



Centennial Coal



Mining Operations Plan **Amendment A**

Airly Mine

1 January 2018 to 31 December
2024

Airly Mine	
Mining Operations Plan	
Name of Mine	Airly Mine
MOP Commencement Date	1 January 2018
MOP Completion Date	31 December 2024
Mining Authorisations (Lease / Licence No.)	ML 1331, AUTH 232
Name of Authorisation holder(s)	Centennial Airly Pty Limited
Name of Mine Operator (if different)	Centennial Airly Pty Limited
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Title	Mine Manager
Signature	
Date	<u>3/3/2020</u>
Version	Amendment A

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1 Introduction

Airly Mine (Airly/the Mine) is an underground mine located in the Western Coalfields, within the Sydney Basin, approximately 40 kilometers (km) north-northwest of Lithgow and approximately 171 km northwest of Sydney in New South Wales (NSW). The regional locality of Airly is shown on **Figure 1**.

Centennial Airly Pty Limited (Centennial Airly) is the operator of Airly and is a wholly owned subsidiary of Centennial Coal Company Pty Limited (Centennial Coal). Centennial Coal was purchased by Banpu Public Company Limited (Banpu) in October 2010.

This Mining Operations Plan (MOP) outlines the proposed operations at the Airly Mine as approved by Development Consent SSD-5581 under the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act). The area covered by the operations at the Airly Mine is hereafter referred to as the MOP Area.

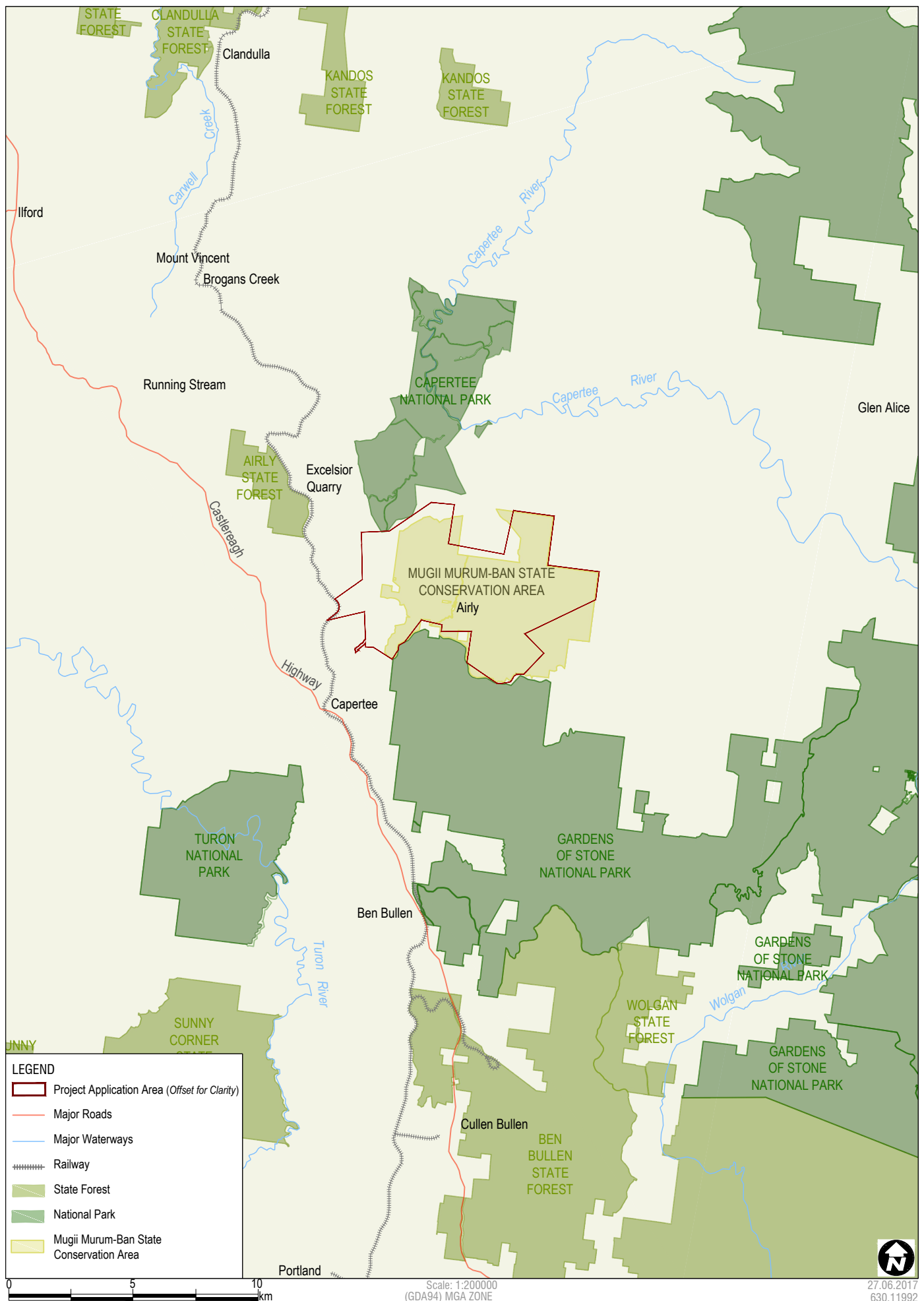
This MOP has been prepared in accordance with the Department of Industry – Division of Resources and Energy (DRE) publication titled *ESG3: Mining Operations Plan (MOP) Guidelines* (DRE, 2013). This MOP has also been prepared to satisfy the requirements of a Rehabilitation Management Plan (required by Schedule 4, Condition ~~29~~ 27 of Development Consent SSD-5581 MOD 2).

The MOP has been prepared for the seven year period from 1 January 2018 to 31 December 2024, herein referred to as the MOP Term.

This document was submitted to Secretary and DRE for approval on 28 July 2017 to satisfy the requirements of a Rehabilitation Management Plan in accordance with Development Consent SSD-5581.

This MOP Amendment A has been prepared to incorporate the importation of water from Centennial's Charbon Colliery by rail as per Modification 2 to Development Consent SSD-5581 (MOD 2). Additionally, MOP Amendment A has been prepared to include the construction and operation of a 2 Mega Watt (MW) solar photovoltaic (PV) system (solar farm) and ancillary infrastructure as approved by DA033/19.

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REGIONAL LOCALITY

FIGURE 1

1.1 History of Operations

Airly was granted development consent DA 162/91 on 14 April 1993 pursuant to Section 101 of the EP&A Act. DA 162/91 allowed for the extraction of 1.8 million tonnes per annum (Mtpa) of run of mine (ROM) coal within Mining Lease (ML) 1331 (**Figure 2**)

Following delays associated with a new State Significant Development (SSD) application for the Airly Mine Extension Project, time extensions were sought and granted for continued mining under the DA162/91; MOD4 approved mining to 30 April 2016, MOD5 to 31 October 2016 and MOD6 to 31 January 2017.

On 15 December 2016, Development Consent SSD-5581 for the Airly Mine Extension Project was approved by the Planning Assessment Commission (PAC) (under delegation from the Minister of Planning) pursuant to Part 4 of the EP&A Act. This consent replaces Development Consent DA 162/91 which will be surrendered by 31 January 2018 (in accordance with Schedule 2, Condition 10 of SSD-5581). Development Consent SSD-5581 allows for the continued underground mining operations at existing production rates until 31 January 2038. Mining is undertaken using low impact bord and pillar mining techniques to extract coal from the Lithgow Seam. Coal is supplied to both domestic and international markets by rail.

Development Consent SSD-5581 also approves exploration drilling activities within the bounds of Authorisation (AUTH) 232 (refer **Figure 2**). Exploration is undertaken to obtain specific geological information regarding coal seam quality and thickness, through logging and testing of cores and boreholes. Information is used for the ongoing refinement of Airly's existing geological model allowing for detailed mine planning. Following the drilling of exploration bores, the bores may also be used to install piezometers in the aquifers of interest for ongoing groundwater monitoring.

SSD-5581 MOD 2 allows for the importation of up to 170 ML/year of water from Charbon Colliery using rail via the Wallerawang – Gwabegar Rail Line. This includes minor amendments to the existing water management infrastructure at Airly.

The modification elements are as follows:

- upgrades to existing water pumping facilities to allow for importation of water via train;
- enlargement of the existing Train Loader Dam to increase water storage; and
- importation of up to 170 ML/year by rail from Charbon Colliery to Airly Mine.

The modification addresses the significant shortfall of water at Airly at the approved level, which has an ongoing water shortage, sufficient to limit its long-term mining potential. The volume of 170 ML/year corresponds to the process water deficit identified in the Airly Mine site water balance in a dry year for all activities approved under SSD 5581. The average water deficit at Airly is forecast at 64 ML/year while no deficit is forecast for a wet year. The transfer of water from Charbon Colliery to Airly Mine occurs on an as needs basis, to ensure imported water does not increase the likelihood of discharges to Airly Creek. Charbon Colliery has a licenced surplus which is not required for site management or rehabilitation and allows Airly to operate at full capacity as a result of the water transfer.

The modification has little effect on key consented activities at Airly, and as listed below it does not:

- increase the approved life of Airly Mine;
- change the rehabilitation process, which will continue in accordance with this MOP;
- change the approved hours of operations; or
- significantly change the onsite water management.

Charbon Colliery concurrently modified its consent PA 08_0211 and has prepared a separate MOP Amendment to permit transfer of up to 170 ML/year of water to Airly by rail.

DA033/19 allows for the construction of a solar farm development and ancillary infrastructure within the approved Reject Emplacement Area (REA) disturbance area.

The project includes:

- Installation of an access road with underground services;
- 4 m wide access road consisting of 300 mm compacted road base with swale drainage and culverts;
- Underground 11 kV and fibre optic cables and conduit;
- Installation of the solar array;
- Installation of underground cables;
- Installation of ancillary infrastructure;
- Connection of the solar farm to the existing Airly Sub 1 Substation 11kv Distribution Board; and
- Testing and commissioning.

The solar farm will generate power to be primarily used by the Airly Mine with any excess being fed to the grid. Additionally, the solar farm will contribute towards Centennial's commitment to sustainability and reduce the Airly Mine carbon footprint. It is anticipated that the solar farm will reduce Airly Mine's demand on grid electricity by approximately 25 percent.

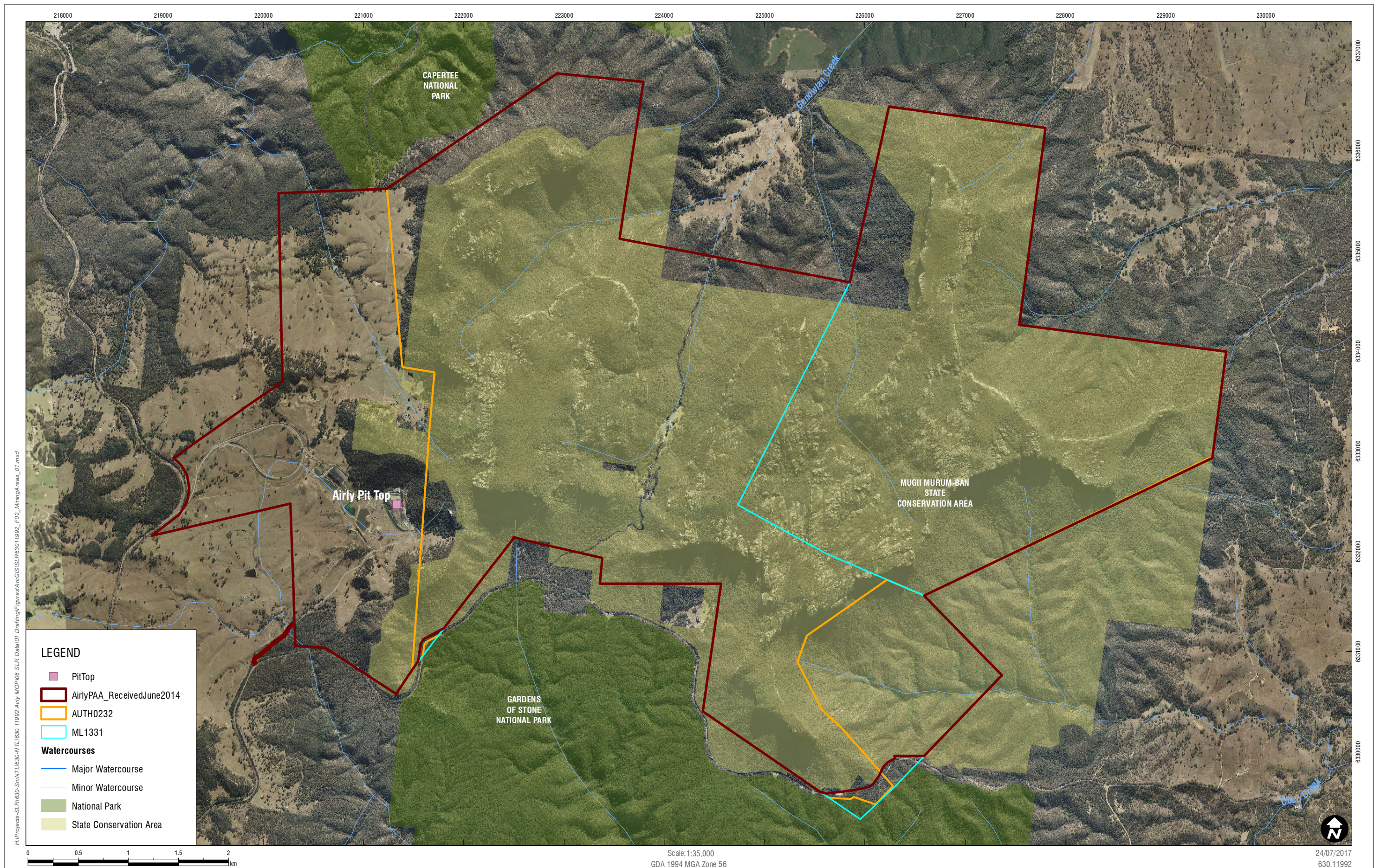
The solar farm will be constructed within the existing disturbance footprint and will not result in increased biodiversity or visual impacts. All potential negative impacts will be managed.

Operations at Airly Mine have been undertaken in accordance with the MOPs outlined in **Table 1**. This document replaces the fourth extension to the Airly Mine MOP 2014 to 2016 which was approved on 24 February 2017.

Table 1 – MOP History

MOP Name	Amendment	Status	Approval Date	Expiry Date	Comment
Mining Operations Plan 2014-2016	Extension 4	Current	24/02/2017	31/12/2017	Covers activities at Airly Mine during operations.
	Extension 3	Superseded	28/10/2016	28/02/2017	
	Extension 2	Superseded	20/04/2016	31/10/2016	
	Extension 1	Superseded	15/01/2016	30/04/2016	
	Original MOP	Superseded	14/03/2014	1/03/2016	
Care and Maintenance MOP	Original MOP	Superseded	29/08/2013	30/06/2020	Covered activities at Airly when the site was under care and maintenance.
Mining Operations Plan 2010-2012	Amendment	Superseded	26/11/2012	31/08/2013	Covered activities at Airly Mine during operations.
	Extension	Superseded	18/01/2012	30/06/2013	
	Original MOP	Superseded	30/07/2010	30/06/2012	
Mining Operations Plan 2018-2024	Original MOP	Current	01/01/2018	31/12/2024	Covers activities at Airly Mine during operations.

This MOP Amendment A will replace the original MOP 2018-2024.



1.2 Current Consents, Authorisations and Licences

1.2.1 State Significant Development

Airly Mine is State Significant Development (SSD) in accordance with Clause 8 and Schedule 1 (Item 5) of State Environmental Planning Policy (State and Regional Development) 2011, subsequently it is considered to be a Level 1 Mine as specified in *ESG3: Mining Operations Plan (MOP) Guidelines* (DRE 2013).

1.2.2 Development Consent

On 15 December 2016, Development Consent SSD-5581 for the Airly Mine Extension Project was approved by the Planning Assessment Commission (PAC) (under delegation from the Minister of Planning) pursuant to Part 4 of the EP&A Act. This consent replaces Development Consent DA 162/91 which will be surrendered by 31 January 2018 (in accordance with Schedule 2, Condition 10 of SSD-5581). A copy of SSD-5581 (as modified) has been attached as **Appendix 1**.

In brief SSD-5581 approves the following activities:

- Continued operation of all previously approved activities, facilities and infrastructure of Airly Mine;
- Continued extraction of up to 1.8 Mtpa of ROM coal from the Lithgow seam underlying the Project Application Area using underground mining techniques;
- Extension of the life of mine (LOM) by 20 years from the date of commencement of operations under the Consent¹;
- Continued extraction of coal using partial extraction methods within the ML1331, and extend the mining area to the east of the existing workings into the A232 area;
- Construction of a new coal preparation plant, coal stockpile and reject emplacement area; and
- Upgrades and modifications to other existing infrastructure where necessary.

A detailed project description is provided in **Section 2.1**.

In April 2019, Airly submitted an application to the DPE for SSD-5581 (MOD 2) for receipt of up to 170 ML of water per year from Charbon via the Wallerawang – Gwabegar Rail Line. MOD 2 was approved on 30 July 2019.

In February 2019 Airly submitted *Proposed Airly Solar Farm – Statement of Environmental Effects* (SEE) to Lithgow City Council (LCC) for the approval of a 2 MW solar farm to be installed within the approved REA footprint. LCC approved the solar farm on 31 May 2019 and issued DA033/19.

Additional detail pertaining to Airly Mine Development Consents has been provided in **Table 2**.

Table 2 – Development Consents

Development Consent	Details	Date of Issue	Expiry
SSD-5581	Airly Mine Extension Project	15 December 2016	31 January 2038
SSD-5581	MOD 1 - Airly Mine Extension Project	30 August 2018	31 January 2038

¹ Under the consent Airly is required to rehabilitate the site and perform additional undertakings to the satisfaction of the Secretary and the DRE. Therefore the consent continues to apply in all respects other than the right to conduct mining operations until the rehabilitation of the site and the additional undertakings have been carried out satisfactorily.

Development Consent	Details	Date of Issue	Expiry
SSD-5581	MOD 2 - Airly Mine Extension Project	30 July 2019	31 January 2038
DA 162/91	Underground mine development to extract 1.8 million tonnes per annum	14 April 1993	12 October 2014
	MOD 1 - Temporary coal transport by road for trial mine	20 October 1999	12 October 2014
	MOD 2 - Construction of a 66kV Powerline and Associated Infrastructure	21 August 2009	12 October 2014
	MOD 3 - Extension of operations until 31 October 2015	9 October 2014	31 October 2015
	MOD 4 - Extension of operations until 30 April 2016	28 August 2015	30 April 2016
	MOD 5 - Extension of operations until 31 October 2016	17 March 2016	31 October 2016
	MOD 6 - Extension of operations until 31 January 2017	29 September 2016	31 January 2017
DA 033/19	Construction and operation of a 2MW solar farm	31 May 2019	-

1.2.3 EPBC Approval

Airly Mine was granted Federal approval under the *Commonwealth Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) by the Department of Environment and Energy (DEE) on 18 May 2017. EPBC Approval 2013-7076 approves the expansion of underground mining operations at the existing Airly Mine until 31 March 2047.

1.2.4 Mining and Exploration Authorities

Airly Mine currently undertakes mining in accordance with ML 1331. Exploration activities are undertaken in accordance with AUTH 232. These authorities are shown on **Figure 2** and detailed in **Table 3**.

Table 3 – Summary of Mining Authorities, Agreements and Licences

Name	Description	Issued by	Grant Date	Expiry Date
Mining Lease 1331	Mining lease area of approximately 2,745 hectares	Dept. Industry Resources and Energy	8/5/2014	20/10/2035
Authorisation (AUTH) 232	Exploration area of approximately 3,054 hectares	Dept. Industry Resources and Energy	21/5/2015	20/10/2019*
Mining Lease Application (MLA) 559	Mining lease area of approximately 1,252 hectares	NA	NA	NA

* Renewal being sought

~~During the MOP Term, Centennial Airly will submit a Mining Lease Application (MLA) for the areas to the east of ML 1331.~~

1.2.5 Environmental Protection Licence

Airly Mine is a premises-based activity under Schedule 1 of the *Protection of the Environment Operations Act 1997* (POEO Act). On this basis, the occupier of the premises must hold an Environmental Protection Licence (EPL) administered by the Environment Protection Authority (EPA) under Section 43(b) of the POEO Act.

Airly currently operates under EPL 12374, issued under the POEO Act.

EPL 12374 was issued on 12 December 2005 and is renewed annually. A summary of variations to EPL 12374 is contained in **Table 4**.

Table 4 Summary of EPL 12374 Variations

Notice Number	Variation Date	Description of Variation
1103175	18 August 2009	- Deletion of L5.1 – condition regarding the generation, receipt, treatment, reprocessing and disposal of waste. - Changes to pollutants monitored at Point 1.
1502722	19 December 2011	- Inclusion of a Pollution Reduction Program - Changes to format of the licence.
1508458	31 August 2012	- Correction of the postal address for Licensee; - Increasing the Fee Based activity scale to >500,000 - 2,000,000; - The addition of discharge/monitoring points 7 and 8 and associated monitoring and limit conditions; - The modification of the upper pH limit to 9.0 for points 1, 7 and 8; - The modification of volume monitoring requirements at discharge point 1; and - The removal of condition O4.1 (irrigation of effluent).
1513730	27 May 2014	- The insertion of condition L2.5 (exclusions to discharges when rainfall exceeds a certain level. - The insertion of conditions O4.1, O4.2 and O4.3 (discharges, desilting following rainfall events and general desilting of sediment basins.
1530630	14 August 2018	- Amends P1.3 to update description of Points 1, 7, 8; - Amends L2.4 to apply additional pollutant concentration limits to Point 1.

1.2.6 Extraction Plan Approvals

Underground mining at Airly Mine is undertaken in accordance with an approved Extraction Plan which was prepared to satisfy the requirements of relevant mining authorities and development consents. Details pertaining to the Extraction Plan approvals at Airly Mine have been provided in **Table 4**.

Table 5 – Extraction Plan Approvals

Approval	Description	Issued	Expiry Date	Status
Mt Airly Panel & Pillar Mining Zone Extraction Plan	Required to meet the requirements of Condition 7 of Schedule 3 of development consent SSD_5581. The extraction plan describes the regulatory framework, mine planning, management and monitoring measures to be implemented to ensure the protection of all surface/subsurface natural and built features and the protection of public safety from subsidence associated with secondary extraction via panel and pillar mining within the EP Area.	19/04/2019	No expiry date	Active
Cliff Line Zone of First Workings Extraction Plan (ML1331)	Required for first workings and prepared for the Cliff Line Zone and Zone of First Workings (CLZ) as defined in SSD_5581.	16/10/2017	No expiry date	Active
Splitting & Quartering Extraction Plan	Airly Mine Splitting and Quartering Extraction Plan for 206-207 Panel was approved, in line with Modification 1 of SSD_5581.	30/8/2018	When 207 and 206 extraction is complete	Active

Approval	Description	Issued	Expiry Date	Status
MOD 3 Extraction Plan Variation Approval	Variation to MOD 3 Extraction Plan to include a minor variation to the management area resulting from an extension to DA 162/91	DPE 6/9/2016	No expiry date	Active
MOD 3 Extraction Plan Approval	Extraction Plan including all approved mining areas covered by MOD3 of DA 162/91.	28/7/2015	No expiry date	Superseded

In accordance with the requirements of SSD-5581, an Extraction Plan is currently being prepared to incorporate additional approved mining operations.

1.2.7 Water Licences

Centennial Airly currently holds six licences for groundwater monitoring bores issued under Section 115 of the *Water Act 1912* for the purposes of monitoring groundwater levels in the Airly Mine lease area. Airly also holds two groundwater extraction licences.

A summary of water licences relevant to Airly operation are outlined in **Table 5**.

Airly will continue to liaise with the Department of Primary Industries – Water (DPI Water) with regard to the site's future licensing requirements.

Table 6 – Water Licences

Licence	Purpose	Bore(s)	Date of Issue	Expiry
WAL 24386	Groundwater extraction	N/A	1/9/2014	Perpetuity
WAL 36565	Groundwater extraction	N/A	11/2014	Perpetuity
10BL604518	Monitoring	ARP01	14/2/2011	Perpetuity
10BL604520	Monitoring	ARP02a ARP03A	14/2/2011	Perpetuity
10BL604521	Monitoring	ARP04 ARP05	14/2/2011	Perpetuity
10BL605352	Monitoring	ARP06 ARP07 ARP08 ARP09	28/3/2013	Perpetuity
10BL605794	Monitoring	ARP11	19/08/2016	Perpetuity
10BL605793	Monitoring	ARP12 ARP13 ARP13SP ARP14 ARP15 ARP15SP	17/08/2016	Perpetuity

1.2.8 Access Arrangements

The Mugii-Murum-ban State Conservation Area (SCA) is located above the majority of the Airly underground workings (refer **Figure 2**). The SCA is owned and managed by National Parks and Wildlife Service NSW (NPWS).

Under Clause 140 of the *Mining Act 1992*, the holder of a prospecting title must not carry out prospecting operations except in accordance with an access arrangement to be agreed in writing

between the title holder and each landholder. Access arrangements agreed in writing are obtained by Centennial Airly prior to the commencement of any exploration activities and/or groundwater monitoring activities within the Mugii-Murum-ban SCA.

1.3 MOP/Rehabilitation Management Plan Requirements

Development Consent SSD-5581 contains conditions relevant to the preparation of a Rehabilitation Management Plan. On 13 February 2017, DPE granted approval for the consolidation of Rehabilitation Management Plan into the MOP required by the conditions of ML 1331. A copy of this approval letter is attached as **Appendix 2**.

Table 7 summarises the relevant conditions of SSD-5581 and ML 1331 with regard to the preparation of the MOP/Rehabilitation Management Plan along with where each condition has been addressed within this document. Detailed objectives and regulatory requirements relating to rehabilitation and post mining land use are outlined in **Section 4.3**.

Table 7 – Relevant Development Consent and Mining Tenement Requirements for the Preparation of a MOP / Rehabilitation Management Plan

Condition	Requirement	Section Addressed
SSD-5581 Schedule 4 Condition 29 27	Rehabilitation Management Plan Prior to carrying out any development under this consent, unless the Secretary agrees otherwise, the Applicant must prepare a Rehabilitation Management Plan for the development to the satisfaction of the DPE Resources Regulator . This plan must:	This document
	(a) Be prepared in consultation with the Department, DPI Water, OEH Council the Water Division, BCD and the CCC;	Section 1.5
	(b) Be prepared in accordance with any relevant DPE Resources Regulator guideline;	This document, Section 1.5
	(c) Include detailed performance and completion criteria for evaluating the performance of the rehabilitation of the site, and triggering remedial action (if required);	Section 6
	(d) Describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent, and address all aspects of rehabilitation including mine closure, final landform and final land use;	Section 8
	(e) Include the design and implementation of a Closure Groundwater Monitoring and Management Plan, which: - Assists in restoring natural groundwater flow to pre-mining conditions to the maximum extent possible; - Includes the implementation of appropriate mitigation strategies to reduce adverse groundwater impacts to seeps, springs and flows in terms of acidity, salinity or location; - Involves the removal of all non-natural material from within the mine not required for groundwater monitoring of subsidence management and describe measures that would be implemented to prevent polluting materials from entering the mine so as to not affect groundwater quality;	Section 3.3.12 and Section 4.3 To be addressed as a separate document and prepared during the MOP term.
	(f) Include interim rehabilitation where necessary to minimise the area exposed for dust generation;	Section 3
	(g) Include a program to monitor, independently audit and report of the effectiveness of the rehabilitation measures and progress against the detailed performance and completion criteria; and	Section 8
	(h) Build to the maximum extent practicable on the other management plans required under this consent.	This document
	The Applicant must implement the approved Rehabilitation Management Plan for the development.	Noted

Condition	Requirement	Section Addressed
	<i>Note: The Biodiversity Management Plan and Rehabilitation Management Plan require substantial integration to achieve biodiversity objectives for the rehabilitated mine site.</i>	Noted
ML 1331 Condition 3	Mining Operations Plan and Annual Rehabilitation Report (a) The lease holder must comply with an approved Mining Operations Plan (MOP) in carrying out any significant surface disturbing activities, including mining operations, mining purposes and prospecting. The lease holder must apply to the Minister for approval of a MOP. An approved MOP must be in place prior to commencing any significant surface disturbing activities, including mining operations, mining purposes and prospecting.	This document
	(b) The MOP must identify the post mining land use and set out a detailed rehabilitation strategy which: (ii) identifies areas that will be disturbed; (iii) details the staging of specific mining operations, mining purposes and prospecting; (iv) identifies how the mine will be managed and rehabilitated to achieve the post mining land use; (v) identifies how mining operations, mining purposes and prospecting will be carried out in order to prevent and or minimise harm to the environment; and (vi) reflects the conditions of approval under: • the <i>Environmental Planning and Assessment Act 1979</i> ; • the <i>Protection of the Environment Operations Act 1997</i> ; and • any other approvals relevant to the development including the conditions of this mining lease.	Section 2.2 Section 2.2 This document Section 3.3 Section 1.2
	(c) The MOP must be prepared in accordance with the <i>ESG3: Mining Operations Plan (MOP) Guidelines September 2013</i> published on the Department's website at www.resources.nsw.gov.au/environment	This document
	(d) The lease holder may apply to the Minister to amend an approved MOP at any time.	Noted
	(e) It is not a breach of this condition if: (i) the operations which, but for this condition 3(e) would be a breach of condition 3(a), were necessary to comply with a lawful order or direction given under the <i>Environmental Planning and Assessment Act 1979</i> , the <i>Protection of the Environment Operations Act 1997</i> , the <i>Mine Health and Safety Act 2004 / Coal Mine Health and Safety Act 2002</i> and <i>Mine Health and Safety Regulation 2007 / Coal Mine Health and Safety Regulation 2006</i> or the <i>Work Health and Safety Act 2011</i> ; and (ii) the Minister had been notified in writing of the terms of the order or direction prior to the operations constituting the breach being carried out.	Noted
	(f) The lease holder must prepare a Rehabilitation Report to the satisfaction of the Minister. The report must: (i) provide a detailed review of the progress of rehabilitation against the performance measures and criteria established in the approved MOP; (ii) be submitted annually on the grant anniversary date (or at such other times as agreed by the Minister); and (iii) be prepared in accordance with any relevant annual reporting guidelines published on the Department's website at www.resources.nsw.gov.au/environment <i>Note: The Rehabilitation Report replaces the Annual Environmental Management Report.</i>	Section 10 The Rehabilitation Report is addressed in the Annual Review.

1.4 Land Ownership and Land Use

The MOP Area covers 3,982 hectares (ha) of land within the Lithgow Local Government Area (LGA).

The Gardens of Stone National Park and Ben Bullen State Forest lie almost immediately to the south of the MOP Area, whilst the Wollemi National Park is approximately 35 km to the east. The Gardens

of Stone Nation Park is part of the Greater Blue Mountains World Heritage Area. The Capertee National Park lies immediately to the north of the MOP Area.

Approximately 3,090 ha or 78% of the MOP Area is located within the Mugii Murum-ban SCA. The Mugii Murum-ban SCA covers an area of 3,650 ha. It has significant natural and cultural heritage values as well as significant mineral resources. As an SCA, Mugii Murum-ban is reserved to protect environmental and heritage values whilst permitting mining and exploration activities. The Mugii Murum-ban SCA is characterised by two mesas (Mount Airly and Genowlan Mountain), pagodas, cliffs and dissected sandstone gorges.

Plan 1B and **Plan 1C** show the pre-mining natural and built environments, respectively.

1.4.1 Land Ownership

Land ownership within and surrounding the MOP Area comprises Crown Land, land owned by Centennial Coal, privately owned freehold, and land owned and managed by NPWS.

Most of the land within the MOP Area is owned by NPWS with the majority of the remainder owned by Centennial Airly. There are two freehold private properties within the MOP Area, one being located on the southern boundary, the second being a parcel of freehold land located in Airly Gap.

Land ownership is shown on **Figure 3**.

1.4.2 Current and Historic Land Use

Current land uses within the MOP Area are:

- The current mining operation;
- Grazing on non-operational Centennial owned lands within ML 1331; and
- Recreational and conservation activities within the Mugii Murum-ban SCA.

Surrounding land uses include residential in the village of Capertee, rural residential, agriculture (predominantly cattle grazing) and unpopulated forested areas. A limestone quarry is located approximately 5 km north west of the Airly Mine pit top.

Historical land uses in the vicinity of the Airly Mine include a significant shale and coal mining industry as well as gold and diamond mining.

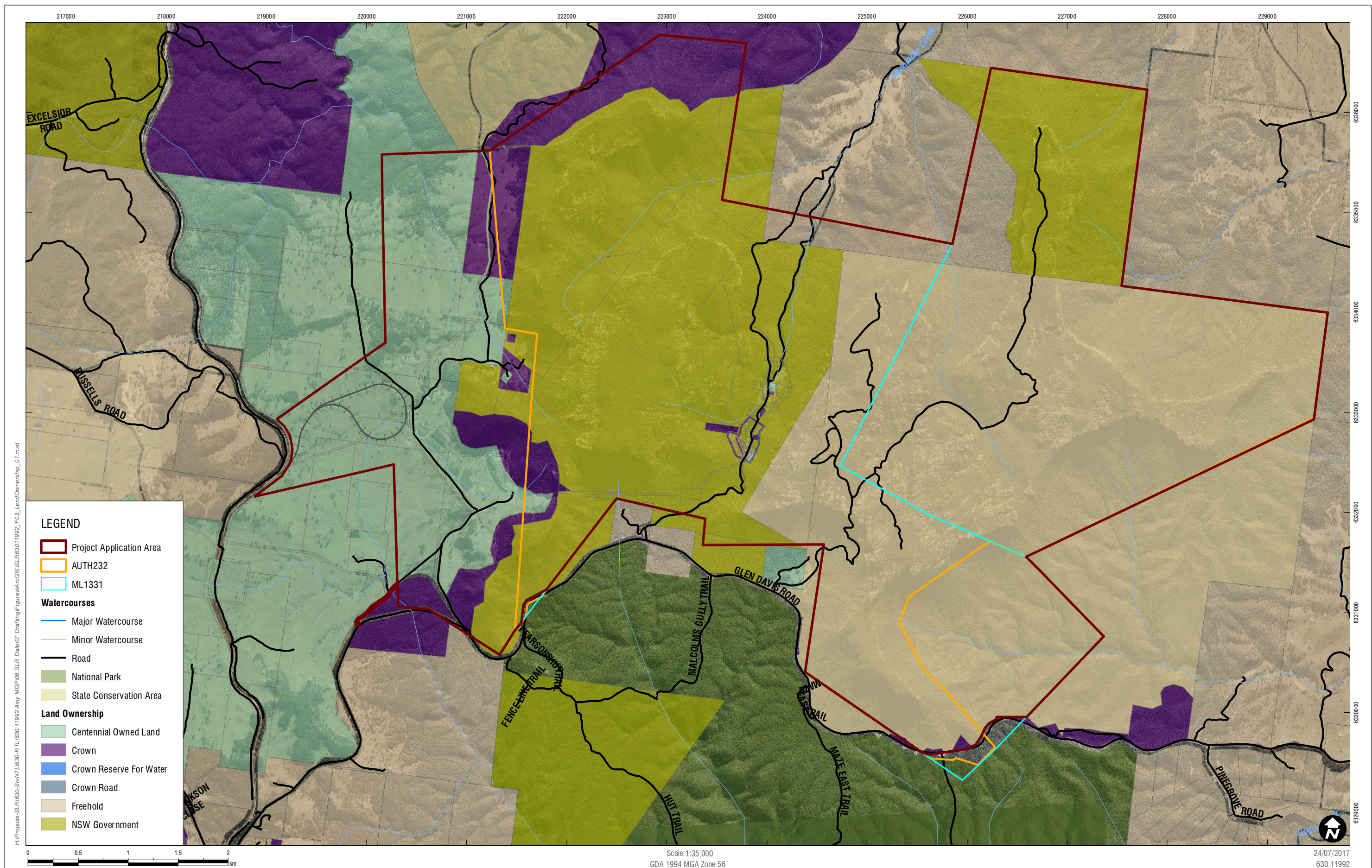
1.4.3 Future Land Use

The proposed post-mining land use is described in **Section 4.2** and is intended to be commensurate with the surrounding area. This will include areas of native forest vegetation as well as areas of pasture commensurate with pre-mining land use. Water management structures will be retained in the final landform to preserve downstream water quality, provide water storages for agricultural use and provide stock watering resources.

1.5 Stakeholder Consultation

1.5.1 Community Consultation

The Airly Community Information and Complaints Line (02 6359 2100) is available on the Centennial Coal website. All complaints are maintained in a register and reported internally to the Environment and Community Coordinator for appropriate action. Any complaints will be reported externally in the Annual Review.



In accordance with the requirements of Schedule 6, Condition 8 of SSD-5581, a Community Consultation Committee (CCC) has been established to provide a forum whereby the community can communicate with the Centennial Airly and be kept up to date with the progress of the mine.

The CCC has representatives from the NPWS, ~~Lithgow City Council (LCC)~~, Capertee Valley Alliance and community representatives. The CCC is operated in accordance with the *Guidelines for Establishing and Operating Community Consultative Committees for Mining Developments* (Department of Planning 2007) and typically meets three times per year.

Following approval, this MOP will be made publicly available on the Centennial website.

1.5.2 Statutory Authorities

To satisfy the requirements of Schedule 4, Condition 29 of SSD-5581 this document was submitted for consultation with the DPE, DPI Water, OEH, LCC and the CCC on 27 July 2017. As agreed with the DPE this document was submitted to the DRE and the Secretary of the DPE for approval prior to 31 July 2017 to satisfy the requirements of a Rehabilitation Management Plan (refer **Appendix 2**). Responses were received from OEH and DPI-Water on 18 August 2017 and 13 September 2017 respectively. No feedback or comments were made requiring changes to this document. No response has been received from any other statutory authority.

The SEE for SSD-5581 Mod 2 was exhibited from 1 May to 14 May 2019. Comments from the DPE and other government agencies were addressed in the Response to Submissions (RTS) submitted in June 2019.

As detailed in the SEE, EPA confirmed that Airly Mine's EPL 12374 will not require a variation to receive water from Charbon.

The LCC was notified in July 2018 of the approach of the solar farm outlined in *Proposed Airly Solar Farm – Statement of Environmental Effects (SEE)*.

The SEE was presented to the CCC in a meeting on 24 July 2018. No formal responses to the presentation were documented.

Airly regularly engages with various government and other agencies to report on its environmental performance. This is facilitated through a number of means including:

- LCC and NPWS representation on the CCC;
- Annual Review to the DPE and CCC;
- Liaison with the NSW EPA regarding EPL conditions;
- Provision of the Annual Review to DRE, DPE, EPA and other relevant Government agencies and stakeholders;
- Provision of the Annual Licence Return to EPA; and
- Provision of the National Pollution Inventory (NPI) to the Commonwealth Department of the Environment via OEH.

Consultation will continue to be undertaken with relevant stakeholders as required under relevant approval conditions and other regulatory requirements relevant to the mine.

1.5.3 Cultural Heritage

Centennial Airly works closely with local Aboriginal people through professional engagement and consultation on cultural heritage management. Consultation between Centennial and the Aboriginal community is undertaken in accordance with the approved *Aboriginal Cultural Heritage Management Plan for Centennial's Western Holdings* (ACHMP).

The Registered Aboriginal Parties for the Airly Mine are:

- Bathurst Local Aboriginal Land Council;
- Gundungurra Aboriginal Heritage Association Inc;
- Gundungurra Tribal Council Aboriginal Corporation;
- Mooka Traditional Owners;
- North-East Wiradjuri Company Ltd;
- Warrabinga Native Title Claimants Aboriginal Corporation;
- Wiradjuri Council of Elders;
- Wiray-dyuraa Ngambaay-dyil;
- Wiray-dyuraa Maying-gu;
- Warrabinga/Wiradjuri people; and
- Mingaan Aboriginal Corporation.

The ACHMP has been prepared to provide Centennial with a consistent approach to their consultation with the local Aboriginal communities regarding Aboriginal cultural heritage matters as well as identifying consistent minimum standards and processes for Aboriginal cultural heritage identification, monitoring and management across Centennials western operations.

The ACHMP also provides the framework for ongoing consultation and engagement with the Aboriginal community, which will be continued by Centennial Airly throughout the life of the Mine.

1.5.4 Stakeholder Expectations Regarding Post Mining Land Use

The *Airly Mine Extension Project Decommissioning and Rehabilitation Strategy* (SLR 2014) was prepared as a component of the *Airly Mine Extension Project EIS* (Golders 2014). Consultation with regard to post-mining land use was undertaken during the preparation of the Decommissioning and Rehabilitation Strategy and included:

- Meetings with individual landholders and stakeholders;
- Letters and community newsletters;
- Publications in local newspapers;
- Community information sessions and open days; and
- Providing information on the Centennial Coal website.

The post-mining land use and rehabilitation commitments outlined within this MOP are consistent with the Decommissioning and Rehabilitation Strategy.

2 Proposed Mining Activities

2.1 Project Description

The approval of SSD-5581 allows Airly Mine to continue underground coal mining operations within the Lithgow Seam at rates up to 1.8 Mtpa until 31 January 2038. In summary, Airly is approved to undertake the following activities during the MOP term:

- Continued operation and use of existing facilities and infrastructure of Airly Mine;
- Extract up to 1.8 Mtpa of ROM coal from the Lithgow seam underlying the Project Application Area using underground mining techniques;
- continue to extract coal using partial extraction methods within the ML1331, and extend the mining area to the east of the existing workings into the A232 area;
- develop underground access roadways from the current mining area to the east to allow access to the proposed mining areas;
- use various partial extraction mining methods that will manage subsidence not to exceed 125 mm in previously unmined areas and minimise further potential subsidence impacts in areas where the historical New Hartley Shale Mine has already impacted the environment;
- continue to operate and maintain the existing ancillary surface infrastructure for mine access, underground ventilation, electricity, water, materials supply, and communications at the pit top, and upgrade this infrastructure as required for mining operations;
- continue to handle ROM coal through a crushing and screening plant at the pit top for transfer to the existing and proposed stockpiles as required to meet market demands;
- complete the construction of the coal handling and preparation plant (CHPP) through construction of a Coal Preparation Plant (CPP) and associated overland conveyors, required for the beneficiation of ROM coal;
- use the existing and new overland conveyor systems for the transfer of ROM and product coal from the underground to the CPP and coal stockpiles prior to despatch to offsite locations;
- construct a life of mine reject emplacement area (REA) for the co-disposal of reject materials from the CPP;
- continue to use the existing water storage dams at the pit top to meet operational water demands;
- construct an appropriately sized new water management dam for the proposed life of mine REA;
- despatch ROM and product coal off site using the existing rail load out facilities for the export and domestic markets;
- continue exploration, predominantly borehole drilling, to further refine the existing geological model;
- operate 24 hours per day and seven days per week for 52 weeks per year;
- provide employment to a full time workforce of up to 135 full time employees and 20 contractors ;
- progressively rehabilitate exploration boreholes and disturbed areas at the pit top no longer required; and
- undertake life-of-mine rehabilitation at the pit top disturbance areas to create final landforms commensurate with the surrounding areas.

MOP Amendment A has been prepared to include the import of up to 170 ML/year from Charbon via the existing Wallerawang-Gwabegar rail line. The changes are wholly contained within the already disturbed areas.

MOP Amendment A has also been prepared include the construction and operation of the 2 MW solar farm and ancillary infrastructure. The changes are contained within the already disturbed areas of the approved REA footprint.

These changes include construction as described in **Section 2.2.2** and minor amendments to the existing infrastructure discussed in **Section 1.1**.

2.2 Activities over the MOP Term

2.2.1 Exploration

Surface exploration activities, predominately borehole drilling to refine the geological model, will continue to be undertaken to obtain specific geological information to assist with detailed mine planning. The exploration programme also allows the installation of piezometers in the aquifers of interest for ongoing groundwater monitoring.

During the MOP Term exploration activities will be located within AUTH 232, and will generally focus on future mining areas (refer **Figure 2**).

In accordance with the requirements of Schedule 4, Condition 26 of Development Consent SSD-5581 Centennial Airly has prepared an *Exploration Activities and Minor Surface Infrastructure Management Plan* (EAMSIMP) to outline measures that will be implemented to mitigate potential environmental impacts during the approved exploration and/or groundwater monitoring activities. All exploration activities within the Project Application Area will be undertaken in accordance with the EAMSIMP. This will include details of the process undertaken by Centennial Airly prior to commencement of exploration and/or groundwater monitoring activities, including due diligence assessment for ecology, Aboriginal heritage and noise (if required). Copies of due diligence assessments will be provided to the DRE, DPE and NPWS (where relevant).

Following the completion of drilling and associated activities, all exploration drill holes will be sealed in accordance with relevant DRE guidelines at the time. Completed and proposed exploration and/or groundwater monitoring activities will be reported in the Annual Review.

Following the completion of rehabilitation and prior to lease relinquishment by DRE, Airly will seek confirmation that the landowner is satisfied with the standard of rehabilitation activities. To achieve this, Airly will provide the landowner with a copy of the DRE (2012) form titled *Landowner/Occupier Rehabilitation Statement (ESB-F06)*. Completed forms will be forwarded to DRE as part of an Exploration Rehabilitation and Relinquishment Report.

2.2.2 Construction

At this stage the construction activities approved by SSD-5581 (including the REA and the CPP) are not planned to be commenced during the MOP term. If a decision is made to commence these construction activities during the MOP term a new MOP would be required.

A workshop and stores warehouses may be constructed at the pit top during the MOP term. This construction would be within the approved disturbance footprint and falls within the exempted development requirements under the Mining SEPP.

Minor surface infrastructure may be constructed within AUTH 232 in accordance with the EAMSIMP. Potential minor surface infrastructure includes boreholes for geological and geotechnical

investigation (refer **Section 2.2.1**), construction of access tracks (where required), and the installation of equipment for alluvial, groundwater, surface water and subsidence monitoring.

Some minor surface clearing is likely to be required to establish drill sites and for the clearing/maintenance of access tracks required to reach drilling locations. Where possible and practicable, drill sites will be selected as close as possible to existing access tracks. This will reduce the requirement for new access tracks to be created and will minimise clearing requirements and surface disturbance for drill site establishment. The proposed drill site footprint will require a maximum disturbance area of approximately 35 metres (m) x 25 m. Where possible, drill sites may also be selected within existing cleared areas.

The planning, design, construction and maintenance all access tracks will be generally in accordance with *Managing Urban Stormwater: Soils and Construction, Volume 2C, Unsealed Roads* (DECC 2008b). Vegetation clearing along existing access tracks will only occur if required on both sides of the road to create a 10 m wide track. This will be partially rehabilitated to a final 5 m track. Erosion and sediment controls will be installed, as required, along access tracks to the drill pad sites. Cross-banks and mitre drains will be constructed along sections of the access tracks at appropriate distances as dictated by topography, in accordance with Volume 2C of the Blue Book (DECC 2008b) to convey run-off away from the road alignment.

The following infrastructure will be constructed to support the solar farm within the approved REA in accordance with DA033/99:

- 500m access road with underground services;
- 4 m wide access road consisting of 300 mm compacted road base with swale drainage and culverts;
- Underground 11 kV and fibre optic cables and conduit;
- Solar array consisting of approximately 5000 400W PV modules (panels) on solar mounting frames consisting of 75 tables on 725 piles;
- Underground 11 kV connecting cable;
- LV switchroom with 24 x 75kWp solar inverters and switchboard;
- 2 MVA step up transformer;
- Ancillary infrastructure including;
 - Inverter shed (9 x 9 x 2.7 m high);
 - Transformer shed (3.9 x 2.3 x 2.0 m high);
 - 1.8 m high security fencing, ring lock with three strands of barb wire;
 - 8 security cameras and motion sensor activated lights on 6.5 m poles; and
 - Connection of solar system to the existing Airly Sub 1 Substation 11kv distribution board.

All construction works will occur within the existing disturbed areas at Airly.

2.2.3 Mining Operations

2.2.3.1 Mine Design and Mining Method

During the MOP term, Airly's underground mining operations will use a combination of first workings and partial extraction methods within ML 1331 and extend into the eastern portion of AUTH 232. A Mining Lease Application (MLA) will be completed during the MOP term prior to commencing activities outside of ML1331

The Airly mine design has taken into consideration the many sensitive features within the MOP areas including cliffs, pagodas, groundwater resources and Aboriginal and European heritage sites and

infrastructure. Mining methods will vary based on differing levels of environmental sensitivity and depth of cover and will be undertaken in accordance with approved Extraction Plans, which will be undertaken in a conservative staged approach consistent with development consent SSD_5581.

The underground mining area has been divided into mining zones in which different mining methods will be used to ensure the desired subsidence levels are met. Significant surface features will be protected through the use of first workings only with long term stable pillars.

