

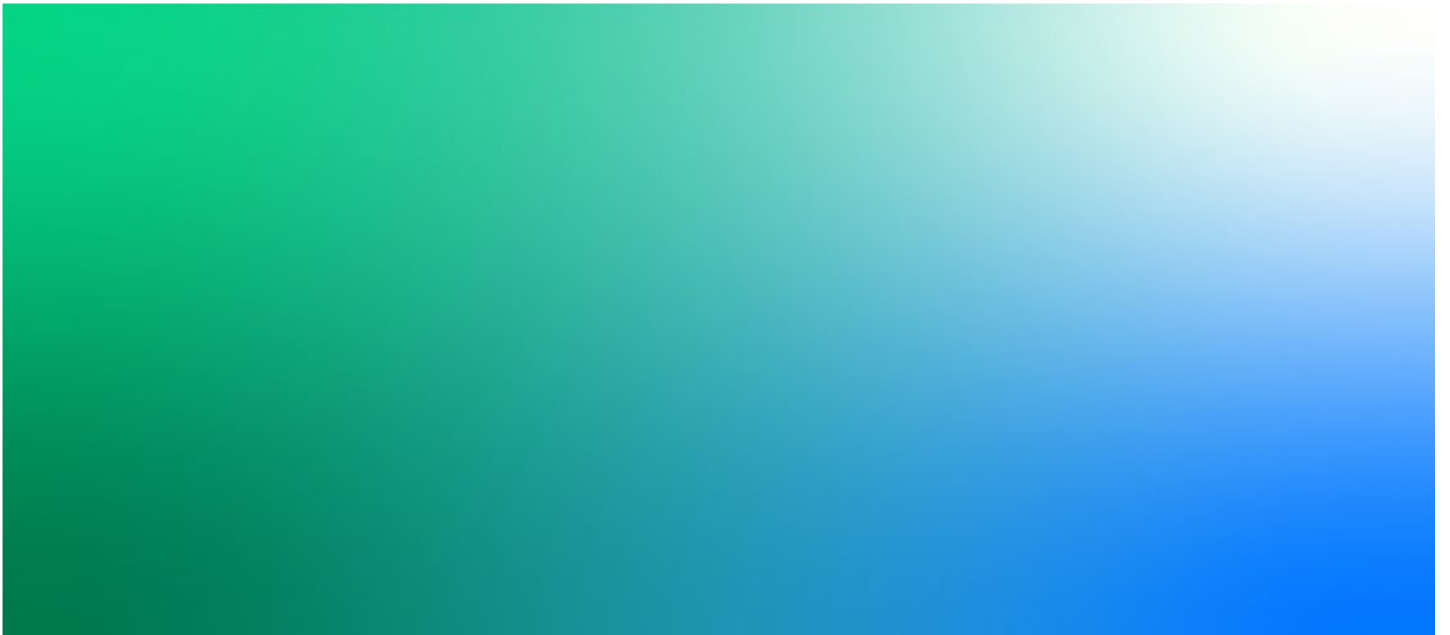


Bayswater Water and Other Associated Operational Works Project
Environmental Impact Statement Response to Submissions Report

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18 December 2020

AGL Macquarie Pty Ltd



Bayswater Water and Other Associated Operational Works Project

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Executive Summary

Background

AGL Macquarie (AGLM) as a subsidiary of AGL Energy Limited (AGL) owns and operates the Bayswater Power Station (Bayswater), located south-east of Muswellbrook in the Local Government Areas (LGA) of Muswellbrook and Singleton. AGLM are proposing to undertake a range of upgrades to Bayswater aimed at improving the environmental performance of ash, salt and water management infrastructure and associated rehabilitation outcomes referred to as the Bayswater Water and Other Associated Operational Works (WOAOW) Project (the Project).

Project Summary

The purpose of the Project is to improve the management of Bayswater's ancillary processes for handling process water and ash over the remaining operating life of Bayswater and to facilitate an improved rehabilitation outcome for the ash disposal area. This would involve:

- Optimising and improving ash management including expanding the Bayswater Ash Dam (BWAD) and recycling operations
- Creating a salt cake disposal landfill
- Improvements to water management around the Coal Handling Plant (CHP) area
- Creating clay borrow-pits to supply the materials for Project components and closure
- Routine clearing of vegetation, maintenance and management of specified ancillary water management infrastructure
- Voluntary surrender and consolidation into the development application of a range of existing development approvals.

Summary of submissions

The Environmental Impact Statement (EIS) for the Project went on public exhibition on 1 July 2020 and closed on 30 July 2020. The Department of Planning, Industry and Environment (DPIE) received a total of 39 submissions during the exhibition period. Of the 39 submissions, 17 were from government authorities, nine were from special interest groups and organisations, and 13 were from the general public.

16 submissions all from special interest groups and organisations or the general public were categorised as objections while 21 submissions made comment and two submissions were categorised as in support of the Project.

AGLM has reviewed and responded to all submissions received. Response to submissions generally takes the form of a direct response to agency, organisation and unique individual submissions with reference to more detailed responses on key recurring issues raised.

Outside of agency submissions, two main topics of concern account for almost all the organisation and public submissions. These were:

- Ash re-use including suitability and markets
- Water quality including requests for further details on hydrogeology, ash dam seepage and water quality impacts.

These concerns are regulated by the Environmental Protection Authority (EPA) under Environmental Protection Licence (EPL) 779 and AGLM are seeking to progress reasonable and feasible options to address identified environmental issues on the site in response to investigations and improvement projects under the EPL.

These topics are also the subject of the Public Works Enquiry into the *Costs for Remediation of Sites Containing Coal Ash Repositories* referenced in a number of organisation and public submissions. The Project in no way pre-empts or precludes implementing any outcomes from the enquiry ultimately adopted by government as enforced through applicable changes to Government regulations or the sites EPL.

Project clarifications in response to submissions

As identified in the EIS, Bayswater has operated for approximately 35 years under a range of approvals or existing use rights. AGL acquired Bayswater from the NSW Government in 2014 forming AGLM and has been managing the environmental performance of the ash management and process water system to comply with EPL 779 since this time.

The major processes of ash disposal, coal handling and salt management have resulted in the following existing situation:

- The BWAD was established without lining, has been receiving ash for 35 years and has a recognised and reported seepage issue
- The transfer of fly ash to fill coal mine voids to facilitate rehabilitation has been separately approved and the pipelines are identified as having a high risk of potential failure which could cause future spills
- The brine from the water treatment plants is currently concentrated and disposed of in an unlined basin that is almost at capacity and the only available alternate disposal mechanism being the Hunter River Salinity Trading Scheme (HRSTS). While a separate approval is in place to provide an alternative means of disposal by converting the waste salt into a cake this has a deferred commencement condition requiring the separate approval for the disposal method for salt cake
- The CHP water management system has generally discharged daily to Tinkers Creek.

The Project does not seek approval for the ongoing operation of Bayswater or the existing processes that have led to these existing conditions. The Project seeks approval for upgrades to infrastructure and processes as described in the EIS in line with the findings of pollution investigations and improvement programs to improve the environmental outcomes associated with these existing processes.

A range of alternative options have been raised in submissions, were previously considered and are discounted as follows:

- Lining new areas would not address existing seepage in any meaningful way so the focus on improved seepage collection is of greater benefit
- The cost of excavating and re-disposal to a fully lined replacement storage area would be prohibitive and result in a range of other environmental impacts that are not considered warranted by the existing impacts to the environment which would be improved by the Project
- Expansion of ash reuse is market driven and steps within AGLM control are proposed as part of the Project while actions outside AGLM control are not precluded
- A 'do-nothing' option would result in a worse case outcome for water quality and long-term outcomes for the site

Options that do not address the Project objective to facilitate improved environmental outcomes and ongoing operation of Bayswater (including early closure of Bayswater) were not considered as Bayswater operations have been endorsed as remaining critical to the stable operation of the National Energy Market (NEM) as it transitions to renewable generation coupled with storage.

Clarifications in response to submissions

Design details for the Project components are yet to be finalised. The Project assessed a reasonable worst-case assumption of impacts and only limited clarifications to the Project description are proposed specifically in relation to construction works required for the Ravensworth Ash Line only. These clarifications will allow

flexibility in the final design. The implications of the clarifications are limited to minor changes to biodiversity impacts.

Commitments have been added in response to submissions in relation to how the design would be completed to address the following issues:

- The salt cake landfill liner and leachate collection system would be designed, constructed and operated in accordance with applicable EPA solid waste landfill guidelines as agreed with the EPA as the applicable regulator
- The Seepage Collection System upgrades would be developed in consultation with the EPA and designed to maximise seepage collection and include lining where appropriate
- The design would include subsidence and seismic risk considerations
- Dam safety would be considered in accordance with the requirements of the *Dams Safety Act 2015* and in consultation with the applicable regulator.

Conclusions

Chapter 21 of the EIS provides an overall evaluation of the merits of the Project and concluded as follows:

This EIS provides a description of the Project, existing information on environmental context and potential for environmental impacts. This EIS has been prepared addressing the SEARs issued by the NSW DPIE on 30 November 2018 and addendum SEARs issued 20 April 2020 and focuses on key issues of biodiversity, heritage, water, traffic, noise and vibration, air and socio-economic impacts. Based on the findings of the EIS the Project is considered able to be approved by the consent authority. The overall Project benefits, including improved environmental outcomes for the ongoing operation of Bayswater, are considered to outweigh the environmental and limited social impacts.

This RtS report addresses the requirement to consider and respond to all submissions received. The RtS report also describes minor clarifications made to the Project description and provides additional information to address submissions. Updated management and monitoring measures are included to provide greater confidence that the Project detailed design for each component would consider applicable guidelines, meet performance outcomes assessed in the EIS and avoid, minimise and offset residual impacts to the extent reasonable and feasible. The revised management measures would be implemented to minimise potential negative impacts of the Project. Where supporting technical assessments have been updated post exhibition in response to consultation and recommendations these are also addressed and appended to this Report.

The outcome of the response to submissions process is that the overall Project benefits, including improved environmental outcomes for the ongoing operation of Bayswater, continue to be considered to outweigh the overall environmental and limited social impacts.

1. Introduction

1.1 Background

AGL Macquarie (AGLM) as a subsidiary of AGL Energy Limited (AGL) owns and operates the Bayswater Power Station (**Bayswater**), located south-east of Muswellbrook in the Local Government Areas (LGA) of Muswellbrook and Singleton. AGLM are proposing to undertake a range of upgrades to Bayswater aimed at improving the environmental performance of ash, salt and water management infrastructure and associated rehabilitation outcomes referred to as the Bayswater Water and Other Associated Operational Works (**WOAOW**) Project (**the Project**).

Bayswater was commissioned in 1985 to utility standards of the time. Bayswater has a current generation capacity of 2640 megawatts (**MW**) and approval for efficiency upgrades that would increase capacity to 2740 MW. The approval of the efficiency upgrade recognised the critical importance of the continued operation of Bayswater until 2035.

The Department of Planning, Industry and Environment (**DPIE**) received 39 submissions on the Project's Environmental Impact Statement (**EIS**), including 17 from government authorities, nine from special interest groups and organisations, and 13 from the general public. A register of submissions is provided in Appendix A and all submissions received by DPIE during the exhibition of the Project are available on DPIE's website at <https://www.planningportal.nsw.gov.au/major-projects/project/9791>. To progress the application, AGLM is now required to prepare and submit a report detailing responses to matters and recommendations raised in all submissions.

This Response to Submissions (**RtS**) report addresses the requirement to consider and respond to all submissions received. The RTS report also describes changes to the Project to address submissions and updated mitigation and management measures which would be implemented to minimise potential any perceived negative impacts relating to the Project. Where supporting technical assessments have been updated post exhibition in response to consultation and recommendations, these are also identified and attached.

1.2 Purpose of this report

The purpose of this report is to:

- Consider and respond to matters raised in the submissions received by DPIE
- Describe any changes to the Project, including a revised set of proposed mitigation measures.

1.3 Report structure

The structure of this report is as follows:

- Chapter 1 – introduction
- Chapter 2 – overview of the Project
- Chapter 3 – engagement during and after EIS exhibition
- Chapter 4 – summary of submissions on the EIS
- Chapter 5 – response to submissions on the EIS
- Chapter 6 – updated project description
- Chapter 7 – management and monitoring measures
- Chapter 8 – Conclusions and confirmation of Project merit

2. Overview of Project

2.1 Project summary

The purpose of the Project is to improve the management of Bayswater's ancillary processes for handling process water and ash over the remaining operating life of Bayswater and to facilitate an improved rehabilitation outcome for the ash disposal area. This would involve:

- Optimising and improving ash management including:
 - Expanding the existing ash disposal area to accommodate predicted ash generation
 - Upgrading ash dam seepage collection infrastructure to better capture and reuse more seepage from the Bayswater Ash Dam (**BWAD**) in accordance with the recommendations of the Water Management Investigation: Bayswater Ash Dam: Bayswater and Liddell PRP (AECOM, 2016) prepared in response to Pollution Reduction Program (**PRP**) 1 of environmental protection licence 779 (EPL 779) and accommodate the modelled dam wall seepage rates from the expanded disposal area
 - Replacing the original sections of the Ravensworth fly ash transfer pipeline which is at risk of ongoing failure as per an enforceable undertaking in accordance with the Protection of the Environment Operations Act 1997 (POEO Act) agreed with the Environmental Protection Authority (**EPA**)
 - Increasing the capacity of existing ash harvesting and recycling facilities so AGLM can appropriately respond to market needs without delays
- Creating a salt cake disposal landfill to fulfil a deferred commencement condition for the approved wastewater upgrade project that facilitates an alternative process for managing water impurities and reduces the reliance on the Hunter River Salinity Trading Scheme (**HRSTS**)
- Improvements to water management around the Coal Handling Plant (**CHP**) area in response to an environmental improvement program being undertaken under EPL 779 regulated by the EPA
- Creating borrow-pits to supply the materials for use in the ash dam expansion and salt cake landfill including their capping and closure.
- Routine clearing of vegetation along the alignments of the Lime Softening Plant (**LSP**) Sludge Line and High Pressure (**HP**) Pipeline for ongoing access for maintenance and management and repositioning of underground pipelines to above ground, replacement or upgrading of ageing pipelines
- Surrender and consolidation of seven existing approvals into the development application.

2.2 Project clarifications

2.2.1 Ongoing operations of Bayswater

Most submissions received focus on issues associated with the historic and ongoing operation of Bayswater as a coal fired power station and in particular issues associated with legacy and ongoing ash generation. As identified in the EIS, Bayswater has operated for approximately 35 years under a range of approvals or existing use rights. AGL acquired Bayswater from the NSW Government in 2014 forming AGLM who have been responsible for the environmental performance of the site from that time. Since 2014, AGLM has been managing the environmental performance of the ash management and process water system to comply with EPL 779. This has included reporting and responding to any incidents in consultation with the EPA, undertaking pollution studies and reduction programs as well as entering into enforceable undertakings to improve overall environmental performance.

The major processes of ash disposal, coal handling and salt management have been operating over the life of Bayswater and have resulted in the following existing situation:

- The BWAD was established without lining, which has been receiving ash for 35 years alongside a recognised and reported seepage issue

- The transfer of fly ash to fill coal mine voids to facilitate rehabilitation has been separately approved and the pipelines are identified as having a high risk of potential failure which could cause future spills
- The brine from the water treatment plants is currently concentrated and disposed of in an unlined basin that is almost at capacity and the only available alternate disposal mechanism being the HRSTS. This involves releasing water with elevated salinity via Lake Liddell in times of high flows into the Hunter River. A separate approval is in place to provide an alternative means of disposal by converting the waste salt into a cake, however this has a deferred commencement condition requiring the separate approval for the disposal method for salt cake
- The Coal Handling Plant (CHP) water management system has generally discharged daily to Tinkers Creek.

The Project does not seek approval for the ongoing operation of Bayswater or these existing processes. The Project seeks approval for upgrades to infrastructure and processes as described in the EIS in line with the findings of pollution investigations and improvement programs to improve the environmental outcomes associated with these existing processes.

At the time of drafting the EIS, the BWAD was projected to reach capacity within two years, or approximately by the middle of 2022. Updated projections have brought this forward to February 2022, four months ahead of the projection provided in the EIS, with the BWAD filling faster than expected. This is the result of more fly ash being transferred to the BWAD in lieu of AGLM's Ravensworth Ash Disposal Facility to reduce the load on the Ravensworth fly ash transfer pipelines until they are replaced. It is noted that there is considerable lead time from when the Project is currently expected to be approved, to when the first stage of BWAD Augmentation would be completed to achieve additional capacity to store ash. The BWAD is projected to reach capacity ahead of the first stage of BWAD augmentation completion based on the current expected approval time. To that end, AGLM has commenced investigating interim options for ash management to ensure the ongoing operation of Bayswater is not impacted.

Additionally, AGLM has committed to replacing the Ravensworth Ash Line in a timely manner to reduce the risk of ongoing failure. Timely replacement of the Ravensworth Ash Line and associated performance improvement measures also has the added benefit of reducing the amount of fly ash deposited into the BWAD, aiding in managing the capacity constraints.

2.2.2 Consideration of alternatives

A range of alternative options were considered in the EIS. Options that do not address the Project objective to facilitate improved environmental outcomes and ongoing operation of Bayswater (including early closure of Bayswater) were not considered as Bayswater operations have been endorsed as remaining critical to the stable operation of the National Energy Market (NEM) as it transitions to a new energy future. As described in the EIS, AGL has an announced plan for retiring Bayswater in 2035 while delivering on obligations to the community and customers.

Alternatives in relation to ash disposal including lining new emplacement areas or excavating and disposing to a purpose built, lined facility are not considered reasonable or feasible. Lining new areas would not address existing seepage in any meaningful way so the focus on improved seepage collection is of greater benefit. The costs associated with excavation and re-locating ash to a new fully lined facility would be prohibitive and do not consider a range of other environmental impacts borne that are not considered warranted by either the existing impacts to the environment, which would be marginally reduced under the Project scenario through improved seepage management and facilitating material supply for capping and closure.

A 'do-nothing' option would result in a worse case outcome for water quality and long term outcomes for the site on the following basis when compared to the Project:

- Existing processes with their existing level of risk and impact would continue unmitigated
- Capping material for closure would need to be sourced off-site with increased traffic impacts
- AGLM would be unable to comply with enforceable undertakings and EPL 799 requirements under the POEO Act.

2.2.3 Upgrade project

The Project has been referred to as an upgrade because the outcome of the Project is focussed on gaining approval under the *Environmental Planning and Assessment Act 1979 (EP&A Act)* and *Environmental Protection and Biodiversity Act 1999 (EPBC Act)* for the works necessary to address existing environmental performance issues. The expansion of the BWAD also represents an upgrade as, along with the seepage management improvements, it facilitates the storage of ash predicted to be generated over the remaining life of Bayswater with a marginally reduced water quality impact.

2.2.4 Public Works Enquiry into the Costs for Remediation of Sites Containing Coal Ash Repositories

It is not AGLM's intention to respond in this document to all matters of ash management, the subject of the Public Works Enquiry into the *Costs for Remediation of Sites Containing Coal Ash Repositories* referenced in many organisation and public submissions. Bayswater is regulated by the EPA under EPL 779 and AGLM are seeking to progress reasonable and feasible options to address identified environmental issues on the site in response to investigations and improvement projects under the EPL. The Project in no way pre-empts or precludes implementing any outcomes from the enquiry ultimately adopted by government as enforced through applicable changes to Government regulations or the sites EPL.

2.3 Project benefits

While the Project does not address all issues associated with the ongoing operation of Bayswater, it is a necessary investment in environmental improvements. The Project represents a private investment to improve the environmental and rehabilitation outcomes of Bayswater that would maximise the long-term social and economic benefits, while minimising long-term negative impacts on communities and the environment. The Project would improve environmental performance and rehabilitation outcomes for the continued operation of Bayswater and would result in positive social impacts including the flow-on effects of additional workers in the area during construction and operation accessing goods and services in the region. Further, the Project would facilitate the capping and rehabilitation of the ash dam leading to improved air quality outcomes post the retirement of Bayswater. More broadly, the Project facilitates the ongoing operation of Bayswater which has previously been identified as critical to energy security within the NEM through the provision of reliable, dispatchable electricity and supporting a planned transition to new energy future.

2.4 Clarifications to Project description

The Project assessed a reasonable worst-case assumption of impacts and only limited clarifications to the Project description are proposed specifically in relation to construction works required for the Ravensworth Ash Line only. These clarifications will allow flexibility in the final design. Clarifications are as follows:

- Amendment to the project footprint within the assessment area to reduce biodiversity and cultural heritage impacts as much as reasonably practical and to utilise previously disturbed areas and areas of non-native vegetation for the project footprint
- More than one pipeline may be an option for final design noting that the existing Ravensworth pipeline consists of two adjacent pipelines and the new wording is added for completeness
- The New England Highway crossing may be above ground or underground but pass under the New England Highway under existing bridge structures as per the existing Ravensworth pipeline
- Crib facilities and laydown areas may be provided as required with location limited to previously disturbed areas, non-native vegetation areas and outside areas of identified archaeological sensitivity, these will be positioned within the Project footprint along the ash line and likely to shift as construction progresses
- Temporary internal access to construct the pipelines as required via existing internal access tracks or new access tracks within the Project footprint
- Pipelines would be attached to steel work or existing structures in some places

- provision included for:
 - Concrete works and earthworks along the length of the pipelines limited to the in-situ construction of footings and ancillary infrastructure
 - Infrastructure for maintenance of the pipelines
 - Maintenance and/or upgrade of inspection tracks as required
 - Drainage works within the Project footprint of the pipelines as required
 - Earthworks associated with installation of the support structures within the Project footprint.

Corrections were also made to names of roads used for access purposes.

