Area 5	Landholders	Completion criteria. Sign-off and termination of land access agreements.
WCCPP to North Cliff powerline.	NPWS	Removal of power line and power poles.
Domain 1, 2, 5, 11 and 12	Tharawal Local Aboriginal Land Council NSW Local Aboriginal Land Council	Final land uses and rehabilitation objectives and completion criteria. It is understood that on expiry of CCL 724, the Crown Lands affected may be subject to Aboriginal Land Claims.

5. PART 5 – FINAL LANDFORM AND REHABILITATION PLAN

Land uses for all sites may be re-evaluated over the life of the asset until closure, and development of detailed rehabilitation plans for each site will be undertaken closer to the time of closure.

The final landform design for North Cliff was prepared in FY23.

The CWEA is constructed, managed, and rehabilitated in accordance with the CWEA Management Plan (CWEAMP) and the final detailed engineering drawings prepared for each CWEA. The CWEAMP is available on the IMC website: here. The Stage 3 landform concept designs are illustrated in Section 5.1. Due to the anticipated life of the Stage 3 CWEA, (which has an expected life of greater than ten (10) years); detailed engineering drawings for Stage 4 are not yet prepared. The engineering drawings for the Stage 4 CWEA will be prepared prior to implementation of the Stage 4 CWEA and these plans will show staging of the emplacement and will comply with Condition 17 (a) and (b) of the Project Approval and Condition 6(b) of the EPBC Approval 2010/5350. There have been no disturbance activities to date within the Stage 4 CWEA and this is not expected to occur for some years to come.

IMC is currently undertaking a review of the current design of the Stage 3 CWEA (refer Study 8, Table 20). As such, the final landform design for future areas may be subject to change pending the outcomes of the study.

5.1 Final Landform and Rehabilitation Plans – Electronic Copy

Due to the large number of plans and sub plans required, the Final Landform and Rehabilitation Plans for all domains are included as Appendix 2.

6. PART 6 – REHABILITATION IMPLEMENTATION

6.1 Life of Mine Rehabilitation Schedule

Most surface facilities are required for the operational life of Appin Mine (until at least 2041). Rehabilitation activities will be limited to the following:

- Progressive rehabilitation of the CWEA and formal sign-off for Stages 1 and 2a of the CWEA.
- Progressive closure of redundant assets (North Cliff and Bulli Shafts) and supporting closure studies (refer to Table 20).

In addition to the above, South32 is undertaking rehabilitation planning activities such as technical studies (see Table 20).

Table 20: Forward Work Program and Schedule.

Prog No	Description	Responsible Department	Completion Date
Redundant Infrastructure Decommissioning Program			
1.	Consult with stakeholders to define and agree detailed closure and rehabilitation plans, standards and criteria for the Bulli Shaft and North Cliff sites, and the removal of the West Cliff to North Cliff powerline.	Infrastructure & Legacy Sites	FY24
2.	Consult with landowners regarding the Personal Emergency Device (PED) cable in Appin Mining Area 5, conduct remedial works where necessary and terminate access agreements.	Infrastructure & Legacy Sites, Corporate Affairs	FY24
3.	Conduct a ventilation study to assess the impacts of, and options for, sealing the North Cliff shafts.	Infrastructure & Legacy Sites	Partially complete. Ongoing in FY24
4.	Seek formal sign-off on the rehabilitation of Bulli No. 4 Shaft site and apply for relinquishment of title.	Infrastructure & Legacy Sites	FY24
Post-closure Land Use Study			
5.	Review post-closure land use options and incorporate relevant findings of the ILM study into future versions of the closure plan.	Closure Planning	Complete

Prog No	Description	Responsible Department	Completion Date
Climate Change			
6.	Conduct an assessment of climate change with respect to the likely effects on analogue systems within the region and determine the appropriate design rainfall events to use for closure.	Sustainability	FY24
CWEA and Brennans Creek Diversion			
7.	Conduct a materials balance to assess the availability of growth media to support the rehabilitation of the final stages of the emplacement.	Environment	Topsoil survey undertaken. Ongoing.
8.	Implement the recommendations of the South32 DMS Audit review, including: • Geotechnical investigation of the Emplacement to assess potential risks associated with stability of batters, combustibility, liquefaction and material quality for geotechnical design for the final landform. This will include a review of previous geotechnical reports and material assessment reports, as well as additional subsurface investigation at selected locations within the active emplacement prior to closure, and sampling of materials for laboratory testing to assess mechanical properties. • Geochemical analysis and associated capping design / drainage redesign inputs if required based on geochemical outcomes • Undertake landform evolution modelling • Update the emplacement final landform design	Environment	Partially complete (GISTM project) and ongoing in FY24

Prog No	Description	Responsible Department	Completion Date
9.	Subsequent to the outcomes of the Bushfire survey, seek progressive sign-off from DPE for Stages 1 and 2a of the emplacement.	Environment	FY24
10.	Monitor the characteristics of under-drainage from the different stages of the emplacement and assess the extent to which the first-flush drainage from the emplacement may require capture and treatment post-closure.	Environment	Ongoing
Brennans Creek Dam			
11.	Review options for draining the dam to enable discharge licence limits to be met.	Environment	>FY25
12.	Assess the likely changes to downstream flows and associated impacts to riparian vegetation and other water users following removal of Brennans Creek Dam.	Environment	>FY25
13.	Develop an appropriate landform design for Brennans Creek Dam footprint following removal of the dam.	Closure Planning	>FY25
Groundwater			
14.	Assess management requirements for post-mining groundwater recoveries.	Directional Studies	Complete
Georges River Remediation			
15.	Implement the Georges River Subsidence Remediation Plan.	Approvals	FY24
Social and Employment Transition Plans			

Prog No	Description	Responsible Department	Completion Date
16.	Develop social and employment transition plans for closure.	Corporate Affairs	>FY25
EPBC Environmental Management Plan			
17.	Develop and submit for approval an environmental management plan to ensure the closure of the mine does not result in on-going impacts to EPBC Act listed species.	Environment	3 yr prior to closure
Surface Facility Rehabilitation Plans			
18.	Conduct a European heritage survey of surface infrastructure older than fifty years prior to demolition or alteration / redevelopment.	Closure Planning	5 yr prior to closure
19.	Conduct a flora and fauna survey to identify: • the presence of any threatened species (e.g. bats) that may require protection during closure works; and • the target vegetation communities and associated completion criteria to be achieved through rehabilitation (if relevant to the post-closure land use).	Closure Planning	5 yr prior to closure
20.	Confirm post-mining land use in consultation with key stakeholders and agree completion criteria.	Closure Planning	5 yr prior to closure
21.	Conduct contaminated sites investigations and develop and implement remediation plans, if required.	Closure Planning	5 yr prior to closure
22.	Conduct hazardous materials survey and demolition execution risk assessment to inform demolition planning.	Closure Planning	5 yr prior to closure

Prog No	Description	Responsible Department	Completion Date
23.	Develop landform, drainage and erosion control designs suitable for the selected land use.	Closure Planning	5 yr prior to closure
24.	Based on the post-mining land use and landform design, assess the need for growth media and identify appropriate sources of material.	Closure Planning	5 yr prior to closure
25.	If appropriate to the post-closure land use, develop a vegetation management plan that includes an outline of post-rehabilitation maintenance requirements.	Closure Planning	5 yr prior to closure
Offsets			
26.	Determine arrangements for the in-perpetuity management and relinquishment of the *Persoonia hirsuta* offset area and the Cumberland Plain offset area.	Environment	>2025

6.2 Phases of Rehabilitation and General Methodologies

6.2.1 Active Mining Phase

a. Soils and Materials

The availability of topsoil and growth medium at most sites across Appin is yet to be verified. It is an identified risk that there may be a topsoil deficit at the end of operations. Studies are planned to review anticipated volumes of topsoil available and implement corrective actions to minimise risk. This may include the import and stockpiling of suitable material, including the use of material from major infrastructure projects. There are existing stockpiles of material from the construction of the ventilation shaft sites; however, the exact quantities are not well understood.

Specific to the CWEA, stripping and stockpiling of topsoil and subsoil horizons will be undertaken as per the CWEAMP. All vegetation including shrubs, trees and roots are cleared from the active emplacement area using a two-stage clearing process before coal wash emplacement commences. Loose vegetation from site clearing, such as tree branches, are used as mulch or brush matting over areas of the emplacement being rehabilitated. Soil is stripped from areas cleared for coal wash emplacement and where practicable, the seed rich surface layer of topsoil is separated from lower-level soils. Stripped soil is applied to a depth of typically 0.5 m (where appropriate) over completed areas of the emplacement as soon as practical. When seed rich topsoil stripped from cleared areas is available, it is spread as the surface layer on emplacement areas being rehabilitated. Seed rich topsoil is reused as quickly as possible to prevent seeds from dying.

When the emplacement is progressing to its final stages, particular attention will be paid to stockpiling the necessary volumes of soil to achieve adequate soil cover during rehabilitation of the final landform. It is an identified risk that there may be a topsoil deficit at the end of operations. Studies are planned to review anticipated volumes of topsoil available and implement corrective measures to minimise this risk (refer Study 7, Table 20). This may include the import and stockpiling of suitable material, including the use of material from major infrastructure projects. Where disturbance is required for infrastructure projects, topsoil will be stripped and stockpiled in a suitable location for reuse.

b. Flora

Threatened flora and fauna communities at Appin Mine are managed in accordance with Condition 17 of Schedule 4 of the Project Approval and Condition 6 of the EPBC Approval 2010/5350. It is also managed in accordance with the following approved plans:

- CWEAMP;
- Broad-headed Snake Management Plan;
- Southern Brown Bandicoot Management Plan;
- *Persoonia hirsuta* Offset Management Plan;
- Strategic Biodiversity Offset Plan;
- Ventilation Shaft No. 6 Biodiversity Management Plan;
- Sandstone Shale Transition Forest Offset Management Plan; and

- Adaptive Management Plan for Water Sensitive Environmental Protection and Biodiversity Conservation (EPBC) Act Listed Species.

These plans include the management and mitigation measures for threatened species or habitats that occur at the Appin Mine operations and are available on the IMC website: here.

The CWEAMP outlines measures that are implemented for the management of fauna and resources required to establish any specific flora species in rehabilitation. Measures that are implemented for vegetation clearing and maintenance include:

- Disturbance of land/vegetation clearing is minimised to reduce the risk of soil erosion and sediment loss.
- Disturbed areas are stabilised progressively with suitable vegetation species.
- Vegetation is managed to provide vegetative screening between the site and the local community.
- Bushfire hazard reduction works, including the removal of trees and undergrowth, is undertaken periodically to reduce the risk to site infrastructure from bushfire.
- Weed control is undertaken to eradicate noxious weeds and progressively control other weeds present on site in accordance with accepted bush regeneration and landscape methods.

A Permit to Disturb process is in place and is required to be followed for any clearing required at Appin Mine. Habitat reinstatement techniques such as transplanting dead stags, addition of habitat logs and woody debris, nest box use, and reconstruction of rock outcrops is undertaken as described in the CWEAMP. Research into the potential impact of bushfire on the rehabilitated sites in the CWEA has been undertaken.

c. Fauna

As per above.

d. Rock/Overburden Emplacement

Refer Section (i) on Ore Beneficiation Waste Management (Reject and Tailings Disposal).

e. Waste Management

Waste management for Appin Mine is undertaken as per the Appin Mine Waste Management Plan available on the IMC website: here. The Waste Management Plan has been developed to meet Condition 29 of Schedule 4 of the Project Approval.

Presently there are comprehensive waste segregation processes in place (on- and off-site) which significantly reduce the amount of general waste going to landfill. General or specific exempted wastes may be disposed of in the CWEA.

f. Geology and Chemistry

Typical geochemistry risks related to Appin Mine include water liberated from the:

- extraction of coal;
- coal washing process; and
- emplacement of coal wash.

These waters may contain:

- suspended particulates; or
- low concentrations of nitrogen (soluble organic nitrogen compounds and ammonia) and trace metals.

Coal wash produced from the WCCPP and Dendrobium Coal Preparation Plant (DCPP) is classified as an inert waste and can be directly deposited to the CWEA without further processing. Testing conducted on the geochemical properties of coal wash material has indicated that the trace element composition of the coal wash material poses little or no contamination risk to the environment or public health. The coal wash material is not pyritic and has a low potential to produce acidity in the form of acid mine drainage (AMD) (Illawarra Coal, 2006).

Previous geochemical test work investigations undertaken in the Southern Coalfield from the washing of coal in the Bulli Seam indicate the material is generally inert:

- The Bulli Seam consists of coal and carbonaceous clays / claystone and usually contains few, if any, non-coal bands or splits (Department of Mineral Resources, 2000).
- Investigations by Sinclair Knight and Partners (1990) concluded the coal wash material was inherently inert and unreactive and the potential for acid discharges to be produced over time was minimal.
- EGi (2008) concluded the Bulli Seam coal wash had relatively low total sulphur content, varying acid neutralising capacity, and the materials were low risk.
- International Environmental Consultants Pty Ltd (2006) investigations conducted for the Glenlee Redevelopment at the Glenlee Washery indicated the coal wash produced from the Bulli Seam was known to be non-hazardous and chemically inert. The coal wash material was found to be non-saline, low in total and soluble heavy metals with a low potential to produce acids or other hazardous leachate over time.

In addition, Ecoengineers (Ecoengineers., 2007a) collated information on the typical qualities of seepage and run-off from coal wash emplacements in the Southern Coalfields. Key conclusions arising from this study were:

- The major potential off-site surface and groundwater quality impacts have typically been associated with:
  - suspended coal wash fines (surface water only);
  - salinity; and
  - soluble nitrogen-based nutrients in some environments.
- Salinity generally derives from the moderately saline groundwater which is pumped from the mine workings and is used in the WCCPP. This water becomes entrained in the 'fresh' wet coal wash at the time of its actual emplacement. Studies have shown that very little extra salinity is contributed by leaching of salts from the solid coal wash once it is emplaced. Subsurface drainage is generally less saline than wastewater exiting coal preparation plants due to infiltration of fresh rainwater and its retention within the mass of coal wash.

- There was no evidence for the export of significant concentrations of toxic heavy metals or organic compounds from large coal wash emplacements. However subsurface drainage was found to invariably contain higher levels of dissolved iron and manganese, and a lower pH than wastewater leaving a coal preparation plant.

Groundwater impacts resulting from emplacement of coal wash are considered unlikely, given the above elements are managed by a dedicated dirty water treatment system.

