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Health Safety & Environment Management System

Ravensworth South Modification Rehabilitation Strategy

Table of Contents

1. Introduction	4
1.1 Background and Project Overview	4
1.2 Purpose and scope	6
1.3 Limitations	7
2. Project description	8
3. Legislative and other requirements	9
3.1 Commonwealth Legislation	9
3.2 New South Wales Legislation	9
3.3 Policies and Guidelines	9
3.4 Consultation	10
4. Rehabilitation objectives	11
5. Land use strategy	13
6. Landform establishment	15
6.1 Ash emplacement	15
6.2 Infrastructure removal	15
6.3 Capping and borrow areas	15
6.4 Growth medium establishment	16
7. Revegetation and landform development	17
7.1 Growth medium	17
7.2 Revegetation species	17
8. Surface Water management	18
9. Rehabilitation monitoring and maintenance	19
10. Completion criteria	20
11. Stakeholder engagement	25
12. Risks and opportunities	26
13. Reporting and revision	27
13.1 Reporting	27
13.2 Revision of this strategy	27
14. References	28

Glossary and abbreviations

Abbreviation	Description
AEMP	Ash Emplacement Management Plan
AGL	AGL Energy
AGLM	AGL Macquarie
Bayswater	Bayswater Power Station
CCC	Community Consultative Committee
DA	Development Application
DS NSW	Dam Safety NSW
EMS	Environmental Management Strategy
EPA	Environmental Protection Authority
EPL	Environment Protection Licence
Liddell	Liddell Power Station
KPI	Key Performance Indicator
LFA	Landscape Function Analysis
m	Metre
MSC	Muswellbrook Shire Council
RSCM	Ravensworth South Coal Mine
RL	Reduced level
RMP	Rehabilitation Management Plan
RR	Resource Regulator NSW
Strategy	Rehabilitation Strategy
SSD	State Significant Development

1. Introduction

1.1 Background and Project Overview

AGL Macquarie Pty Limited (AGLM) owns and operates Ravensworth South Coal Mine (RSCM) in accordance with Development Approval (DA) 86/51. The approval covers the rehabilitation of final voids by filling with ash from the neighbouring power stations. Extraction of coal ceased in 2000, and Void 5 was formed from the incomplete filling of the mined area with overburden.

Under current operations, AGLM fill Void 5 with ash from Bayswater Power Station (the Project). AGLM applied to modify DA 86/51 to enable changes to the operational management of Void 5. The modification was approved by the Department of Planning and Environment (DPE) on 19 April 2023.

The Modification enables changes to a number of operational changes to:

- Reflect updated estimates of the amount of coal ash available for emplacement
- Reflect the hydrogeological conditions of Void 5
- Make the final landform free draining by provisioning for capping and rehabilitation
- Make provision for establishment of mine spoil borrow pits and stockpiling of surplus spoil from neighbouring mines for use in closure and rehabilitation.

The development, as modified, is substantially the same development as that originally approved under DA 86/51 as it involves the continued rehabilitation of the former RSCM Void 5.

This Rehabilitation Strategy (Strategy) has been prepared specifically for the RSCM Void 5 project for AGLM. This Strategy also builds upon initial modification information provided within the Ravensworth South Mine – Rehabilitation Amendment Modification Report (Jacobs 2022a) and the Response to Submissions (Jacobs 2022b). An overview of the RSCM Void 5 project is shown in Figure 1.