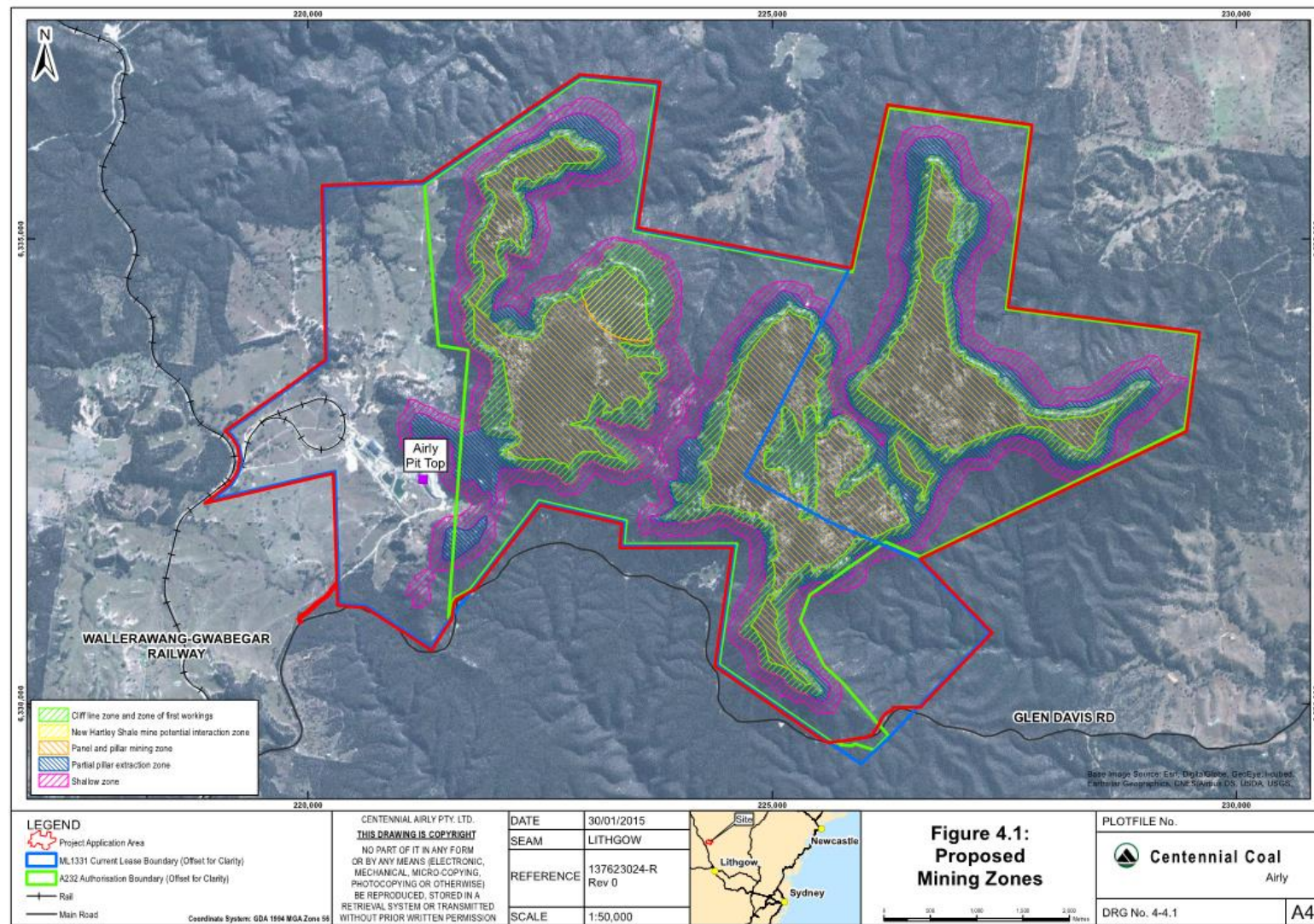
In summary the following mining methods will be used in the various mining zones as defined by development consent SSD_5581 (unless amended by an approved Extraction Plan):

- **Panel and Pillar Zone:** This is the plateau area where depth of cover is greater than 160 m. The maximum void width will be 61 m and highly sub-critical. Long term stable pillars will be left between the voids to allow spanning of the overburden between pillars, thus greatly limiting the level of subsidence. This mining method will be used over the majority of the mining area.
- **Cliff Line Zone:** This is an area of first workings only (no secondary extraction at any time) defined by a setback of 30 m from both the crest and toe of the cliffs. The Cliff Line Zone illustrated in Appendix 3 of Development Consent SSD_5581 (reproduced in **Figure 4** below) includes a 26.5 degree angle of draw setback from proposed panel and pillar second workings to cliffs mapped in the EIS in the vicinity of the New Hartley Shale Mine Potential Interaction Zone, as described in the EIS Response to Submissions, Feb 2015. An additional 50m buffer will be included in the mine design submitted with relevant Extraction Plans, which effectively establishes a combined setback of 26.5 degrees angle of draw plus 50m.
- **Partial Pillar Lifting Zone:** This zone extends from the Cliff Line Zone down to the 80 m depth of cover contour and is the zone of partial pillar stripping, creating limited spans (15.5m to 25.5 m) and leaving long term stable pillars remaining to provide overburden support.
- **Shallow Zone:** This is a second zone of partial extraction using splitting quartering of larger first workings pillars to a smaller size but remaining long term stable. The zone extends between the 20 m and 110 m depth of cover contours. Splitting and quartering is to be only carried out in areas where the depth exceeds 30m. In areas of European heritage the horizontal extent of protection areas of first workings around the heritage sites is defined by half the depth.
- **New Hartley Shale Mine Protection Interaction Zone:** This is an area of panel and pillar mining in the Mount Airly plateau area below the old oil shale workings. Interaction between the underlying panel and pillar mining in the Lithgow seam and the overlying oil shale workings is expected.

Figure 4 illustrates the proposed mine indicative boundaries of the proposed mining zones.

All secondary extraction areas and any first workings within the Cliff Line Zone will be subject to the approval of an Extraction Plan.

Figure 4 Approved Mining Zones



Source: Figure 3 from SSD_5581.

2.2.3.2 Mining Sequence

Mining will continue from the existing workings in the west of the MOP area and progress generally eastwards under Mount Airly and Genowlan Mountain. The mine schedule will be generally in accordance with the approved EIS as detailed in staged approved extraction plans.

2.2.4 Materials Handling and Processing

ROM coal is conveyed from the underground via the trunk conveyor. ROM coal is fed directly onto a surface conveyor system and transferred to the coal crushing and screening plant where it is sized to less than 50 mm. Crushed coal is stockpiled on the Product Coal Stockpile via the skyline tripper conveyor.

All coal is then transported from Airly Mine by rail. Coal from the Product Coal Stockpile is reclaimed via a reclaim tunnel onto a conveyor, which transfers coal to the rail bin. Coal is loaded from the bin into trains for transport offsite to domestic and overseas markets.

The CPP approved by SSD-5581 is proposed to have the capacity to beneficiate 1.8 Mtpa of ROM coal; however, there is currently no plan to commence construction of the CPP during the MOP Term.

The layout of the Airly Pit Top is shown in **Figure 5**.

2.2.5 Rock/Overburden Emplacement

Airly is an underground coal mine, subsequently there is no overburden generated at the site.

2.2.6 Processing Residues and Tailings

Airly does not currently require an REA or tailings dam for reject (coarse or fine) material management as no coal beneficiation is currently undertaken at the site.

As outlined in **Section 2.2.2**, the construction of the REA approved under SSD-5581 is not currently considered necessary at Airly and will not be completed during the MOP term. Should a decision is made to commence construction of the REA a new MOP would be required.

2.2.7 Waste Management

2.2.7.1 Production Waste

Production waste is not generated at Airly Mine given that no coal beneficiation occurs and no reject materials are produced.

2.2.7.2 Non-Production Waste

Airly Mine has implemented a *Waste Minimisation and Management Plan* to improve waste management procedures and to minimise wastage particularly in relation to general waste to land fill. The objectives of this Plan are to achieve waste minimisation through segregation, maximising re-use and recycling strategies, to ensure environmentally responsible disposal of waste materials not suitable for re-use or recycling and to ensure environmental protection throughout all stages of waste handling, storage, collection and disposal.

Table 7 identifies typical wastes and their disposal destinations.

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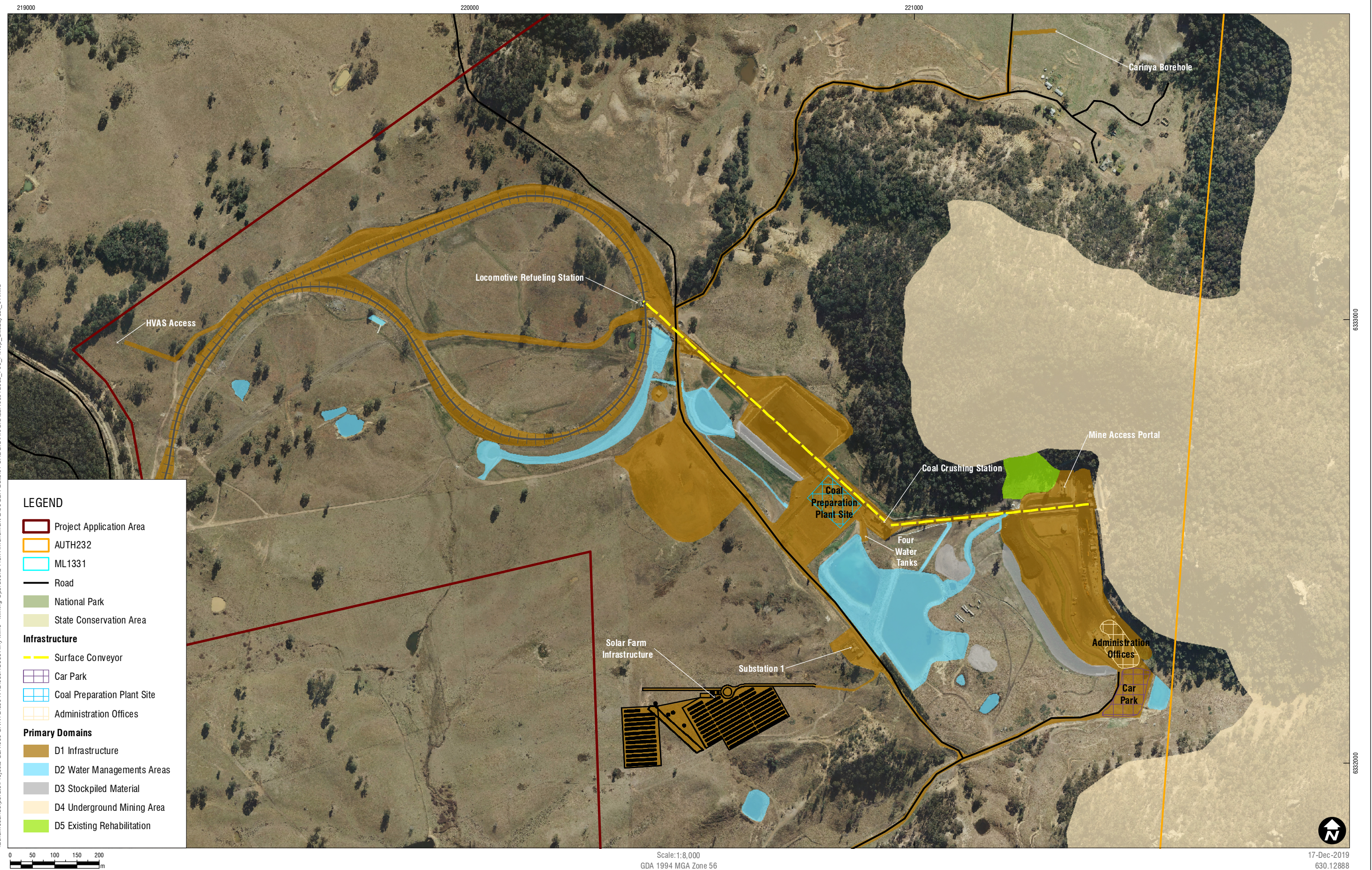


Table 8 – Typical Waste Streams and Disposal

Waste Stream	Example Waste	Management / Disposal Method
General Solid Waste		
Mixed Solid Waste	Putrescible wastes and non-putrescible wastes. This also includes waste that meets the classification of <i>General Solid Waste</i> under the <i>Waste Classification Guideline</i> (DECCW 2009)	General consumable materials are stored in waste skips and which are collected regularly by licenced providers for offsite disposal to landfill.
General Solid Waste (Recyclables)		
Paper and cardboard	Paper and cardboard	Colour coded recycling containers are placed in identified areas for collection of cardboard and paper products. These, and smaller receptacles in the administration and office areas, are collected by licenced providers.
Scrap Steel/Metals	Scrap Steel/Metals	All scrap steel/metal is placed into a dedicated skip and sold to scrap steel merchants for recycling
Liquid Waste		
Used oil filters and drums	Waste oils / grease	Used oil filters are stored in designated bins and are taken to a recycling facility by a registered waste disposal company. At the recycling facility, these are crushed to recover all oil and subsequently both the oil and metal is recovered. Materials still containing liquid are not disposed of to landfill. These materials are removed by licenced contractors for recycling or disposal at a licenced waste management facility. 20 L drums are drained into waste oil collection (drum drainer) and placed into scrap metal recycling bins. Grease cartridges are placed in sealed drums within the bulk oil store, prior to collection by licenced contractors.
Hydrocarbons / Hazardous Materials	Oils, diesel fuels	Hazardous materials including oils and fuels are stored in accordance with Australian Standards. A spill response procedure is in place which addresses clean-up procedures in the event of a spill of these materials. Hazardous materials that need to be disposed of are stored within an allocated area prior to being removed by a licenced hazardous waste contractor.
Waste Effluent	Sewage	Sewage and grey water from the bathhouse and offices at the pit top areas is treated on site by a sewage treatment facility. The mine's effluent system upgrade was completed during June 2012 and the life of mine Ecomax Effluent Treatment System caters for the expected workforce. Underground sewage is contained by Aflab activated biological toilets. Septic tanks have been installed at the Train Loader facility to manage sewage from the toilet located at the Train Loader. The sewage is transported by a licenced contractor to the Ecomax Effluent Treatment System or off site waste facility for disposal.

2.2.8 Decommissioning and Demolition Activities

During the MOP Term decommissioning of exploration boreholes will be undertaken where they are not required for long term groundwater monitoring. All other facilities that are no longer required will be progressively removed and the area rehabilitated.

There is no other proposed decommissioning or demolition of infrastructure at the Airly Mine during the MOP Term.

2.2.9 Temporary Stabilisation

Temporary stabilisation may be required at construction areas during the MOP Term. Prior to the re-establishment of vegetation cover, temporary control measures will be utilised for erosion and sediment control. These measures may include the use of sediment fences for non-channelised flow over disturbed areas, sand bags, rip rap, or any combination of those materials. Consideration will be given to erosion and sediment control procedures for activities undertaken during the construction phase. These procedures may include restricted access during wet weather or to areas under rehabilitation, reporting of erosion and sediment hazards or incidents and regular checking and maintenance of structures.

The temporary control measures utilised are selected dependent on the site constraints (dispersive soils, slope), time of year, type of flow (concentrated or sheet flow) and the duration of disturbance.

2.2.10 Progressive Rehabilitation and Completion

Since the Airly Mine is an underground mine, the relatively small disturbance footprint associated with surface infrastructure means that there are limited opportunities for progressive rehabilitation. To what extent is appropriate, rehabilitation will be undertaken progressively on areas that cease to be used for mining or mining related activities as soon as is reasonably practicable.

Rehabilitation activities forecast for the current MOP Term include:

- Progressive rehabilitation of exploration and/or groundwater monitoring sites (refer **Section 2.2.1**);
- Rehabilitation of areas affected by subsidence, as required, in accordance with an approved Extraction Plan; and
- Maintenance and monitoring of areas of existing rehabilitation.

Further details of rehabilitation activities to be undertaken during the MOP Term are provided in **Section 7**.

2.2.11 Material Production Schedule during MOP Term

The proposed production schedule for Airly Mine over the period covered by this MOP is shown in **Table 9**. No coarse reject material is generated as no coal benefaction occurs at the site.

Table 9 – Production Schedule

Material	Unit	2018	2019	2020	2021	2022	2023	2024
Stripped topsoil	m ³	0	0	0	0	0	0	0
Rock / Overburden Rock	m ³	0	0	0	0	0	0	0
Ore (ROM coal)	T	1,345,000	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000
Coarse Reject	T	0	0	0	0	0	0	0
Product Coal	T	1,345,000	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000	1,800,000

2.3 Primary Domains

For the purpose of this MOP, primary (operational) domains have been defined as the set of discrete areas that have a particular operational or functional purpose. All areas previously disturbed by mining, or proposed to be subject to the activities described in **Section 2.1** and **Section 2.2**, have been assigned to an appropriate primary domain. Primary domains at Airly are defined in **Table 13**. The footprint of each primary domain at the commencement of the MOP Term is depicted on **Plan 2**.

Table 10 – Primary Domains

Domain	Description	Code
Infrastructure	Includes all existing infrastructure and facilities at the Airly Mine including the rail loop, coal handling infrastructure, administration buildings, workshops, car parks and access roads, and hardstand/laydown areas and the 2MW solar farm and ancillary infrastructure including a switchroom and access roads. It also includes underground mining infrastructure including the box cut and underground mine access portal, ventilation shafts, and exploration and groundwater monitoring bores.	1
Water Management Area	Includes the network of dams and associated water management infrastructure at the Airly Pit Top.	2
Stockpiled Material	Includes the Product Coal Stockpile and Emergency Stockpile	3
Underground Mining Area	This domain encompasses the surface areas above the underground workings that will be monitored for potential subsidence impacts in accordance with the existing (and future) Extraction Plan(s).	4
Existing Rehabilitation	This domain covers the existing rehabilitation to the north of the surface conveyor and emergency stockpile.	5
Other Lands	This domain incorporates all lands within the MOP area not captured by domains 1 to 5 above.	6

2.4 Asset Register

The asset register included as **Table 11** provides a summary of the key features of each primary domain at MOP commencement (refer to **Section 2.3**), and principal activities required for rehabilitation. This asset register is intended to provide a suitable level of context for the Rehabilitation Cost Estimate (RCE) (refer to **Section 2.4.1**).

The areas for each primary domain represent the total disturbance footprint for each domain at the commencement of the MOP Term, as depicted on **Plan 2**. Domain selection is described further in **Section 5.1**.

Table 11 – Asset Register

Major Assets	Use	Demolition / Rehabilitation Activities	Approvals Required	Quantity	Unit
Domain 1 – Infrastructure: 35.9 42.0 ha					
Surface Portal/Decline Entry	Materials and personnel access to underground workings – currently utilised	Disconnect services; backfill and seal decline tunnels with non-contaminated materials against an engineered bulk head; install appropriate drainage infrastructure.	DRE approval for sealing	7	Item
Ventilation Shaft Facilities – two electrically powered centrifugal fans	Mine air ventilation – currently utilised	Remove ventilation fans and equipment; backfill and seal shafts; construct engineered plug; disconnect services; demolish and remove infrastructure; and remove concrete pads.	DRE approval for sealing	2	item
Coal clearance system including transfer tower, conveyor and crusher building	Coal transfer and crushing – currently utilised	Disconnect and terminate all services; demolish and remove plant; remove carbonaceous material.	Demolition certificates; Phase 1 and Phase 2 Contamination Assessments	550	m ²
Rail loop	Coal loading and dispatch – currently utilised	Disconnect and terminate services; demolish and remove plant; remove carbonaceous materials; remove rail line and infrastructure.	Demolition certificates; Phase 1 and Phase 2 Contamination Assessments	2500	m ²
Administration buildings, bathhouse and portable offices	Administration and staff facilities – currently utilised	Disconnect services; demolish and remove infrastructure; and remove concrete pads.	Demolition certificates; Phase 1 and Phase 2 Contamination Assessments	2,300	m ²
Mechanical workshop, store and sheds.	Workshops, service buildings and storage of materials/equipment – currently utilised	Disconnect services; demolish and remove small buildings; remove concrete pads; remove potentially contaminated material; on site remediation of contaminated soil.	Demolition certificates; Phase 1 and Phase 2 Contamination Assessments	135	m ²
Hardstand/Laydown Areas	Storage of equipment – currently utilised.	Remove plant and material; and remove concrete pads.	Demolition certificates; Phase 1 and Phase 2 Contamination Assessments	19,272	m ²

Major Assets	Use	Demolition / Rehabilitation Activities	Approvals Required	Quantity	Unit
Car parking areas	Car parking facilities for existing mine personnel and visitors – currently utilised.	Demolish and remove infrastructure; and remove concrete pads.	Demolition certificates; Phase 1 and Phase 2 Contamination Assessments		
Two Substations	Electricity generation – currently utilised	Disconnect services; demolish and remove infrastructure and remove concrete pads.	Demolition certificates; Phase 1 and Phase 2 Contamination Assessments	2	Item
2MW Solar Farm	Electricity generation	Disconnect services; demolish and remove infrastructure and remove concrete pads.	Demolition certificates; Phase 1 and Phase 2 Contamination Assessments	4.2	ha
Sewage / Water Treatment Plan	Sewage and water treatment – currently utilised	Disconnect services; demolish and remove infrastructure and remove concrete pads.	Demolition certificates; Phase 1 and Phase 2 Contamination Assessments	1	Item
Domain 2 – Water Management Area: 10.0 10.1 ha					
Dams including the Train Loader Dam, 7 ML Dam, 35 ML Discharge Dam, 109 ML Dam, Filter Pond and 3 Settling Ponds.	Water storage, treatment and management – currently utilised	Drain and remove contaminated sediments from the floor of the dams to enable it to be converted into a clean water structure.	None	100,000 101,000	m ²
Domain 3 – Stockpile Material: 2.3 ha					
Topsoil stockpiles	Storage of topsoil – currently utilised	Respread to specified depth.	None	23,000 24,000	m ²
Domain 4 – Underground Mining Area : 2,177.3 ha					
Survey Markers	Monitoring of subsidence	Subsidence markers will be decommissioned and removed	Approval from DRE for the removal of subsidence lines	N/A	N/A
Domain 5 – Existing Rehabilitation : 0.98 ha					

Major Assets	Use	Demolition / Rehabilitation Activities	Approvals Required	Quantity	Unit
No buildings or plant located within this domain	N/A	Continuation of rehabilitation management activities	N/A	N/A	N/A
Domain 6 – Other Lands: 1,756.4 1,750.2 ha					
No buildings or plant located within this domain	N/A	Continuation of rehabilitation management activities	N/A	N/A	N/A

2.5 Rehabilitation Cost Estimate

The RCE prepared for this MOP submission has been calculated to undertake the necessary works to achieve the desired final land use (refer to **Section 4** and **Plan 4**). In accordance with *the ESG1: Rehabilitation Cost Estimate Guidelines* (Department of Industry and Investment 2010), the RCE has been prepared based upon a “snapshot” of disturbance at the end of 2017. The RCE provides for:

- Decommissioning and demolition of all surface infrastructure;
- Rehabilitation of all areas disturbed by mining as depicted in **Plan 2**, with the exception of dams to be retained for post mining use; and
- Mobilisation costs, project management and contingencies.

A copy of the RCE was submitted to DRE with the Annual Review in March 2017. Revised RCEs will be submitted annually with the Annual Review

3 Environmental Issues Management

3.1 Environmental Risk Assessment

A risk assessment was undertaken for this MOP which addressed all risks to rehabilitation at the Airly Mine. This included key operational and rehabilitation risks for Centennial Airly. The risk assessment was facilitated by Centennial Coal on 11 April 2017 and included key Airly and SLR Consulting personnel.

Centennial Coal's Risk Management Standard Risk Matrix was used to calculate the consequence and likelihood of an event to evaluate the subsequent risk level (risk rank). Risks are ranked as Low, Moderate, Significant, High or Extreme. The risk assessment was undertaken in accordance with the AS/NZS ISO 3100:2009 *Risk Management – Principles and Guidelines*.

The risk assessment identified 36 key rehabilitation risks which are summarised as follows:

- 23 risks were ranked as low;
- 13 risks were ranked as moderate;
- No risks were ranked as significant;
- No risks were ranked as high; and
- No risks were ranked as extreme.

The complete risk assessment, including the Centennial Coal Risk Management Standard is attached as **Appendix 3**.

3.2 Environmental Risk Management

Airly has developed an Environmental Management Strategy (EMS) to adhere to Centennial Coal's Environmental Policy. The EMS provides the management framework to identify and control potential environmental impacts to achieve compliance with environmental legislation and regulatory requirements applicable to Centennial Airly under SSD-5581.

The EMS has been developed and implemented to ensure the effective management of environmental issues and compliance with all regulatory requirements while providing a means for continued improvement in the environmental performance of Centennial Airly. The EMS incorporates a number of environmental management plans which are designed to assist in meeting community and regulatory expectations.

In accordance with the requirements of SSD-5581, Centennial Airly has prepared and submitted the management plans as outlined in **Table 12**.

Table 12 – EMS Management Plans

Management Plan	SSD-5581 Condition	Status
Extraction Plan and associated management plans	Schedule 3 Condition 7	MOD3 Extraction Plan prepared and approved by DPE. Additional Extraction Plans to be prepared for future second workings
Noise Management Plan	Schedule 4 Condition 4	Incorporated into the Centennial Western Region Noise Management Plan. Submitted to DPE for approval on 30 April 2017 and approved on 4 July 2018.
Air Quality Management Plan	Schedule 4 Condition 7	Incorporated into the Centennial Western Region Air Quality and Greenhouse Gas

Management Plan	SSD-5581 Condition	Status
		Management Plan. Submitted to DPE for approval on 30 April 2017 and approved on 4 July 2018.
Water Management Plan	Schedule 4 Condition 15	Submitted to DPE for approval on 30 April 2017 and approved on 7 September 2018.
- Site Water Balance		
- Surface Water Management Plan		
- Groundwater Management Plan		
Biodiversity Management Plan	Schedule 4 Condition 17	Incorporated into the Centennial Western Region Biodiversity Management Plan. Submitted to DPE for approval on 30 April 2017.
Traffic Management Plan	Schedule 4 Condition 19	Submitted to DPE for approval on 30 April 2017 and approved on 7 September 2018.
Heritage Management Plan	Schedule 4 Condition 21	Incorporated in the Centennial Western Holdings Aboriginal Cultural Heritage Management Plan and Western Holdings Historic Heritage Management Plan.
Exploration Activities and Minor Surface Infrastructure Management Plan	Schedule 4 Condition 26	Being prepared. Approved by the DPE on 1 November 2018.
Rehabilitation Management Plan	Schedule 4 Condition 29	This document. Approved by the DPE on 10 January 2018.

As noted by Schedule 6 Condition 4 of SSD-5581, Airly will ensure that operations at the site are covered by suitable strategies and plans at all times. As such, Airly will continue to manage the development in accordance with the equivalent or similar management plans prepared under DA 162/91 (as modified) until such a time that the management plans required under SSD-5581 are approved. Further, as required by the MOP Guidelines, should the management plans be amended during the MOP term then this will be reported in the Annual Review.

The environmental management plans are backed by an environmental monitoring network. Monitoring results are reported monthly on Centennial's website and on an annual basis in the Annual Review, which is also available online.

3.3 Specific Risks Relating to Rehabilitation

3.3.1 Geology and Geochemistry

Airly is located within the southern part of the Western Coalfield of NSW, on the western edge of the Sydney Basin. The area is underlain by Triassic sandstone of the Narrabeen Group, which is underlain by the Illawarra Coal Measures. The Lithgow Seam within the lower Illawarra Coal Measures, which has an average thickness of 3.4 m, is the target coal seam at Airly Mine.

The risk to rehabilitation related to geology and geochemistry was ranked as moderate due to the risk of discharge of contaminated surface runoff. This could be caused by pollution of surface water by contaminated material and/or a failure to capture and contain runoff.

As discussed further in **Section 3.3.12**, both surface and groundwater at Airly are managed in accordance with the Water Management Plan which has been updated in accordance with Schedule 4 Condition 15 of SSD-5581. The erosion and sediment controls detailed in **Section 3.3.4** will

minimise the potential for surface water pollution, and during the MOP term, Airly will investigate options for the construction of additional water control dams to ensure adequate storage capacity is available for future water management.

3.3.1 Material Prone to Spontaneous Combustion

The Lithgow coal seam has a low propensity for spontaneous combustion. There have been no spontaneous combustion issues in relation to in-situ or extracted Lithgow seam coal and no instances of spontaneous combustion to date at Airly.

Typically the highest risk of spontaneous combustion for Lithgow seam coal is during stockpiling for more than one year. Airly employs management strategies to ensure coal is not stockpiled for long periods of time. Consequently spontaneous combustion was considered a low risk to rehabilitation in the risk assessment.

3.3.2 Material Prone to Generating Acid Mine Drainage

There is no historical evidence of acid mine drainage at Airly and consequently this was ranked as a low risk to rehabilitation. A monitoring program has been developed as part of the Water Management Plan which will identify any potential contamination of surface water.

3.3.3 Mine Subsidence

The risk to rehabilitation from mine subsidence was deemed low during the risk assessment due to the low impact bord and pillar mining techniques used to extract coal from the Lithgow Seam. The mine design has been specifically designed to provide long-term stable pillars to protect the surface such that there is no adverse impact, therefore sinkholes and subsidence cracks are not expected to have significant impact on rehabilitation.

In accordance with the requirements of Schedule 3, Condition 7 of SSD-5581, Centennial Airly has prepared an Extraction Plan for all future secondary workings on the site. The Extraction Plan includes:

- Built Features Management Plan
- Water Management Plan;
- Biodiversity Management Plan;
- Land Management Plan;
- Heritage Management Plan;
- Public Safety Management Plan; and
- Subsidence Monitoring Program.

Should subsidence impacts occur to surface features, remediation and rehabilitation will be undertaken in accordance with the approved Extraction Plan. Subsidence remediation and rehabilitation will be on-going throughout the life of the mine.

3.3.4 Erosion and Sediment Control

The risk to rehabilitation from erosion was considered low during the risk assessment due the management measures currently in place at Airly.

Management of erosion and sedimentation at Airly is achieved by implementing the following principles in accordance with the Water Management Plan:

- Separating undisturbed, 'clean water' runoff from disturbed, 'dirty water' runoff to minimise and isolate the amount of dirty water to be treated and either reused or discharged off site;

- Directing sediment-laden runoff into designated sediment control retention ponds;
- Diverting 'clean water' runoff unaffected by the operations offsite; and
- Maintaining sediment control structures to ensure that the designed capacities are maintained for optimum settling of sediments.

Additional measures will be implemented to manage erosion and sedimentation resulting from construction, approved exploration and/or monitoring activities and associated access roads during activities within the SCA. These include:

- Undertaking works in accordance with:
 - *Managing Urban Stormwater: Soils and Construction, Volume 1 (The Blue Book)* (Landcom, 2004);
 - *Managing Urban Stormwater: Soils and Construction Volume 2A, Installation of Services* (DECC, 2008a);
 - *Managing Urban Stormwater: Soils and Construction Volume 2C, Unsealed Roads* (DECC, 2008b); and
 - *Managing Urban Stormwater: Soils and Construction Volume 2E, Mines and Quarries* (DECC, 2008c).
- Prior to commencement of construction works, waterways and drainage lines in close proximity to the site will be identified;
- Stormwater will be diverted away from disturbed areas by directing clean water around the site. This may be achieved by installing a silt bag bund or a compacted earthen bund upslope of the work site;
- Sediment build up will be regularly cleaned from behind controls to ensure they work efficiently;
- In-ground sumps to be pumped down ahead of rain events to prevent overflow;
- All erosion and sediment controls will be checked regularly and before and after rainfall events, and maintained as required to ensure they are operating effectively; and
- Unless designed and constructed for wet weather use, Airly will restrict the use of unsealed roads and access tracks during wet weather to prevent damage to that track or road.
- Excavated sediment from water management structures will be stockpiled in a contained area within the pit top disturbance area,

3.3.5 Soil Type(s) and Suitability

The Agricultural and Land Use Impact Assessment (SLR Consulting 2014), prepared for the Airly Mine Extension Project, identified 11 soil landscapes within the Project Application Area. The majority of the Project Application Area is comprised of soils with low to moderately low inherent fertility.

Stripping and stockpiling of topsoils followed by re-spreading for revegetation is regarded as best practice rehabilitation in the mining industry. The use of topsoil in this regard has three main advantages: as a source of seeds (seed bank), soil microbial organisms, and as a physical covering for dispersive subsoils. Biologically, the value of stockpiled topsoil is largely determined by the length of time that soil will be stockpiled and the physical shape of the stockpile. Soil will be re-spread directly onto stripped areas where practical. Topsoil will be spread, treated with fertiliser and seeded in one consecutive operation, where possible, to reduce the potential for topsoil loss to wind and water erosion. Soil will be re-spread to the approximate depth from which it was stripped. Soil management during exploration activities will be undertaken in accordance with the EAMSIMP.

Soil type(s) and suitability was ranked as moderate during the risk assessment as limited suitable topsoil or poor topsoil quality could result in failure to achieve successful rehabilitation. This risk will continue to be managed by the utilisation of appropriate subsoil materials as a substitute for topsoil

where possible, or the utilisation of benign spoil materials amenable to colonisation of native trees and shrubs.

3.3.6 Flora and Fauna

A detailed assessment of ecological communities and threatened species was undertaken by RPS as part of the EIS (Golder Associates, 2014). The findings are detailed in the Airly Mine Extension Project Flora and Fauna Assessment (RPS 2014a).

Two Endangered Ecological Communities (EECs) listed under the *Threatened Species Conservation Act 1995* (TSC Act) were recorded within the Airly Project Application Area. These were:

- Genowlan Point *Allocasuarina nana* Heathland (TSC Act); and
- White Box – Yellow Box – Blakely’s Red Gum Woodland (TSC Act) and White-Box – Yellow Box – Blakely’s Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act).

The following threatened plant species have also been identified within the Project Application Area:

- *Eucalyptus cannonii* (Capertee Stringybark);
- *Prostanthera stricta* (Mount Vincent Mint Bush); and
- *Pultenaea* sp. Genowlan (Genowlan Point *Pultenaea*).

Flora and fauna at Airly is managed in accordance with the Western Operations Regional Biodiversity Management Plan, which has been updated in accordance with the requirements of Schedule 4 Condition 17 of SSD-5581, along with Biodiversity Management Plan contained within approved Extraction Plan (discussed in **Section 3.3.3**).

During the risk assessment, the impact of feral animals on rehabilitation was considered low, as was the risk of impacting habitat for fauna species or aquatic fauna during rehabilitation activities.

The impact to existing remnant native species caused by disturbance to undisturbed or previous rehabilitated areas, or adequate drainage was deemed a moderate risk. In accordance with the requirements of Condition 17 of AUTH 232, vegetation clearing and vegetation disturbance will be limited to the minimum extent necessary to facilitate the conduct of subsidence and environmental monitoring as well as drilling operations.

Due-diligence field inspections and targeted surveys of proposed drill sites and associated access tracks will be undertaken by appropriately qualified ecologists prior to commencement of works to ensure the potential for localised impacts and risks are minimised and, where necessary, appropriately managed. Airly will consult with the DPE and use all reasonable and feasible efforts to avoid impacting threatened species, populations or their habitats and EECs (including through the relocation of access tracks and exploration/ monitoring sites). The combination of environmental sensitivity risk mapping and targeted due-diligence surveys of potential drill sites will provide greater flexibility in selecting the most suitable final drill site locations with minimal impact on the local environment.

Additionally, a range of management measures will be implemented to minimise impacts from vegetation clearing, including:

- Impacts on vegetation will be minimised as much as possible, and constrained to the approved disturbance footprint;
- Prior to clearing the approved disturbance footprint will be clearly demarcated;
- For those areas where hard surfaces are required, undertake stockpiling of soil to enable re-establishment of visible habitat following infrastructure decommissioning;

- During clearing, and where it would not interfere with operations, the removal of vegetation will be limited to above ground parts as much as possible. This will enable any vegetation that is able to re-sprout once works are completed to do so;
- Where possible, clearing activities will avoid hollow-bearing trees. Where this cannot be avoided clearing will be timed where possible to avoid removal of hollow-bearing trees during breeding season of threatened species;
- Employment of best practice methods for felling of hollow-bearing trees;
- Placement of hollow logs and felled hollow-bearing trees, where possible, within adjacent uncleared vegetation to provide additional habitat resources for terrestrial fauna; and
- Any native animals found within the drilling footprint will be allowed to leave the area without undue harassment or duress. If relocation is required, appropriate expert assistance will be considered (e.g. Wildlife Information Rescue and Education Service, NPWS, specialist consultants, etc.).

Airly undertakes flora and fauna monitoring which is reported in the Annual Review.

3.3.7 Weeds and Pests

The risk to rehabilitation from poor management of weeds and noxious species was ranked low during the risk assessment. Rehabilitation completed to date has not been hampered by weeds, and a baseline weed survey has been completed. Management of weeds at Airly includes:

- Weed monitoring will be undertaken to identify potential weed infestations. If identified these will be appropriately managed to ensure surrounding communities are protected from invasive species, until the rehabilitation has been signed off by the landowner;
- Any listed noxious weeds infestations identified will be treated. This will include any that are deemed to be deleterious to the revegetation effort, or are likely to spread during the course of the rehabilitation work. Herbicides will be used with due consideration to environmental knock-on effects;
- Any weeds that germinate from the seed bank in the topsoil stockpile will also be treated as required to prevent outbreaks that pose an ongoing liability;
- Any vehicles driven off-road through weed infested areas will be cleaned of weed and weed seeds prior to moving into new areas.

Details of any noxious species targeted each year will be reporting in the Annual Review.

3.3.8 Slopes and Slope Management

The risk to rehabilitation from long term stability failure of highwalls during the risk assessment was considered low. There is limited road access and fencing to restrict access to the highwall, along with an exclusion zone and chain link fencing at the base of the highwall to arrest minor rock falls.

The long term stability of steep slopes and the final landform was also deemed a low risk to rehabilitation. The mine has been specifically designed to provide long-term stable pillars to protect the surface such that there is no adverse impact, and the *Extraction Plan* in place provides a comprehensive monitoring program to identify and manage any potential impacts.

The long-term stability of dam embankments was considered a moderate risk to rehabilitation. All dams were developed in accordance with Blue Book criteria, and routine inspections are performed (which include dam wall integrity) to identify any issues. Centennial Airly will review options for an additional downstream control dam during the MOP term.

3.3.9 Waste

The risk to rehabilitation from the inappropriate disposal of waste materials at Airly was considered low during the risk assessment. A waste management and recycling strategy is currently implemented and Airly has a contract with JR Richards for waste disposal.

3.3.10 Air Quality

This risk of emissions of particulate matter resulting in complaints or non-compliance during rehabilitation was ranked low during the risk assessment.

Air quality will be managed in accordance with the with the Western Region Air Quality and Greenhouse Gas Management Plan (AQGHGMP) which was prepared to provide fulfil the requirements of Schedule 3 Condition 10 of SSD-5581 and relevant conditions of EPL 12374. The Western Region AQGHGMP has been prepared to manage air quality impacts to private receivers and the wider environment from mining operations and associated mining related activities within Centennial's western region. The aims of adopting a regional approach to the management and monitoring of air and greenhouse gas emissions include the following:

- Provide a consistent and consolidated management measures and procedures across all sites;
- Management of 'airshed' emissions, rather than focusing on individual operations; and
- Rationalise monitoring procedures and locations with consideration of 'airshed' emissions.

THE AQGHGMP includes a number of emissions controls and standard work procedures which are implemented across all sites to manage and minimise emissions of dust and particulate matter. These work procedures are current best practice standards for the underground coal mining industry and include:

- The use of water sprays/carts to dampen exposed surfaces and trafficable areas;
- Vehicle speed limits enforced onsite;
- The use of water cannons/water sprays on coal stockpiles;
- The use of an automatic train loader which produces a low and even profile of coal on the surface of the wagon and reduces spillages;
- Transporting coal with a high inherent moisture content;
- A combination of partial and fully enclosed conveyors and conveyor transfer points.
- Maintaining plant and equipment to ensure optimal operating conditions;
- Use of low sulphur diesel;
- Use of diesel engines which conform to the United States EPA Tier 3 standards for exhaust emissions;
- Underground dust suppression system (water strays on coal cutting machinery and running conveyor belts);
- Timely rehabilitation of disturbed areas where practical; and
- All haulage trucks entering and leaving the sites have their loads covered.

Air quality monitoring results are reported in the Annual Review. ~~During the MOP term a High Volume Air Sampler (HVAS) is proposed to be installed at the site.~~ A new High Volume Air Sampler (HVAS) was installed at the site in 2019.

3.3.11 Greenhouse Gas

Gas monitoring undertaken by Centennial Airly indicates a low concentration of methane and carbon dioxide from the mine, therefore the risk was deemed low during the risk assessment. The gas monitoring procedure will continue to be implemented at Airly during the life of the mine.

3.3.12 Surface Water and Groundwater

Both surface and groundwater at Airly is managed in accordance with the Water Management Plan which has been updated in accordance with Schedule 4 Condition 15 of SSD-5581. Objectives of this Plan are to:

- Manage water discharge from the site to a level that is acceptable for environmental management and community expectations;
- Minimise water discharges by maximising, where practicable, opportunities for reuse and recycling of water on site;
- Minimise discharges of dirty water from the site; and
- Manage discharge to natural waterways in accordance with relevant EPL conditions or as agreed by the EPA.

There is an extensive monitoring program of both surface and groundwater at Airly with sampling undertaken on a monthly basis and results reported in the Annual Review. Regular inspections of all water management structures at Airly are also undertaken to assess capacity, structural integrity and effectiveness.

The Water Management Plan also contains Trigger Action Response Plans (TARPs), which outline the triggers and appropriate responses to manage any potentially adverse impacts on surface water or groundwater due to operational activities.

Discharge of polluted water offsite due to high rainfall events, inadequate drainage or storage was considered a moderate risk during the risk assessment. Centennial Airly will review the option for a downstream water control dam during the MOP term. The management of erosion and sediment control discussed in **Section 3.3.4** will also continue to be implemented to minimise the potential for polluted water.

Groundwater discharge from underground workings due to connectivity between the groundwater and surface water interface, or the underground workings filling with groundwater was considered a moderate risk during the risk assessment. Airly will continue to be operated in accordance with the Water Management Plan to mitigate this risk, along with the Water Management Plan contained within approved Extraction Plans (discussed in **Section 3.3.3**). In addition, prior to the construction and use of boreholes, Airly will prepare a Ground Water Monitoring and Modelling Plan in accordance with Condition 12 of AUTH 232 and in consultation with the DPI Water. This Plan will:

- Describe methods for identifying aquifers, their depths, behaviour, containing layers and connectivity with surrounding aquifers or surface water systems;
- Describe methods for collection of data relevant to the type, quantity and quality of water contained within aquifer systems likely to be encountered during prospecting operations;
- Provide for the future development of a conceptual model of regional groundwater behaviour;
- Provide for the future development of a calibrated computer model of regional groundwater behaviour, to enable the impacts of any proposed mining operations to be assessed;
- Describe how records of all data collected will be maintained;
- Describe the staging process for implementation of the Plan; and

- Be prepared in accordance with any additional requirements prescribed by the Secretary of the DRE.

Prior to closure, Airly will prepare a detailed Closure Groundwater Monitoring and Management Plan to address the requirements of Schedule 4 Condition 29e of SSD 5581 (refer **Table 6**). This Plan will detail the measures to be implemented to:

- Assist in restoring natural groundwater flow to pre-mining conditions to the maximum extent possible;
- reduce adverse groundwater impacts to seeps, springs and flows in terms of acidity, salinity or location;
- Ensure the removal from within the mine of all non-natural material not required for ongoing monitoring; and
- Prevent polluting materials from entering the mine so as to not affect groundwater quality.

3.3.13 Hazardous Materials and Dangerous Goods

The risk to rehabilitation from hazardous materials and dangerous goods was considered low during the risk assessment. Airly has established an inventory of site based hazardous materials which are stored on concrete pads and hardstand areas to reduce the risk of groundwater pollution. Spill kits are available and a PIRMP is implemented in the event of a spill. There is no asbestos associated with mining areas at Airly.

3.3.14 Contaminated Land

Airly is a newly established mine site, with no legacy of historical contamination. There has been no contaminated land identified at Airly to date and the risk to rehabilitation was deemed low during the risk assessment.

There are adequate hydrocarbon storage facilities onsite located on concrete pads and hard stand areas, but should any material found to be contaminated, it will be collected and disposed of offsite or bio-remediated on site as considered appropriate in accordance with the PIRMP.

3.3.15 Blasting

No blasting is carried out at Airly and no explosives are stored on site.

3.3.16 Noise

Noise was considered a low risk to rehabilitation during the risk assessment. There have been no significant historical issues concerning noise at the site and noise associated with rehabilitation activities is not expected to have a significant impact on surrounding receptors.

Noise emissions from the Centennial Airly operations are managed in accordance with the Western Region Noise Management Plan (RNMP). The RNMP has been prepared to adopt a regional approach to the management and monitoring of noise emissions including the following:

- Provision of consistent and consolidated management measures and procedures across all sites;
- Management of cumulative impacts, rather than focusing on individual operations, and
- Rationalisation of monitoring procedures and locations with consideration of cumulative impacts.

The RNMP outlines noise management and monitoring measures that will be implemented at all Centennial's Western operations to measure compliance with statutory requirements.

3.3.17 Visual and Lighting

Visual impacts and lighting emissions were ranked as a low risk to rehabilitation at Airly during the risk assessment. A lighting review was undertaken by SLR in March 2017 which concluded that Airly has a low visual impact and all external lighting is compliant with Australian Standard AS 4282 1997 – *Control of Obtrusive Effects of Outdoor Lighting*.

If there are found to be inadvertent impacts of stray light from the sight on the surrounding community during closure activities, all necessary actions will be taken to address the issue. Such actions or controls may consist of the relocation or realignment of lights on the site and infrastructure as well as a review of the lighting control systems. As discussed in **Section 3.3.7**, weeds and noxious species will continue to be managed to prevent visual impact on the rehabilitation.

Visual impacts were assessed in the *Proposed Airly Solar Farm – Statement of Environmental Effects (SEE)*. The visual impacts were considered negligible due to the scale and consistency with existing mine infrastructure and the solar farm will not be directly visible by sensitive receptors.

3.3.18 Cultural Heritage

3.3.18.1 Aboriginal Cultural Heritage

The Cultural Heritage Impact Assessment (RPS 2014) for the Airly Mine Extension Project identified 25 Aboriginal sites located within the Project Application Area, nine of which are located above the mining area. However, the low levels of subsidence tilt and strain predicted does not pose a risk of harm to these sites. Four artefact scatters and one art site are located adjacent to roads within the Project Application Area and are not predicted to be impacted. The risk assessment considered the disturbance of an Aboriginal site or artefact as a moderate risk to rehabilitation at Airly.

Aboriginal Cultural Heritage at Airly Mine is managed in accordance with the Western Region Aboriginal Cultural Heritage Management Plan (ACHMP). The ACHMP aims to provide a consistent approach to consultation between Centennial and the Aboriginal community as well as identify standard Aboriginal cultural heritage monitoring and management requirements. This ACHMP should be used by Centennial personnel to ensure that the appropriate protocols are adopted for the identification, monitoring and management of Aboriginal material culture. The structure of the management plan has been designed as an over-arching document which must be followed in conjunction with specific development consent requirements for each operation within the Western Holdings.

3.3.18.2 Non-Indigenous Heritage

The Cultural Heritage Impact Assessment (RPS 2014) for the Airly Mine Extension Project identified that the Project Application Area contains the Airly Shale Mining Complex, which comprise of 34 sites at Airly Village and three sites within the Torbane processing site a Carinya. The Airly Village sites sit wholly within the Mugii Murum-ban SCA managed by the NPWS. Although the Airly Village will be undermined, the low levels of subsidence predicted do not pose a risk to remnant structures. The risk to rehabilitation from disturbance of a heritage site or artefact was therefore deemed low.

Non-indigenous heritage management is detailed in the Western Region Historic Heritage Management Plan (HHMP) which has been prepared to provide Centennial with a consistent approach to Centennial's consultation with historic heritage identification, recording and management. The HHMP covers historic heritage protected under the NSW Heritage Act 1977.

3.3.19 Bushfire

The majority of the land within the MOP Area is heavily forested with native vegetation and has been identified as bushfire prone land. As such, there is a risk of impact during extreme fire danger periods and the potential for personnel to be exposed to bushfire in isolated or rough terrain, with limited access provisions and potentially hindering a safe evacuation. The risk of bushfire impacting rehabilitation and infrastructure was considered moderate during the risk assessment.