An extensive groundwater monitoring program exists for the monitoring of subsidence impacts from longwall mining. Refer to the relevant approved SMP or Extraction Plan on the IMC website for more detail.

g. Material Prone to Spontaneous Combustion

Combustibility testing for Appin Mine coal wash at the CWEA has been undertaken. Spontaneous combustion is not considered an issue at Appin Mine. The coal and overburden characteristics are unlikely to lead to spontaneous combustion. There have been no recorded events of spontaneous combustion associated with the current or previous mining operations. The sampling program will continue to detect any changes in coal quality that could potentially lead to spontaneous combustion occurring in coal stockpiles or emplacements.

Coal wash combustion potential risk can be managed and be acceptable to consumers of coal wash reject, through appropriate design, controls and placement (SLR, 2023).

h. Material Prone to Acid Mine Drainage

There have been no recorded events of acid mine drainage (AMD) associated with the current or previous mining operations. The coal is very low in pyritic material, therefore coal extracted is unlikely to produce acidic leachates. The sampling program will continue during operations to detect any changes in acidity (AMD potential).

i. Ore Beneficiation Waste Management (Reject and Tailings Disposal)

Coal wash is produced as a by-product of processing ROM coal. ROM coal from Appin Mine will continue to be processed at the WCCPP with a small percentage processed at the DCPP on an as needed basis.

The coal wash from the WCCPP will continue to be emplaced at the CWEA, with coal wash from the DCPP only being emplaced at the CWEA if beneficial reuses of the coal wash are unable to be sourced. IMC actively seeks opportunities for the beneficial reuse of coal wash from the DCPP.

Stage 2 of the emplacement area is complete. Stage 3 is currently active, with coal wash emplacement being undertaken in Stage 3. Whilst coal wash emplacement in Stage 4 will not commence for at least 10 years, design work and construction of Emplacement Pond 4 (EP4) will commence. It is assumed that the timing for EP4 construction will align with the Mine Plan and exhausting of EP3 capacity.

Stockpile No. 4 capacity (for coal and coal wash) was increased using engineering fill (coal wash) under the Operational Purpose Deduction (OPD) Certificate (DOC19/767835). Coal wash is being and is planned to be used as engineering fill for haul road development under OPD DOC21/1078960-2 and DOC21/565215-01.

Through the period of the RMP, typically 0.7 to 0.8 Mt of coal wash will be emplaced at the CWEA annually from the WCCPP. Additional coal wash may be emplaced if beneficial reuse options are not available for the coal wash generated from processing Dendrobium ROM product by the DCPP. Rehabilitation of the CWEA takes place progressively as each section of embankment fill reaches the finished level in accordance with the CWEAMP.

j. Erosion and Sediment Control

Pit Tops

Erosion and sediment control issues at the Appin Mine Pit Top sites will be managed in accordance with the approved Appin Mine Water Management Plan available on the IMC website: here. Any sediment and erosion associated with construction activities will be mitigated by the existing erosion and sediment controls on site, with additional controls installed where required dependent on risk. Site runoff is directed to sediment ponds which are designed to:

- capture general site runoff; and
- allow for gravimetric separation of solids.

The water management system across Appin Mine is regularly inspected by site environmental personnel to verify each part of the system is operating as efficiently as possible. Regular maintenance includes:

- sediment removal from drains and sediment basins;
- installation, proper operation and routine maintenance of any flocculant dosing equipment (where required);
- replacement and/or repair of sediment control structures as required; and
- repair of areas that become unstable following periods of high flow.

The Water Management Plan includes details of the water quality monitoring program that has been implemented for the Pit Top sites and surroundings.

CWEA

The potential for erosion at the CWEA is managed in accordance with the CWEAMP. The following activities are undertaken to minimise the likelihood of erosion within the emplacement area:

- compaction of emplaced material;
- profiling of finished areas to design gradients; and
- revegetation of the CWEA (once material is emplaced to meet design criteria).

The Water Management Plan includes details of the water quality monitoring program that has been implemented for the CWEA.

Emplacement runoff and subsurface drainage

The CWEAMP includes details of the emplacement monitoring undertaken. This includes:

- emplacement height, to determine the appropriate emplacement design heights; and
- emplacement compaction, carried out to achieve 95% Standard Compaction.

The CWEA is being constructed in accordance with the approved design in Brennans Creek Valley, and Brennans Creek has been diverted around the west side of the CWEA.

A key closure aim is to achieve long term stability of these landforms. As part of the closure process, IMC will conduct a peer review of the as-constructed CWEA and Brennans Creek diversion to confirm their achievement of completion criteria for long term stability (Refer Study 8 Table 20).

Subsidence Areas

Accelerated erosion and deposition can occur due to mine subsidence and can affect natural features. Strategies to manage and minimise impacts from this are incorporated into the relevant Subsidence Management Plans/Extraction Plans (SMPs/EPs).

k. Ongoing Management of Biological Resources for Use in Rehabilitation

All vegetation including shrubs, trees and roots are cleared from the active emplacement area using a two-stage clearing process before coal wash emplacement commences. Loose vegetation from site clearing, such as tree branches, are used as mulch or brush matting over areas of the emplacement being rehabilitated.

l. Mine Subsidence

Potential impacts from mining induced subsidence are monitored and managed via SMPs/EPs, which are approved by the Planning Secretary prior to longwall mining commencing in any area. It is a requirement of Condition 5 of Schedule 3 of the Appin Mine approval that EPs are submitted on a progressive basis as mining commences.

Details of historical subsidence impacts within the Appin mining area are included in:

- Impact Reports which are provided to relevant government agencies;
- End of Panel Reports; and
- Annual Reviews.

Extraction of Longwalls 31 to 38 in Area 5 resulted in gas releases, iron staining, minor saline springs and rock fracturing to pools and rockbars along the Georges River. The gas releases and iron staining have required no further action, however, a decline in the water level below baseline in some pools has been recorded which has resulted in Trigger Level 2 impacts. Some of these impacts have remediated naturally (Cardno, 2009) and some have been remediated in accordance with appropriate plans. There are several water level impacts to the Georges River that still need to be addressed, and a remediation plan has been developed.

m. Management of Potential Cultural and Heritage Issues

A Heritage Management Plan has been developed for Appin Mine in accordance with Condition 24 of Schedule 4 of the Project Approval. It outlines measures that will be implemented for potential cultural and heritage sites located within the operational areas of Appin Mine.

The CWEAMP describes the disturbance of recorded Aboriginal and historical archaeological sites and addresses Condition 17 (a) and (b) of the Project Approval which requires:

- detailed design plans which include options for reducing, avoiding and/or managing impacts on Aboriginal heritage sites in and adjacent to the southwestern fringe of the proposed Stage 4 footprint (including sites 52-2-2228/3617, 52-2-1373, 52-2-3533/3613 and 52-2-3506); and
- management strategies to ensure no impacts to Aboriginal heritage site 52-2-3505 other than negligible impacts, including consideration of potential staged development of the emplacement and/or buffer areas.

n. Exploration Activities

Activities associated with exploration, such as seismic lines and drill pads, will be progressively rehabilitated in accordance with relevant guidelines. Potential risks to rehabilitation of exploration sites include restricted access to exploration sites (due to heavy rainfall, community concerns etc.) and unplanned delays in commencement/execution. Due to the progressive nature of exploration rehabilitation, potential risks are minimised.

6.2.2 Decommissioning

All decommissioning activities on site after closure, following either the cessation of mining or progressively over the life of the operation, will be managed in accordance with the Appin Mine Conceptual Closure Plan. The following sections reference information from the Closure Plan.

Each Domain requires a different suite of activities, depending on the facilities present on site (Table 21).

Several pre-closure studies are required to inform the development of detailed rehabilitation plans for the surface facilities. These are incorporated into the Forward Work Program (Table 20).

Table 21: Closure Activities Relevant to Each Domain

Domain		Closure Implementation Requirements										
No.	**Name**	**Pre-closure studies**	**Infrastructure Decommissioning**	**Infrastructure Demolition**	**Heritage Management**	**Portal**	**Shaft**	**Boreholes**	**Water Storage / Sediment Ponds**	**Contamination Remediation**	**Re-profile / Erosion Protection**	**Rehabilitation**
1	WCCPP (except CWEA)	✓	✓	✓			✓		✓	✓	✓	✓
2	Appin North Pit Top	✓	✓	✓		✓			✓	✓	✓	✓
3	Appin East Pit Top	✓	✓	✓	?[1]	✓			✓	✓	✓	✓
4	Appin West Pit Top	✓	✓	✓			✓		✓	✓	✓	✓
5	North Cliff	✓	✓	✓			✓		✓	✓	✓	✓
6	Appin No. 1 &.2 Ventilation Shafts	✓	✓	✓	?[1]		✓		✓	?[2]	✓	✓
7	Appin No. 3 Ventilation Shafts	✓	✓	✓			✓		✓	?[2]	✓	✓
8	Appin No. 6 Ventilation Shaft	✓	✓	✓	✓		✓		✓	?[2]	✓	✓
10	Mine Safety Gas Drainage	✓	✓	✓				✓		?[2]	✓	✓
11	CWEA							✓			✓	✓
12	Brennans Creek Dam	✓	✓	✓					✓	?[2]	✓	✓
14	Douglas North Substation	✓	✓	✓				✓		?[2]	✓	✓
15	Powerlines and Cables between WCCPP and North Cliff	✓	✓	✓								✓
16	Appin No. 7 and 8 Ventilation Shafts	✓	✓	✓			✓		✓	?[2]	✓	✓

[1] These sites are over 50 years old and heritage assessments have not yet been conducted. As discussed in Section 8.6.5, heritage assessments will be conducted prior to demolition and if required, appropriate management strategies will be implemented.
[2] Contaminated sites investigations have not yet been conducted at these sites, or will need to be conducted at closure to confirm that the findings of the Basix, (2010a; 2010b) investigations are still valid. As discussed in Section 8.6.9, site investigations to identify remediation requirements will be conducted as part of the detailed Rehabilitation Plans for each site.

a. Site Security

Prior to demolition, infrastructure will be decommissioned and made safe to ensure the sites remain secure and do not pose a security risk to the public or IMC employees.

This includes the following management actions:

- Review all fencing at the site.
- Implement security controls as appropriate.
- Provide appropriate unauthorised entry and warning signage.
- Secure all buildings and structures.
- Secure shafts via appropriately designed and constructed temporary seals.
- Secure all bores and mine safety wells.

b. Infrastructure to be Removed or Demolished

A detailed demolition study was conducted for IMC facilities in 2016 and updated in 2018 (Liberty Industrial, 2016; 2018). Except for structures which have been identified as being preserved for heritage reasons, all surface structures will be demolished, unless otherwise agreed with stakeholders. It has been assumed that:

- Removal of underground infrastructure in the final mining areas will be assessed on safety and environmental risk. Infrastructure located between the portal and in-bye (lower) bulkhead of drift plug will be removed.
- Any hoisting equipment will be removed from within any “personnel and materials” hoisting shafts.

Demolition includes removal of:

- All above ground infrastructure (except as agreed with stakeholders).
- Roads and hardstand areas and any associated road furnishings (signage, road markers etc.), unless otherwise agreed with future landowners / managers.
- Culverts and watercourse crossings to re-establish natural drainage.
- Building footings / foundations which will be broken up and removed to up to 1.5 m below ground level. Depending on the post-closure land use, in ground infrastructure below 1.5 m below ground level may also be removed. This would be assessed on a site-by-site basis and would form part of the detailed decommissioning, demolition, and rehabilitation planning for each site.
- All pipelines and services within 1.5 m of ground surface. Services below this depth will be left in situ, with the exception of the gas pipeline from the gas drainage facility to the West Cliff cogeneration plant which will be removed.

Concrete will be crushed on site and used as backfill for shafts and portals or general site fill. All other materials will be removed from site and either sold for scrap or disposed to a licenced landfill facility.

c. Buildings, Structures and Fixed Plant to be Retained

Prior to demolition, heritage assessments will be completed. Where infrastructure of heritage value is required to be decommissioned, a cultural heritage management plan will

be developed. This may include developing photographic records of heritage infrastructure, repairing, and maintaining infrastructure and / or transferring ongoing ownership and management responsibilities to a third party.

d. Management of Carbonaceous/Contaminated Material

Contamination will be delineated through investigation and remediated by:

- removal and disposal at an appropriately licensed facility;
- encapsulation; or
- in-situ treatment.

e. Hazardous Materials Management

Dangerous goods and hazardous materials will be managed in accordance with the following actions:

- Conduct hazardous materials surveys (e.g. asbestos, PCBs, etc.) to identify and remove hazardous materials.
- Conduct a dangerous goods and hazardous substances audit; and:
    - Remove all fuels, oils, chemicals, and reagents from all storage vessels (or verify they are appropriately secured).
    - Purge fuels and oils from any service lines that run within the sites.
    - Purge fuels and oils from any pumps, drives, motors etc.
    - Clean all storage vessels to verify they are gas free.
    - Dispose of any drums, containers etc. containing any remnant chemicals or hazardous substances.

f. Underground infrastructure

After mining all mine portals, shafts and other entries will be filled and sealed to the satisfaction of the Resources Regulator. The Guideline (MDG 6001) for the Permanent Filling and Capping of Surface Entries to Coal Seams (NSW Division of Resources & Energy, 2012a) will be used as the basis for backfilling and capping all mine portals, hoisting and ventilation shafts. The following sources of backfill may be used:

- crushed concrete from demolition;
- sediment from water management infrastructure;
- coal wash from the WCCPP or DCPP;
- spoil associated with the construction of the shaft which has been stored on site; and
- locally available sources of suitably graded material (quarry, sand mine, infrastructure projects, residential developments etc.).

Under the EPBC Act approval, a survey is required to identify threatened species prior to the closure of each shaft / mine entry and decommissioning and capping is required to be conducted in a manner that prevents the death or injury of these species.

As mentioned previously, removal of underground infrastructure in the final mining areas will be assessed on safety and environmental risk. Infrastructure located between the portal and in-bye (lower) bulkhead of drift plug will be removed.

6.2.3 Landform Establishment

a. Water Management Infrastructure

The Appin Mine Closure Plan assumes that all water storages will be drained and rehabilitated at the time of closure. However, some of these water storages may remain on site, with the consent of the future land manager and other relevant stakeholders (e.g. Crown Lands), subject to the outcome of further stakeholder consultation. For example, for agricultural final landforms, watering points will need to be established and may utilise existing dams/ponds.