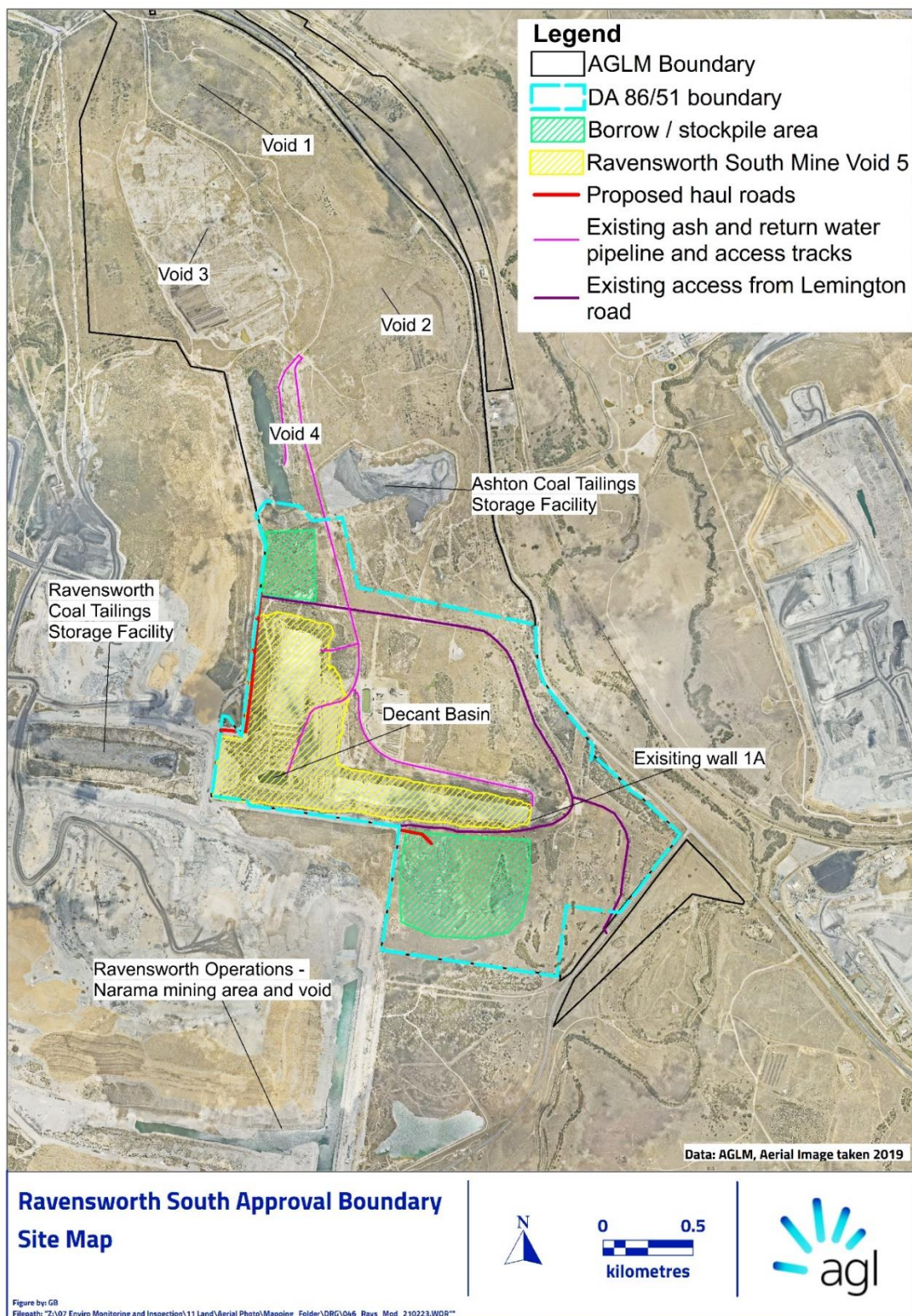


Figure 1 Ravensworth South

1.2 Purpose and scope

GHD Pty Ltd (GHD) was engaged by AGLM to prepare a Strategy which summarises the proposed approach to rehabilitation for the project to address the Development Approval requirements (DA 86/51). It describes the activities and measures which will be undertaken, if required, to achieve the project's goals. This strategy addresses the relevant criteria in the DA as outlined below and details how AGLM will meet these requirements.

The strategy focuses on the proposed approach to rehabilitation of Void 5 following the approved changes from the Modification Report.

Table 1 outlines the requirements of DA 86/51 Condition B22 and where these have been addressed in this Strategy.

Table 1 Requirements of DA 86/51

Requirement	Where addressed
The Applicant must prepare a Rehabilitation Strategy for all land disturbed by the development to the satisfaction of the Planning Secretary. This plan must:	This Plan
a) be submitted for approval within six months of the approval of Mod 1;	This Plan is scheduled to be submitted by 19 October 2023
b) be prepared by a suitably qualified and experienced person/s;	This Plan was prepared by GHD on behalf of AGLM (2023)
c) be prepared in consultation with the Resources Regulator and Council;	Section 3.4
d) build upon the Rehabilitation Objectives in Table 3, describe the overall rehabilitation outcomes for the site, and address all aspects of rehabilitation including final landform, post-mining land use/s and water management;	Section 4
e) align with strategic rehabilitation and mine closure objectives and address the principles of the Strategic Framework for Mine Closure (ANZMEC and MCA, 200);	Section 6, 7, 8 and 11
f) describe how the Applicant will ensure that surface water from the free draining final landform will not result in downstream water quality impacts;	Section 8
g) include details of target vegetation communities and species to be established within the proposed revegetation areas;	Section 7.2 and 10
h) investigate opportunities to refine and improve the final landform outcomes over time;	Section 5
i) includes a risks and opportunities assessment and risk register	Section 12

Requirement	Where addressed
j) include a post-mining land use strategy to investigate and facilitate post-mining beneficial land uses for the site, that;	Section 5
i. align with regional and local strategic land use planning objectives and outcomes;	Section 3.3 and 5
ii. support a sustainable future for the local community;	Section 3.4 and 5
iii. utilise existing mining infrastructure where practicable; and	Section 5 and 6.1
iv. avoid disturbing self-sustaining native ecosystems, where practicable	Section 6.3
k) include a stakeholder engagement plan to guide rehabilitation and mine closure planning processes and outcomes;	Section 11
l) investigate ways to minimise adverse socio-economic effects associated with rehabilitation, and;	Section 5
m) include a program to periodically review and update this strategy at least every three years.	Section 13.2

1.3 Limitations

This report has been prepared by GHD for AGL Macquarie and may only be used and relied on by AGL Macquarie for the purpose agreed between GHD and AGL Macquarie as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than AGL Macquarie arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by AGL Macquarie and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2. Project description

The RSCM is located within the Singleton Local Government Area and is authorised under Development Approval 86/51 (DA 86/51). The RSCM was developed in 1987 by the Electricity Commission of NSW to supply coal to the nearby Bayswater Power Station (Bayswater) and Liddell Power Station (Liddell). Mining operations commenced in 1987 and ceased in 2000, leaving a final void (Void 5) behind which was formed from the incomplete filling of the mined area with overburden.

The rehabilitation of Void 5 was commenced in 2014 by Macquarie Generation, the former owner of the Bayswater Power Station, in accordance with the "Ravensworth South - Final Void Rehabilitation Plan" dated 1 May 2012, approved under condition 2 of DA 86/51. The Rehabilitation Management Plan was updated in 2022.

Modification 1 of DA 86/51 proposed the following changes for the project:

- Change the ash emplacement methodology within Void 5 to facilitate free draining landform and reflect current hydrogeological conditions.
- Removal of redundant pumping infrastructure from Void 5 to allow ash disposal in the area below the current internal terraces.
- Provision for the receipt, stockpiling and use of mine spoil or alternative capping materials to provide the final capping for Void 5 including authorising mine spoil borrow-pits for use in capping and rehabilitation:
 - Vegetation clearing to the west of the north arm of the void to enable ongoing ash deposition in Void 5.
 - Authorise alternative suitable options for the final landform to allow for flexibility should the earlier than previously forecast closure of Bayswater Power Station preclude the generation of sufficient ash to completely fill Void 5; and
 - Updating the proposed final landform associated with the eastern wall of the eastern arm of Void 5 to include works comprising a 5 m downstream raising, if required.