Airly has developed a Bushfire Management Plan. Fire risk management measures include:

- Prohibiting entry to the Mugii Murum-ban SCA during periods of extreme fire weather;
- Managing potential sources of ignition via a hot works management system;
- Maintaining firebreaks surrounding Centennial Airly operations;
- Providing firefighting equipment at Centennial Airly operations;
- Maintaining a water supply for firefighting purposes;
- Trained and competent personnel on-site who can conduct fire-fighting if required; and
- Regular dialogue with the local Rural Fire Service (RFS) and NPWS in relation to Bushfire Management Practices.

~~Centennial Airly will review the Bush Fire Management Plan during the MOP term.~~

In accordance with the EAMSIMP, specific risk management actions will also be implemented for exploration drilling and/or monitoring activities including:

- No drilling will be conducted on total fire ban days;
- Firefighting equipment will be kept on all active sites at all times;
- Airly has a hot work management system that needs to be followed to prevent any fires resulting from hot works outside of designated areas.
- Fire trails and access tracks are maintained to a suitable standard to allow vehicle access for fire prevention and fire fighting purposes;
- Operational procedures and evacuation planning will be prepared prior to the commencement of site preparation works to identify site specific emergency access/egress; and
- Evacuation plans and emergency contacts are provided on site and will be included in the staff inductions, as will the significance of working in bushfire prone land.

~~In accordance with the conditions of the DA033/19, a revised Bushfire Management Plan has been prepared to incorporate additional management measures associated with the solar farm.~~

Furthermore, any specific or additional bushfire risk management requirements of the landholder (i.e. NPWS) will be complied with during project planning and prior to site establishment.

3.3.20 Drought

Prolonged periods to dry weather could impact on the success of rehabilitation therefore drought was identified as a moderate risk to rehabilitation during the risk assessment. Water storage exists onsite in accordance with the Water Management Plan, but Centennial Airly will investigate options for additional water storage dams to address this risk.

3.3.21 Public Safety

Public safety was considered a moderate risk to rehabilitation during the risk assessment. The main public safety risks include illegal access either on foot, car or motorbike and resultant injury whilst on site. There are two security gates on the access road into Airly. The site is fully fenced and

security patrols occur twice daily after hours. An after-hours telephone number is displayed at the front entrance in the case of an emergency. Airly site will ultimately be attended 24 hours per day, 5 days per week.

The performance of security provisions will be monitored as part of ongoing risk assessments, including a review of the Highwall security fence.

3.3.22 Social and Community

During the risk assessment, the potential that community expectations for closure were not met because of inadequate rehabilitation was considered low. Consultation with the local community will continue to be undertaken through CCC meetings and community updates at the monthly Capertee Progress Association Meetings.

The social impact caused by mine closure was deemed a moderate risk due to loss of employment, however Centennial Airly will develop a Stakeholder Engagement Strategy for Mine Closure during detailed mine closure planning to address these impacts.

3.3.23 Sealing of Underground Entries

Inadequate sealing of adits, drifts, portals, shafts and boreholes was identified as a moderate risk to rehabilitation at Airly, resulting in potential public safety issues and failure to satisfy regulatory requirements required for lease relinquishment. To address this risk, Airly have developed the EAMSIMP to address the progressive sealing and rehabilitation of exploration boreholes and groundwater monitoring bores when they are no longer required for ongoing monitoring. In addition, a detailed sealing strategy will be prepared prior to closure to address the sealing of all remaining adits, portals and shafts.

3.4 Additional Studies

Based on the outcomes of the risk assessment, Centennial Airly commit to undertaking the additional studies outlined in **Table 15** to inform rehabilitation and closure activities and to mitigate and manage identified risks to rehabilitation.

Table 13 – Further Studies Required to Inform Closure Activities

Aspect	Study	Objective	Proposed Timing
Surface and Groundwater	Water storage review	Review option for downstream water control dam.	During the MOP term
	Closure Groundwater Monitoring and Management Plan	Address the requirements of Schedule 4 Condition 29(e) of SSD-5581 to address potential groundwater impacts following the closure of the mine.	5 years prior to mine closure
Sealing of Exploration Boreholes	Exploration Activities and Minor Surface Infrastructure Management Plan	Prepare an Exploration Activities and Minor Surface Infrastructure Management Plan in accordance with Condition 26, Schedule 4 of SSD-5581 to address the sealing rehabilitation of exploration boreholes.	Currently being prepared
Sealing of Underground Entries	Detailed Sealing Strategy	Develop a detailed sealing strategy for all adits, drifts, portals, shafts and boreholes in accordance with relevant guideline in order to achieve lease relinquishment	5 years prior to mine closure
Drought	Water Storage	Investigate options for additional water dam storage in the event of prolonged period of dry	5 years prior

Aspect	Study	Objective	Proposed Timing
		weather. Investigate options for rehabilitation irrigation using site storage dams.	to mine closure
Social impacts	Social Impact Assessment	Undertake stakeholder consultation regarding mine closure five years prior to planned closure of the mine to assist in minimise long term impacts associated with mine closure, including socio-economic impacts.	5 years prior to mine closure

4 Post Mining Land Use

4.1 Regulatory Requirements

The regulatory requirements specific to post mining land-use and rehabilitation outcomes at Airly Mine are summarised in **Table 14**.

Table 14 – Regulatory Requirements

Condition	Requirement	Applicable areas	Status																						
SSD-5581 Schedule 4 Condition 27 25	Rehabilitation Objectives The Applicant must rehabilitate the site to the satisfaction of DRE. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EIS (and depicted conceptually in Appendix 10), and comply with the objectives in Table 7. Table 7: Rehabilitation Objectives <table><tr><th>Feature</th><th>Objective</th></tr><tr><td>Site (as a whole)</td><td> - Safe, stable and non- polluting. </td></tr><tr><td>Surface infrastructure</td><td> - To be decommissioned and removed, unless DRE the Resources Regulator agrees otherwise. - The Reject Emplacement Area and all surface infrastructure to be made safe and hydraulically and geotechnically stable. - All surface infrastructure sites are to be revegetated with suitable local native plant species to a landform consistent with the surrounding environment. </td></tr><tr><td>Rehabilitation materials</td><td> - Materials from areas disturbed under this consent (including topsoils, substrates and seeds) are to be recovered, managed and used as rehabilitation resources. </td></tr><tr><td>REA</td><td> - The REA is to be revegetated with suitable local native plant species, and to a landform consistent with the surrounding environment - Capping materials (including depth of application) are to be approved by DRE the Resources Regulator prior to capping </td></tr><tr><td>Revegetated final landforms</td><td> - Stable and sustain the intended land use. - Consistent with surrounding topography to minimise visual impacts. - Incorporate relief patterns and design principles consistent with natural drainage </td></tr><tr><td>Native flora and fauna</td><td> - Flora species used in rehabilitation selected to re-establish and complement local and regional biodiversity. - Rehabilitated areas contribute to achieving self-sustaining biodiversity habitats. </td></tr><tr><td>Cliffs and steel slopes</td><td> - No additional risk to public safety compared to pre-mining conditions </td></tr><tr><td>All watercourses subject to mine-water discharges and/or subsidence impacts</td><td> - Hydraulically and geomorphologically stable, with aquatic ecology and riparian vegetation that is the same, or better than, prior to grant of this consent. </td></tr><tr><td>Water quality</td><td> - Water retained on site is fit for the intended post mining land use(s) - Water management is consistent with the regional catchment management strategy. </td></tr><tr><td>Community</td><td> - Ensure public safety. - Minimise the adverse socio- economic effects associated with mine closure. </td></tr></table> <i>Note: These rehabilitation objectives apply to all subsidence impacts and environmental consequences caused by mining taking place after the date of this consent, and to all surface infrastructure part of the project, whether conducted prior to or following the date of this consent.</i>	Feature	Objective	Site (as a whole)	Safe, stable and non- polluting.	Surface infrastructure	- To be decommissioned and removed, unless DRE the Resources Regulator agrees otherwise. - The Reject Emplacement Area and all surface infrastructure to be made safe and hydraulically and geotechnically stable. - All surface infrastructure sites are to be revegetated with suitable local native plant species to a landform consistent with the surrounding environment.	Rehabilitation materials	Materials from areas disturbed under this consent (including topsoils, substrates and seeds) are to be recovered, managed and used as rehabilitation resources.	REA	- The REA is to be revegetated with suitable local native plant species, and to a landform consistent with the surrounding environment - Capping materials (including depth of application) are to be approved by DRE the Resources Regulator prior to capping	Revegetated final landforms	- Stable and sustain the intended land use. - Consistent with surrounding topography to minimise visual impacts. - Incorporate relief patterns and design principles consistent with natural drainage	Native flora and fauna	- Flora species used in rehabilitation selected to re-establish and complement local and regional biodiversity. - Rehabilitated areas contribute to achieving self-sustaining biodiversity habitats.	Cliffs and steel slopes	No additional risk to public safety compared to pre-mining conditions	All watercourses subject to mine-water discharges and/or subsidence impacts	Hydraulically and geomorphologically stable, with aquatic ecology and riparian vegetation that is the same, or better than, prior to grant of this consent.	Water quality	- Water retained on site is fit for the intended post mining land use(s) - Water management is consistent with the regional catchment management strategy.	Community	- Ensure public safety. - Minimise the adverse socio- economic effects associated with mine closure.	Project Application Area	In progress
Feature	Objective																								
Site (as a whole)	Safe, stable and non- polluting.																								
Surface infrastructure	- To be decommissioned and removed, unless DRE the Resources Regulator agrees otherwise. - The Reject Emplacement Area and all surface infrastructure to be made safe and hydraulically and geotechnically stable. - All surface infrastructure sites are to be revegetated with suitable local native plant species to a landform consistent with the surrounding environment.																								
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Native flora and fauna	- Flora species used in rehabilitation selected to re-establish and complement local and regional biodiversity. - Rehabilitated areas contribute to achieving self-sustaining biodiversity habitats.																								
Cliffs and steel slopes	No additional risk to public safety compared to pre-mining conditions																								
All watercourses subject to mine-water discharges and/or subsidence impacts	Hydraulically and geomorphologically stable, with aquatic ecology and riparian vegetation that is the same, or better than, prior to grant of this consent.																								
Water quality	- Water retained on site is fit for the intended post mining land use(s) - Water management is consistent with the regional catchment management strategy.																								
Community	- Ensure public safety. - Minimise the adverse socio- economic effects associated with mine closure.																								

Condition	Requirement	Applicable areas	Status
SSD-5581 Schedule 4 Condition 28 26	Progressive Rehabilitation The Applicant must rehabilitate the site progressively, that is, as soon as practicable following disturbance. All reasonable and feasible measures must be taken to minimise the total area exposed for dust generation at any time.	Project Application Area	In progress
Airly Mine Extension Project EIS Statement of Commitments	Decommissioning and Rehabilitation Strategy The Proposed REA will be rehabilitated in stages and limited progressive vegetation batters will occur with each lift of the REA. Native species tree planting at the base of the REA will be undertaken prior to the commencement of the REA establishment to provide visual screening. On the completion of mining and associated activities, all disturbed areas will be rehabilitated, through the following stages: - Decommissioning: demolition of infrastructure; - Landform establishment: shaping, bulk earthworks and construction of drainage works; - Growth media development: topsoiling and application of soil ameliorants - Ecosystem establishment: revegetation; - Ecosystem sustainability: monitoring and maintenance.		To be prepared within 5 years of mine closure
ML 1331 Condition 2	Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.	Lease Area	In progress
AUTH 232, Condition 25	The licence holder must ensure that all topsoil removed in the course of prospecting operations is stockpiled for later use in rehabilitating those operations.	Lease Area	In progress
AUTH 232, Condition 39	The licence holder must ensure that all water land and wetland crossings that are disturbed during prospecting operations are rehabilitated such that the natural flow of water is unimpeded and bank stability is maintained to prevent erosion.	Lease Area	In progress
AUTH 232, Condition 40	The licence holder must comply with any relevant guidelines issued by the Secretary in the rehabilitation of disturbance resulting from prospecting operations under this exploration licence.	Lease Area	In progress
AUTH 232, Condition 41	All rehabilitation of disturbance resulting from prospecting operations under this exploration licence must be completed before the expiry of this exploration licence or as soon as practicable following cancellation of this exploration licence, unless otherwise approved by the Minister.	Lease Area	In progress
AUTH 232, Condition 42	Boreholes that have been abandoned as a result of previous mining or prospecting operations, and which have been opened up or used by the licence holder are subject to the conditions of this exploration licence as if the boreholes were constructed by the holder of this exploration licence.	Lease Area	In progress

4.2 Post Mining Land Use Goal

The conceptual long term mine rehabilitation objective is to provide a low maintenance, geotechnically stable and safe landform that is commensurate with the surrounding area.

Post mining land use options for the Airly Mine were assessed in the Airly Mine Extension Project Decommissioning and Rehabilitation Strategy (SLR Consulting, 2014) which was prepared for the Airly Mine Extension Project EIS.

The intended post-mining land use for the disturbed areas around the Airly Pit Top a mixture of open forest commensurate with the adjacent native vegetation and Muglii Murum-ban SCA, and pasture capable consistent with the pre-mining land use.

As Airly is an underground mine, the remainder of the MOP Area will not be disturbed. The exception to this might be areas impacted by subsidence which will be addressed and managed on an ongoing basis through the approved Extraction Plan(s). As there will be limited disturbance, the pre-mining land use(s) will not be significantly impacted and therefore the post-mining land use(s) will be consistent with pre-mining conditions.

A conceptual final landform rehabilitation plan which details the proposed post-mining land use(s) is provided on **Plan 4**.

4.3 Rehabilitation Objectives

Rehabilitation objectives for the Airly Mine are outlined in Schedule 3, Condition ~~27~~ 25 of Development Consent SSD-5581 and have been provided in **Table 18**.

Table 15 – SSD-5581 Rehabilitation Objectives

Feature	Objective
Site (as a whole)	• Safe, stable and non- polluting.
Surface infrastructure	• To be decommissioned and removed, unless DRE agrees otherwise. • The Reject Emplacement Area and all surface infrastructure to be made safe and hydraulically and geotechnically stable. • All surface infrastructure sites are to be revegetated with suitable local native plant species to a landform consistent with the surrounding environment.
Rehabilitation materials	• Materials from areas disturbed under this consent (including topsoils, substrates and seeds) are to be recovered, managed and used as rehabilitation resources.
REA ¹	• The REA is to be revegetated with suitable local native plant species, and to a landform consistent with the surrounding environment • Capping materials (including depth of application) are to be approved by DRE prior to capping
Revegetated final landforms	• Stable and sustain the intended land use. • Consistent with surrounding topography to minimise visual impacts. • Incorporate relief patterns and design principles consistent with natural drainage
Native flora and fauna	• Flora species used in rehabilitation selected to re-establish and complement local and regional biodiversity. • Rehabilitated areas contribute to achieving self-sustaining biodiversity habitats.
Cliffs and steel slopes	• No additional risk to public safety compared to pre-mining conditions
All watercourses subject to mine-water discharges and/or subsidence impacts	• Hydraulically and geomorphologically stable, with aquatic ecology and riparian vegetation that is the same, or better than, prior to grant of this consent.
Water quality	• Water retained on site is fit for the intended post mining land use(s) • Water management is consistent with the regional catchment management strategy.
Community	• Ensure public safety. • Minimise the adverse socio- economic effects associated with mine closure.

Note 1 – the construction of the REA approved by SSD-5581 is not currently proposed during the MOP period.

4.4 Detailed Mine Closure Planning

In accordance with the Airly Mine Extension Project Decommissioning and Rehabilitation Strategy (SLR Consulting, 2014) and the *Strategic Framework for Mine Closure* (Minerals Council of Australia, 2004) Airly will commence the detailed mine closure planning process at least five years prior to the anticipated mine closure date (i.e. the planned cessation of mining). Based upon current approvals, mining operations at Airly will cease in 2038. Detailed mine closure planning will include the following:

- Stakeholder consultation regarding mine closure will commence five years prior to planned closure of the mine to assist in minimise long term impacts associated with mine closure, including socio-economic impacts;
- An agreed detailed mine closure plan will be developed at least two years prior to the anticipated mine closure date;
- A Closure Groundwater Monitoring and Management Plan to address the requirements of Schedule 4 Condition 29e of SSD 5581;
- An infrastructure demolition plan will be developed two years prior to mine closure; and
- The final closure plan will be submitted to the appropriate regulatory agencies for approval two years prior to cessation of mining.

5 Rehabilitation Planning and Management

5.1 Domain Selection

Primary and secondary domains have been defined in accordance with the methodology prescribed in *ESG3: Mining Operations Plan (MOP) Guidelines* (DRE 2013). As such, the following applies:

- Primary domains are defined as the set of discrete areas that have a particular operational or functional purpose. Land management units with similar operational function are likely to have similar geophysical features and constraints/opportunities for rehabilitation.
- Secondary domains are land management units with similar post mining land use objectives, such as woodland communities and native grasslands.

Accordingly, domains have been defined considering the operational function and specific final land use objectives. Domains at the commencement of the MOP period are shown in **Plan 2**, and listed in **Table 16**.

Table 16 – MOP Domains

Code	Primary Domain (Operational)	Code	Secondary Domain (Post Mining Land Use)
1	Infrastructure - Includes all existing infrastructure and facilities at the Airly Mine including the rail loop, coal handling infrastructure, administration buildings, workshops, car parks and access roads, the solar farm and hardstand/laydown areas. It also includes underground mining infrastructure including the box cut and underground mine access portal, ventilation shafts, and exploration and groundwater monitoring bores.	A	Rehabilitation Area – Forest – areas at the pit top to be rehabilitated to native forest comprising of a mixture of native trees and shrubs.
2	Water Management Area - Includes the network of dams and associated water management infrastructure at the Airly Pit Top.	B	Rehabilitation Area – Rural Land – areas to be rehabilitated with perennial pasture species commensurate with pre-mining land use.
3	Stockpiled Material - Includes the Product Coal Stockpile and Emergency Stockpile	C	Retained Water Management Area – includes the dams and water management structures to be retained in the final landform.
4	Underground Mining Area - This domain encompasses the surface areas above the underground workings that will be monitored for potential subsidence impacts in accordance with the existing (and future) Extraction Plan(s).	D	Other Lands – Areas within the MOP area which have been generally undisturbed by mining will retain their pre-mining land use.
5	Existing Rehabilitation Area – this domain encompasses the area of rehabilitation to the north of the surface conveyor and emergency stockpile	-	
6	Other Lands - This domain incorporates all lands within the MOP area not captured by domains 1 to 5 above.	-	

5.2 Domain Rehabilitation Objectives

General rehabilitation objectives for Airly are outlined in **Section 4.3**. Rehabilitation domains require specific management objectives to realise the desired final land use outcome due to the distinct features associated with the current land function.

Key rehabilitation objectives for the Domains identified in **Section 5.1** are defined in **Table 20**.

Table 17 – Domain Rehabilitation Objectives

Code	Domain	Rehabilitation Objective
Primary Domains		
1	Infrastructure Area	- The mining infrastructure will be decommissioned and removed progressively; - Drainage structures will be designed and constructed where required in accordance with Blue Book requirements; - All land contamination / hazardous materials will be identified and appropriately remediated; - All mine openings including boreholes, shafts and declines will be backfilled, sealed and rehabilitated in accordance with the relevant DRE requirements; and - Final landforms are safe, stable, non-polluting and compatible with the surrounding landscape.
2	Water Management Area	- Water quality leaving site to be in accordance with the EPL water quality criteria; - Quality of water should not cause significant deterioration of water quality for the downstream beneficial users; and - Drainage structures will be designed and constructed where required in accordance with Blue Book requirements. - Final landforms are safe, stable, non-polluting and compatible with the surrounding landscape.
3	Stockpiled Material	- Final landforms are safe, stable, non-polluting and compatible with the surrounding landscape. - All carbonaceous material will be removed; and - All land contamination / hazardous materials will be identified and appropriately removed or remediated.
4	Underground Mining Area	- Final landforms are safe, stable, non-polluting and compatible with the surrounding landscape; - Cliffs and steep slopes present no additional risk to public safety compared to pre-mining conditions; - Drainage structures will be designed and constructed where required in accordance with Blue Book; - All mine openings including boreholes, shafts and declines will be backfilled, sealed and rehabilitated in accordance with the relevant DRE requirements. - Identified surface cracks resulting from subsidence are remediated appropriately in line with approvals.
5	Existing Rehabilitation Area	- Final landforms are safe, stable, non-polluting and compatible with the surrounding landscape; - Post mining land use to be self-sustaining natural ecosystem comprising native trees and shrubs generally representative of vegetation in comparable analogue communities; - Weeds and feral animal species do not present a risk to rehabilitation; - Drainage structures will be designed and constructed where required in accordance with Blue Book requirements; - Erosion does not present a safety hazard or compromise the post mining land capability; and - Vegetation meets the long term completion criteria being low maintenance and self-sustaining.
6	Other Lands	- Final landforms are safe, stable, non-polluting and compatible with the surrounding landscape; - All mining related material has been removed; - Cliffs and steep slopes present no additional risk to public safety compared to pre-

Code	Domain	Rehabilitation Objective
		mining conditions; - All mine openings including boreholes, shafts and declines will be backfilled, sealed and rehabilitated in accordance with the relevant DRE requirements. - Ecosystem composition satisfying completion criteria.
Secondary Domains		
A	Rehabilitation Area – Forest	- Final landforms are safe, stable, non-polluting and compatible with the surrounding landscape; - Post mining land use to be self-sustaining natural ecosystem comprising native trees and shrubs generally representative of vegetation in comparable analogue communities; - Cliffs and steep slopes present no additional risk to public safety compared to pre-mining conditions; - Weeds and feral animal species do not present a risk to rehabilitation; - Drainage structures will be designed and constructed where required in accordance with Blue Book requirements; - Erosion does not present a safety hazard or compromise the post mining land capability; and - Vegetation meets the long term completion criteria being low maintenance and self-sustaining.
B	Rehabilitation Area – Rural Land	- Final landforms are safe, stable, non-polluting and compatible with the surrounding landscape; - Post mining land use to pasture commensurate with pre-mining land use (Land Capability Class VI or better); - Weeds and feral animal species do not present a risk to rehabilitation; - Drainage structures will be designed and constructed where required in accordance with Blue Book requirements; and - Erosion does not present a safety hazard or compromise the post mining land capability.
C	Retained Water Management Area	- Final landforms are safe, stable, non-polluting and compatible with the surrounding landscape; - Water management is consistent with the regional catchment management strategy; - Water quality leaving site to be in accordance with the EPL water quality criteria; and - Drainage structures will be designed and constructed where required in accordance with Blue Book requirements.
D	Other Lands	- Final landforms are safe, stable, non-polluting and compatible with the surrounding landscape; - Ecosystem composition satisfying completion criteria.

5.3 Rehabilitation Phases

Achievement of the agreed post mining land use will be reached through a series of conceptual rehabilitation phases which are described as:

- **Phase 1: Decommissioning** – removal of hardstand areas, plant, equipment, buildings and other structures, and all contaminated materials and hazardous materials.
- **Phase 2: Landform Establishment** – incorporates gradient, slope aspect, drainage, substrate material characterisation and morphology.
- **Phase 3: Growth Medium Development** – incorporates physical structure, chemical properties and biological properties of a soil stratum suitable for plant growth,
- **Phase 4: Ecosystem and Land Use Establishment** – incorporates revegetated lands and habitat augmentation; species selection, species presence and growth. Incorporates management activities such as weed and feral pest control to achieve species establishment and growth to juvenile communities and habitat augmentation.

- **Phase 5: Ecosystem and Land Use Sustainability** – Incorporates features including species reproduction, nutrient recycling and community structure which are the key elements of a sustainable landscape.
- **Phase 6: Land Relinquishment** – Completion criteria for rehabilitation are met and the land is determined to be suitable to be relinquished from the mine lease.

Table 18 – Summary of Rehabilitation Phases for each Domain at the End of MOP Term

Rehabilitation Phase \ Domain	Infrastructure – Rehabilitation Area Forest (1A)	Infrastructure – Rehabilitation Area Rural land (1B)	Water Management Area – Rehabilitation Area Forest (2A)	Water Management Area – Rehabilitation Area Rural land (2B)	Water Management Area – Retained Water Management Area (2C)	Stockpiled Material – Rehabilitation Area Forest (3A)	Stockpiled Material – Rehabilitation Area Rural Land (3B)	Underground Mining Area – Rehabilitation Area Forest (4A)	Existing Rehabilitation Area – Rehabilitation Area Forest (5A)	Other Lands – Other Lands (6D)
Active	✓	✓	✓	✓	✓	✓	✓	✓	✓	x
Phase 1 Decommissioning	x	x	x	x	x	x	x	x	✓	x
Phase 2 Landform Establishment	x	x	x	x	x	x	x	x	✓	x
Phase 3 Growth Medium Development	x	x	x	x	x	x	x	x	✓	x
Phase 4 Ecosystem and Land Use Establishment	x	x	x	x	x	x	x	x	✓	x
Phase 5 Ecosystem and Land Use Sustainability	x	x	x	x	x	x	x	x	x	x
Phase 6 Relinquished Lands	x	x	x	x	x	x	x	x	x	x

✓ = Areas of this domain are subject to this rehabilitation phase during MOP Term.

x = Domain not expected to enter this rehabilitation phase during the MOP Term.

6 Performance Indicators and Completion/Relinquishment Criteria

The completion criteria are objective target levels or values assigned to a variety of indicators (e.g. slope, species diversity, percent groundcover), which can be measured to demonstrate progress and ultimate success of rehabilitation. As such, they provide a defined end point, at which point in time rehabilitation can be deemed successful and the lease relinquishment process can proceed. The rehabilitation completion criteria for each of the rehabilitation phases at Airly Mine are listed in **Table 19 to Table 23**.

These completion criteria will be utilised to demonstrate achievement of rehabilitation objectives. It is noted that the completion criteria may be subject to refinement as the operation progresses, including as a result of consultation with the relevant stakeholders. The achievement (or otherwise) of the completion criteria will be monitored and reported within the annual reports to be submitted to relevant government agencies.

Table 19 – Phase 1 – Decommissioning Phase

Domain Objective	Performance Indicator	Completion Criteria	Justification/Source	Complete (Yes/No)	Link to TARP	Progress at start of MOP
All Primary Domains						
Final landforms are safe, stable, non-polluting and compatible with the surrounding landscape.	No public safety risk	Excavations have been rendered safe; all holes/pits and other openings are securely capped, filled or otherwise made safe; access to members of the public and livestock is restricted as appropriate to site conditions; no rubbish remains at the surface, or at risk of being exposed through erosion.	SSD _5581 Schedule 4 Condition 27	No	No	Not commenced
	Site security	Adequate fencing and gates has been installed (where required) prior to commencing decommissioning and demolition works. Redundant fencing is removed in accordance with this MOP.	NSW Work Health and Safety (Mines and Petroleum Sites) Act 2013	No	No	Not commenced
All hazardous and/or contaminated materials will be removed or remediated in-situ such that the land is suitable for the intended post mining land use.	Removal of hazardous materials	A hazardous materials assessment has been undertaken and any hazardous and contaminated materials are identified and removed from site by a licenced contractor (verified by Certificates of disposal).	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	No	Not commenced
	Remediation of contaminated land as required	A Phase 2 contamination assessment has been undertaken and any contaminated areas have been remediated so that appropriate guidelines for land use are satisfied.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	No	Not commenced
	Carbonaceous material	Remove remaining carbonaceous material.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	No	Not commenced
Domain 1 – Infrastructure						
Infrastructure (other than that remaining in the final landform) will be decommissioned	Removal of infrastructure	All surface infrastructure that is not required as part of the post-mining land use has been demolished and removed from the site (unless otherwise agreed in writing by the DRE and new landowner).	SSD _5581 Schedule 4 Condition 27 <i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	No	Not commenced

Domain Objective	Performance Indicator	Completion Criteria	Justification/Source	Complete (Yes/No)	Link to TARP	Progress at start of MOP
progressively and rehabilitated when no longer required.	Demolition of infrastructure	All demolition work has been carried out in accordance with <i>AS2601-2001: Demolition of Structures</i> or its latest version.	AS2604-2001	No	No	Not commenced
	Removal of underground infrastructure	All underground infrastructure has been removed where required. The length of services to be dismantled will be determined by the regulatory requirements at the time of decommissioning.	This document	No	No	Not commenced
	Disconnect / remove services	All services, including power, water, data and telephone, that are not required for demolition activities have been safely isolated, disconnected and terminated. Generally all underground services will be made safe and left buried in-situ.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	No	Not commenced
	All surface entries and shafts sealed in accordance with DRE guidelines	All adits, shafts and drifts to be filled and capped in accordance with DRE guideline <i>MDG 6001 for the Permanent Filling and Capping of Surface Entries to Coal Seams</i> (DRE 2012), or contemporary equivalent. Once completed, all capping and filling has been appropriately verified and approved.	MDG 6001 Invalid source specified. SSD _5581 Schedule 4 Condition 27 SLR 2014	No	No	Not commenced
	Removal of machinery	All mobile machinery not required for rehabilitation activities has been removed from the site.	This document	No	No	Not commenced
	No petroleum, chemicals and explosive products on site	All petroleum, chemicals and explosive products have been removed from the site.	This document	No	No	Not commenced
	Footings and pads	Where not retained, all concrete footings, foundation pads and pavements have been broken up and either removed, beneficially reused across the site or sold for some other beneficial reuse.	Waste Classification Guidelines Invalid source specified.	No	No	Not commenced

Domain Objective	Performance Indicator	Completion Criteria	Justification/Source	Complete (Yes/No)	Link to TARP	Progress at start of MOP
	Bitumen roads, tracks, car parks and hard stand areas	All roads, tracks, car parks and hard stand areas not required for future land use (or agreed for retention with stakeholders) have been scalped to remove stabilised and compacted material. Inert waste has either been disposed of in a suitable location onsite or at an approved waste management facility offsite. Material assessed as non-hazardous or contaminated can be crushed and disposed of in associated mine portals or as fill in the shafts.	This document	No	No	Not commenced
Domain 2 – Water Management Area						
Mine water dams and sediment dams are decontaminated prior to removal or re-use as retained clean water dams in the final landform.	Removal of all water management structures not required in the final landform	All water management structures that are not required as part of the post-closure land use have been removed.	SSD _5581 Schedule 4 Condition 27	No	No	Not commenced
	Hazardous materials	Sediments accumulated in dams are removed from the floor of the dam prior to removal or converting to clean water structure.	SSD _5581 Schedule 4 Condition 27	No	No	Not commenced
	Pumping Infrastructure	All ancillary equipment including pumps and pipelines has been removed and services terminated.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	No	Not commenced
Domain 3 – Stockpiled Material						
All coal stockpiles will be excavated with all carbonaceous materials removed	Carbonaceous material	All carbonaceous material has been stripped and removed from the ROM stockpiles. This material has either been reprocessed for sale, used to backfill portals and shafts or placed against earthworks cuttings and highwalls and used as a buttress	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	No	Not commenced
Domain 4 – Underground Mining Area						
Infrastructure (other than that remaining in the final landform)	Subsidence Pegs	All subsidence pegs removed in consultation with DRE.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	No	Not commenced

Domain Objective	Performance Indicator	Completion Criteria	Justification/Source	Complete (Yes/No)	Link to TARP	Progress at start of MOP
will be decommissioned progressively and rehabilitated when no longer required.	Exploration and groundwater monitoring boreholes decommissioned and sealed	Exploration and groundwater monitoring wells have been decommissioned and sealed in accordance with DRE requirements, excluding those being retained for monitoring purposes.	Exploration and Minor Surface Infrastructure Management Plan (SLR 2017)	No	No	Ongoing
Domain 5 – Existing Rehabilitation Area						
No proposed decommissioning activities in this domain						
Domain 6 – Other Lands						
Infrastructure (other than that remaining in the final landform) will be decommissioned progressively and rehabilitated when no longer required.	Airly related materials	All mining related material removed, beneficially reused across the site or sold for some other beneficial reuse.	This MOP	No	No	Not commenced
	Removal of Centennial owned access tracks	Removal of all Centennial owned access tracks that are not required for monitoring or maintenance access.	This MOP	No	No	Not commenced
	Exploration and groundwater monitoring boreholes decommissioned and sealed	Exploration and groundwater monitoring wells have been decommissioned and sealed in accordance with DRE requirements, excluding those being retained for monitoring purposes.	Exploration and Minor Surface Infrastructure Management Plan (SLR 2017)	No	No	Not commenced

Table 20 – Phase 2 – Landform Establishment

Domain Objective	Performance Indicator	Completion Criteria	Justification/Source	Complete (Yes/No)	Link to TARP	Progress at start of MOP
All Primary Domains						
Final landforms are safe, stable, non-polluting and free-draining and compatible with the surrounding landscape.	Stable final land form	Geotechnical report completed by qualified person at mine closure shows landform is stable and suitable for post mining land use.	SSD _5581 Schedule 4 Condition 27 This document	No	No	Not Commenced
	Surface layer is free of any hazardous materials	Inspection conducted by a suitably qualified person confirms that the surface layer is free of any hazardous materials	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	No	Not Commenced
	Erosion control	Erosion control structures have been installed at intervals commensurate with the slope of the landform.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	1	Not Commenced
		There is no evidence of slumping in the landform or uncontrolled erosion that would cause a safety issue or compromise the preferred post mining land uses.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	1	Not Commenced
		Any gullies or rills are assessed to be limited and stabilising.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	1	Not Commenced
	Surface water drainage	The landform is stable and in-slope berms and water diversion drains are installed to direct water into stable areas or into sediment control basins sized generally in accordance with the <i>Managing Urban Stormwater: Soils and Construction, Volume 1</i> (the Blue Book) (Landcom, 2004) and <i>Volume 2E Mines and Quarries</i> (DECC, 2008) and any drainage or other studies .	Blue Book (Landcom 2004) and V2E (DECC 2008)	No	3	Not Commenced
Domain 1 – Infrastructure Area						

Domain Objective	Performance Indicator	Completion Criteria	Justification/Source	Complete (Yes/No)	Link to TARP	Progress at start of MOP
Final landforms are safe, stable, non-polluting and free-draining and compatible with the surrounding landscape.	Backfilled boxcut/highwalls	Geotechnical report completed by qualified person at mine closure shows landform is stable and suitable for post mining land use.	This MOP	No	No	Not Commenced
Domain 2 – Water Management Area						
Final landform drainage will integrate with surrounding catchments, achieve long term geomorphic stability and minimise erosion.	Stable landform	Water storages to remain in the final landform have been rehabilitated to a stable non-polluting condition.	SSD _5581 Schedule 4 Condition 27	No	No	Not Commenced
	Landform drainage design	Landform drainage structures including drains and retained dams have been designed and constructed in accordance with <i>Managing Urban Stormwater: Soils and Construction, Volume 1 and Volume 2E</i> , Mines and Quarries (the Blue Book) (Landcom, 2004) requirements and any drainage or other studies .	Blue Book (Landcom 2004) and V2E (DECC 2008)	No	3	Not Commenced
	Water management	Water management is consistent with the regional catchment management strategy	SSD _5581 Schedule 4 Condition 27	No	No	Not Commenced
	Geomorphic stability	Drainage structures are assessed to be hydraulically and geomorphologically stable with no active gully heads, tunnel erosion or bank failure.	SSD _5581 Schedule 4 Condition 27	No	1, 2	Not Commenced
Domain 4 – Underground Mining Area						
Final landforms are safe, stable, non-polluting, free-draining and consistent with the surrounding landform.	Subsidence	Any subsidence is within the maximum predicted limits outlined in the Extraction Plan and any impacts associated with the operations have been appropriately remediated as per the management procedures outlined in the Extraction Plan during the operation of the Mine. Areas of high risk will be monitored in accordance with the Extraction Plan.	Extraction Plan	No	No	Ongoing

Domain Objective	Performance Indicator	Completion Criteria	Justification/Source	Complete (Yes/No)	Link to TARP	Progress at start of MOP
		Subsidence remediated cracks are stable and minimise risk to the public, livestock and wildlife for post mining land use.	Extraction Plan			
	Slope gradient	Areas affected by mine induced subsidence will generally have gradients that are consistent with the pre-mining and/or the surrounding topography and which are geotechnically stable (i.e. no increased risk of landslip or mass slope failure).	SSD _5581 Schedule 4 Condition 27	No	No	Ongoing
Domain 5 – Existing Rehabilitation Area						
No proposed landform establishment activities in this domain						
Domain 6 – Other Lands						
No proposed landform establishment activities in this domain						

Table 21 – Phase 3 – Growth Medium Development

Domain Objective	Performance Indicator	Completion Criteria	Justification/Source	Complete (Yes/No)	Link to TARP	Progress at start of MOP
All Secondary Domains						
Final landform is safe, stable and non-polluting	Erosion controls	Appropriate erosion control structures have been installed prior to soil spreading.	This MOP, Erosion and Sediment Control Plan	No	1, 3	Not Commenced
Domain A – Rehabilitation Area Forest						
Growing media appropriate for the intended final land use is reinstated at all rehabilitation areas.	Topsoil depth	Native vegetation establishment has been successfully achieved with limited or no topsoil reinstatement on other sites. Where available, topsoil or a suitable alternative are spread uniformly to a depth that is appropriate for native vegetation growth.	Section 3.3.5 of this MOP, other Centennial sites	No	5, 6	Not Commenced
		Areas of benign bare earth utilised for targeted native vegetation establishment have leaf litter accumulated.		No	5	Not Commenced
	Amelioration	Where required appropriate soil ameliorants (e.g. gypsum, fertilisers, mulch) have been applied in accordance with specifications.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	No	Not Commenced
	Soil parameters	Topsoil's and topsoil substitutes have been tested to assess suitability for post mining land use. Properties of soil are within 20 % from relevant analogue site after 5 years of rehabilitation.	Based on criteria for similar sites.	No	6	Not Commenced
Domain B – Rehabilitation Area – Rural Land						
Growing media appropriate for the intended final land use is reinstated at all rehabilitation areas.	Topsoil	Where practicable, previously stockpiled topsoil has been used in the rehabilitation activities. Where it is assessed as not being suitable (or not available) an alternative topsoil substitute will be considered (for example bio-solids, organics etc)	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	5	Not Commenced
	Compacted land	Compacted land ripped to a depth of 300 mm.	Based on criteria for similar sites.	No	No	Not Commenced

Domain Objective	Performance Indicator	Completion Criteria	Justification/Source	Complete (Yes/No)	Link to TARP	Progress at start of MOP
	Topsoil spreading	Soil is spread to a depth of 0.2 m over surface (if available)	Based on criteria for similar sites.	No	5	Not Commenced
	Soil fertility	Topsoil's and topsoil substitutes have been tested to assess suitability for post mining land use. Properties of soil are within 20 % from relevant analogue site after 5 years of rehabilitation.	Based on criteria for similar sites.	No	6	Not Commenced
	Amelioration	Where required appropriate soil ameliorants (e.g. gypsum, fertilisers, mulch) have been applied in accordance with specifications.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	No	Not Commenced
	Soil protective cover	A minimum soil protective cover (vegetation or rock) of 70% has been achieved over vegetated areas.	Based on criteria for similar sites.	No	7	Not Commenced
Domain C – Retained Water Management Area						
Final landforms are safe, stable and non-polluting.	Discharge water quality	Discharge water quality meets EPL criteria with relevant contaminant limits (EC, pH, TSS and oil and grease)	EPL	No	4	Not complete

Table 22 – Phase 4 – Ecosystem and Land Use Establishment

Domain Objective	Performance Indicator	Completion Criteria	Justification/Source	Complete (Yes/No)	Link to TARP	Progress at start of MOP
All Secondary Domains						
Weeds and feral animal species do not present a risk to rehabilitation.	Weed presence	Monitoring verifies there are no significant weed infestations and weeds do not comprise a significant proportion of the species in any stratum.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	8	Ongoing
		Monitoring records indicate that noxious weeds are controlled in accordance with legislation and the MOP.	This MOP, Noxious Weeds Act 1993	No	8	Ongoing
	Feral animal presence	Monitoring records indicate that feral and pest animal species are controlled in accordance with relevant legislation and the MOP.	This MOP, Game and Feral Animal Control Act 2002, Local Land Services Act 2013, Non-indigenous Animals Act 1987	No	9	Ongoing
Water quality from rehabilitation area meets relevant water quality standards	Runoff water quality from rehabilitation areas	Water quality monitoring data provides evidence that runoff water quality from rehabilitation areas is within the range of baseline surface water from nearby creeks.	This MOP	No	4	Not Commenced
Erosion does not present a safety hazard or compromise the post mining land capability.	Erosion and Sediment Control	Visual monitoring indicates there is no significant erosion that compromises land capability or the intended final land use.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	1	Not Commenced
		Any gullies or rills are assessed to be limited and stabilising.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	1	Ongoing
	Surface Cover	Rehabilitation monitoring verifies that ground cover (vegetation, leaf litter, mulch) is greater than 70% at Year 5.	Tongway & Hindley 1996	No	7	Not Commenced
Management measures implemented to minimise bushfire risks in rehabilitation areas.	Bushfire risk management	Bushfire mitigation actions including managing fuel loads, maintaining fire-breaks and firefighting access are implemented in accordance with the Bushfire Management Plan.	Bushfire Management Plan	No	No	Ongoing

Domain Objective	Performance Indicator	Completion Criteria	Justification/Source	Complete (Yes/No)	Link to TARP	Progress at start of MOP
Domain A – Rehabilitation Area - Forest						
Woodland rehabilitation areas species diversity is comparable to analogue native vegetation community	Species Selection	A mixture of native trees, shrubs and grasses representative of regionally occurring woodland in analogue sites is present.	SSD _5581 Schedule 4 Condition 27	No	10	Not Commenced
	Vegetation health	Rehabilitation monitoring verifies more than 75% of trees are healthy and growing as indicated by rehabilitation monitoring at Year 5 following establishment.	Tongway & Hindley 1996	No	11	Not Commenced
	Species composition	Rehabilitation monitoring verifies species diversity for each stratum (canopy, mid storey and ground cover) is comparable to analogue sites for regionally occurring woodland at Year 5.	Tongway & Hindley 1996	No	10	Not Commenced
Land capability commensurate with pre-mining land capability	Habitat features	Habitat features are salvaged during clearing and where assessed as being of use, incorporated into wooded/forested rehabilitation areas.	This MOP	No	No	Not Commenced
Domain B – Rehabilitation Area – Rural Land						
Land capability of rural areas will be comparable to pre-mining land capability.	Species composition	At least 75% of species surveyed are representatives of the grassland species in analogue sites	Based on criteria for similar sites.	No	10	Not Commenced
		Two years following revegetation to grassland, species composition consist of grasses and legumes appropriate to the district and recognised as suitable for post mining land use.	Based on criteria for similar sites.	No	10	Not Commenced
	Ground cover	Twelve months following revegetation to grassland, vegetative cover is at least 70% over a minimum of 95% of areas treated.	Based on criteria for similar sites.	No	7	Not Commenced
Domain C – Retained Water Management Area						
Final landform drainage will integrate with surrounding catchments, achieve long term geomorphic stability and minimise erosion.	Discharge water quality	Discharge water quality meets the EPL criteria.	EPL	No	4	Ongoing Water generally meets criteria.
	Geomorphic stability	Drainage structures are assessed to be stable by a suitably qualified engineer at Year 5 following establishment.	Blue Book Vol 2E (DECC 2008)	No	3	Not Commenced

Table 23 – Phase 5 – Ecosystem Sustainability

Domain Objective	Performance Indicator	Completion Criteria	Justification/Source	Complete (Yes/No)	Link to TARP	Progress at start of MOP
All Secondary Domains						
Final landform is appropriate for the intended final land use.	Community structure	The community structure is commensurate with pre-mining conditions and/or nearby analogue sites.	This MOP	No	10	Not commenced
	Habitat	Typical food and water sources required by the majority of vertebrate and invertebrate inhabitants of that ecosystem type are present.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	No	Not commenced
	Land Management	The rehabilitated sites can be managed for the designated land uses without any greater management inputs than other land in the area being used for a similar purpose.	This MOP	No	No	Not commenced
Weeds and feral animal species do not present a risk to rehabilitation.	Weed presence	Monitoring verifies there are no significant weed infestations and weeds do not comprise a significant proportion of the species in any stratum.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	8	Not commenced
		Monitoring records indicate that noxious weeds are controlled in accordance with legislation and the MOP.	This MOP, Noxious Weeds Act 1993	No	8	Not commenced
	Feral animal presence	Monitoring records indicate that feral and pest animal species are controlled in accordance with relevant legislation and the MOP.	This MOP	No	9	Not commenced
Domain A – Rehabilitation Area - Forest						
Forest rehabilitation areas species diversity and structure is comparable to analogue native vegetation community.	Species composition	Rehabilitation monitoring verifies species diversity for each stratum (canopy, mid storey and ground cover) is comparable to analogue sites for regionally occurring woodland at Year 5.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	10	Not commenced
	Projected foliage cover	Projected foliage cover for each stratum is comparable to analogue sites.	(Tongway & Hindley, 1996)	No	No	Not commenced
	Vertebrate Species	Evidence of use of habitat resources (such as nest boxes, logs, leaf litter) by target fauna species.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	No	Not commenced
		Native fauna species abundance and diversity is on a trajectory towards representative analogue site abundance and diversity.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	No	Not commenced

Domain Objective	Performance Indicator	Completion Criteria	Justification/Source	Complete (Yes/No)	Link to TARP	Progress at start of MOP
	Vegetation health	More than 75 per cent of trees are healthy and growing as indicated by long term rehabilitation monitoring.	(Tongway & Hindley, 1996)	No	11	Not commenced
	Vegetation Structure	Rehabilitation monitoring confirms woodland rehabilitation areas provide a range of structural habitats (e.g. eucalypts, shrubs, ground cover, developing litter layer etc.).	Based on criteria for similar sites.	No	No	Not commenced
Domain B – Rehabilitation Area – Rural Land						
Land capability of rural areas will be comparable to pre-mining land capability.	Erosion and sediment control	No significant erosion is present that constitutes a safety hazard or compromises the capability of the supporting the end land use.	Based on criteria for similar sites.	No	1	Not commenced
	Species composition	Vegetation composition is assessed to consist of grasses and legumes representative of the district and recognised as suitable for a grazing post mining land use or as agreed with the landowner.	Based on criteria for similar sites.	No	No	Not commenced
	Vegetation Health	Vegetation health is comparable to analogue sites as indicated by long term rehabilitation monitoring.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	11	Not commenced
	Land capability	Lands rehabilitated to a grazing post mining land use are assessed to have a Land Capability Class 6 or better.	<i>Decommissioning and Rehabilitation Strategy</i> (SLR 2014)	No	No	Not commenced
Domain C – Retained Water Management Area						
Final landform drainage will integrate with surrounding catchments, achieve long term geomorphic stability and minimise erosion.	Discharge water quality	Discharge water quality meets the EPL requirements.	EPL	No	4	Ongoing - Water generally meets criteria.
	Discharge water quality	Water quality of the receiving waters is not affected by surface water runoff from the site, discharge water meets the contaminant limits (EC, pH, TSS and oil and grease) of the EPL criteria.	EPL	No	4	Ongoing - Water generally meets criteria.

7 Rehabilitation Implementation

7.1 Status at MOP Commencement

The status of each Primary and Secondary Domain at the commencement of this MOP Term has been shown on **Plan 2**. The status of operations and rehabilitation relevant to each domain at the commencement of the MOP Term is summarised in **Table 27**.

Table 24 – Rehabilitation Status at MOP Commencement

Code	Domain	Status at MOP Commencement
Primary Domains		
1	Infrastructure Area	This domain occupies 35.9 42.0 ha and is currently active and subject to ongoing operations.
2	Water Management Area	This domain occupies 10.0 10.1 ha and is currently active and subject to ongoing operations.
3	Stockpiled Material	This domain occupies 2.3 ha and is currently active and subject to ongoing operations.
4	Underground Mining Area	This domain occupies 2,177.3 ha and is currently subject to subsidence management activities as required.
5	Existing Rehabilitation Area	This domain includes all rehabilitated areas at MOP commencement. Rehabilitation management and maintenance is being undertaken as required.
6	Other Lands	This domain occupies 1,756.4 1,750.2 ha and is currently subject to management activities as required.
Secondary Domains		
A	Rehabilitation Area – Forest	This domain is currently active and subject to ongoing operations
B	Rehabilitation Area – Rural Land	This domain is currently active and subject to ongoing operations
C	Retained Water Management Area	This domain includes those dams which will be retained in the final landform. This domain is currently active and subject to ongoing operations
D	Other Lands	This domain is currently subject to management activities as required.