Closure and rehabilitation of water storages will comprise:

- Draining and removing all contaminated or unsuitable fill material and treating or disposing, as appropriate. Pond liners will be removed and disposed off-site.
- Backfilling dam storage areas with suitable dam wall fill material and/or clean material as appropriate.
- Re-profiling and shaping to create a natural draining final landform with sustainable grades and no pooled areas, as close as possible to the original topography and/or consistent with surrounding area.
- Rehabilitating the area.

b. Final Landform Construction: General Requirements

Activities will generally comprise:

- Re-profiling and shaping to create a natural draining final landform with sustainable grades and no pooled areas, as close as possible to the original topography and/or consistent with surrounding area. The CWEA has specific requirements and are identified in the CWEAMP.
- Deep ripping of compacted areas such as hardstands and roads and contour ripping to stabilise soils.

c. Final landform construction: reject emplacement areas and tailings dams

Rehabilitation of the CWEA takes place progressively as each section of embankment fill reaches the finished level in accordance with the Appin Mine CWEAMP.

d. Final landform construction: final voids, highwalls and low walls

N/A. As mentioned previously, the CWEA is constructed in accordance with the CWEAMP. Highwalls in the Brennans Creek Valley may require management pending the final design of the CWEA.

e. Construction of creek/river diversion works

Surface drainage will be required to direct and discharge surface water runoff from the site into the surrounding catchments in a controlled manner. The overall objective of surface drainage is to limit the potential for erosion across landforms and preserve water quality. Erosion and sediment control measures will be implemented and will usually comprise

reducing the slope lengths of final landforms by constructing contour banks and armouring channels to prevent erosion.

If appropriate to the post-mining land use, surface drainage will be reinstated as close as possible to natural pre-mining conditions.

Refer to Section 2.2.2 for specific requirements for the Brennan's Creek Diversion Channel.

6.2.4 Growth medium development

The requirements for the CWEA are detailed in the CWEAMP.

For all other domains, activities will generally comprise:

- Placement of growth medium / topsoil to an appropriate depth depending on the slope gradient and availability. Moisture conditioning of topsoil will be undertaken, where necessary prior to placement, to minimise loss of material to dust during placement and verify that the topsoil has an acceptable structure for sowing seed. Topsoil / growth medium resources will be assessed to determine their suitability for rehabilitation purposes prior to use. Where possible, importation of topsoil should be minimised. If there is insufficient topsoil / growth medium on site for successful revegetation, the preference is for any imported soil to be from benign materials, such as local crushed sandstone or virgin excavated natural material (VENM). If foreign materials are to be imported to sensitive sites (e.g. WaterNSW Special Areas) they may be required to be categorised and certified as weed and pathogen free to prevent the introduction of weeds, disease or possible water quality contaminants into the site.
- Covering the final land surface with erosion matting, brush matting or mulch if needed.
- Where land is to be returned to agricultural uses, undertaking agronomic assessments to identify appropriate soil ameliorants required to return land to a productive state.

6.2.5 Ecosystem and land use establishment

Revegetate as per the final revegetation plan utilising local species of appropriate provenance. The vegetation mapping of each site and the relevant vegetation community descriptions provides the basis for species selection. The revegetation plan will include:

- Specification of seed mixes and sources.
- Seedlings propagated from local seed stock (where available) with species selection undertaken such that the rehabilitated ecosystem is consistent with the surrounding environs.
- Direct seeding using an appropriate method (eg hand sowing, drone application, hydro-seeding / hydro-mulching).
- A program for weed management and control.
- Staged plantings, where required, to provide an adequate quality of the resultant vegetation.

- Monitoring requirements and milestones to be achieved and vehicle hygiene measures to be implemented.

The relevant Plant Community Types (PCTs)[13] for Appin Mine, North Cliff and the Bulli Ventilation Shafts are provided in Table 22.

Table 22: PCTs

Site	PCTs	Dominant PCT
Appin East	3616: Sydney Hinterland Grey Gum Transition Forest 3615: Sydney Hinterland Apple-Blackbutt Gully Forest 3616: Sydney Hinterland Grey Gum Transition Forest	3616: Sydney Hinterland Grey Gum Transition Forest
Appin North and BCD	3595: Sydney Coastal Sandstone Gully Forest 3598: Woronora Plateau Scribbly Gum Woodland 3615: Sydney Hinterland Apple-Blackbutt Gully Forest 3616: Sydney Hinterland Grey Gum Transition Forest 3924: Sydney Coastal Upland Swamp Heath 3619: Sydney Hinterland Enriched Sandstone Bloodwood Forest	3598: Woronora Plateau Scribbly Gum Woodland
Appin West	3320: Cumberland Shale Plains Woodland 3615: Sydney Hinterland Apple-Blackbutt Gully Forest	3616: Sydney Hinterland Grey Gum Transition Forest

[13] Source: State Vegetation Type Mapping [SVTM] (DPE 2022)

	3321: Cumberland Shale-Sandstone Ironbark Forest 3616: Sydney Hinterland Grey Gum Transition Forest 3318: Cumberland Moist Shale Woodland	
Bulli Ventilation Shaft 1	3598: Woronora Plateau Scribbly Gum Woodland	3598: Woronora Plateau Scribbly Gum Woodland
Bulli Ventilation Shaft 2	3598: Woronora Plateau Scribbly Gum Woodland	3598: Woronora Plateau Scribbly Gum Woodland
Bulli Ventilation Shaft 3	3598: Woronora Plateau Scribbly Gum Woodland 3924: Sydney Coastal Upland Swamp Heath	3598: Woronora Plateau Scribbly Gum Woodland
Bulli Ventilation Shaft 4	3598: Woronora Plateau Scribbly Gum Woodland 3591: Southern Sydney Sheltered Forest 3261: Sydney Sandstone Plateau Shale Forest	3591: Southern Sydney Sheltered Forest
North Cliff	3598: Woronora Plateau Scribbly Gum Woodland 3924: Sydney Coastal Upland Swamp Heath	3598: Woronora Plateau Scribbly Gum Woodland
Ventilation Shaft 6	3321: Cumberland Shale-Sandstone Ironbark Forest 3318: Cumberland Moist Shale Woodland 3319: Cumberland Shale Hills Woodland 3616: Sydney Hinterland Grey Gum Transition Forest	3616: Sydney Hinterland Grey Gum Transition Forest

6.2.6 Ecosystem and land use development

The following milestones are to be achieved:

- Succession.
- Vegetation health and condition.
- Soil health.
- Resilience to drought and fire.
- Threats to rehabilitation (weeds and feral herbivores) well controlled.

For agricultural revegetation areas, the objective is for the areas to be sustainable for the long-term and only require maintenance that is consistent with the intended final land use.

6.3 Rehabilitation of areas affected by subsidence

The rehabilitation will be undertaken in accordance with the Georges River Rehabilitation Plan (GRRP). Generally, the following rehabilitation methods will be employed, where applicable, at each site.

- Stage 1 Hand mortaring: Large surface cracks with observable flow diversion.
- Stage 2 Pattern Grouting: commencing with a nominal grid spacing, determined per site. Angled holes under bank where the work zone is concurrent with the bank edge. Drill holes away from front lip so as not to damage the rock bar; angled holes upstream to grout under front lip.
- Stage 3 Monitoring success of works and repeat as necessary with informed and amended techniques.
- Stage 4 Pattern Grouting: if initial pattern grouting is insufficient, recommence the process with a smaller grid spacing within nominated zones. If pattern grouting is insufficient, a grout curtain in nominated sections of the rock bar will be considered; nominally two rows (1 m offset) with 1 m spacing.
- Deep-angle grouting: Where access constraints make pattern grouting inappropriate (for example where a pool has not totally drained), directionally drilled holes may be installed from some distance away from the river to allow grouting to be delivered from a remote location.

The rehabilitation work is proposed to be carried out in several stages, as grouting works will need to be conducted iteratively. Pools with more significant impacts will generally be targeted as a priority, as this may then indirectly improve the condition of pools with lesser impacts. The staged nature of the rehabilitation project has been designed to enable improvements and efficiencies to be incorporated in later activities. Therefore, the activities listed may be adjusted during implementation.

Trials have been undertaken at WC21 (Wongawilli Creek, located in the Metropolitan Special Area above Dendrobium Mine) that will inform the methodology to be employed in the Georges River.

The timeframe stated in the GRRP will not be met due to issues associated with COVID 19, extended catchment closures (affecting the timeframes for trials and assessment of results) and accessibility to impact sites in the Georges River. IMC will continue to work with the

Resources Regulator to progress this project in accordance with the stages as outlined in the GRRP.

7. PART 7 – REHABILITATION QUALITY ASSURANCE PROCESS

To achieve relinquishment of mining and surface leases, the following activities need to be completed:

- Detailed rehabilitation plans and associated completion criteria suitable to the post-closure land use are agreed by the landowner/manager and Resources Regulator.
- Rehabilitation is executed in accordance with the plans and appropriate records are kept that demonstrate this (Table 23).
- The performance of rehabilitation is monitored and compared to completion criteria (Section 8). Records of performance monitoring must be kept.
- Where completion criteria have been met, sign-off is obtained from the landowner/manager and Resources Regulator and an application is made for title relinquishment.
- Where completion criteria are not met, remedial plans must be agreed with the landowner/manager and Resources Regulator, or completion criteria revised and an application for title relinquishment made.

Table 23 summarises the processes that will be used to validate rehabilitation throughout all the phases to ensure works are on track to achieve the final land use goals and relinquishment.

Table 23: Quality Assurance Processes across Appin Mine, throughout the various rehabilitation phases

Rehabilitation Phase	Quality Assurance / Validation Methods
Decommissioning	Statements or utility service disconnection records. As built/constructed surveys and marked on plans. Decommissioning report. Before and after photos. Engineering reports/statements. Abandonment logs, grouting records (bores). Contamination assessment reports.
Landform Establishment	Before and after photos. Rehabilitation monitoring reports. As-constructed surveys. Erosion surveys.

Rehabilitation Phase	Quality Assurance / Validation Methods
	Independent geotechnical reports (where required). Compaction testing results (CWEA).
Growth Medium Development	Before and after photos of vegetation growth. Rehabilitation monitoring reports that validate the growth medium supports vegetation establishment.
Ecosystem and Land Use Establishment	Before and after photos. Rehabilitation monitoring reports. Independent ecological reports (where required) that validate rehabilitation completion criteria have been met. Trajectory analysis (veg growth).
Ecosystem and Land Use Development	Rehabilitation monitoring reports. Independent ecological report (where required). Independent soil report (where required) for soil health. Independent agronomist report (where required). Independent aquatic ecology expert (where required). Remote sensing analysis of vegetation condition.
Relinquishment	ESF2 form completed, submitted, and approved by NSW Resources Regulator. Security bond returned.

8. PART 8 – REHABILITATION MONITORING PROGRAM

8.1 Analogue site baseline monitoring

For areas that will be returned to Native Ecosystem, the monitoring program will involve the collection of analogue site data to assist in the development of measurable completion criteria.

There is an ongoing operational program of subsidence monitoring and remediation which includes airborne laser scanning, 3D survey points, 2D survey lines, field inspections, and monitoring of infrastructure, groundwater, surface water, landscape, flora and fauna. Subsidence monitoring programs are outlined in the relevant SMP/EPs for each mining area and are not repeated in this plan. Each EP also contains a TARP to guide remedial activities if certain thresholds are exceeded.

An annual program to monitor the success of the progressive rehabilitation of the emplacement also exists. The program is detailed in the CWEAMP and includes six analogue sites. Monitoring the controls will:

- allow the measurement of the success of soil translocation within the CWEA through the comparison of a range of site condition attributes with local benchmark condition;
- provide long term data regarding the condition of local vegetation types and the targets for rehabilitation; and
- account for any stochastic variability within the local ecosystems (e.g. bushfire, climate, etc.) and allow for the consideration of such variability in relation to the outcomes on the site.

The six locations chosen as control sites have been stratified evenly (three of each) between the two locally dominant vegetation types. These six sites may be used to determine completion criteria for other domains that have similar surrounding vegetation types.

Analogue sites were identified for North Cliff in 2023.

8.2 Rehabilitation establishment monitoring

A maintenance program will be developed for each rehabilitation site. This will include:

- inspection and repair of fences, signage or any other security barrier;
- repair of any erosion;
- weed control and replanting / reseeding of areas of failed revegetation, if required; and
- topping up of backfilled shafts, if required.

The rehabilitated CWEA areas are inspected in accordance with the CWEAMP to determine the progress and effectiveness of the rehabilitation. The CWEA Rehabilitation Monitoring Report is produced on an annual basis as per the Project Approval and the EPBC Approval 2010/5350. The report is appended to the Annual Review, available on the IMC website. Further details on the CWEA Rehabilitation Monitoring Program are contained in the CWEAMP.

Table 24 outlines a generic monitoring and response plan that may be used for surface facilities, depending on the post-mining land use of the sites.

8.3 Measuring performance against rehabilitation objectives and rehabilitation completion criteria

As previously mentioned, the rehabilitated CWEA areas are inspected in accordance with the CWEAMP to determine the progress and effectiveness of the rehabilitation. For the purposes of this RMP, Table 24 outlines a generic monitoring plan that may be used for surface facilities, depending on the post-mining land use of the sites.

9. PART 9 - REHABILITATION RESEARCH, MODELLING AND TRIALS

9.1 Current rehabilitation research, modelling and trials

Research into the impact of fire on the rehabilitation of the CWEA was completed in FY23.

The population of threatened *Persoonia hirsuta* plants at the Appin North mine site and specifically the CWEA, is being enhanced by a series of propagation and translocation trials.

Stage 1 planting of *P. hirsuta* was conducted in the CWEA *Persoonia* Offset area in 2019. 128 plants were initially planted as an experimental translocation designed to assess the effect of several planting techniques on survival. 25 plants had survived as of December 2020. Despite the low survivorship several key outcomes were determined:

- Among the surviving individuals, 19.5% were propagated from seeds and 72% were protected by a plant guard.
- Seedling propagation techniques and the use of plant guards can significantly assist in ensuring the early survival of *P. hirsuta* post-translocation.
- Mulching around plants may buffer against summer drought conditions.
- There were key root morphological differences among the two propagation types.
- Recipient site soil was dissimilar to the soil environments of extant plants.

In May 2021, a second translocation was carried out with 90 *Persoonia hirsuta* planted at Appin North in the CWEA Stage 2 rehabilitation area.

In May 2022, a third translocation was carried out with 102 *Persoonia hirsuta* planted in the Offset Area.