3. Legislative and other requirements

The requirements of relevant legislation and guidelines will be applied to all stages of the rehabilitation of RSCM. A list of such requirements is listed below.

3.1 Commonwealth Legislation

- *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*

3.2 New South Wales Legislation

- *Environmental Planning and Assessment Act 1979 (EP&A Act)*
- *Protection of the Environment Operations Act 1997 (POEO Act)*
- *The Mining Act 1992*
- *Biodiversity Conservation Act 2016 (BC Act)*
- *Water Management Act 2000 (WM Act)*
- *Fisheries Management Act 1994 (FM Act)*
- *Biosecurity Act 2015 (BA Act)*
- *Dam Safety Act 2015 (DS Act)*
- *National Parks and Wildlife Act 1974 (NPW Act)*
- *Coal Mine Subsidence Compensation Act 2017 (CMS Act)*

3.3 Policies and Guidelines

- DSC3F Guidelines for decommissioning (NSWDSC, 2010).
- Australian National Committee on Large Dams (ANCOLD) Guidelines on Tailing Dams (ANCOLD, 2019).
- Strategic Framework for Mine Closure (MCA; ANZMEC, 2000).
- Leading Practice Sustainable Development Program for the Mining Industry – Mine Closure (Australian Government, 2016).
- Managing Urban Stormwater: Soils and construction - Volume 1, 4th edition (the 'Blue Book', Landcom 2004).
- Planning for Integrated Mine Closures: Toolkit (ICMM, 2008).
- Form and Way: Rehabilitation management plan for large mines (NSW Resources Regulator, 2021).
- Land Use Development Strategy. Coal Mine Land Use Strategy, A Guide for Strategic Land Use in the Muswellbrook Shire (Muswellbrook Shire Council, 2012).
- Singleton Local Environment Plan 2013.
- Hunter Regional Plan 2036 (Department of Planning and Environment, 2016).
- Singleton Community Strategic Plan – 2017-2027 ((Singleton Council, 2017).
- Socio-Economic Development Strategy 2020/2024 (Singleton Council, 2020).
- Singleton Local Strategic Planning Statement 2041.

3.4 Consultation

As per the requirements of DA 86/5, consultation was undertaken with the relevant agencies, as outlined in Table 2 below and Appendix A.

Table 2 Consultation outcomes

Agency Consulted	Date	Comment
Resources Regulator NSW	Emailed on 12/09/2023	No comments or response received.
Singleton Council	Emailed on 12/09/2023	No comments or response received.

4. Rehabilitation objectives

Rehabilitation objectives for the project are defined by Condition B21 (Table 3) of DA 85/51. These objectives are summarised in Table 3.

Table 3 Rehabilitation Objectives

Feature	Objective
All areas of the site affected by the development	<ul style="list-style-type: none"> • Safe, stable and non-polluting • Fit for the intended post-mining land use/s • Establish the final landform and post-mining land use/s as soon as practicable after cessation of the emplacement activities • Minimise post-mining and emplacement activity environmental impacts.
Areas proposed for native ecosystem re-establishment	<ul style="list-style-type: none"> • Establish/restore self-sustaining native woodland ecosystems • Establish local plant community types • Establish: <ul style="list-style-type: none"> • habitat, feed and foraging resources for threatened fauna species, and • vegetation connectivity and wildlife corridors, as far as is reasonable and feasible.
Areas proposed for agricultural land	<ul style="list-style-type: none"> • Establish/restore grassland areas to support sustainable agricultural activities • Use species found in the local area that are suitable for pasture production • Achieve land and soil capabilities that are equivalent or better than pre-mining • Locate adjacent to surrounding agricultural land, where practicable.
Final Landform	<ul style="list-style-type: none"> • Stable for the intended post-mining land use/s • Integrated with surrounding natural landforms and other mine rehabilitated landforms, to the greatest extent practicable • Incorporate micro-relief and drainage features that mimic natural topography and mitigate erosion, to the greatest extent practicable • Maximise surface water drainage to the natural environment i.e. free draining • Minimise visual impacts, where practicable.
Surface infrastructure of the development	<ul style="list-style-type: none"> • To be decommissioned and removed, unless the Resources Regulator agrees otherwise.

Feature	Objective
Rehabilitation materials	<ul style="list-style-type: none"> Materials from areas disturbed as a part of works authorised under Mod 1 (including topsoils, substrates and seeds) are to be recovered, managed and reused as rehabilitation resources, to the greatest extent practicable.
Water quality	<ul style="list-style-type: none"> Water retained on the site is fit for the intended post-mining land use/s Water discharged from the site is suitable for receiving waters and fit for aquatic ecology and riparian vegetation.
Community	<ul style="list-style-type: none"> Ensure public safety Minimise adverse socio-economic effects associated with mine closure.

5. Land use strategy

The final land use for the project is generally limited to grazing and native woodland landscape that is safe, stable and non-polluting. The final land use for RSCM will limit post closure impacts on the immediate and surrounding areas.

Key components of the final land use strategy are:

- Land will be rehabilitated in accordance with the relevant standards applicable at the time of rehabilitation
- Rehabilitated land will represent a minimal source of offsite environmental impacts, such as dust, water pollution, visual amenity and weeds
- Rehabilitated land will require ongoing management inputs no greater than similar adjacent land
- To reinstate a viable drainage network on the site which is hydrologically stable and incorporates erosion controls and sediment collection dams which isolate effectively the rehabilitated area from adjoining area
- Successful design and rehabilitation of landforms to ensure structural stability, revegetation success and containment of wastes, and
- Post-mining land use compatible with surrounding land uses, that provides optimal environmental, economic and community benefits.