Design details for the Project components are yet to be finalised. Commitments have been added in response to submissions in relation to how the design would be completed to address the following issues:

- The salt cake landfill liner and leachate collection system would be designed, constructed and operated in accordance with applicable EPA solid waste landfill guidelines as agreed with the EPA as the applicable regulator
- The Seepage Collection System upgrades would be developed in consultation with the EPA and designed to maximise seepage collection and include lining where appropriate
- The design would include subsidence and seismic risk considerations
- Dam safety would be considered in accordance with the requirements of the *Dams Safety Act 2015* and in consultation with the applicable regulator.

2.5 Implications of design clarifications

As described in the EIS, the assessment of the Project within the EIS was based on consideration of reasonable worst case environmental impacts to allow flexibility in design and construction methodology. Ongoing design of Project components would adopt the performance outcomes for the Project as identified in the EIS. The implications of the above clarifications in response to submissions is identified and addressed as follows:

Water: The minor changes to the Project description do not alter the predicted surface water, groundwater or flooding implications for the Project. Further description of the hydrogeology and existing surface water and groundwater quality based on detailed review of available water quality investigations undertaken to date is presented in Appendix B in response to recommendations raised by the EPA, Councils, organisation and public submissions. While not resolving all current ash dam seepage issues, the Project remains an improvement in comparison to a 'do-nothing' scenario and water quality is expected to remain suitable based on the absence of water users or sensitive environments within the zone of influence of seepage.

Land: The minor changes to the Ravensworth Ash Line do not alter land impacts or increase potential for land use conflicts. As concluded in the EIS, the chemical concentrations identified in soil and groundwater within the study area are unlikely to represent a significant risk to human health and/or the environment given appropriate management and the continued use of the site as a power station. Based on the results of the assessment and conceptual site model presented within the Land Contamination Constraints Assessment, the potential contamination risk associated with the study areas are considered, overall, to be low and acceptable. As no change of use to a more sensitive land use is currently proposed, remediation is not required or included as part of the Project.

Transport: No additional traffic or traffic impacts would result from the minor design changes. The Bayswater site access currently operates at excellent levels of service with abundant spare capacity. The cumulative impact of the Project and nearby developments would increase delays slightly within the interchange but would not significantly impact its operation. Ravensworth Ash Line crossings of New England Highway are agreed with Transport for NSW under a deed that is in the process of being updated to accommodate the Project.

Noise: No changes to predicted noise emissions would result from the minor design changes. Noise from construction activities would not result in off-site impacts at surrounding residential receivers. Levels are also predicted to remain below the Interim Construction Noise Guideline Noise Management Levels at the nearest industrial receivers.

Biodiversity: Minor changes to the disturbance footprint remain within the assessed area of the Biodiversity Development Assessment Report (**BDAR**) (Refer to Figures 2.1 to 2.6). Additional targeted species survey for Pine Donkey Orchid (*Diuris tricolor*) and Leek Orchid (*Prasophyllum petilum*) have been completed in optimal survey conditions and found to be absent from the disturbance footprint and retirement of credits for these species is therefore no longer required. The BDAR has been updated to reflect the minor amendments to the development footprint along the proposed Ravensworth Ash Line and to address comments raised by the Biodiversity Conservation Division (**BCD**) and Councils which is included in Appendix C.

No Serious and Irreversible Impacts were identified within the Development Site and residual impacts of the Project which require offsetting have been re-calculated as follows:

- Impacts on 200.64 hectares (**ha**) of Plant Community Type (**PCT**) 1691, generating a credit obligation of 3780 ecosystem credits (reduced from 206.82 ha and 3,904 credits)
- Impacts on 61.66 ha of PCT 1692, generating a credit obligation of 1275 ecosystem credits (increase from 61.64 ha and 1,275 credits)
- Impacts on 2.41 ha of PCT 1731, generating a credit obligation of 30 ecosystem credits (increased from 2.40 ha)
- Impacts on Paddock Trees associated with PCT 1691 requires a total of 31 ecosystem credits (no change)
- Impacts on 55.08 ha of Squirrel Glider habitat, generating a credit obligation of 1346 species credits (reduced from 59.05 ha and 1,433 credits)
- Impacts on 8.11 ha of Southern Myotis habitat, generating a credit obligation of 233 species credits (no change)
- Impacts on 116.74 ha of Striped Legless Lizard habitat, generating a credit obligation of 2,102 species credits (reduced from 120.68 ha and 2169 credits).

The retirement of biodiversity credits would occur in a staged manner as clearing for each portion of the Project is not expected to occur immediately. A clearing staging plan has been provided in the updated BDAR which sets out the biodiversity credit obligation for each stage of clearing.

Waste: The minor changes to the Project description do not alter anticipated waste generation or approach to management. Additional information on ash recycling to address issues raised in submissions is provided in Section 5.4. While AGLM are seeking to maximise ash recycling, and are motivated to do so to avoid ash dam augmentation costs, the 1 million tonne (**t**) maximum recycling and 600,000 t average volumes stated in the EIS remain aspirational and subject to market demand. AGLM are committed to doing what is within their control and area of expertise to respond to market demand including demonstrating ash characteristics can comply with applicable resource recovery order and exemptions, and establishing approvals and infrastructure necessary to lawfully deliver ash products to the market.

Aboriginal heritage: The minor clarifications to Ravensworth Ash Line description remain within the area surveyed. The additional proposed infrastructure and construction facilities would avoid additional disturbance to Aboriginal heritage values (Refer to Figures 2.1 to 2.6). The proposed test excavation program has been completed. An updated Aboriginal Cultural Heritage Assessment Report (**ACHAR**) has been reviewed by the Registered Aboriginal Parties (**RAPs**) and the ACHAR has now been finalised (Appendix C). Mitigation measures agreed with the RAPs based on the outcomes of test excavations, have replaced those previously proposed in the EIS (Refer to Section 7).

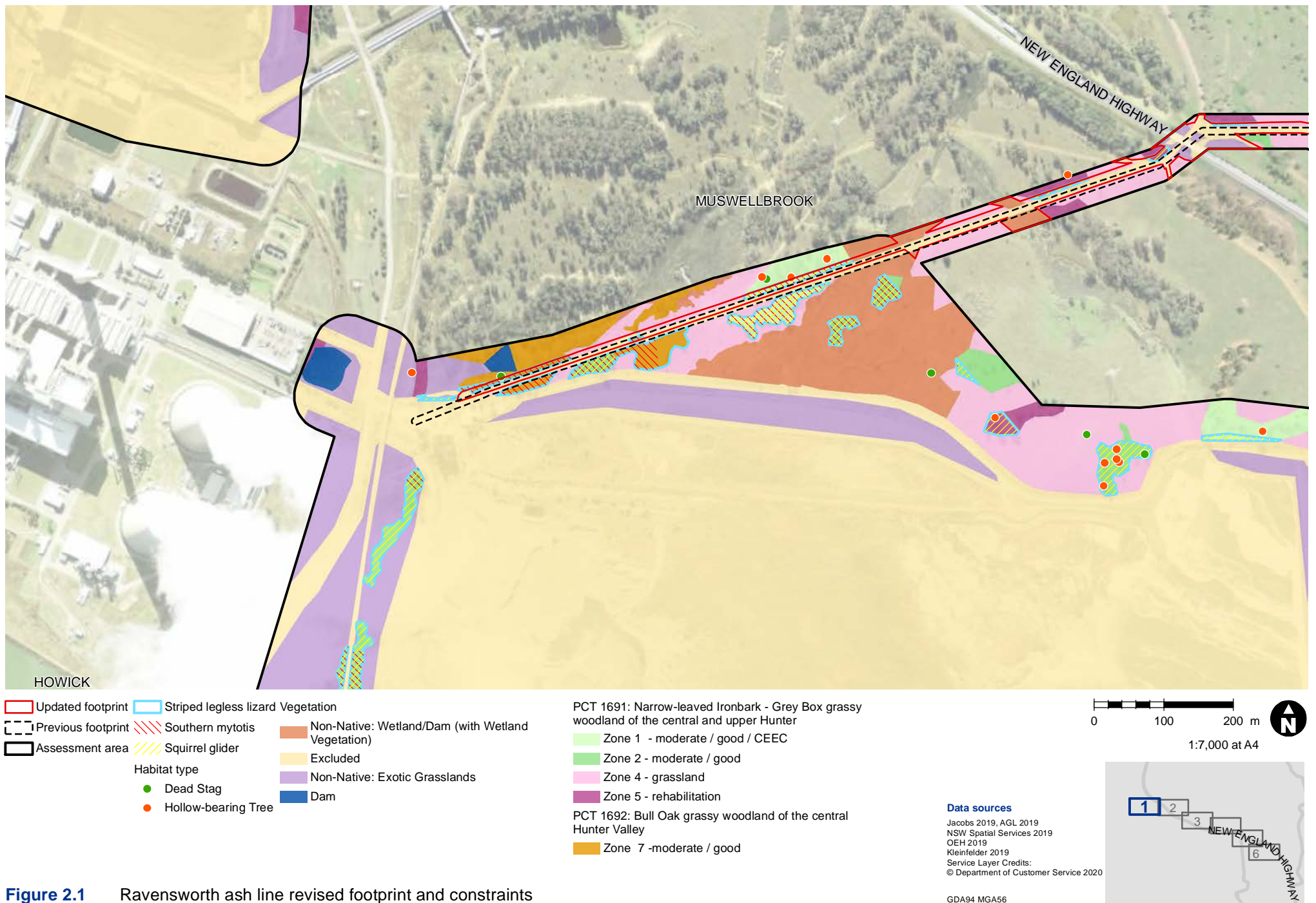


Figure 2.1 Ravensworth ash line revised footprint and constraints

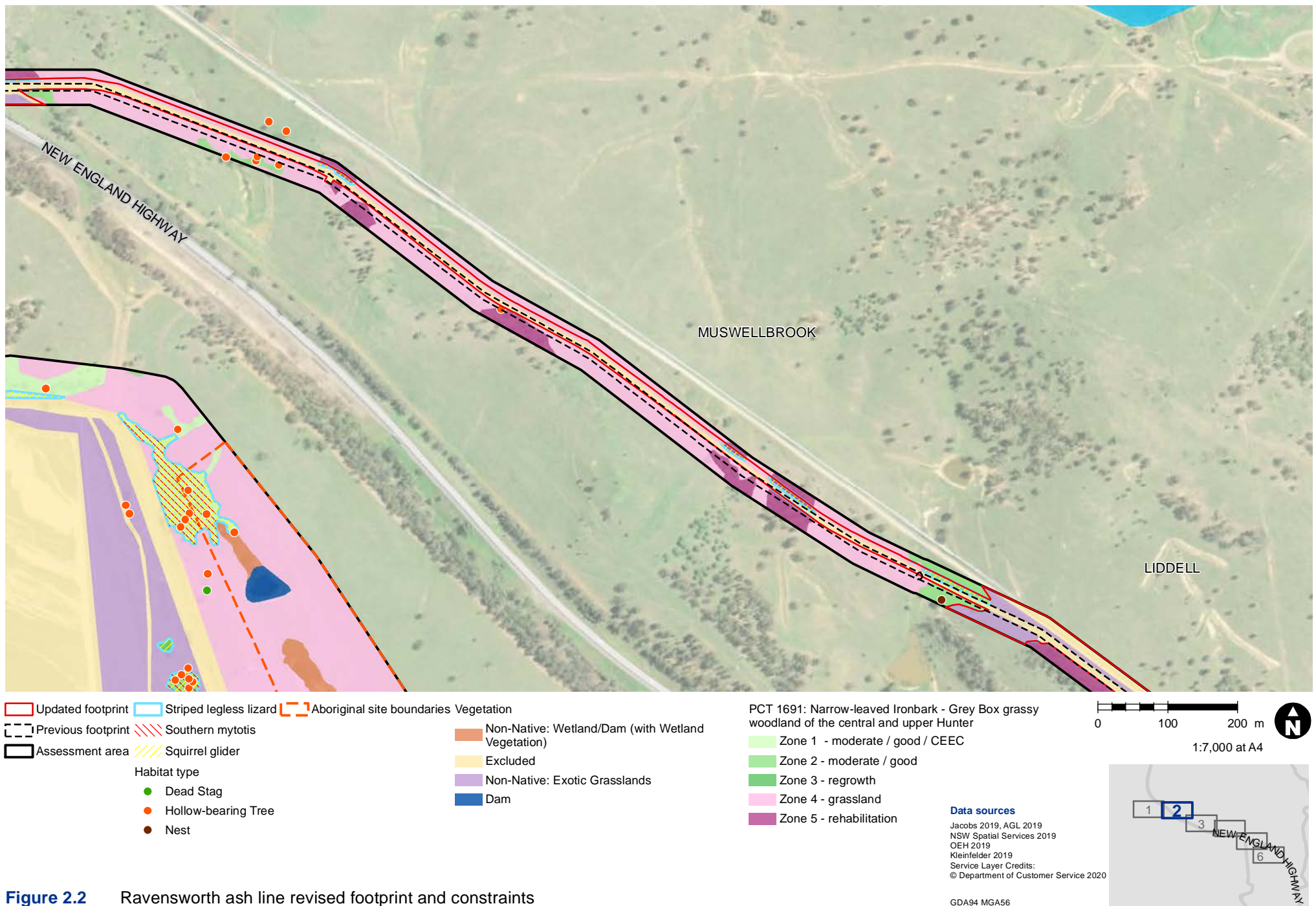
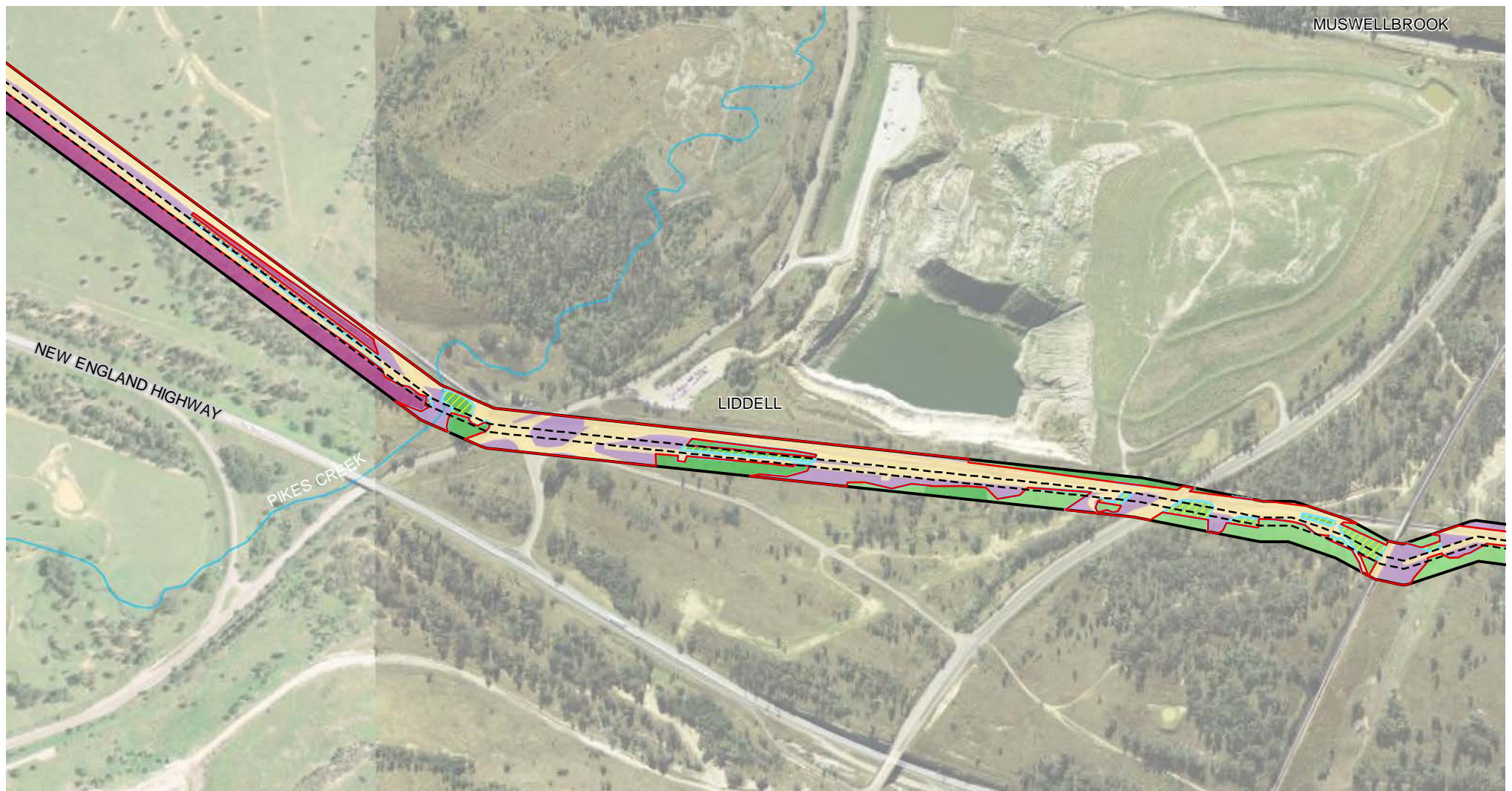
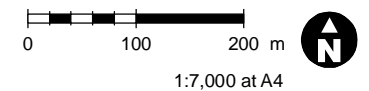


Figure 2.2 Ravensworth ash line revised footprint and constraints



- | | | |
|---|---------------------------------------|---|
| [Red outline] Updated footprint | [Blue outline] Striped legless lizard | [Green outline] Vegetation |
| [Dashed black outline] Previous footprint | [Red diagonal lines] Southern myotis | [Yellow fill] Excluded |
| [Thick black outline] Assessment area | [Blue diagonal lines] Squirrel glider | [Purple fill] Non-Native: Exotic Grasslands |
| PCT 1691: Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter | | |
| [Light green fill] Zone 2 - moderate / good | | |
| [Dark green fill] Zone 3 - regrowth | | |
| [Purple fill] Zone 5 - rehabilitation | | |



Data sources

Jacobs 2019, AGL 2019
 NSW Spatial Services 2019
 OEH 2019
 Kleinfelder 2019
 Service Layer Credits:
 © Department of Customer Service 2020

GDA94 MGA56

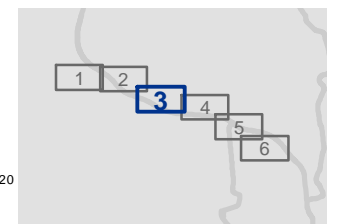
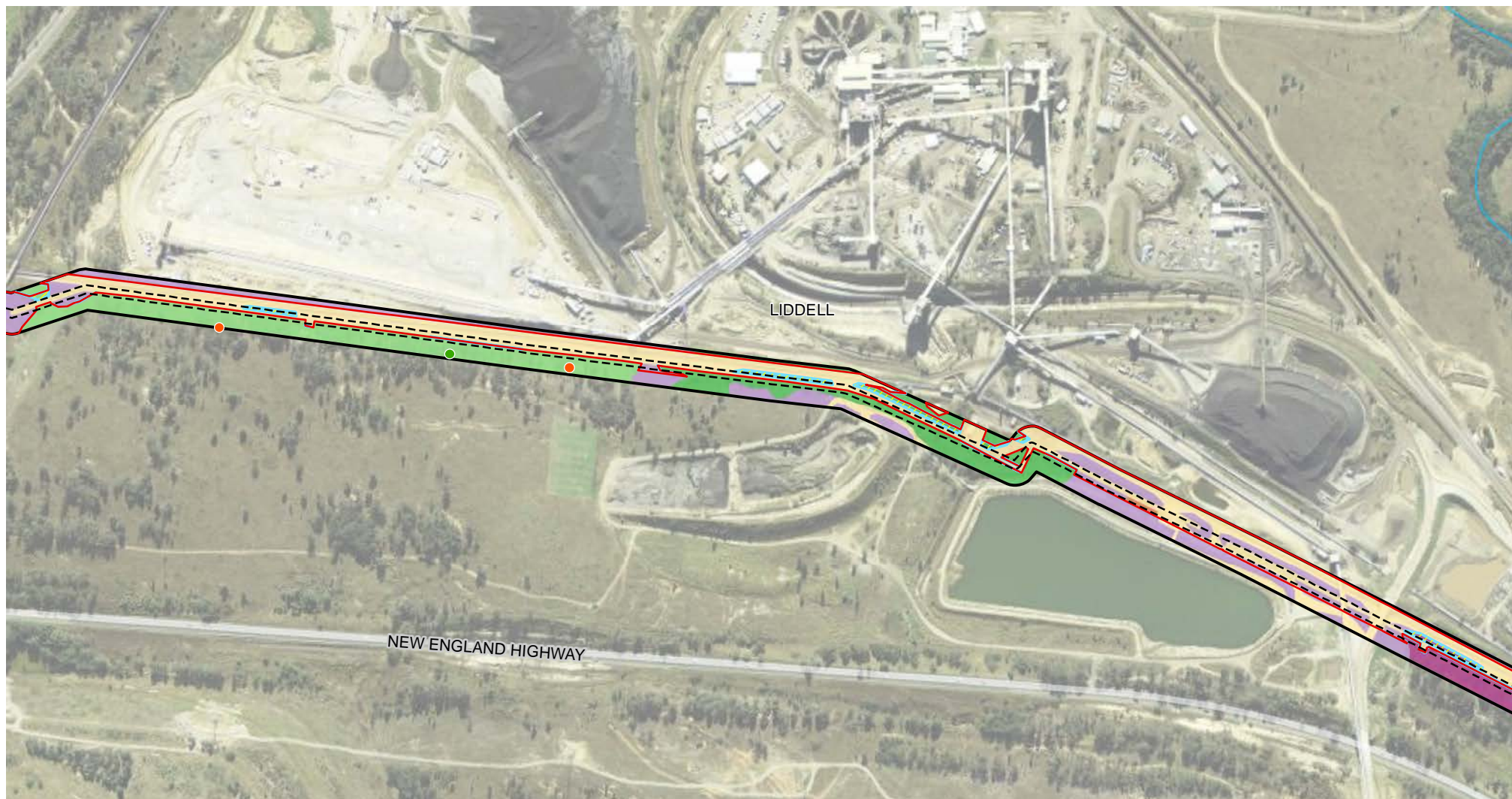