IMC is currently monitoring the success of these translocations.

For more detail on the translocation trials refer to Section 6 of the Research Report on *Persoonia hirsuta* (Haynes and Gregory, 2021), available on the IMC website: Persoonia Research Report (2021). In addition, IMC reports the results of these trials in the Annual Review.

To further support the longevity of the *Persoonia hirsuta* and other flowering native vegetation, IMC supported a UTS honors project in FY23 looking into pollinator interactions and diversity in mine-site restoration areas. This study will help inform future endeavours around rehabilitation onsite and best ways to support pollinator networks, which is crucial to ecological health and longevity of rehabilitation. This project is unique to our mine site rehabilitation area, with pollinator activity giving a crucial insight into overall health of the ecosystem, however, is particularly under researched. This was supported by the installation of artificial bee habitat to encourage pollinator activity, not only in rehabilitation areas but around the total mine site footprint.

9.2 Future rehabilitation research, modelling and trials

IMC will continue to monitor the outcomes from the translocation trials.

10. PART 10 – INTERVENTION AND ADAPTIVE MANAGEMENT

Table 24 outlines a generic monitoring plan that may be used for surface facilities, depending on the post-mining land use of the sites.

Table 24: Generic surface facility Post-Closure Monitoring and TARP

Monitoring	Objective	Frequency	Method	Trigger	Response
Safety	To confirm that the site is safe.	Post-demolition	Inspection.	Unsafe infrastructure remains on site.	Determine why infrastructure cannot be removed and address barriers to removal, or if infrastructure must stay, then develop an appropriate security / access control plan.
		Post sealing of bores and mine entries	Inspection.	Seals of shafts, mine entrances and bores show signs of failure.	Determine root cause of failure. Repair seals in accordance with guidelines (EDG01 and MDG6001).
Surface water quality	Assess the quality of surface water run-off.	Quarterly	Surface water grab sampling for pH, total dissolved solids, total suspended solids.	Water quality exceeds relevant guidelines (e.g. NWQMS / ANZECC, EPL).	Identify cause of exceedance. Develop and implement an appropriate remedial action plan.
Groundwater quality	Assess the quality of groundwater.	Quarterly	Grab samples analysed for pH, total dissolved solids and relevant metals.		
Aquatic Ecology	Assess the recovery of Georges River	6 -monthly	Semi-quantitative measures of habitat.	Statistical analysis shows Georges River is not recovering.	Identify cause. Develop and implement an appropriate remedial action plan.

Monitoring	Objective	Frequency	Method	Trigger	Response
			Ecotoxicological testing. Macrobenthos sampling.		
Soil quality	Confirm that soil remediation meets guidelines.	Post-remediation	Validation samples to confirm effectiveness of remediation.	Contaminant levels exceed relevant guidelines (e.g. National Environment Protection (Assessment of Site Contamination) Measure 1999.	Conduct further remediation and additional validation sampling.
Landform	To confirm landform has been constructed in accordance with designs.	Post-construction	Survey and inspection.	Landform is not constructed in accordance with approved plans	Determine root causes for departures from plans and either rectify issue or seek regulatory and stakeholder approval for variation, as appropriate.
Erosion	To indicate whether the landform is stable and to identify whether erosion is occurring that could adversely affect surrounding areas.	As required after rainfall events	Inspection.	Excessive erosion and sedimentation inconsistent with surrounding environment	Investigate cause and implement corrective actions such as: • Silt fences and sediment traps. • Repairs to vegetation / landform erosion. • Erosion protection measures.

Monitoring	Objective	Frequency	Method	Trigger	Response
					• Improvements to drainage system. • Restrict vehicle access to affected areas.
Growth medium	To confirm growth medium is being placed as required.	During rehabilitation	Inspection.	Growth medium is less than specifications.	Rework area to achieve specifications.
Vegetation	To assess whether vegetation completion criteria are being met.	Annual	Vegetation survey by a qualified botanist.	Establishment criteria are not met.	Review root cause of failure to meet criteria. Identify appropriate corrective actions in consultation with key stakeholders. Implement approved corrective actions.
				Development criteria are not met.	
				Weed criteria are not met.	Weed control program.

11. PART 11 – REVIEW, REVISION, AND IMPLEMENTATION

In accordance with Clause 11 of Schedule 8A to the Mining Regulation 2016, IMC will amend the RMP in the following circumstances:

- as a consequence of an amendment made to the rehabilitation objectives, rehabilitation completion criteria or final landform and rehabilitation plan;
- to reflect any changes to the risk control measures in the rehabilitation management plan that are identified in a rehabilitation risk assessment; or
- whenever directed in writing to do so by the Secretary of the Department that administers the *Mining Act 1992*.

Whenever any foreseeable hazard is identified that presents a risk to achieving the rehabilitation objectives, the rehabilitation completion criteria and the final landform and rehabilitation plan, IMC is required to update the rehabilitation risk assessment and the RMP.

12. REHABILITATION REPORTING

12.1 Annual Rehabilitation Report

IMC will prepare an annual Rehabilitation Report and forward program for the mining area in accordance with the mining lease conditions, in the form and way specified in Form and Way - Annual Rehabilitation Report and Forward Program.

The Annual Rehabilitation Report is published on the IMC website at link.

12.2 Annual Review

An Annual Review will be prepared in accordance with Condition 4 of Schedule 6 of the Project Approval. The Annual Rehabilitation Report is appended to the Annual Review.

12.3 Annual CWEA Rehabilitation Monitoring Report

The Annual CWEA Rehabilitation Monitoring Report will be completed in accordance with the CWEA Management Plan and attached to the Annual Review.

12.4 Annual *Persoonia hirsuta* Health Monitoring Report

A report will be prepared each year in accordance with the *Persoonia hirsuta* Offset Management Plan, to comply with the EPBC Approval conditions. The report will summarise the results from the translocation trials (Section 9.1).

12.5 Incident Reporting

Incident/non-compliance reporting requirements under Condition 18 of Schedule 8A of the *Mining Regulation 2016* are outlined in the IMC Environmental Compliance/Conformance Assessment and Reporting Procedure (IMCP0186).

13. REFERENCES

- Basix Environmental Solutions. (2010b). Preliminary Contamination Assessment of West Cliff Colliery Pit Top, Coal Processing Plant and Coal Wash Emplacement Sites. Unpublished report prepared for Illawarra Coal, Report ref. 1005 Rev 0, March 2010.
- Basix Environmental Solutions. (2010c). Preliminary Contamination Assessment of North Cliff Mine. Unpublished report prepared for Illawarra Coal, Rev 0, January 2010.
- BSO Project Approval 08_150 Link Project Approval (south32.net)
- Cardno Forbes Rigby. (2007). West Cliff Coal Preparation Plant Stage 3 Coal Wash Emplacement Management plan. Unpublished Report No. 107045-01 Report 003 Rev 1. July 2007.
- Cardno. (2009). West Cliff Colliery Area 5 Longwalls 34 to 36 Subsidence Management Plan.Prepared for BHP Billiton, Revision 1, November 2009 - Incorporating the Georges River Management Plan.
- Cardno. (2010). Bulli No. 4 Shaft and Powerlines Rehabilitation Plan. Prepared for Illawarra Coal, Project No. 105066-02, Report No. 001 Rev 0, June 2010.
- Department of Mineral Resources. (2000). A compilation of the Geology of the Southern Coalfield. New South Wales: Geological Survey Report No. GS1998/277.
- Ecoengineers. (2007a). West Cliff Colliery Coal Wash Emplacement Water Quality Impact Assessment and Stage 3 Emplacement Water Quality Management Plan. Unpublished Report No. 05/07 Version 1 Approved 23 May 2007.
- bulli-seam-operations-project-surface-water-management-plan.pdf (south32.net)
- EDG01 Borehole Sealing Requirements on Land: Coal Exploration (NSW Division of Resources & Energy, 2012b) – under review
- (http://www.resourcesandenergy.nsw.gov.au/__data/assets/pdf_file/0005/427019/EDG01-borehole-sealing-land-23-April-2012.pdf).
- EDG02 Borehole Sealing Requirements on the Beds of Water bodies: Coal Exploration (NSW Division of Resources & Energy, 1997) – under review
- (http://www.resourcesandenergy.nsw.gov.au/__data/assets/pdf_file/0015/427020/edg02_borehole_sealing_water.pdf).
- EGi. (2008). Assessment of Acid Forming Characteristics.
- International Environmental Consultants. (2006). Glenlee Industrial Complex Redevelopment Preliminary Assessment Report.
- Global Industry Standard on Tailings Management (GISTM)
- Haynes, A. & Gregory, D. (2021). The Persoonia Puzzle. Research Report on Persoonia hirsuta Report prepared for Illawarra Metallurgical Coal. Link: Persoonia Research Report (2021)
- Ipsos. (2016). South32 Community and Stakeholder Perceptions. Unpublished report prepared for South32 by Ipsos.

- Illawarra Coal. (2006a). Georges River Report Assessment of Georges River Remediation West Cliff Longwalls 5A1-4. Revision 0, 23 November 2006. Illawarra Coal. (2006b). Coal Wash Data and Product Specification: Fill.
- Liberty Industrial. (2016). South32 NSW Coal Assets Fixed Plant and Infrastructure Decommissioning Study. Unpublished report prepared for South32.
- Liberty Industrial. (2018). Fixed Plant and Infrastructure Decommissioning Study. Unpublished report prepared for South32, 19 December 2018.
- MDG6001 Guidelines for the permanent Filling and Capping of Surface Entries to Coal Seams (NSW Division of Resources & Energy, 2012a)
- (http://www.resourcesandenergy.nsw.gov.au/__data/assets/pdf_file/0018/420516/MDG-6001-sealing-guidelines.pdf).
- Mining Amendment (Standard Conditions of Mining Leases—Rehabilitation) Regulation 2021 under the Mining Act 1992.
- National Environment Protection (Assessment of Site Contamination) Measure 1999
- National standards for the practice of ecological restoration in Australia: http://www.seraustralasia.com/standards/National%20Restoration%20Standards%202nd%20Edition.pdf.
- Niche 2023. North Cliff Analogue Sites Baseline Data 2023. Project 7953.
- Niche 2023. PCT updates for the Appin and Dendrobium mine sites (Niche Ref: 8129).
- NSW Division of Resources & Energy. (2012a). MDG6001 Guidelines for the Permanent Filling and Capping of Surface Entries to Coal Seams.
- NSW Resources Regulator (2021) Form and way: Rehabilitation Management Plan (large mines)
- NSW Resources Regulator (2021) Guideline: Mine Rehabilitation Portal
- NSW Resources Regulator (2021) Guideline: Rehabilitation objectives, rehabilitation completion criteria and final landform and rehabilitation plan for large mines
- NSW Resources Regulator (2023) Form and way: Annual Rehabilitation Report and Forward Program (large mines)
- Sinclair Knight & Partners. (1990). Proposed Coal Reject Emplacement and Colliery Upgrading, Metropolitan Colliery Helensburgh, Environmental Impact Statement. Prepared for Danehurst Limited.
- SLR. (2023). ACARP Project C29016 – Southern Coalfields Coal Washery Reject (CWR) Characterisation and Classification, including management strategies for applications in Civil Engineering. SLR Ref: 610.18603-R01
- South32, IMC Southern Brown Bandicoot and Broad-headed Snake Management Plan
- South32, IMC. Environmental Compliance/Conformance Assessment and Reporting Procedure (IMCP0186)
- South 32, IMC. Adaptive Management Plan for Water Sensitive Commonwealth Environmental Protection and Biodiversity Conservation (EPBC) Listed Species.

- South32, IMC. *Persoonia hirsuta* Offset Management Plan
- South32, IMC. North Cliff Rehabilitation Execution Plan.
- South32, IMC. Strategic Biodiversity Offset Plan.
- South32, IMC. Sandstone Shale Transition Forest Offset Management Plan.
- South32, IMC. Ventilation Shaft No.6 Biodiversity Management Plan.
- South32, IMC. West Cliff Coal Wash Emplacement Management Plan.
- South32, IMC. Georges River Remediation Plan (GRPP).
- South32 Closure Standard.
- South32 Dam Management Standard.
- South32 Risk Management Standard.
- Umwelt. (2018). South32 Illawarra Coal Social Baseline Assessment and Social Impact and Opportunities Assessment. Unpublished report prepared by Umwelt Environmental and Social Consultants. Report No. 668/R01. Draft. November 2018.

14. APPENDICES

Appendix 1: Rehabilitation Objectives and Completion Criteria

The approved Rehabilitation Objectives are provided in Appendix 1.

Rehabilitation criteria are currently under development and will be submitted to the Resources Regulator portal for approval when the format and process for submission has been agreed with the Resources Regulator.

NSW GOVERNMENT

NSW Resources Regulator

ROBJ0001278

APPROVED REHABILITATION OBJECTIVES STATEMENT

Appin Colliery

MONDAY 4 SEPTEMBER 2023

NSW Resources Regulator

Contents

Summary

DETAIL	APPROVAL
Reference	ROBJ0001278
Date of approval	Monday 4 September 2023
Mine	Appin Colliery
Contact	Chris Schultz

Important note

The Regulator may make the information in your application and any supporting information(including this approval) available for inspection by members of the public, including by publication on its website or by displaying the information at any of its offices. If you consider any part of your application to be confidential, please communicate this to the Regulator via the message function on this application within the Portal.

Rehabilitation Objectives

The following rehabilitation objectives have been approved.

REHABILITATION OBJECTIVE CATEGORY	SPATIAL REFERENCE	REHABILITATION OBJECTIVES
	A1	Groundwater quality meets the requirements of the development consent/Environment Protection Licence and does not present a risk of environmental harm.
	A1	Impacts to groundwater regime are within range as per the development consent/pre-mining environmental assessment.
Bushfire	A1	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.
Ecological rehabilitation	A1	The vegetation composition of the rehabilitation contains species that are commensurate with PCT 3591 found in the local area.
Ecological rehabilitation	A1	The vegetation structure of the rehabilitation is similar to that of PCT 3591 found in the local area.
Ecological rehabilitation	A1	Levels of ecosystem function have been established that demonstrate the rehabilitation is self sustainable.
Ecological rehabilitation	A1	The vegetation structure of the rehabilitation is similar to that of PCT 3598 found in the local area.
Ecological rehabilitation	A1	The vegetation structure of the rehabilitation is similar to that of PCT 3616 found in the local area.
Ecological rehabilitation	A1	The vegetation composition of the rehabilitation contains species that are commensurate with PCT 3598 found in the local area.