RSCM has moderate to high limitation for high impact land uses such as cropping, high-intensity grazing and horticulture due to historic mining activities and presence of material susceptible to spontaneous combustion. Therefore, the final land use of grazing and native woodland is considered the most suitable final landform that is safe, stable and non-polluting.

Final land use was informed by stakeholder consultation and a number of key site considerations pertaining to:

- High risk of degradation if cultivation were to occur
- Sodic and saline nature of the soils
- Cultivation would bring the rock present in the overburden to the surface creating problems for equipment
- Climatic data for the area shows that the rainfall is highly variable with an unreliable pattern that would create a significant risk if cultivation were to occur due to failure from reduced rainfall and erosion risk associated with bare ground
- Steep topography
- Presence of mining infrastructure
- Current use for composting facility
- Areas affected by spontaneous combustion

The final land use strategy is consistent with current regional policy context in relation to mine rehabilitation, as policy preferences for mine voids avoided or rehabilitated where economic uses are not viable and to ensure that post mining landforms are stable and productive. The final landform authorises the filling of Void 5 with ash within the upper and lower bounds of expected ash generation rates, providing flexibility and opportunity to refine the final landform dependent on Bayswater Power Station operation. The final landform consistent with the surrounding environment of coal mining and agricultural land use.

A composting facility has been established at the site in agreement with AGL. This facility operates under a separate Environment Protection Licence and Development consent. The compost facility is expected to operate for at least 20 years with the operator recently upgrading their facility to enable processing of food organics. This facility supplies organics to AGL and the surrounding area for activities such as mine site rehabilitation. Going forward it is also likely that the facility will support local councils as they shift to Food Organics Garden Organics recycling. The compost facility operator is also looking to augment operations and is investigating other technologies such as biodigesters.

AGL is also investigating suitable opportunities for the site associated with the proposed Industrial Energy Hubs planned for the Liddell Power Station, Bayswater Power Station and other AGL land holdings.

6. Landform establishment

6.1 Ash emplacement

Ash emplacement in Void 5 will occur in a manner which creates a free draining surface with a fall from the northern boundary of the Void 5 North Arm to the eastern boundary of the East Arm. To achieve this landform, the following ash emplacement strategy will be implemented:

- Discontinuing the establishment of internal walls including sealer wall rises
- Retrieval of redundant water management infrastructure
- Commencement of deposition of ash into decant basin and continuation until ash levels reach existing levels within the eastern and northern arms of the Void 5
- Ongoing deposition from various relocatable points within the North and East Arms of Void 5 and over the decant basin, as well as any necessary ash contouring once stabilised, to best achieve a free draining final landform. The estimated maximum RL of ash will remain approximately RL 101 m and will be generally at the level with the existing top of void at the north of the northern arm. Ash will be placed to establish a landform with a minimum estimated 0.5% gradient down to the existing Wall 1A RL of 85 m, and
- Localised re-contouring of the tops of void walls to establish a safe and stable tie-in to the final void landform.

This ash emplacement strategy will enable flexibility and allow AGLM to account for the future operation of Bayswater Power Station and subsequent ash generation quantities and still meet the final landform requirements.

6.2 Infrastructure removal

Following the closure of Bayswater Power Station, the following infrastructure will be removed from RSCM:

- Ash transfer pipelines
- Return water pipelines
- Pumping infrastructure including pumps, water tanks and pontoons
- Powerlines and power infrastructure related to AGLM's operations that is no longer required
- Access roads no longer required following rehabilitation of the site.

Any demolition will be undertaken in accordance with Australian Standard AS2601: The demolition of structures (AS 2601). All structures will be inspected for the presence of hazardous materials prior to demolition.

Boundary fencing and main access routes to the site will remain in the final landform.

6.3 Capping and borrow areas

A capping layer will be established over Void 5 following completion of ash deposition. The ash will be capped with a minimum 500 mm depth of inert material and have a low permeability layer to reduce potential infiltration into the ash filled void. Capping material will be sourced from Borrow Areas from the following areas:

- Stockpiling of spoil material from outside AGLM's landholdings (if available) in an area immediately north of Void 5, situated between Void 5 and Void 4

- If sufficient spoil material from offsite cannot be utilised, then two borrow areas will be established:
 - Borrow area 1: located between Void 5 and Void 4, approximately 10.28 ha in size with an intended supply volume of 360,000 m³
 - Borrow Area 2 and to the south of the eastern arm of Void 5, approximately 37 ha in size with an intended supply volume of 1,300,000 m³.

To be able to transfer material from stockpile/borrow area 1 and 2 to Void 5, two haul roads will be constructed and linked to existing haul roads. Some vegetation clearing is required to create these areas. Vegetation clearing will be restricted to the approved limits outlined in DA 86/51. The Borrow areas will be reshaped and blended into the surrounding landform following the completion of extraction.

6.4 Growth medium establishment

Following the completion of ash deposition and capping of Void 5, the landform will be prepared for revegetation. Growth medium will be approximately 100 mm in depth and have a minimum 0.5% gradient flowing north to south and then to the east as per the final landform.

7. Revegetation and landform development

7.1 Growth medium

There is limited topsoil at RSCM due to historical mining practices. Growth medium will be predominantly sought from third party composting companies located within the AGLM land boundary. This material has been used for the past five years with the results from the rehabilitation monitoring showing its benefit. The composts consist of a mix of biosolids, garden organics and paper crumble. If available, the food organics will also be added to the compost material. The compost will be incorporated into rehabilitation areas at allowable rates as directed by soil analysis. Weed management will be undertaken to reduce the risk of weed infestation prior to compost placement.

7.2 Revegetation species

The final land use for RSCM is grazing and native woodland to create a safe, stable and non-polluting landscape. Native and exotic pasture grasses will be used as a vegetation cover on the capped areas of Void 5 as trees and shrubs are not a suitable vegetation cover, as they have the potential to penetrate and damage the capping and make it ineffective.