7.2 Proposed Rehabilitation Activities during the MOP Term

Disturbance and rehabilitation activities during the MOP Term are shown on **Plans 3A to 3H**. Rehabilitation activities to be completed during the term of this MOP will largely be confined to stabilisation, erosion control and revegetation of disturbed areas and maintenance and monitoring of areas of rehabilitation including:

- Progressive rehabilitation of exploration and/or groundwater monitoring sites (refer **Section 2.2.1**);
- Rehabilitation of areas affected by subsidence, as required, in accordance with an approved SMP or Extraction Plan; and
- Maintenance and monitoring of areas of existing rehabilitation.

Table 28 summarises the forecast total disturbance and rehabilitation areas for each year of the MOP Term.

Table 25 – Rehabilitation and Disturbance Rates during the MOP Term

Year	Total Disturbance Area (ha)	Total Rehabilitation Area (ha)	Cumulative Rehabilitation Area (ha)	Comments
Start of MOP	48.2	0.98	0.98	See Plan 2
2018	48.2	0.98	0.98	See Plan 3A
2019	48.2 54.4	0.98	0.98	No disturbance or rehabilitation. Addition of 0.1 ha associated with the expansion of the Train Loader Dam and 0.1 ha of disturbance associated with stockpile material. Addition of 4.2 ha of disturbance associated with the solar farm. Addition of 0.3 ha of disturbance associated with the access track to the new HVAS. Addition of 1.4 ha of disturbance associated with an indicative pipeline from the rail loop to the Carinya Bore. Addition of 0.1 ha of disturbance associated with the pads required for the 4 tanks to the east of the 35 ML Dam.
2020	48.2 54.4	0.98	0.98	No disturbance or rehabilitation
2021	48.2 54.4	0.98	0.98	No disturbance or rehabilitation
2022	48.2 54.4	0.98	0.98	No disturbance or rehabilitation
2023	48.2 54.4	0.98	0.98	No disturbance or rehabilitation
2024	48.2 54.4	0.98	0.98	No disturbance or rehabilitation
End of MOP	48.2 54.4	0.98	0.98	See Plan 3B

7.3 Rehabilitation Methodologies for Activities in the MOP Term

The following sections outline the proposed rehabilitation activities for each of the relevant domains throughout the MOP period.

7.3.1 Domain 1 – Infrastructure Area

During the MOP Term decommissioning of exploration boreholes will be undertaken where they are not required for long term groundwater monitoring. All other facilities that are no longer required will be progressively removed and the area rehabilitated.

Following the completion of drilling and associated activities, all exploration drill holes will be sealed in accordance with relevant DRE guidelines at the time. Records will be kept to demonstrate the method used to seal each drill hole, volume and types of materials used and information on the drillhole such as depth, diameter and casing string(s) left in the hole. Where non-grouted casing

cannot be removed, grouting methods will be undertaken in accordance with DRE guidelines. All records relating to the sealing of drill holes will be provided to the DRE together with a declaration confirming that the work was carried out according to the guidelines.

Exploration drill holes that are consistent with the requirements of the Centennial Coal groundwater plan/model will be used for groundwater monitoring. These exploration boreholes will be approved to remain open or be partially grouted to allow access to install groundwater monitoring equipment to subsequently satisfy the commitments as outlined within the Airly Mine Extension Project EIS (Golder, 2014).

Following grouting or the installation of piezometers, all boreholes will be surveyed in accordance with DRE requirements to determine their horizontal and vertical positions and a permanent steel identification plate or reference mark will be placed at the location of each borehole for re-identification purposes.

Rehabilitation of the drill site will commence as soon as practical after completion of drilling activities and follows on from demobilisation of equipment and removal of waste materials. Following re-profiling to near the original landform within the disturbed areas, the stockpiled topsoil will be re-spread onto areas requiring rehabilitation. The disturbed areas will be seeded using species consistent with the surrounding vegetation.

Exploration bore sites which have groundwater piezometers installed will have surrounding surface disturbance rehabilitated, where practical. The groundwater monitoring equipment may be in used for the remaining Life of Mine (LOM). When the groundwater monitoring equipment is no longer required, the infrastructure will be cut off below ground level, grouted and sealed in accordance with DRE requirements. The remaining area will be rehabilitated. The success of rehabilitation will be checked within 12 months of drilling being completed.

Following the completion of rehabilitation and prior to lease relinquishment by DRE, Airly will seek confirmation that the landowner (NPWS) is satisfied with the standard of rehabilitation activities. To achieve this, Airly will provide the landowner with a copy of the DRE (2012) form titled *Landowner/Occupier Rehabilitation Statement (ESB-F06)*. Completed forms will be forwarded to DRE as part of an Exploration Rehabilitation and Relinquishment Report.

Unless required for future access to groundwater monitoring site or manage subsidence-related impacts, access tracks constructed to access each site will be progressively closed and rehabilitated. The tracks will be ripped using the tynes of a bulldozer (or similar) and previously cleared topsoil and vegetation (if any) will be pushed over the ripped surface.

7.3.2 Domain 2 – Water Management Area

This domain will remain active in the MOP Term. There is no proposed rehabilitation within this domain.

7.3.3 Domain 3 – Stockpiled Material

This domain will remain active in the MOP Term. There is no proposed rehabilitation within this domain.

7.3.4 Domain 4 – Underground Mining Area

Should subsidence impacts occur to surface features, remediation and rehabilitation will be undertaken in accordance with the existing Extraction Plan and future approved Extraction Plans

that will be developed. Specific subsidence remediation measures are/will be outlined in the Extraction Plans along with appropriate trigger action response plans (TARPs).

7.3.5 Domain 5 – Existing Rehabilitation Area

Activities associated with this domain are generally ongoing maintenance and land management. Maintenance at rehabilitated areas will include, but not be limited to:

- Weeds and pest/feral animal species control;
- Managing bushfire risks;
- Minor earthworks to remediate any significant erosion features, including contour banks and diversion channels;
- Infill planting and/or seeding to meet rehabilitation requirements; and
- Maintaining erosion and sediment controls.

7.3.6 Domain 6 – Other Lands

This domain will remain generally undisturbed by mining operations during the MOP term. Areas of this domain within Centennial owned lands to the west of the Mugii Murum-ban SCA will be managed as required by Airly including slashing and bushfire management. Areas within the Mugii Murum-ban SCA will continue to be managed by NPWS. Any disturbance by Centennial within the Mugii Murum-ban will be undertaken in accordance with the EAMSIMP.

7.3.7 Domain A – Rehabilitation Area – Forest

This domain will remain active during the MOP Term. Subsidence remediation will be undertaken as required throughout the MOP Term (refer **Section 7.3.4**).

7.3.8 Domain B – Rehabilitation Area – Rural Land

This domain will remain active during the MOP Term. Subsidence remediation will be undertaken as required throughout the MOP Term (refer Section 7.3.4).

7.3.9 Domain C – Retained Water Management Area

This domain refers to the surface water management structures (dams) that will be retained in the final landform following mine closure. The water management domain is active and subject to ongoing operations. The location of the water management structures that will be retained in the final landform are shown in **Plan 4**.

7.3.10 Domain D – Other Lands

As Domain 6.

7.4 Summary of Rehabilitation Areas during the MOP Term

A summary of the rehabilitation in each primary and secondary domain during the MOP Term is outlined in **Table 29**.

Table 26 – Summary of Rehabilitation Proposed during the MOP Term

Primary Domain	Secondary Domain	Code	Rehabilitation Phase	Area at start of MOP (ha)	Area at end of MOP (ha)	Comment
Infrastructure (1)	Rehabilitation Area - Forest (A)	1A	Active	14.27 14.3	14.27 14.3	There is the potential for exploration works to be undertaken in this domain during the MOP Term. Any disturbance, remediation and rehabilitation will be undertaken in accordance with the Exploration Activities and Minor Surface Infrastructure Management Plan. There is no other proposed disturbance or rehabilitation to this domain during the MOP Term Addition of approximately 0.1 ha of disturbance associated with the pads required for the 4 tanks to the east of the 35 ML Dam.
			Decommissioning	0	0	
			Landform Establishment	0	0	
			Growth Medium Development	0	0	
			Ecosystem & Land Use Establishment	0	0	
			Ecosystem Sustainability	0	0	
	Relinquished Lands	0	0			
	Rehabilitation Area - Rural Land (B)	1B	Active	21.67 27.7	23.63 27.7	There is no proposed disturbance or rehabilitation to this domain during the MOP Term Addition of 4.2 ha of disturbance associated with the solar farm constructed on the REA footprint. Addition of 0.3 ha of disturbance associated with the access track to the new HVAS. Addition of 1.4 ha of disturbance associated with an indicative pipeline from the rail loop to the Carinya Bore. There is no proposed rehabilitation to this domain during the MOP Term.
			Decommissioning	0	0	
			Landform Establishment	0	0	
			Growth Medium Development	0	0	
			Ecosystem & Land Use Establishment	0	0	
			Ecosystem Sustainability	0	0	
			Relinquished Lands	0	0	
Total for Domain 1				35.9 42.0	35.9 42.0	
Water Management Area (2)	Rehabilitation Area - Forest (A)	2A	Active	0.03	0.03	There are no proposed water management structures being constructed during the MOP Term. The Train Loader Dam will be expanded during
			Decommissioning	0	0	
			Landform Establishment	0	0	
			Growth Medium Development	0	0	

Primary Domain	Secondary Domain	Code	Rehabilitation Phase	Area at start of MOP (ha)	Area at end of MOP (ha)	Comment
			Ecosystem & Land Use Establishment	0	0	the MOP term to accommodate importation of water from Charbon. This will also include minor disturbance associated with existing pump and pipeline upgrades. Additionally there is no proposed rehabilitation to this domain during the MOP Term.
			Ecosystem Sustainability	0	0	
			Relinquished Lands	0	0	
Water Management Area (2)	Rehabilitation Area - Rural Land (B)	2B	Active	5.37 5.2	5.37 5.2	There are no proposed water management structures being constructed during the MOP Term. The Train Loader Dam will be expanded during the MOP term to accommodate importation of water from Charbon. This will also include minor disturbance associated with existing pump and pipeline upgrades. Additionally there is no proposed rehabilitation to this domain during the MOP Term.
			Decommissioning	0	0	
			Landform Establishment	0	0	
			Growth Medium Development	0	0	
			Ecosystem & Land Use Establishment	0	0	
			Ecosystem Sustainability	0	0	
			Relinquished Lands	0	0	
Water Management Area (2)	Retained Water Management Area (C)	2C	Active	4.61 4.8	4.61 4.8	There are no proposed water management structures being constructed during the MOP Term. The Train Loader Dam will be expanded during the MOP term to accommodate importation of water from Charbon. This will also include minor disturbance associated with existing pump and pipeline upgrades. Additionally there is no proposed rehabilitation to this domain during the MOP Term.
			Decommissioning	0	0	
			Landform Establishment	0	0	
			Growth Medium Development	0	0	
			Ecosystem & Land Use Establishment	0	0	
			Ecosystem Sustainability	0	0	
			Relinquished Lands	0	0	
Total for Domain 3				10.01 10.1	10.01 10.1	
Stockpiled Material (3)	Rehabilitation Area - Woodland (A)	3A	Active	1.57	1.57	There is no proposed rehabilitation to this domain during the MOP Term
			Decommissioning	0	0	
			Landform Establishment	0	0	
			Growth Medium Development	0	0	
			Ecosystem & Land Use Establishment	0	0	
			Ecosystem Sustainability	0	0	
			Relinquished Lands	0	0	
Stockpiled Material (3)	Rehabilitation Area – Rural Land (B)	3B	Active	0.69 0.8	0.69 0.8	There is no proposed rehabilitation to this domain during the MOP Term. Addition of 0.11 ha of disturbance associated with stockpile material.
			Decommissioning	0	0	
			Landform Establishment	0	0	
			Growth Medium Development	0	0	
			Ecosystem & Land Use Establishment	0	0	
			Ecosystem Sustainability	0	0	

Primary Domain	Secondary Domain	Code	Rehabilitation Phase	Area at start of MOP (ha)	Area at end of MOP (ha)	Comment
			Relinquished Lands	0	0	
Total for Domain 5				2.26 2.4	2.26 2.4	
Underground Mining Area (4)	Rehabilitation Area - Forest (A)	4A	Active	2,177.31	2,177.31	There is the potential for minor subsidence remediation works to be undertaken in this domain during the MOP Term. Any remediation and rehabilitation will be undertaken in accordance with the existing and future approved Extraction Plans.
			Decommissioning	0	0	
			Landform Establishment	0	0	
			Growth Medium Development	0	0	
			Ecosystem & Land Use Establishment	0	0	
			Ecosystem Sustainability	0	0	
			Relinquished Lands	0	0	
Total for Domain 4				2,177.31	2,177.31	
Existing Rehabilitation Area (5)	Rehabilitation Area - Forest (A)	5A	Active	0	0	Rehabilitation management and maintenance will be undertaken in this domain as required.
			Decommissioning	0	0	
			Landform Establishment	0	0	
			Growth Medium Development	0	0	
			Ecosystem & Land Use Establishment	0.98	0.98	
			Ecosystem Sustainability	0	0	
			Relinquished Lands	0	0	
Total for Domain 5						
Other Lands (6)	Other Lands (D)	6D	Active	1,756.36 1,750.2	1,756.36 1,750.2	Land management and maintenance will be undertaken in this domain as required. This domain has reduced due to the additional disturbance in domains 2 and 3 above.
			Decommissioning	0	0	
			Landform Establishment	0	0	
			Growth Medium Development	0	0	
			Ecosystem & Land Use Establishment	0	0	
			Ecosystem Sustainability	0	0	
			Relinquished Lands	0	0	
Total for Domain 6				1756.36 1,750.2	1756.36 1,750.2	
Overall Total				3982.9	3982.9	

7.5 Relinquishment Phase Achieved during the MOP Term

As mining activities at Airly are planned to continue past the MOP Term, no areas are anticipated to meet the required rehabilitation obligations for lease relinquishment.

8 Rehabilitation Monitoring and Research

8.1 Rehabilitation Monitoring

8.1.1 Proposed Monitoring Methodology

A commitment to effective rehabilitation involves an on-going monitoring program (with concurrent maintenance as required) that will be developed for the Airly Mine during the MOP Term. Areas of completed rehabilitation will be regularly inspected and assessed against the rehabilitation objectives and relevant completion criteria outlined in **Section 6**.

Centennial Airly are committed to establishing a dedicated monitoring system during the MOP Term to assess effectiveness of implementation of the rehabilitation measures and to identify the need for corrective action as soon as required. The initial scale of the monitoring program will reflect the nature of current disturbance/rehabilitation at Airly and will increase commensurately during the MOP term to incorporate new areas of rehabilitation.

The monitoring program will be developed for relevant domains, incorporating the most appropriate indicators and methods that:

- Provide a measure of completion criteria to be assessed in accordance with the defined rehabilitation objectives;
- Are reproducible;
- Utilise scientific recognised techniques; and
- Are cost-effective.

Monitoring of the rehabilitation areas will be undertaken using the Biobanking Assessment Methodology and the Ecosystem Function Analysis technique. Rehabilitation monitoring will include analysis of the following:

- Rehabilitation age and technique used;
- Slope and general soil description;
- Vegetation characteristics, which includes species, count and diversity results;
- Erosion observations, which will include type and severity of erosion along a 50 m transect;
- Sustainability assessment with regards to safety, landform stability and land use; and
- Limitations to future success of rehabilitation.

Monitoring will be conducted annually by independent, suitably skilled and qualified persons at locations which will be representative of the range of conditions on the rehabilitating areas. In addition to the rehabilitated areas, at least two reference/analogue sites will be monitored to allow a comparison of the development and success of the rehabilitation against a control. The selection of analogue sites is discussed further in **Section 8.2.1**.

Monitoring results, any required maintenance activities and any refinements of rehabilitation techniques will be reported in the site's Annual Review.

8.2 Research and Rehabilitation Trials and Use of Analogue Sites

8.2.1 Use of Analogue Sites

Data from analogue rehabilitation sites is an integral part of the monitoring procedure throughout the monitoring process. The purpose of analogue sites is to provide a reference against which to document the progress of rehabilitation towards reaching ecosystem health, structure and composition consistent with undisturbed areas.

During the MOP term, Centennial Airly will engage a suitably qualified person to select and monitor analogue sites to assess whether they are suitable in the context of the proposed final land use and to suggest the species that will be appropriate for revegetation.

Analogue sites are proposed with undisturbed areas in the vicinity of the Airly Pit Top corresponding with the intended post mining land use of native bushland and pasture, commensurate with pre-mining conditions.

Specific analogue sites will be selected based on the following general criteria:

- Contain vegetation types similar to the rehabilitation sites;
- Secure from future mining related disturbance; and
- Contain vegetation and conditions suitable as a basis for rehabilitation performance criteria.

The monitoring results from analogue sites will provide the basis for comparison to measure the success of the rehabilitation against the relevant closure criteria. Results of analogue site monitoring will be reported in the Annual Review.

9 Intervention and Adaptive Management

9.1 Threats to Rehabilitation

Where rehabilitation performance is not trending to the nominated completion criteria this may indicate that there is a threat to long term rehabilitation success. Threats to rehabilitation may include events such as periods of drought, bushfire events, or pressures from weeds and feral animals.

Section 3.4 provides examples of key threats to rehabilitation. Where rehabilitation monitoring indicates that there is a significant threat to rehabilitation, Airly Mine will undertake adaptive management in accordance with the TARP (refer **Section 9.2**).

9.2 Trigger Action Response Plan

The following TARP for rehabilitation has been developed to identify required management actions in the event of impacts specifically to rehabilitation areas, or where rehabilitation outcomes are not achieved in an acceptable timeframe. Where necessary, rehabilitation procedures will be amended accordingly with the aim of continually improving rehabilitation standards.

The TARP is provided as **Table 30**, and will be reviewed and may be revised as conditions at Airly change or new risks to rehabilitation are identified.

Table 27 – Rehabilitation Trigger Action Response Plan

Aspect/ Category	Key Element	Element Number	Trigger Response	Condition Green	Condition Amber	Condition Red
Landform stability	Erosion control	1	Trigger	No gully or tunnel erosion. No rilling present.	Minor gully or tunnel erosion present and/or rilling <300 mm deep.	Significant gully or tunnel erosion present and/or rilling >300 mm deep.
			Response	No response required. Continue monitoring program.	A suitably trained person to inspect the site. Investigate opportunities to install water management infrastructure to address erosion. Remediate as appropriate.	Undertake a review of the drainage of the area and provide recommendations to appropriately remediate the erosion. Remediate as soon as practicable.
	Free draining landforms	2	Trigger	No ponding or drainage issues present in landform	Landforms exhibiting minor ponding	Landforms exhibiting significant drainage issues, threatening or causing rehabilitation failure.
			Response	No response required. Continue monitoring program.	An inspection of the site will be undertaken by a suitably trained person. Investigate opportunities to address issues. Remediate as appropriate or as required by the landowner..	Undertake a review of the drainage design and provide recommendations to appropriately remediate the area. Remediate as soon as practicable or as required by the landowner. Liaison with DRE regarding landform.
	Water management structures	3	Trigger	Water management structures have been designed and constructed in accordance with Blue Book requirements and maintained in good condition with no erosion and/or scouring.	Water management structures (sediment dams, channels, contour banks) display minor erosion and/or scouring	Water management structures fail or display significant scouring / erosion
			Response	No response required. Continue monitoring program.	An inspection of the site will be undertaken by a suitably trained person. Identify remedial actions such as amelioration, re-vegetation or alternative scour protection	Engage suitable person to develop a site specific remediation plan and review water management structure design criteria

Aspect/ Category	Key Element	Element Number	Trigger Response	Condition Green	Condition Amber	Condition Red
Water Quality	Monitoring parameters	4	Trigger	Surface water quality of runoff from rehabilitation areas is within EPL criteria and rehabilitation performance criteria established within this document.	Water quality exceeds EPL or performance criteria but does <u>not</u> indicate a long-term rehabilitation issue. Monitoring does not illustrate impact to rehabilitation.	Water quality exceeds criteria, indicating a long term rehabilitation liability. Monitoring illustrates impact to rehabilitation.
			Response	No response required. Continue monitoring program.	Review and investigation of water quality monitoring and management where appropriate. Implement relevant remedial measures where required.	Reporting as per statutory reporting requirements. Implement relevant responses and undertake immediate review to determine source of issues and implement remediation measures identified as soon as practicable. Liaison with relevant regulatory authorities.
Soil quality	Topsoil quality	5	Trigger	Sufficient topsoil, benign overburden material or appropriate topsoil substitute material is identified for rehabilitation over the MOP term and for the Life of the Mine.	Topsoil balance indicates a deficiency in topsoil available (and an alternative media or benign overburden material is not available) for rehabilitation and there is a chance that the required rehabilitation outcomes may not be met.	Deficiency significant and alternate not available such that it will delay rehabilitation progression during the MOP term and the likelihood of rehabilitation success is low.
			Response	No response required. Continue monitoring program.	Investigate options and alternatives (e.g. organic growth medium [OGM]) to be able to meet future topsoil requirements. Continue to direct seed into material where possible and monitor.	Source and budget for purchasing topsoil for use in rehabilitation, Investigate use of alternatives such as OGM.
	Monitoring parameters	6	Trigger	Properties of soil are within 20 % from relevant analogue site after 5 years of rehabilitation.	Properties of soil are > 20 % from results at relevant analogue site after 5 years of rehabilitation; however area is able to sustain selected vegetation species.	Properties of soil are > 20 % from results at relevant analogue site after 5 years; the area is <u>not</u> able to sustain selected vegetation species.

Aspect/ Category	Key Element	Element Number	Trigger Response	Condition Green	Condition Amber	Condition Red
			Response	No response required. Continue monitoring program.	Investigate application of additional soil, and/or use of appropriate soil ameliorants or management options to address soil quality if deemed necessary.	Consultant to be engaged to assist with recommendations to appropriately remediate soil quality and depth. Remediate as soon as practicable.
Vegetation	Ground cover	7	Trigger	Five years following rehabilitation to woodland, $\geq 70\%$ total ground cover (vegetation, leaf litter, mulch) is present within rehabilitated areas.	Five years following rehabilitation to woodland, total ground cover (vegetation, leaf litter, mulch) of between 55 – 70 % in rehabilitated areas.	Five years following rehabilitation to woodland, total ground cover (vegetation, leaf litter, mulch) is $< 55\%$ within rehabilitated areas.
			Response	No response required. Continue monitoring program.	Review procedures where required to increase vegetation cover.	A suitably trained person to inspect the site. Investigate use of appropriate management options to remediate. Remediate as appropriate.
	Weed presence	8	Trigger	Twelve months following rehabilitation, no significant weed infestations present.	Twelve months following rehabilitation, $>10\%$ but $<25\%$ cover of undesirable species present.	Twelve months following rehabilitation, $>25\%$ cover of undesirable species present.
			Response	No response required. Continue monitoring program.	Engage weed management contractor to remove introduced species from the site.	Engage weed management contractor to remove introduced species from the site as soon as practicable. Investigate management measures to assist native plant establishment including use of ameliorants and implement as appropriate.

Aspect/ Category	Key Element	Element Number	Trigger Response	Condition Green	Condition Amber	Condition Red
	Pest animal species presence	9	Trigger	No significant pest animal species present.	Significant pest animal species present but do <u>not</u> threaten to cause rehabilitation failure.	Significant numbers of pest animals causing widespread damage to rehabilitation.
			Response	No response required. Continue monitoring program.	Consult with relevant authorities regarding appropriate pest animal control campaign.	Consult with relevant authorities regarding appropriate pest animal control campaign. Engage a suitably qualified specialist to prepare a site management plan and implement recommendations such as augmenting pest animal exclusion fencing and re-vegetation.
	Species composition	10	Trigger	Five years following rehabilitation species composition comprises a mixture of native trees, shrubs and/or grasses representative of vegetation in comparable analogue sites.	Five years following rehabilitation vegetation composition comprises <75% species consistent with analogue site.	Five years following vegetation composition comprises <60% species consistent with analogue site.
			Response	No response required. Continue monitoring program.	Review native seed mix and amend accordingly. Consider remedial actions such as tubestock planting or re-seeding to achieve required species composition.	An inspection of the site will be undertaken by a suitably trained person. Investigate remedial options to achieve required species composition and implement recommendations.

Aspect/ Category	Key Element	Element Number	Trigger Response	Condition Green	Condition Amber	Condition Red
	Vegetation Health	11	Trigger	Five years following rehabilitation ≥75% of trees / shrubs and grasses are healthy and growing.	Five years following rehabilitation <75 % but > 60% of trees / shrubs and grasses are healthy and growing.	Five years following rehabilitation <60% % of trees / shrubs and grasses are healthy and growing.
			Response	No response required. Continue monitoring program.	Undertake a field survey to identify likely causes of unsatisfactory vegetation health.	An inspection of the site will be undertaken by a suitably trained person to identify likely causes of unsatisfactory vegetation health. Investigate management measures to assist native plant sustainability and implement as appropriate.

10 Reporting

As is currently undertaken, during the MOP Term a summary of rehabilitation monitoring will be included in each Annual Review. This summary will include:

- Results of rehabilitation monitoring against key performance measures/indicators;
- Comparison of rehabilitation results against predictions presented in this MOP;
- Key trends in monitoring results and progression towards performance indicators and achievement of rehabilitation objectives;
- Reporting on discrepancies between the predicted and actual results;
- Reporting of where a TARP has been implemented to counter poor/unpredicted rehabilitation results or environmental impacts;
- Results of trials;
- Non-compliances;
- Incidents/near misses; and
- Any other requirements from the DRE.

The Annual Review will also be prepared to fulfil the requirements of a Rehabilitation Report as required by ML 1331.

11 Plans

Airly is classified as a Level 1 Mine, and therefore the following Plans have been prepared for this MOP:

- **Plans 1A – 1C** show the location and pre mining natural and physical environment at Airly;
- **Plan 2** shows the mine domains at commencement the MOP;
- **Plans 3A and 3B** show the general sequence of mining and rehabilitation activities at the start and the end of the MOP Term respectively. No surface disturbance or rehabilitation are proposed during the MOP Term and therefore an annual MOP Plan 3 series is not considered necessary;
- **Plan 4** shows the proposed post mining land use and landform at the end of mine life; and
- **Plan 5** shows vertical and longitudinal cross sections.

MOP Plans are attached as **Appendix 4**.

12 Review and Implementation of the MOP

12.1 Review of the MOP / Rehabilitation Management Plan

In accordance with the requirements of Schedule 6, Condition 3 of Development Consent SSD-5581, Airly will review and if necessary revise this document within three months of the following:

- a) Submission of an incident report;
- b) Submission of an Annual Review;
- c) Submission of an Independent Environmental Audit; or
- d) Any modification to the conditions of SSD-5581.

Additional triggers for a review of this document will include:

- Deficiencies identified during implementation of the MOP;
- Recommendations and results from rehabilitation monitoring; and
- Substantial changes to the mine plan.

If required, the proposed management strategies and control measures will be modified to address evolving site conditions, latent conditions and/or changes to the proposed exploration sequence. Any changes to the MOP will then be communicated to the relevant site personnel via daily “toolbox talk” training and weekly project meetings.

This management plan is a controlled document and will be reviewed on an as needs basis.

Following amendments, a copy of the revised MOP will be provided to the DPE and DRE for approval.

12.2 Implementation

Table 28 lists the Centennial Airly personnel who are responsible for the monitoring, review and implementation of this MOP.

Table 28 – MOP Responsibilities

Position	Responsibility
Mine Manager	• Authorisation of the MOP. • Delegation of resources to implement the MOP requirements. • Ensure all personnel undertaking works in relation to this MOP are trained and competent.
Mining Approvals Coordinator	• Implementation of the procedures listed in the MOP. • Ensure mine planning is consistent with the MOP. • Plan and coordinate future reviews of the MOP.
Environment and Community Coordinator	• Implement the MOP requirements and procedures. • Undertake rehabilitation monitoring and maintenance as required. • Commence detailed rehabilitation planning for Centennial Airly operations in accordance with this MOP. • Report on the progress of any rehabilitation and monitoring of rehabilitation success in the Annual Review. • Consult with regulatory authorities as required.

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APPENDICES

Appendix 1 – SSD_5581

Development Consent

Section 89E of the *Environmental Planning & Assessment Act 1979*

As delegate of the Minister for Planning, the Planning Assessment Commission of NSW approves the development application referred to in Schedule 1, subject to the conditions in Schedules 2 to 6.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the development.



Ms Robyn Kruk AM
Member of the Commission



Dr Maurice Evans
Member of the Commission



Mr David Johnson
Member of the Commission

Sydney

2016

SCHEDULE 1

Application Number:

SSD_5581

Applicant:

Centennial Airly Pty Limited

Consent Authority:

Minister for Planning

Land:

See Appendix 1

Development:

Airly Mine Extension Project

August 2018 MOD 1 in red type

July 2019 MOD 2 in blue type

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DEFINITIONS

Adaptive management	Adaptive management includes monitoring subsidence effects and impacts and, based on the results, modifying the mining plan as mining proceeds to ensure that the effects, impacts and/or associated environmental consequences remain within predicted and/or designated ranges and in compliance with the conditions of this consent
Annual review	The review required by condition 13 of Schedule 6
Applicant	Centennial Airly Pty Limited, or any other person/s who rely on this consent to carry out the development
ANZECC guidelines	Australian and New Zealand guidelines for fresh and marine water quality (2000), or their latest version
BCD	Biodiversity and Conservation Division, within the Department
BCA	Building Code of Australia
Built features	Includes any building or work erected or constructed on land, and includes dwellings and infrastructure such as any formed road, street, path, walk or driveway; pipeline; water, sewer, telephone, gas or other service main
CCC	Community Consultative Committee
Cliff	Continuous rock face, including overhangs, having a minimum length of 20 metres, a minimum height of 10 metres and a minimum slope of 2 to 1 (> 63.4°)
Cliff Line Zone and Zone of First Workings	The area of proposed mining shown in Figure 2 in Appendix 3, as may be modified by an approved Extraction Plan
CHPP	Coal Handling and Preparation Plant
Conditions of this consent	Conditions contained in Schedules 2 to 6 inclusive
Construction	The demolition of buildings or works, carrying out of works and erection of buildings covered by this consent
Council	Lithgow City Council
Date of commencement	The date notified to the Department by the Applicant under condition 9 of Schedule 2
Day	The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
Department	Department of Planning, Industry and Environment
Development	The development described in the EIS
DoEE	The Australian Government Department of the Environment and Energy, which administers the EPBC Act
DSC	Dams Safety Committee
EEC	Endangered ecological community, as defined under the <i>Threatened Species Conservation Act 1995</i>
EIS	The environmental impact statement titled <i>Airly Mine Extension Project</i> , dated September 2014 and associated response to submissions titled <i>Airly Mine Extension Project</i> , dated February 2015, including the supplementary information comprising water licensing requirements letter dated 6 March 2015, noise assessment letter dated 10 March 2015, MSEC peer review report dated 18 March 2015, revised economic impact assessment dated March 2015, ecotoxicology assessment dated March 2015, supplementary letters and attachments dated 15 April 2015, 8 May 2015 and 18 June 2015, and Centennial's responses to the IPRP's Report in letters dated 8 July and 19 July 2016, as modified by: MOD 1 - Airly Mine SSD_5581 MOD 1 – Statement of Environmental Effects including the associated Response to Submissions (dated 21 June 2018); and MOD 2 - Statement of Environmental Effects - Airly Mine Extension Project State Significant Development 5581 - Modification 2 (dated April 2019) including the associated Response to Submissions (dated 13 June 2019), and additional information provided by the Applicant on 24 June 2019.
Environmental consequences	The environmental consequences of subsidence impacts, including damage to built features; loss of surface water flows to the subsurface; loss of standing pools in watercourses; adverse water quality impacts; cliff falls; rock falls; damage to Aboriginal heritage sites; impacts on terrestrial or aquatic ecology; and ponding
EPA	Environment Protection Authority, or its successor
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPL	Environment Protection Licence issued under the POEO Act

Evening	The period from 6pm to 10pm
Exploration activities	Prospecting Operations, as defined under the <i>Mining Act 1992</i>
Feasible	Feasible relates to engineering considerations and what is practical to build or implement
First workings	The extraction of coal by bord and pillar mining methods and from main headings and the like (but not including pillar splitting or quartering)
GDE	Groundwater Dependent Ecosystems
Heritage item	An item as defined under the <i>Heritage Act 1977</i> and/or an Aboriginal Object or Aboriginal Place as defined under the <i>National Parks and Wildlife Act 1974</i>
Heritage Division	Heritage Division, within the NSW Department of Premier and Cabinet
Incident	A set of circumstances that: • causes or threatens to cause material harm to the environment; and/or • breaches or exceeds the limits or performance measures/criteria in this consent
IEP	Independent Expert Panel to be established and operated by the Department, which must be comprised of suitably qualified, experienced and independent experts with expertise in the assessment, monitoring and management of subsidence-related impacts on cliff lines, pagodas and steep slopes, to the satisfaction of the Secretary
IPRP's Report	<i>Report of the Independent Review Panel established to review and report on accuracy and reliability of mine subsidence impacts on sensitive features across the Airly mine extension project application area, dated 1 July 2016</i>
Land	As defined in the EP&A Act, except for where the term is used in the noise and air quality conditions in Schedule 4 of this consent where it is defined to mean the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this consent
Material harm to the environment	Actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial
Mining operations	Includes the extraction, processing, handling, storage and transportation of coal carried out on the site
Minister	Minister for Planning and Public Spaces, or delegate
Minor cliff	A continuous rock face, including overhangs, which has a: • minimum length of 20 metres and a height between 5 metres and 10 metres; and • minimum slope of 2 to 1 (> 63.4°)
Mitigation	Activities associated with reducing the impacts of the development
Negligible	Small and unimportant, such as to be not worth considering
New Hartley interaction zone	The area of proposed mining which may interact with the former workings of the New Hartley mine complex identified as the New Hartley Shale mine potential interaction zone in Figure 2 in Appendix 3, as may be modified by an approved Extraction Plan
Night	The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
NPWS	National Parks and Wildlife Service
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
Pagodas	Conical or sub-conical rock formations, whether smooth, platy, stepped or terraced, generally between 5 and 20 metres in height and that are not cliffs or minor cliffs
Panel and Pillar Mining Zone	The area of proposed mining shown in Figure 2 in Appendix 3, as may be modified by an approved Extraction Plan
Partial Pillar Extraction Zone	The area of proposed mining shown in Figure 2 in Appendix 3, as may be modified by an approved Extraction Plan
Privately-owned land	Land that is not owned by a public agency or a mining or petroleum company (or its subsidiary)
Public infrastructure	Linear and other infrastructure that provides services to the general public, such as roads, railways, water supply, drainage, sewerage, gas supply, electricity, telephone, telecommunications, etc
Reasonable	Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, costs of mitigation versus benefits provided, community views and the nature and extent of potential improvements
Reasonable costs	The costs agreed between the Department and the Applicant for obtaining independent experts to review the adequacy of any aspects of the extraction plan, or where such costs cannot be agreed, the costs determined by a dispute resolution process
Resources Regulator	Resources Regulator, within the Department

Rehabilitation	The restoration of land disturbed by the development to a good condition, to ensure it is safe, stable and non-polluting
Remediation	Activities associated with partially or fully repairing or rehabilitating the impacts of the development or controlling the environmental consequences of this impact
ROM	Run-of-mine
RMS	Roads and Maritime Services
Safe, serviceable & repairable	Safe means no danger to users who are present, serviceable means available for its intended use, and repairable means damaged components can be repaired economically
Second workings	The extraction of coal by pillar extraction methods (including panel and pillar mining, single and double-sided lifting, and pillar splitting and quartering) except where remnant pillars are designed to be long-term stable and non-subsiding (ie leading to < 20 mm subsidence at the surface)
Secretary	Secretary of the Department, or any person authorised to act on their behalf
Site	All land to which the development application applies as listed in Appendix 1 and shown in Appendix 2
Steep slope	An area of land having a gradient between 1 in 3 (33% or 18.3°) and 2 in 1 (200% or 63.4°)
Subsidence	The totality of subsidence effects, subsidence impacts and environmental consequences of subsidence impacts
Subsidence effects	Deformation of the ground mass due to mining, including all mining induced ground movements, such as vertical and horizontal displacement, tilt, strain and curvature
Subsidence impacts	Physical changes to the ground and its surface caused by subsidence effects, including tensile and shear cracking of the rock mass, localised buckling of strata caused by valley closure and upsidence and surface depression or troughs.
TSC Act	<i>Threatened Species Conservation Act 1995</i>
Water Division	Water Division, with the Department

SCHEDULE 2 ADMINISTRATIVE CONDITIONS

OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

1. In addition to meeting the specific performance measures and criteria established under this consent, the Applicant must implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the development.

TERMS OF CONSENT

2. The Applicant must carry out the development
 - (a) generally in accordance with the EIS and the Mining schedule (see Figure 3 in Appendix 2); and
 - (b) in accordance with the IPRP's Report and the conditions of this consent.

Note: The layout of the development is shown in Appendices 2, 3 and 10.
3. If there is any inconsistency between the documents in condition 2(a) above, the most recent document shall prevail to the extent of the inconsistency. However, the conditions of this consent shall prevail to the extent of any inconsistency.
4. The Applicant must comply with any reasonable requirement/s of the Secretary arising from the Department's assessment of:
 - (a) any strategies, plans, programs, reviews, audits, reports or correspondence that are submitted in accordance with this consent (including any stages of these documents);
 - (b) any reviews, reports or audits undertaken or commissioned by the Department regarding compliance with this consent; and
 - (c) the implementation of any actions or measures contained in these documents.

LIMITS ON CONSENT

Mining Operations

5. The Applicant may carry out mining operations on the site for a period of 20 years from the date of commencement.

Note: Under this consent, the Applicant is required to rehabilitate the site and perform additional undertakings to the satisfaction of the Secretary and the Resources Regulator. Consequently, this consent will continue to apply in all other respects other than the right to conduct mining operations until the rehabilitation of the site and these additional undertakings have been carried out satisfactorily.

Coal Extraction

6. The Applicant must not extract more than 1.8 million tonnes of ROM coal from the site in any calendar year.

Hours of Operation

7. The Applicant may undertake mining operations 24 hours a day, 7 days a week.

Rail Movements

8. The Applicant must ensure that:
 - (a) all product coal is transported from the site by rail;
 - (b) movement of laden coal trains and water trains is restricted to:
 - (i.) no more than an average of 2 trains leaving the site per day over any calendar year; and
 - (ii.) no more than 5 trains leaving the site on any day; and
 - (c) no more than one water train is received from Charbon Colliery on any day.

Note: The rail transfer route for the water train is shown in Figure 13 in Appendix 12.

NOTIFICATION OF COMMENCEMENT

9. Prior to commencing any development under this consent, the Applicant must notify the Department in writing of the date on which it will commence the development permitted under this consent.

SURRENDER OF EXISTING DEVELOPMENT CONSENTS

10. Within 12 months of the date of commencement, unless the Secretary agrees otherwise, the Applicant must surrender the existing development consent DA162/91 (as modified) in accordance with clause 97(1) of the EP&A Regulation, to the satisfaction of the Secretary.

Following the commencement of development under this consent, the conditions of this consent must prevail to the extent of any inconsistency with the conditions of those consents and approvals.

Note: This requirement does not extend to the surrender of construction and occupation certificates for existing and proposed building works under Part 4A of the EP&A Act. Surrender of a consent should not be understood as implying that works legally constructed under a valid consent can no longer be legally maintained or used.

STRUCTURAL ADEQUACY

11. The Applicant must ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.

Note: Under Part 4A of the EP&A Act, the Applicant is required to obtain construction and occupation certificates (where applicable) for the proposed building works. Part 8 of the EP&A Regulation sets out the requirements for the certification of the development.

DEMOLITION

12. The Applicant must ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures*, or its latest version.

PROTECTION OF PUBLIC INFRASTRUCTURE

13. Unless the Applicant and the applicable authority agree otherwise, the Applicant must:
 - (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development; and
 - (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the development.

Note: This condition does not apply to damage to roads caused as a result of general road usage.

OPERATION OF PLANT AND EQUIPMENT

14. The Applicant must ensure that all plant and equipment used on site, or to monitor the performance of the development is:
 - (a) maintained in a proper and efficient condition; and
 - (b) operated in a proper and efficient manner.

COMMUNITY ENHANCEMENT

15. From the date of commencement, the Applicant must pay a community contribution to **Council** of \$0.03 per saleable tonne of coal produced at Airly mine capped at a maximum payment of \$200,000 in total from the Springvale, Angus Place and Airly mines (ie for all 3 mines collectively). The community contribution is to be paid on an annual basis to **Council** and no later than 31 March each year (for the preceding calendar year). The contribution must be used for long-term community activities and projects to be agreed by both the Applicant and **Council** and must be reported publicly.

SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS – UNDERGROUND MINING

SUBSIDENCE

Restrictions on Mining

1. The Applicant must not carry out any second workings:
 - a) in the Panel and Pillar Extraction Zone within an angle of draw of 26.5 degrees of the crest of any cliffs identified in the Cliff Line Zone of First Workings before at least four adjacent extraction panels in the Panel and Pillar Zone beneath Mount Airly have been completed;
 - b) in the Partial Pillar Extraction Zone within an angle of draw of 26.5 degrees of the toe of any cliffs identified in the Cliff Line Zone of First Workings before it has completed the Trial Mining Area in Panels 206 and 207 as shown in Appendix 11; and
 - c) within an angle of draw of 26.5 degrees plus 50 metres of the limit of the New Hartley Shale Mine workings.

Note: For more detail on the zones referred to in this condition, see the Figure 2 in Appendix 3.

Performance Measures – Natural and Heritage Features, etc

2. The Applicant must ensure that the development does not cause any exceedances of the performance measures in Table 1 to the satisfaction of the Secretary.

Table 1: Subsidence Impact Performance Measures – Natural and Heritage Features, etc

Water Resources	Performance Measure
Gap and Genowlan Creeks	- Wherever depth of cover is < 40 m, no first or second workings within 20 m of the edge of the creek bed, measured horizontally in the seam - Negligible environmental consequences to water quality and to bed and bank stability - No greater environmental consequences than predicted in the EIS to water flows (including baseflow)
All other watercourses	No greater subsidence impacts or environmental consequences than predicted in the EIS
Land	
The Grotto	Negligible subsidence impacts or environmental consequences
Cliffs within a 26.5 degree angle of draw of the Airly underground mine workings	No greater subsidence impacts or environmental consequences than predicted in the EIS (<i>ie occasional rock falls, displacement or dislodgment of boulders or slabs of less than 30 m³, or fracturing, that do not impact Aboriginal heritage, EECs or public safety</i>), that in total do not impact more than 2% of the total area of such cliffs
Pagodas within a 26.5 degree angle of draw of the Airly underground mine workings (other than pagodas affected by the New Hartley interaction zone)	No greater subsidence impacts or environmental consequences than predicted in the EIS (<i>ie occasional rock falls, displacement or dislodgment of boulders or slabs of less than 30 m³, or fracturing, that do not impact Aboriginal heritage, EECs or public safety</i>), that in total do not impact more than 2% of the total area of such pagodas
Pagodas within a 26.5 degree angle of draw of the New Hartley interaction zone	No greater subsidence impacts or environmental consequences than predicted in the EIS
Minor cliffs	No greater subsidence impacts or environmental consequences than predicted in the EIS
Steep slopes	No greater subsidence impacts or environmental consequences than predicted in the EIS
All other land not covered by a performance measure above	No greater subsidence impacts or environmental consequences than predicted in the EIS
Biodiversity	
Threatened species, threatened populations, EECs and groundwater dependent ecosystems (with the exception of those listed below)	Negligible environmental consequences
<i>Pultenaea</i> sp. Genowlan Point population and Genowlan Point <i>Allocasurina nana</i> Heathland community	No environmental consequences

Heritage sites	
Aboriginal heritage sites identified in Appendix 5	Negligible environmental consequences
Non-Aboriginal heritage sites identified in Appendix 6	Negligible environmental consequences. Wherever depth of cover is < 30 m, no second workings to occur within a setback distance defined by half the depth of cover from site 3 and site 24, measured horizontally in the seam
Mine workings	
First workings beneath any feature where performance measures in this table require no or negligible environmental consequences and to all first workings beneath cliffs	To remain long-term stable and non-subsiding
Second workings	To be carried out only in accordance with an approved Extraction Plan

Notes:

- These performance measures apply to all mining taking place after the date of this consent.
- The Applicant will be required to define more detailed performance indicators (including impact assessment criteria) for each of these performance measures in the various management plans that are required under this consent (see condition 5 below).
- Measurement and/or monitoring of compliance with performance measures and performance indicators is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans. In the event of a dispute over the appropriateness of proposed methods, the Secretary will be the final arbiter.

Performance Measures – Built Features

- The Applicant must ensure that the development does not cause any exceedances of the performance measures in Table 2 to the satisfaction of the Secretary.

Table 2: Subsidence Impact Performance Measures – Built Features

Built Features	Performance Measures
Emergency services communication tower and associated sheds and infrastructure	• Always safe and serviceable • Damage must be fully repairable, and must be fully repaired
State survey mark at Genowlan Trig Station, Telstra copper cable and Nissen Hut and outbuilding	• Always safe and serviceable, unless otherwise agreed with the owner • Damage must be fully repairable, and must be fully repaired
“Stone Cottage”	• No second workings to occur within a setback distance defined by half the depth of cover from the building, measured horizontally in the seam, unless otherwise agreed with the owner • Always safe and serviceable, unless otherwise agreed with the owner • Damage must be fully repairable, and must be fully repaired, unless otherwise agreed with the owner
Other built features and improvements including Airly Camp Ground, walking and 4WD tracks, fences and gates	• Use should be maintained wherever practicable in consultation with BCD • Damage must be fully repairable and must be fully repaired
Public Safety	
Public safety	Negligible additional risk, in consultation with the Resources Regulator and BCD

Notes:

- These performance measures apply to all mining taking place after the date of this consent.
- The Applicant will be required to define more detailed performance indicators for each of these performance measures in the Built Features Management Plans or Public Safety Management Plan (see [condition 7](#) below).
- Measurement and/or monitoring of compliance with performance measures and performance indicators is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans. In the event of a dispute over the appropriateness of proposed methods, the Secretary will be the final arbiter.
- Requirements regarding safety or serviceability do not prevent preventative or mitigatory actions being taken prior to or during mining in order to achieve or maintain these outcomes.

4. Any dispute between the Applicant and the owner of any built features over the interpretation, application or implementation of the performance measures in Table 2 is to be settled by the Secretary, following consultation with **the Resources Regulator**. Any decision by the Secretary shall be final and not subject to further dispute resolution under this consent.

Independent Review and Monitoring Panel

5. The Applicant must pay all costs incurred by the Department to establish and operate an IEP for the development.

First Workings

6. With the exception of first workings in the Cliff Line Zone and Zone of First Workings, the Applicant may carry out first workings within the underground mining area, other than in accordance with an approved Extraction Plan, provided that **the Resources Regulator** is satisfied that the first workings are designed to remain stable and non-subsiding in the long-term, except insofar as they may be impacted by approved second workings.

Note: The intent of this condition is not to require an additional approval for first workings, but to ensure that first workings are built to geotechnical and engineering standards sufficient to ensure long term stability, with negligible resulting direct subsidence impacts.