Figure 2.3 Ravensworth ash line revised footprint and constraints



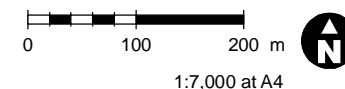
- | | | |
|---|---|---|
| Updated footprint | Striped legless lizard | Vegetation |
| Previous footprint | Squirrel glider | Non-Native: Wetland/Dam (with Wetland Vegetation) |
| Assessment area | Dead Stag | Excluded |
| Habitat type | Hollow-bearing Tree | Non-Native: Exotic Grasslands |
| Nest | | |

PCT 1691: Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter

 Zone 2 - moderate / good

 Zone 3 - regrowth

 Zone 5 - rehabilitation



Data sources

Jacobs 2019, AGL 2019
 NSW Spatial Services 2019
 OEH 2019
 Kleinfelder 2019
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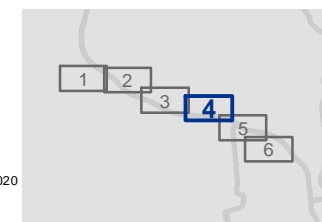
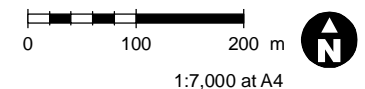
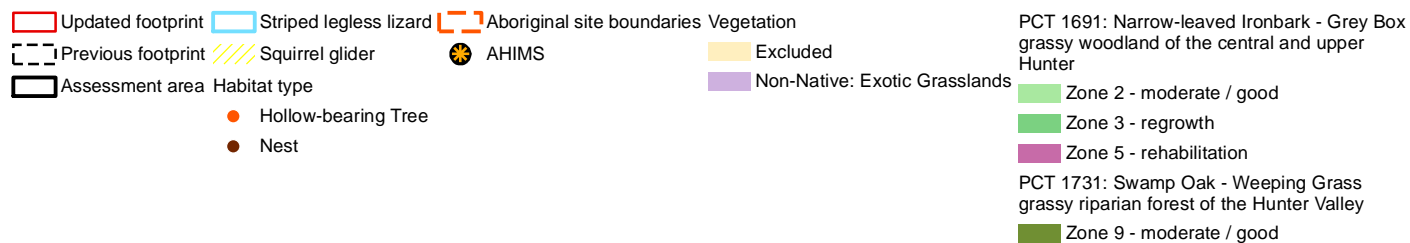
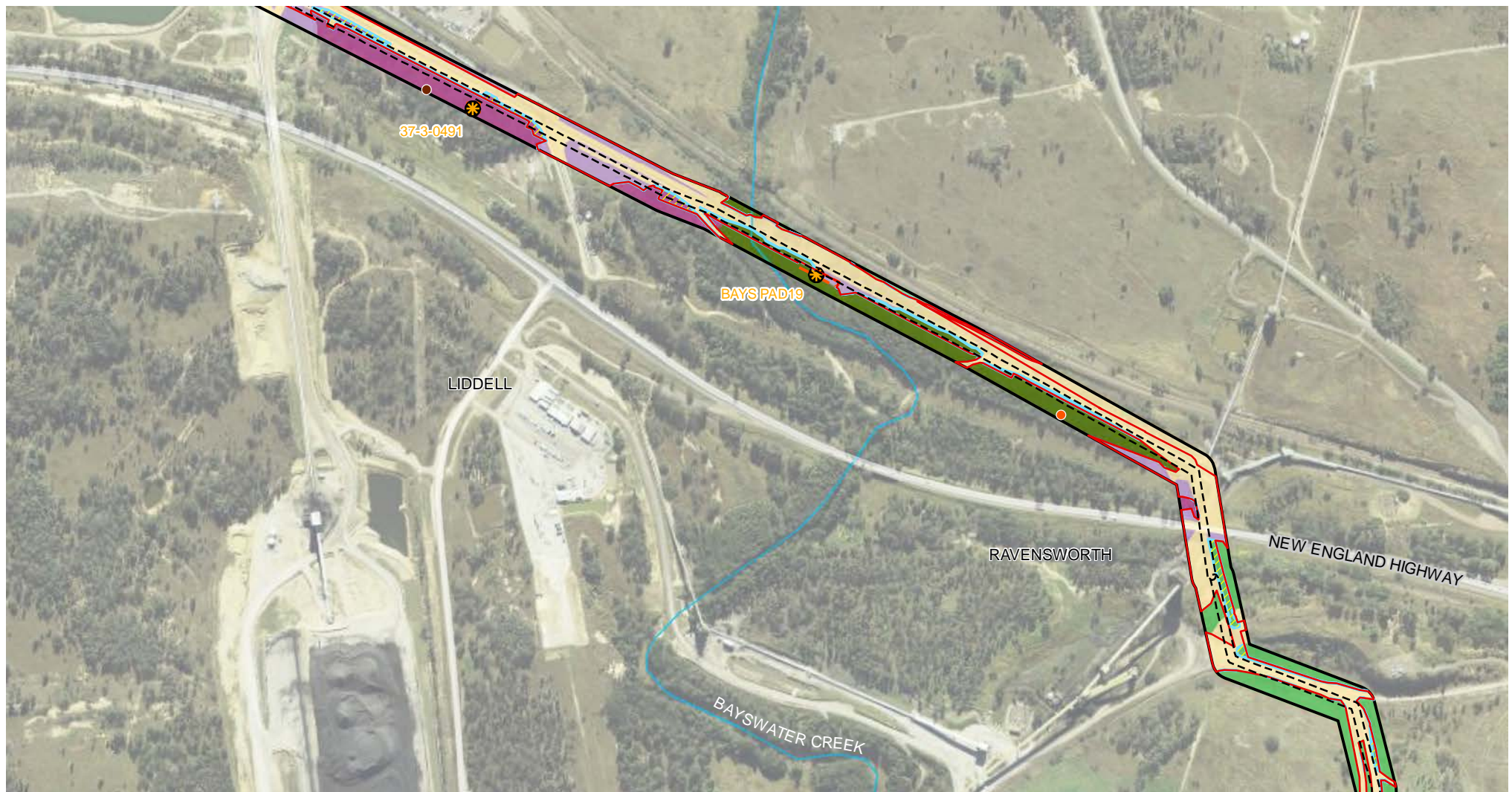


Figure 2.4 Ravensworth ash line revised footprint and constraints



Data sources

Jacobs 2019, AGL 2019
 NSW Spatial Services 2019
 OEH 2019
 Kleinfelder 2019
 Service Layer Credits:
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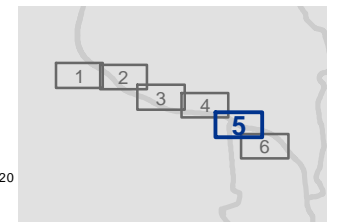
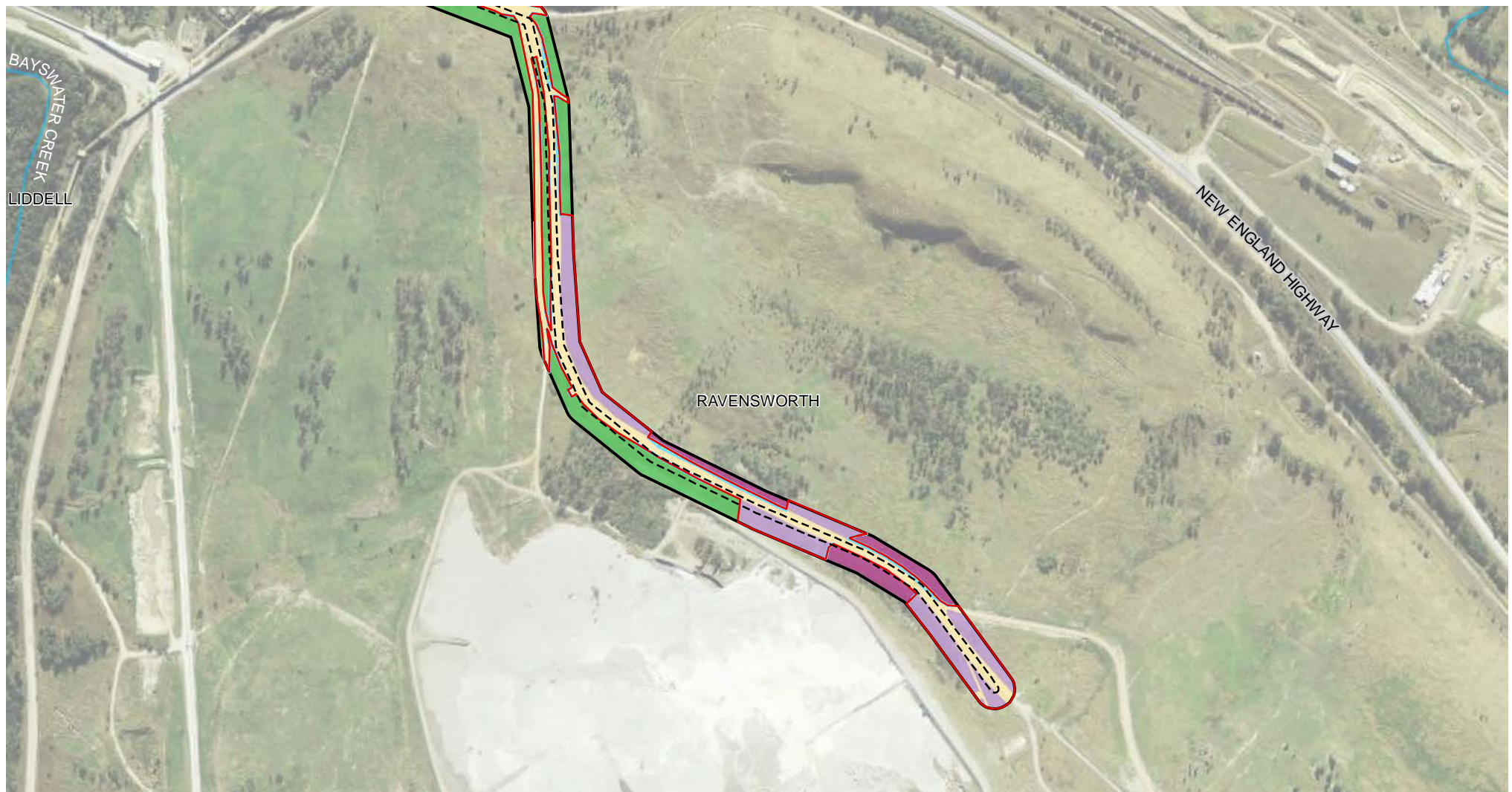
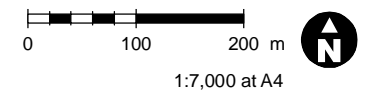


Figure 2.5 Ravensworth ash line revised footprint and constraints



- | | | | |
|---|---|---|--|
| Updated footprint | Striped legless lizard | Vegetation | PCT 1691: Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter |
| Previous footprint | Squirrel glider | Excluded | Zone 3 - regrowth |
| Assessment area | | Non-Native: Exotic Grasslands | Zone 5 - rehabilitation |



Data sources

Jacobs 2019, AGL 2019
 NSW Spatial Services 2019
 OEH 2019
 Kleinfelder 2019
 Service Layer Credits:
 © Department of Customer Service 2020

GDA94 MGA56

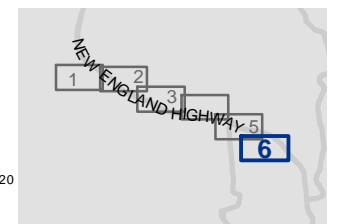


Figure 2.6 Ravensworth ash line revised footprint and constraints

Non-Aboriginal heritage: The minor design changes do not introduce an increased risk to non-Aboriginal heritage items on the site and the commitments made in the EIS are retained. There are no significant non-Aboriginal heritage constraints associated with the Project.

Visual amenity: No changes to predicted visual impacts would result from the minor design clarifications. The Project would result in very minor loss or alteration to key elements/features of the remnant agricultural landscape and the changes would be characteristic with the environs of the power stations and mining operations. It is unlikely that the changes would be remarkable within the context of Bayswater and the magnitude of change is therefore negligible. In the absence of any sensitive visual receptor within the Zone of visual impact, overall visual impacts associated with the Project would be minimal.

Air: No changes to the predicted air quality impacts would result from the minor design clarifications. EPA impact assessment criteria for Total Suspended Particles and PM2.5 would be met at surrounding sensitive receivers, with no additional exceedances of 24-hour averaged PM10 predicted. Negligible (less than 1 percent) (%) contributions of annually averaged PM10 and deposited dust were predicted. The results indicate that the Project would not result in unacceptable changes in local air quality.

Hazards: No changes to the predicted hazards would result from the minor design clarification. Commitments have been added that design would consider subsidence and seismic risks. The detailed design of the BWAD would incorporate assessment of the societal risk and individual risk and consequence category and be provided to Dam Safety as per the requirements of the *Dams Safety Act 2015* and associated guidelines and methodologies.

Socio-economic assessment: The design refinements do not affect the likely socio-economic impacts of the Project.

3. Engagement during and after EIS exhibition

3.1 Consultation prior to exhibition

Consultation undertaken during the early Project planning phases, Project Scoping Report and EIS preparation are summarised in Chapter 5 of the EIS.

3.2 Consultation during EIS exhibition

The EIS for the Project went on public exhibition on 1 July 2020 and closed on 30 July 2020. Copies of the EIS were available at the following locations during the exhibition period:

- The EIS is available online through the DPIE Major Projects website at <https://www.planningportal.nsw.gov.au/major-projects/project/9791>
- Muswellbrook Shire Council Administration Office
- Singleton Council Administration Office.

An electronic copy of the EIS and supporting documents was also provided directly to the Nature Conservation Council before the exhibition date.

Newspaper advertisements were run on 1 July 2020 in the Sydney Morning Herald, Daily Telegraph, The Australian and Singleton Argus newspapers informing the public of the commencement of exhibition and inviting submissions via DPIE website:

It is understood DPIE contacted adjoining residents and public authorities directly to notify of the EIS submission and exhibition period.

3.3 Consultation post EIS exhibition

AGLM has continued consultation with the following agencies in response to their detailed submissions. The purpose of ongoing consultation was to clarify submission details and understand expectations regarding a response:

- EPA – AGLM held a meeting with EPA representatives on the 13 October 2020. EPA comments surrounding hydrogeology, the Ravensworth ash line, the salt cake landfill and surface water were the main focal points. At this meeting it was agreed that the response would revolve around the preparation of a document that summarised all relevant water quality investigations to date and more clearly articulates and justifies why the Project would represent an improvement. The outcomes of the meeting have shaped the detailed responses provided in Section 5.1.7 with the water quality investigations summary report attached in Appendix B.
- BCD – AGLM's biodiversity expert prepared a tabular response to BCD comments outlining how the BDAR had been updated since exhibition and to address outcomes of further survey effort. BCD has responded to the general effect that the updates should address their concerns. A detailed response to BCD submission is provided in Section 5.1.11.
- Muswellbrook Shire Council (MSC) – AGLM met with MSC representatives to discuss their detailed submission on 22 October 2020. The outcomes of this meeting have informed the detailed response provided in Section 5.1.12.
- Singleton Council – AGLM met with Singleton Council representatives to discuss their detailed submission on 30 November 2020. The outcomes of this meeting have informed the detailed response provided in Section 5.1.14.
- Transport for NSW (TfNSW) – AGLM have been liaising regularly with TfNSW regarding the update to the existing Deed of Agreement that covers AGLM assets on TfNSW land, to reflect the changes proposed in this application.

4. Summary of submissions on the EIS

4.1 Summary of submissions

DPIE received a total of 39 submissions during the exhibition period. Of the 39 submissions, 17 were from government authorities, nine were from special interest groups and organisations, and 13 were from the general public. The submissions were categorised by DPIE as supporting, commenting or objecting to the Project, as shown in Table 4-1.

Table 4-1 Summary of submissions received

Position	Number of submissions from government authorities	Number of submissions from special interest groups/organisations	Number of submissions from community members	Total
Support	0	2	0	2
Comment	17	1	3	21
Object	0	6	10	16
Total	17	9	13	39

DPIE assigned each submission with a unique submitter identification number (**Submitter ID**). A submissions register is provided in Appendix A. Copies of the full submissions can be viewed and downloaded from the NSW Major Projects website. Submissions were received from the following agencies and organisations:

- Fisheries NSW
- Heritage Council of NSW
- Subsidence Advisory NSW
- Crown Lands
- WaterNSW
- Dams Safety
- EPA
- Department of Primary Industries - Agriculture
- Division of Resources and Geoscience
- Transport for NSW (**TfNSW**) (Two identical submission documented under Department of Transport and Roads and Maritime Services Division)
- BCD
- MSC
- Department of Planning, Industry and Environment - Water Group
- Singleton Council
- Heritage NSW – Aboriginal Cultural Heritage
- NSW Rural Fire Service

- TransGrid
- The Wilco Group
- Vecor Australia Pty Ltd
- Environmental Justice Australia
- Hunter Community Environment Centre
- Correct Planning and Consultation for Mayfield Group
- Hunter Environment Lobby Inc.
- Nature Conservation Council of NSW
- Coal-ash Community Alliance Inc.

4.2 Summary of Issues

Issues raised have been grouped into the following themes:

- Level of design detail and project description (responded to in Section 2.2)
- Issues within the regulatory jurisdiction or interest of agencies (responded to in Section 5.1)
- Organisation submissions (responded to in Section 5.2)
- Public submissions (responded to in Section 5.3) and grouped where similar in content
- Ash re-use including suitability and markets (responded to in Section 5.4)
- Water quality including requests for further details on hydrogeology, ash dam seepage and water quality impacts (responded to in Section 5.5 and Appendix B).

Chapter 5 provides AGLM's response to submissions and generally takes the form of a direct response to agency, organisation and unique individual submissions with reference to more detailed responses on key recurring issues raised.

5. Response to submissions on the EIS

5.1 Agency submissions and response

5.1.1 Fisheries NSW

Fisheries NSW raised no issues with the proposal. Fisheries NSW confirmed that documents provided had been reviewed and there are no works in proposed waterways, considered Key Fish Habitat and that there are no significant changes affecting receiving waters.

5.1.2 Heritage Council of NSW

Heritage Council of NSW stated that the subject site is not listed on the State Heritage Register (SHR), nor is it in the immediate vicinity of any SHR items. Heritage Council of NSW further note that the site does not contain any known historical archaeological deposits and that no further heritage comments are required.

5.1.3 Subsidence Advisory NSW

Subsidence Advisory NSW raised the following issues in their submission:

- Advised that some of the mining is historic and may be inaccurate in terms of extent of mining as well as the percentage of coal extraction. Several areas are considered at risk of either shallow mine failure (potholes) or pillar failure
- Recommends that a full desktop geotechnical study be undertaken of the recorded workings to determine the risk of subsidence to the development. The risks and consequences should then be incorporated into structural design of the Project
- References to the *Mine Subsidence Compensation Act 1961* in Section 3.14 of the EIS document are out of date. The current act is the *Coal Mine Subsidence Compensation Act 2017*.

The comments are noted, and a commitment is made that the detailed design of Project components would consider subsidence risks where relevant.

5.1.4 Crown Lands

Crown Lands has no comments for this Project.

5.1.5 WaterNSW

WaterNSW requested a condition that WaterNSW access to water monitoring site 210110 Bayswater Creek at Liddell must be maintained along Pikes Gully Road, or alternative access arranged in consultation with WaterNSW.

The requested condition is accepted and a commitment to this affect has been added to the management and monitoring measures in Chapter 7.

5.1.6 Dams Safety

Dams Safety has no comment/objection other than requesting to be notified of any future modifications to the Bayswater Ash Dam.

The detailed design of the ash dam would involve the reassessment of the societal risk and individual risk and consequence category of the BWAD. The detailed design and supporting assessments would be provided to Dams Safety as per the requirements of the *Dams Safety Act 2015* and associated guidelines and methodologies. A commitment to this effect has been added to the management and monitoring measures in Chapter 7.

5.1.7 Environment Protection Authority

The EPA requested additional information regarding water quality management be provided to facilitate their assessment. AGLM met with the EPA to clarify the Project scope and discuss their information requirements. As agreed with EPA at this meeting, additional information requested by EPA and available at this time is provided as a summary report in Appendix B.

5.1.8 DPI Agriculture

DPI Agriculture has no comments for this Project.

5.1.9 Division of Resources and Geoscience

The NSW Department of Regional NSW – Mining, Exploration & Geoscience – Geological Survey of NSW (GSNSW) stated that the Department of Agriculture, Water and the Environment is likely to classify the Project as a controlled action therefore requiring biodiversity offsets. GSNSW acknowledges the proponent will provide more detail to GSNSW as it becomes available on the required offsets and location.

The revised BDAR contains a staging plan for biodiversity offsetting (Refer to Appendix C).

5.1.10 Transport for NSW (Identical submission documented under Department of Transport and Roads and Maritime Services Division)

Transport for NSW provided recommendations in its submission with specific requested conditions in Table 5-1.