The recommended pasture species list used by AGLM for rehabilitation are indicated in Table 4. Recommended native woodland species are included in Table 5. Note that the native species listed are a guide only and will be subject to availability. Where species are not available, appropriate alternatives will be substituted.

Table 4 Recommended Pasture Species Direct Seeding and Rate

Pasture	Seeding Rate (kg/ha)
Japanese millet (spring/summer only)	10
Coolabah oats (autumn/winter only)	10
Brassica – Hunter - autumn	0.75
Brassica – Rangi - autumn	0.75
Consul Lovegrass	1
Couch grass - Hulled	5
Kikuyu	3
Medic - Sephi	1
Perennial rye grass – Kangaroo Valley	6
Rhodes Grass	3
Rye - Eclipse	5
Sub-clover - Seaton Park	3
White clover - Haifa	3
Woolly Pod vetch - Namoi	4

Table 5 Recommended Woodland Species Direct Seeding Rates

Cover crop species	Seeding Rate (kg/ha)
Japanese millet (spring/summer only)	10
Coolabah oats (autumn/winter only)	10
Low Shrub Species	Seeding Rate (kg/ha)
<i>Acacia amblygona</i>	0.4
<i>Acacia falcata</i> (Sickle wattle)	0.8
<i>Acacia decora</i> (Western Silver Wattle)	05
<i>Bursaria spinosa</i> (Blackthorn)	0.5
<i>Daviesia genistifolia</i> , <i>D. ulicifolia</i>	1
Mid Shrub Species	Seeding Rate (kg/ha)
<i>Acacia paradoxa</i>	0.4
<i>Acacia implexa</i> (Hickory Wattle)	0.8
<i>Acacia parvipinnula</i> (Silver Stemmed Wattle)	0.4
<i>Acacia salicina</i> (Cooba)	1
Tree Species	Seeding Rate (kg/ha)
<i>Angophora floribunda</i> (Rough Barked Apple)	0.6
<i>Corymbia maculata</i> (Spotted Gum)	1.2
<i>Eucalyptus crebra</i> (Narrow Leafed Ironbark)	1.0
<i>Eucalyptus melliodora</i>	0.5
<i>Eucalyptus moluccana</i> (Grey Box)	1.0
<i>Eucalyptus tereticornis</i> (Forest Red Gum)	0.5

8. Surface Water management

During rehabilitation, disturbed areas will be progressively rehabilitated to minimise the amount of exposed soil. Stabilisation work in areas of high erosion hazard such as the borrow pits, steep slopes on the project site and drainage lines will be ameliorated with gypsum, where required to reduce erodibility as part of the soil amelioration.

The final landform will direct surface water flows from north to south then to the east via the 0.5% fall incorporated into the final landform. This will ensure that the landform is free draining, and that ponding does not occur. All clean water surface flows will flow to the east of Void 5 where it will then flow to the existing settlement dams. During larger rainfall events, the clean water will flow through settlement dam/s prior to leaving site.

9. Rehabilitation monitoring and maintenance

Rehabilitation monitoring activities include:

- Rehabilitation monitoring occurring annually including:
 - landscape function analysis
 - vegetation dynamics assessment
 - species abundance counts
 - habitat monitoring
 - pasture assessments
 - soil sampling and analysis
 - photographic monitoring
 - comparison to analogue sites
- Vegetation strike and survival surveys through visual inspections and random quadrat sampling at four to eight week intervals at the completion of vegetation in new area (weather permitting)
- Random area monitoring and photography of rehabilitation conditions, weeds, pest animal and erosion
- Spontaneous combustion monitoring (thermal scans and visual monitoring) occurring on a five yearly basis
- Inspections of the dam walls as required by the Dam Safety Act.

Rehabilitation monitoring will be undertaken to track RSCM progress towards completion criteria and to determine if corrective action is required to areas that have been rehabilitated.

10. Completion criteria

Completion criteria for RSCM was developed in the Rehabilitation Management Plan (RMP) dated 2 July 2022. Completion criteria provides a defined end point at which rehabilitation can be deemed to be successful and the mining lease can be relinquished. The rehabilitation completion criteria have been developed to be consistent with the proposed final land use for the site and is shown in Table 6.

Table 6 Conceptual Completion Criteria

Operational Areas	Objective	Completion criteria
Ash Emplacement Area Water Management Infrastructure Borrow/Stockpile Areas	Retention of infrastructure: All infrastructure that is to remain as part of the final land use is safe and does not pose any hazard to the community.	Hazards isolated and secured.
		The location of the infrastructure remaining has been marked on a plan and registered with the relevant local authority and Dial Before You Dig. Formal acceptance from the subsequent landowner that underground infrastructure has been left in a condition that is suitable for the intended final land use in accordance with formal agreement.
		Damage to access tracks has been repaired and stabilised.
	Removal of infrastructure: All infrastructure that is not to be used as part of the final land use is removed to ensure the site is safe and free of hazardous materials.	All relevant utility infrastructure removed.
		Pipes removed and appropriately recycled reused or disposed. No ash slurry present.
		Footings removed and or removed to specific depths to avoid impacting pathways to subsequent final land use.
Removal of all water management infrastructure (including pumps, pipes and power).		
Land Contamination: There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	All hazardous materials removed from site.	
	There are no visible signs of contamination following the removal of plant, equipment and materials. All rubbish/ waste materials removed from site. Contamination will be appropriately remediated so that appropriate guidelines for land use are met, e.g. Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) or other relevant guideline/s. Excess sludge/material has been removed from surface water dams.	
Management of waste and process materials	Visual – verification that capping, type and placement consistent with design.	