APPROVED REHABILITATION OBJECTIVES STATEMENT

ROBJ0001278 | Appin Colliery

NSW Resources Regulator

REHABILITATION OBJECTIVE CATEGORY	SPATIAL REFERENCE	REHABILITATION OBJECTIVES
Ecological rehabilitation	A1	The vegetation composition of the rehabilitation contains species that are commensurate with PCT 3616 found in the local area.
Land contamination	A1	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.
Landform stability	A1	Landform that is commensurate with surrounding natural landform and where appropriate, incorporates geomorphic design principles.
Landform stability	A1	The final landform is stable for the long-term and does not present a risk of environmental harm downstream / downslope of the site or a safety risk to the public/stock/native fauna.
Management of waste and process materials	A1	Residual waste materials stored on site (e.g. coarse rejects and other wastes) will be appropriately contained / encapsulated so it does not pose any hazards or constraints for intended final land use.
Removal of infrastructure	A1	Relevant approvals are in place for the management of threatened species habitat as part of the decommissioning and sealing of mine entrances
Removal of infrastructure	A1	All infrastructure that is not to be used as part of the final land use is removed to ensure the site is safe and free of hazardous materials.
Retention of infrastructure	A1	All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and / or licence/lease/binding agreement, etc).
Retention of infrastructure	A1	All infrastructure that is to remain as part of the final land use is safe, does not pose any hazard to the community.
Surface water	A1	Runoff water quality from mine site meets the requirements of the development consent / Environment Protection Licence and does not present a risk of environmental harm.
	A3	Groundwater quality meets the requirements of the development consent/Environment

REHABILITATION OBJECTIVE CATEGORY	SPATIAL REFERENCE	REHABILITATION OBJECTIVES
		Protection Licence and does not present a risk of environmental harm.
	A3	Impacts to groundwater regime are within range as per the development consent/pre-mining environmental assessment.
Bushfire	A3	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.
Ecological rehabilitation	A3	The vegetation composition of the rehabilitation contains species that are commensurate with PCT 3616 found in the local area.
Ecological rehabilitation	A3	The vegetation structure of the rehabilitation is similar to that of PCT 3591 found in the local area.
Ecological rehabilitation	A3	The vegetation composition of the rehabilitation contains species that are commensurate with PCT 3598 found in the local area.
Ecological rehabilitation	A3	Levels of ecosystem function have been established that demonstrate the rehabilitation is self sustainable.
Ecological rehabilitation	A3	The vegetation structure of the rehabilitation is similar to that of PCT 3598 found in the local area.
Ecological rehabilitation	A3	The vegetation structure of the rehabilitation is similar to that of PCT 3616 found in the local area.
Ecological rehabilitation	A3	The vegetation composition of the rehabilitation contains species that are commensurate with PCT 3591 found in the local area.
Land contamination	A3	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.

APPROVED REHABILITATION OBJECTIVES STATEMENT

ROBJ0001278 | Appin Colliery

NSW Resources Regulator

REHABILITATION OBJECTIVE CATEGORY	SPATIAL REFERENCE	REHABILITATION OBJECTIVES
Landform stability	A3	The final landform is stable for the long-term and does not present a risk of environmental harm downstream / downslope of the site or a safety risk to the public/stock/native fauna.
Landform stability	A3	Landform that is commensurate with surrounding natural landform and where appropriate, incorporates geomorphic design principles.
Management of waste and process materials	A3	Residual waste materials stored on site (e.g. coarse rejects and other wastes) will be appropriately contained / encapsulated so it does not pose any hazards or constraints for intended final land use.
Removal of infrastructure	A3	All infrastructure that is not to be used as part of the final land use is removed to ensure the site is safe and free of hazardous materials.
Retention of infrastructure	A3	All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and / or licence/lease/binding agreement, etc).
Retention of infrastructure	A3	All infrastructure that is to remain as part of the final land use is safe, does not pose any hazard to the community.
Surface water	A3	Runoff water quality from mine site meets the requirements of the development consent / Environment Protection Licence and does not present a risk of environmental harm.
	A4	Impacts to groundwater regime are within range as per the development consent/pre-mining environmental assessment.
	A4	Groundwater quality meets the requirements of the development consent/Environment Protection Licence and does not present a risk of environmental harm.
Bushfire	A4	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.
Land contamination	A4	There is no residual soil contamination on site that is incompatible with the final land use or

REHABILITATION OBJECTIVE CATEGORY	SPATIAL REFERENCE	REHABILITATION OBJECTIVES
		that poses a threat of environmental harm.
Landform stability	A4	Landform that is commensurate with surrounding natural landform and where appropriate, incorporates geomorphic design principles.
Landform stability	A4	The final landform is stable for the long-term and does not present a risk of environmental harm downstream / downslope of the site or a safety risk to the public/stock/native fauna.
Management of waste and process materials	A4	Residual waste materials stored on site (e.g. coarse rejects and other wastes) will be appropriately contained / encapsulated so it does not pose any hazards or constraints for intended final land use.
Removal of infrastructure	A4	All infrastructure that is not to be used as part of the final land use is removed to ensure the site is safe and free of hazardous materials.
Retention of infrastructure	A4	All infrastructure that is to remain as part of the final land use is safe, does not pose any hazard to the community.
Retention of infrastructure	A4	All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and / or licence/lease/binding agreement, etc).
Surface water	A4	Runoff water quality from mine site meets the requirements of the development consent / Environment Protection Licence and does not present a risk of environmental harm.
	A6	Groundwater quality meets the requirements of the development consent/Environment Protection Licence and does not present a risk of environmental harm.
	A6	Impacts to groundwater regime are within range as per the development consent/pre-mining environmental assessment.
Bushfire	A6	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.

APPROVED REHABILITATION OBJECTIVES STATEMENT

ROBJ0001278 | Appin Colliery

NSW Resources Regulator

REHABILITATION OBJECTIVE CATEGORY	SPATIAL REFERENCE	REHABILITATION OBJECTIVES
Ecological rehabilitation	A6	The vegetation composition of the rehabilitation contains species that are similar to that of vegetation communities found in the local area (where surface rehabilitation is required).
Ecological rehabilitation	A6	Levels of ecosystem function have been established that demonstrate the rehabilitation is self sustainable (where surface rehabilitation is required).
Ecological rehabilitation	A6	The vegetation structure of the rehabilitation is similar to that of the vegetation communities found in the local area (where surface rehabilitation is required).
Land contamination	A6	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.
Landform stability	A6	Landform that is commensurate with surrounding natural landform and where appropriate, incorporates geomorphic design principles.
Landform stability	A6	The final landform is stable for the long-term and does not present a risk of environmental harm downstream / downslope of the site or a safety risk to the public/stock/native fauna.
Removal of infrastructure	A6	All infrastructure that is not to be used as part of the final land use is removed to ensure the site is safe and free of hazardous materials.
Retention of infrastructure	A6	All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and / or licence/lease/binding agreement, etc).
Retention of infrastructure	A6	All infrastructure that is to remain as part of the final land use is safe, does not pose any hazard to the community.
Surface water	A6	Restore pre-mining surface flow and pool holding capacity. Hydraulically and geomorphologically stable, with riparian vegetation that is the same or better than prior to mining.

APPROVED REHABILITATION OBJECTIVES STATEMENT

ROBJ0001278 | Appin Colliery

NSW Resources Regulator

REHABILITATION OBJECTIVE CATEGORY	SPATIAL REFERENCE	REHABILITATION OBJECTIVES
	B1	Groundwater quality meets the requirements of the development consent/Environment Protection Licence and does not present a risk of environmental harm.
	B1	Impacts to groundwater regime are within range as per the development consent/pre-mining environmental assessment.
Agricultural revegetation	B1	Land use capability is capable of supporting the target agricultural land use (eg grazing).
Agricultural revegetation	B1	Revegetation is sustainable for the long-term and only requires maintenance that is consistent with the intended final land use.
Bushfire	B1	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.
Land contamination	B1	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.
Landform stability	B1	Landform that is commensurate with surrounding natural landform and where appropriate, incorporates geomorphic design principles.
Landform stability	B1	The final landform is stable for the long-term and does not present a risk of environmental harm downstream / downslope of the site or a safety risk to the public/stock/native fauna.
Management of waste and process materials	B1	Residual waste materials stored on site (e.g. coarse rejects and other wastes) will be appropriately contained / encapsulated so it does not pose any hazards or constraints for intended final land use.
Removal of infrastructure	B1	All infrastructure that is not to be used as part of the final land use is removed to ensure the site is safe and free of hazardous materials.
Removal of infrastructure	B1	Relevant approvals are in place for the management of threatened species habitat as part of

REHABILITATION OBJECTIVE CATEGORY	SPATIAL REFERENCE	REHABILITATION OBJECTIVES
		the decommissioning and sealing of mine entrances
Retention of infrastructure	B1	All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and / or licence/lease/binding agreement, etc).
Retention of infrastructure	B1	All infrastructure that is to remain as part of the final land use is safe, does not pose any hazard to the community.
Surface water	B1	Runoff water quality from mine site meets the requirements of the development consent / Environment Protection Licence and does not present a risk of environmental harm.
	B3	Groundwater quality meets the requirements of the development consent/Environment Protection Licence and does not present a risk of environmental harm.
	B3	Impacts to groundwater regime are within range as per the development consent/pre-mining environmental assessment.
Agricultural revegetation	B3	Land use capability is capable of supporting the target agricultural land use (eg grazing).
Agricultural revegetation	B3	Revegetation is sustainable for the long-term and only requires maintenance that is consistent with the intended final land use.
Bushfire	B3	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.
Land contamination	B3	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.
Landform stability	B3	The final landform is stable for the long-term and does not present a risk of environmental harm downstream / downslope of the site or a safety risk to the public/stock/native fauna.

APPROVED REHABILITATION OBJECTIVES STATEMENT

ROBJ0001278 | Appin Colliery

NSW Resources Regulator

REHABILITATION OBJECTIVE CATEGORY	SPATIAL REFERENCE	REHABILITATION OBJECTIVES
Landform stability	B3	Landform that is commensurate with surrounding natural landform and where appropriate, incorporates geomorphic design principles.
Management of waste and process materials	B3	Residual waste materials stored on site (e.g. coarse rejects and other wastes) will be appropriately contained / encapsulated so it does not pose any hazards or constraints for intended final land use.
Removal of infrastructure	B3	All infrastructure that is not to be used as part of the final land use is removed to ensure the site is safe and free of hazardous materials.
Retention of infrastructure	B3	All infrastructure that is to remain as part of the final land use is safe, does not pose any hazard to the community.
Retention of infrastructure	B3	All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and / or licence/lease/binding agreement, etc).
Surface water	B3	Runoff water quality from mine site meets the requirements of the development consent / Environment Protection Licence and does not present a risk of environmental harm.
Water approvals	F3	Structures that take or divert water such as dams are appropriately licensed (e.g. under the Water Management Act 2000) and where required sufficient water licence shares are in place. are held in the water source(s) to account for water take.

Appendix 2: Final Landform and Rehabilitation Plans

The Final Landform and Rehabilitation Plans were approved by the Resources Regulator on 4 September 2023.

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ARR Plan 1A - A - Current status of mining and rehabilitation

Bulli Seam Operations
Domain 1 - WCCPP (Except CWEA)

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400
Metres

Mining Domain Type (Submission ID = 5379)
- Infrastructure Area
- Overburden Emplacement Area
- Underground Mining Area (SMP)
- Water Management Area

Rehabilitation Phase (Submission ID = 5404)
- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development
- Relinquishment (Rehabilitated)

- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 055

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

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ARR Plan1B - A - Current landform contours

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400
Metres

- Current Landform Contours (Submission ID = 5373)
- Project Approval Boundary (Submission ID = 5369)
- Coal - Current Title

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 1 - WCCPP (Except CWEA)

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 056

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

299000 299500 300000

6212000 6211500 6211000 6210500

FLRP Plan 1A - Final Landform Features

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400
Metres

Project Approval Boundary (Submission ID = 5369)
Coal - Current Title
Final Landform Features (Submission ID = 5374)

Final Landuse Domain (Submission ID =5368)

Native Ecosystem

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 1 - WCCPP (Except CWEA)

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 023

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6212000 6211500 6211000 6210500

FLRP Plan 2A - Final Landform Contours

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400
Metres

- Final Landform Contours (Submission ID = 5375)
- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 1 - WCCPP (Except CWEA)

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 024

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ARR Plan1A - B - Current status of mining and rehabilitation

Bulli Seam Operations
Domain 2 - Appin North Pit Top

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200
Metres

Rehabilitation Phase (Submission ID = 5404)
- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development
- Relinquishment (Rehabilitated)

Mining Domain Type (Submission ID = 5379)
- Infrastructure Area
- Overburden Emplacement Area
- Underground Mining Area (SMP)
- Water Management Area

- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

SOUTH32
Illawarra Metallurgical Coal

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

IMC GIS 2023 057

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

300000

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6210000

6209500

ARR Plan 1B - B - Current landform contours

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2023

0 100 200
Metres

Current Landform Contours (Submission ID =5373)
Project Approval Boundary (Submission ID = 5369)
Coal - Current Title

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 2 - Appin North Pit Top

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 058

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

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FLRP Plan 1B - Final Landform Features

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200
Metres

Project Approval Boundary (Submission ID = 5369)
Coal - Current Title
Final Landform Features (Submission ID = 5374)

Final Landuse Domain (Submission ID = 5368)

Native Ecosystem

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 2 - Appin North Pit Top

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 025

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

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FLRP Plan 2B - Final Landform Contours

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200
Metres

Coal - Current Title
Project Approval Boundary (Submission ID = 5369)
Final Landform Contours (Submission ID = 5375)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 2 - Appin North Pit Top

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 026

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297000

ARR Plan 1A - C - Current status of mining and rehabilitation

30/06/2023

Prepared by: B Moylan

GDA 94 MGA Zone 56

Aerial photography May 2022

0 25 50 100 150

Metres

Mining Domain Type (Submission ID = 5379)

- Infrastructure Area
- Overburden Emplacement Area
- Underground Mining Area (SMP)
- Water Management Area

Rehabilitation Phase (Submission ID = 5404)

- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development
- Relinquishment (Rehabilitated)

- Coal - Current Title
- Project_Approval_Boundary (Submission ID = 5369)

Bulli Seam Operations

Domain 3 - Appin East Pit Top

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32

Illawarra Metallurgical Coal

IMC GIS 2023 059

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

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ARR Plan1B - C - Current landform contours