Extraction Plan

7. Prior to carrying out any first workings within the Cliff Line Zone and Zone of First Workings (refer to Figure 2 in Appendix 3) or second workings, the Applicant must prepare an Extraction Plan for the relevant workings to the satisfaction of the Secretary. Each Extraction Plan must:
 - (a) be prepared by suitably qualified and experienced persons whose appointment has been endorsed by the Secretary;
 - (b) provide a detailed justification for any proposed divergence from the advice of the IEP or **the Resources Regulator**;
 - (c) include detailed plans of existing and proposed first and second workings and overlying surface features, including the identification of appropriate setback distances between cliffs, steep slopes and pagodas and second workings and any applicable adaptive management measures;
 - (d) include adequate consideration of mine roof and floor conditions, pillar width to height ratio, final pillar design dimensions and the long-term stability of pillars, **following consultation with the IEP**;
 - (e) give express consideration to the design parameters underpinning the advice in the IPRP's report, and if the proposed mine layout diverges from these parameters, provide a detailed justification for the proposed divergence, **following consultation with the IEP**;
 - (f) **provide an assessment of the likely stability of cliff lines, pagodas and steep slopes, in consultation with the IEP**;
 - (g) provide revised predictions of the potential subsidence effects, subsidence impacts and environmental consequences of the proposed mining covered by the Extraction Plan, incorporating any relevant information obtained since this consent, **in consultation with the IEP**;
 - (h) describe in detail the performance indicators and measures that would be implemented to ensure compliance with the performance measures in Tables 1 and 2, and manage or remediate any impacts and/or environmental consequences to meet the rehabilitation objectives in **condition 27** of Schedule 4, **following consultation with the IEP**;
 - (i) include a:
 - (i) **Subsidence Monitoring Program** which has been prepared in consultation with the IEP, **Resources Regulator** and **BCD**, to:
 - monitor the subsidence effects and subsidence effects of the development;
 - develop effective remote monitoring techniques for the development;
 - monitor pillar loads underground to develop an understanding of the loading conditions on pillars in the vicinity of cliff lines, pagodas and steep slopes;
 - provide data to assist with the management of risks associated with subsidence;
 - validate the subsidence predictions;
 - analyse the relationship between the predicted and resulting subsidence effects and predicted and resulting impacts under the plan and any ensuing environmental consequences; and
 - inform the contingency plan and adaptive management process;
 - (ii) **Built Features Management Plan** which has been prepared in consultation with **Resources Regulator**, to manage the potential subsidence impacts of the proposed underground workings on built features, and which:
 - has been prepared in consultation with the owner/s of potentially affected feature/s;
 - addresses in appropriate detail all items of key public infrastructure and other public infrastructure and all classes of other built features;

- recommends appropriate pre-mining mitigation measures to reduce subsidence impacts; and
 - recommends appropriate remedial measures and includes commitments to mitigate, repair, replace or compensate predicted impacts on potentially affected built features in a timely manner;
- (iii) *Water Management Plan* which has been prepared in consultation with BCD and the Water Division, which provides for the management of potential impacts and/or environmental consequences of the proposed underground workings on watercourses and aquifers, including:
- detailed baseline data on:
 - surface water flows and quality in Gap and Genowlan Creeks;
 - surface water flows in Airly village spring and the Grotto;
 - groundwater levels, yield and quality in the region;
 - surface and groundwater impact assessment criteria, including trigger levels for investigating any potentially adverse impacts on water resources or water quality;
 - a surface water monitoring program to monitor and report on:
 - stream flows and quality;
 - stream and riparian vegetation health;
 - channel and bank stability;
 - a groundwater monitoring program to monitor and report on:
 - springs, their discharge quantity and quality, as well as any associated groundwater dependent ecosystems;
 - groundwater inflows to the underground mining operations;
 - the height of groundwater depressurization;
 - background changes in groundwater yield/quality against mine-induced changes, in particular, on groundwater bore users;
 - permeability, hydraulic gradient, flow direction and connectivity of the deep and shallow groundwater aquifers;
 - a description of any adaptive management practices implemented to guide future mining activities in the event of greater than predicted impacts on aquatic habitat;
 - a program to validate the surface water and groundwater models for the development, and compare monitoring results with modelled predictions; and
 - a plan to respond to any exceedances of the surface water and groundwater assessment criteria.
- (iv) *Biodiversity Management Plan* which has been prepared in consultation with DoEE and BCD, which provides for the management of potential impacts and/or environmental consequences of the proposed first and second workings on aquatic and terrestrial flora and fauna, with a specific focus on threatened species populations and their habitats, endangered ecological communities and groundwater dependent ecosystems including, but not limited to:
- *Pultenaea* sp. Genowlan Point;
 - Genowlan Point *Allocasuarina nana* Heathland;
 - *Prostanthera stricta* (Mount Vincent Mint-bush); and
 - *Eucalyptus cannonii* (Capertee Stringybark);
- (v) *Land Management Plan* which has been prepared in consultation with the IEP, Resources Regulator, BCD and any affected public authorities, to manage the potential impacts and/or environmental consequences of the proposed underground workings on land in general, with a specific focus on cliffs, pagoda formations, steep slopes and gorges;
- (vi) *Heritage Management Plan* which has been prepared in consultation with Heritage Division and relevant Aboriginal stakeholders, to manage the potential environmental consequences of the proposed workings on Aboriginal and historic heritage and includes all requirements under condition 19 of Schedule 4;
- (vii) *Public Safety Management Plan* which has been prepared in consultation with the IEP, Resources Regulator and BCD to ensure public safety and manage access on the site;
- (viii) include Trigger Action Response Plans, or equivalent, to prevent greater than predicted subsidence impacts and environmental consequences that may result from mining subsidence;
- (ix) include a contingency plan that expressly provides for adaptive management where monitoring indicates that there has been an exceedance of any performance measure in Tables 1 and 2, or where any such exceedance appears likely;
- (x) proposes appropriate revisions to the Rehabilitation Management Plan required under condition 27 in Schedule 4; and
- (xi) include a program to collect sufficient baseline data for future Extraction Plans.

The Applicant must implement the approved Extraction Plan for the development.

Notes:

- *This condition does not apply to first or second workings which are covered by an Extraction Plan or Subsidence Management Plan approved, or under assessment as at the date of this development consent.*
- *In accordance with condition 4 in Schedule 6, the preparation and implementation of Extraction Plans may be staged, with each plan covering a defined area of underground workings. In addition, these plans are only required to contain management plans that are relevant to the specific underground workings that are being carried out.*
- *Due to the sensitive and rugged terrain of the Mugii Murum-ban State Conservation Area, the Applicant may propose remote subsidence monitoring techniques.*

PAYMENT OF REASONABLE COSTS

8. The Applicant must pay all reasonable costs incurred by the Department to engage suitably qualified, experienced and independent experts to review the adequacy of any aspect of an Extraction Plan.
-

SCHEDULE 4 ENVIRONMENTAL PERFORMANCE CONDITIONS – GENERAL

NOISE

Hours of Operation

- The Applicant must comply with the restrictions to operating hours in Table 3.

Table 3: Operating hours

Activity	Operating Hours
- Construction - Exploration and monitoring borehole drilling	7 am to 6 pm Monday to Friday and 8 am to 1 pm Saturdays.

Noise Criteria

- The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 4.

Table 4: Noise criteria dB(A)

Land	Day <i>L_{Aeq}(15 min)</i>	Evening <i>L_{Aeq}(15 min)</i>	Night <i>L_{Aeq}(15 min)</i>	Night <i>L_A (max)</i>
Any residence on privately-owned land	35	35	35	52
	<i>L_{Aeq} (period)</i>			
R17 (camp ground)	50 (when in use)			N/A
R18 (Nissen Hut)	50 (when in use)			N/A

Note: To interpret the locations referred to in Table 4 see the applicable figure(s) in Appendix 7.

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy*. Appendix 8 sets out the meteorological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has a negotiated agreement with the owner/s of the relevant residence or land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

Operating Conditions

- The Applicant must:
 - minimise the construction, road and rail noise of the development;
 - minimise the noise impacts of the development during meteorological conditions under which the noise limits in this consent do not apply (see Appendix 8);
 - carry out monitoring to determine whether the development is complying with the relevant conditions of this consent,
to the satisfaction of the Secretary

Noise Management Plan

- Prior to carrying out any development under this consent, unless the Secretary agrees otherwise, the Applicant must prepare a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:
 - be prepared in consultation with the EPA;
 - describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions of this consent;
 - include a monitoring program that evaluates and reports on:
 - compliance against the noise criteria in this consent; and
 - compliance with the noise operating conditions in condition 3 above.

The Applicant must implement the approved Noise Management Plan for the development.

AIR QUALITY

Air Quality Criteria

5. The Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria in Table 5 at any residence on privately-owned land.

Table 5: Air quality criteria

Pollutant	Averaging Period	Criterion	
Particulate matter < 10 µm (PM ₁₀)	Annual	a,d 25 µg/m ³	
Particulate matter < 10 µm (PM ₁₀)	24 hour	a 50 µg/m ³	
Total suspended particulates (TSP)	Annual	a,d 90 µg/m ³	
^c Deposited dust	Annual	^b 2 g/m ² /month	a,d 4 g/m ² /month

Notes to Table 5:

a Cumulative impact (ie increase in concentrations due to the development plus background concentrations due to all other sources).

b Incremental impact (ie increase in concentrations due to the development alone, with zero allowable exceedances of the criteria over the life of the development).

c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.

d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Secretary.

e "Reasonable and feasible avoidance measures" includes, but is not limited to, the operational requirements in conditions 6 and 7 to develop and implement an air quality management system that ensures operational responses to the risks of exceedance of the criteria.

Operating Conditions

6. The Applicant must:
 - (a) implement all reasonable and feasible measures to minimise the:
 - odour, fume and dust emissions of the development; and
 - release of greenhouse gas emissions from the development;
 - (b) minimise any visible air pollution generated by the development;
 - (c) minimise the surface disturbance of the site generated by the development; and
 - (d) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note d to Table 5 above),
 to the satisfaction of the Secretary.

Air Quality Management Plan

7. Prior to carrying out any development under this consent, unless the Secretary agrees otherwise, the Applicant must prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must:
 - (a) be prepared in consultation with the EPA;
 - (b) describe all reasonable and feasible measures which would be implemented to ensure compliance with the air quality criteria and operating conditions of this consent;
 - (c) describe the air quality management system in detail;
 - (d) include an air quality monitoring program that:
 - uses monitors to evaluate the performance of the development against the air quality criteria in this consent;
 - adequately supports the air quality management system;
 - evaluates and reports on:
 - the effectiveness of the air quality management system; and
 - compliance with the air quality criteria and operating conditions in condition 6 above;
 - defines what constitutes an air quality incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any air quality incidents.

The Applicant must implement the approved Air Quality Management Plan for the development.

METEOROLOGICAL MONITORING

8. Prior to commencement of development under this consent and for the life of the development, the Applicant must ensure that there is a meteorological station in the vicinity of the site that:
- (a) complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* guideline and the *NSW Industrial Noise Policy*; and
 - (b) is capable of continuous real-time measurement of atmospheric stability category determined by the sigma theta method in accordance with the *NSW Industrial Noise Policy*.

WATER

Water Supply

9. The Applicant must ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of operations on site to match its available water supply.

Note: Under the Water Act 1912 and/or the Water Management Act 2000, the Applicant is required to obtain the necessary water licences for the development.

Water Pollution

10. Unless an EPL authorises otherwise, the Applicant must comply with Section 120 of the POEO Act.

Compensatory Water Supply

11. The Applicant must provide a compensatory water supply to the owner of any privately-owned land whose water supply is adversely and directly impacted (other than a negligible impact) as a result of the development, in consultation with [the Water Division](#), and to the satisfaction of the Secretary.

The compensatory water supply measures must provide an alternative long-term supply of water that is equivalent, in quality and volume, to the loss attributed to the development. Equivalent water supply should be provided (at least on an interim basis) within 24 hours of the loss being identified.

If the Applicant and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

If the Applicant is unable to provide an alternative long-term supply of water, then the Applicant must provide alternative compensation to the satisfaction of the Secretary.

Water Management Performance Measures

12. The Applicant must comply with the performance measures in Table 6 to the satisfaction of the Secretary.

Table 6: Water Management Performance Measures

Feature	Performance Measure
Water Management – General	- Minimise the use of clean water on site - Minimise the use of the supplementary water supply from the production bore
Construction and operation of linear infrastructure	- Design, install and maintain erosion and sediment controls generally in accordance with the series <i>Managing Urban Stormwater: Soils and Construction including Volume 1, Volume 2A – Installation of Services and Volume 2C – Unsealed Roads</i> - Design, install and maintain infrastructure within 40 m of watercourses generally in accordance with the <i>Guidelines for Controlled Activities on Waterfront Land (July 2012)</i>, or its latest version - Design, install and maintain creek crossings generally in accordance with <i>Policy and Guidelines for Fish Friendly Waterway Crossings (NSW Fisheries 2003)</i> and <i>Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (NSW Fisheries 2003)</i>, or their latest versions
Sediment dams	Design, install and maintain the dams generally in accordance with the series <i>Managing Urban Stormwater: Soils and Construction – Volume 1 and Volume 2E – Mines and Quarries</i>

Feature	Performance Measure
Mine water storages	- Design, install and maintain mine water storage infrastructure to ensure no unlicensed or uncontrolled discharge of mine water off-site - Minimise discharges to surface waters as far as reasonable and practicable - New on-site storages (including mine infrastructure dams, groundwater storage and treatment dams) are suitably treated to comply with a permeability standard of $< 1 \times 10^{-9}$ m/s - Achieve an improvement in the quality of water held in the 35 ML dam generally in accordance with Figure 6-7 in Appendix F of the EIS (surface water impact assessment) over the life of the mine.
Water discharge to Airly Creek	- No greater impacts than predicted in the EIS for water flow and quality in Airly Creek between LDP 001 and Point 4 (refer Appendix 9) - Negligible environmental consequences for water quality (ie. protection to 99% of all species in accordance with ANZECC guidelines) and flow in Airly Creek where it enters the Gardens of Stone National Park and Greater Blue Mountains World Heritage Area
Gap and Genowlan Creeks	No greater impact than predicted in the EIS for water flow and quality
Emplacement of CHPP rejects	Emplacement, and/or encapsulation and/or capping to prevent or minimise the migration of pollutants due to seepage from the REA
Chemical and petroleum storage	Chemical and hydrocarbon products to be stored in bunded areas in accordance with relevant Australian Standards
Aquatic and riparian ecosystems	- Maintain or improve baseline channel stability - Develop site-specific water quality objectives in accordance with ANZECC Guidelines and <i>Using the ANZECC Guidelines and Water Quality Objectives in NSW</i> procedures (DECC 2006) or its latest version

Water Management Plan

13. Prior to carrying out any development under this consent, unless the Secretary agrees otherwise, the Applicant must prepare a Water Management Plan for the development to the satisfaction of the Secretary. This plan must:
- be prepared in consultation with the DoEE, EPA and the Water Division, by suitably qualified and experienced person/s whose appointment has been approved by the Secretary;
 - include detailed performance criteria and describe measures to ensure that the Applicant complies with the Water Management Performance Measures (see Table 6);
 - in addition to the standard requirements for management plans (see condition 3 of Schedule 6), this plan must include a:
 - Site Water Balance, that:
 - includes details of:
 - sources and security of water supply, including contingency supply for future reporting periods;
 - water use and management on site;
 - any off-site water discharges; and
 - reporting procedures, including the preparation of a site water balance for each calendar year; and
 - investigates and implements all reasonable and feasible measures to minimise water use on site;
 - Surface Water Management Plan, that includes:
 - detailed baseline data on water flows and quality in the watercourses that could potentially be affected by the development, including, but not limited to Gap, Genowlan and Airly Creeks;
 - continuous flow monitoring at Airly village spring and the Grotto;
 - provisions for the recalculation of site-specific trigger values in relation to water discharges to Airly Creek once a minimum of two years data is obtained from the Airly Creek 'U/S' monitoring location (refer Appendix 9) in accordance with ANZECC guidelines;
 - the provision and implementation of adaptive management measures to ensure that subsequent water discharges to Airly Creek comply with the recalculated site-specific trigger values derived from the Airly Creek 'U/S' monitoring location;
 - a detailed description of the water management system, including the:
 - clean water diversion systems;
 - erosion and sediment controls (mine water system); and

- mine water management systems;
 - detailed objectives and performance criteria, including trigger levels for investigating any potentially adverse impacts associated with the development for:
 - downstream surface water quality;
 - downstream water users, including with respect to any subsidence-related flow reductions in Gap and Genowlan Creeks;
 - stream and riparian vegetation health in Gap, Genowlan and Airly Creeks within and immediately outside of the site;
 - design and management for the emplacement of coal reject materials;
 - reinstatement of drainage lines on the rehabilitated areas of the site; and
 - control of any potential water pollution from the rehabilitated areas of the site;
 - a program to monitor and report on:
 - effectiveness of the mine water management system;
 - surface water flows, quality and geomorphology of the watercourses potentially affected by the development within and immediately outside of the site;
 - the performance measures listed in Table 6 including, but not limited to event-based monitoring of the hydrology, quality, ecotoxicology and chemical composition of water in Airly Creek under discharge conditions at points 5 and 6 (refer Appendix 9), or as otherwise determined in consultation with the EPA, to ensure that protection is provided to 99% of all species in the Gardens of Stone National Park and Greater Blue Mountains World Heritage Area in accordance with ANZECC Guidelines;
 - reporting procedures for the results of the monitoring program; and
 - a plan to respond to any exceedances of the performance measures, and repair, mitigate and/or offset any adverse surface water impacts of the development, including measures to provide compensatory water supply to any affected downstream water user under [condition 11](#) of this Schedule;
- (iii) Groundwater Management Plan, which is consistent with [the NSW Government](#) guideline entitled *Groundwater Monitoring and Modelling Plans – Introduction for prospective mining and petroleum activities*, and includes:
- detailed baseline data of groundwater levels, yield and quality in the region that could be affected by the development, including licensed privately-owned groundwater bores and a detailed survey/schedule of groundwater dependent ecosystems (including springs and their discharge quantity and quality);
 - consultation with [the Water Division](#) on the installation of all new monitoring bores, the scheduled sampling and quality determination of parameters for monitoring bores;
 - groundwater assessment criteria including trigger levels for investigating any potentially adverse groundwater impacts;
 - a program to monitor and report on:
 - springs and their discharge quantity and quality;
 - groundwater inflows transferred to the surface water management system;
 - the seepage/leachate from water storages and emplacements;
 - impacts of the development on:
 - o regional and local (including alluvial) aquifers;
 - o groundwater supply of potentially affected landowners; and
 - o groundwater dependent ecosystems (including rules for the management of groundwater level impacts to protect GDEs), and riparian vegetation;
 - a program to monitor and report on stygofauna and hyporheic fauna;
 - a program to review and validate the groundwater model for the development, including independent expert review; and
 - a plan to respond to any exceedances of the performance measures.

The Applicant must implement the approved Water Management Plan for the development.

Independent Expert Review

14. As part of any Independent Environmental Audit of the development (see condition 12 of schedule 6), the Applicant must commission an independent expert whose appointment has been endorsed by the Secretary, to carry out a review of the Groundwater Management Plan for the development, including the groundwater model. This review must include a:
- (a) review of all available monitoring data;
 - (b) comparison of predicted and actual groundwater impacts; and
 - (c) review of the effectiveness of the Groundwater Management Plan for the development, including the groundwater model.

BIODIVERSITY

Biodiversity Management Plan

15. Prior to carrying out any development under this consent that would cause surface disturbance, the Applicant must prepare a Biodiversity Management Plan for the development to the satisfaction of the Secretary. This plan must:
- (a) be prepared in consultation with BCD and DoEE;
 - (b) establish baseline data for the existing remnant vegetation and habitat on site, including mapping of the location of the *Pultenaea* sp. Genowlan Point;
 - (c) describe the short, medium, and long-term measures that would be implemented to manage the remnant vegetation and habitat on the site, including but not limited to;
 - *Prostanthera stricta* (Mt Vincent Mint-bush);
 - *Eucalyptus cannonii* (Capertee Stringybark);
 - *Pultenaea* sp. Genowlan Point; and
 - Genowlan Point *Allocasurina nana* Heathland;
 - (d) include a detailed description of the measures that would be implemented to:
 - minimise the impacts to fauna on site, including undertaking pre-clearance surveys;
 - avoid and mitigate the spread of *Phytophthora cinnamomi* (*P. cinnamomi*);
 - control weeds and feral pests including, but not limited to goats, rabbits, European Red Fox, cats and pigs;
 - manage salinity;
 - control erosion;
 - control access; and
 - manage bushfire risk;
 - (e) include a program to monitor and report on the effectiveness of these measures, and progress against the detailed performance and completion criteria; and
 - (f) include details of who would be responsible for monitoring, reviewing, and implementing the plan.

The Applicant must implement the approved Biodiversity Management Plan for the development.

Note: The Biodiversity Management Plan and Rehabilitation Management Plan need to be substantially integrated for achieving biodiversity objectives for the rehabilitated mine-site.

TRANSPORT

Monitoring of Coal Transport

16. The Applicant must monitor and report on:
- (a) the amount of coal transported from the site; and
 - (b) the date and time of each train movement to and from the site;
- to the satisfaction of the Secretary.

Traffic Management Plan

17. Prior to the commencement of construction activities approved under this consent or within three months of the commencement of development under this consent (whichever is sooner), the Applicant must prepare a Traffic Management Plan for the development to the satisfaction of the Secretary. This plan must:
- (a) be prepared in consultation with RMS and Council;
 - (b) include measures to minimise the traffic impacts to Glen Davis Road and in the village of Capertee that may occur during the construction of new and/or upgraded surface infrastructure at the pit top; and
 - (c) a program to monitor and report on the effectiveness of these measures.

The Applicant must implement the approved Traffic Management Plan for the development.

HERITAGE

Protection of Aboriginal Sites

18. Unless otherwise authorised under the *National Parks and Wildlife Act 1974*, the Applicant must ensure that the development does not cause any direct or indirect impact on identified Aboriginal sites.

Note: Aboriginal heritage sites are identified in Appendix 6.

Heritage Management Plan

19. Prior to carrying out any development under this consent that would cause surface disturbance, the Applicant must prepare a Heritage Management Plan for the development to the satisfaction of the Secretary. This plan must:
- (a) be prepared by suitably qualified and experienced person/s whose appointment has been endorsed by the Secretary;
 - (b) be prepared in consultation with [Heritage Division](#), Council, any relevant local historical organisations (in relation to non-Aboriginal heritage) and local Aboriginal stakeholders (in relation to Aboriginal heritage);
 - (c) include a description of the measures that would be implemented for:
 - managing the discovery of human remains or previously unidentified heritage items on site; and
 - ensuring any workers on site receive suitable heritage inductions and that suitable records are kept of these inductions;
 - (d) include the following for the management of Aboriginal heritage:
 - a description of the measures that would be implemented for:
 - protecting, monitoring and/or managing (including any proposed archaeological investigations and/or salvage measures) the heritage items identified in Appendix 5;
 - managing the discovery of previously unidentified Aboriginal items on site;
 - conserving the sites outside the surface disturbance area (see Appendix 5);
 - maintaining and managing reasonable access for Aboriginal stakeholders to heritage items on site;
 - ongoing consultation with the Aboriginal stakeholders in the conservation and management of Aboriginal cultural heritage on site; and
 - (e) include the following for the management of non-Aboriginal heritage items:
 - a description of the measures that would be implemented for:
 - protecting, monitoring and managing the heritage items identified in Appendix 6; and
 - managing the discovery of previously unidentified cultural heritage items on site.

Note: This plan can be incorporated in a regional Aboriginal Cultural Heritage Management Plan for Centennial's other mines and mine infrastructure in the Lithgow Local Government Area.

The Applicant must implement the approved Heritage Management Plan for the development.

VISUAL

Visual Screening of Reject Emplacement Area

20. The Applicant must:
- (a) plant trees at the basal area of the proposed reject emplacement area (REA) to minimise views of the REA to travellers along Glen Davis Road;
 - (b) **carry out tree planting in the road reserve of the Castlereagh Highway in locations where the REA is visible, in consultation with the relevant road authority;**
 - (c) complete this tree planting at least three months prior to constructing the proposed REA; and
 - (d) maintain this tree screening over the life of the mine to the satisfaction of the Secretary.

Operating Conditions

21. The Applicant must:
- (a) implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts of the development;
 - (b) ensure that all external lighting associated with the development complies with *Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting* or its latest version;
 - (c) ensure that the visual appearance of all buildings, structures, facilities or works (including paint colours and specifications) is aimed at blending as far as possible with the surrounding landscape, to the satisfaction of the Secretary.

BUSHFIRE MANAGEMENT

22. The Applicant must:
- (a) ensure that the development is suitably equipped to respond to any fires on site; and
 - (b) assist the Rural Fire Service, emergency services and NPWS as much as possible if there is a fire in the surrounding area.

WASTE

23. The Applicant must:
- (a) implement all reasonable and feasible measures to minimise the waste (including coal reject) generated by the development;
 - (b) ensure that the waste generated by the development is appropriately stored, handled and disposed of; and
 - (c) monitor and report on the effectiveness of waste minimisation and management measures in the Annual Review, to the satisfaction of the Secretary.

EXPLORATION ACTIVITIES & SURFACE INFRASTRUCTURE

Exploration Activities and Minor Surface Infrastructure Management Plan

24. Prior to carrying out exploration activities on site under this consent that would cause surface disturbance or the construction and/or upgrade of minor surface infrastructure, the Applicant must prepare an Exploration Activities and Minor Surface Infrastructure Management Plan for the development to the satisfaction of the Secretary. This Plan must:
- (a) be prepared by suitably qualified and experienced person/s whose appointment has been endorsed by the Secretary;
 - (b) be prepared in consultation with [the Resources Regulator](#) and [BCD](#);
 - (c) include a description of the measures that would be implemented for:
 - managing exploration activities on site;
 - managing construction and operation of minor surface infrastructure (including groundwater monitoring bores) and associated access tracks;
 - consulting with and addressing concerns of affected landowners;
 - avoiding threatened species, populations or their habitats and EECs;
 - minimising clearance and disturbance of native vegetation;
 - minimising erosion and sedimentation;
 - achieving applicable standards and goals; and
 - rehabilitating disturbed areas.

The Applicant must implement the approved Exploration Activities and Minor Surface Infrastructure Management Plan for the development.

Note: This condition does not apply to the construction of approved surface infrastructure in the Airly Pit Top area.

REHABILITATION

Rehabilitation Objectives

25. The Applicant must rehabilitate the site to the satisfaction of the [Resources Regulator](#). This rehabilitation must be generally consistent with the proposed Rehabilitation Strategy described in the EIS (and depicted conceptually in Appendix 10) and comply with the objectives in Table 7.

Table 7: Rehabilitation objectives

Feature	Objective
Site (as a whole)	• Safe, stable and non-polluting
Surface Infrastructure	• To be decommissioned and removed, unless the Resources Regulator agrees otherwise • The Reject Emplacement Area and all surface infrastructure is to be made safe and hydraulically and geotechnically stable • All surface infrastructure sites are to be revegetated with suitable local native plant species to a landform consistent with the surrounding environment
Rehabilitation materials	• Materials from areas disturbed under this consent (including topsoils, substrates and seeds) are to be recovered, managed and used as rehabilitation resources
REA	• The REA is to be revegetated with suitable local native plant species, and to a landform consistent with the surrounding environment

Feature	Objective
	Capping materials (including depth of application) are to be approved by the Resources Regulator prior to capping
Revegetated final landforms	- Stable and sustain the intended land use - Consistent with surrounding topography to minimise visual impacts - Incorporate relief patterns and design principles consistent with natural drainage
Native flora and fauna	- Flora species used in rehabilitation selected to re-establish and complement local and regional biodiversity - Rehabilitated areas contribute to achieving self-sustaining biodiversity habitats
Cliffs and steep slopes	No additional risk to public safety compared to pre-mining conditions
All watercourses subject to mine-water discharges and/or subsidence impacts	Hydraulically and geomorphologically stable, with aquatic ecology and riparian vegetation that is the same, or better than prior to grant of this consent
Water quality	- Water retained on site is fit for the intended post mining land use(s) - Water management is consistent with the regional catchment management strategy
Community	- Ensure public safety - Minimise the adverse socio-economic effects of mine closure

Note: These rehabilitation objectives apply to all subsidence impacts and environmental consequences caused by mining taking place after the date of this consent, and to all surface infrastructure part of the project, whether constructed prior to or following the date of this consent.

Progressive Rehabilitation

26. The Applicant must rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable and feasible measures must be taken to minimise the total area exposed for dust generation at any time.

Rehabilitation Management Plan

27. Prior to carrying out any development under this consent, unless the Secretary agrees otherwise, the Applicant must prepare a Rehabilitation Management Plan for the development to the satisfaction of the [Resources Regulator](#). This plan must:
- be prepared in consultation with the Department, [the Water Division](#), [BCD](#), Council and the CCC;
 - be prepared in accordance with any relevant [Resources Regulator](#) guideline;
 - include detailed performance and completion criteria for evaluating the performance of the rehabilitation of the site, and triggering remedial action (if necessary);
 - describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent, and address all aspects of rehabilitation including mine closure, final landform and final land use;
 - include the design and implementation of a Closure Groundwater Monitoring and Management Plan, which:
 - assists in restoring natural groundwater flow to pre-mining conditions to the maximum extent possible;
 - includes the implementation of appropriate mitigation strategies to reduce adverse groundwater impacts to seeps, springs and flows in terms of acidity, salinity or location;
 - involves the removal of all non-natural material from within the mine not required for groundwater or subsidence management and describe measures that would be implemented to prevent polluting materials from entering the mine so as to not affect groundwater quality;
 - include interim rehabilitation where necessary to minimise the area exposed for dust generation;
 - include a program to monitor, independently audit and report on the effectiveness of the rehabilitation measures and progress against the detailed performance and completion criteria; and
 - build to the maximum extent practicable on the other management plans required under this consent.

The Applicant must implement the approved Rehabilitation Management Plan for the development.

Note: The Biodiversity Management Plan and Rehabilitation Management Plan require substantial integration to achieve biodiversity objectives for the rehabilitated mine site.

SCHEDULE 5 ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS/TENANTS

1. As soon as practicable after obtaining monitoring results showing:
 - (a) an exceedance of any relevant criteria in Schedule 4, the Applicant must notify the affected landowners in writing of the exceedance, and provide regular monitoring results to these landowners until the project is again complying with the relevant criteria; and
 - (b) an exceedance of the relevant air quality criteria in Schedule 4, the Applicant must send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time), to the affected landowners and/or existing tenants of the land (including the tenants of any mine-owned land).

INDEPENDENT REVIEW

2. If an owner of privately-owned land considers the project to be exceeding the relevant criteria in Schedule 4, then he/she may ask the Secretary in writing for an independent review of the impacts of the project on his/her land.

If the Secretary is satisfied that an independent review is warranted, then within 2 months of the Secretary's decision the Applicant must:

- (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to:
 - consult with the landowner to determine his/her concerns;
 - conduct monitoring to determine whether the project is complying with the relevant criteria in Schedule 4; and
 - if the project is not complying with these criteria, then identify the measures that could be implemented to ensure compliance with the relevant criteria; and
 - (b) give the Secretary and landowner a copy of the independent review.
-

SCHEDULE 6

ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING

ENVIRONMENTAL MANAGEMENT

Environmental Management Strategy

1. Prior to carrying out any development under this consent, the Applicant must prepare an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must:
 - (a) be submitted to the Secretary for approval, unless otherwise agreed;
 - (b) provide the strategic framework for environmental management of the development;
 - (c) identify the statutory approvals that apply to the development;
 - (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;
 - (e) describe the procedures that would be implemented to:
 - keep the local community and relevant agencies informed about the operation and environmental performance of the mine;
 - receive, handle, respond to, and record complaints;
 - resolve any disputes that may arise during the course of the development;
 - respond to any non-compliance;
 - respond to emergencies; and
 - (f) include:
 - copies of any strategies, plans and programs approved under the conditions of this consent; and
 - a clear plan depicting all the monitoring to be carried out in relation to the development.

The Applicant must implement the approved Environmental Management Strategy for the development.

Management Plan Requirements

2. The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:
 - (a) detailed baseline data;
 - (b) a description of:
 - the relevant statutory requirements (including any relevant approval, licence or lease conditions);
 - any relevant limits or performance measures/criteria;
 - the specific performance indicators or triggers that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;
 - (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;
 - (d) a program to monitor and report on the:
 - impacts and environmental performance of the development;
 - effectiveness of any management measures (see c above);
 - (e) a contingency plan to manage any unpredicted impacts and their consequences;
 - (f) a program to investigate and implement ways to improve the environmental performance of the development over time;
 - (g) a protocol for managing and reporting any:
 - incidents;
 - complaints;
 - non-compliances with statutory requirements; and
 - exceedances of the impact assessment criteria and/or performance criteria; and
 - (h) a protocol for periodic review of the plan.

Revision of Strategies, Plans and Programs

3. Within 3 months of:
 - (a) the submission of an incident report under [condition 9](#) below;
 - (b) the submission of an annual review under [condition 11](#) below;
 - (c) the submission of an audit report under [condition 12](#) below; or
 - (d) any modification to the conditions of this consent, (unless the conditions require otherwise),the Applicant must review the strategies, plans, and programs required under this consent, to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted for the approval of the Secretary.

Note: This is to ensure that strategies, plans and programs are regularly updated to incorporate any measures recommended to improve the environmental performance of the development.

Updating & Staging of Strategies, Plans or Programs

4. To ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the development, the Applicant may submit revised strategies, plans or programs required under this consent at any time. With the agreement of the Secretary, the Applicant may also submit any strategy, plan or program required by this consent on a staged basis.

The Secretary may approve a revised strategy, plan or program required under this consent, or the staged submission of any of these documents, at any time. With the agreement of the Secretary, the Applicant may prepare the revised or staged strategy, plan or program without undertaking consultation with all parties nominated under the applicable condition in this consent.

Notes:

- While any strategy, plan or program may be submitted on a staged basis, the Applicant must ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times.
- If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program.

Relationships between Management Plans

5. The Water, Biodiversity and Heritage Management Plans required by conditions 13, 15 and 19 of Schedule 4, respectively, are to be prepared in respect of all parts of the development that are not covered by an Extraction Plan approved under condition 7 of Schedule 3. In particular, those management plans should address all areas subject to existing or proposed surface disturbance associated with the development.

Consolidation of Strategies, Plans or Programs

6. With the approval of the Secretary, the Applicant may incorporate any strategies, plans or programs required by this consent (except those required under condition 7 of Schedule 3) with the strategies, plans and programs required for Centennial Coal's mining operations in the Lithgow Local Government Area.

Adaptive Management

7. The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the performance measures and/or criteria in Schedules 3 and 4. Any exceedance of these performance measures and/or criteria constitutes a breach of this consent 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 Applicant 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 Secretary, to the satisfaction of the Secretary.

COMMUNITY CONSULTATIVE COMMITTEE

8. The Applicant must operate a Community Consultative Committee (CCC) for the development to the satisfaction of the Secretary. This CCC must be operated in accordance with the *Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects* (Department of Planning, 2007) or its latest version.

Notes: The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Applicant complies with this consent.

REPORTING

Incident Reporting

9. The Applicant must immediately notify the Secretary and any other relevant agencies of any incident. Within 7 days of the date of the incident, the Applicant must provide the Secretary and any relevant agencies with a detailed report on the incident and such further reports as may be requested.

Regular Reporting

10. The Applicant must provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent.

Annual Review

11. By the end of March each year following the commencement of development under this consent, or other timing as may be agreed by the Secretary, the Applicant must submit a report to the Department reviewing the environmental performance of the development to the satisfaction of the Secretary. This review must:
 - (a) describe the development (including any rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;
 - (b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, which includes a comparison of these results against the:
 - the relevant statutory requirements, limits or performance measures/criteria;
 - the monitoring results of previous years; and
 - the relevant predictions in the documents listed under condition 2(a) and the IPRP's Report;
 - (c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;
 - (d) identify any trends in the monitoring data over the life of the development;
 - (e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and
 - (f) describe what measures will be implemented over the next year to improve the environmental performance of the development.

INDEPENDENT ENVIRONMENTAL AUDIT

Independent Environmental Audit

12. Within one year of the date of commencement and every 3 years thereafter, unless the Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:
 - (a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;
 - (b) include consultation with the relevant agencies;
 - (c) assess the environmental performance of the development and assess whether it is complying with the requirements in this consent, and any other relevant approvals, relevant EPL/s and/or Mining Lease/s (including any assessment, plan or program required under these approvals);
 - (d) review the adequacy of any strategies, plans or programs required under the abovementioned approvals; and
 - (e) recommend appropriate measures or actions to improve the environmental performance of the development, and/or any strategy, plan or program required under these approvals; and
 - (f) be conducted and reported to the satisfaction of the Secretary.

Note: This audit team must be led by a suitably qualified auditor, and include experts in any fields specified by the Secretary.

13. Within 12 weeks of commissioning this audit, or as otherwise agreed by the Secretary, the Applicant must submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report and a timetable for the implementation of these recommendations as required. The Applicant must implement these recommendations, to the satisfaction of the Secretary.

ACCESS TO INFORMATION

14. The Applicant must:
 - (a) make the following information publicly available on its website:
 - the documents listed under condition 2(a);
 - the IPRP's report;
 - all current statutory approvals for the development;
 - approved strategies, plans or programs required under the conditions of this consent;
 - a comprehensive summary of the monitoring results of the development, which have been reported in accordance with the various plans and programs approved under the conditions of this consent;
 - a complaints register, which is to be updated on a monthly basis;
 - minutes of CCC meetings;
 - the last five annual reviews;

- any independent environmental audit, and the Applicant's response to the recommendations in any audit;
 - any report and/or advice issued by the IEP to the Applicant in respect of a draft or approved Extraction Plan;
 - any other matter required by the Secretary; and
- (b) keep this information up to date,
to the satisfaction of the Secretary.
-

**APPENDIX 1
SCHEDULE OF LAND**

Property ID	Lot/Section No./ Deposited Plan
1	1//1152312
2	4//1152312
3	2//1152312
4	3//1152312
5	5//1152312
6	3//1758011
7	14//755757
8	1//1758011
9	4//1758011
10	154//722292
11	7020//1029319
12	13//755786
13	66//722329
14	68//722329
15	81//755757
16	117//755757
17	112//755757
18	124//755757
19	102//755757
20	94//755757
21	104//755757
22	105//755757
23	95//755757
24	33//755757
25	98//755757
26	91//755757
27	11//1758011
28	7//3758011
29	12//1118801
30	7026//1050399
31	7304//1130566

Property ID	Lot/Section No./ Deposited Plan
32	21//1118800
33	20//1118800
34	23//1118800
35	7//1118784
36	10//1118784
37	13//1118784
38	8//1118784
39	16//1118801
40	100//755757
41	7018//1051447
42	7014//1057712
43	83//755757
44	113//755757
45	121//755757
46	7022//1050402
47	67//722329
48	7016//1114802
49	7300//1130496
50	16//2758011
51	6//2758011
52	5//2758011
53	8//1758011
54	9//1758011
55	5//3758011
56	4//3758011
57	8//3758011
58	5//755766
59	7023//1050402
60	56//755786
61	3//2758011
62	1//577478

Property ID	Lot/Section No./ Deposited Plan
63	4//755766
64	1//1007126
65	4//2758011
66	1//755766
67	12//755786
68	3//755766
69	19//755766
70	5//1758011
71	51//755786
72	2//1758011
73	7021//1050431
74	7001//1057060
75	97//755757
76	119//755757
77	22//755786
78	116//755757
79	79//755757
80	109//755757
81	107//755757
82	90//755757
83	126//755757
84	120//755757
85	110//755757
86	108//755757
87	99//755757
88	115//755757
89	6//3758011
90	1//2758011
91	1//3758011
92	2//3758011
93	3//3758011

Property ID	Lot/Section No./ Deposited Plan
94	9//3758011
95	123//755757
96	34//755757
97	10//1118781
98	7303//1130566
99	18//1118800
100	19//1118800
101	22//1118800
102	11//1118784
103	14//1118784
104	13//1118801
105	14//1118801
106	15//1118801
107	24//1118800
108	9//1118784
109	12//1118784
110	101//755757
111	96//755757
112	106//755757
113	78//755757
114	89//755757
115	118//755757
116	82//755757
117	7001//1028024
118	7024//1050402
119	39//755786
120	125//755757
121	80//755757
122	42//755757
123	103//755757
124	7025//1050399

Property ID	Lot/Section No./ Deposited Plan
125	7031//1116097
126	7032//1116097
127	7034//1116073
128	7300//1130282
129	114//755757
130	28//755786
131	10/1//758011
132	17/2//758011
133	2/2//758011
134	15/2//758011
135	60//755757
136	6/1//758011
137	7/1//758011
138	701//1058328
139	4//577478
140	7018//1030008
141	71//755758
142	100//849168
143	7037//1065193
144	72//755758
145	7021//1030009
146	65//755786
147	3//577478
148	7017//1029387
149	701//1030007
150	703//1030007
151	701//1058325
152	70//755758
153	7036//1065193
154	63//755758
155	7027//1066212

Property ID	Lot/Section No./ Deposited Plan
156	89//755758
157	7016//1029387
158	7025//1066211
159	7014//1029387
160	9//655050
161	702//1058325
162	702//1058328
163	7024//1066211
164	7026//1066212
165	704//1030007
166	11//755757
167	702//1030007
168	2//577478
169	7015//1029387
170	54//755786
171	7300//1126380
172	7301//1126380
173	7023//1116918
174	7005//1116573
175	7006//1116573
176	7024//1116919
177	7303//1130728
178	7302//1130590
179	1//864999
180	7004//1029383
181	2//864999
182	10//755758
183	22//650039
184	7035//1117631
185	7033//1116073
186	7013//1057515

Property ID	Lot/Section No./ Deposited Plan
187	94//755758
188	93//755758
189	7020//1030008
190	7022//1029388
191	102//1079781
192	103//1079781
193	7013//1029386
194	111//755758
195	7001//1029380
196	13//755758
197	5//986083
198	17//244899
199	39//746912
200	10//132551
201	17//755758
202	2//131546
203	44//755758
204	28//755758
205	37//746912
206	25//755758
207	7002//1029380
208	A//349704
209	9//755758
210	1//346651
211	107//755758
212	36//755758
213	16//755758
214	41//755758
215	23//755758
216	6//131546
217	46//755758

Property ID	Lot/Section No./ Deposited Plan
218	38//746912
219	5//131546
220	18//244899
221	24//755758
222	8//755758
223	C//349704
224	1//119590
225	3//131546
226	45//755758
227	B//349704
228	1//1072590
229	32//755758
230	19//244899
231	14//244899
232	110//755758
233	20//244899
234	4//131546
235	78//755758
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237	15//244899
238	41//746912
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241	1//131546
242	22//755758
243	16//244899
244	2//927952
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246	18//1106972
247	7010//1021311
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Property ID	Lot/Section No./ Deposited Plan
249	1//122407
250	42//755758
251	112//755758
252	31//755758
253	26//755758
254	27//755758
255	29//755758
256	30//755758
257	7019//1030008
258	82//755758
259	1//197770
260	126//722134
261	7029//1065275
262	81//755758
263	153//257075
264	142//755757
265	7009//1029698
266	4//755757
267	67//755758
268	17//755757
269	92//755757
270	156//722330
271	102//610704
272	94//755778
273	13//244899
274	86//755757
275	51//755757
276	133//755757
277	85//755757
278	603//615881
279	101//610704

Property ID	Lot/Section No./ Deposited Plan
280	185//755778
281	164//48336
282	2//132549
283	2//379339
284	87//755757
285	35//755758
286	231//1012729
287	159//722293
288	77//755757
289	1//194534
290	2//813231
291	25//665681
292	601//615881
293	2//547497
294	128//755757
295	1//1070723
296	54//755757
297	163//48336
298	47//755758
299	77//755758
300	7015//1057714
301	3//792135
302	58//755757
303	1//132549
304	134//755757
305	1//564345
306	10//755757
307	49//755757
308	135//755757
309	75//755757
310	2//792135

Property ID	Lot/Section No./ Deposited Plan
311	3//709009
312	233//1012729
313	7008//1029698
314	111//755757
315	31//755757
316	55//755757
317	4//709009
318	48//755758
319	6//665679
320	79//755758
321	25//665682
322	141//755757
323	56//755757
324	40//755757
325	3//565109
326	7003//1056614
327	232//1012729
328	132//755757
329	59//755757
330	129//755757
331	4//792135
332	1//831104
333	1//195875
334	157//722330
335	7012//1056868
336	15//755757
337	7028//1029701
338	7029//1075846
339	83//755758
340	70//755757
341	43//755757

Property ID	Lot/Section No./ Deposited Plan
342	7038//1117632
343	158//722293
344	139//755757
345	93//755757
346	7037//1117633
347	7036//1117631
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349	13//755757
350	136//755757
351	20//755757
352	18//755757
353	27//755757
354	41//755757
355	26//755757
356	47//755757
357	24//755757
358	50//755757
359	7002//1058210
360	7302//1130728
361	7304//1130728
362	7028//1065275
363	21//755758
364	35//755786