Operational Areas	Objective	Completion criteria
		<p>Visual – no signs of compromised capping performance indicated by vegetation health.</p> <p>Visual – no areas of unexpected seepage.</p> <p>Survey verifies that capping placement consistent with design and settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement.</p> <p>Quality assurance records verify capping constructed and in accordance with design specifications relevant to site risks and target final land use. For example:</p> <ul style="list-style-type: none"> • Ash Capping depth – 400mm • Capping material type as per specification <p>Groundwater and surface monitoring verify capping function e.g. ‘store and release’ and design performance permeability/seepage.</p> <p>Groundwater and surface water monitoring surface and groundwater quality consistent with predicted quality.</p>
	<p>Landform Stability:</p> <p>The final landform is stable for the long-term and does not present a risk of environmental harm downstream/downslope of the site or a safety risk to the public/stock/native fauna. Landform that is commensurate with surrounding natural landform and where appropriate, incorporates geomorphic design principles.</p>	<p>Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works.</p> <p>Visual – no signs of land instability such as mass movement.</p> <p>Visual - no areas of active gully erosion. No gullies greater than 20cm depth over transects.</p> <p>Visual - no evidence of tunnel erosion.</p> <p>Visual – no evidence of active scour likely to compromise surface water management structure.</p> <p>Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan.</p>

Operational Areas	Objective	Completion criteria
		Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement.
		Significant surface water management structures have been constructed in accordance with hydrological design.
	Bushfire: The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	Bushfire controls implemented.
	Spontaneous Combustion: The risk of spontaneous combustion and impacts on rehabilitated areas has been addressed.	No areas show up on thermal scan.
	Surface Water: Runoff water quality from mine site is similar to, or better than the pre-disturbance runoff water quality.	Water quality discharged from rehabilitated mining operation meet specifications in Environment Protection Licence.
	Water Approvals: Structures that take or divert water such as final voids, dams etc. are appropriately licensed (e.g. under the <i>Water Management Act 2000</i>) and where required ensure sufficient licence shares are held in the water source(s) to account for water take.	Water approvals / licences are granted by relevant NSW Government Agency.
	Groundwater Quality: Groundwater quality is similar to, or better than the predicted/modelled Water quality parameters included in environmental a groundwater quality in relevant assessment documents.	Water quality discharged from rehabilitated mining operation meet specifications in environmental assessment and/or Environment Protection Licence.
	Agricultural Revegetation:	Rural land classification system criteria specified in environmental assessments met.

Operational Areas	Objective	Completion criteria
	<p>Revegetation is sustainable for the long-term and only requires maintenance that is consistent with the intended final land use. Land use capability is capable of supporting the target agricultural land use.</p>	<p>Routine soil testing indicates no key deficiencies that could prevent or affect pasture vegetation establishment, health and production.</p> <p>Minimum 70% productive groundcover (live and litter cover).</p> <p>Less than 20% of foliage cover of pasture weeds (weeds listed Weedwise, Hunter Region).</p> <p>>75% of herbage cover is provided by grasses and legumes suitable for grazing.</p> <p>Total herbage mass of pasture areas – >1,500 kg DM/ha pre introduction of cattle for grazing or comparable to reference sites (biomass of desirable pasture species only).</p>

11. Stakeholder engagement

A stakeholder engagement plan has been developed for the project, which is attached in Appendix B. The objectives of this plan are to give opportunities for stakeholders to guide rehabilitation activities at the site. The stakeholder engagement plan also will enable AGLM to identify ways to minimise adverse socio-economic effects associated with rehabilitation.

AGLM will update the stakeholder engagement plan at least every three years, and will seek feedback from BCD, Dams Safety NSW, DPE Water, EPA, Heritage NSW, MEG, Subsidence Advisory and Resources Regulator every three years in the preparation of updated versions of this plan. As the site progresses towards closure, detailed consultation will be undertaken with relevant government agencies to inform the closure reporting and preparation process.

12. Risks and opportunities

A risk assessment was undertaken in accordance with Form and Way: Rehabilitation Management Plans for Large Mines guideline (NSW Resources Regulator, 2021) during the preparation of the rehabilitation management plan. The key risk identified was the failure to relinquish site and successfully rehabilitate the project. The risk assessment identified two critical controls for rehabilitation, being:

- Progressive rehabilitation (annually)
- Environmental monitoring

A further 50 controls were identified, including both existing and potential future controls.

The risk assessment found that financial and environmental risks remained the highest risk consequence with the implementation of controls, followed by regulatory, social licence and reputational impacts.

Opportunities created by the project include reduction of legacy impacts through proper rehabilitation, creation of pasture and improving habitat value of the site.

13. Reporting and revision

13.1 Reporting

A reporting schedule for the project is presented in Table 7.

Table 7 Reporting schedule

Report type	Frequency	Reference
Rehabilitation report and Forward program	Annually, submitted to Resources Regulator.	Clauses 9 and 13 of Schedule 8A to the <i>Mining Regulation 2016</i>
Incident reporting	Immediately following becoming aware of an incident.	Condition C7 of DA 86/51
Non-compliance reporting	Within seven days of becoming aware of a non-compliance.	Condition C8 of DA 86/51
Independent Environmental Audit	Within one year of approval of Mod 1, and every three years after.	Condition C9 and C10 of DA 86/51

13.2 Revision of this strategy

This strategy will be reviewed at a minimum frequency of three years, or in accordance with the requirements of Condition C5 which requires AGLM to review and, if necessary, revise this strategy within three months of the following circumstances:

- a) the submission of an incident report under condition C7 or C8
- b) the submission of an audit report under condition C9
- c) the approval of any modification to the conditions of this consent, (unless the conditions require otherwise).

Where this review leads to revisions in this Strategy, then within six weeks of the review the revised document will be submitted to the Secretary for approval, unless otherwise agreed with the Secretary.