30/06/2023

Prepared by: B Moylan

GDA 94 MGA Zone 56

Aerial photography April 2020

0 25 50 100 150

Metres

Current Landform Contours (Submission ID = 5373)

Project Approval Boundary (Submission ID = 5369)

Coal - Current Title

Bulli Seam Operations

Domain 3 - Appin East Pit Top

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32

Illawarra Metallurgical Coal

IMC GIS 2023 060

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

296500

297000

FLRP Plan 1C - Final Landform Features

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 25 50 100 150
Metres

Project Approval Boundary (Submission ID = 5369)
Coal - Current Title
Final Landform Features (Submission ID = 5374)
Final Landuse Domain (Submission ID =5368)
Native Ecosystem

Bulli Seam Operations

Domain 3 - Appin East Pit Top

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 027

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

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FLRP Plan 2C - Final Landform Contours

30/06/2023

Prepared by: B Moylan

GDA 94 MGA Zone 56

Aerial photography May 2022

Final Landform Contours (Submission ID = 5375)

Coal - Current Title

Project Approval Boundary (Submission ID = 5369)

0 25 50 100 150

Metres

Bulli Seam Operations

Domain 3 - Appin East Pit Top

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32

Illawarra Metallurgical Coal

IMC GIS 2023 028

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ARR Plan 1A - D - Current status of mining and rehabilitation

Bulli Seam Operations

Domain 4 - Appin West Pit Top

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 25 50 100 150
Metres

Mining Domain Type (Submission ID = 5379)
- Infrastructure Area
- Overburden Emplacement Area
- Underground Mining Area (SMP)
- Water Management Area

Rehabilitation Phase (Submission ID = 5404)
- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development
- Relinquishment (Rehabilitated)

- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 061

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

289500

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6211000

ARR Plan1B - D - Current landform contours

30/06/2023

Prepared by: B Moylan

GDA 94 MGA Zone 56

Aerial photography May 2022

0 25 50 100 150

Metres

Current Landform Contours (Submission ID = 5373)

Project Approval Boundary (Submission ID = 5369)

Coal - Current Title

Bulli Seam Operations

Domain 4 - Appin West Pit Top

SOUTH32

Illawarra Metallurgical Coal

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

IMC GIS 2023 062

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

289500

290000

6211000

FLRP Plan 1D - Final Landform Features

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 25 50 100 150
Metres

Project Approval Boundary (Submission ID = 5369)
Coal - Current Title
Final Landform Features (Submission ID = 5374)
Final Landuse Domain (Submission ID =5368)
Native Ecosystem

Bulli Seam Operations

Domain 4 - Appin West Pit Top

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 029

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

289500

290000

6211000

FLRP Plan 2D - Final Landform Contours

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2023

0 25 50 100 150
Metres

Final Landform Contours (Submission ID = 5375)
Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

Bulli Seam Operations

Domain 4 - Appin West Pit Top

SOUTH32
Illawarra Metallurgical Coal

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

IMC GIS 2023 030

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

304500

6212000

ARR Plan 1A - E - Current status of mining and rehabilitation

Bulli Seam Operations

Domain 5 - North Cliff

30/06/2023

Prepared by: B Moylan

GDA 94 MGA Zone 56

Aerial photography May 2022

0 25 50 100 150

Metres

Mining Domain Type (Submission ID = 5379)

- Infrastructure Area
- Overburden Emplacement Area
- Underground Mining Area (SMP)
- Water Management Area

Rehabilitation Phase (Submission ID = 5404)

- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development
- Relinquishment (Rehabilitated)

- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32

Illawarra Metallurgical Coal

IMC GIS 2023 063

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

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6212000

ARR Plan1B - E - Current landform contours

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

N

Current Landform Contours (Submission ID = 5373)
Project Approval Boundary (Submission ID = 5369)
Coal - Current Title

0 25 50 100 150
Metres

Bulli Seam Operations

Domain 5 - North Cliff

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 064

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

304500

6212000

FLRP Plan 1E - Final Landform Features

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 25 50 100 150
Metres

Coal - Current Title
Project Approval Boundary (Submission ID = 5369)
Final Landform Features (Submission ID = 5374)
Final Landuse Domain (Submission ID =5368)
Native Ecosystem

Bulli Seam Operations

Domain 5 - North Cliff

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 031

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

304500

6212000

FLRP Plan 2E - Final Landform Contours

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

N

Final Landform Contours (Submission ID = 5375)
Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

0 25 50 100 150
Metres

Bulli Seam Operations

Domain 5 - North Cliff

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 032

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

294500

295000

6212500

ARR Plan 1A - F - Current status of mining and rehabilitation

Bulli Seam Operations

Domain 6 - Appin No. 1 and 2 Ventilation Shafts

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 25 50 100 150
Metres

Mining Domain Type (Submission ID = 5379)
- Infrastructure Area
- Overburden Emplacement Area
- Underground Mining Area (SMP)
- Water Management Area

Rehabilitation Phase (Submission ID = 5404)
- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development
- Relinquishment (Rehabilitated)

- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 065

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

294500

295000

6212500

ARR Plan1B - F - Current landform contours

30/06/2023

Prepared by: B Moylan

GDA 94 MGA Zone 56

Aerial photography May 2022

Current Landform Contours (Submission ID = 5373)

Project Approval Boundary (Submission ID = 5369)

Coal - Current Title

0 25 50 100 150

Metres

Bulli Seam Operations

Domain 6 - Appin No. 1 and 2 Ventilation Shafts

SOUTH32

Illawarra Metallurgical Coal

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

IMC GIS 2023 066

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

294500

295000

6212500

Agricultural - Grazing

FLRP Plan 1F - Final Landform Features

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 25 50 100 150
Metres

Project Approval Boundary (Submission ID = 5369)
Coal - Current Title
Final Landform Features (Submission ID = 5374)
Final Landuse Domain (Submission ID =5368)
Agricultural – Grazing

Bulli Seam Operations

Domain 6 - Appin No. 1 and 2 Ventilation Shafts

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 033

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

294500

295000

6212500

FLRP Plan 2F - Final Landform Contours

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

Final Landform Contours (Submission ID = 5375)
Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

0 25 50 100 150
Metres

Bulli Seam Operations

Domain 6 - Appin No. 1 and 2 Ventilation Shafts

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 034

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

292000

292200

292400

6213600

ARR Plan 1A - G - Current status of mining and rehabilitation

Bulli Seam Operations

Domain 7 - Appin No.3 Ventilation Shaft

30/06/2023

Prepared by: B Moylan

GDA 94 MGA Zone 56

Aerial photography May 2022

0 25 50 100 150

Metres

Mining Domain Type (Submission ID = 5379)

- Infrastructure Area
- Overburden Emplacement Area
- Underground Mining Area (SMP)
- Water Management Area

Rehabilitation Phase (Submission ID = 5404)

- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development
- Relinquishment (Rehabilitated)

- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown
Note - Full spatial extent of pipeline not covered by this plan

SOUTH32

Illawarra Metallurgical Coal

IMC GIS 2023 067

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

292000

292200

292400

6213600

ARR Plan1B - G - Current landform contours

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

- Current Landform Contours (Submission ID = 5373)
- Project Approval Boundary (Submission ID = 5369)
- Coal - Current Title

0 25 50 100 150
Metres

Bulli Seam Operations

Domain 7 - Appin No.3 Ventilation Shaft

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown
Note - Full spatial extent of pipeline not covered by this plan

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 068

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

292000

292200

292400

6213600

Agricultural - Grazing

FLRP Plan 1G - Final Landform Features

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

Project Approval Boundary (Submission ID = 5369)
Coal - Current Title
Final Landform Features (Submission ID = 5374)
Final Landuse Domain (Submission ID =5368)
Agricultural – Grazing

0 25 50 100 150
Metres

Bulli Seam Operations

Domain 7 - Appin No.3 Ventilation Shaft

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown
Note - Full spatial extent of pipeline not covered by this plan

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 035

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

292000

292200

292400

6213600

FLRP Plan 2G - Final Landform Contours

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

Final Landform Contours (Submission ID = 5375)
Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

0 25 50 100 150
Metres

Bulli Seam Operations

Domain 7 - Appin No.3 Ventilation Shaft

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown
Note - Full spatial extent of pipeline not covered by this plan

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 036

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

289500 290000 290500 291000

6217000 6216500 6216000 6215500 6215000

ARR Plan 1A - H - Current status of mining and rehabilitation

Bulli Seam Operations

Domain 8 - Appin No.6 Ventilation Shaft

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400
Metres

Mining Domain Type (Submission ID = 5379)
- Infrastructure Area
- Overburden Emplacement Area
- Underground Mining Area (SMP)
- Water Management Area

Rehabilitation Phase (Submission ID = 5404)
- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development
- Relinquishment (Rehabilitated)

- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 069

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

289500 290000 290500 291000

6217000 6216500 6216000 6215500 6215000

ARR Plan1B - H - Current landform contours

Bulli Seam Operations

Domain 8 - Appin No.6 Ventilation Shaft

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

N

Current Landform Contours (Submission ID = 5373)
Project Approval Boundary (Submission ID = 5369)
Coal - Current Title

0 100 200 400 600
Metres

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 070

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

289500 290000 290500 291000

6217000 6216500 6216000 6215500 6215000

Agricultural - Grazing

Native Ecosystem

FLRP Plan 1H - Final Landform Features

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

Coal - Current Title
Project Approval Boundary (Submission ID = 5369)
Final Landform Features (Submission ID = 5374)

Final Landuse Domain (Submission ID =5368)

Agricultural – Grazing
Native Ecosystem

0 100 200 400 600
Metres

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 8 - Appin No.6 Ventilation Shaft

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 037

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

289500 290000 290500 291000

6217000 6216500 6216000 6215500 6215000

FLRP Plan 2H - Final Landform Contours

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

N

Final Landform Contours (Submission ID = 5375)
Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

0 100 200 400 600
Metres

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

Bulli Seam Operations
Domain 8 - Appin No.6 Ventilation Shaft

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 038

Bulli Shaft No. 1

Bulli Shaft No. 2

Bulli Shaft No. 3

Bulli Shaft No. 4

0 5 10 20 30
Metres

0 5 10 20 30
Metres

0 25 50 100 150
Metres

ARR Plan 1A - H - Current status of mining and rehabilitation

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

Mining Domain Type (Submission ID = 5379)
- Infrastructure Area
- Overburden Emplacement Area
- Underground Mining Area (SMP)
- Water Management Area

Rehabilitation Phase (Submission ID = 5404)
- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development
- Relinquishment (Rehabilitated)

- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

Bulli Seam Operations
Domain 9 - Bulli Shafts Sites

SOUTH32
Illawarra Metallurgical Coal

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

IMC GIS 2023 071

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

Bulli Shaft No. 1

Bulli Shaft No. 2

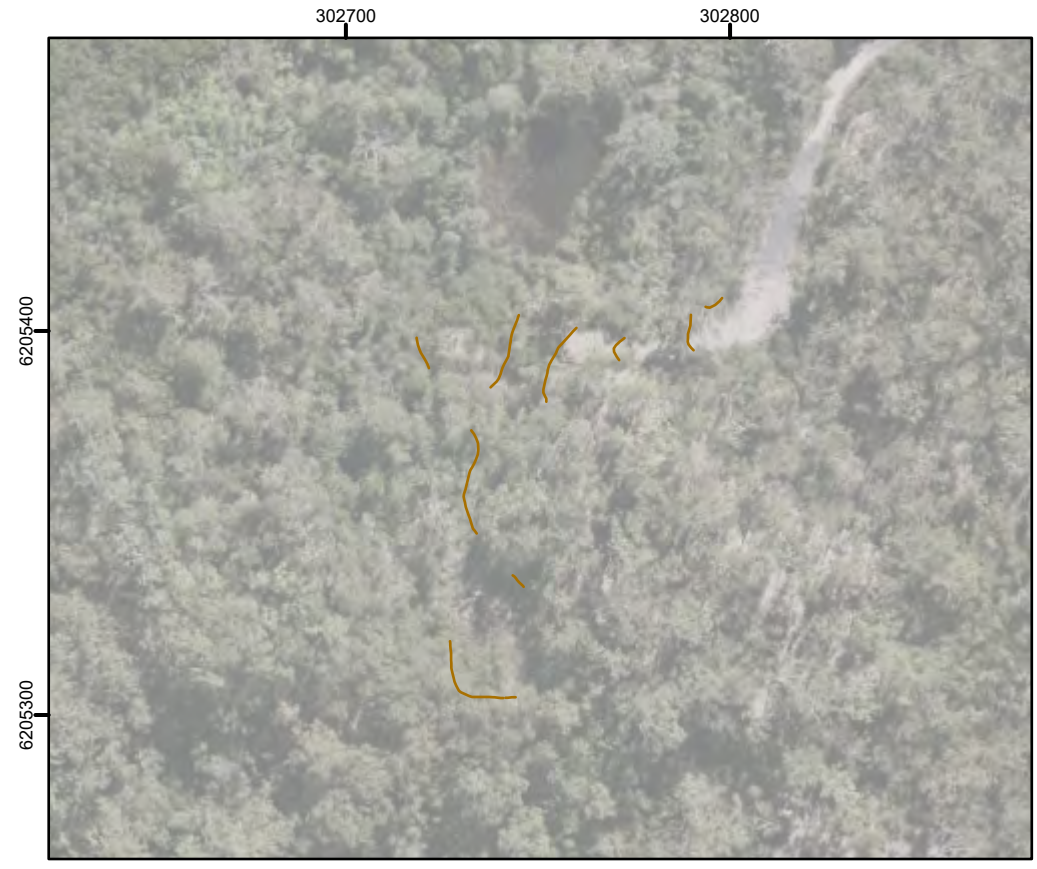
0 5 10 20 30

Metres

Bulli Shaft No. 3

0 5 10 20 30

Metres



Bulli Shaft No. 4

0 25 50 100 150

Metres

ARR Plan1B - I - Current landform contours

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

Current Landform Contours (Submission ID = 5373)
Project Approval Boundary (Submission ID = 5369)
Coal - Current Title