Table 5-1 Key issues raised and responses to submission by Roads and Maritime Services Division

Requested conditions	Responses
Transport and traffic <ul style="list-style-type: none"> Any approved works within the TfNSW State Road reserve (including Ravensworth Ash Line Crossings and any other utility works associated with the project), TfNSW concurrence is required in accordance with Section 138 of the <i>Roads Act 1993</i>, as the work required affects New England Highway (H9), a classified Regional/State road The site has multiple common boundaries with the New England Highway which has been declared as a Controlled Access Road through this section of State Road and accordingly direct access across these common boundaries are restricted Consent authority should ensure that appropriate traffic measures are in place during the construction phase of the project to minimise the impacts of construction vehicles on traffic efficiency and road safety within the vicinity. 	<p>The need for approval under Section 138 of the <i>Roads Act 1993</i> was noted in the EIS and would be sought prior to any works being undertaken within road reserves as necessary.</p> <p>Noted. No direct access across the boundaries of the New England Highway is proposed.</p> <p>Noted. Construction traffic would not exceed the capacity of roads in the vicinity of the Project. A commitment to the preparation of a traffic management plan for any oversized loads is included in the management and monitoring measures in Chapter 7.</p>
Hydrology and flooding <ul style="list-style-type: none"> The likely chance of the dam fail at Pikes Creek and Chillcotts Creek, impact on New England Highway, and flood mitigation 	<p>The detailed design of the ash dam would involve the reassessment of the societal risk and individual risk and consequence category of the BWAD. The detailed design and supporting assessments would be provided to Dams</p>

<p>measures shall be included in detailed flood study</p> <ul style="list-style-type: none"> The design of the dam and detailed flood study are required to be independently verified by Dams Safety authorities and satisfy current regulatory requirements Upon completion, the detailed flood study shall be submitted to the satisfaction of TfNSW for review. 	<p>Safety as per the requirements of the <i>Dams Safety Act 2015</i> and associated guidelines and methodologies. These documents will also be provided to TfNSW for review. A commitment to this effect has been added to the management and monitoring measures in Chapter 7.</p>
<p>Land use and property</p> <ul style="list-style-type: none"> TfNSW has no proposal that requires any part of the property. 	<p>Noted.</p>

5.1.11 Biodiversity and Conservation Division

BCD provided recommendations and required additional information in its submission. A revised BDAR has been prepared by Kleinfelder and is attached as Appendix B. A summary of how each recommendation has been addressed is provided in Table 5.2.

Table 5.2: BCD Recommendations and response

BCD Comment	Kleinfelder Response
BCD recommends the lead / principal BAM accredited assessor (and their accreditation number) be identified in the BDAR and on the BAM calculator (including output reports), and that detailed summaries of prior experience are provided for all staff involved in the preparation of the BDAR.	<p>The BAM accredited Assessor for the project is Dr. Gilbert Whyte (Accredited Assessor Number: BAAS18041). This information has been included in Section 1.5.2 of the BDAR.</p> <p>BAM output reports has been updated with assessor details.</p> <p>CVs of all staff involved in the preparation of the BDAR have been included in Appendix 12 of the BDAR.</p>
BCD recommends the BAM accredited assessor submits the credit calculator via the NSW Biodiversity Accredited Assessor System prior to the submission of response to submissions report.	The credit calculator is to be submitted via the NSW Biodiversity Accredited Assessor System with the submission of this report.
BCD recommends the BAM accredited assessor includes the plot field data sheets in the submitted BDAR prior to the submission of response to submissions report.	BAM Plot Datasheets have been included in the BDAR in Appendix 13.
BCD recommends the BAM accredited assessor certifies that the BDAR was finalised within 14 days of the exhibition of the EIS.	Kleinfelder to certify updated BDAR was finalised within 14 days of submission of the BAMC with the submission of the Response to Submissions Report.
BCD recommends the BDAR include detailed justification as to why the Plant Community Type 1691 and their variants do not meet the listing criteria for the NSW listed Central Hunter Grey Box – Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions endangered	The BDAR has been updated with further justifications in Section 3.2. An individual justification is provided for each vegetation zone based on floristic structure and the presence of key diagnostic species.

BCD Comment	Kleinfelder Response
ecological community, as per the NSW Threatened Species Scientific Committee Final Determination.	
<p>The following threatened flora species require targeted surveys in accordance with the 2020 Surveying threatened plants and their habitats - NSW survey guide for the Biodiversity Assessment Method (DPIE, 2020) or an expert report or adequate justification to determine likely absence or presence:</p> <ul style="list-style-type: none"> ▪ <i>Cynanchum elegans</i> (White-flowered Wax Plant), ▪ <i>Rhodamnia rubescens</i> (Scrub Turpentine), and ▪ <i>Thesium australe</i> (Austral Toadflax). 	<p>Appendix 2 of the BDAR has been updated with information to demonstrate that no suitable habitat is present within the study area for these threatened species as follows:</p> <p><i>Cynanchum elegans</i> (White-flowered Wax Plant) usually occurs on the edge of dry rainforest vegetation. Other associated vegetation types include littoral rainforest; Coastal Tea-tree <i>Leptospermum laevigatum</i> – Coastal Banksia <i>Banksia integrifolia subsp. integrifolia</i> coastal scrub; Forest Red Gum <i>Eucalyptus tereticornis</i> aligned open forest and woodland; Spotted Gum <i>Corymbia maculata</i> aligned open forest and woodland; and Bracelet Honey myrtle <i>Melaleuca armillaris</i> scrub to open scrub. Appendix 2 of the BDAR has been updated to state that no suitable habitat occurs within the Development Site for this species.</p> <p><i>Rhodamnia rubescens</i> (Scrub Turpentine) is found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils. The species occupies a range of volcanically derived and sedimentary soils and is also a common pioneer species in eucalypt forests. Appendix 2 of the BDAR has been updated to state that no suitable habitat occurs within the Development Site for this species.</p> <p><i>Thesium australe</i> (Austral Toadflax). Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass (<i>Themeda australis</i>). A root parasite that takes water and some nutrient from other plants, especially Kangaroo Grass. No records of this species occur within a 10km radius of the Development Site and this species is not returned by the BAM as a “candidate species for further assessment”. The recommended survey period for <i>Thesium australe</i> (Austral Toadflax) is November to February. A survey in accordance with the 2020 Surveying threatened plants and their habitats – NSW survey guide for the Biodiversity Assessment Method (DPIE, 2020) was conducted from 8 – 9 October 2019 (Round 2). Section 4.2.2.1 has been updated to present this information.</p>
The red goshawk requires further justification of its exclusion from further assessment or targeted surveys (in accordance with the BCD fauna survey guidelines) or an expert report.	No records of this species occur within a 10km radius of the Development Site (nearest records to the site occur at Falbrook – 18km away in 1981). This species is not returned by the BAM as a “candidate species for further assessment” hence targeted surveys are not required; however, the current survey effort for bird species is

BCD Comment	Kleinfelder Response
	<p>adequate to confirm absence of the species from the Development Site.</p> <p>Reference to the species is included in Table 11 of the BDAR to show that adequate surveys were conducted. The species is not returned by the BAM as requiring assessment. The species was not detected during surveys and the Likelihood of occurrence states that the habitat is unsuitable for the species.</p>
<p>BCD recommends that if the credit obligations for the threatened ground orchids, <i>Diuris tricolor</i> and <i>Prasophyllum petilum</i>, are reassessed prior to project approval, then the targeted surveys should: (i) be undertaken in accordance with the parallel transect method outlined Surveying threatened plants and their habitats - NSW survey guide for the Biodiversity Assessment Method (DPIE, 2020), (ii) survey the full habitat species polygon identified in the expert report (i.e. 160 hectares), (iii) utilise reference populations (such as Mangoola Coal Mine lease or Thomas Mitchell Drive) to determine optimal timing of flowering, and (iv) be undertaken during optimal seasonal conditions when the species is likely to be detected.</p>	<p>Surveys for <i>Diuris tricolor</i> and <i>Prasophyllum petilum</i> were undertaken in September 2020 when the Mangoola reference populations were confirmed to be in flower. The parallel transect surveys were undertaken in accordance with Surveying threatened plants and their habitats - NSW survey guide for the Biodiversity Assessment Method (DPIE, 2020), across the 166 hectares of habitat as identified in the expert report.</p> <p>No individuals of either of these species were identified within the Development Site; hence the BDAR has been updated. The resultant species credit obligation for impacts to these species has been removed.</p> <p>The BDAR has been updated to show that the surveys for these species were undertaken in accordance with Surveying threatened plants and their habitats – NSW survey guide for the Biodiversity Assessment Method (DPIE, 2020). A letter has been included in the report by Dr Stephen Bell to demonstrate that the expert is satisfied with the outcome of the assessment.</p>
<p>BCD recommends that the geographic distribution for <i>Prasophyllum petilum</i> be updated in the BDAR and expert report to include the record from Thomas Mitchell Drive, south of Muswellbrook.</p>	<p>BDAR has been updated. Based on the surveys completed in September 2020 (species not detected), the species has a low likelihood of occurrence within the Development Site.</p>
<p>BCD recommends that the accredited assessor demonstrate that the native vegetation within vegetation zones described as Non-native Vegetation - Exotic Grasslands is non-native and permissible for use under the Paddock Tree Calculator.</p>	<p>The non-native vegetation - exotic grasslands were dominated by exotic grasses <i>Briza subaristata</i>, <i>Paspalum dilatatum</i> (Paspalum), <i>Bromus diandrus</i> (Great Brome), and <i>Vulpia myuros</i> (Rat's Tail Fescue), and exotic herbs and subshrubs <i>Galenia pubescens</i> (Galenia), <i>Hypochaeris radicata</i> (Cat's Ear), <i>Sida rhombifolia</i> (Paddy's Lucerne), <i>Plantago lanceolata</i> (Lamb's Tongues), <i>Senecio madagascariensis</i> (Fireweed) and <i>Stachys arvensis</i> (Stagger Weed).</p> <p>Paddock trees were assessed in accordance with Appendix 1 of the BAM (OEH 2017) on 6 January 2020. Trees assessed as part of the Paddock Tree Assessment were defined as all native trees outside of mapped native vegetation zones and where the groundcover is dominated by exotic species. Within the Study Area this equated to those areas mapped as Non-native Vegetation: Exotic Grasslands. These areas meet the definition of Paddock Trees as:</p>

BCD Comment	Kleinfelder Response
	<p>The native vegetation that comprises the groundcover is:</p> <ul style="list-style-type: none"> ▪ Less than 50% of the cover is of indigenous species of vegetation, and ▪ Not less than 10% of the area is covered with vegetation (whether dead or alive), and ▪ The assessment is made at the time of year when the proportion of the amount of indigenous vegetation in the area to the amount of non-indigenous vegetation in the area is likely to be at its maximum, and ▪ The foliage cover for the tree growth form group is less than 25% of the benchmark for tree cover for the most likely plant community type.
BCD recommends that the credit obligation for each clearing stage under the proposed clearing plan be outlined in the BDAR.	A staging plan has been included in the revised BDAR in Section 6.2.3 and Table 13.
BCD recommends that the accredited assessor update the BDAR to include measures proposed to address the offset obligations.	AGLM has provided the proposed measures to offset obligations included in Section 6.2.3 of BDAR
BCD recommends that the BDAR and BAM calculator be updated to reflect possible changes requested during this review stage from the above recommendations.	The BDAR and BAM calculator has been updated to reflect the changes discussed in this response.

5.1.12 Muswellbrook Shire Council

Muswellbrook Shire Council (MSC) provided a detailed submission recommending conditions to be considered by the DPIE. A summary of issues raised and AGLMs response is provided in Table 5-3.

Table 5-3 Key issues raised and responses to submission by Muswellbrook Shire Council

Recommendation	Response
<p>Ocean disposal of salt</p> <p>The cumulative impact of not having a means to transfer salt to the ocean means:</p> <p>a) a growing number of voids, dams and pits in the landscape, containing highly saline material, which will become a legacy for future generations to manage; and</p> <p>b) a limitation on economic activity as some potential activities may not proceed due to the difficulty faced in dealing with salt on individual development sites.</p> <p>This is an issue that should be addressed by the NSW State Government.</p>	<p>AGLM would welcome a viable alternative means of salt management. No feasible means of ocean disposal is currently available, and the salt cake landfill is proposed as an improvement on the current disposal methods.</p>
<p>Surrender of consents</p> <p>Council fully supports opportunities for consolidation and improvement of approvals for</p>	<p>AGLM welcomes MSC's support in this regard. AGLM is committed to consolidating consents as indicated recently through the WOAOW and the Liddell Battery and</p>

Recommendation	Response
the Liddell and Bayswater Power Station sites. The new approval should include contemporary reporting, management and rehabilitation requirements.	Bayswater Ancillary Works State Significant Development (SSD) projects. Commitments in relation to ongoing management and rehabilitation are included in Section 7 and AGLM will comply with reporting obligations arising from the application.
Section 7.12 contributions The EIS does not identify that there is a s7.12 contributions plan applying to the site, with contributions calculated on Capital Investment Value of the development. Typically, developments of this scale would offer to enter into a VPA to make provision toward community facilities, the costs of employing Council staff to respond to detailed environmental planning and monitoring, and to contribute to closure and transition planning in the future. At a minimum, Council requests that a condition of approval be included requiring a contribution in accordance with s7.12.	AGLM does not propose entering into a State Voluntary Planning Agreement (SVPA) with MSC. The Project does not impact infrastructure, facilities or services provided by MSC and the proposed surrender and consolidation of local government consents would reduce Council's ongoing involvement in the regulation of the site.
Soils Soils on the site are highly erodible, with low fertility, structural issues and salinity. There are several access tracks and fire trails on the site. The Project will require detailed stormwater, erosion and sediment control plans and a Rehabilitation Management Plan. All existing and proposed earthworks and structures need to be included in these plans.	Commitments are made to the preparation and implementation of detailed stormwater, erosion and sediment control plans and a Rehabilitation Management Plans in Section 7. The Project does not seek approval for existing earthworks and structures except where they relate to approvals to be surrendered.
Biodiversity	
The EIS fails to clearly identify which accredited Assessor takes responsibility for the Biodiversity Development Assessment Report (BDAR) and the associated BAM Calculator and surveys. Clause 6.8 of the Biodiversity Conservation Regulation sets out the minimum requirements for a BDAR which includes the requirement to include details of the accreditation of the person preparing the report and of the qualification and experience of any other person commissioned to conduct research or investigations that are relied on in preparing the report.	The BAM accredited Assessor for the project is Dr. Gilbert Whyte (Accredited Assessor Number: BAAS18041). This information has been included in Section 1.5.2 of the BDAR. BAM output reports has been updated with assessor details. CVs for all staff involved in the preparation of the BDAR have been included in Appendix 12 of the BDAR.
The Assessor has not certified that the BDAR was finalised within 14 days of submission/exhibition of the EIS. Section 6.15 of the BC Act requires that a BDAR cannot be submitted in connection with a relevant application unless the accredited person certifies in the report that the report has been prepared on the basis of the requirements of (and	Updated BDAR was finalised within 14 days of submission of the BAMC with the submission of the Response to Submissions Report.

Recommendation	Response
information provided under) the biodiversity assessment method as at a specified date and that date is within 14 days of the date the report is so submitted.	
The BAM Calculator output reports indicate that the BAM Calculator has yet to be finalised.	The BAM Calculator was not finalised due to the requirement to update the credit calculations following completion of the targeted surveys for threatened flora (September 2020). These calculations have now been finalised.
The BAM Calculator output reports do not include the name or assessor number of the Assessor who completed the calculator.	BAM output reports has been updated with assessor details.
<p><i>Aprasia parapulchella</i> was recorded on the nearby Maxwell Underground Mine site and needs to be considered to potentially occur on the site of the Bayswater Power Station Upgrade Project. Therefore, likelihood of occurrence is not 'low' as indicated in the BDAR.</p>	<p>This species is not a candidate species for further assessment as returned by the BAM.</p> <p>Targeted surveys were conducted for <i>A. parapulchella</i> in conjunction with surveys for <i>Delma impar</i>. Both of these species can be detected via the same survey methods such as via diurnal and nocturnal searches of suitable habitat and via Tile array surveys (see Section 4.2.3.1 of the BDAR).</p> <p>Targeted searches identified no evidence of a population of <i>A. parapulchella</i> within the Development Site. Few areas of suitable habitat for this species occur within the Development Site (i.e. rocky outcrops or scattered, partially buried rocks).</p> <p>Given the proximity of the record at Maxwell Underground Mine, the "likelihood of occurrence" assessment has been changed from low to moderate in the BDAR.</p>
Council's expectation is that any modification proposing to reduce the Project's credit obligations would be accompanied by a detailed technical explanation of why the expert report did not adequately assess the population size for these species under section 6.5.2.8 of the BAM and why the Assessor still chose to submit the BDAR. If the Assessor submitted the BDAR with the intent of undertaking surveys during the exhibition/determination phase of the application, Council would argue that the Assessor has not complied with the BAM due to not submitting a complete and finalised BDAR.	<p>Due to sub-optimal weather conditions during the 2019 survey period, <i>Diuris tricolor</i> and <i>Prasophyllum petilum</i> did not flower at local reference populations (September to November). A valid survey for these species within the Development Site could not be completed in 2019.</p> <p>An expert report was prepared by Dr. Stephen Bell to determine the habitat suitability of the Development Site for these species (Appendix 8 of the BDAR). The expert report determined that approximately 166 ha of habitat for these species occurs within the Development Site. For the purposes of submitting the BDAR, both species were assumed to be present within the Development Site.</p> <p>Surveys for <i>Diuris tricolor</i> and <i>Prasophyllum petilum</i> were undertaken in September 2020 when the Mangoola reference populations were confirmed to be in flower. The parallel transect surveys were undertaken in accordance with Surveying threatened plants and their habitats - NSW survey guide for the Biodiversity Assessment Method (DPIE, 2020), across the 166 ha of habitat as identified in the BDAR.</p>

Recommendation	Response
	No individuals of either of these species were identified within the Development Site; hence the BDAR has been updated.
The BDAR states that for <i>Diuris tricolor</i> and <i>Prasophyllum petilum</i> 'approximately 160 hectares of habitat will potentially be impacted', the assessor needs to explain why this habitat will only be 'potentially' impacted.	At the time of writing the BDAR, targeted surveys for these species had not been completed when the reference populations were in flower; hence, impacts were uncertain. The BDAR has been updated to show that the surveys for these species were undertaken in accordance with Surveying threatened plants and their habitats – NSW survey guide for the Biodiversity Assessment Method (DPIE, 2020). A letter has been included in the report by Dr Stephen Bell to demonstrate that the expert is satisfied with the outcome of the assessment.
The BDAR states that, regarding the EPBC Act listed Striped Legless Lizard (<i>Delma impar</i>) and <i>Prasophyllum</i> sp Wybong, they 'have been identified as species for which impacts are uncertain'. This again highlights that the Assessor potentially does not consider the expert report and their own assumption regarding <i>Delma impar</i> habitat to be adequate. An expert report must determine what the population size is for <i>Prasophyllum petilum</i> (the same species as the EPBC Act listed <i>Prasophyllum</i> sp. Wybong) on the development site as per the BAM (6.5.2.8 of the BAM 2017) which it has done.	An expert report has been prepared for <i>Prasophyllum</i> sp Wybong and further surveys in 2020 confirmed that the species is not present in the Development Site. Impacts to the Striped Legless Lizard (<i>Delma impar</i>) were identified as uncertain due to low numbers of individuals detected during surveys; however, the offset obligation (species credits) is based on the area of habitat to be impacted. The assessment of impacts to the Striped Legless Lizard (<i>Delma impar</i>) and <i>Prasophyllum</i> sp Wybong have been conducted in accordance with the requirements of the BAM.
The Assessor indicates that this application will be assessed under the Bilateral agreement. Therefore, this would enable an accurate assessment of significance under the EPBC Act for these species and Council does not consider the Assessor's statement on this matter to be correct.	DPIE and Department of Agriculture, Water and Environment (DAWE) agreed in writing to assess under the bilateral agreement on 28 April 2020. The assessment requirements are outlined in the addendum Secretary's Environmental Assessment Requirements (SEARs), which have been addressed in the BDAR.
The expert report states that 'There are no validated populations of <i>Prasophyllum petilum</i> outside of the Wybong (Mangoola Coal mine) locality (c. 28 km WNW)'. This is incorrect as there is a record on Thomas Mitchell Drive.	This information has been updated in the BDAR.
It should also be noted that <i>Delma impar</i> was recorded on the nearby Maxwell Underground Mine site under 'cow pats' which is reflected in the profile for this species.	This information has been updated in the BDAR.
The BDAR is required to consider all direct and indirect impacts associated with a development that an existing consent doesn't cover (access road widening, stockpiles, laydown sites, shaping of batters etc). The 'development site' boundaries as identified in the BDAR are hard boundaries. Therefore, any impacts outside of the development	Relevant to the conditions of consent. Works outside the BDAR assessed Development Site will not result in any vegetation impacts. Works within the study areas as described in the EIS will constitute the approved development site.