Operational activities will be subject to regular review to ensure conformance with commitment made in the Environmental Management Strategy (EMS) and subordinate plans and strategies.

14. References

AECOM (2016). *Ravensworth Mining Operations Plan for Ravensworth Ash Disposal Area (Rehabilitation Management Plan) (MOP)*. AGL Macquarie – ABN: 18167859494.

Aurecon (2015). *Ravensworth Void 5 Ash Emplacement Management Plan (AEMP)*. AGL Macquarie. Reference – 243776.

Department of Planning and Environment, 2016. Hunter Regional Plan (Hunter Regional Plan).

GHD (2022). *Ravensworth Ash Disposal Area Rehabilitation Management Plan*.

Jacobs, 2018. *Void 5 Water Loss Investigation - Seepage Investigation Report*.

Jacobs 2022a, *Ravensworth South Mine – Rehabilitation Amendment Modification Report*. AGL Macquarie Pty Limited. Reference - IS349200.

Jacobs 2020b, *Ravensworth South Mine – Rehabilitation Amendment Modification Report Response to Submissions Report*. AGL Macquarie Pty Limited. Reference – IA334000.

Kleinfelder, 2022 *Ravensworth South Mine -Biodiversity Development Assessment Report*.

Landcom, 2004. *Managing Urban Stormwater: Soils and construction - Volume 1, 4th edition*.

Macquarie Generation, 2012. *Ravensworth South - Final Void Rehabilitation Plan*.

Appendix A – Consultation correspondence

From: [Matthew Parkinson \(InTouch\)](#)
To: [Resources Regulator](#)
Subject: DA 86/51 - Mod 1 - Rehabilitation Strategy - Consultation
Attachments: [image001.png](#)
[image003.png](#)
[12615143_RPT-1_AGL_Rehabilitation_Strategy_Ravensworth_Sth_Mod_Draft.docx](#)

To Whom it May Concern,

The Department of Planning and Environment approved the modification to Development Approval 86/51 for the Ravensworth South Coal Mine on 19 April 2023.

Condition B22 of DA 86/51 requires the preparation of Rehabilitation Strategy in consultation with the Resources Regulator.

Please see attached the draft Rehabilitation Strategy prepared under condition B22 of DA 86/51 as modified.

Please provide any feedback on the attached Rehabilitation Strategy by Tuesday 10th October 2023. We are happy to have a meeting to run through the Rehabilitation Strategy if required.

If you have any questions, please do not hesitate to contact me.

Kind Regards,

Matthew Parkinson
Manager Environment and Approvals
Liddell Transition

m: 0407819236

e: matthew.parkinson@agl.com.au



From: [Matthew Parkinson \(InTouch\)](#)
To: council@singleton.nsw.gov.au
Subject: DA 86/51 - Mod 1 - Rehabilitation Strategy - Consultation
Attachments: [image001.png](#)
[image003.png](#)
[12615143_RPT-1_AGL_Rehabilitation_Strategy_Ravensworth_Sth_Mod_Draft.docx](#)

To Whom it May Concern,

The Department of Planning and Environment approved the modification to Development Approval 86/51 for the Ravensworth South Coal Mine on 19 April 2023.

Condition B22 of DA 86/51 requires the preparation of Rehabilitation Strategy in consultation with Singleton Council.

Please see attached the draft Rehabilitation Strategy prepared under condition B22 of DA 86/51 as modified.

Please provide any feedback on the attached Rehabilitation Strategy by Tuesday 10th October 2023. We are happy to have a meeting to run through the Rehabilitation Strategy if required.

If you have any questions, please do not hesitate to contact me.

Kind Regards,

Matthew Parkinson
Manager Environment and Approvals
Liddell Transition

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Appendix B – Stakeholder engagement plan

Stakeholder Engagement Plan (SEP)

Ravensworth South Coal Mine
Modification (DA 86/51 -
Mod1)

Table of Contents

1. Introduction	3
1.1. Project Overview	3
1.2. Project Scope	3
2. Stakeholders	4
2.1. Stakeholder Identification	4
3. Engagement	5
3.1. Previous Stakeholder Engagement	5
3.2. Ongoing Stakeholder Engagement	7
3.3. Community consultation	7
3.4. Ongoing Community Engagement Strategy	7

1. Introduction

1.1. Project Overview

AGLM owns and operates Ravensworth South Coal Mine (RSCM) in accordance with Development Approval (DA) 86/51. The approval covers the rehabilitation of final voids by filling with ash from the neighbouring power stations. Under current operations, AGLM fill Void 5 with ash from Bayswater Power Station (the Project). AGLM's application to modify DA 86/51 to enable changes to the operational management of Void 5 was approved by the Department of Planning and Environment (DPE) on 19 April 2023.

The Modification enables changes to a number of operational changes to:

- Reflect updated estimates of the amount of coal ash available for emplacement
- Reflect the hydrogeological conditions of Void 5
- Make the final landform free draining by provisioning for capping and rehabilitation
- Make provision for establishment of mine spoil borrow pits and stockpiling of surplus spoil from neighbouring mines for use in closure and rehabilitation.

The development, as modified, is substantially the same development as that originally approved under DA 86/51 as it involves the continued rehabilitation of the former RSCM Void 5.

1.2. Project Scope

This document is the Stakeholder Engagement Plan (SEP) for the Ravensworth South Coal Mine (RSCM) Void 5 project for AGLM (the Project). The SEP was developed to fulfil the RSCM Modification Consent Condition B22 (k) to "include a stakeholder engagement plan to guide rehabilitation and mine closure planning processes and outcomes".

The SEP is a "live" document that will be periodically reviewed and updated as required.

2. Stakeholders

2.1. Stakeholder Identification

Stakeholders are individuals or groups/organisations that may be directly or indirectly affected by or have an interest in the Project. A detailed list of Project stakeholders is provided in **Table 1**.