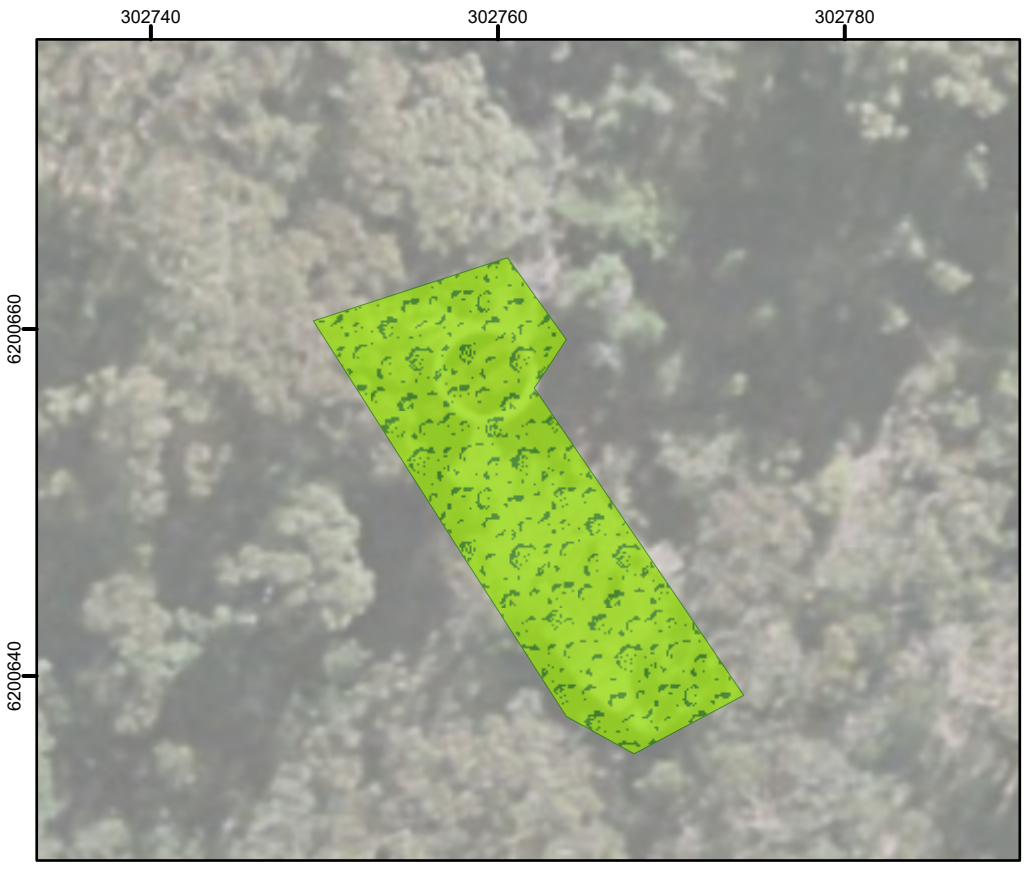
Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 9 - Bulli Shafts Sites

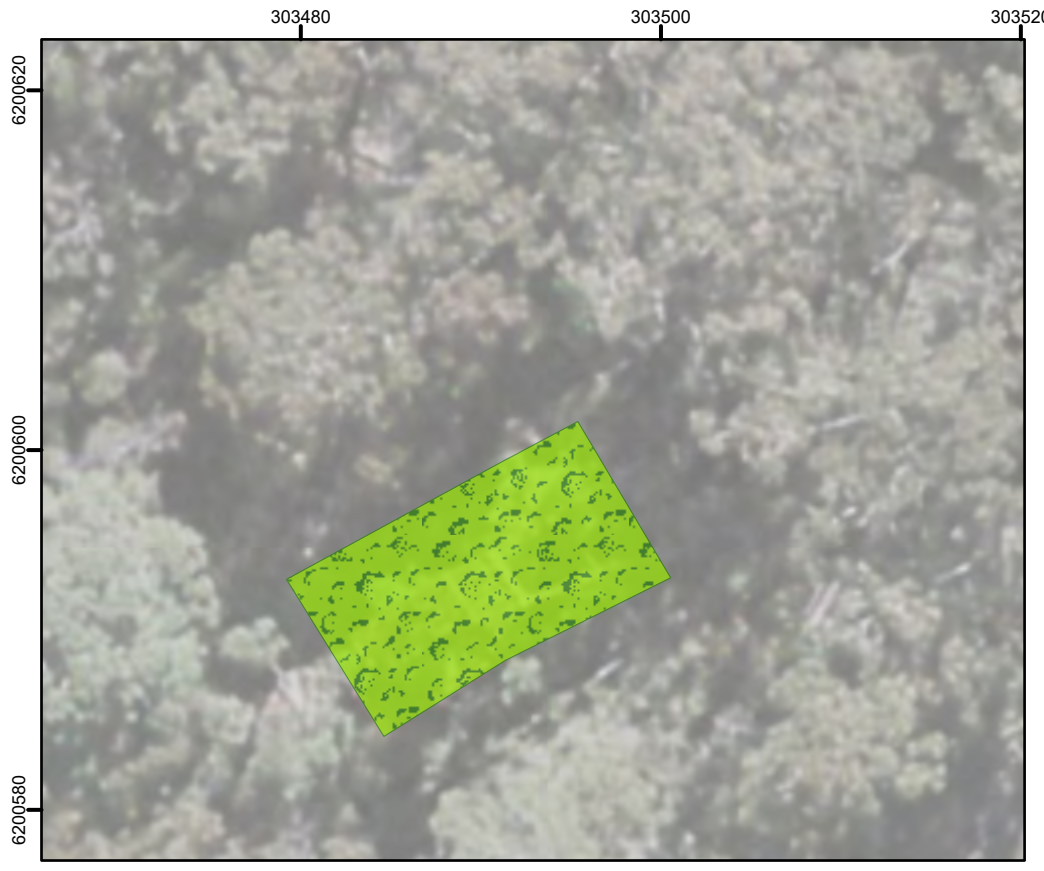
SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 072

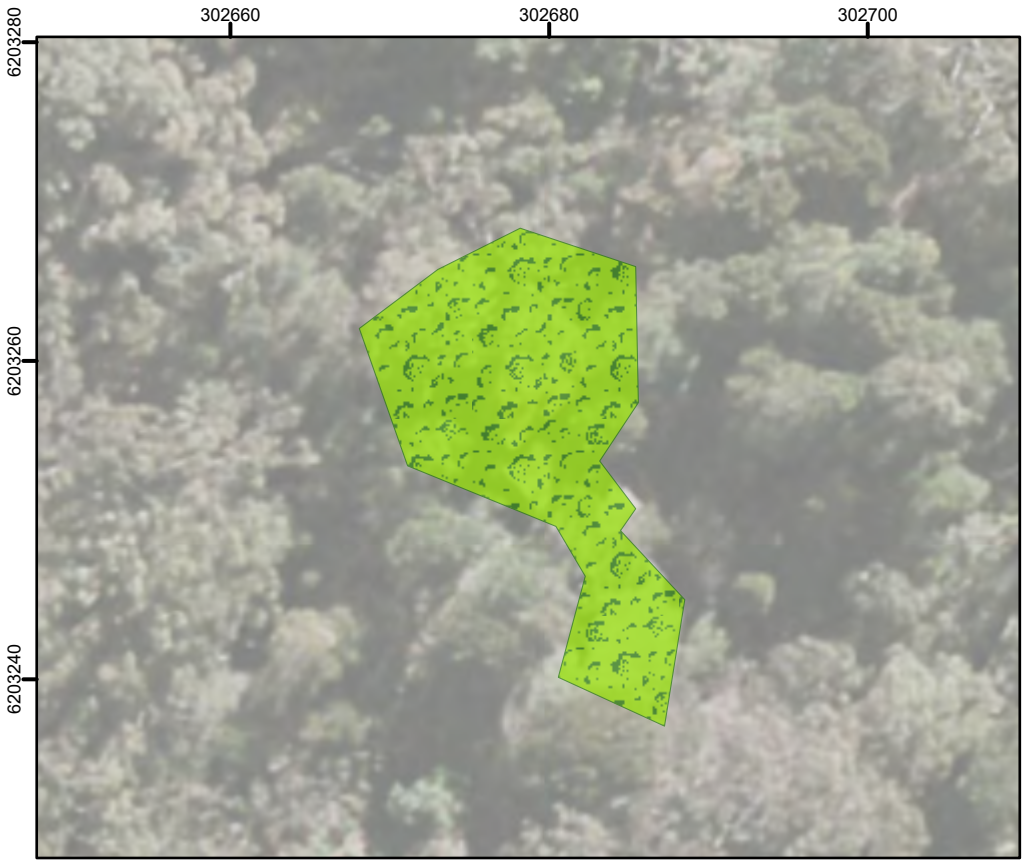
Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx



Bulli Shaft No. 1



Bulli Shaft No. 2



Bulli Shaft No. 3

Bulli Shaft No. 4

0 5 10 20 30

Metres

0 5 10 20 30

Metres

0 25 50 100 150

Metres

FLRP Plan 1I - Final Landform Features

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

Project Approval Boundary (Submission ID = 5369)
Coal - Current Title
Final Landform Features (Submission ID = 5374)

Final Landuse Domain (Submission ID =5368)

Native Ecosystem

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

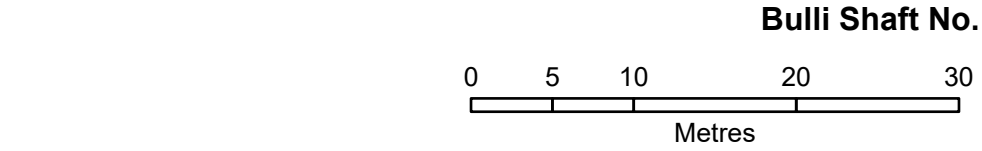
Bulli Seam Operations
Domain 9 - Bulli Shafts Sites

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 039

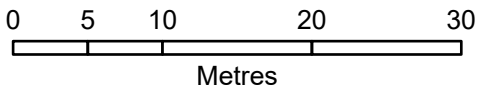
Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

Bulli Shaft No. 1

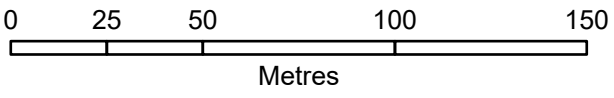


Bulli Shaft No. 2

Bulli Shaft No. 3



Bulli Shaft No. 4



FLRP Plan 2I - Final Landform Features

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

Final Landform Contours (Submission ID = 5375)
Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 9 - Bulli Shafts Sites

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 040

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

285500 286000 286500 287000 287500 288000 288500 289000 289500 290000 290500

6217500 6217000 6216500 6216000 6215500 6215000

ARR Plan 1A - J - Current status of mining and rehabilitation

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400 600
Metres

Mining Domain Type (Submission ID = 5379)
- Infrastructure Area
- Overburden Emplacement Area
- Underground Mining Area (SMP)
- Water Management Area

Rehabilitation Phase (Submission ID = 5404)
- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development
- Relinquishment (Rehabilitated)

- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

Bulli Seam Operations

Domain 10 - Mine Safety Gas Drainage

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 073

285500 286000 286500 287000 287500 288000 288500 289000 289500 290000 290500

6217500 6217000 6216500 6216000 6215500 6215000

ARR Plan1B - J - Current landform contours

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400 600
Metres

Current Landform Contours (Submission ID = 5373)
Project Approval Boundary (Submission ID = 5369)
Coal - Current Title

Bulli Seam Operations

Domain 10 - Mine Safety Gas Drainage

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 074

285500 286000 286500 287000 287500 288000 288500 289000 289500 290000 290500

6217500 6217000 6216500 6216000 6215500 6215000

FLRP Plan 1J - Final Landform Features

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400 600
Metres

Project Approval Boundary (Submission ID = 5369)
Coal - Current Title
Final Landuse Domain (Submission ID =5368)
Agricultural – Grazing
Final Landform Features (Submission ID = 5374)

Bulli Seam Operations

Domain 10 - Mine Safety Gas Drainage

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 041

285500 286000 286500 287000 287500 288000 288500 289000 289500 290000 290500

6217500
6217000
6216500
6216000
6215500
6215000

FLRP Plan 2J - Final Landform Contours

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400 600
Metres

Final Landform Contours (Submission ID = 5375)
Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

Bulli Seam Operations

Domain 10 - Mine Safety Gas Drainage

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 042

298000 298500 299000 299500 300000 300500

6212500 6212000 6211500 6211000 6210500 6210000 6209500 6209000

ARR Plan 1A - K - Current status of mining and rehabilitation

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400 600
Metres

Mining Domain Type (Submission ID = 5379)
- Infrastructure Area
- Overburden Emplacement Area
- Underground Mining Area (SMP)
- Water Management Area

Rehabilitation Phase (Submission ID = 5404)
- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development
- Relinquishment (Rehabilitated)

- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

Bulli Seam Operations
Domain 11 - CWEA

SOUTH32
Illawarra Metallurgical Coal

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

IMC GIS 2023 075

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

298000 298500 299000 299500 300000 300500

6212500 6212000 6211500 6211000 6210500 6210000 6209500 6209000

ARR Plan1B - K - Current landform contours

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400 600
Metres

Current Landform Contours (Submission ID = 5373)
Project Approval Boundary (Submission ID = 5369)
Coal - Current Title

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 11 - CWEA

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 076

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

298000 298500 299000 299500 300000 300500

6212500 6212000 6211500 6211000 6210500 6210000 6209500 6209000

FC Plan 2A - A - Mining and Rehabilitation – Year 1

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400 600
Metres

Forecast Data Year1 (Submission ID = 5376)
Forecast Disturbance
Forecast Land Prepared for Rehabilitation

Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 11 - CWEA

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 087

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

298000 298500 299000 299500 300000 300500

6212500 6212000 6211500 6211000 6210500 6210000 6209500 6209000

FC Plan 2B - A - Mining and Rehabilitation – Year 2

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400 600
Metres

Forecast Data Year2 (Submission ID = 5377)
Forecast Disturbance
Forecast Land Prepared for Rehabilitation

Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 11 - CWEA

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 088

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

298000 298500 299000 299500 300000 300500

6212500 6212000 6211500 6211000 6210500 6210000 6209500 6209000

FC Plan 2C-A - Mining and Rehabilitation – Year 3

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400 600
Metres

Forecast Data Year3 (Submission ID = 5378)
Forecast Disturbance
Forecast Land Prepared for Rehabilitation

Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 11 - CWEA

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 089

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

298000 298500 299000 299500 300000 300500

6212500 6212000 6211500 6211000 6210500 6210000 6209500 6209000

FLRP Plan 1K - Final Landform Features

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400 600
Metres

- Project Approval Boundary (Submission ID = 5369)
- Coal - Current Title
- Final Landform Features (Submission ID = 5374)

Final Landuse Domain (Submission ID =5368)