Recommendation	Response
<p>site boundary will not have consent under this application, for example there is no connection between Borrow Pits 1 and 2 where they join the Ash Dam Augmentation Area. Council's expectation is that the condition of consent will require the impact boundaries nominated in the BDAR to be surveyed and demarcated before any works commence.</p>	
<p>Regarding the use of the paddock tree calculator, the Assessor needs to demonstrate that the assumptions around the use of the calculator are justified. The Assessor needs to demonstrate that the native vegetation that comprises the groundcover is less than 50% cover of indigenous species, and not less than 10% of the area is covered with vegetation (whether dead or alive), and the assessment is made at the time of year when the proportion of the amount of indigenous vegetation in the area to the amount of non-indigenous vegetation in the area is likely to be at its maximum. However, the BDAR indicates that no plots or transects were conducted in the vegetation zones identified as Non-native Vegetation - Exotic Grasslands. The Assessor needs to better demonstrate that the Non-native Vegetation - Exotic Grasslands is correctly identified and that the vegetation zone meets the requirements for the use of the Paddock Tree Calculator.</p>	<p>Paddock trees were assessed in accordance with Appendix 1 of the BAM (OEH 2017) on 6 January 2020. Trees assessed as part of the Paddock Tree Assessment were defined as all native trees outside of mapped native vegetation zones and where the groundcover is dominated by exotic species. Within the Study Area this equated to those areas mapped as Non-native Vegetation: Exotic Grasslands.</p> <p>The request for plots or transects to be conducted in the vegetation zones identified as Non-native Vegetation - Exotic Grasslands is not consistent with the assessment requirements of the BAM.</p>
<p>The site does not contain statutory wildlife corridors. However, the site sits within what Council considers to be a nationally significant corridor connecting the Barrington Tops World Heritage Area and the Wollemi World Heritage Area (this corridor is the closest that these two world heritage areas come to one another). There are considerable areas of offsets within the immediate locality that help to conserve this corridor. Council requests that the Proponent indicate where they will be sourcing their credits from and that they commit to sourcing them from within the immediate locality to compensate for the impact to this corridor.</p>	<p>Relevant to the Offset Strategy (post approval)</p>
<p>The BDAR needs to nominate whether the Proponent proposes to apply the variation rules for the retirement of credits as this may be conditioned.</p>	<p>Relevant to the Offset Strategy (post approval). Application of the variation rules for retirement of credits is a post approval mechanism for retirement of credits. This is not relevant to the BDAR or assessment of the Project.</p>
<p>The Assessor's statement that 'all areas of the Borrow Pits may not be cleared' is noted but it doesn't have a bearing on this application. If the</p>	<p>Relevant to the Offset Strategy (post approval)</p>

Recommendation	Response
<p>Proponent wishes to clear less than what was nominated in the BDAR then Council supports this. However, if the Proponent wishes to reduce their credit obligations accordingly then the applicant will need to submit a post consent modification to do so. This is complicated by the fact that the necessary credits must be retired before any work is undertaken.</p>	
<p>The Proponent proposes a staged retirement of credits. The Assessor must detail the credit requirements for each element of the development and then include them as a conditional item, not 'prior to works commencing' as indicated by the Assessor. Council's expectation is that the relevant condition will require the retirement of the necessary credits before an element of the development commences. It is not clear why this plan was not provided with the BDAR for public exhibition and again raises the question of the completeness of the BDAR.</p>	<p>A staging plan has been included in the revised BDAR in Section 6.2.3 and Table 13.</p>
<p>The EIS does not adequately address the <i>SEPP (Koala Habitat Protection) 2019</i>. Parts of the development occur on land identified on the Koala Development Application Map. If the Proponent undertook surveys to determine whether the site contains Core Koala Habitat, then details on how the Draft Koala habitat Protection Guideline 2020 Appendix C was addressed needs to be specifically detailed. Based on the information provided, no SATs or nocturnal surveys etc. were undertaken on land identified on the Koala Development Application Map.</p>	<p>Within the Development Site, two areas were identified as constituting potential Koala habitat as defined under <i>State Environmental Planning Policy (Koala Habitat Protection) 2019 (Koala SEPP)</i>.</p> <p>Two Spot Assessment Technique (SAT) surveys (Phillips and Callaghan, 2011) were conducted within vegetation dominated by Koala Feed Trees <i>Eucalyptus tereticornis</i> (Forest Red Gum) and <i>Eucalyptus punctata</i> (Grey Gum) on 6 January 2019.</p> <p>No evidence of Koala activity was identified during surveys, therefore habitat was determined not to represent core Koala habitat.</p>
<p>Where mitigation measures are proposed they must be prepared in accordance with Section 9.3 of the BAM and be included as a condition of consent. Therefore, the Assessor needs to ensure that proposed mitigation measures are consistent with the BAM and that they are presented and worded in a way that enables them to be easily integrated into a condition of consent.</p>	<p>Mitigation measures to manage impacts on biodiversity are presented in section 5.3 of the BDAR. The measures are reproduced in Section 7 that can be incorporated into the consent.</p>
<p>Where any waterbodies are proposed to be decommissioned and/or drained then a dam de-watering plan needs to be provided as the site contains Green and Golden Bell Frog habitat based on historical records.</p>	<p>A site-specific Management Plan will be prepared prior to commencement of any clearing or construction works to ensure that impacts are minimised. This Management Plan will include a de-watering plan as required.</p>
<p>Rather than just responding via the Response to Submissions process Council requests that the most contemporary version of the BDAR is placed on record.</p>	<p>The BDAR has been updated as provided in Appendix B and will be made available with this RTS on the DPIE Major Projects website.</p>

Recommendation	Response
Council would also welcome the opportunity to review the BAM Calculator for this Project as well as the provision of relevant GIS files to enable a complete review of the application.	Environment and Community Services Muswellbrook Shire Council was added as a case party to allow review of the application (Case 00018204) on 07/10/2020.
<p>Visual</p> <p>MSC identifies that:</p> <ul style="list-style-type: none"> ▪ The Upper Hunter suffers many amenity impacts from mines and the Power Stations affecting the sense of place felt by the community, and the attractiveness of the Upper Hunter experienced by the travelling public ▪ Every effort needs to be made to ensure that activities that are approved today do not become a negative legacy that inhibits new uses ▪ The EIS states that the height of the BWAD wall will be increased by 11.5 metres and it is not clear how much alteration to the existing wall is proposed ▪ If the wall is being altered significantly it would be an ideal time to introduce a more natural landform style ▪ The provision of landscaping for the full frontage of the BWAD wall, and on the wall itself would also lessen visual impact. ▪ Council requests that conditions be included that require: ▪ The BWAD wall and any other new landform structures to be constructed in a manner that is safe, stable and non-polluting ▪ Final landforms are designed to incorporate natural micro-relief and natural drainage lines ▪ Restoration of self-sustaining ecosystems, including establishing screen plantings installed at sufficient density to assist with landscaping the BWAD wall and other Project components from the New England Highway and internal sealed roads and achieving criteria canopy density. 	<p>The EIS is required to describe the existing environment and the descriptions provided in relation to visual impacts were not intended to be dismissive of impacts. The EIS acknowledges the existing visual environment, and provides assessment and mitigation measures to minimise impacts now and in the future.</p> <p>The augmentation of the BWAD is described in Section 2.2.1 of the EIS. The main embankment will only be altered by the installation of a 1.5 metre (m) concrete parapet wall. The 11.5 m high wall would be located at the western end of the BWAD and screened from the New England Highway by the existing features of the BWAD. As such the main embankment wall and existing northern saddle dam are not being significantly altered.</p> <p>The provision of landscape planting at the foot of the main embankment wall is precluded by the seepage collection system while planting on ash dam walls would be detrimental to dam safety.</p> <p>The EIS included the following commitments as provided in Chapter 7 of this report:</p> <ul style="list-style-type: none"> ▪ Visual impacts would be considered in the detailed design to minimise visual impacts where compatible with biodiversity and heritage management measures and Project requirements ▪ A rehabilitation management plan would be developed and include prioritising screening vegetation in areas able to support larger vegetation around permanent, unnatural landforms.
<p>Waste</p> <p>Council supports the proposed coal ash recycling activities as a mechanism to reduce:</p> <ul style="list-style-type: none"> ▪ Disposal of waste on site; and ▪ Consumption of raw materials and resources. 	MSC's support is welcomed.
<p>Management and monitoring</p> <p>There is regular low-level seismic activity (generally measuring less than 4 on the Richter scale) in the Muswellbrook LGA with epicentres predominantly near Mt Arthur mine, which is close</p>	The detailed design of Project components would consider seismic risks. The impact assessments considered risks of liner failure and a commitment has been made to a Trigger Action Response Plan for the salt cake landfill (refer Chapter 7).

Recommendation	Response
<p>to Bayswater Power Station. On average there are two events/month. All liners and structures should be designed to withstand this regular seismic activity, and an inspection regime must be in place for infrastructure following notification by Geosciences Australia that a seismic event has been recorded in the Muswellbrook LGA or the northern half of the Singleton LGA.</p> <p>The locality has high expressions of salinity in riparian areas and has a number of off-stream, dryland salinity discharge sites.</p>	<p>Salinity management in riparian and off-stream areas outside the Project footprint is currently outside the scope of the development application.</p>
<p>Rehabilitation and closure</p> <p>MSC notes that the local community is dependent on the Power Stations for positive impacts on the local economy and the impact of closure on local and even regional socio-economics may be significant.</p> <p>MSC recommends that:</p> <ul style="list-style-type: none"> ▪ Every effort should be made to maintain the quantum of employment opportunities with a range of potential site uses raised ▪ A contemporary condition of consent should be included to require planning for the transition of the site to a post-coal fired power generating future, and that this planning begin at least 5 years prior to the closure and decommissioning ▪ A working party should be established by the year 2030 to commence planning for the transition to post-coal fired power generating uses for the site ▪ A condition be included for the preparation of a decommissioning and rehabilitation plan to be prepared within 3 years of approval with review to occur every 3 years ▪ That the conditioned decommissioning and rehabilitation plan be implemented at the planned end of life of Bayswater. 	<p>The Project development application does not seek approval for the closure and decommissioning of Bayswater. AGLM acknowledges that approval for demolition and decommissioning of Bayswater will be required and has established the broad terms of the process that will be followed to rehabilitate the site in the AGL report (2017) <i>Rehabilitation- AGL's approach to rehabilitation of power generation infrastructure</i> (Available at: https://www.agl.com.au/-/media/agl/about-agl/documents/media-center/asx-and-media-releases/2017/170810-agl-rehabilitation-report.pdf?la=en&hash=E1759AA8468DC6FD0E7DD3C7DBEEC3E4).</p> <p>The Project does include infrastructure essential to the ongoing operation of Bayswater. The proposed infrastructure would be decommissioned and the subject land rehabilitated as part of the overall process of decommissioning and repurposing Bayswater.</p> <p>AGLM is open to discuss a condition to commence planning for the closure and decommissioning of infrastructure the subject of the application five years prior to the end of life of Bayswater and that this process will make provision for consultation with MSC, Singleton Council and DPIE as well as relevant stakeholders.</p> <p>The EIS includes commitments that a rehabilitation plan would be developed covering all Project elements, which would include measures to remediate the land where required following decommissioning in accordance with <i>State Environmental Planning Policy No 55— Remediation of Land</i>. As noted in the submission, each Project component also includes plans for decommissioning and rehabilitation. While AGLM is committed to decommissioning and rehabilitation at end of Bayswater's operational life, and accepts that this planning should start five years prior to this time, the development of decommissioning and rehabilitation plans within 3 years of approval is not supported. Instead, a commitment has been made that all areas disturbed as part of the Project would be rehabilitated on a progressive basis where appropriate.</p>

5.1.13 Department of Planning, Industry and Environment – Water and the Natural Resources Access Regulator

Water Group and the Natural Resources Access Regulator (NRAR) provided recommendations relating to groundwater. These recommendations and AGLM's response are documented in Table 5.4.

Table 5.4: Water and the Natural Resources Access Regulator recommendations and response

Recommendation	Responses
Prepare a monitoring and reporting program for groundwater ingress during the construction of the ash transport pipeline. AGL may need to obtain water entitlements if the project is required to dewater greater than 3 Megalitres (ML) per year for excavation works.	Underground sections of the pipeline are to be constructed by directional drilling. Any necessary water entitlements would be sought.
Leaks to be inspected daily as per the EIS, however it is noted there is a gap between monitoring below-ground level sections. Report on risks associated with leakages from the ash pipeline and devise a monitoring and mitigation program to address those risks	<p>The replacement of the Ravensworth Pipeline is aimed at significantly reducing risks of leakage that are currently associated with the age and dilapidation of the existing assets as documented in the enforceable undertaking.</p> <p>The EIS contains a commitment that "Routine inspections and monitoring of the Ravensworth Ash line would be undertaken to ensure any leakages are promptly identified and fixed".</p> <p>The current monitoring and shut-off system, which includes flow meters and automatic shut-off of ash pumping in response to triggers indicative of a leak, would be applied to the Ravensworth pipeline. If the system indicates a leak and no leak is identified in above ground sections, this would trigger investigations of underground sections of pipeline.</p>
Prepare a trigger action and response plan (TARP) to address groundwater quality monitoring below the salt cake landfill, including baseline and trigger values	A TARP would be prepared in consultation with the EPA, DPIE Water Group and NRAR prior to the operation of the salt cake landfill and a commitment to this effect has been included in Section 7.
<p>Provide further details on works occurring on waterfront land, as well as management, mitigation, and/or rehabilitation methods after completion of the project to address landform issues.</p> <p>All works should be in accordance with the Guidelines for Controlled Activities on Waterfront Land (NRAR, 2018).</p>	<p>Design information for works in waterfront land is not yet available. Works in waterfront land are generally described in Section 5.1 of Appendix D of the EIS.</p> <p>A commitment that all works within waterfront land would be undertaken in accordance with Guidelines for Controlled Activities on Waterfront Land (NRAR, 2018) has been added to the management and monitoring measures in Chapter 7.</p>

5.1.15 Singleton Council

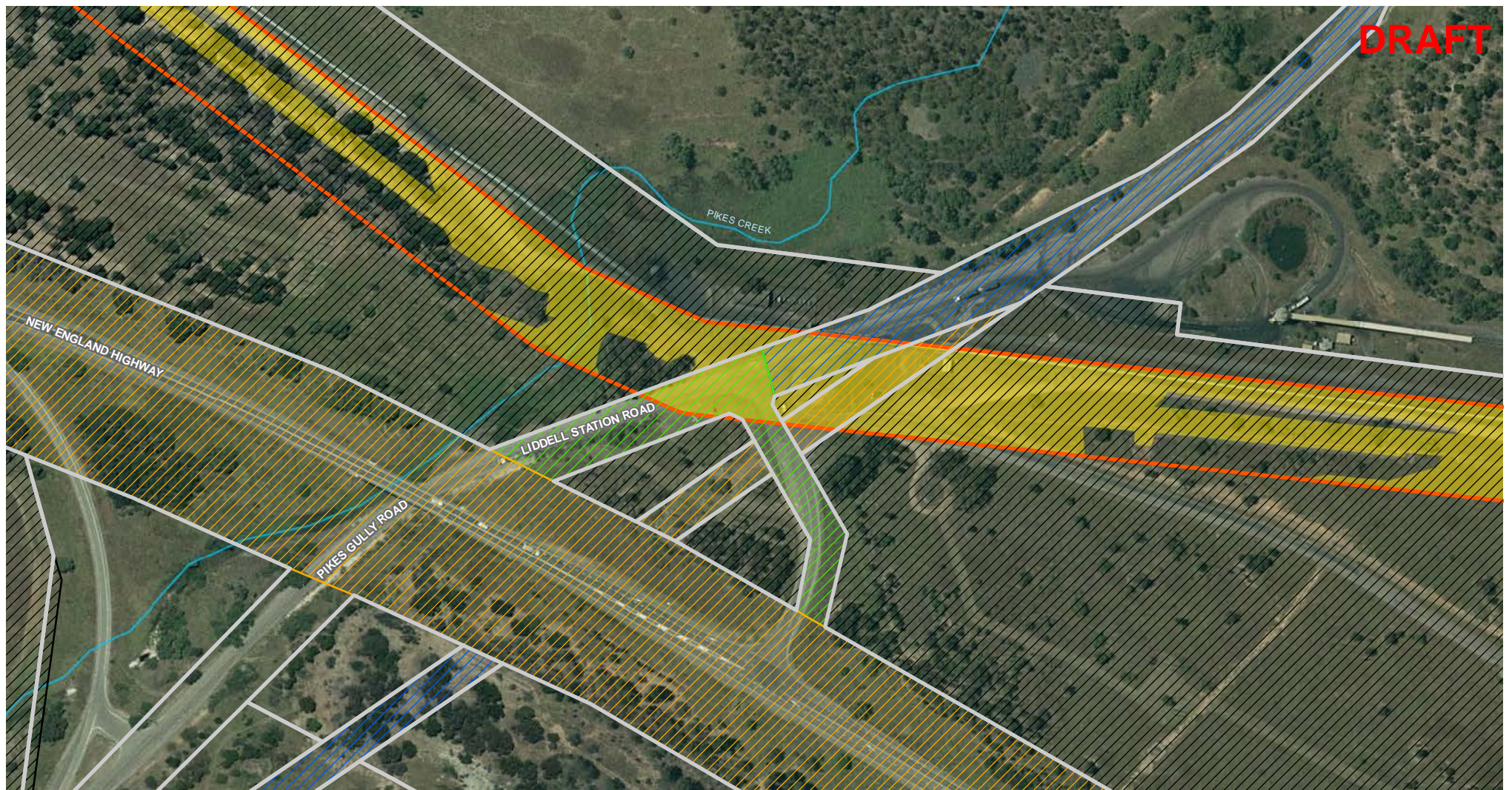
Singleton Council provided a detailed submission recommending conditions to be considered by the DPIE. A summary of issues raised and AGLM's response is provided in Table 5-5.

Table 5-5 Key issues raised and responses to submission by Singleton Council

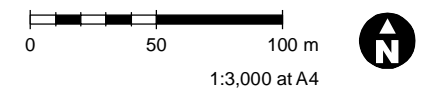
Singleton Council Submission item/issue raised	AGLM Response
<p>Comments on the Project</p> <p>The EIS provides little detail as to how Project component activities will be synergised across the two Local Government Areas, particularly in relation to rehabilitation planning and decommissioning.</p> <p>Consideration should be given to the LEP objectives of the zone noting that Council agrees the development is not inconsistent with these objectives.</p>	<p>Details of synergies across the LGA boundary were not provided on the basis that while two LGAs are affected by the Project and ongoing operation of Bayswater, AGLM does not approach site planning and management with a focus on the different LGAs. The EIS has considered permissibility within each LGA and all components are permissible. Rehabilitation and decommissioning planning will be approached consistently across the LGA boundary.</p> <p>Singleton LEP objectives for the RU1 Primary Production zoning that applies were documented in Section 3.4.7 EIS and the Project considered compatible. The basis of the consideration was that the Project does not introduce land use conflicts or fragment resources lands as documented in Section 4.4 of the EIS.</p>
<p>Land ownership</p> <p>The EIS states that part of the Project will encroach on land owned by Singleton Council but the encroachment was not shown within EIS mapping or discussed with Council.</p>	<p>Land owned by Singleton Shire Council affected by the Project is understood to be limited to the road reserve associated with Pikes Gully Road north of the New England Highway. As described in the EIS, Pikes Gully Rd would be under bored and used for access for the construction and maintenance of the Ravensworth pipelines component of the Project only.</p> <p>AGLM contacted Singleton Council on 7 April 2020 regarding land ownership at Pikes Gully and Singleton Council replied on 22 April 2020 to confirm the need for a Section 138 application under the <i>Roads Act 1993</i> would be required as documented in Table 5-1 of the EIS.</p> <p>AGLM has further discussed land ownership at Pikes Gully Rd at the meeting on 30 November 2020 confirming no further action other than the s138 application is required and committing that AGLM will provide an updated figure in the Response to submissions (Figure 5.1).</p>
<p>Decommissioning, Rehabilitation and Final Land Use</p> <p>Council seeks further clarification from the Applicant on:</p>	<p>The Project development application does not seek approval for the closure and decommissioning of Bayswater of an as yet identified future land use. AGLM acknowledges that approval for demolition and decommissioning of Bayswater will be required and has established the broad terms of the process that will be</p>