APPENDIX 2 DEVELOPMENT SITE

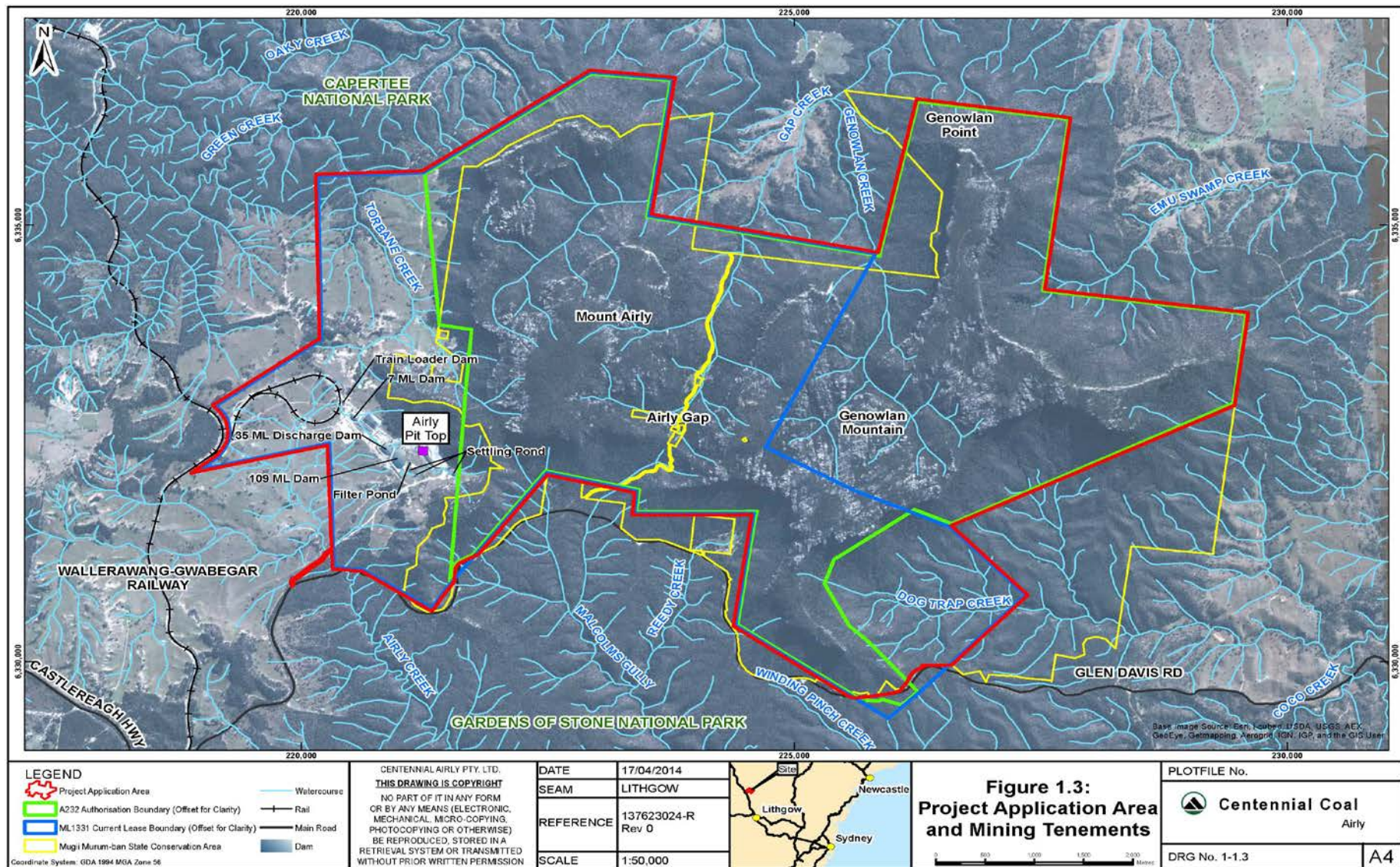


Figure 1: Airly Mine Extension Project – Development Site

APPENDIX 3 DEVELOPMENT LAYOUT

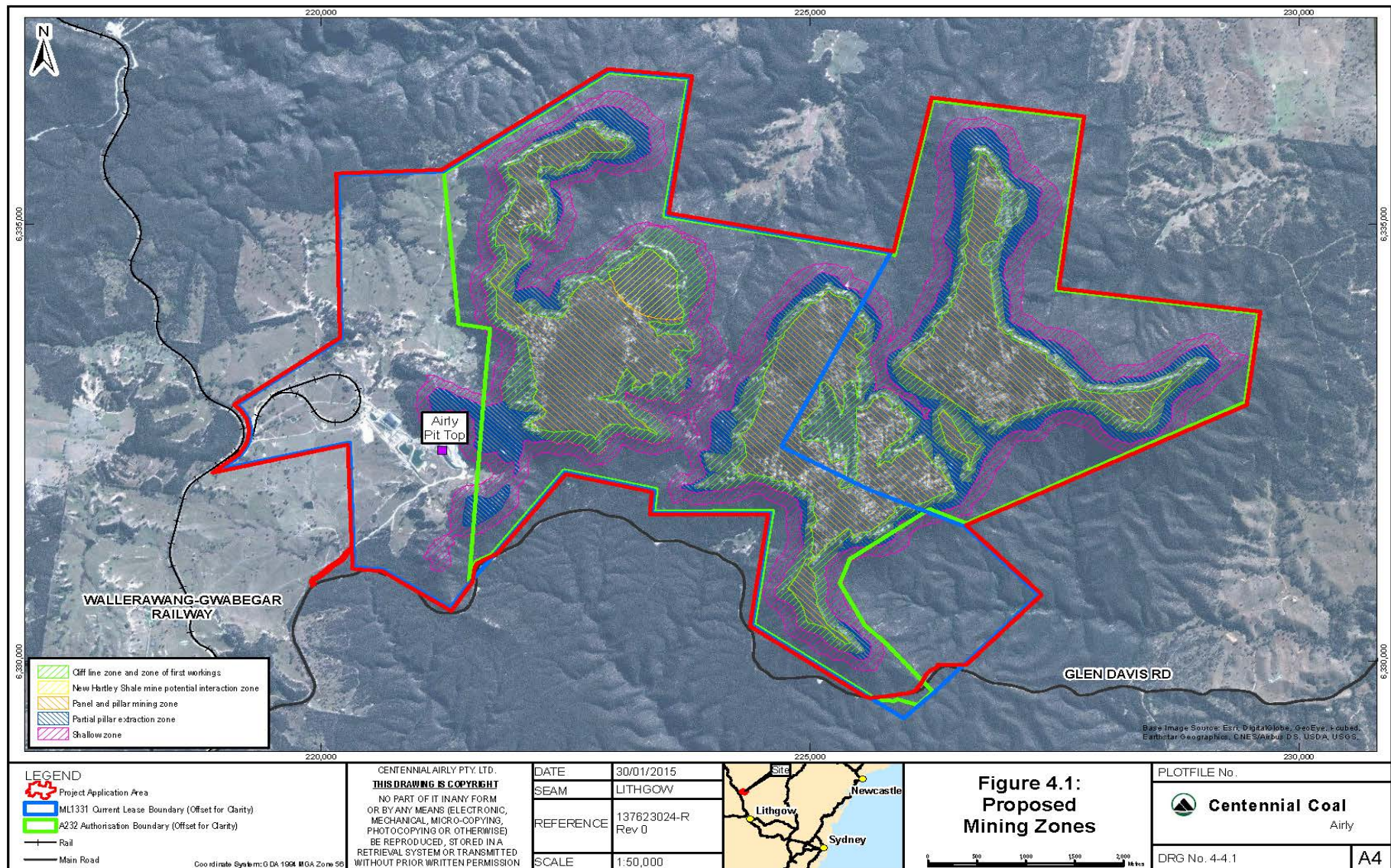


Figure 2: General layout of mining zones

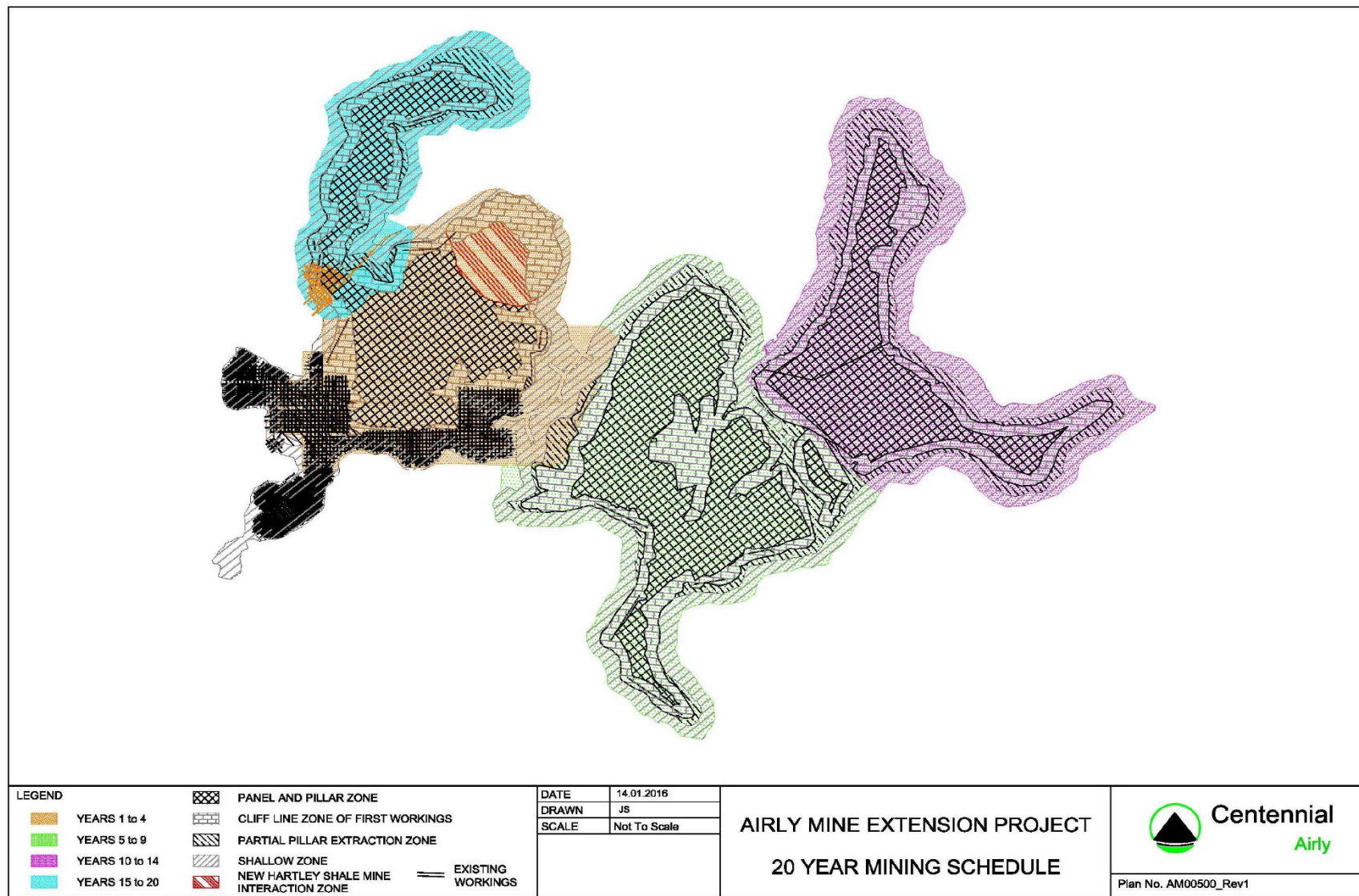


Figure 3: Mining schedule

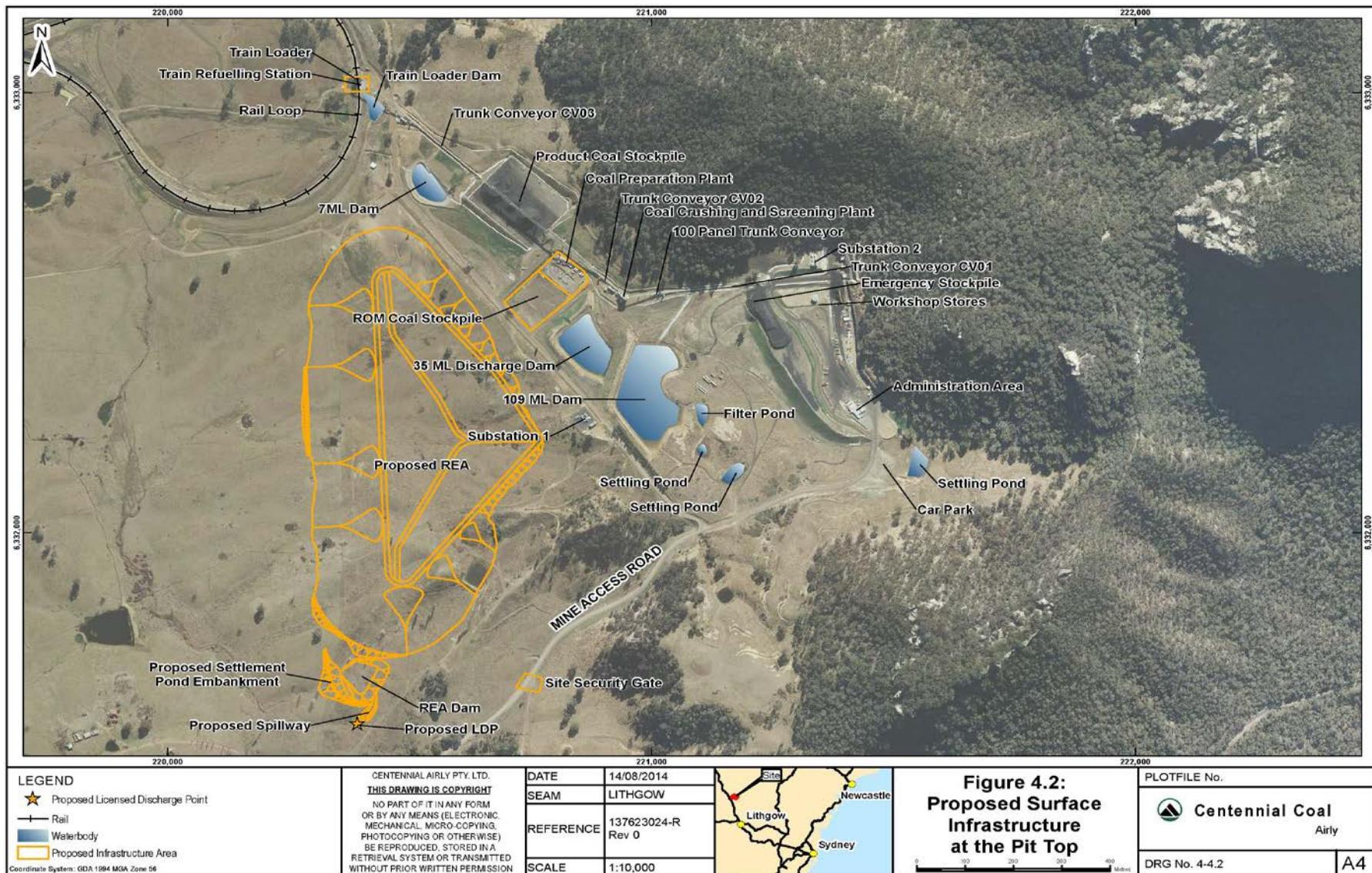


Figure 4: General layout of existing and proposed infrastructure areas

APPENDIX 4 LAND OWNERSHIP

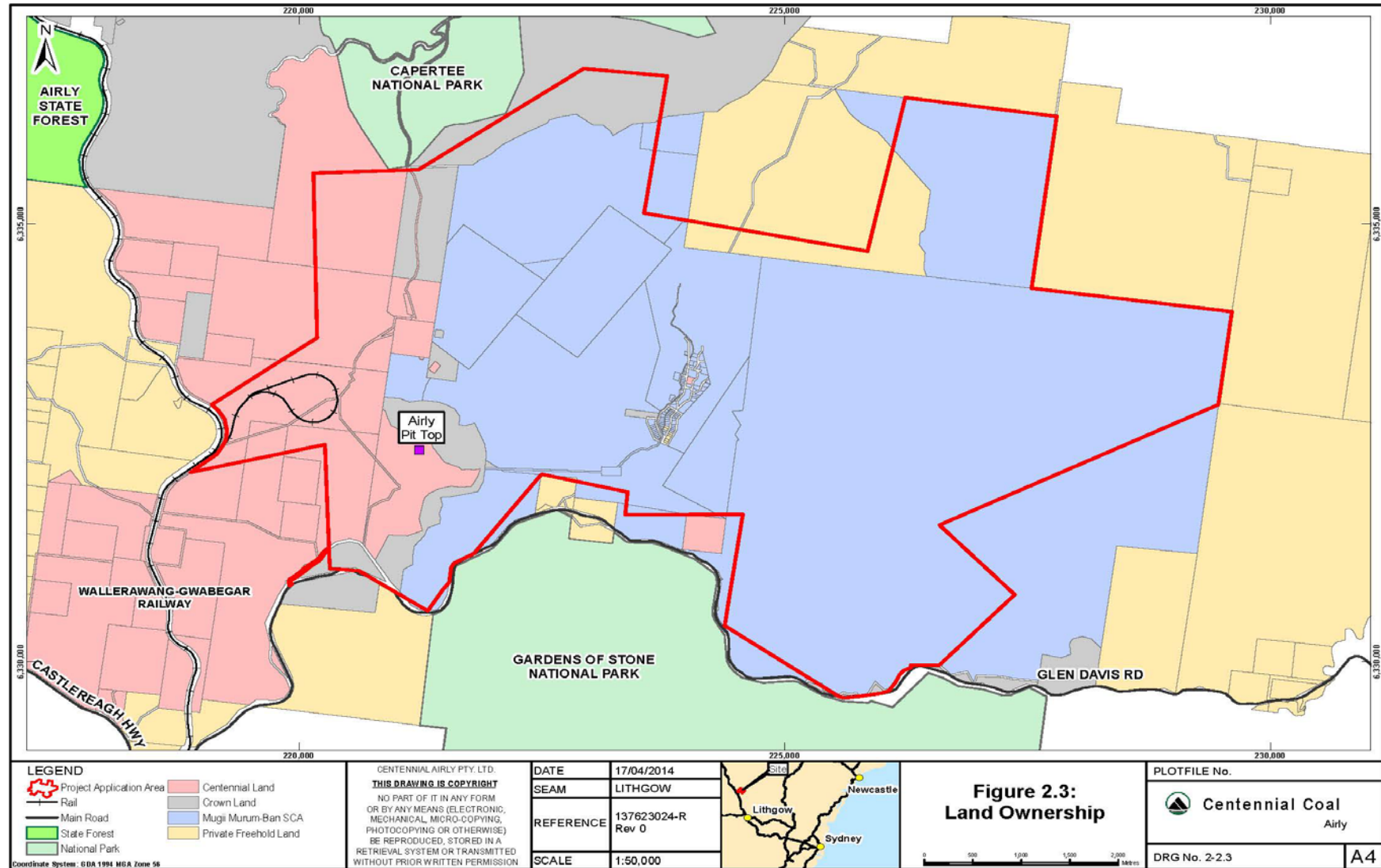


Figure 5: Land ownership plan

APPENDIX 5 ABORIGINAL HERITAGE SITES

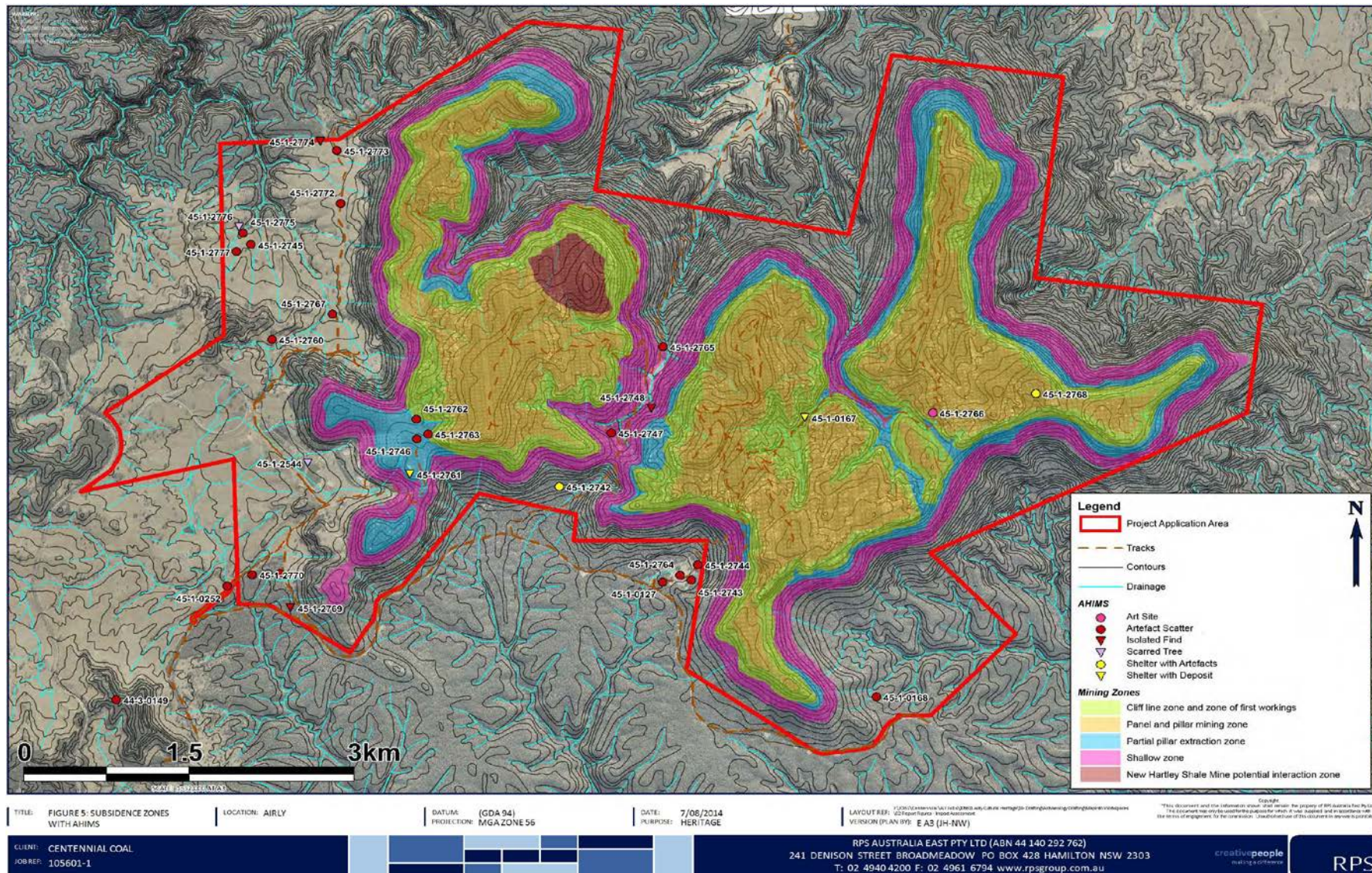


Figure 6: Aboriginal heritage sites within or near to the PAA and proposed mining zones

APPENDIX 6 NON-ABORIGINAL HERITAGE SITES

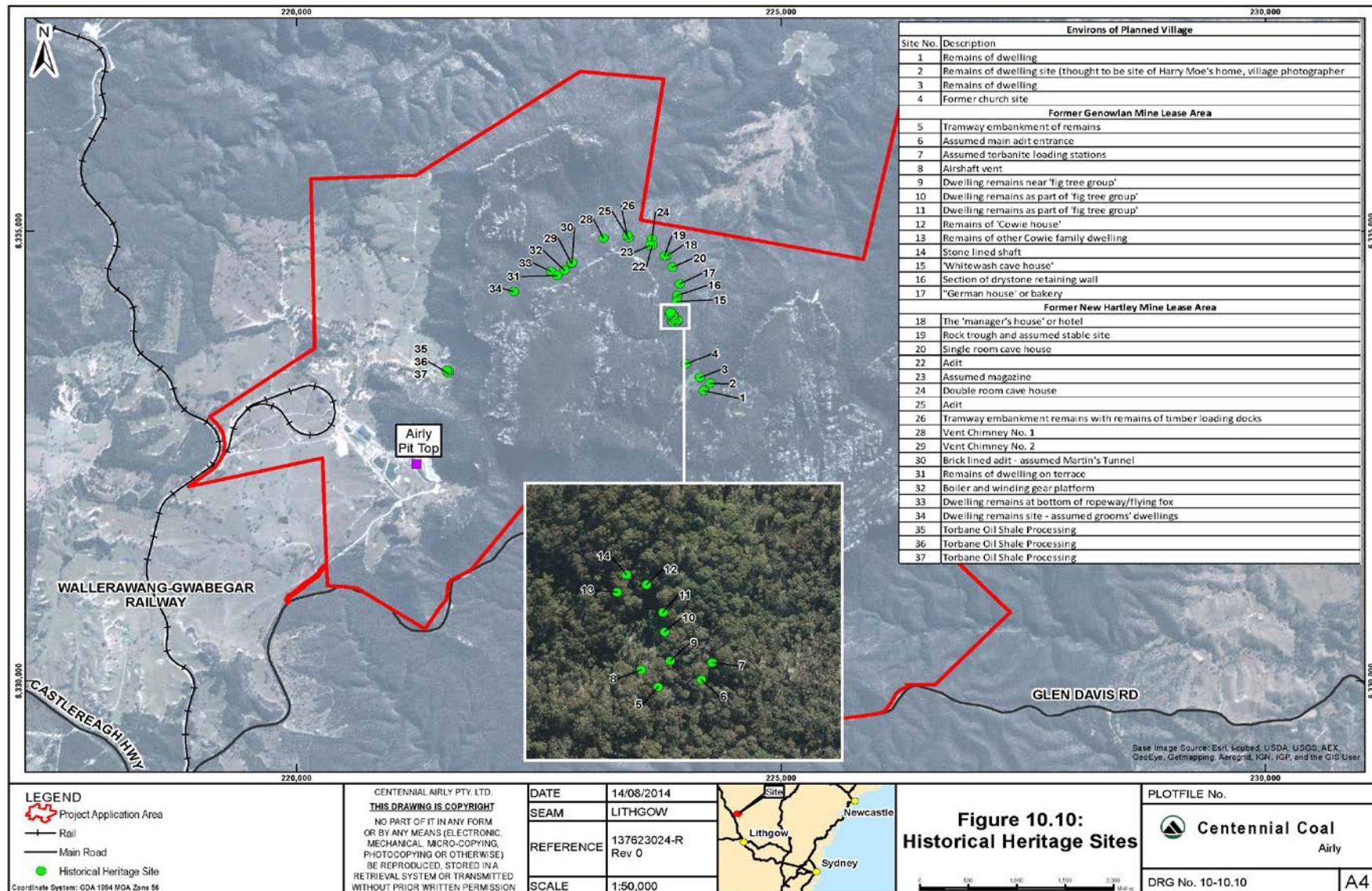


Figure 7: Cultural heritage sites in the PAA

APPENDIX 7 NOISE RECEIVER LOCATIONS

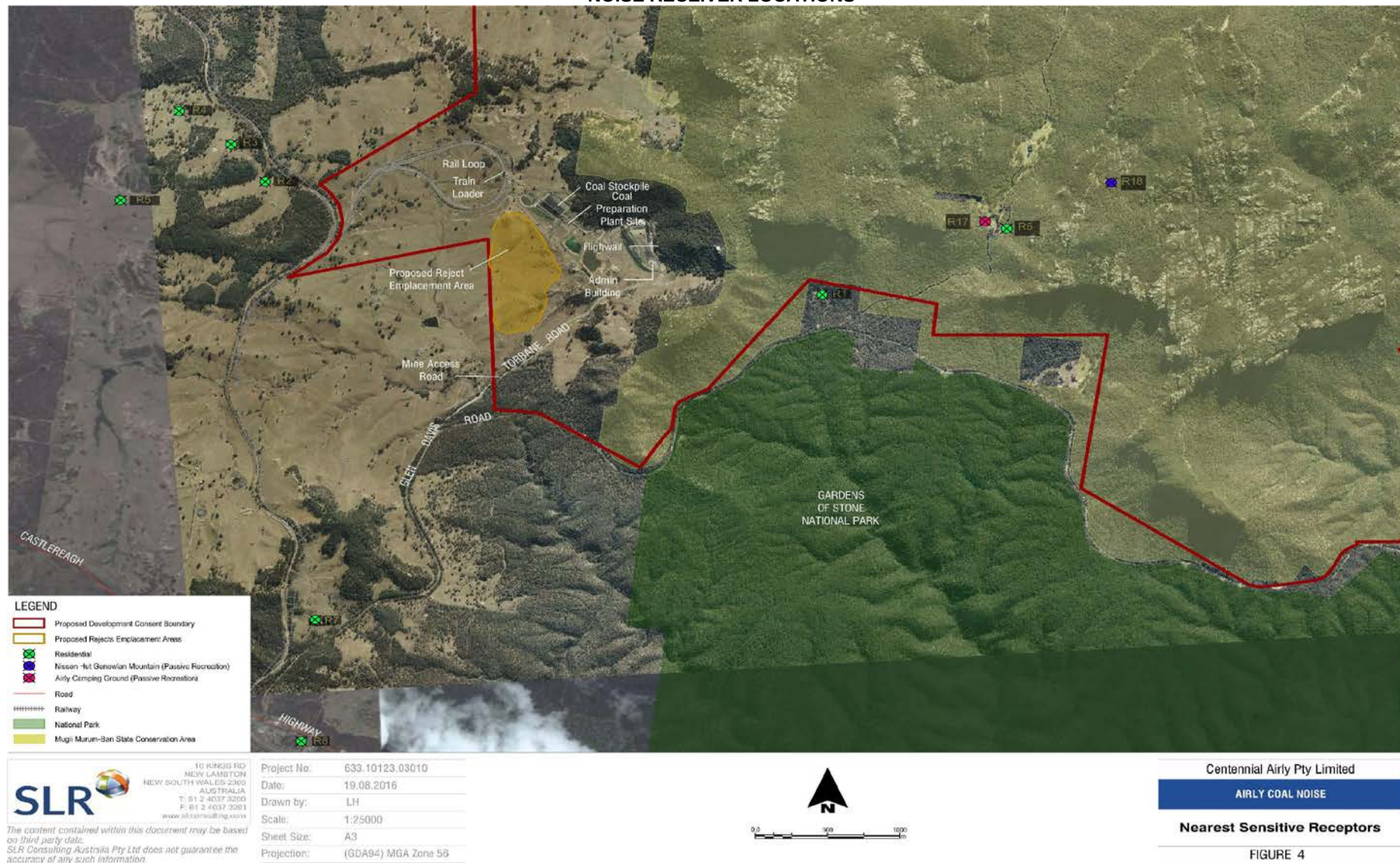


Figure 8: Noise receiver locations

APPENDIX 8 NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 4 in Schedule 4 are to apply to a receiver under all meteorological conditions except under:
 - (a) wind speeds greater than 3 m/s at 10 m above ground level; or
 - (b) stability category F temperature inversions and wind speed greater than 2 m/s at 10 m above ground level; or
 - (c) stability category G temperature inversion conditions.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station required under condition 8 of Schedule 4.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.
4. Unless the Secretary agrees otherwise, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
 - (a) monitoring locations for the collection of representative noise data;
 - (b) meteorological conditions during which collection of noise data is not appropriate;
 - (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
 - (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

APPENDIX 9 AIRLY CREEK MONITORING LOCATIONS

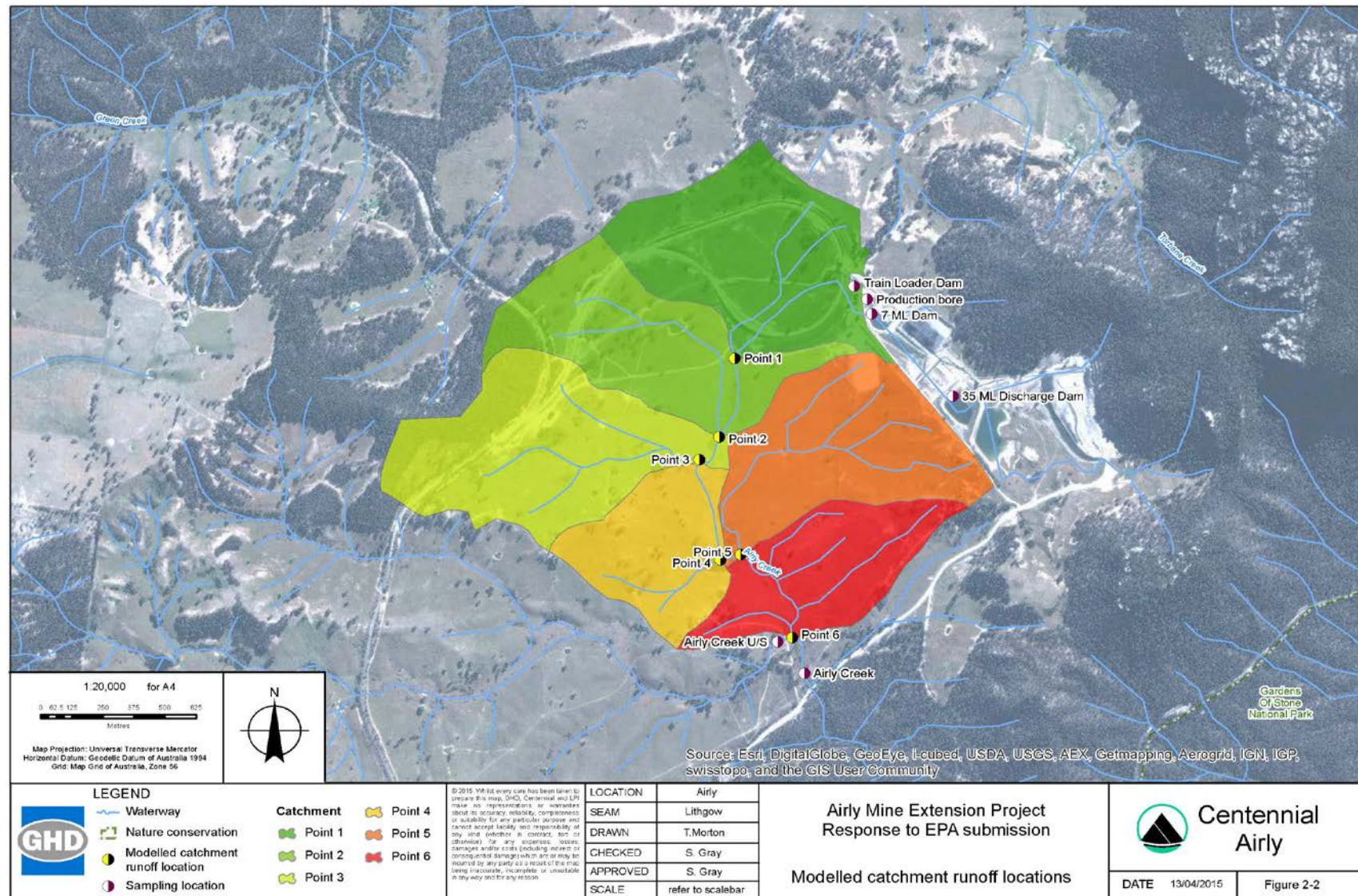


Figure 9: Airly Creek Monitoring Locations

APPENDIX 10 REHABILITATION PLANS

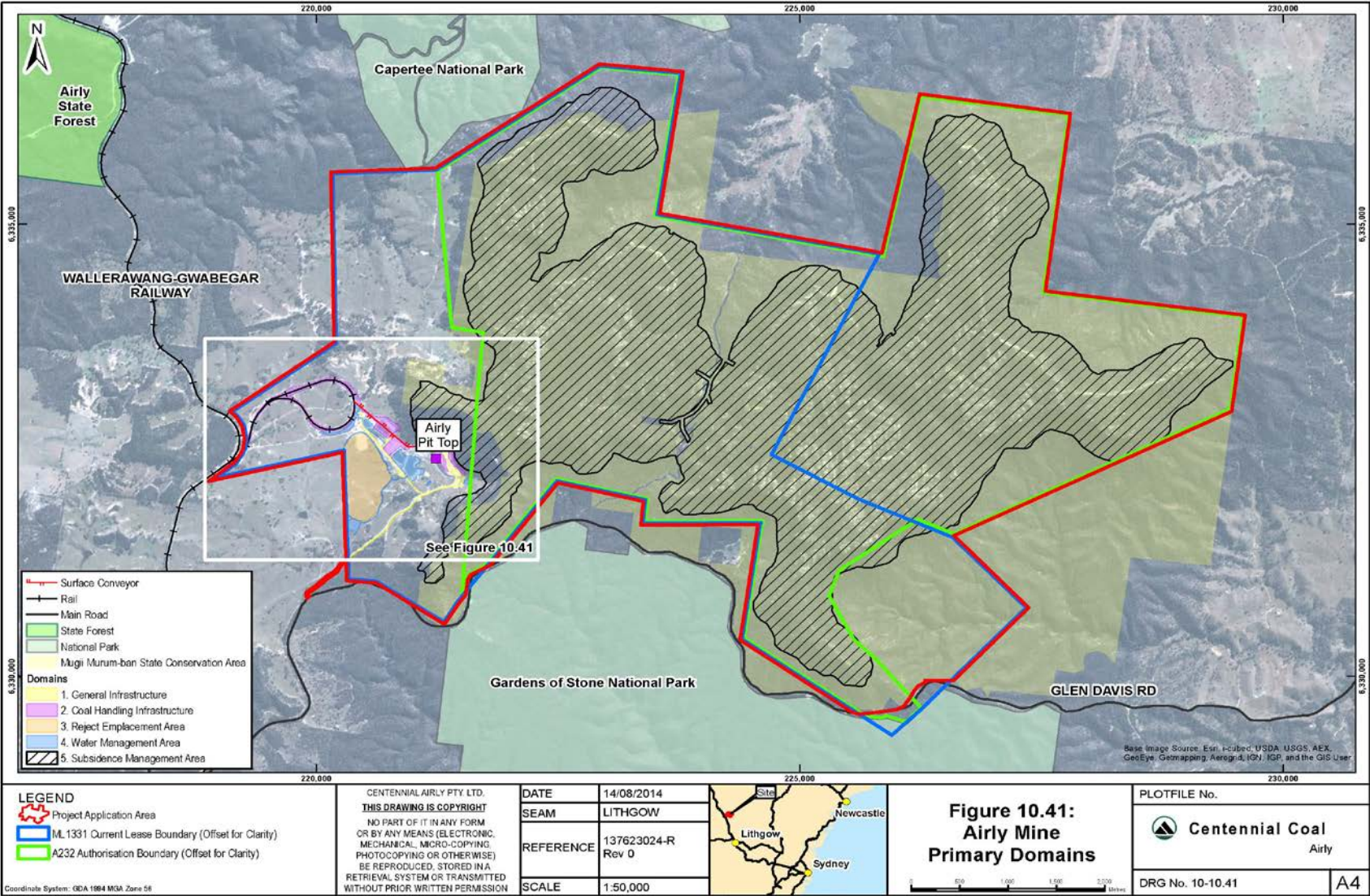


Figure 10: Primary domain rehabilitation plans

APPENDIX 11: TRIAL MINING AREA

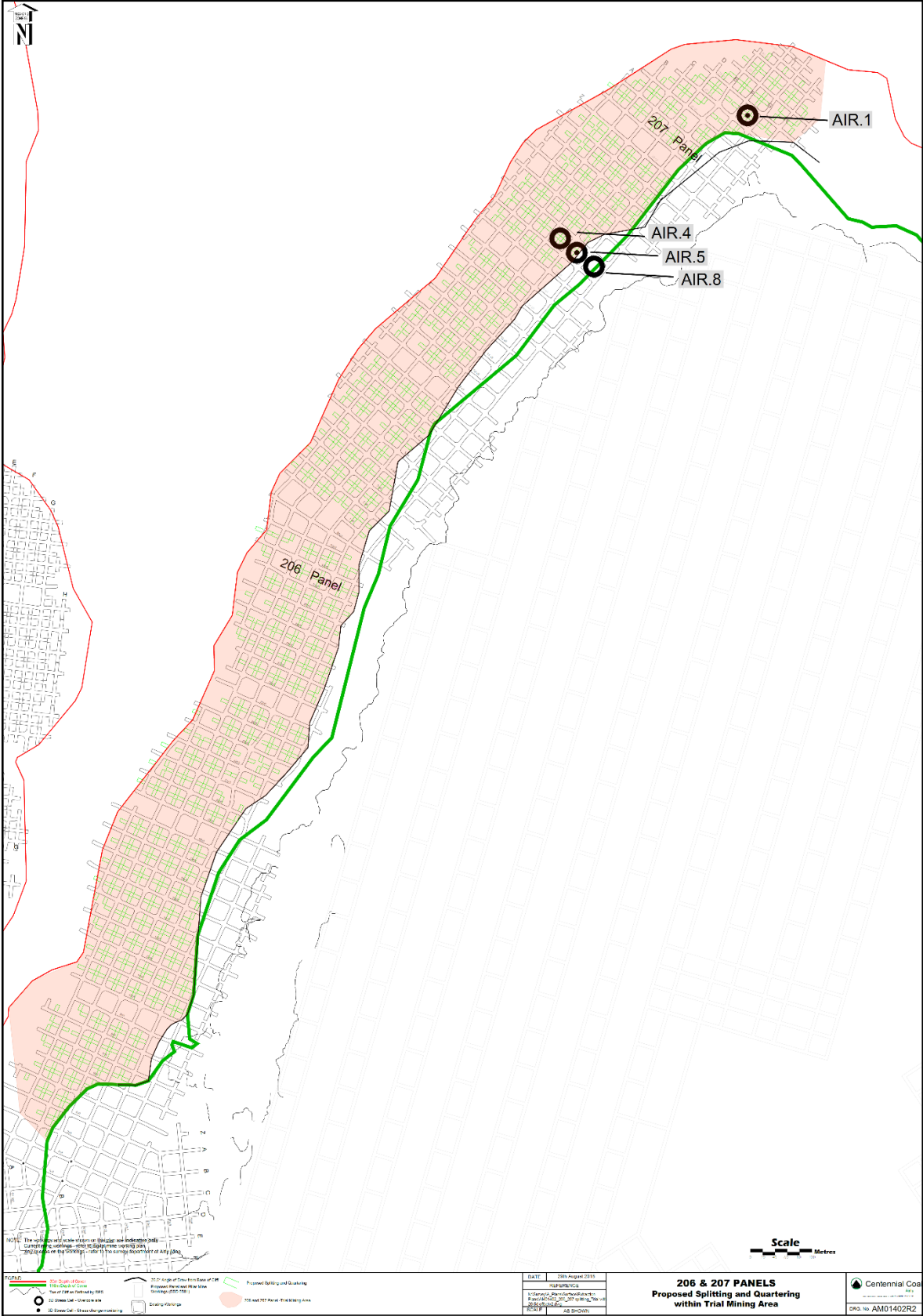


Figure 12: Trial mining area

APPENDIX 12: Water Transfer Route



Figure 13: Rail route for water transfer from Charbon Colliery to Airly Coal Mine

Appendix 2 – DPE Approval



Mr James Wearne
Group Manager Approvals
Centennial Coal Pty Limited
100 Miller Road
FASSIFERN NSW 2283

Dear Mr Wearne

**Airly Mine Extension Project (SSD 5581)
Rehabilitation Management Plan**

I refer to your correspondence dated 22 December 2016 and 7 February 2017 requesting further time to submit the Rehabilitation Management Plan (RMP) for the Airly Mine Extension Project (SSD 5581) and to consolidate the RMP into the Mining Operations Plan required by conditions of the mining lease.

The Department has considered the merits of this request and the Secretary has agreed for you to:

- extend the time period to prepare the Rehabilitation Plan, until 31 July 2017; and
- consolidate the Rehabilitation Management Plan into the Mining Operations Plan.

In order to allow Centennial to produce one rehabilitation plan which satisfies both the conditions of approval and the mining lease, the Department requests that the RMP is submitted to the Department for approval by 31 July 2017.

If you have any further enquiries about this matter, please contact Anthony Ko on the above contact details.

Yours sincerely

13/2/17

Clay Preshaw
A/Director
Resource Assessments
as nominee of the Secretary

Appendix 3 – Risk Assessment

Site: Airly
Title: Mine Operations Plan Risk Assessment
Stature ID:1001147011
Version: 1
Lifecycle State:

1 of 44



Centennial Coal

Stature for Risk Management

Administration:

Risk Assessment Title: Mine Operations Plan Risk Assessment

Version: 1

Region: West

Site: Airly

Department: ZZZZ Whole Site

Equipment / Process: Community

Stature Risk Assessment No.: 1001147011

Study Lifecycle State: Risk Assessment In Progress

Potential Hazard No.:

PULSE Actions Required URL:

Site Risk Assessment Ref. No. (Optional):

1. Background

In accordance with the NSW Department of Trade and Investment, Regional Infrastructure and Services (NSW Trade & Investment) ESG3: Mining Operations Plan (MOP) Guidelines (2013), Airly Mine has to complete a risk assessment to identify risks associated with continued operations, rehabilitation and closure.

2. Objective

The following Hierarchy of Controls offers a framework for considering the effectiveness of controls. Note that the effectiveness of a control that is intended to reduce a risk decreases from top to bottom of the list. In other words, the closer the control type is to the top of the hierarchy, the more potentially effective the control.

- Eliminate the hazard or energy source (do not use the energy)
- Minimise or replace the hazard or energy source (reduce the amount of energy to a less damaging level or replace the energy with another that has less potential negative consequences)
- Control the hazard or energy using engineered devices (ex. Lock outs, chemical containers, mechanical roof support, gas monitors, etc.)
- Control the hazard or energy by using physical barriers (ex. machine guarding, fences or enclosures, etc.)
- Control the hazard or energy with procedures (ex. Isolation procedures, standard operating procedures, etc.)
- Control the hazard or energy with personal protective equipment (ex. hard hats, boots with toe caps, gloves, safety glasses, welding gear, etc.)
- Control the hazard or energy with warnings and awareness (ex. posters, labels, warning signs, verbal warnings, etc.)

The objective of this Risk Assessment is to:

- To identify risks to the continued operation of the mine through the facilitation of a Risk Assessment;
- To identify risks for all work areas;
- Identify the specific nature of the risk/hazard;
- Identify knowledge gaps;
- Identify the existing controls that are in place to manage the risk/hazard;
- Identify actions required to fill knowledge gaps;
- Evaluate the consequence and likelihood of the risk/hazard; and
- Develop a series of controls/actions to reduce all risk/hazard to an acceptable level.

3. Potential Hazards

Impacts associated with mine operation include, but are not limited to, the below factors:

- Surface water pollution;
- Groundwater pollution;
- Landform stability issues causing sediment/erosion impacts;
- Impacts to biodiversity;
- Impacts to Aboriginal and Historic heritage;
- Air quality and noise impacts to surrounding receptors;
- Public safety;
- Failure of rehabilitation;
- Subsidence; and
- Bushfire.

4a. Risk Assessment Boundary Definition

Colliery holdings including ML1331 and A232

5. Risk Assessment Methods

Risk Assessment Methods:

Workplace Risk Assessment and Control (WRAC): Yes

Fault Tree Analysis (FTA):

Safety Integrity Level Analysis to Australian Standard 61508 (SIL):

Bow Tie Analysis (BTA):

Failure Modes and Effects Analysis (FMEA):

Hazard and Operability Analysis (HAZOP):

6. Previous Risk Assessment and other documents to be used and/or referenced

Document Name	Title	Version	Referenced Document Date
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10. Scope Confirmation

Approver	Scope Confirmation	Date	Comments
1. Jacqueline Cooke [Jacqueline.Cooke]	Yes	April 04, 2017	

WRAC Analysis Worksheet

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
1. Geology and Geochemistry	There is a risk to Airly from ::: Discharge of contaminated surface runoff ::: Caused by: Pollution of surface water by contaminated material and failure to capture and contain Resulting in: Impacts to biodiversity values or Impacts to water courses.	1.1.a. PIRMP in place at the site.	C (D)	2 (E)	8 (M)	2. Investigate options for additional water storage dam.	
		1.1.b. Site Water Management Plan in place.					
		1.1.c. Monitoring programme developed as part of the Water Management Plan.					
		1.1.d. Water managment structures designed in accorandace with blue book criteria					
		1.1.e. Routine Inspection of water managment structures.					
	There is a risk to Airly from ::: Acid Mine Drainage ::: Caused by: Inadequate knowledge of potential contamination sources/geochemistry or Pollution of surface water by contaminated material and failure to capture and contain or Use of contaminated fill material Resulting in: Impacts to biodiversity values or Impacts to surface water quality in creeks or Non compliance with water quality criteria.	1.2.a. Site Water Management Plan in place for the site.	D (D)	2 (E)	5 (L)		
		1.2.b. Monitoring program developed as part of the Water Management Plan.					
		1.2.c. No historical evidence of AMD.					
		1.2.d. No Reject Emplacement Area (REA).					
	There is a risk to Airly from ::: Erosion ::: Caused by: Dispersive materials exposed at surface Resulting in: Erosion and sedimentation or Exposure of capped coal and reject materials or Failure to achieve successful	1.3.a. Site Water Management Plan in place for the site.	C (D)	1 (E)	4 (L)		
		1.3.b. Sediment control dams in place.					
		1.3.c. Erosion and sediment control Inspections and maintenance protocol in place.					
		1.3.d. Mine Operations Plan (MOP)					

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	rehabilitation or Impact to land/soil or Impacts to surface water quality in creeks or Impacts to the capacity of the sites water management system.						
2. Spontaneous Combustion	There is a risk to Airly from ::: Spontaneous combustion of coal ::: Caused by: exposed coal seams at the surface or Exposed underground coal seams Resulting in: Failure to meeting rehabilitation and closure criteria objectives or Ongoing management issues and costs or Public safety issues.	2.1.a. No historical issues concerning spontaneous combustion. 2.1.b. Spontaneous Combustion Management Plan in place. 2.1.c. R 70 testing determined Low propensity to spon com	D (D)	2 (E)	5 (L)		
3. Mine Subsidence	There is a risk to Airly from ::: Sinkholes/subsidence cracks ::: Caused by: Shallow depth of cover or Water storage above previously mined areas Resulting in: Failure to meeting rehabilitation and closure criteria objectives or Ongoing management issues and costs or Public safety issues.	3.1.a. Subsidence Management Plan 3.1.b. Shallow workings HRA - including geotechnical assessment 3.1.c. Routine Visual inspections 3.1.d. Mining Method -first workings long term stable	D (D)	2 (E)	5 (L)		
4. Colliery Adits	There is a risk to Airly from ::: Portals and boreholes not sealed appropriately ::: Caused by: Failure of seals or failure to follow MDG 6001 Resulting in: Failure to satisfy government agency requirements or ongoing liability or Public safety issues.	4.1.a. Mine is currently operational - no requirement for sealling 4.1.b. Bore holes currently not sealed due to groundwater monitoring. 4.1.c. REF's for all installed bore holes.	D (D)	3 (L)	9 (M)	3. Review of existing portal seals at Airly to determine compliance with DRE guidelines. 4. Develop a detailed sealing strategy prior to closure. 5. Exploration Activities and Minor Surface Infrastructure Management Plan to be developed.	
5. Erosion and Sediment	There is a risk to Airly from	5.1.a. Erosion and sediment control	C	1	4		



Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
Control	∴ Erosion and/or sediment on disturbed mining areas, disturbed infrastructure/workshop/roads/pit top areas and exploration/monitoring sites. ∴ Caused by: Delay in implementation of Rehabilitation Strategy or Failure of existing rehabilitation efforts or Failure to implement appropriate surface drainage or Significant rainfall events Resulting in: Failure to achieve successful rehabilitation or Impacts to water courses or Non compliance with water quality criteria or Ongoing management issues and costs.	Inspections and maintenance protocol in place. 5.1.b. Sediment control dams in place. 5.1.c. Monitoring programme developed as part of the Water Management Plan. 5.1.d. Site Water Management Plan in place for the site Including erosion and sediment control.	(D)	(L)	(L)		
6. Soil Type and Suitability	There is a risk to Airly from ∴ Poor rehabilitation success ∴ Caused by: Limited suitable topsoil availability or Poor top soil quality Resulting in: Failure to achieve successful rehabilitation.	6.1.a. Use appropriate subsoil materials as a topsoil substitute where possible 6.1.b. Benign spoil materials are amenable to colonisation by native trees and shrubs 6.1.c. REF for exploration activities	C (D)	2 (E)	8 (M)	11. ALARP	
7. Flora	There is a risk to Airly from ∴ Poor rehabilitation success ∴ Caused by: Failure to manage weeds/noxious species or Use of incorrect rehabilitation species Resulting in: Failure to achieve successful rehabilitation.	7.1.a. Rehabilitation completed to date has not been hampered by weeds. 7.1.b. Weed control program implemented. 7.1.c. Baseline weed survey completed.	D (D)	1 (E)	2 (L)		
	There is a risk to Airly from	7.2.a. Vegetation communities	D	3	9	11. ALARP	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Impact to existing remnant native species Caused by: Disturbance to undisturbed or previous rehabilitated areas or Inadequate drainage Resulting in: Impact to land/soil or Loss/impacts to flora or Non compliance with approvals.	mapped. 7.2.b. Surface disturbance protocol developed and implemented 7.2.c. REF's and Due Diligence Surveys for disturbance areas. 7.2.d. Mining Method -first workings long term stable	(D)	(E)	(M)		
8. Fauna	There is a risk to Airly from Feral animals Caused by: Failure to manage feral animals Resulting in: Failure to achieve successful rehabilitation.	8.1.a. National Parks Feral animal control program in place.	D (D)	1 (E)	2 (L)		
	There is a risk to Airly from Impact to habitat for fauna species Caused by: Disturbance to undisturbed or previous rehabilitated areas or Use of incorrect rehabilitation species Resulting in: loss of biodiversity values or Non compliance with approvals.	8.2.a. Surface disturbance protocol developed 8.2.b. Vegetation communities mapped. 8.2.c. REF's, EIS, and Due Diligence Surveys 8.2.d. Mining Method -first workings long term stable	D (D)	2 (E)	5 (L)		
	There is a risk to Airly from Impact to aquatic fauna Caused by: Connectivity between groundwater and surface water interface or Failure of existing rehabilitation efforts or inadequate surface water management or Geotechnical failure or Inadequate	8.3.a. Site Water Management Plan in place for the site. 8.3.b. Monitoring programme developed as part of the Water Management Plan. 8.3.c. Baseline water investigations commenced. 8.3.d. No significant historical evidence of AMD.	D (D)	2 (E)	5 (L)		

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	knowledge of potential contamination sources/geochemistry or Pollution of surface water by contaminated material and failure to capture and contain or Use of contaminated fill material Resulting in: Impacts to biodiversity values or Impacts to surface water quality in creeks or Impacts to water courses or Non compliance with approvals.	8.3.e. Sediment control dams in place. 8.3.f. Annual aquatic ecology monitoring conducted 8.3.g. Mining Method -first workings long term stable					
9. Slopes and Slope Management	There is a risk to Airly from ::: Long term stability failure of highwalls ::: Caused by: Geotechnical failure Resulting in: Failure to achieve successful rehabilitation or Impacts to surface water quality in creeks or loss of biodiversity values or Ongoing management issues and costs or Public safety issues.	9.1.a. Fencing to restrict public at the top of the highwall.	D (D)	2 (E)	5 (L)		
		9.1.b. Limited road access.					
		9.1.c. Visual Inspections					
		9.1.d. Exclusion zone and chain link fencing at the base of the highwall to arrest minor rock falls					
	There is a risk to Airly from ::: Long term stability of dam embankments ::: Caused by: Geotechnical failure Resulting in: Impacts to surface water quality in creeks. or loss of biodiversity values or Non compliance with approvals or Non compliance with water quality criteria or Ongoing management issues and costs or Public safety issues.	9.2.a. Routine Inspections including dam wall integrity	D (D)	3 (L)	9 (M)	6. Review option for downstream storage dam.	
		9.2.b. No trees growing on dam walls.					
		9.2.c. Dams developed in accordance with Blue Book criteria					
	There is a risk to Airly from ::: Long term stability of steep slopes :::	9.3.a. Mining Method -first workings long term stable	D (D)	2 (L)	5 (L)		
		9.3.b. Subsidence and Extraction					

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Caused by: Geotechnical failure Resulting in: Failure to achieve successful rehabilitation or Impacts to surface water quality in creeks or loss of biodiversity values or Non compliance with approvals or Ongoing management issues and costs or Public safety issues.	Management Plans					
		9.3.c. Routine inspection and maintenance of steep slopes.					
	There is a risk to Airly from ::: Long term stability of final landform ::: Caused by: Geotechnical failure or Inadequate final landform design Resulting in: Failure to achieve successful rehabilitation or loss of biodiversity values or Ongoing management issues and costs or Public safety issues.	9.4.a. Routine inspection and maintenance of steep slopes.					
		9.4.b. Subsidence and Extraction Management Plans					
		9.4.c. Mining Method -first workings long term stable	D (D)	2 (L)	5 (L)		
10. Relinquishment	There is a risk to Airly from ::: Failure to achieve relinquishment ::: Caused by: New conditions of a development consent no currently considered or Unidentified closure obligations Resulting in: Failure to meeting rehabilitation and closure criteria objectives or Ongoing management issues and costs.	10.1.a. Development Consent SSD_5581 is predicted to be sufficient for life of mine.				7. Develop suitable completion criteria	
		10.1.b. Revised MOP/RMP currently being developed	D (D)	2 (L)	5 (L)	8. Develop detailed Mine Closure Plan within 5 years of closure.	
11. Waste	There is a risk to Airly from ::: Inappropriate disposal of waste materials ::: Caused by:	11.1.a. Service contract with JR Richards for waste disposal					
		11.1.b. Waste management and recycling strategy currently implemented.	D (D)	2 (E)	5 (L)		
		11.1.c. PIRMP in place at the site.					