- Native Ecosystem
- Water Management Areas

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 11 - CWEA

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 043

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

298000 298500 299000 299500 300000 300500

6212500 6212000 6211500 6211000 6210500 6210000 6209500 6209000

FLRP Plan 2K - Final Landform Contours

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400 600
Metres

- Final Landform Contours (Submission ID = 5375)
- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 11 - CWEA

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 044

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

297500 298000 298500 299000 299500 300000

6212500

6212000

6211500

ARR Plan 1A - L - Current status of mining and rehabilitation

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400 600
Metres

Mining Domain Type (Submission ID = 5379)
- Infrastructure Area
- Overburden Emplacement Area
- Underground Mining Area (SMP)
- Water Management Area

Rehabilitation Phase (Submission ID = 5404)
- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development
- Relinquishment (Rehabilitated)

- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

Bulli Seam Operations

Domain 12 - Brennans Creek Dam

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 077

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

297500 298000 298500 299000 299500 300000

6212500

6212000

6211500

ARR Plan1B - L - Current landform contours

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

N

0 100 200 400 600
Metres

Current Landform Contours (Submission ID = 5373)
Project Approval Boundary (Submission ID = 5369)
Coal - Current Title

Bulli Seam Operations

Domain 12 - Brennans Creek Dam

SOUTH32
Illawarra Metallurgical Coal

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

IMC GIS 2023 078

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

297500 298000 298500 299000 299500 300000

6212500

6212000

6211500

FLRP Plan 1L - Final Landform Features

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400 600
Metres

Project Approval Boundary (Submission ID = 5369)
Coal - Current Title
Final Landform Features (Submission ID = 5374)
Final Landuse Domain (Submission ID =5368)
Native Ecosystem

Bulli Seam Operations

Domain 12 - Brennans Creek Dam

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 045

297500 298000 298500 299000 299500 300000

6212500

6212000

6211500

FLRP Plan 2L - Final Landform Contours

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

N

0 100 200 400 600
Metres

Final Landform Contours (Submission ID = 5375)
Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

Bulli Seam Operations

Domain 12 - Brennans Creek Dam

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 046

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

296500 297000 297500

6217500 6217000 6216500 6216000 6215500

ARR Plan 1A - M - Current status of mining and rehabilitation

Bulli Seam Operations

Domain 13 - Mine Subsidence Impacts

30/06/2023

Prepared by: B Moylan

GDA 94 MGA Zone 56

Aerial photography May 2022

0 100 200 400

Metres

Mining Domain Type (Submission ID = 5379)

- Infrastructure Area
- Overburden Emplacement Area
- Underground Mining Area (SMP)
- Water Management Area

Rehabilitation Phase (Submission ID = 5404)

- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development
- Relinquishment (Rehabilitated)

- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

SOUTH32

Illawarra Metallurgical Coal

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

IMC GIS 2023 079

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

296500 297000 297500

6217500 6217000 6216500 6216000 6215500

ARR Plan1B - M - Current landform contours

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400
Metres

Current Landform Contours (Submission ID = 5373)
Project Approval Boundary (Submission ID = 5369)
Coal - Current Title

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 13 - Mine Subsidence Impacts

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 080

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

296000 296500 297000 297500 298000 298500

6218000
6217500
6217000
6216500
6216000
6215500
6215000

FC Plan 2B - B - Mining and Rehabilitation – Year 2

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400 600
Metres

Forecast Data Year2 (Submission ID = 5377)
Forecast Disturbance
Forecast Land Prepared for Rehabilitation

Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 13 - Mine Subsidence Impacts

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 090

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

296000 296500 297000 297500 298000 298500

6218000 6217500 6217000 6216500 6216000 6215500 6215000

FC Plan 2C - B - Mining and Rehabilitation – Year 3

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400 600
Metres

Forecast Data Year3 (Submission ID = 5378)
Forecast Disturbance
Forecast Land Prepared for Rehabilitation

Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 13 - Mine Subsidence Impacts

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 091

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

296500 297000 297500

6217500 6217000 6216500 6216000 6215500

FLRP Plan 1M - Final Landform Features

13/06/2022

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400
Metres

Project Approval Boundary (Submission ID = 5369)
Coal - Current Title
Final Landform Features (Submission ID = 5374)

Final Landuse Domain (Submission ID =5368)

Native Ecosystem

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 13 - Mine Subsidence Impacts

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 047

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

296500 297000 297500

6217500 6217000 6216500 6216000 6215500

FLRP Plan 2M - Final Landform Contours

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 100 200 400
Metres

Final Landform Contours (Submission ID = 5375)
Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 13 - Mine Subsidence Impacts

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 048

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

290500

ARR Plan 1A - N - Current status of mining and rehabilitation

Bulli Seam Operations
Domain 14 - Douglas North Substation

30/06/2023
Prepared by: B Moylan

GDA 94 MGA Zone 56
Aerial photography May 2023

0 10 20 40 60
Metres

Mining Domain Type (Submission ID = 5379)
- Infrastructure Area
- Overburden Emplacement Area
- Underground Mining Area (SMP)
- Water Management Area

Rehabilitation Phase (Submission ID = 5404)
- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development
- Relinquishment (Rehabilitated)

- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 081

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

290500

ARR Plan1B - N - Current landform contours

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 10 20 40 60
Metres

Current Landform Contours (Submission ID = 5373)
Project Approval Boundary (Submission ID = 5369)
Coal - Current Title

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 14 - Douglas North Substation

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 081

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

290500

Agricultural - Grazing

FLRP Plan 1N - Final Landform Features

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 10 20 40 60
Metres

Project Approval Boundary (Submission ID = 5369)
Coal - Current Title
Final Landform Features (Submission ID = 5374)

Final Landuse Domain (Submission ID =5368)

Agricultural – Grazing

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 14 - Douglas North Substation

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 049

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

290500

FLRP Plan 2N - Final Landform Contours

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 10 20 40 60
Metres

Final Landform Contours (Submission ID = 5375)
Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

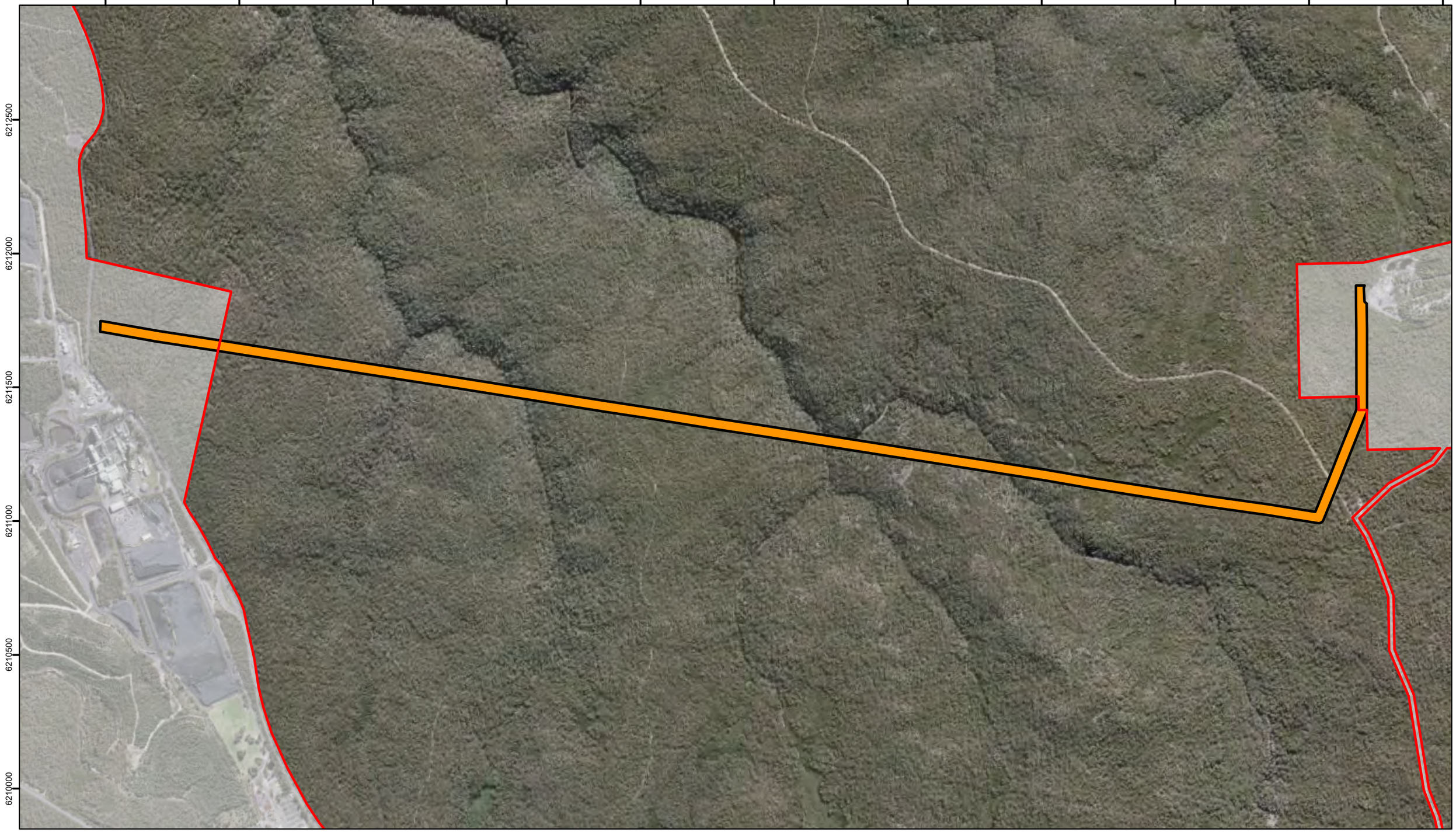
Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 14 - Douglas North Substation

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 050

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx



ARR Plan 1A - O - Current status of mining and rehabilitation

Bulli Seam Operations
Domain 15 - Powerlines and Cables between WCCPP and North Cliff

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

Mining Domain Type (Submission ID = 5379)
- Infrastructure Area
- Overburden Emplacement Area
- Underground Mining Area (SMP)
- Water Management Area

Rehabilitation Phase (Submission ID = 5404)
- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development
- Relinquishment (Rehabilitated)

- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

0 250 500 1,000 1,500
Metres

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 082

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

299500 300000 300500 301000 301500 302000 302500 303000 303500 304000 304500

6212500
6212000
6211500
6211000
6210500
6210000

ARR Plan1B - O - Current landform contours

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

Current Landform Contours (Submission ID = 5373)
Project Approval Boundary (Submission ID = 5369)
Coal - Current Title

0 250 500 1,000 1,500
Metres

Bulli Seam Operations

Domain 15 - Powerlines and Cables between WCCPP and North Cliff

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 084

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

299500 300000 300500 301000 301500 302000 302500 303000 303500 304000 304500

6212500 6212000 6211500 6211000 6210500 6210000

FLRP Plan 1O - Final Landform Features

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2023

- Project Approval Boundary (Submission ID = 5369)
- Coal - Current Title
- Final Landform Features (Submission ID = 5374)

Final Landuse Domain (Submission ID =5368)

- Native Ecosystem

0 250 500 1,000 1,500
Metres

Bulli Seam Operations

Domain 15 - Powerlines and Cables between WCCPP and North Cliff

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 051

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

299500 300000 300500 301000 301500 302000 302500 303000 303500 304000 304500

6212500 6212000 6211500 6211000 6210500 6210000

FLRP Plan 2O - Final Landform Contours

30/06/2023
Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

N

Final Landform Contours (Submission ID = 5375)
Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

0 250 500 1,000 1,500
Metres

Bulli Seam Operations

Domain 15 - Powerlines and Cables between WCCPP and North Cliff

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 052

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

290500

6219500

6219000

ARR Plan 1A - P - Current status of mining and rehabilitation

Bulli Seam Operations

Domain 16 - Appin No.7 and 8 Ventilation Shafts

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 25 50 100 150
Metres

Mining Domain Type (Submission ID = 5379)
- Infrastructure Area
- Overburden Emplacement Area
- Underground Mining Area (SMP)
- Water Management Area

Rehabilitation Phase (Submission ID = 5404)
- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment
- Ecosystem and Land Use Development
- Relinquishment (Rehabilitated)

- Coal - Current Title
- Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 085

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

290500

6219500

6219000

ARR Plan1B - P - Current landform contours

Bulli Seam Operations

Domain 16 - Appin No.7 and 8 Ventilation Shafts

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 25 50 100 150
Metres

Current Landform Contours (Submission ID = 5373)
Project Approval Boundary (Submission ID = 5369)
Coal - Current Title

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 086

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

290000

290500

6219500

6219000

FC Plan 2A - C - Mining and Rehabilitation – Year 1

30/06/2023

Prepared by: B Moylan
GDA 94 MGA Zone 56
Aerial photography May 2022

0 25 50 100 150 200 250
Metres

Forecast Data Year1 (Submission ID = 5376)
Forecast Disturbance
Forecast Land Prepared for Rehabilitation

Coal - Current Title
Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

Bulli Seam Operations
Domain 16 - Appin No.7 and 8 Ventilation Shafts

SOUTH32
Illawarra Metallurgical Coal

IMC GIS 2023 092

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_forecast.aprx

290500

6219500

Agricultural - Grazing

6219000

FLRP Plan 1P - Final Landform Features

Bulli Seam Operations

Domain 16 - Appin No.7 and 8 Ventilation Shafts

30/06/2023

Prepared by: B Moylan

GDA 94 MGA Zone 56

Aerial photography May 2022

0 25 50 100 150

Metres

Project Approval Boundary (Submission ID = 5369)

Coal - Current Title

Final Landform Features (Submission ID = 5374)

Final Landuse Domain (Submission ID =5368)

Agricultural – Grazing

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32

Illawarra Metallurgical Coal

IMC GIS 2023 053

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx

290500

6219500

6219000

FLRP Plan 2P - Final Landform Contours

Bulli Seam Operations

Domain 16 - Appin No.7 and 8 Ventilation Shafts

30/06/2023

Prepared by: B Moylan

GDA 94 MGA Zone 56

Aerial photography May 2022

0 25 50 100 150

Metres

Final Landform Contours (Submission ID = 5375)

Coal - Current Title

Project Approval Boundary (Submission ID = 5369)

Note - Project Approval Boundary may not appear on this map if it is outside the extent shown

SOUTH32

Illawarra Metallurgical Coal

IMC GIS 2023 054

Document Path: P:\GIS\Workspace\HSE\Rehabilitation_data-DRG\APRXs\2023\APPIN_plans.aprx