<ul style="list-style-type: none"> ▪ Timing of detailed closure planning including the actions needed to be taken to achieve land use that is suitable and does not result in a negative socioeconomic impact to the community. ▪ Role of both councils and the community in the land use options assessment and analysis, including the extent to which such consultation has occurred and its outcomes. ▪ The relationship between land use and the principles of strategic land use planning, including the extent to which the Applicant has consulted with council on the future strategic land use planning outcomes for the local government area; ▪ Assessment of the suitability, permissibility and sustainability of the final land use(s) proposed by area or domain, including actual feasibility and economic viability, as well as linkage between final landform and final land use(s) (that is, will be landform proposed actual provide for the uses identified) ▪ Analysis of the climate changing risks (temperature, rainfall, fire) on the success of rehabilitation, including the contingency measures that would be implemented in the event rehabilitation fails ▪ Viability of final land uses, including where on the lease or AGL owned land these uses could be applied ▪ The consequences of the final land use options, including the final use of the ash dam, on the principles of ecologically sustainable development, in particular, inter-generational equity ▪ Safety, stability, pollution potential and sustainability of the proposed final land uses in the context of the final landform ▪ Timeframe/timetable for investigation and implementation of one or more option(s) through to feasibility ▪ Ash dam management actions that will be taken to ensure dam stability during and post operations, including contingencies for final landform design and rehabilitation outcomes should the dam wall destabilise during and/or post operation. 	<p>followed to rehabilitate the site in the AGL report (2017) <i>Rehabilitation- AGL's approach to rehabilitation of power generation infrastructure</i></p> <p>(Available at: https://www.agl.com.au/-/media/agl/about-agl/documents/media-center/asx-and-media-releases/2017/170810-agl-rehabilitation-report.pdf?la=en&hash=E1759AA8468DC6FD0E7DD3C7DBEEC3E4).</p> <p>The Project does include infrastructure essential to the ongoing operation of Bayswater. The proposed infrastructure would be decommissioned and the subject land rehabilitated as part of the overall process of decommissioning and repurposing Bayswater.</p> <p>AGLM intends to commence planning for the closure and decommissioning of infrastructure the subject of the application five years prior to the end of life of Bayswater and that this process will make provision for consultation with Singleton Council, Muswellbrook Council and DPIE as well as relevant stakeholders. AGLM expects a condition to this effect would be incorporated into any approval for the Project.</p> <p>The EIS includes commitments that a rehabilitation plan would be developed covering all Project elements, which would include measures to remediate the land where required following decommissioning in accordance with <i>State Environmental Planning Policy No 55—Remediation of Land</i>. As noted in the submission, each Project component also includes plans for decommissioning and rehabilitation.</p> <p>A commitment has been made that all areas disturbed as part of the Project and not affected by ongoing operational requirements would be rehabilitated on a progressive basis.</p> <p>AGLM offers to meet with Council regarding concepts for future land use at a mutually convenient time.</p> <p>AGLM has committed to consulting with Singleton Shire and Muswellbrook councils in Bayswater closure and rehabilitation planning. As identified in Chapter 5 of the EIS, AGLM maintains a community reference group at which plans for future developments are presented for comment as they arise.</p> <p>Should intensive future land uses be permissible under land use zoning at the time they are likely to require approval and consultation with the community would be undertaken in accordance with applicable requirements and AGL stakeholder consultation policies.</p> <p>Should land use options be incompatible with land use zoning at the time, AGLM would pursue rezoning via the relevant Council at which point community would be invited to provide input in accordance with the council's Community Participation Plans.</p>
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<p>Flooding</p> <p>It should be noted that Singleton Council is currently reviewing and updating its flood management study and plan, and any flood modelling completed as part of the Project should be reviewed on adoption of that study</p>	<p>Noted. AGLM has committed to further consideration of flooding in all construction planning and design of Project components and would incorporate relevant findings of Singleton Shire Council's flood management study and plan as available at the time.</p>
<p>Surface water</p> <p>There is limited information in the EIS regarding the existing surface and groundwater environment at the site, however, it is noted that there are groundwater quality exceedances recorded in the vicinity of the existing ash dam.</p>	<p>The EPA as the regulator of the site has raised similar issues and requested additional information regarding water quality management be provided to facilitate their assessment. AGLM met with the EPA to clarify the Project scope and discuss their information requirements. As agreed with EPA at this meeting, additional information requested by EPA and available at this time is provided as a summary report in Appendix A.</p> <p>Further details of site hydrogeology and a conceptual site model for the BWAD is provided in 5.5.2.</p>
<p>It is not clear whether the design capacity of the ash dam seepage sumps are capable of containing a 1:100 year rainfall event and how seepage water would be managed under such circumstances. Council would like clarity on where seepage overflow water discharges to and what the consequences of this discharge will be to downstream water users and the environment.</p>	<p>Detailed design of the proposed seepage collection system upgrades is ongoing and would be completed in consultation with the EPA.</p> <p>The Project does not seek approval for current impacts and a commitment is made that the design would result in an improved seepage outcome for the BWAD. Current impacts are summarised in more detail in Appendix A.</p>
<p>The assessment dam wall failure assessment should include the likelihood of dam failure under varied climate scenarios and ensure adequate management controls of the potential impacts are identified and implemented. The assessment should also include the impact of dam wall failure on downstream infrastructure, particularly owned or managed by council and including roads and water supply to Jerrys Plains</p>	<p>The detailed design of the ash dam would involve the reassessment of the societal risk and individual risk and consequence category of the BWAD. The detailed design and supporting assessments would be provided to Dams Safety as per the requirements of the <i>Dams Safety Act 2015</i> and associated guidelines and methodologies. A commitment to this effect has been added to the management and monitoring measures in Chapter 7.</p> <p>While not confirmed, impact on council assets including Jerry's Plain water supply is considered unlikely.</p>
<p>Salt Cake landfill</p> <p>Provide future detail on whether the proposed Salt Cake Landfill will achieve the design outcomes required for salt cake generation.</p>	<p>The detailed design of the salt cake landfill is ongoing. AGLM has confirmed that the salt caking plant is not planned to operate until 2023 at the earliest. As such from commencement of operation to planned retirement of Bayswater would be 12 years. If generating the maximum 50,000 tonnes per year this would produce up to 600,000 tonnes in total which was the stated in the EIS.</p>
<p>Council seek further clarification and assessment of the potential for salt cake landfill failure to impact the quality of water supply to Jerrys Plains identified by Council as being stored in Plashett's Reservoir.</p>	<p>AGLM has clarified that water supplied to Jerrys Plain is stored in the Freshwater Dam, not Plashett's Reservoir, which is up gradient of the proposed landfill.</p>



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|--|--|
| Study area | Land ownership |
| Ravensworth ash pipeline | Transport for NSW |
| Cadastre | Council owned land |
| | Crown land |
| | AGL owned land |



Data sources
 Jacobs 2019
 AGL 2019
 NSW Spatial Services 2019
 Service Layer Credits:
 © Department of Customer Service 2020

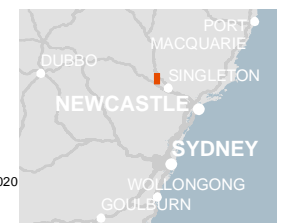


Figure 5 - 1 Singleton Shire land ownership project interaction at Pikes Gully Road

GDA94 MGA56

5.1.16 Heritage NSW – Aboriginal Cultural Heritage

Heritage NSW – Aboriginal Cultural Heritage provided the following recommendations relating to Aboriginal heritage:

- Recommends that an Aboriginal Cultural Heritage Management Plan (**ACHMP**) be prepared and implemented for the management of all Aboriginal cultural values and sites within the SSD Project Approval Boundary
- The ACHMP should clearly identify the location and site coordinates of all extant sites in order that they are appropriately managed. Heritage NSW recommends that the identifying details of each site including, but not limited to: Aboriginal Heritage Information Management System (**AHIMS**) number; site name; site type; site status; and site coordinates, be included as an appendix to the ACHMP so that these details can be updated as required over the course of the project
- Recommends that consultation is undertaken with the RAPs to arrange for a secure, locked facility to be used as a temporary keeping place for any salvaged Aboriginal objects. The identifying details of this facility should be included in the ACHMP and provided to Heritage NSW.

The Project ACHAR has been updated following completion of test excavation program and provided in Appendix C. Revised mitigation measures as recommended by the ACHAR in consultation with RAPs are provided in Section 7.

5.1.17 NSW Rural Fire Service

The NSW Rural Fire Service recommends that the Bayswater Power Station Bush Fire Management Plan be updated to reflect the proposed works and activities to manage those works.

The recommendation reflects the commitment made in the EIS and is accepted.

5.2 Organisation submissions and response

5.2.1 TransGrid

TransGrid have reviewed the proposal and advise that the works do not appear to impact TransGrid infrastructure. TransGrid have asked if it could be consulted if anything might affect TransGrid infrastructure or easements during the works.

5.2.2 The Wilco Group

The Wilco Group supports the Project, however they believe the project brief is limiting the potential outcomes. The Wilco Group proposes to take the coal ash and chemically convert it into aggregate for use in concrete and states that a proposal utilising The Wilco Group's capability would:

- Provide an absolute and complete means of coal ash remediation, rather than deferring the problem for future generations to deal with
- Pay for itself over the life of the project
- Encapsulate into concrete, the heavy metal toxins that come from the coal ash
- Provide a solution to the nearby Liddell Power Station which is due for closure in 2023
- Create products for the building and construction markets which will add significant benefit to green-star ratings
- Create a method for dealing with the 650 million t of ash currently stored in Australia
- Create a precedent for dealing with the 500 million t of excess coal ash that is generated globally, each and every year, let alone that which is already held in storage.

The Wilco Group also notes that the existing coal ash storage facilities at Bayswater will reach capacity within two years. To build any sort of facility capable of handling up to 1,000,000 t per annum, will take considerable time (probably two years or more). The project needs to be expediated as soon as possible.

AGLM welcomes Wilco Group interest in the use of ash from Bayswater and Liddell. The Project aims to improve ash management over the remaining life of Bayswater but does not preclude the separate assessment and development of alternative uses of ash. AGLM are open to conversations with technology providers showcasing their proposals for the use of ash but remain focussed on the critical need to maintain the ability of Bayswater to generate electricity and as such have prioritised the steps necessary and within their control to facilitate the improved environmental performance of existing ash management processes and practices. As per the EIS, the development of the Ash Dam Augmentation is proposed to be undertaken in stages and if alternative uses are identified, all stages may not be built.

5.2.3 Vecor Australia Pty Ltd

Vecor Australia Pty Ltd supports the project and has provided a detailed submission which raised the following recommendations:

- The core recommendation is for the government to conduct a feasibility study into the composition of fly ash generated at Bayswater Power station and other power stations within the State with a view to determining their suitability for manufacturing sand and aggregates from fly ash. This would result in one or more pilot plants being established to test novel technologies (such as Vecor's) for fly ash re-use
- The NSW Government should provide sustained support for resource recovery programs into later stages of industry growth and policies and programs should be put in place to support this form of industry development
- Fly ash aggregates should be utilised in government construction projects
- Sustainable re-use of coal ash should be established
- Good practice within the electricity generation sector should be incentivised.

AGLM welcomes Vecor Australia's support and interest in the use of ash from Bayswater. The Project aims to improve ash management over the remaining life of Bayswater but does not preclude the separate assessment and development of alternative uses of ash.

5.2.4 Environmental Justice Australia

Environmental Justice Australia (EJA) has provided a detailed submission supported by the following documents:

- An analysis of the Bayswater upgrade EIS undertaken by Gordon Johnson, M. Sc., P. Eng accompanied by Mr Johnson's CV
- EJA, Unearthing Australia's Toxic Coal Ash Legacy: how the regulation of toxic coal ash waste is failing Australian communities (2019)
- EJA submission in response to New South Wales Public Works Committee Inquiry into the costs for remediation of sites containing coal ash repositories (21 February 2020).

EJA submission has been reviewed in full and AGLM's response to the resulting recommendations is presented in Table 5.6 with the following clarifications made in responding:

The EIS has sought to respond to the DPIE and MSC's preference that the number of approvals held by AGLM for the site are reduced by making an attempt to incorporate works with a similar purpose (in this case ash and process water management) into the one application. This has resulted in the range of Project components at different stages of design being incorporated into the one application with the approval process needing to be completed in time for critical upgrades. While detail within the Project description may be limited, the EIS has assessed a reasonable worst-case assumption in relation to impacts including disturbance footprint and seepage

rates under a 'do-nothing' and Project scenarios. The findings of the EIS are that with the implementation of proposed mitigation measures, including commitments that detailed design would be undertaken in accordance with relevant guidelines, the Project would result in an improved water quality outcome for the site and the surrounding environment.

The EIS does not seek approval for, or assess, the ongoing operation of Bayswater or the legacy decisions that have led to the formation of Bayswater Ash Dam in its current configuration. AGLM are responding to this legacy through the Project by improving seepage management. The fact that seepage with associated impacts is occurring is not disputed and the Project represents AGLM's identified reasonable and feasible response to reducing these impacts. A commitment has been made to the effect that the detailed design of the seepage collection upgrade would facilitate an improved environmental outcome on a 'do-nothing' scenario with the inclusion of the expansion of the Bayswater Ash Dam.

The detailed design of Project components is ongoing and the intention of the EIS was to describe reasonable worst-case impacts resulting from the Project only. In the absence of detailed design, the approach has been to identify the likely implications of the Project and commit to achieving performance outcomes through the completion of the detailed design process. The performance outcomes are set through the EPL for the site and the pollution investigations and improvement projects being implemented under it.

The Ravensworth Voids were formed from the process of open-cut mining and overburden placement. The rehabilitation objectives as approved were to fill voids to facilitate a safe and stable final landform that could be rehabilitated with a mix of pasture and woodland areas. The Project does not seek approval for the ongoing placement of ash within these voids and only seeks to replace the pipelines used in this process which are identified as at a high risk of failure.

Table 5.6: Environmental Justice Australia submissions and response

Recommendation	Responses
<p>AGL be required to withdraw the EIS such that the approval process is postponed until after the Public Works Committee has released its final report into the Costs for remediation of sites containing coal ash repositories (the Inquiry).</p>	<p>The withdrawal of the EIS is not supported. AGLM acknowledges the ongoing inquiry and has participated through the provision of a submission, answering questions at a hearing and providing follow-up information in response to questions on notice.</p> <p>Bayswater operations have been endorsed as remaining critical to the stable operation of the NEM as it transitions to renewable generation coupled with storage. As described in the EIS, AGLM has an announced plan for retiring Bayswater in 2035 while delivering on obligations to the community and customers.</p> <p>A 'do-nothing' option would result in a worse case outcome for water quality and long-term outcomes for the site on the following basis when compared to the Project:</p> <ul style="list-style-type: none"> Existing process with their existing level of risk and impact would continue unmitigated Capping material for closure would need to be sourced off-site with increased traffic impacts AGLM would be unable to lawfully comply with enforceable undertakings under the EP&A Act. <p>The Project does not preclude the implementation of the outcomes of the Public Works Committee Inquiry that may ultimately be endorsed and implemented by the NSW Government. In the meantime, the Project is needed to allow AGLM to lawfully undertake upgrades to infrastructure and processes as described in the EIS in line with the findings of</p>

	pollution investigations and improvement programs to improve the environmental outcomes associated with these existing processes.
AGL be required to address the gaps in the EIS to ensure it legally complies with requirements for an EIS including addressing the general and specific issues expressed in the SEAR. The following gaps were identified by EJA:	The EIS provides a cross reference table in Appendix B as to how it addressed both the SEARs and <i>Environmental Planning and Assessment Regulations 2000</i> .
<ul style="list-style-type: none"> Under Cl. 7(1)(c) (of Schedule 2) of the Regulations with respect to feasible alternatives, including those identified by Mr Johnson, and failure to consider replacing coal ash dam with a suitably engineered dry ash emplacement in accordance with best practice 	Alternatives to undertaking the Project, including a 'do-nothing' scenario as required by the Regulations were considered in Section 4.3 of the EIS. Importantly, feasible is interpreted through reference to definitions regularly including in approvals under the EP&A Act as generally meaning what is possible and practical in the circumstances. The replacement of the ash dam with an engineered dry ash emplacement involving the excavating and re-disposal would come at enormous cost and result in a range of other environmental impacts that are not warranted by either the existing impacts to the environment.
<ul style="list-style-type: none"> Under Cl. 7(1)(d)(ii) of the Regulation with respect to hydrogeology 	A description of hydrogeology of the Project area was provided in Section 4.8 of Appendix D of the EIS.
<ul style="list-style-type: none"> Under Cl. 7(4) of the Regulation with respect to no apparent regard being had to principles of ecological sustainable development 	The principles of ecologically sustainable development (ESD) are considered in the EIS in Sections 21.3.1 to 21.3.4.
<ul style="list-style-type: none"> Failure to provide a full description of the development as required by the SEAR 	The Project is described in full in Chapter 2 of the EIS and an overview is given in Chapter 1 Section 1.1. Appendix B of the EIS identified how the SEARs requirement for the Project description has been addressed.
<ul style="list-style-type: none"> Incomplete assessment of the likely impacts of the development on the environment, including a description of the existing environment likely to be affected, the cumulative impacts of the site and existing or proposed developments (including to groundwater, surface water, and including Ravensworth mine fill) as required by the SEAR 	<p>The existing environment for each environmental aspect is described at Sections 7.2, 8.1, 9.1, 10.2, 11.2, 12.2, 13.1, 14.1, 15.3, 16.1 and 17.2.</p> <p>Impacts are described at Sections 6, 7.3, 8.2, 9.2, 10.3, 11.3, 12.4, 13.2, 14.3, 15.4, 16.2, 17.3, 18 and 19 of the EIS. Groundwater and surface water do not have cumulative impacts on the basis that the Project would be designed and implemented to result in improved seepage and water quality management for both the do nothing and Project scenarios.</p>
<ul style="list-style-type: none"> How the principles of ESD have been integrated into the design, construction and ongoing operations of the development as required by the SEAR 	The principles of ESD are considered in the EIS in Sections 21.3.1 to 21.3.4 in relation to the Project for which approval is sought.
<ul style="list-style-type: none"> Failure to provide details of landfill cell design in accordance with best practise industry guidelines including EPAs Environmental Guidelines: Solid Waste 	While detailed designs remain unavailable for the salt cake landfill, a commitment has been made that they would be developed and implemented in accordance with the EPA's

Management as required by the SEAR	Environmental Guidelines: Solid Waste Management in consultation with the EPA as the appropriate regulator.
<ul style="list-style-type: none"> Failure to provide actions and investments to be taken to expand coal ash reuse markets or create new markets as required by the SEAR. 	AGLM are seeking to facilitate the lawful increase in ash re-use as described in the EIS. As stated in the Coal Ash enquiry, AGLM is not best placed to expand or create coal ash reuse markets. AGLM are motivated to increase reuse of ash from site both to reduce the cost of ash dam augmentation and from a revenue generation perspective. AGLM's response is aimed at ensuring ash generated meets applicable waste exemptions and the approval and facilities are in place to respond to market demand. Refer to Section 5.4 for further details on steps AGLM are taking to maximise reuse.
The Department of Planning, Industry and Environment extend the public submission process accordingly.	Recommendation is directed towards DPIE. AGLM notes that any delays to the process would inhibit AGLM's ability to comply with the requirements of enforceable undertakings and environmental improvement projects included in the Project and is not considered warranted.
The Department of Planning, Industry and Environment otherwise must postpone the decision making process until the final report for the Inquiry is released.	<p>AGLM is participating in the Coal Ash Inquiry which is understood to focus on:</p> <ul style="list-style-type: none"> The potential quantum and timing of any NSW Government expenditure associated with remediating contamination at coal ash repositories, including Bayswater The economic and employment opportunities associated with coal ash re-use, site remediation and repurposing of land The current regulatory regime for ensuring best practice remediation of coal ash repositories Risks and liabilities associated with inadequate remediation of coal ash repositories. <p>AGLM has provided a submission, attended a hearing and have provided follow-up on questions on notice.</p> <p>As per the EIS, the Project includes significant investment in environmental improvement works associated with ash management to facilitate compliance with requirements of the site EPL. Further, the Project does not preclude the NSW Government from enforcing the outcomes of the inquiry. Postponing the decision-making process would delay implementation of environmental improvements included in the Project.</p>
The Bayswater coal ash dam must be replaced with an appropriately engineered landfill that complies with best-practise construction and management.	AGLM are responsible for ash emplaced since 2014 and the ongoing management and closure of the BWAD. As stated above, excavating and disposing to a purpose built, lined facility is not considered feasible. Excavating and re-disposal would come at enormous cost and result in a range of other environmental impacts.

5.2.5 Nature Conservation Council of NSW

The Nature Conservation Council of NSW (NCC) objects to the proposal and makes eight recommendations to the DPIE as follows:

- The Department should reject the development application.

- Failing that, the Department should request a more detailed EIS from AGL prior to progressing this application. In order for the consent authority to make an informed decision, the EIS requires more information regarding hydrogeology.
- The Department should impose a condition requiring AGL to meet the reuse target of one million tonnes per annum.
- The Department should require AGL to provide a coal ash reuse management plan to ensure the proposed one million tonnes of ash is not dumped in an abandoned mine. The coal ash reuse management plan should detail potential markets and measures to ensure compliance with toxicity limits.
- The Department should consider the ample evidence put forward in the inquiry into 'costs for remediation of sites containing coal ash repositories' to inform global best practice for coal ash reuse and storage.
- The Department should impose a condition that AGL will pay a fee for any coal ash disposed of in repositories to ensure AGL complies with its reuse targets. At a minimum this fee should be imposed until coal ash is brought into a load based licencing scheme.
- The Department should require AGL to improve their salt cake landfill liner. A clay liner does not comply with guidelines for landfill construction and risks contamination.
- The Department should require AGL to enter into a long-term monitoring and make good agreement for the salt cake landfill, including providing financial assurance.

The issues raised in making these recommendations are responded to in Table 5-7.

Table 5-7 Key issues raised and responses to submission by the Nature Conservation Council

Recommendation	Responses
<p>The EIS in its current form is incomplete and requires further information</p> <p>The EIS is lacking key information for a consent authority to make an informed decision. The EIS fails to:</p> <ul style="list-style-type: none"> ▪ Describe the hydrogeology of the project area ▪ Detail groundwater flows, recharge areas and discharge areas ▪ Define aquifers in the area that could be affected by the industrial operations and coal ash disposal practices. <p>As a result, the EIS fails to assess the full implications of ongoing coal ash disposal in the repository.</p>	<p>A description of hydrogeology of the study areas was provided in Section 4.8 of Appendix D of the EIS. Refer to Appendix A for further consideration of the hydrology of the study areas.</p> <p>The EIS addresses the implications of the Project, including on water quality and hydrology and is considered to represent an improved outcome compared to the do-nothing scenario.</p>
<p>More transparency is required around coal ash reuse</p> <p>The EIS proposes a target for coal ash reuse, seeking to recycle one million tonnes of coal ash per year.</p> <p>NCC welcomes coal ash reuse as it reduces the risk of a long-term toxic legacy developing at the site. However, we are concerned about the likelihood of AGL failing to meet the proposed reuse</p>	<p>AGLM does consider the reuse of ash is market dependant. AGLM are not best placed to establish such a market and the Project seeks approval such that AGLM can lawfully supply coal ash to the market on an as required basis. AGLM are motivated to expand ash reuse as doing so allows reduced expenditure on the proposed ash dam augmentation. Refer to Section 5.4 for further details on AGLM's approach to ash reuse.</p> <p>AGLM and the EIS are transparent on how ash will be managed where it cannot be reused. This includes both the expansion of the ash dam and ongoing filling of Ravensworth coal mine voids for</p>

Recommendation	Responses
rate, which AGL defines as “market-driven”. There is currently little market demand for coal ash. Combined with the imposed ash reuse rate of the Eraring coal-fired power station, the risk of AGL failing to meet this target is high. Without a strong market in Australia for coal ash recycling, AGL must provide transparency regarding what will happen to coal ash in the case it cannot be reused.	rehabilitation purposes in accordance with separate approvals and as regulated under EPL 779 applying to the site.
AGL should improve their proposed salt cake landfill lining.	While detailed designs remain unavailable for the salt cake landfill a commitment has been made that they would be developed and implemented in accordance with the EPA’s Environmental Guidelines: Solid Waste Management in consultation with the EPA as the appropriate regulator.

5.2.6 Hunter Community Environment Centre

The Hunter Community Environment Centre (HCEC) objects to the proposal based on the issues raised in Table 5-8.