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Capacity of local landfills or Lack of approvals or Poor planning Resulting in: Fine or Increase in disposal costs.						
12. Reject Emplacement Area	There is a risk to Airly from ::: Delay to rehabilitation ::: Caused by: Capping suitability or Inadequate drainage or Low surface strength and trafficability issues Resulting in: Delay to rehabilitation or Increased costs.	12.1.a. No Reject Emplacement Area (REA) currently exists at Airly	E ()	2 ()	3 (L)		
13. Surface Water and Groundwater	There is a risk to Airly from ::: Discharge of polluted water off site ::: Caused by: High rainfall events or Inadequate drainage or Inadequate storage Resulting in: Impacts to biodiversity values or Impacts to surface water quality in creeks or Non compliance with approvals or Non compliance with water quality criteria.	13.1.a. Site Water Management Plan in place for the site.	C (D)	2 (E)	8 (M)	6. Review option for downstream storage dam.	
		13.1.b. Monitoring programme developed as part of the Water Management Plan.					
		13.1.c. Sediment control dams in place.					
		13.1.d. Erosion and sediment control Inspections and maintenance protocol in place.					
		13.1.e. L2.5 rainfall exemption within EPL528					
	There is a risk to Airly from ::: Groundwater discharge from underground mine workings ::: Caused by: Connectivity between groundwater and surface water interface - Village Spring or Underground workings fill with groundwater Resulting in: Impacts to biodiversity values or	13.2.a. Site Water Management Plan in place for the site. 13.2.b. Subsidence and Extraction Management Plans 13.2.c. Mining Method -first workings long term stable	C (D)	2 (E)	8 (M)	11. ALARP	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Impacts to surface water quality in creeks or Non compliance with approvals or Non compliance with water quality criteria.						
14. Hazardous Materials and Dangerous Goods	There is a risk to Airly from ::: Land contamination ::: Caused by: Failure to identify hazardous materials and dangerous goods remaining on site at closure or Inappropriate disposal or Innappropriate storage of hazardous materials or dangerous goods Resulting in: Impact to land/soil or Impacts to biodiversity values or Impacts to surface water quality in creeks or Non compliance with approvals or Non compliance with water quality criteria or Public safety issues.	14.1.a. Inventory of site based hazardous materials established.	D (D)	2 (L)	5 (L)		
		14.1.b. No Asbestos associated with Mining Areas					
		14.1.c. Newly established Mine site, no legacy or historic contamination					
		14.1.d. Adequate hydrocarbon storage facilities					
		14.1.e. Storage of hazardous materials contained to concrete pads and hard stand ares to mitigate against groundwater pollution					
		14.1.f. PIRMP in place at the site.					
		14.1.g. Spill kits					
		14.1.h. Water Management Plan					
15. Contaminated Land	There is a risk to Airly from ::: Inability to relinquish lease ::: Caused by: higher than acceptable levels of contaminants or Poor rehabilitation Resulting in: Failure to achieve successful rehabilitation or Failure to meeting rehabilitation and closure criteria objectives or ongoing liability or Public safety issues.	15.1.a. No Asbestos associated with Mining Areas	D (D)	2 (L)	5 (L)		
		15.1.b. Water Management Plan					
		15.1.c. Spill kits					
		15.1.d. Newly established Mine site, no legacy or historic contamination					
		15.1.e. PIRMP in place at the site.					
		15.1.f. Adequate hydrocarbon storage facilities					
		15.1.g. Storage of hazardous materials contained to concrete pads and hard stand ares to mitigate against groundwater pollution					
		15.1.h. Inventory of site based hazardous materials established.					



Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
16. Greenhouse Gas	There is a risk to Airly from ::: Impacts to air quality ::: Caused by: Methane gas from underground workings/exposed coal seam Resulting in: Impact to air quality or Public safety issues.	16.1.a. Gas monitoring indicates low concentration of methane and carbon dioxide. 16.1.b. Gas monitoring procedures in place.	D (D)	2 (E)	5 (L)		
17. Air Quality	There is a risk to Airly from ::: Emission of particulate matter ::: Caused by: Exposed disturbed areas or Rehabilitation activities and heavy plant use or Use of incorrect rehabilitation species Resulting in: Community complaints or Non compliance with air quality standards or Non compliance with approvals.	17.1.a. Air Quality Monitoring Program currently implemented 17.1.b. No significant historical issues concerning air quality 17.1.c. Air Quality Management Plan	D (D)	2 (L)	5 (L)	1. Install HVAS	
18. Noise	There is a risk to Airly from ::: Noise emissions ::: Caused by: Rehabilitation activities and heavy plant use Resulting in: Community complaints or Failure to meeting rehabilitation and closure criteria objectives or Impact to air or Public safety issues.	18.1.a. Noise Monitoring Program currently implemented 18.1.b. No significant historical issues concerning noise 18.1.c. Noise Management Plan	D (D)	2 (E)	5 (L)		
19. Public Safety	There is a risk to Airly from ::: Injury to members of the public ::: Caused by: Unauthorised access	19.1.a. Security fencing. 19.1.b. Locked gates 19.1.c. signage. 19.1.d. limited road access.	E (D)	4 (R)	10 (M)	9. Review Highwall Security Fence.	



Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Resulting in: Injury or death.						
20. Visual and Lighting	There is a risk to Airly from ::: Visual impacts and lighting emissions ::: Caused by: Failure to manage weeds/noxious species or Lighting Towers or Rehabilitation activities and heavy plant use or Stockpile/Infrastructure Areas Resulting in: Community complaints.	20.1.a. Rehabilitation completed to date has not been hampered by weeds. 20.1.b. Weed control program implemented. 20.1.c. Baseline weed survey completed. 20.1.d. Lighting review completed by SLR in March 2017	C (D)	1 (L)	4 (L)		
21. Aboriginal Cultural Heritage	There is a risk to Airly from ::: Disturbance of Aboriginal site or artifact ::: Caused by: Unintended interaction with Aboriginal site or artifact Resulting in: Non compliance with approvals or Unauthorised impact to Aboriginal site or artifact.	21.1.a. ACHMP 21.1.b. Fenced off sites within proximity to access tracks 21.1.c. REF's and Due Diligence Surveys for disturbance areas. 21.1.d. Surface disturbance protocol developed and implemented	D (D)	3 (L)	9 (M)	11. ALARP	
22. Historic Heritage	There is a risk to Airly from ::: Disturbance of heritage site or artifact ::: Caused by: Unintended interaction with heritage site or artifact Resulting in: Non compliance with approvals or Unauthorised impact to heritage site or artifact.	22.1.a. REF's and Due Diligence Surveys for disturbance areas. 22.1.b. Surface disturbance protocol developed and implemented 22.1.c. Historic Heritage Management Plan	D (D)	2 (L)	5 (L)		
23. Bushfire	There is a risk to Airly from	23.1.a. Site has a Bushfire Management Plan	C (D)	2 (F)	8 (M)	12. Reveiw Airlys bushfire Managment Plan	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	::: Bushfire impacting rehabilitation ::: Caused by: Inadequate bushfire management Resulting in: Impacts on rehabilitation success or Public safety issues.	23.1.b. Working relationship with RFS and National Parks 23.1.c. Fire breaks utilised onsite					
	There is a risk to Airly from ::: Bushfire impacting infrastructure ::: Caused by: Inadequate bushfire management Resulting in: Business Interruption and cost or Public safety issues.	23.2.a. Fire breaks utilised onsite 23.2.b. Working relationship with RFS and National Parks 23.2.c. Site has a Bushfire Management Plan	C (D)	2 (F)	8 (M)	12. Reveiw Airlys bushfire Managment Plan	
24. Drought	There is a risk to Airly from ::: Prolonged dry weather periods ::: Caused by: Drought Resulting in: Failure to meeting closure criteria objectives or Impacts on rehabilitation success.	24.1.a. Dams and water storage	C (D)	2 (E)	8 (M)	2. Investigate options for additional water storage dam.	
25. Community	There is a risk to Airly from ::: Community expectations not met ::: Caused by: Inadequate rehabilitation and post mining land use not met Resulting in: Community complaints or Impacts to business reputation.	25.1.a. CCC meetings 25.1.b. Community consultation as part of EIS 25.1.c. Community updates provided at monthly Capertee Progress Association Meetings	D (D)	2 (E)	5 (L)		
	There is a risk to Airly from ::: Social Impacts :::		C (D)	2 (R)	8 (M)	10. Develop Stakeholder Engagment Strategy for Mine Closure during detailed mine closure planning.	

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control	Bow Tie Extension
	Caused by: Closure of the mine - loss of employment Resulting in: Negative social/economic impacts on local communities.						

WRAC Analysis Sorted by RR

Instructions:

WRAC Analysis Sorted by RR (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
19. Public Safety	There is a risk to Airly from ::: Injury to members of the public ::: Caused by: Unauthorised access Resulting in: Injury or death.	19.1.a. Security fencing.	E (D)	4 (R)	10 (M)	9. Review Highwall Security Fence.
		19.1.b. Locked gates				
		19.1.c. signage.				
		19.1.d. limited road access.				
4. Colliery Adits	There is a risk to Airly from ::: Portals and boreholes not sealed appropriately ::: Caused by: Failure of seals or failure to follow MDG 6001 Resulting in: Failure to satisfy government agency requirements or ongoing liability or Public safety issues.	4.1.a. Mine is currently operational - no requirement for sealling	D (D)	3 (L)	9 (M)	3. Review of existing portal seals at Airly to determine compliance with DRE guidelines.
		4.1.b. Bore holes currently not sealed due to groundwater monitoring.				4. Develop a detailed sealing strategy prior to closure.
		4.1.c. REF's for all installed bore holes.				5. Exploration Activities and Minor Surface Infrastructure Management Plan to be developed.
7. Flora	There is a risk to Airly from ::: Impact to existing remnant native species ::: Caused by: Disturbance to undisturbed or previous rehabilitated areas or Inadequate drainage Resulting in: Impact to land/soil or Loss/impacts to flora or Non compliance with approvals.	7.2.a. Vegetation communities mapped.	D (D)	3 (E)	9 (M)	11. ALARP
		7.2.b. Surface disturbance protocol developed and implemented				
		7.2.c. REF's and Due Diligence Surveys for disturbance areas.				
		7.2.d. Mining Method -first workings long term stable				
9. Slopes and Slope Management	There is a risk to Airly from ::: Long term stability of dam embankments ::: :::	9.2.a. Routine Inspections including dam wall integrity	D (D)	3 (L)	9 (M)	6. Review option for downstream storage dam.
		9.2.b. No trees growing on dam walls.				

Instructions:

WRAC Analysis Sorted by RR (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Caused by: Geotechnical failure Resulting in: Impacts to surface water quality in creeks. or loss of biodiversity values or Non compliance with approvals or Non compliance with water quality criteria or Ongoing management issues and costs or Public safety issues.	9.2.c. Dams developed in accordance with Blue Book criteria				
21. Aboriginal Cultural Heritage	There is a risk to Airly from ::: Disturbance of Aboriginal site or artifact ::: Caused by: Unintended interaction with Aboriginal site or artifact Resulting in: Non compliance with approvals or Unauthorised impact to Aboriginal site or artifact.	21.1.a. ACHMP 21.1.b. Fenced off sites within proximity to access tracks 21.1.c. REF's and Due Diligence Surveys for disturbance areas. 21.1.d. Surface disturbance protocol developed and implemented	D (D)	3 (L)	9 (M)	11. ALARP
1. Geology and Geochemistry	There is a risk to Airly from ::: Discharge of contaminated surface runoff ::: Caused by: Pollution of surface water by contaminated material and failure to capture and contain Resulting in: Impacts to biodiversity values or Impacts to water courses.	1.1.a. PIRMP in place at the site. 1.1.b. Site Water Management Plan in place. 1.1.c. Monitoring programme developed as part of the Water Management Plan. 1.1.d. Water managment structures designed in accorandace with blue book criteria 1.1.e. Routine Inspection of water managment structures.	C (D)	2 (E)	8 (M)	2. Investigate options for additional water storage dam.
6. Soil Type and Suitability	There is a risk to Airly from ::: Poor rehabilitation success ::: Caused by: Limited suitable topsoil availability or Poor top soil quality	6.1.a. Use appropriate subsoil materials as a topsoil substitute where possible 6.1.b. Benign spoil materials are amenable to colonisation by native trees and shrubs 6.1.c. REF for exploration activities	C (D)	2 (E)	8 (M)	11. ALARP

Instructions:

WRAC Analysis Sorted by RR (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Resulting in: Failure to achieve successful rehabilitation.					
13. Surface Water and Groundwater	There is a risk to Airly from ::: Discharge of polluted water off site ::: Caused by: High rainfall events or Inadequate drainage or Inadequate storage Resulting in: Impacts to biodiversity values or Impacts to surface water quality in creeks or Non compliance with approvals or Non compliance with water quality criteria.	13.1.a. Site Water Management Plan in place for the site. 13.1.b. Monitoring programme developed as part of the Water Management Plan. 13.1.c. Sediment control dams in place. 13.1.d. Erosion and sediment control Inspections and maintenance protocol in place. 13.1.e. L2.5 rainfall exemption within EPL528	C (D)	2 (E)	8 (M)	6. Review option for downstream storage dam.
13. Surface Water and Groundwater	There is a risk to Airly from ::: Groundwater discharge from underground mine workings ::: Caused by: Connectivity between groundwater and surface water interface - Village Spring or Underground workings fill with groundwater Resulting in: Impacts to biodiversity values or Impacts to surface water quality in creeks or Non compliance with approvals or Non compliance with water quality criteria.	13.2.a. Site Water Management Plan in place for the site. 13.2.b. Subsidence and Extraction Management Plans 13.2.c. Mining Method -first workings long term stable	C (D)	2 (E)	8 (M)	11. ALARP
23. Bushfire	There is a risk to Airly from ::: Bushfire impacting rehabilitation ::: Caused by: Inadequate bushfire management Resulting in: Impacts on rehabilitation success or Public safety issues.	23.1.a. Site has a Bushfire Management Plan 23.1.b. Working relationship with RFS and National Parks 23.1.c. Fire breaks utilised onsite	C (D)	2 (F)	8 (M)	12. Reveiw Airlys bushfire Managment Plan
23. Bushfire	There is a risk to Airly from	23.2.a. Fire breaks utilised onsite	C	2	8	12. Reveiw Airlys bushfire Managment Plan

Instructions:

WRAC Analysis Sorted by RR (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	::: Bushfire impacting infrastructure ::: Caused by: Inadequate bushfire management Resulting in: Business Interruption and cost or Public safety issues.	23.2.b. Working relationship with RFS and National Parks 23.2.c. Site has a Bushfire Management Plan	(D)	(F)	(M)	
24. Drought	There is a risk to Airly from ::: Prolonged dry weather periods ::: Caused by: Drought Resulting in: Failure to meeting closure criteria objectives or Impacts on rehabilitation success.	24.1.a. Dams and water storage	C (D)	2 (E)	8 (M)	2. Investigate options for additional water storage dam.
25. Community	There is a risk to Airly from ::: Social Impacts ::: Caused by: Closure of the mine - loss of employment Resulting in: Negative social/economic impacts on local communities.		C (D)	2 (R)	8 (M)	10. Develop Stakeholder Engagment Strategy for Mine Closure during detailed mine closure planning.
1. Geology and Geochemistry	There is a risk to Airly from ::: Acid Mine Drainage ::: Caused by: Inadequate knowledge of potential contamination sources/geochemistry or Pollution of surface water by contaminated material and failure to capture and contain or Use of contaminated fill material Resulting in: Impacts to biodiversity values or Impacts to surface water quality in creeks or Non	1.2.a. Site Water Management Plan in place for the site. 1.2.b. Monitoring program developed as part of the Water Management Plan. 1.2.c. No historical evidence of AMD. 1.2.d. No Reject Emplacement Area (REA).	D (D)	2 (E)	5 (L)	

Instructions:

WRAC Analysis Sorted by RR (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	compliance with water quality criteria.					
2. Spontaneous Combustion	There is a risk to Airly from ::: Spontaneous combustion of coal ::: Caused by: exposed coal seams at the surface or Exposed underground coal seams Resulting in: Failure to meeting rehabilitation and closure criteria objectives or Ongoing management issues and costs or Public safety issues.	2.1.a. No historical issues concerning spontaneous combustion.	D (D)	2 (E)	5 (L)	
		2.1.b. Spontaneous Combustion Management Plan in place.				
		2.1.c. R 70 testing determined Low propensity to spon com				
3. Mine Subsidence	There is a risk to Airly from ::: Sinkholes/subsidence cracks ::: Caused by: Shallow depth of cover or Water storage above previously mined areas Resulting in: Failure to meeting rehabilitation and closure criteria objectives or Ongoing management issues and costs or Public safety issues.	3.1.a. Subsidence Management Plan	D (D)	2 (E)	5 (L)	
		3.1.b. Shallow workings HRA - including geotechnical assessment				
		3.1.c. Routine Visual inspections				
		3.1.d. Mining Method -first workings long term stable				
8. Fauna	There is a risk to Airly from ::: Impact to habitat for fauna species ::: Caused by: Disturbance to undisturbed or previous rehabilitated areas or Use of incorrect rehabilitation species Resulting in: loss of biodiversity values or Non compliance with approvals.	8.2.a. Surface disturbance protocol developed	D (D)	2 (E)	5 (L)	
		8.2.b. Vegetation communities mapped.				
		8.2.c. REF's, EIS, and Due Diligence Surveys				
		8.2.d. Mining Method -first workings long term stable				
8. Fauna	There is a risk to Airly from ::: Impact to aquatic fauna ::: Caused by:	8.3.a. Site Water Management Plan in place for the site.	D (D)	2 (E)	5 (L)	
		8.3.b. Monitoring programme developed as part of the Water Management Plan.				

Instructions:

WRAC Analysis Sorted by RR (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Connectivity between groundwater and surface water interface or Failure of existing rehabilitation efforts or inadequate surface water management or Geotechnical failure or Inadequate knowledge of potential contamination sources/geochemistry or Pollution of surface water by contaminated material and failure to capture and contain or Use of contaminated fill material Resulting in: Impacts to biodiversity values or Impacts to surface water quality in creeks or Impacts to water courses or Non compliance with approvals.	8.3.c. Baseline water investigations commenced. 8.3.d. No significant historical evidence of AMD. 8.3.e. Sediment control dams in place. 8.3.f. Annual aquatic ecology monitoring conducted 8.3.g. Mining Method -first workings long term stable				
9. Slopes and Slope Management	There is a risk to Airly from ::: Long term stability failure of highwalls ::: Caused by: Geotechnical failure Resulting in: Failure to achieve successful rehabilitation or Impacts to surface water quality in creeks or loss of biodiversity values or Ongoing management issues and costs or Public safety issues.	9.1.a. Fencing to restrict public at the top of the highwall. 9.1.b. Limited road access. 9.1.c. Visual Inspections 9.1.d. Exclusion zone and chain link fencing at the base of the highwall to arrest minor rock falls	D (D)	2 (E)	5 (L)	
9. Slopes and Slope Management	There is a risk to Airly from ::: Long term stability of steep slopes ::: Caused by: Geotechnical failure Resulting in: Failure to achieve successful rehabilitation or Impacts to surface water quality in creeks or loss of biodiversity values or Non compliance with approvals or Ongoing management issues and costs or Public safety issues.	9.3.a. Mining Method -first workings long term stable 9.3.b. Subsidence and Extraction Management Plans 9.3.c. Routine inspection and maintenance of steep slopes.	D (D)	2 (L)	5 (L)	
9. Slopes and Slope	There is a risk to Airly from	9.4.a. Routine inspection and	D	2	5	

Instructions:

WRAC Analysis Sorted by RR (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
Management	::: Long term stability of final landform ::: Caused by: Geotechnical failure or Inadequate final landform design Resulting in: Failure to achieve successful rehabilitation or loss of biodiversity values or Ongoing management issues and costs or Public safety issues.	maintenance of steep slopes. 9.4.b. Subsidence and Extraction Management Plans 9.4.c. Mining Method -first workings long term stable	(D)	(L)	(L)	
10. Relinquishment	There is a risk to Airly from ::: Failure to achieve relinquishment ::: Caused by: New conditions of a development consent not currently considered or Unidentified closure obligations Resulting in: Failure to meeting rehabilitation and closure criteria objectives or Ongoing management issues and costs.	10.1.a. Development Consent SSD_5581 is predicted to be sufficient for life of mine. 10.1.b. Revised MOP/RMP currently being developed	D (D)	2 (L)	5 (L)	7. Develop suitable completion criteria 8. Develop detailed Mine Closure Plan within 5 years of closure.
11. Waste	There is a risk to Airly from ::: Inappropriate disposal of waste materials ::: Caused by: Capacity of local landfills or Lack of approvals or Poor planning Resulting in: Fine or Increase in disposal costs.	11.1.a. Service contract with JR Richards for waste disposal 11.1.b. Waste management and recycling strategy currently implemented. 11.1.c. PIRMP in place at the site.	D (D)	2 (E)	5 (L)	
14. Hazardous Materials and Dangerous Goods	There is a risk to Airly from ::: Land contamination ::: Caused by: Failure to identify hazardous materials and	14.1.a. Inventory of site based hazardous materials established. 14.1.b. No Asbestos associated with Mining Areas 14.1.c. Newly established Mine	D (D)	2 (L)	5 (L)	

Instructions:

WRAC Analysis Sorted by RR (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	dangerous goods remaining on site at closure or Inappropriate disposal or Innappropriate storage of hazardous materials or dangerous goods Resulting in: Impact to land/soil or Impacts to biodiversity values or Impacts to surface water quality in creeks or Non compliance with approvals or Non compliance with water quality criteria or Public safety issues.	site, no legacy or historic contamination 14.1.d. Adequate hydrocarbon storage facilities 14.1.e. Storage of hazardous materials contained to concrete pads and hard stand ares to mitigate against groundwater pollution 14.1.f. PIRMP in place at the site. 14.1.g. Spill kits 14.1.h. Water Management Plan				
15. Contaminated Land	There is a risk to Airly from ::: Inability to relinquish lease ::: Caused by: higher than acceptable levels of contaminants or Poor rehabilitation Resulting in: Failure to achieve successful rehabilitation or Failure to meeting rehabilitation and closure criteria objectives or ongoing liability or Public safety issues.	15.1.a. No Asbestos assciated with Mining Areas 15.1.b. Water Management Plan 15.1.c. Spill kits 15.1.d. Newly established Mine site, no legacy or historic contamination 15.1.e. PIRMP in place at the site. 15.1.f. Adequate hydrocarbon storage facilities 15.1.g. Storage of hazardous materials contained to concrete pads and hard stand ares to mitigate against groundwater pollution 15.1.h. Inventory of site based hazardous materials established.	D (D)	2 (L)	5 (L)	
16. Greenhouse Gas	There is a risk to Airly from ::: Impacts to air quality ::: Caused by: Methane gas from underground workings/exposed coal seam	16.1.a. Gas monitoring indicates low concentration of methane and carbon dioxide. 16.1.b. Gas monitoring procedures in place.	D (D)	2 (E)	5 (L)	

Instructions:

WRAC Analysis Sorted by RR (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Resulting in: Impact to air quality or Public safety issues.					
17. Air Quality	There is a risk to Airly from ::: Emission of particulate matter ::: Caused by: Exposed disturbed areas or Rehabilitation activities and heavy plant use or Use of incorrect rehabilitation species Resulting in: Community complaints or Non compliance with air quality standards or Non compliance with approvals.	17.1.a. Air Quality Monitoring Program currently implemented	D (D)	2 (L)	5 (L)	1. Install HVAS
		17.1.b. No significant historical issues concerning air quality				
		17.1.c. Air Quality Management Plan				
18. Noise	There is a risk to Airly from ::: Noise emissions ::: Caused by: Rehabilitation activities and heavy plant use Resulting in: Community complaints or Failure to meeting rehabilitation and closure criteria objectives or Impact to air or Public safety issues.	18.1.a. Noise Monitoring Program currently implemented	D (D)	2 (E)	5 (L)	
		18.1.b. No significant historical issues concerning noise				
		18.1.c. Noise Management Plan				
22. Historic Heritage	There is a risk to Airly from ::: Disturbance of heritage site or artifact ::: Caused by: Unintended interaction with heritage site or artifact Resulting in: Non compliance with approvals or Unauthorised impact to heritage site or artifact.	22.1.a. REF's and Due Diligence Surveys for disturbance areas.	D (D)	2 (L)	5 (L)	
		22.1.b. Surface disturbance protocol developed and implemented				
		22.1.c. Historic Heritage Managment Plan				
25. Community	There is a risk to Airly from ::: Community expectations not met :::	25.1.a. CCC meetings	D (D)	2 (E)	5 (L)	
		25.1.b. Community consultation as part of EIS				

Instructions:

WRAC Analysis Sorted by RR (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Caused by: Inadequate rehabilitation and post mining land use not met Resulting in: Community complaints or Impacts to business reputation.	25.1.c. Community updates provided at monthly Capertee Progress Association Meetings				
1. Geology and Geochemistry	There is a risk to Airly from ::: Erosion ::: Caused by: Dispersive materials exposed at surface Resulting in: Erosion and sedimentation or Exposure of capped coal and reject materials or Failure to achieve successful rehabilitation or Impact to land/soil or Impacts to surface water quality in creeks or Impacts to the capacity of the sites water management system.	1.3.a. Site Water Management Plan in place for the site. 1.3.b. Sediment control dams in place. 1.3.c. Erosion and sediment control Inspections and maintenance protocol in place. 1.3.d. Mine Operations Plan (MOP)	C (D)	1 (E)	4 (L)	
5. Erosion and Sediment Control	There is a risk to Airly from ::: Erosion and/or sediment on disturbed mining areas, disturbed infrastructure/workshop/roads/pit top areas and exploration/monitoring sites. ::: Caused by: Delay in implementation of Rehabilitation Strategy or Failure of existing rehabilitation efforts or Failure to implement appropriate surface drainage or Significant rainfall events Resulting in: Failure to achieve successful rehabilitation or Impacts to water courses or Non compliance with water quality criteria or Ongoing management issues and costs.	5.1.a. Erosion and sediment control Inspections and maintenance protocol in place. 5.1.b. Sediment control dams in place. 5.1.c. Monitoring programme developed as part of the Water Management Plan. 5.1.d. Site Water Management Plan in place for the site Including erosion and sediment control.	C (D)	1 (L)	4 (L)	
20. Visual and Lighting	There is a risk to Airly from	20.1.a. Rehabilitation completed to date has not been	C (D)	1 (L)	4 (L)	

Instructions:

WRAC Analysis Sorted by RR (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Visual impacts and lighting emissions Caused by: Failure to manage weeds/noxious species or Lighting Towers or Rehabilitation activities and heavy plant use or Stockpile/Infrastructure Areas Resulting in: Community complaints.	hampered by weeds. 20.1.b. Weed control program implemented. 20.1.c. Baseline weed survey completed. 20.1.d. Lighting review completed by SLR in March 2017				
12. Reject Emplacement Area	There is a risk to Airly from Delay to rehabilitation Caused by: Capping suitability or Inadequate drainage or Low surface strength and trafficability issues Resulting in: Delay to rehabilitation or Increased costs.	12.1.a. No Reject Emplacement Area (REA) currently exists at Airly	E ()	2 ()	3 (L)	
7. Flora	There is a risk to Airly from Poor rehabilitation success Caused by: Failure to manage weeds/noxious species or Use of incorrect rehabilitation species Resulting in: Failure to achieve successful rehabilitation.	7.1.a. Rehabilitation completed to date has not been hampered by weeds. 7.1.b. Weed control program implemented. 7.1.c. Baseline weed survey completed.	D (D)	1 (E)	2 (L)	
8. Fauna	There is a risk to Airly from Feral animals Caused by: Failure to manage feral animals Resulting in: Failure to achieve successful rehabilitation.	8.1.a. National Parks Feral animal control program in place.	D (D)	1 (E)	2 (L)	

WRAC Analysis Sorted by Consequence

Instructions:

WRAC Analysis Sorted by Consequence (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
19. Public Safety	There is a risk to Airly from ::: Injury to members of the public ::: Caused by: Unauthorised access Resulting in: Injury or death.	19.1.a. Security fencing. 19.1.b. Locked gates 19.1.c. signage. 19.1.d. limited road access.	E (D)	4 (R)	10 (M)	9. Review Highwall Security Fence.
4. Colliery Adits	There is a risk to Airly from ::: Portals and boreholes not sealed appropriately ::: Caused by: Failure of seals or failure to follow MDG 6001 Resulting in: Failure to satisfy government agency requirements or ongoing liability or Public safety issues.	4.1.a. Mine is currently operational - no requirement for sealing 4.1.b. Bore holes currently not sealed due to groundwater monitoring. 4.1.c. REF's for all installed bore holes.	D (D)	3 (L)	9 (M)	3. Review of existing portal seals at Airly to determine compliance with DRE guidelines. 4. Develop a detailed sealing strategy prior to closure. 5. Exploration Activities and Minor Surface Infrastructure Management Plan to be developed.
9. Slopes and Slope Management	There is a risk to Airly from ::: Long term stability of dam embankments ::: Caused by: Geotechnical failure Resulting in: Impacts to surface water quality in creeks. or loss of biodiversity values or Non compliance with approvals or Non compliance with water quality criteria or Ongoing management issues and costs or Public safety issues.	9.2.a. Routine Inspections including dam wall integrity 9.2.b. No trees growing on dam walls. 9.2.c. Dams developed in accordance with Blue Book criteria	D (D)	3 (L)	9 (M)	6. Review option for downstream storage dam.
21. Aboriginal Cultural Heritage	There is a risk to Airly from	21.1.a. ACHMP 21.1.b. Fenced off sites within	D (D)	3 (L)	9 (M)	11. ALARP

Instructions:

WRAC Analysis Sorted by Consequence (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	∴ Disturbance of Aboriginal site or artifact ∴ Caused by: Unintended interaction with Aboriginal site or artifact Resulting in: Non compliance with approvals or Unauthorised impact to Aboriginal site or artifact.	proximity to access tracks 21.1.c. REF's and Due Diligence Surveys for disturbance areas. 21.1.d. Surface disturbance protocol developed and implemented				
7. Flora	There is a risk to Airly from ∴ Impact to existing remnant native species ∴ Caused by: Disturbance to undisturbed or previous rehabilitated areas or Inadequate drainage Resulting in: Impact to land/soil or Loss/impacts to flora or Non compliance with approvals.	7.2.a. Vegetation communities mapped. 7.2.b. Surface disturbance protocol developed and implemented 7.2.c. REF's and Due Diligence Surveys for disturbance areas. 7.2.d. Mining Method -first workings long term stable	D (D)	3 (E)	9 (M)	11. ALARP
25. Community	There is a risk to Airly from ∴ Social Impacts ∴ Caused by: Closure of the mine - loss of employment Resulting in: Negative social/economic impacts on local communities.		C (D)	2 (R)	8 (M)	10. Develop Stakeholder Engagment Strategy for Mine Closure during detailed mine closure planning.
9. Slopes and Slope Management	There is a risk to Airly from ∴ Long term stability of steep slopes ∴ Caused by: Geotechnical failure Resulting in: Failure to achieve successful	9.3.a. Mining Method -first workings long term stable 9.3.b. Subsidence and Extraction Management Plans 9.3.c. Routine inspection and maintenance of steep slopes.	D (D)	2 (L)	5 (L)	

Instructions:

WRAC Analysis Sorted by Consequence (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	rehabilitation or Impacts to surface water quality in creeks or loss of biodiversity values or Non compliance with approvals or Ongoing management issues and costs or Public safety issues.					
9. Slopes and Slope Management	There is a risk to Airly from ::: Long term stability of final landform ::: Caused by: Geotechnical failure or Inadequate final landform design Resulting in: Failure to achieve successful rehabilitation or loss of biodiversity values or Ongoing management issues and costs or Public safety issues.	9.4.a. Routine inspection and maintenance of steep slopes.	D (D)	2 (L)	5 (L)	
		9.4.b. Subsidence and Extraction Management Plans				
		9.4.c. Mining Method -first workings long term stable				
10. Relinquishment	There is a risk to Airly from ::: Failure to achieve relinquishment ::: Caused by: New conditions of a development consent no currently considered or Unidentified closure obligations Resulting in: Failure to meeting rehabilitation and closure criteria objectives or Ongoing management issues and costs.	10.1.a. Development Consent SSD_5581 is predicted to be sufficient for life of mine.	D (D)	2 (L)	5 (L)	7. Develop suitable completion criteria
		10.1.b. Revised MOP/RMP currently being developed				8. Develop detailed Mine Closure Plan within 5 years of closure.
14. Hazardous Materials and Dangerous Goods	There is a risk to Airly from ::: Land contamination ::: Caused by: Failure to identify hazardous materials and dangerous goods remaining on site at closure or Inappropriate disposal or Inappropriate storage of hazardous materials or dangerous goods Resulting in:	14.1.a. Inventory of site based hazardous materials established.	D (D)	2 (L)	5 (L)	
		14.1.b. No Asbestos associated with Mining Areas				
		14.1.c. Newly established Mine site, no legacy or historic contamination				
		14.1.d. Adequate hydrocarbon storage facilities				
		14.1.e. Storage of hazardous				

Instructions:

WRAC Analysis Sorted by Consequence (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Impact to land/soil or Impacts to biodiversity values or Impacts to surface water quality in creeks or Non compliance with approvals or Non compliance with water quality criteria or Public safety issues.	materials contained to concrete pads and hard stand ares to mitigate against groundwater pollution 14.1.f. PIRMP in place at the site. 14.1.g. Spill kits 14.1.h. Water Management Plan				
15. Contaminated Land	There is a risk to Airly from ::: Inability to relinquish lease ::: Caused by: higher than acceptable levels of contaminants or Poor rehabilitation Resulting in: Failure to achieve successful rehabilitation or Failure to meeting rehabilitation and closure criteria objectives or ongoing liability or Public safety issues.	15.1.a. No Asbestos associated with Mining Areas 15.1.b. Water Management Plan 15.1.c. Spill kits 15.1.d. Newly established Mine site, no legacy or historic contamination 15.1.e. PIRMP in place at the site. 15.1.f. Adequate hydrocarbon storage facilities 15.1.g. Storage of hazardous materials contained to concrete pads and hard stand ares to mitigate against groundwater pollution 15.1.h. Inventory of site based hazardous materials established.	D (D)	2 (L)	5 (L)	
17. Air Quality	There is a risk to Airly from ::: Emission of particulate matter ::: Caused by: Exposed disturbed areas or Rehabilitation activities and heavy plant use or Use of incorrect rehabilitation species Resulting in:	17.1.a. Air Quality Monitoring Program currently implemented 17.1.b. No significant historical issues concerning air quality 17.1.c. Air Quality Management Plan	D (D)	2 (L)	5 (L)	1. Install HVAS

Instructions:

WRAC Analysis Sorted by Consequence (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Community complaints or Non compliance with air quality standards or Non compliance with approvals.					
22. Historic Heritage	There is a risk to Airly from ∴ Disturbance of heritage site or artifact ∴ Caused by: Unintended interaction with heritage site or artifact Resulting in: Non compliance with approvals or Unauthorised impact to heritage site or artifact.	22.1.a. REF's and Due Diligence Surveys for disturbance areas. 22.1.b. Surface disturbance protocol developed and implemented 22.1.c. Historic Heritage Management Plan	D (D)	2 (L)	5 (L)	
23. Bushfire	There is a risk to Airly from ∴ Bushfire impacting rehabilitation ∴ Caused by: Inadequate bushfire management Resulting in: Impacts on rehabilitation success or Public safety issues.	23.1.a. Site has a Bushfire Management Plan 23.1.b. Working relationship with RFS and National Parks 23.1.c. Fire breaks utilised onsite	C (D)	2 (F)	8 (M)	12. Reveiw Airlys bushfire Managment Plan
23. Bushfire	There is a risk to Airly from ∴ Bushfire impacting infrastructure ∴ Caused by: Inadequate bushfire management Resulting in: Business Interruption and cost or Public safety issues.	23.2.a. Fire breaks utilised onsite 23.2.b. Working relationship with RFS and National Parks 23.2.c. Site has a Bushfire Management Plan	C (D)	2 (F)	8 (M)	12. Reveiw Airlys bushfire Managment Plan
1. Geology and Geochemistry	There is a risk to Airly from ∴ Discharge of contaminated surface runoff ∴ Caused by:	1.1.a. PIRMP in place at the site. 1.1.b. Site Water Management Plan in place. 1.1.c. Monitoring programme developed as part of the Water Management Plan.	C (D)	2 (E)	8 (M)	2. Investigate options for additional water storage dam.

Instructions:

WRAC Analysis Sorted by Consequence (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Pollution of surface water by contaminated material and failure to capture and contain Resulting in: Impacts to biodiversity values or Impacts to water courses.	1.1.d. Water management structures designed in accordance with blue book criteria 1.1.e. Routine Inspection of water management structures.				
1. Geology and Geochemistry	There is a risk to Airly from ::: Acid Mine Drainage ::: Caused by: Inadequate knowledge of potential contamination sources/geochemistry or Pollution of surface water by contaminated material and failure to capture and contain or Use of contaminated fill material Resulting in: Impacts to biodiversity values or Impacts to surface water quality in creeks or Non compliance with water quality criteria.	1.2.a. Site Water Management Plan in place for the site. 1.2.b. Monitoring program developed as part of the Water Management Plan. 1.2.c. No historical evidence of AMD. 1.2.d. No Reject Emplacement Area (REA).	D (D)	2 (E)	5 (L)	
2. Spontaneous Combustion	There is a risk to Airly from ::: Spontaneous combustion of coal ::: Caused by: exposed coal seams at the surface or Exposed underground coal seams Resulting in: Failure to meeting rehabilitation and closure criteria objectives or Ongoing management issues and costs or Public safety issues.	2.1.a. No historical issues concerning spontaneous combustion. 2.1.b. Spontaneous Combustion Management Plan in place. 2.1.c. R 70 testing determined Low propensity to spontaneous combustion	D (D)	2 (E)	5 (L)	
3. Mine Subsidence	There is a risk to Airly from ::: Sinkholes/subsidence cracks ::: Caused by: Shallow depth of cover or Water storage	3.1.a. Subsidence Management Plan 3.1.b. Shallow workings HRA - including geotechnical assessment 3.1.c. Routine Visual inspections	D (D)	2 (E)	5 (L)	

Instructions:

WRAC Analysis Sorted by Consequence (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	above previously mined areas Resulting in: Failure to meeting rehabilitation and closure criteria objectives or Ongoing management issues and costs or Public safety issues.	3.1.d. Mining Method -first workings long term stable				
6. Soil Type and Suitability	There is a risk to Airly from ::: Poor rehabilitation success ::: Caused by: Limited suitable topsoil availability or Poor top soil quality Resulting in: Failure to achieve successful rehabilitation.	6.1.a. Use appropriate subsoil materials as a topsoil substitute where possible 6.1.b. Benign spoil materials are amenable to colonisation by native trees and shrubs 6.1.c. REF for exploration activities	C (D)	2 (E)	8 (M)	11. ALARP
8. Fauna	There is a risk to Airly from ::: Impact to habitat for fauna species ::: Caused by: Disturbance to undisturbed or previous rehabilitated areas or Use of incorrect rehabilitation species Resulting in: loss of biodiversity values or Non compliance with approvals.	8.2.a. Surface disturbance protocol developed 8.2.b. Vegetation communities mapped. 8.2.c. REF's, EIS, and Due Diligence Surveys 8.2.d. Mining Method -first workings long term stable	D (D)	2 (E)	5 (L)	
8. Fauna	There is a risk to Airly from ::: Impact to aquatic fauna ::: Caused by: Connectivity between groundwater and surface water interface or Failure of existing rehabilitation efforts or inadequate surface water management or Geotechnical failure or Inadequate knowledge of potential contamination sources/geochemistry or Pollution of	8.3.a. Site Water Management Plan in place for the site. 8.3.b. Monitoring programme developed as part of the Water Management Plan. 8.3.c. Baseline water investigations commenced. 8.3.d. No significant historical evidence of AMD. 8.3.e. Sediment control dams in place.	D (D)	2 (E)	5 (L)	

Instructions:

WRAC Analysis Sorted by Consequence (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	surface water by contaminated material and failure to capture and contain or Use of contaminated fill material Resulting in: Impacts to biodiversity values or Impacts to surface water quality in creeks or Impacts to water courses or Non compliance with approvals.	8.3.f. Annual aquatic ecology monitoring conducted 8.3.g. Mining Method -first workings long term stable				
9. Slopes and Slope Management	There is a risk to Airly from ::: Long term stability failure of highwalls ::: Caused by: Geotechnical failure Resulting in: Failure to achieve successful rehabilitation or Impacts to surface water quality in creeks or loss of biodiversity values or Ongoing management issues and costs or Public safety issues.	9.1.a. Fencing to restrict public at the top of the highwall. 9.1.b. Limited road access. 9.1.c. Visual Inspections 9.1.d. Exclusion zone and chain link fencing at the base of the highwall to arrest minor rock falls	D (D)	2 (E)	5 (L)	
11. Waste	There is a risk to Airly from ::: Inappropriate disposal of waste materials ::: Caused by: Capacity of local landfills or Lack of approvals or Poor planning Resulting in: Fine or Increase in disposal costs.	11.1.a. Service contract with JR Richards for waste disposal 11.1.b. Waste management and recycling strategy currently implemented. 11.1.c. PIRMP in place at the site.	D (D)	2 (E)	5 (L)	
13. Surface Water and Groundwater	There is a risk to Airly from ::: Discharge of polluted water off site ::: Caused by: High rainfall events or Inadequate drainage or Inadequate storage Resulting in:	13.1.a. Site Water Management Plan in place for the site. 13.1.b. Monitoring programme developed as part of the Water Management Plan. 13.1.c. Sediment control dams in place. 13.1.d. Erosion and sediment	C (D)	2 (E)	8 (M)	6. Review option for downstream storage dam.