The stakeholder list will be amended if new stakeholders are identified.

Table 1 Key Project Stakeholders

Stakeholder Type	Stakeholder
Neighbouring Landholders	Glencore & subsidiary companies
	Ashton Coal Operations (ACO)
Local Government	Singleton Council (SC)
State Government Bodies	Resources Regulator
	Department of Planning and Environment (DPE)
	DPE Water
	Biodiversity and Conservation Division (BCD) (part of the DPE)
	Environmental Protection Authority (EPA)
	Dams Safety NSW
	Mining, Exploration and Geoscience (MEG)
	Subsidence Advisory NSW
	Resources Regulator
	Department of Planning and Environment (DPE)
	DPE Water

3. Engagement

3.1. Previous Stakeholder Engagement

AGLM has engaged with various stakeholders to introduce the Project, including neighbouring landholders (Glencore and ACO), local council (SC) and NSW government bodies (including Resources Regulator, DPE, BCD, BCD Water and EPA). Engagement activities that have been undertaken by AGLM are detailed in the Modification Report (Jacobs, 2022) and are shown in **Table 2**.

Table 2 Summary of consultation and engagement activities undertaken by AGLM

Stakeholder	Date	Comments	Action Plan
Resources Regulator	4 May 2022	Site visit held to run through the Proposed Modification at RSCM. Resources Regulator generally supportive. Resources Regulator questioned how Ashton Coal Operations (ACO) Proposed Modification to mine under Void 5 would impact AGL's operations.	AGL agreed to send a map to the Resources Regulator detailing the Proposed Modification. The plan was provided to the Resources Regulator on 10 May 2022.
DPE	22 June 2020	<p>A teleconference was held to discuss:</p> <ul style="list-style-type: none"> ▪ How the Proposed Modification would tie in with the separately proposed Bayswater Upgrade project; ▪ Capacity of the voids and relevant approvals to fill up the voids, including figures and maps; ▪ Ash production rate; and ▪ Where the ash would be transferred in the remaining life of Bayswater Power Station. <p>During the meeting DPE advised that:</p> <ul style="list-style-type: none"> ▪ AGLM are to work with SC to ensure consistent plans apply across the whole site; and ▪ Groundwater is a key item to be addressed and as such DPE - Water must be consulted with. 	A follow up meeting was held with DPE/EPA on the 11 January 2022. AGLM issued a scoping letter to DPE on the 31 March 2022 regarding the justification of the Proposed Modification and the next steps.
	19 April 2022	DPE responded to AGLM's correspondence regarding preparing the Proposed Modification.	N/A

Stakeholder	Date	Comments	Action Plan
Glencore & subsidiary companies	December 2020, January and February 2021 and February 2022	<p>Consultation included emails and teleconferences. Points of discussion included:</p> <ul style="list-style-type: none"> ▪ Access to AGLM and ROC land; ▪ EPL boundaries; ▪ ROC / AGLM infrastructure; ▪ Leases; and ▪ Void seepage/groundwater assessment. <p>Glencore shared data to support groundwater modelling and assessment.</p>	Ongoing discussions regarding AGLM and Glencore's Proposed Modifications to RUM.
SC	25 May 2021	Meeting with Mary-Anne Crawford & Ziggy Anderson to provide project briefing.	SC informed AGLM they will review when Modification Report is formally lodged.
BCS	3 March 2021	BCS were emailed regarding the BDAR requirements and assessment approach.	BCS confirmed that a full BDAR would be required to support the Proposed Modification
	28 April 2021	BCS were emailed required the requirements for Brush-tailed Phascogale assessments.	BCS responded and confirmed the assessment requirements.
EPA	11 January 2022	AGL met with the EPA to provide a briefing on the Proposed Modification and discuss a pollution reduction study relating to voids.	The EPA informed AGLM they will review when Modification Report is formally lodged.
DPE Water	20 January 2022	A letter was provided to DPE Water to provide a briefing on the Proposed Modification.	DPE Water informed AGLM they will review when Modification Report is formally lodged.
Ashton Coal Operations (ACO)	Ongoing	Consultation ongoing. Agreement between AGLM & ACO is currently under negotiation in relation to ACO's Proposed Modification and AGLM's Proposed Modification.	

3.2. Ongoing Stakeholder Engagement

As the Project progresses, detailed consultation will be undertaken with relevant stakeholders to inform the closure reporting and preparation process. This will be undertaken as required by regulators or when considered necessary by AGLM. Community consultation through the Community Dialogue Group (Section 3.3) and through the Community Complaints Framework will also guide engagement.

3.3. Community consultation

AGLM maintains a community reference group known as the AGL Macquarie Community Dialogue Group (CDG) which meets quarterly. Membership of this group includes representatives from the surrounding community interest groups, MSC, SC and Upper Hunter Shire Council, local business chambers and local Indigenous stakeholder groups.

3.4. Ongoing Community Engagement Strategy

AGLM's Community Engagement Strategy enables community members to submit feedback through multiple channels. AGLM also has a dedicated online forum, email address and a 24/7 contact number to ensure community members can provide feedback and raise any issues through a method that they are comfortable with.

AGLM has developed a Community Complaints Framework to ensure that feedback and complaints are managed in a uniform way. The most common feedback methods are outlined in **Table 3**.

Table 3 Feedback Methods

Feedback Method	
Online Community Engagement Forum	The AGL website includes an AGL Community Engagement Forum with specific groups for each of AGL's assets and current projects.
24-hour Enquiries and Complaints Hotline	An Enquiries and Complaints Hotline is available for all stakeholders to contact with questions and is available 24/7. 1800 039 600
Email	The AGL Community email address allows stakeholders to provide feedback or ask questions. AGLCommunity@agl.com.au

Document status

Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4	0	E Luscombe	S Murphy		M Kiejda		18/10/23

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