Table 5-8 Key issues raised and responses to submission by the Hunter Community Environment Centre

Issues	Responses
<p>Coal-ash and water pollution risks</p> <p>Australian coal-ash contains a range of potentially toxic trace elements including heavy metals including arsenic, boron, barium, cadmium, chromium, copper, mercury, manganese, nickel, lead, selenium, thorium, thallium, uranium and zinc which are polluting surface and groundwater, posing a risk to aquatic species and birdlife populations in NSW.</p> <p>The opportunistic approach to coal-ash reuse and the lack of appropriate classification and over-sight led to AGL being fined in 2019 for the sale of coal-ash with unsafe heavy metal levels from Bayswater and Liddell, potentially from as far back as 2015.</p>	<p>AGLM are responsible for ash emplaced since 2014 and the ongoing management and closure of the BWAD. The Project specifically includes AGLM’s proposed works to reduce identified seepage issues from the ash dam in response to findings of pollution investigations.</p> <p>AGLM has commissioned a study of all past investigations and water quality results related to BWAD seepage. Refer to a summary of findings in Section 5.50 and Appendix B.</p> <p>In relation to the comments on the sale of coal ash, AGLM has entered into an enforceable undertaking under the POEO Act following the self-identification of deficiencies in complying with sampling frequencies and analysis test methods for bottom ash in January 2019. AGLM took the following steps in response:</p> <ul style="list-style-type: none"> ▪ Voluntary suspension of ash sales ▪ Notification to the EPA ▪ Publication of media releases for community ▪ Review of sampling results by independent environmental consultants ▪ Commissioning a Human Health and Ecological Risk Assessment as a precaution. <p>The Human Health and Ecological Risk Assessment (Environmental Risk Sciences Pty Ltd, 2019) reached the following conclusions:</p>

	<p>"There are no human health risk issues of concern in relation to exposures to workers or the general public as a result of the beneficial re-use of coal ash materials from Bayswater Power Station and Liddell Power Station...</p> <p>There are no concentrations of metals, pH or conductivity in coal ash materials beneficially reused from Bayswater Power Station and Liddell Power Station which are considered to be of concern to terrestrial ecology or aquatic ecology".</p> <p>AGLM has completed ash classification reports for both bottom ash and fly ash generated by Bayswater which confirm they comply with parameters of the Coal Ash Order and Exemptions under the POEO Act. The sale of bottom ash remains suspended pending acceptance of AGLM's updated sampling and analysis plans and issue of specific waste exemption by the EPA.</p>
<p>Deceptive information</p> <p>The primary purpose of the Project is to increase the capacity of the coal ash impoundment by 12.5 M m3 and build a salt cake landfill and not for the increase of coal ash reuse.</p> <p>AGL is intentionally inflating its stated coal ash production.</p>	<p>The purpose of the Project is clearly articulated in Section 2.1 of the EIS as to improve the management of Bayswater's ancillary processes over the remaining operating life of Bayswater and to facilitate an improved rehabilitation outcome for the ash disposal area and includes:</p> <ul style="list-style-type: none"> ▪ Ash dam augmentation defined as the expansion of the existing Bayswater Ash Dam to provide additional ash storage capacity and improvements to water management structures and systems to ensure continued collection and reuse of process water and return waters from the Bayswater Ash Dam ▪ Construction and operation of a salt cake landfill facility to dispose of salt cake waste from the approved salt caking plant ▪ Increasing coal ash recycling activities to produce up to 1,000,000 tonnes per annum of ash derived product material and reuse of coal ash and upgrades to existing fly ash harvesting infrastructure including the installation of weighbridges, construction of a new 240 tonne silo, tanker wash facility and additional truck parking ▪ AGLM and the EIS does not suggest the primary purpose of the Project was to increase ash re-use and instead is seeking to be able to lawfully supply ash to the market in response to market demand noted in the submission. Refer to Section 5.4 for further details on AGLM's intentions in relation to ash re-use. ▪ AGLM has recorded actual coal burned observations for the period July 2015 through to June 2018, along with the total weight of ash produced over this time. This, along with anticipated Bayswater operations has been used to forecast ash generation rates as presented in Table 18-4 of the EIS.
<p>Current coal ash containment facilities are inadequate and outdated</p> <p>AGL's ash management is poor, as it is based on unlined ash dams and mine voids to contain its unused ash. These facilities are seeping heavy metal leachate into groundwater and surface waters.</p> <p>EPA monitoring for AGL's Bayswater EPL show concentrations of boron are</p>	<p>The EIS does not seek approval for, or assess, the ongoing operation of Bayswater Power Station or the legacy decisions that have led to the formation of Bayswater Ash Dam in its current configuration. AGLM are responding to this legacy through the Project by improving seepage management. The fact that seepage with associated impacts is occurring is not disputed and the Project represents AGLM's identified reasonable and feasible response to reducing these impacts. A commitment has been made to the effect that the detailed design of the seepage collection upgrade would facilitate an improved environmental</p>

<p>consistently orders of magnitude above ANZECC 95% protection, long-term irrigation, and recreational use Guidelines.</p> <p>Pollution Reduction Programs have failed to noticeably reduce the heavy metal contamination.</p>	<p>outcome on a do-nothing scenario with the inclusion of the expansion of the Bayswater Ash Dam.</p> <p>Approval of the Project is required to facilitate AGLM lawfully complying with expected outcomes of pollution reduction investigations and programs related to ash dam seepage.</p> <p>Refer to Section 5.5 and Appendix B for further detail on seepage investigations and water quality.</p> <p>The use of ash for rehabilitation purposes at former Ravensworth mines is subject to separate approvals.</p>
<p>Salt cake landfill and risk to groundwater</p> <p>The ability of a clay barrier to mitigate potential groundwater impacts from the proposed salt cake land fill is not established in the EIS and the potential degradation of the clay barrier over time warrants the installation of an additional impermeable membrane to ensure that leachate does not make its way into groundwater.</p>	<p>While detailed designs remain unavailable for the salt cake landfill a commitment has been made that they would be developed and implemented in accordance with the EPA's Environmental Guidelines: Solid Waste Management in consultation with the EPA as the appropriate regulator.</p>
<p>Coal-ash reuse opportunities</p> <p>While the reuse of between 0.6 and 1 million tonnes of coal ash is commendable, we question whether these rates can be sustained without Government support for the ash reuse industry to identify new markets and conduct pilot projects to determine suitability of the ash for reuse products.</p> <p>To ensure coal ash is reused at maximum possible rates a cost must be imposed on generators for dumping ash in unlined containment facilities. We believe at least \$20 a tonne would be above the cost of providing adequate reuse options and incentivise maximum safe coal ash reuse.</p>	<p>AGLM are open to conversations with technology providers and government in relation to proposals for the use of ash but remain focussed on the critical need to maintain the ability of Bayswater to generate electricity and as such have prioritised the steps necessary and within their control to facilitate the improved environmental performance of existing ash management processes and practices.</p>

5.2.7 Correct Planning and Consultation for Mayfield Group

The Correct Planning and Consultation for Mayfield Group objects to the proposal based on the issues raised in Table 5-9.

Table 5-9 Key issues raised and responses to submission by the Correct Planning and Consultation for Mayfield Group

Issues	Responses
Coal-ash reuse practices are risky with few benefits for the community (which saw owner AGL fined for sale of ash with un-safe heavy metal levels)	Refer to Section 5.4. Coal ash sales will only be undertaken in accordance with Coal Ash Order and Exemption or specific waste exemptions under the POEO Act and where safe to do so.

Issues	Responses
Dumps coal-ash in mine void	While AGLM have continued the practice of using coal ash for filling and rehabilitating former coal mine voids at Ravensworth, this is undertaken under separate approvals and the Project does not seek approval to change this practice.
The proposal lacks any information about water pollution risks from heavy metal leachate	Refer to Section 5.5. The Project is AGLM's response to pollution risks identified in pollution investigations and improvement projects under the site EPL.
The EIS proposes the reuse of up to 1 million tonnes per annum with no detail about where, how or what	AGLM are responsible for confirming that ash conforms with sampling and analysis requirements applicable waste exemptions as part of ash sales to third party users. The purchaser of ash is responsible for only using that ash in accordance with the same waste exemptions.
There are no plans to safely, beneficially and economically reuse decontaminated coal-ash in building products	AGLM are not best placed to understand the markets for building products but are open to conversations with market participants with proposals for the use of ash. AGLM remain focussed on the critical need to maintain the ability of Bayswater to generate electricity and as such have prioritised the steps necessary and within their control to facilitate the improved environmental performance of existing ash management processes and practices.
Taking a "cap and monitor pollution" approach to so-called remediation of huge toxic coal-ash dump sites	The cap and monitor approach remains the only feasible option for long term management of the Bayswater ash dam. The Project would improve the environmental performance of this approach to ash management and does not preclude options that may be identified as viable in the future subject to increase markets for coal ash products.
The Group believes that Bayswater needs to do better and clean up polluting coal-ash which they have dumped.	The Project represents AGLM's proposed approach to reducing the environmental impacts of current and legacy ash management on the site. AGLM will continue to operate Bayswater in accordance with applicable legislative requirements.

5.2.8 Hunter Environment Lobby Inc.

The Hunter Environment Lobby Inc. objects to the proposal based on the issues raised in Table 5-10

Table 5-10 Key issues raised and responses to submission by the Hunter Environment Lobby Inc.

Issues	Responses
The EIS fails to describe hydrogeology of the project area. It needs to address groundwater flows, recharge and discharge areas, and define aquifers in the area that could be affected by operations and coal ash disposal. As a result, the EIS fails to address the full implication of ongoing coal ash disposal.	A description of hydrogeology of the Project area was provided in Section 4.8 of Appendix D of the EIS. Refer to Appendix A for further consideration of the hydrology of the study area. The EIS addresses the implications of the Project, including on water quality and hydrology and is considered to represent an improved outcome compared to the 'do nothing' scenario.
There needs to be more transparency around coal ash reuse.	As stated in Chapter 18 of the EIS, AGLM proposes to expand recycling activity, and hence is expanding the capacity of its

<p>The EIS proposes an ambitious target for coal ash reuse, seeking to recycle 1 million tonnes of coal ash. While coal ash reuse could be a good thing, the ambitiousness of the proposed reuse rate is concerning. There is little market demand for coal ash.</p> <p>Without a strong market for coal ash recycling, AGL must provide transparency regarding what will happen to coal ash in the case it cannot be reused. A thorough reuse and disposal plan will assure the community and the Department that this enormous amount of coal ash will not be dumped in abandoned mine pits. Coal ash is toxic and if not carefully disposed of can contaminate air, soil and water.</p>	<p>recycling operation (including storage, processing and dispatching facilities). This material is expected to be supplied to large road infrastructure projects on an 'as required' basis. Expansion is market driven. There is no specific reuse target for bottom ash, but it is noted that greater reuse of the bottom ash would reduce the size of the ash dam augmentation required. AGLM does not have any market guarantees for this offtake.</p> <p>The Project seeks approval such that AGLM can lawfully supply coal ash to the market on an as required basis. Refer to Section 5.4 for further details. AGLM and the EIS are transparent on how ash will be managed where it cannot be reused. This includes both the expansion of the ash dam and ongoing filling of Ravensworth coal mine voids for rehabilitation purposes in accordance with separate approvals and as regulated under EPL779 applying to the site.</p>
<p>AGL can improve the salt cake landfill lining and is non-compliant with the EPA's standards for solid landfills. AGL proposes clay liners and caps in their EIS demonstrate a lack of understanding of the risks that salt poses to the integrity of a clay landfill liner and the geotechnical process at play. Salt can destroy clay lining and poses massive contamination risks. The Department should require AGL to propose an alternative liner.</p>	<p>While detailed designs remain unavailable for the salt cake landfill a commitment has been made that they would be developed and implemented in accordance with the EPA's Environmental Guidelines: Solid Waste Management in consultation with the EPA as the appropriate regulator.</p>
<p>AGL needs to re-evaluate its EIS process and the gaps in the document and ask that they be able to submit further if more examination of the documents show up even more issues than are apparent presently.</p>	<p>The EIS provides a cross reference table in Appendix B as to how it addressed both the SEARs and <i>Environmental Planning and Assessment Regulations 2000</i>. While it is preferable that detailed design is progressed to facilitate impact assessment, a reasonable worst-case assumptions approach is considered reasonable where this is not possible. The urgency in implementing some Project components to facilitate compliance with enforceable undertakings under the POEO Act and expressed preference of Council and DPIE for consolidation of applications and approvals where appropriate, has meant that the EIS needed to progress on this basis.</p>

5.2.9 Coal-ash Community Alliance Inc.

The Coal-ash Community Alliance Inc. objects to the proposal based on the issues raised in Table 5-11.

Table 5-11 Key issues raised and responses to submission by the Coal-ash Community Alliance Inc.

Issues	Responses
Bayswater has continually been the subject of licence breaches resulting in	The Project seeks approval to lawfully complete works associated with past incidents and enforceable undertakings under the POEO

<p>finest and/or Enforced Undertakings for Air & Water pollution. These issues closely reflect the issues at other Power Stations in the region, documented in compliance reports with the cumulative Environmental impacts being duplicated, yet the breaches continue.</p>	<p>Act. The Project will result in improved environmental outcomes over a 'do nothing' scenario from an ash management perspective.</p>
<p>There are no heavy metal concentration limits in the Bayswater Environmental Protection Licence yet numerous breaches of heavy metal concentrations have occurred above Australia's National Water Quality Guidelines for species protection, being ANZECC guidelines. Water impacts in the E.I.S indicate exceedances for boron, chlorine, chromium, copper, fluoride, lead, sodium and zinc in Tinkers Creek. EPL 8, Bayswater Creek, Hunter River, Plashett Reservoir & Pikes Creek also exceeded licensing approvals and recommended limits for species protection.</p>	<p>As noted in the NSW government submission to the coal ash inquiry:</p> <p>"The National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPM) sets out a nationally consistent approach for the assessment of contamination. Under NEPM a site assessment should be carried out to determine whether site contamination poses a threat to human health or the environment and whether it is of significant magnitude to warrant remediation.</p> <p>The NEPM is clear that the assessment of site contamination should consider a hierarchy of options for site clean-up and/or management. This assessment should be part of broader site assessment and management process. The NEPM emphasises that the appropriate option at a site will vary depending on a range of local factors.</p> <p>The options chosen for site clean-up should include on-site or off-site treatment to reduce risk to an acceptable level. If that is not practical, the contamination should be isolated on site through the containment of contaminated soil and through removal of contaminated material to an approved site or facility. If the assessment indicates remediation would have no net environmental benefit or a net negative environmental impact an appropriate management strategy should be adopted.</p> <p>When deciding which option to choose, the sustainability (environmental, economic and social) of each option should be considered in order to achieve an appropriate balance between the benefits and effects of implementing the option. If there is no readily available or economically feasible method available, then regulatory controls or other forms of remediation could be adopted".</p> <p>And</p> <p>"With regard to the management of ash repositories, Groundwater investigation levels (GILs) are typically most applicable in the assessment of potential impacts to groundwater associated with the potential leaching of contaminants from ash. The GILs are defined within the NEPM as "the concentration of a contaminant in groundwater above which further investigation (point of extraction) or a response (point of use) is required". The GIL's presented within the NEPM are sourced from:</p> <ul style="list-style-type: none"> ▪ Australian water quality guidelines for fresh and marine water (AWQG) (ANZECC & ARMICANZ 2000) ▪ Australian drinking water guidelines (ADWG) (NHMRC & NRMCC 2011) ▪ Guidelines for managing risk in recreational water (GMRRW) (NHMRC 2008).

	<p>The NEPM notes that GILs were developed to avoid unacceptable impacts to exposed people or ecosystems under a range of different circumstances. The GILs for protection of freshwater and marine water ecosystems were, for example, calculated at four different protection levels, where the data permitted, and are applied according to the condition of the ecosystem. Similar to the HILs, GILs are not intended to be clean-up levels. The NEPM specifically states that “concentrations marginally in excess of the GILs do not imply unacceptability or that a significant human health or ecosystem impact is likely to be present.</p> <p>Subject to further scientific assessment, a decision not to take further action or to take further action may be justifiable based on the findings”.</p> <p>AGLM has undertaken a suite of investigations into exceedances of water quality guideline screening levels in consultation with the EPA. The Project seeks approval to lawfully implement recommendations arising out of these investigations.</p>
The EIS fails to give detail on how Bayswater ash will be reused. Doubt has been raised on AGL's ability to achieve the reuse rate set out in the EIS. How can the public be assured that the predicted amount of coal ash reuse will be achievable with such little information?	The Project seeks approval such that AGLM can lawfully supply coal ash to the market on an as required basis. AGLM are motivated to expand ash reuse as doing so allows reduced expenditure on the proposed ash dam augmentation. Refer to Section 5.4 for further details on AGLM's approach to ash reuse.
Concern that AGL's predicted reuse rate is only for their current annual production of new ash and does not include material stored within their dam over decades, leading to further water pollution through leachate and ash dam overflow.	The extraction and reuse of all ash within the BWAD is not currently proposed however, if a feasible method and viable market arises in the future the Project would not preclude such an undertaking. The Project represents AGLM's approach to improving seepage management and will result in an improved outcome when compared to a 'do nothing' scenario. The detailed design of the ash dam would consider flooding risks and the ash dam expansion is required such that ash overflows could be prevented.
Only on-site ash processing for reuse and production of products is acceptable from an environmental perspective.	AGLM has completed ash classification reports for both bottom ash and fly ash generated by Bayswater which confirm they comply with parameters of the Coal Ash Order and Exemptions under the POEO Act. The sale or reuse of ash from Bayswater will only be undertaken where able to comply with existing coal ash orders and exemptions of specific waste exemptions and after implementing compliant ash sampling and analysis plans accepted by the EPA.
Any Salt Cake landfill proposal must be accompanied by a reassurance of World's Best Practice techniques to satisfy the community's concerns of further groundwater contamination at the hands of Bayswater. The C.C.A. does not believe this information is forthcoming through this E.I.S.	While detailed designs remain unavailable for the salt cake landfill a commitment has been made that they would be developed and implemented in accordance with the EPA's Environmental Guidelines: Solid Waste Management in consultation with the EPA as the appropriate regulator.

5.3 Summary of Community submissions

5.3.1 Submitter SE-8529500

The submitter commented to DPIE about how environmental enhancements within a community are omitted from major projects, the risk of COVID-19 and bilateral agreements such as the EPBC Act.

AGLM has no comment to provide in relation to the submission.

5.3.2 Submitter SE-8689035

Issues	Responses
It is difficult to see that the Coal Ash Dam is being "augmented", it is being made bigger.	The EIS includes a glossary of terms and abbreviations in which Ash Dam augmentation is defined as "Expansion of the existing Bayswater Ash Dam to provide additional ash storage capacity and improvements to water management structures and systems to ensure continued collection and reuse of process water and return waters from the Bayswater Ash Dam". For avoidance of doubt, the development application seeks approval to increase the size of the ash dam as described in Chapter 2 of the EIS.
Concern that clay is not totally impermeable and that the risk of water pollution from the coal ash that gets dumped in the Ravensworth Final Void has not been considered.	The use of ash in filling Ravensworth coal mine voids is separately approved and no changes to this process are sought as part of the Project.
Concern that salt cake is regarded as solid waste as once the salt cake gets wet, it will become liquid. This is a concern given there are toxic heavy metals in the groundwater which would become concentrated in the salt cake.	The management of the salt cake landfill would be undertaken such that water ingress into the salt cake is avoided. The detailed design of the landfill would be undertaken in consultation with the EPA.
It is not clear that the requirement to avoid and minimise impacts on Matters of National Environmental Significance has been complied with.	A revised BDAR provided in Appendix B deals with avoidance and mitigation measures for biodiversity including matters of national environmental significance.
If the design of the augmentation of the dam included lining with a membrane, the area of vegetation clearing would be less as there would be less need for clay.	Borrow-pits are proposed to supply clay for the creation of the new levee dam, saddle dams, internal divider walls, additions to the existing northern saddle dam and ash dam capping. No use of clay to line the existing or new areas of the ash dam is proposed.
The Federal Government has not received adequate information to determine the significance of impact of the proposal on Demla impar, Striped Legless Lizard which is listed as Vulnerable under the EPBC Act and so cannot make an informed decision.	The BDAR has applied the precautionary principle and assumed presence of the species in suitable habitat. Mitigation measures are proposed to minimise impacts and residual impacts to the species would be offset in accordance with the NSW Biodiversity Offset Strategy.
The reuse of decontaminated coal ash is highly appropriate but this proposal lacks due diligence.	AGLM has completed ash classification reports for both bottom ash and fly ash generated by Bayswater which confirm they comply with parameters of the Coal Ash Order and Exemptions

	under the POEO Act. The sale or reuse of ash from Bayswater would only be undertaken where able to comply with existing coal ash orders and exemptions of specific waste exemptions and after implementing compliant ash sampling and analysis plans accepted by the EPA.
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5.3.3 Submitter SE-8689407, Submitter SE-8694753, Submitter SE-8695498, Submitter SE-8700977, Submitter SE-8701357

The submitters raised the following issues relating to the proposal:

- The proposal employs risky coal-ash reuse practices with little community benefit and high environmental risk
- Coal-ash would be dumped in the Ravensworth mine void
- The proposal lacks any information about water pollution risks from heavy metal leachate
- The proposal will see up to one million tonnes of coal-ash reused with no detail about where, how or for what purpose
- There are no plans to safely, beneficially and economically reuse decontaminated coal-ash in building products which could bring employment to coal-energy regions and reduce volumes stored in leaching dumps
- A “cap and monitor pollution” approach is planned for the so-called remediation of huge toxic waste sites.

These submissions reflect the comments from the Correct Planning and Consultation for Mayfield Group. Refer to Table 5-9 above for response.