Instructions:

WRAC Analysis Sorted by Consequence (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Impacts to biodiversity values or Impacts to surface water quality in creeks or Non compliance with approvals or Non compliance with water quality criteria.	control Inspections and maintenance protocol in place.				
		13.1.e. L2.5 rainfall exemption within EPL528				
13. Surface Water and Groundwater	There is a risk to Airly from ::: Groundwater discharge from underground mine workings ::: Caused by: Connectivity between groundwater and surface water interface - Village Spring or Underground workings fill with groundwater Resulting in: Impacts to biodiversity values or Impacts to surface water quality in creeks or Non compliance with approvals or Non compliance with water quality criteria.	13.2.a. Site Water Management Plan in place for the site. 13.2.b. Subsidence and Extraction Management Plans 13.2.c. Mining Method -first workings long term stable	C (D)	2 (E)	8 (M)	11. ALARP
16. Greenhouse Gas	There is a risk to Airly from ::: Impacts to air quality ::: Caused by: Methane gas from underground workings/exposed coal seam Resulting in: Impact to air quality or Public safety issues.	16.1.a. Gas monitoring indicates low concentration of methane and carbon dioxide. 16.1.b. Gas monitoring procedures in place.	D (D)	2 (E)	5 (L)	
18. Noise	There is a risk to Airly from ::: Noise emissions ::: Caused by: Rehabilitation activities and heavy plant use Resulting in: Community complaints or Failure to meeting rehabilitation and closure criteria	18.1.a. Noise Monitoring Program currently implemented 18.1.b. No significant historical issues concerning noise 18.1.c. Noise Management Plan	D (D)	2 (E)	5 (L)	

Instructions:

WRAC Analysis Sorted by Consequence (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	objectives or Impact to air or Public safety issues.					
24. Drought	There is a risk to Airly from ::: Prolonged dry weather periods ::: Caused by: Drought Resulting in: Failure to meeting closure criteria objectives or Impacts on rehabilitation success.	24.1.a. Dams and water storage	C (D)	2 (E)	8 (M)	2. Investigate options for additional water storage dam.
25. Community	There is a risk to Airly from ::: Community expectations not met ::: Caused by: Inadequate rehabilitation and post mining land use not met Resulting in: Community complaints or Impacts to business reputation.	25.1.a. CCC meetings 25.1.b. Community consultation as part of EIS 25.1.c. Community updates provided at monthly Capertee Progress Association Meetings	D (D)	2 (E)	5 (L)	
12. Reject Emplacement Area	There is a risk to Airly from ::: Delay to rehabilitation ::: Caused by: Capping suitability or Inadequate drainage or Low surface strength and trafficability issues Resulting in: Delay to rehabilitation or Increased costs.	12.1.a. No Reject Emplacement Area (REA) currently exists at Airly	E (D)	2 (D)	3 (L)	
5. Erosion and Sediment Control	There is a risk to Airly from ::: Erosion and/or sediment on disturbed mining areas, disturbed infrastructure/workshop/roads/pit top areas and exploration/monitoring sites. :::	5.1.a. Erosion and sediment control Inspections and maintenance protocol in place. 5.1.b. Sediment control dams in place. 5.1.c. Monitoring programme	C (D)	1 (L)	4 (L)	

Instructions:

WRAC Analysis Sorted by Consequence (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	Caused by: Delay in implementation of Rehabilitation Strategy or Failure of existing rehabilitation efforts or Failure to implement appropriate surface drainage or Significant rainfall events Resulting in: Failure to achieve successful rehabilitation or Impacts to water courses or Non compliance with water quality criteria or Ongoing management issues and costs.	developed as part of the Water Management Plan. 5.1.d. Site Water Management Plan in place for the site Including erosion and sediment control.				
20. Visual and Lighting	There is a risk to Airly from ::: Visual impacts and lighting emissions ::: Caused by: Failure to manage weeds/noxious species or Lighting Towers or Rehabilitation activities and heavy plant use or Stockpile/Infrastructure Areas Resulting in: Community complaints.	20.1.a. Rehabilitation completed to date has not been hampered by weeds. 20.1.b. Weed control program implemented. 20.1.c. Baseline weed survey completed. 20.1.d. Lighting review completed by SLR in March 2017	C (D)	1 (L)	4 (L)	
1. Geology and Geochemistry	There is a risk to Airly from ::: Erosion ::: Caused by: Dispersive materials exposed at surface Resulting in: Erosion and sedimentation or Exposure of capped coal and reject materials or Failure to achieve successful rehabilitation or Impact to land/soil or Impacts to surface water quality in creeks or Impacts to the capacity of the sites water management system.	1.3.a. Site Water Management Plan in place for the site. 1.3.b. Sediment control dams in place. 1.3.c. Erosion and sediment control Inspections and maintenance protocol in place. 1.3.d. Mine Operations Plan (MOP)	C (D)	1 (E)	4 (L)	
7. Flora	There is a risk to Airly from	7.1.a. Rehabilitation completed to date has not been	D (D)	1 (E)	2 (L)	

Instructions:

WRAC Analysis Sorted by Consequence (hover for instructions):

Step	Potential Incident	Current Controls	L	MRC	RR	Recommended Control
	∴ Poor rehabilitation success ∴ Caused by: Failure to manage weeds/noxious species or Use of incorrect rehabilitation species Resulting in: Failure to achieve successful rehabilitation.	hampered by weeds. 7.1.b. Weed control program implemented. 7.1.c. Baseline weed survey completed.				
8. Fauna	There is a risk to Airly from ∴ Feral animals ∴ Caused by: Failure to manage feral animals Resulting in: Failure to achieve successful rehabilitation.	8.1.a. National Parks Feral animal control program in place.	D (D)	1 (E)	2 (L)	

Recommended Controls

Recommended Controls Do NOT enter additional Recommended Controls on this sheet.	Place(s) Used	Allocated To	Required By Date	Pulse User No.	PULSE Ref. No.
		(Only one SITE person for each Recommended Control)			
1. Install HVAS	Events: 17.1	Sam Price	31-Dec-2017	90039	
2. Investigate options for additional water storage dam.	Events: 1.1, 24.1	Sam Price	31-Dec-2017	90039	
3. Review of existing portal seals at Airly to determine compliance with DRE guidelines.	Events: 4.1	David King	31-Dec-2017	90008	
4. Develop a detailed sealing strategy prior to closure.	Events: 4.1	David King	31-Dec-2022	90008	
5. Exploration Activities and Minor Surface Infrastructure Management Plan to be developed.	Events: 4.1	Sam Price	31-Jul-2017	90039	
6. Review option for downstream storage dam.	Events: 9.2, 13.1	Sam Price	31-Dec-2017	90039	
7. Develop suitable completion criteria	Events: 10.1	Sam Price	31-Dec-2017	90039	
8. Develop detailed Mine Closure Plan within 5 years of closure.	Events: 10.1	David King	31-Dec-2022	90008	
9. Review Highwall Security Fence.	Events: 19.1	Greg Guest	30-Sep-2017	90038	
10. Develop Stakeholder Engagement Strategy for Mine Closure during detailed mine closure planning.	Events: 25.2	Sam Price	31-Dec-2022	90039	
11. ALARP	Events: 6.1, 7.2, 13.2, 21.1	Sam Price	30-Sep-2017	90039	
12. Review Airly's bushfire Management Plan	Events: 23.1, 23.2	Sam Price	31-Dec-2017	90039	

CEY Risk Matrix Page 1

CENTENNIAL RISK MATRIX							Likelihood					Description (D)
Rating	Consequence Note: Consequence may result from a single event or may represent a cumulative impact over a period of 12 months. Use the worst case reasonable consequence if there is more than one.						A Certain	B Probable	C Possible	D Remote	E Improbable	
	Financial Impact to Annual Business Plan (F)	Personal Injury (PI)	Business Interruption (BI)	Legal (L)	Reputation (R)	Environment (E)	Common	Has Happened within Centennial	Could Happen & has happened in non-CEY operations	Not Likely	Practically impossible	Probability (Pb)
							Frequent incidents	Regular incidents	Infrequent incidents	Unlikely to occur. Very few recorded or known incidents	May occur in exceptional circumstances. Almost no recorded incidents.	Incident Frequency (IF)
							Operations – within 3 months	Operations – within 2 years	Operations – within 5 years	Operations – within 10 years	Operations – within 30 years	Operations (Op)
							Project – Every project	Project – Every 2 projects	Project – Every 5 projects	Project – Every 10 projects	Project – Every 30 projects	Project (Pr)
5. Catastrophic	>\$50m	Multiple Fatalities	> 1month	Prolonged litigation, heavy fines, potential jail term	Prolonged International media attention	Long term impairment habitats/ ecosystem	25 (E)	24 (E)	21 (H)	19 (H)	15 (S)	
4. Major	\$10m - \$50m	Single Fatality	1 week to 1 month	Major breach/ major litigation	International media attention	Long term effects of ecosystem	23 (E)	22 (E)	18 (H)	14 (S)	10 (M)	
3. Moderate	\$1m - \$10m	Serious/ Disabling Injury	1 day to 1 week	Serious breach of regulation. prosecution/ fine	National media attention	Serious medium term environmental effects	20 (H)	17 (H)	13 (S)	9 (M)	6 (L)	
2. Minor	\$100k - \$1m	Lost Time Injury	12 hrs to 1 day	Non-compliance, breaches in regulation	Adverse local public attention	Minor effects to physical environment	16 (S)	12 (S)	8 (M)	5 (L)	3 (L)	
1. Insignificant	<\$100k	First Aid Treatment Only	< 12 hrs	Low level compliance issue	Local complaints	Limited physical damage	11 (S)	7 (M)	4 (L)	2 (L)	1 (L)	

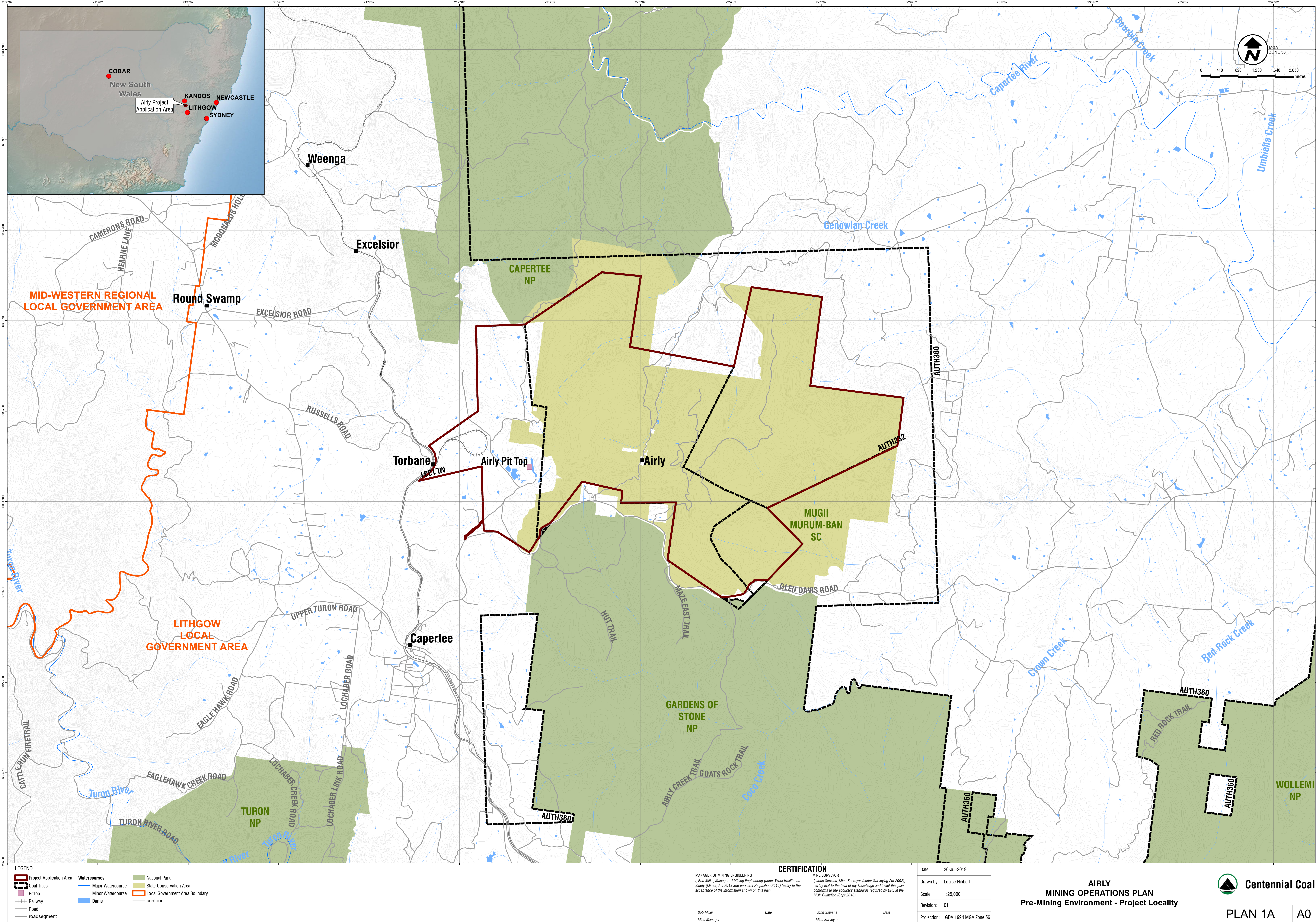
CEY Risk Matrix Page 2

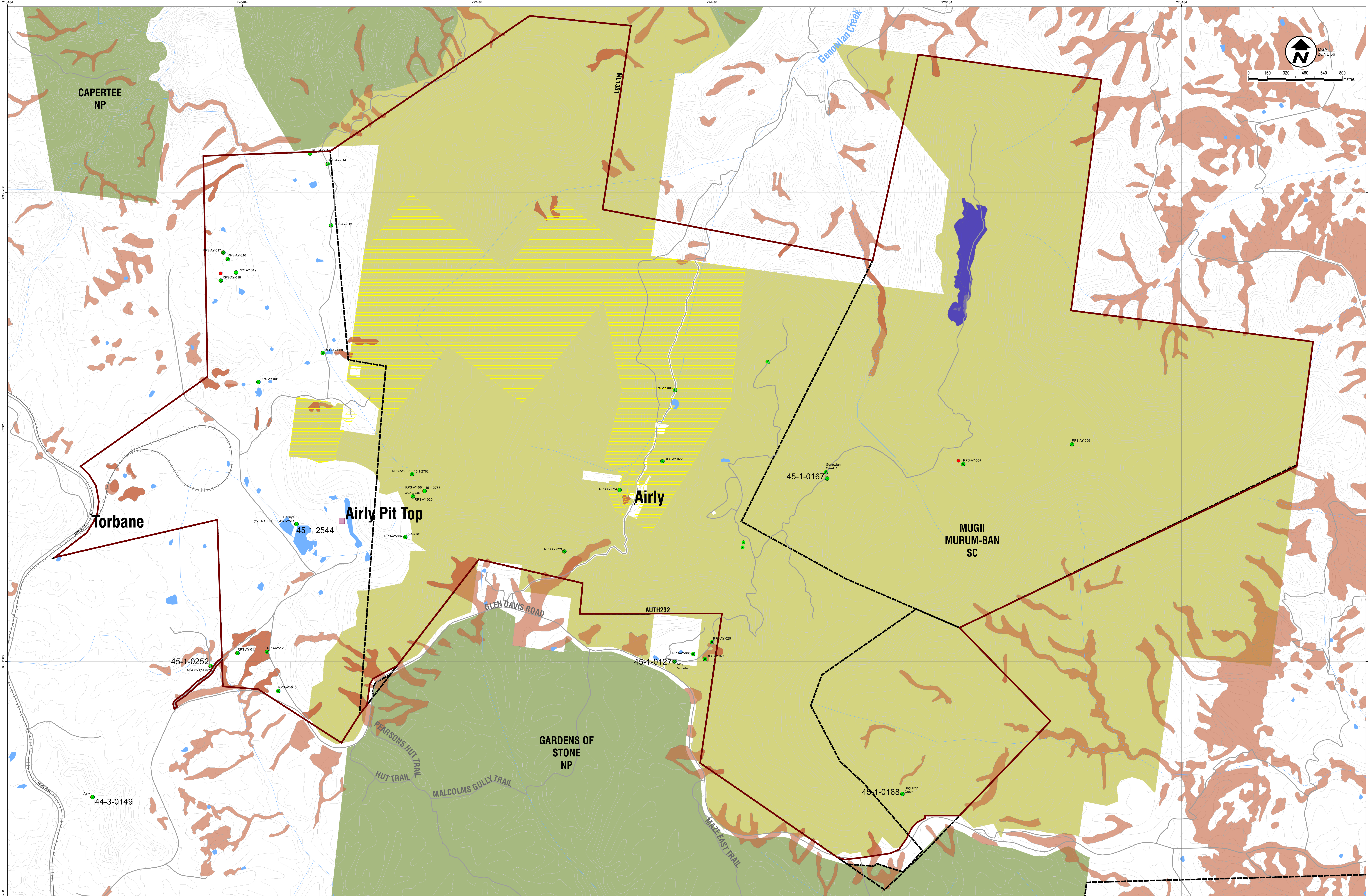
Risk Rating	Risk Category		Generic Management Actions
22 to 25	E	Extreme	Immediate intervention required from senior management to eliminate or reduce this risk
17 to 21	H	High	Imperative to eliminate or reduce risk to a lower level by the introduction of control measures. Management planning required at senior levels
11 to 16	S	Significant	Corrective action required, senior management attention needed to eliminate or reduce risk
7 to 10	M	Moderate	Corrective action to be determined, management responsibility must be specified
1 to 6	L	Low	Monitor and manage by corrective action where practicable

CEY Risk Matrix Page 3

BOW TIE ANALYSIS - Control Effectiveness Matrix									
TYPE OF CONTROL	Examples	Description	Rank	Control Category	CONTROL – Impact / Status / Quality				
					A ≥ 80%	B 50 – 80%	C 50 / 50%	D 50 – 20%	E ≤ 20%
	Replace electric hand tools with compressed air alternatives in wet conditions	Eliminates a hazard by removal	1.	Elimination of hazard	100	45.0	40.0	14.0	10.0
	Replace large diameter, heavy cables with smaller ones that are easier to handle manually	Replace element with less risky alternative	2.	Substitution	85.0	40.0	35.0	13.0	8.5
	Automatic fire fighting sprinkler systems, Earth Leakage protection devices	An automatic device that operates without intervention by personnel	3.	Engineered without people	70.0	30.0	25.0	12.0	7.0
	Fire alarm that sounds & the operator then has to initiate an evacuation	A device that requires personnel to respond to a stimulus	4.	Engineered with people	50.0	20.0	14.0	10.0	5.0
	Inspection, maintenance and repair of machinery	A process carried out by personnel	5.	Procedural	20.0	15.0	10.0	6.5	2.0
	Employee made aware of dangers of large moving equipment where the operators have limited vision	Induction training programs	6.	Awareness	5.0	3.0	2.5	1.5	1.0

Appendix 4 – MOP Plans





PlaceNames

PitTop

Project Application Area

Coal Titles

Railway

Road

Contours 20m

Watercourses

Major Watercourse

Minor Watercourse

Dams

Catchments

Cultural Heritage Sites

Aboriginal Site - Artefact Scatter

Aboriginal Site - Isolated Find

Aboriginal Site - Scared Tree

Aboriginal Site - Shelter with Artefact

Aboriginal Site - Shelter with Deposits

Heritage Areas

General Cultural Area

AHIMS

Hollow Bearing Trees

Vegetation Communities

Gerraween Point Allocasuarina nana Heathland

White Box - Yellow Box - Blakely's Red Gum Woodland

MANAGER OF MINING ENGINEERING

I, Bob Miller, Manager of Mining Engineering (under Work Health and Safety (Mines) Act 2013 and pursuant Regulation 2014) testify to the acceptance of the information shown on this plan.

Bob Miller

Mine Manager

Date

MINING SURVEYOR

I, John Stevens, Mine Surveyor (under Surveying Act 2002), certify that to the best of my knowledge and belief this plan conforms to the accuracy standards required by DRE in the MOP Guidelines (Sept 2013)

John Stevens

Mine Surveyor

Date

Date:

26-Jul-2019

Drawn by:

Louise Hibbert

Scale:

1:10,000

Revision:

01

Projection:

GDA 1994 MGA Zone 56

Centennial Coal

AIRLY

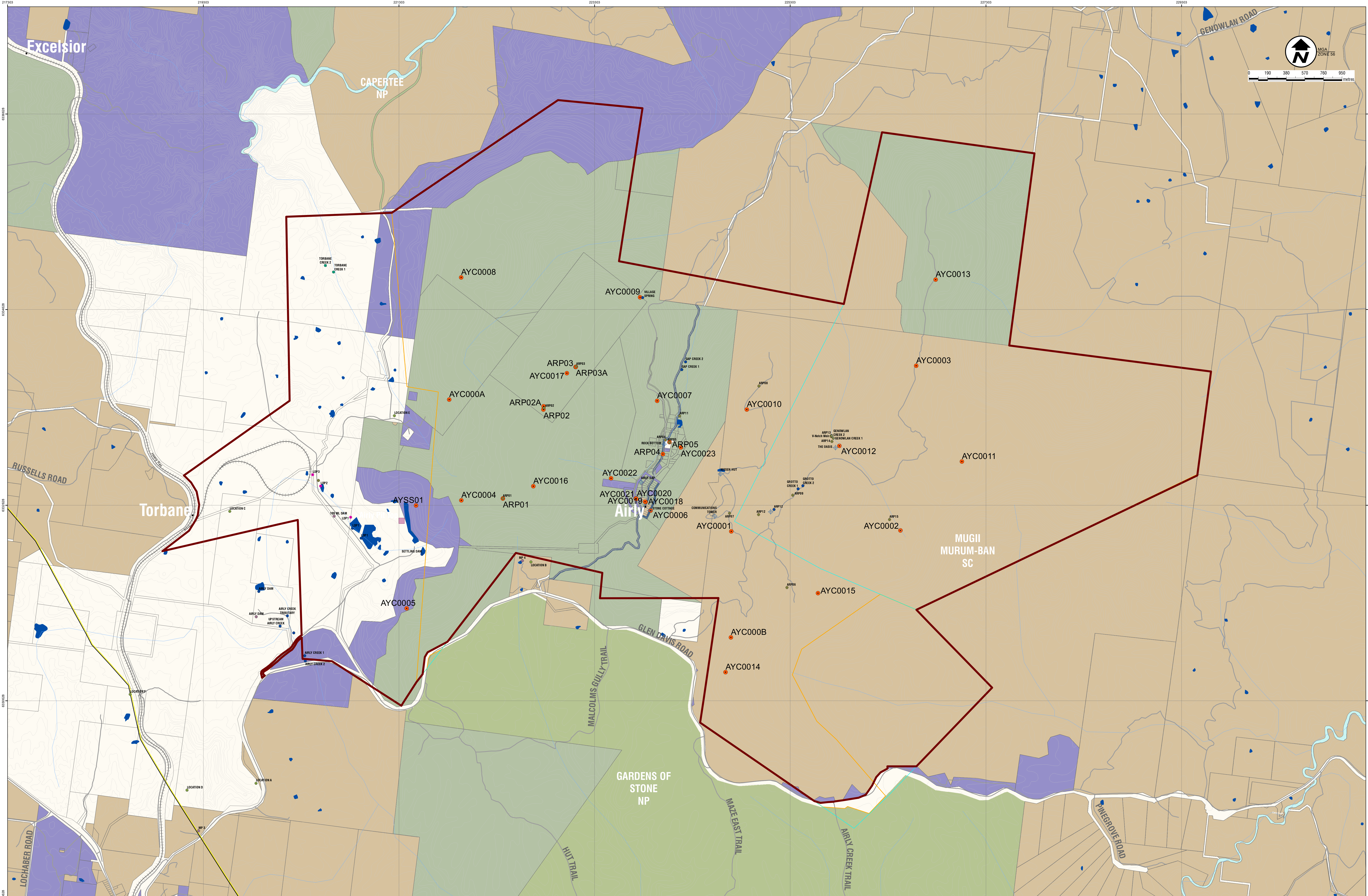
MINING OPERATIONS PLAN

Pre-Mining Environment - Natural Environment

PLAN 1B

A0

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RTTop

Project Application Area

AUTH0232

ML1331

Cadastre

Road

Railway

Contours 20m

pipeline

Transmission Line

Watercourses

Major Watercourse

Minor Watercourse

waterfeature

hydroarea

Monitoring Points

Aquatic monitoring Sites

Dust Monitoring Stations

Groundwater Monitoring Sites

Noise Monitoring Sites

Sensitive Feature

Boreholes

Licensed Discharge Points

Centennial Owned Land

Crown

Crown Reserve For Water

Land Ownership

Centennial Owned Land

Crown

Crown Reserve For Water

NSW Government

National Park

State Conservation Area

Crown Road

Freehold

NSW Government

National Park

State Conservation Area

MANAGER OF MINING ENGINEERING

I, Bob Miller, Manager of Mining Engineering (under Work Health and Safety (Mines) Act 2013 and pursuant Regulation 2014) testify to the acceptance of the information shown on this plan.

Bob Miller

Mine Manager

Date

CERTIFICATION

MINE SURVEYOR

I, John Stevens, Mine Surveyor (under Surveying Act 2002), certify that to the best of my knowledge and belief this plan conforms to the accuracy standards required by CRE in the MOP Guideline (Sept 2013)

John Stevens

Mine Surveyor

Date

Date:

26-Jul-2019

Drawn by:

Louise Hibbert

Scale:

1:12,000

Revision:

01

Projection:

GDA 1994 MGA Zone 56

Centennial Coal

PLAN 1C

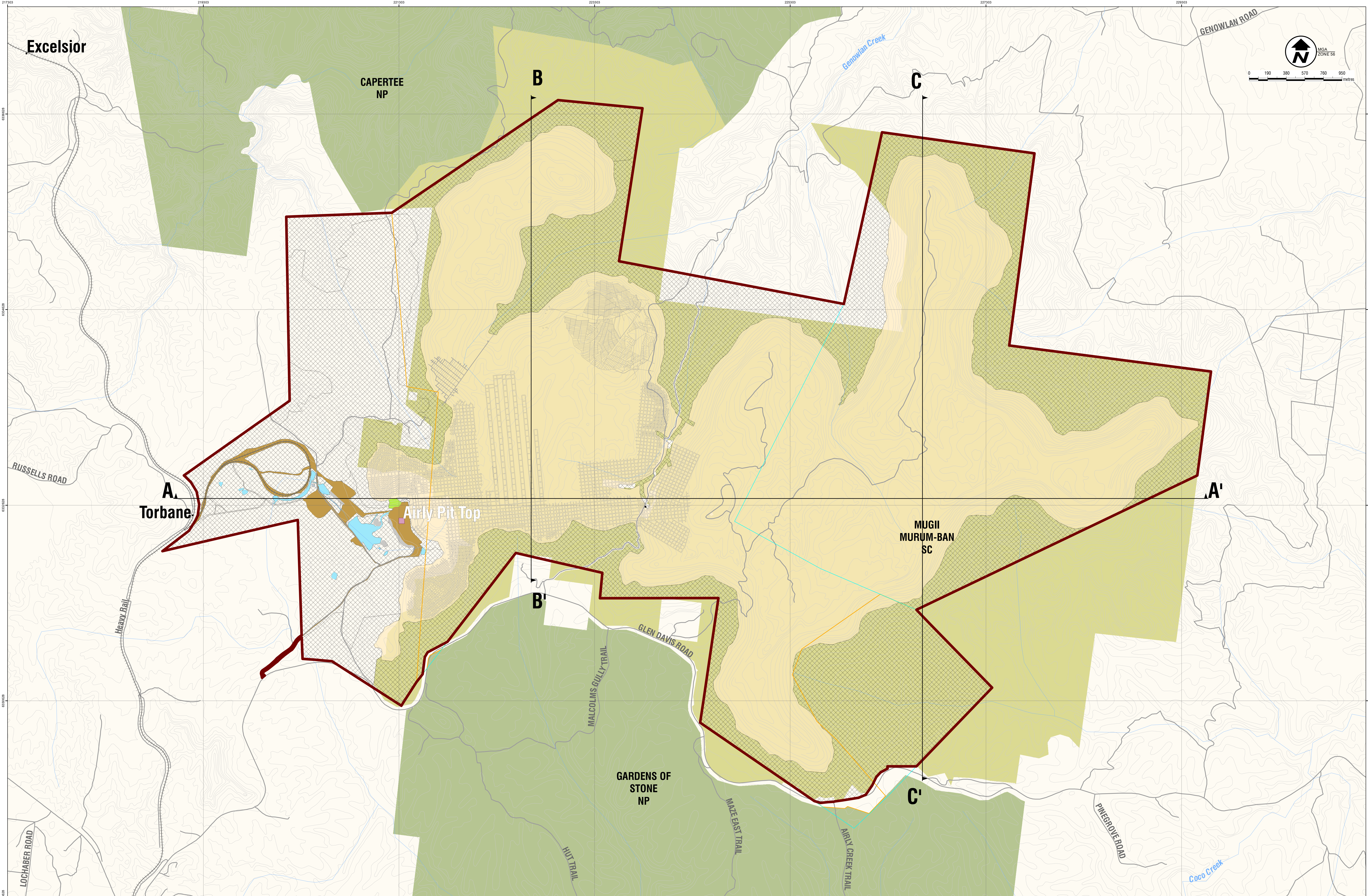
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MINING OPERATIONS PLAN

Pre-Mining Environment - Built Environment

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PitTop

Project Application Area

Coal Titles

AUTH0232

ML1331

Cross Sections

Road

Contours 20m

Railway

Current Mine Workings

Watercourses

Major Watercourse

Minor Watercourse

National Park

State Conservation Area

Primary Domains

D1 Infrastructure

D2 Water Managements Areas

D3 Stockpiled Material

D4 Underground Mining Area

D5 Existing Rehabilitation

D6 Other Lands

MANAGER OF MINING ENGINEERING

I, Bob Miller, Manager of Mining Engineering (under Work Health and Safety (Mines) Act 2013 and pursuant Regulation 2014) testify to the acceptance of the information shown on this plan.

Bob Miller

Mine Manager

Date

CERTIFICATION

MINE SURVEYOR

I, John Stevens, Mine Surveyor (under Surveying Act 2002), certify that to the best of my knowledge and belief this plan conforms to the accuracy standards required by DRE in the MOP Guideline (Sept 2013)

John Stevens

Mine Surveyor

Date

Date:

26-Jul-2019

Drawn by:

Louise Hibbert

Scale:

1:12,000

Revision:

01

Projection:

GDA 1994 MGA Zone 56

AIRLY

MINING OPERATIONS PLAN

Mine Domains at Commencement of MOP

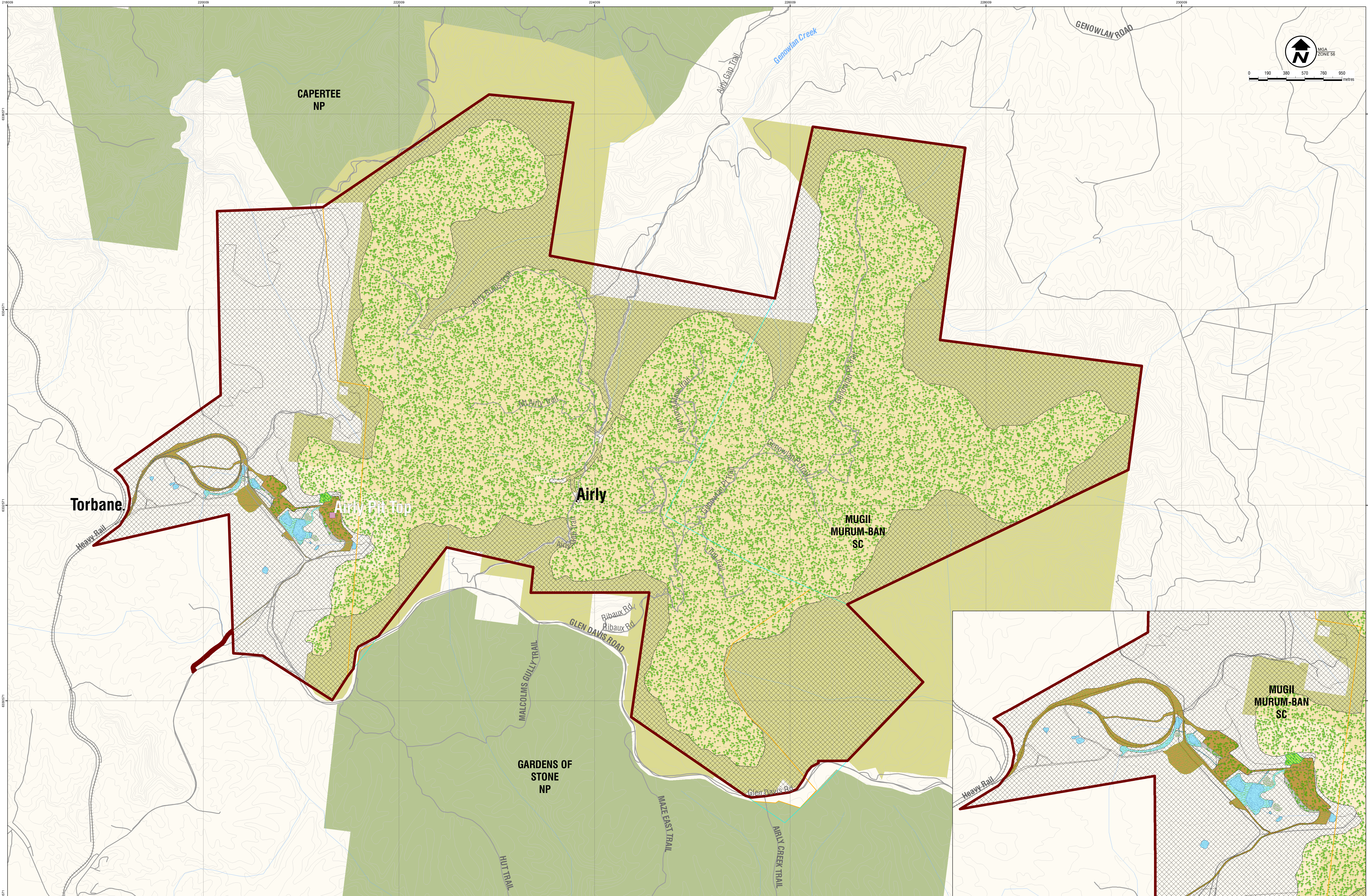
2017

Centennial Coal

PLAN 2

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PitTop

Project Application Area

Coal Titles

AUTH0232

ML1331

Railway

Watercourses

Major Watercourse

Minor Watercourse

Road

Contours 20m

National Park

State Conservation Area

Primary Domains

D1 Infrastructure

D2 Water Managements Areas

D3 Stockpiled Material

D4 Underground Mining Area

D5 Existing Rehabilitation

D6 Other Lands

Secondary Domains

SDA Rehabilitation Forest

SD6 Rural Land

SDC Water Management Areas

SDO Other Lands

Phase

Phase 4 - Ecosystem Establishment

MANAGER OF MINING ENGINEERING

L. Bob Miller, Manager of Mining Engineering (under Work Health and Safety (Mines) Act 2013 and pursuant Regulation 2014) testify to the acceptance of the information shown on this plan.

Bob Miller

Mine Manager

Date

CERTIFICATION

MINE SURVEYOR

L. John Stevens, Mine Surveyor (under Surveying Act 2002), certify that to the best of my knowledge and belief this plan conforms to the accuracy standards required by DRE in the MOP Guideline (Sept 2013)

John Stevens

Mine Surveyor

Date

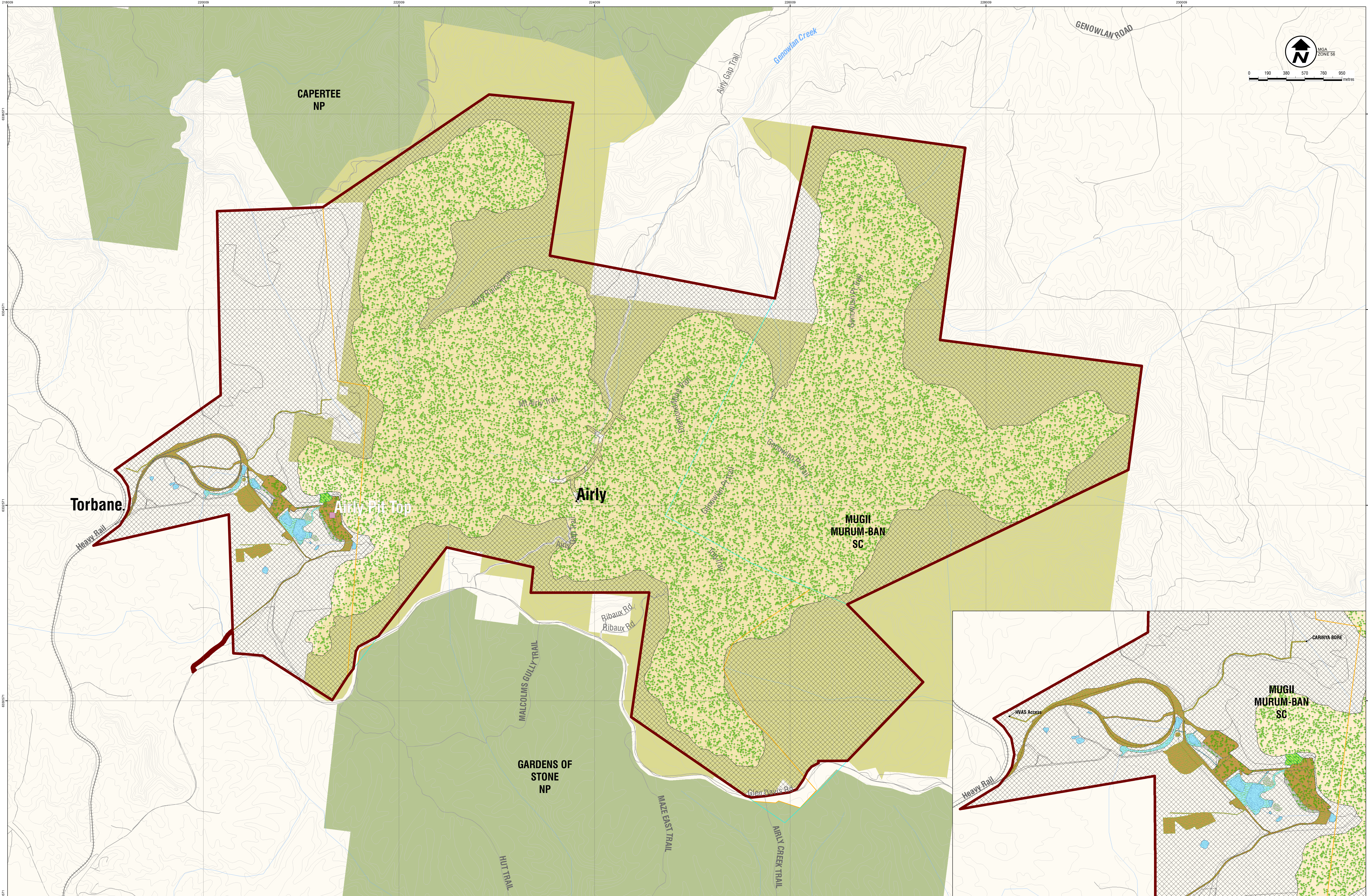
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Drawn by:	Louise Hibbert
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Revision:	01
Projection:	GDA 1994 MGA Zone 56

AIRLY
MINING OPERATIONS PLAN
Mining and Rehabilitation
2018

Centennial Coal

PLAN 3A

A0



LEGEND

PitTop

Project Application Area

Coal Titles

AUTH0232

ML1331

Railway

Watercourses

Major Watercourse

Minor Watercourse

Road

Contours 20m

National Park

State Conservation Area

Primary Domains

D1 Infrastructure

D2 Water Management Areas

D3 Stockpiled Material

D4 Underground Mining Area

D5 Existing Rehabilitation

D6 Other Lands

Secondary Domains

SDA Rehabilitation Forest

SDB Rural Land

SDC Water Management Areas

SDD Other Lands

Phase

Phase 4 - Ecosystem Establishment

CERTIFICATION

MANAGER OF MINING ENGINEERING
I, Bob Miller, Manager of Mining Engineering (under Work Health and Safety (Mines) Act 2013 and pursuant Regulation 2014) testify to the acceptance of the information shown on this plan.

Bob Miller
Mine Manager

Date

MINE SURVEYOR
I, John Stevens, Mine Surveyor (under Surveying Act 2002), certify that to the best of my knowledge and belief this plan conforms to the accuracy standards required by DRE in the MOP Guideline (Sept 2013).

John Stevens
Mine Surveyor

Date

Date: 17-Dec-2019

Drawn by: Louise Hibbert

Scale: 1:12,000

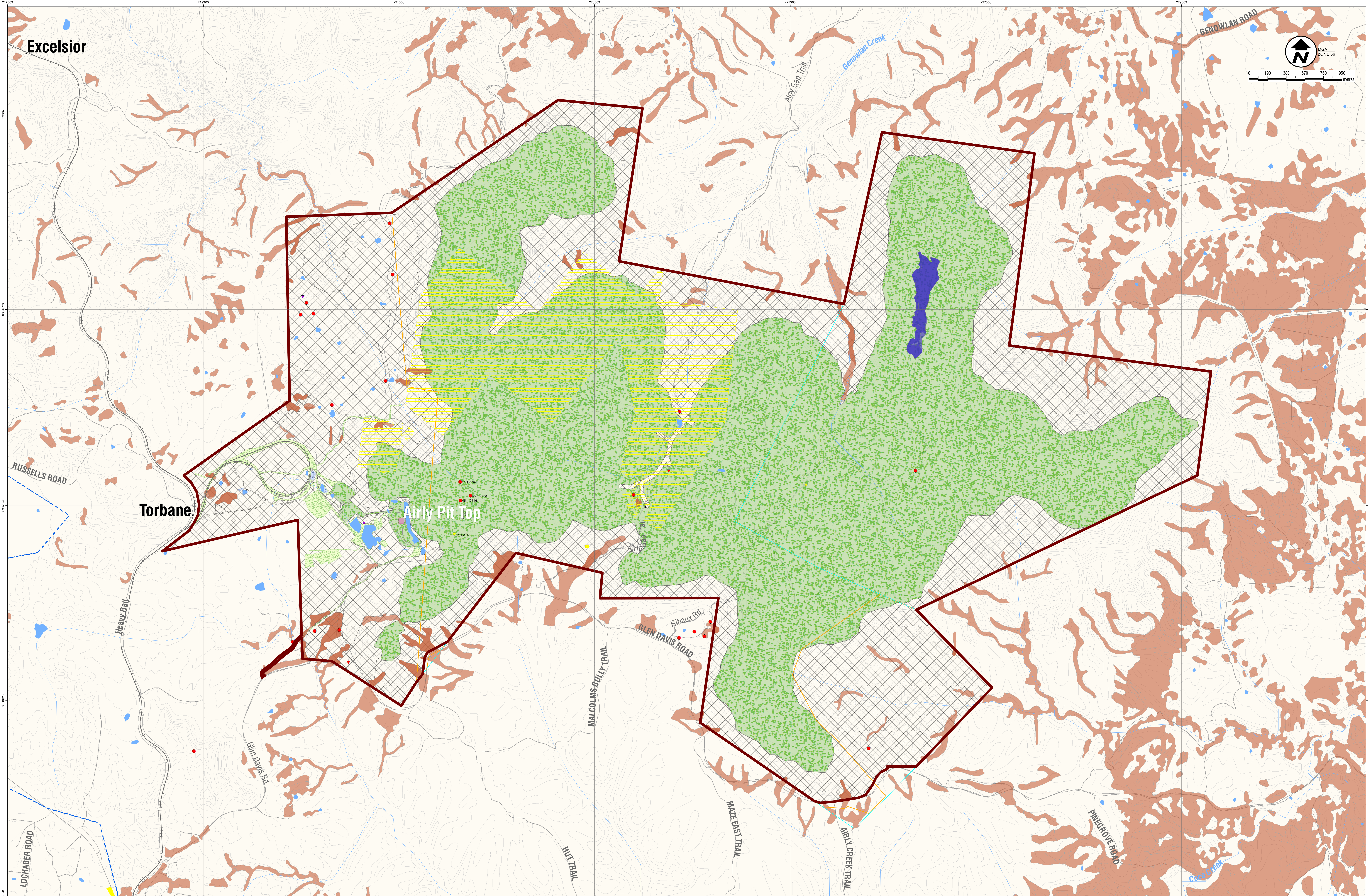
Revision: 01

Projection: GDA 1994 MGA Zone 56

**AIRLY
MINING OPERATIONS PLAN
Mining and Rehabilitation
2019-2024**

Centennial Coal

PLAN 3B A0



LEGEND

PitTop

Project Application Area

Coal Titles

AULH0232

ML1331

Road

Contours 20m

Railways

Major Watercourse

Minor Watercourse

Catchments

Dams

Cultural Heritage Sites

Aboriginal Site - Artefact Scatter

Aboriginal Site - Isolated Find

Aboriginal Site - Scattered Tree

Aboriginal Site - Shelter with Artefact

Aboriginal Site - Shelter with Deposits

Heritage Areas

General Cultural Area

Indicative Vegetation Communities

Genowlan Point Allocasuarina nana Heathland

White Box - Yellow Box - Blakely's Red Gum Woodland

Secondary Domains

SDA - Rehabilitation Forest

SDB - Rural Land

SDC - Water Management Areas

SDD - Other Lands

CERTIFICATION

MANAGER OF MINING ENGINEERING

I, Bob Miller, Manager of Mining Engineering (under Work Health and Safety (Mines) Act 2013 and pursuant Regulation 2014) testify to the acceptance of the information shown on this plan.

Bob Miller
Mine Manager

Date

MINE SURVEYOR

I, John Stevens, Mine Surveyor (under Surveying Act 2002), certify that to the best of my knowledge and belief this plan conforms to the accuracy standards required by CRE in the MOP Guideline (Sept 2013).

John Stevens
Mine Surveyor

Date

Date: 17-Dec-2019

Drawn by: Louise Hibbert

Scale: 1:12,000

Revision: 01

Projection: GDA 1994 MGA Zone 56

AIRLY

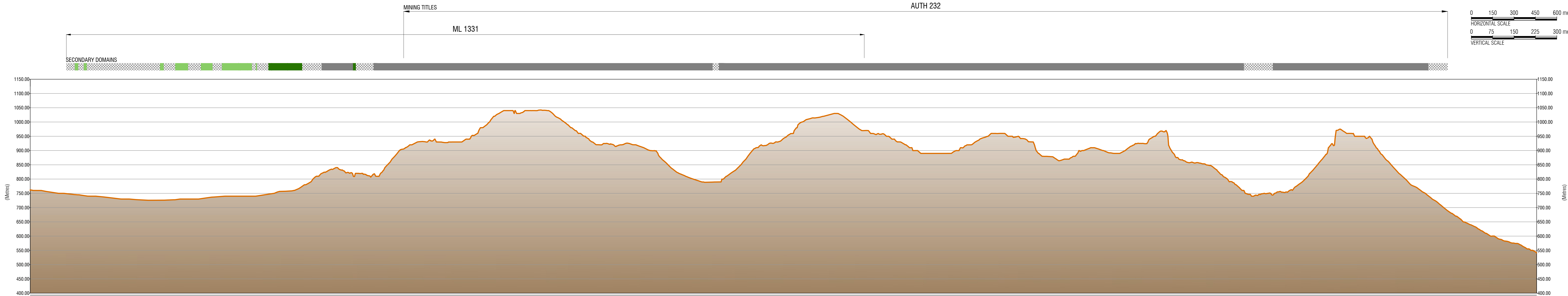
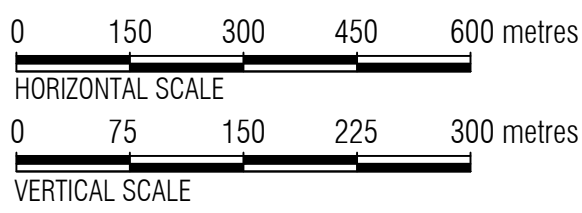
MINING OPERATIONS PLAN

Final Rehabilitation and Post Mining Land Use

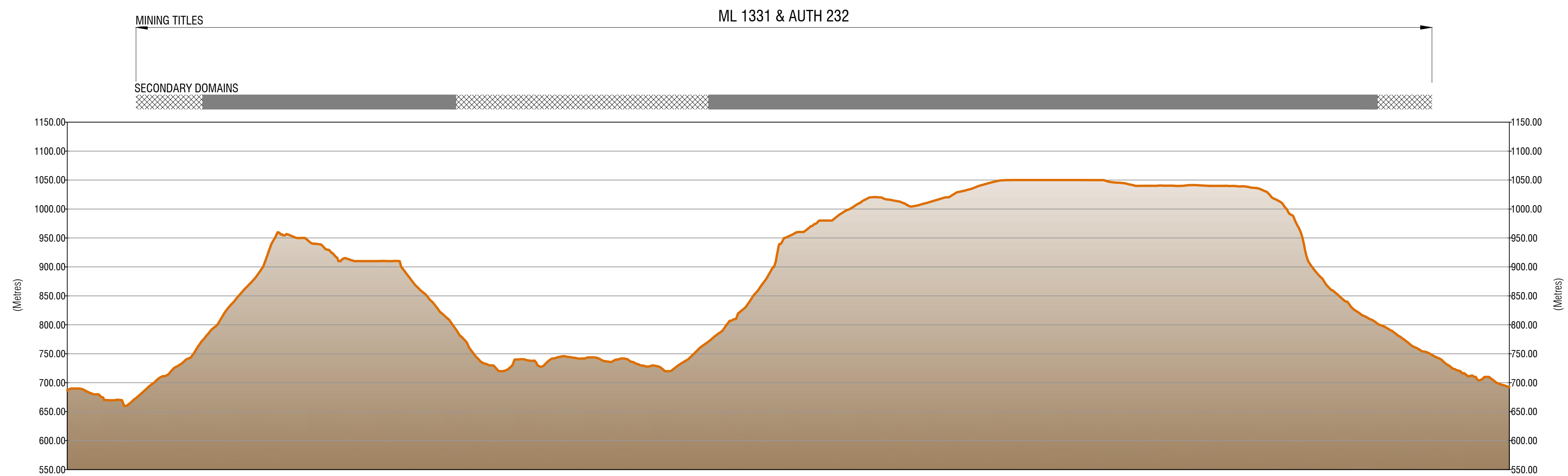
Centennial Coal

PLAN 4

A0



Section A - A'



Section B - B'



Section C - C'

LEGEND:

- Existing Surface (2017)
- Secondary Domains
 - DA
 - DB
- Underground Mining Area
- Undisturbed by Mining

CERTIFICATION

MANAGER OF MINING ENGINEERING
I, Bob Miller, Manager of Mining Engineering (under Work Health and Safety (Mines) Act 2013 and pursuant Regulation 2014) testify to the acceptance of the information shown on this plan.

Bob Miller
Mine Manager

MINE SURVEYOR
I, John Stevens, Mine Surveyor (under Surveying Act 2002), certify that to the best of my knowledge and belief this plan conforms to the accuracy standards required by DME in the MOP Guidelines (Sept 2013).

John Stevens
Mine Surveyor

Date:	26.07.2019
Drawn by:	Louise Hilbert
Scale:	Horizontal 1:10000 Vertical 1:5000
Revision:	01
Projection:	GDA 1994 MGA Zone 56

AIRLY
MINING OPERATIONS PLAN
Rehabilitation and Post Mining Land Use
Cross Sections