5.3.4 Submitter SE-8689916

The submitter objects to the proposal and made the following comments:

- The proposal should not go ahead
- The proposal is money misspent and should instead be spent on clean energy and storage
- Bayswater uses toxic, poisonous and atmospherically damaging methods to generate electricity and its ongoing use as a power source is damaging to human health and the environment
- The EIS fails to state how much diesel fuel is used to run the power station and to extract coal and carry out the upgrade
- Concern that burnt diesel fuel is toxic
- The EIS does not clarify how much carbon dioxide will be discharged before and after the upgrade
- The EIS does not state how much dust would settle on the surrounding towns and fields.

The submission appears to be in relation to the previously approved Turbine Efficiency Upgrade Project. The Project does not seek approval for the ongoing operation of Bayswater and instead is aimed at improving environmental management of coal ash and process water over the remainder of Bayswater’s operational life.

5.3.5 Submitter SE-8690012

The submitter objected to the proposal based on the following issues:

- The proposal should be altered to produce electricity through sustainable and biologically harmonious methods
- Concern that the atmospheric emissions and coal-ash waste created by using more coal will be a perpetual problem

- The cap and monitor approach will not stop continual leaching of heavy metals and other chemicals into the groundwater
- Existing ash needs to be extracted and locked into new products at a dilution that will be safe for exposure to the atmosphere.

The Project does not seek approval for the ongoing operation of Bayswater. The Project is AGLM's preferred approach to reducing acknowledged ash dam seepage impacts and represents an improved outcome from a water quality perspective compared to a 'do-nothing' scenario. AGLM has completed ash classification reports for both bottom ash and fly ash generated by Bayswater which confirm they comply with parameters of the Coal Ash Order and Exemptions under the POEO Act. The sale or reuse of ash from Bayswater will only be undertaken where able to comply with existing coal ash orders and exemptions of specific waste exemptions and after implementing compliant ash sampling and analysis plans accepted by the EPA.

5.3.6 Submitter SE-8696109

The submitter objected to the proposal based on the following issues:

- The purpose of the proposal is to increase the capacity of Bayswater ash dam and not for coal reuse or for the mitigation of heavy metal leachate contamination
- The EIS does not provide enough information to adequately identify the impacts of the proposal
- The EIS provides inaccurate estimates of coal ash produced, volumes of coal burn, and provides no estimates of the ash content of the coal burnt
- The EIS does not provide laboratory analyses of the ash dumped or intended to be reused, or the leachate produced
- No information is provided on what the reused ash will be used for
- The volume of ash intended to be reused is overly optimistic and unlikely to be met without economic incentive
- Increasing the amount of ash dumped at Pikes Gully ash dump and the Ravensworth mine void will increase heavy metal contamination of the Hunter River Valley.

The submission reflects the content of the organisation submissions. Refer to Sections 5.4 and 0 for further details regarding ash reuse and ash dam seepage investigations.

5.3.7 Submitter SE-8697398

This submitter provided options on behalf of two businesses for a partnership to manage and direct fly ash for beneficial reuse. Edos Global and Nexsys Industries are seeking partners to utilise coal ash for sustainable social housing solutions. This would provide the opportunity for 100% repurposing of fly ash for beneficial reuse without further processing.

AGLM welcomes the interest in the use of ash from Edos Global and Nexsys. The Project aims to improve ash management over the remaining life of Bayswater but does not preclude the separate assessment and development of alternative uses of ash. AGLM are open to conversations with technology providers with proposals for the use of ash but remain focussed on the critical need to maintain the ability of Bayswater to generate electricity and as such have prioritised the steps necessary and within their control to facilitate the improved environmental performance of existing ash management processes and practices.

5.3.8 Submitter SE-8703344

The submitter stated that while safe reuse may be commendable if done well, they object to the proposal based on the following issues:

- NSW has a very poor record of ash dam management and the application should not proceed until the NSW Upper House Inquiry into coal ash has concluded and the report has been made public

- Further work should not be undertaken without full consideration of the liabilities of coal ash contamination and clean-up
- It is unclear how the applicant will guarantee public safety and environmental protections, or how the community can benefit given a recent SO52 in NSW Parliament which showed high levels of heavy metal contamination at all ash dams
- Reuse methods and markets are unclear
- The application does not provide sufficient information to determine if the re-use process will be safe.

The submission reflects the content of the organisation submissions. Refer to Sections 5.4 and 5.5 for further details regarding ash reuse and ash dam seepage investigations.

5.3.9 Submitter SE-8704036

The submitter objected to the proposal based on the following issues:

- The EIS is incomplete and lacks key information including a description of the hydrology of the project area which would inform detail of groundwater flows, recharge areas and discharge areas, and the identification of aquifers in the area that could be affected by the industrial operations and coal ash disposal practices
- The Department should evaluate the compliance of the EIS with the EP&A Act
- The ambitiousness of the proposed coal ash reuse rate is concerning as there is little market demand for coal ash. Without a strong market for coal ash reuse, AGL must provide transparency regarding what will happen to coal ash in the case it cannot be reused. A thorough reuse and disposal plan should be prepared.
- Concern that coal ash is toxic and if not carefully disposed of can contaminate air, soil and water.

The submission reflects the content of the organisation submissions. Refer to Sections 5.4 and 5.5 for further details regarding ash reuse and ash dam seepage investigations.

5.3.10 Submitter SE-8824827

The submitter objects to the proposal based on the following issues:

- Ash dam expansions are not part of emergency climate actions and the management of these dams in the Upper Hunter is of great concern
- Questioning why AGL have been given another go when their coal ash was found to contain elevated levels of heavy metals
- Concern about the issue of toxic pollution that ash dams cause
- The toxic nature of coal ash is a major health risk for nearby communities, and communities need protection from recklessly wilful development put forward by fossil fuel companies
- All coal fired power stations should be shut down
- Concern about the impacts of such proposals on future generations
- The proposal should be rejected.

The submission reflects the content of the organisation submissions. Refer to Sections 5.4 and 5.5 for further details regarding ash reuse and ash dam seepage investigations. AGLM acknowledges that the cessation of operation of Bayswater would be the preferred option for many respondents, however Bayswater operations have been endorsed as remaining critical to the stable operation of the NEM as it transitions to renewable generation coupled with storage. As described in the EIS, AGLM has an announced plan for retiring Bayswater in 2035 while delivering on obligations to the community and customers.

5.4 Response to Ash re-use

In requesting this RtS, DPIE also required that in addition to any issues identified in the submissions, the RtS include further information and clarification on the following identified key area of consideration by the Department:

- Historic ash recycling rates at the site
- Background to the proposed ash recycling projections provided in the EIS and demonstration that opportunities to recycle ash will be maximised
- Assessment of ongoing market demand and marketing strategy, including background to the conclusions regarding reduction in market supply and existing market gaps provided in the EIS, and how ash products may compete with other products in the market.

Various submissions also raise concerns regarding the suitability of ash for re-use following AGLM's identification and reporting of non-compliances in relation to sampling and analysis under the Coal Ash Order 2014.

5.4.1 Historic ash recycling rates

AGLM has maintained records of ash sales since acquiring Bayswater and these are presented in Table 5.12.

Table 5.12: Historic ash sales

Month	Fly Ash (Tonnes)	Bottom Ash (Tonnes)	Cenospheres (Bayswater and Liddell Combined) (M ³)
Aug-14	8,894.23	6,559.03	324.00
Sep-14	14,885.93	7,975.93	891.00
Oct-14	11,373.62	7,883.62	486.00
Nov-14	9,979.87	6,394.71	-
Dec-14	7,543.49	4,275.78	324.00
2014 totals (5 months)	52,677.14	33,089.07	2,025.00
Jan-15	2,965.08	4,341.98	162.00
Feb-15	6,201.58	5,232.74	162.00
Mar-15	8,463.37	6,293.41	243.00
Apr-15	7,289.35	5,022.69	-
May-15	9,083.12	5,577.17	69.92
Jun-15	8,905.56	6,365.53	243.00
Jul-15	11,317.24	9,200.70	324.00
Aug-15	9,417.79	6,961.96	-
Sep-15	11,238.80	6,147.93	972.00
Oct-15	11,345.37	5,690.42	486.00
Nov-15	12,078.03	5,280.34	162.00
Dec-15	3,891.68	4,560.10	-
2015 totals	102,196.97	70,674.97	2,823.92

Month	Fly Ash (Tonnes)	Bottom Ash (Tonnes)	Cenospheres (Bayswater and Liddell Combined) (M³)
Jan-16	5,641.11	3,725.55	-
Feb-16	17,528.48	5,622.43	324.00
Mar-16	16,470.11	6,387.68	243.00
Apr-16	16,592.07	5,540.23	-
May-16	20,586.26	6,381.85	405.00
Jun-16	16,996.12	5,091.82	-
Jul-16	14,605.88	5,639.78	175.87
Aug-16	14,596.76	6,171.39	972.00
Sep-16	17,145.82	10,556.69	162.00
Oct-16	17,923.72	7,014.41	162.00
Nov-16	23,201.01	8,420.42	
Dec-16	13,729.84	7,964.89	162.00
2016 totals	195017.18	78517.14	2605.87
Jan-17	10,687.03	3,425.19	567.00
Feb-17	17,764.03	5,775.39	-
Mar-17	13,236.05	6,259.76	
Apr-17	13,289.84	5,023.92	
May-17	14,519.21	7,245.56	81.00
Jun-17	11,172.85	5,770.88	162.00
Jul-17	17,520.06	6,222.61	729.00
Aug-17	23,414.70	6,005.33	324.00
Sep-17	15,958.82	5,099.86	-
Oct-17	14,122.55	4,555.82	162.00
Nov-17	13,583.39	5,650.58	81.00
Dec-17	11,086.19	5,151.35	-
2017 totals	176354.72	66186.25	2106
Jan-18	9,288.40	3,977.76	243.00
Feb-18	13,722.90	4,987.29	243.00
Mar-18	13,136.15	4,170.30	81.00
Apr-18	14,101.16	4,362.50	81.00
May-18	19,155.71	6,193.24	162.00
Jun-18	12,183.63	4,220.63	-
Jul-18	14,264.07	4,331.83	
Aug-18	16,243.84	4,565.18	

Month	Fly Ash (Tonnes)	Bottom Ash (Tonnes)	Cenospheres (Bayswater and Liddell Combined) (M³)
Sep-18	16,619.65	5,050.66	162.00
Oct-18	9,325.79	5,240.40	709.00
Nov-18	15,406.01	4,768.80	466.00
Dec-18	9,918.44	3,192.32	162.00
2018 totals	163365.75	55060.91	2309
Jan-19	Ash sales suspended	Ash sales suspended	No Cenospheres
Feb-19	Ash sales suspended	Ash sales suspended	No Cenospheres
Mar-19	Ash sales suspended	Ash sales suspended	No Cenospheres
Apr-19	Ash sales suspended	Ash sales suspended	No Cenospheres
May-19	Ash sales suspended	Ash sales suspended	No Cenospheres
Jun-19	3,095.23	Ash sales suspended	-
Jul-19	7,076.49	Ash sales suspended	324.00
Aug-19	7,585.11	Ash sales suspended	648.00
Sep-19	8,534.03	Ash sales suspended	648.00
Oct-19	8,933.19	Ash sales suspended	648.00
Nov-19	7,950.16	Ash sales suspended	648.00
Dec-19	5,194.38	Ash sales suspended	324.00
2019 totals	48368.59	0	3240
Jan-20	5,279.40	Ash sales suspended	-
Feb-20	6,194.97	Ash sales suspended	-
Mar-20	7,471.01	Ash sales suspended	-
Apr-20	7,540.85	Ash sales suspended	81.00
May-20	7,542.97	Ash sales suspended	81.00
Jun-20	8,369.09	Ash sales suspended	324.00
2020 (to June)	42,398.29	0	486.00

The following summary notes are provided in relation to the period since January 2019:

- No fly ash taken for period of 6 months January to June 2019 due to the preparation of sampling plan & approval by EPA
- Fly ash & cenosphere sales reinstated in July 2019 with slow restart due to loss of supply contracts to respective clients by ash contractors
- New Fly Ash agreements for longer tenure periods started 1 September 2020
- Bottom ash sales remain suspended pending approval of ash sampling plan and issue of specific waste exemption if necessary.

5.4.2 Ash sales projections

The following ash sales projections were provided by AGLM for the period 2021 to 2025.

Table 5.13: Ash sales projections

Year	Fly Ash (Tonnes)	Bottom Ash (Tonnes)	Cenospheres (m ³)
2021	250,000	30,000	7000
2022	400,000	70,000	7000
2023	400,000	80,000	8000
2024	400,000	100,000	8000
2025	350,000	100,000	6000

The above forecasts are based on the following:

- AGLM has currently entered into 5-year contracts with two companies for the supply of fly ash from Bayswater
- AGLM is not currently able to enter into contracts for bottom ash sales but anticipates approval of a revised bottom ash sampling plan that will allow bottom ash sales to re-commence in 2021
- Cenospheres are currently collected and sold from both Bayswater and Liddell and would be reduced following the closure of Liddell.

As stated in the EIS, the Project seeks approval to increase the scale of current coal ash recycling activities from Bayswater to enable the beneficial reuse of up to 1,000,000 t per annum of ash during periods of peak demand. It is currently envisaged that average production values would reach around 600,000 t per annum depending on activity within the construction industry and proximity to AGLM. The purpose of establishing a 1,000,000 ts per annum threshold was to allow AGLM flexibility to lawfully supply potential major construction projects on an as needed basis in addition to ongoing contracts. Upcoming major projects in the Hunter Valley which could be supplied by Bayswater include Singleton Bypass, Muswellbrook Bypass, Golden Highway widening project and minor rural road projects by Muswellbrook, Singleton, Maitland and Upper Hunter Councils.

5.4.3 Assessment of Market Demand

In 2015, AGLM engaged BG&E Materials Technology (BG&E, 2015) to provide consultancy expertise in developing a long term strategy for disposal and utilisation of fly ash (run of station ash) and bottom ash within a commercial context. While out of date in relation to description of current status of site activities, BG&E (2015) remains the basis of AGLM's understanding of the market and represents the recommendations on which AGLM's future ash sales forecasting is based.

5.4.4 Consideration of ash suitability for re-use

A number of submissions raise concerns regarding the suitability of Bayswater derived coal ash for intended but unspecified reuse purposes. These concerns are related either to AGLM's identified and self-reported non-compliance with Coal Ash Order 2014 sampling and analysis requirements first identified in January 2019 or in general concerns regarding ash toxicity.

AGLM has entered into an enforceable undertaking under the POEO Act following the self-identification of deficiencies in complying with sampling frequencies and analysis test methods for bottom ash in January 2019. AGLM took the following steps in response:

- Voluntary suspension of ash sales
- Notification to the EPA

- Publication of media releases for community
- Review of sampling results by independent environmental consultants
- Commissioning a Human Health and Ecological Risk Assessment as a precaution.

The Human Health and Ecological Risk Assessment (Environmental Risk Sciences Pty Ltd, 2019) reached the following conclusions:

"There are no human health risk issues of concern in relation to exposures to workers or the general public as a result of the beneficial re-use of coal ash materials from Bayswater Power Station and Liddell Power Station..."

There are no concentrations of metals, pH or conductivity in coal ash materials beneficially reused from Bayswater Power Station and Liddell Power Station which are considered to be of concern to terrestrial ecology or aquatic ecology".

AGLM has subsequently completed ash classification reports for both bottom ash and fly ash generated by Bayswater which confirm they comply with parameters of the Coal Ash Order and Exemptions under the POEO Act (Refer to Appendix E). The sale of bottom ash remains suspended pending acceptance of AGLM's updated sampling and analysis plans and issue of specific waste exemption by the EPA.

5.4.5 Proactive steps to increase ash reuse

As noted throughout this report and acknowledged by a range of responders to the Project and the Public Works Enquiry into the *Costs for Remediation of Sites Containing Coal Ash Repositories*, energy generators are not best placed to establish markets for ash re-use. AGL is committed to, and seeking approval for, works that would best allow AGL to respond to market demand as it increases. The following proactive steps to increase ash reuse are within AGL's control and are currently proposed:

- An updated sampling and analysis plans is being finalised for lodgement with the EPA seeking a specific waste exemption under the Protection of the Environment Operations Act 1997 to allow bottom ash harvesting to recommence. AGL anticipates this to occur from January 2021
- An expression of interest process is planned to be distributed to possible contractors for harvesting of bottom Ash and AGL has received and responded to a number of informal enquiries from interested contractors including submitters to the Project
- AGL proposal to join the Ash Development Association of Australia to draw on resources to assist with plans to develop an ash strategy and explore opportunities to increase utilisation of coal combustion products
- Future road projects planned for the Hunter Region could see an increase in current monthly ash tonnages and AGL are tracking the progress of these Projects and seeking to be ready to respond subject to approval of increased reuse volumes through this application

As of 1 September 2020, AGL have established two new, 5 year, supply agreements with incumbent customers. Further agreements are under consideration and are to be driven by an uplifted focus on Business Development for AGL's bi-product beneficial reuse.

5.5 Response to Ash dam seepage and water quality impacts

Various submissions, and in particular the EPAs submission, raised questions regarding the level of information provided in relation to water quality impacts surrounding the BWAD and salt cake landfill. The EPA request for additional information is addressed in Appendix A and forms the basis to responding to organisation and public submissions that sought more information or commented as follows:

- Description of the hydrogeology of the project area
- Coal-ash and water pollution risks
- Inadequacy of current coal ash containment facilities

- Risks associated with degradation of salt cake landfill liner.

The following sections respond to these concerns with further detailed information provided in Appendix A.

5.5.1 General clarifications

The EIS does not seek approval for, or assess the ongoing operation of Bayswater or the legacy decisions that have led to the formation of Bayswater Ash Dam in its current configuration. AGLM are responding to this ash disposal legacy through the Project by improving seepage management. The fact that seepage with associated impacts is occurring is not disputed and the Project represents AGLM's identified reasonable and feasible response to reducing these impacts. A commitment has been made to the effect that the detailed design of the seepage collection upgrade would facilitate an improved environmental outcome on a do-nothing scenario with the inclusion of the expansion of the Bayswater Ash Dam.

Approval of the Project is required to facilitate AGLM lawfully complying with expected outcomes of pollution reduction investigations and programs related to ash dam seepage.

Disposal of Bayswater ash into Ravensworth South Mine voids commenced in 2014 and is expected to continue until the retirement of Bayswater (2035) Ash disposal to Ravensworth is regulated under EPL 799 and separate approvals under the EP&A Act. AGLM is currently working on an application to modify its consent to operate the Ravensworth South Mine ash emplacement area. . For the avoidance of doubt, the Project does not seek approval of any change in ash deposition rates or management beyond the replacement of the Ravensworth ash pipeline that is used in this process.

5.5.2 Description of Hydrogeology

Groundwater is likely to be hosted in two primary formations: the porous sediments of the alluvium associated with the creeks in the Project area, and the fractured rock aquifer of the Permian sequences.

The creek lines may host a small amount of alluvium, which is considered to be sediment that has been transported by water movement and shows flow structure. The groundwater in the alluvium is likely to be unconfined. Groundwater flow in these systems generally flow parallel to the creek flow direction, and dependent on the stream size, whether it is ephemeral perennial etc.

Groundwater hosted in fractured rock systems are likely to be hosted either in the primary porosity of the rock or within the fractures, joints and bedding planes of the rock units. The key aquifers in the fractured rock systems are the coarse and weathered units and the coal seams. the coal seams host groundwater within the jointing and cleat network within the coal seams. The fractured rock groundwater systems can be confined or unconfined, and the shallow aquifer flow directions follow the general surface topography.

Discharge of groundwater from the fractured rock aquifers to the surface and to alluvium can occur at seepage points at the surface or in subcrop. Groundwater from the fractured rock aquifers in the area is generally considered to be brackish to saline. The alluvium is predominantly recharged by rainfall, with a small percentage of rainfall infiltrating to the water table. The alluvium in the area discharges eventually to the Hunter River alluvium or it contributed to baseflow of the surface water bodies. The alluvium is most likely to be recharged by rainfall and discharge from the underlying fractured rock aquifers, except in areas where the fractured rock has been depressurised and/or dewatered by mining. In the areas of depressurisation, the hydraulic gradient may be the opposite and the alluvium may recharge the fractured rock aquifers. Interaction between the porous aquifers and the fractured rock aquifers is likely to be low where the environment is not disturbed.

Depths to groundwater vary considerably. In the alluvium, unconsolidated porous material (such as colluvium) and the weathered rock (all unconfined aquifers) the depth to groundwater is generally low – with depths to water between 0 m below ground level (mBGL) and approximately 10 mBGL. In the fractured rock aquifers, depth to water ranges for a few metres to tens of metres below ground level.

5.5.3 Conceptual site model

Groundwater is hosted in two main geological units: the porous alluvial deposits and weathered regolith that hosts the unconfined water table aquifer, and the fractured rock units of the Permian aged rock units that can host unconfined, semi-confined and confined aquifers. The groundwater flow of the alluvium is generally parallel to the orientation of the surface water flow and the flow within the weathered regolith aquifer generally follows the topography.

In undisturbed conditions, groundwater recharge occurs from rainfall runoff and seepage or surface water to the underlying geology. A small proportion is recharged to the porous media aquifers which in turn recharge a yet smaller proportion to the fractured rock aquifers. At the site, seepage from the BWAD also contribute an additional amount of seepage and the groundwater in the alluvium is likely to be a combination of rainfall runoff, BWAD seepage and discharge from the fractured rock units (including the coal seams).

Currently, seepage from the BWAD appears to occur predominantly at the Main Embankment and the Saddle Dam. Seepage from the Main Embankment is collected at Seepage Collection Ponds 1 and 2, with a larger proportion of seepage that is lost to the surrounding environment, including Pikes Creek, which flows into Bayswater Creek. Seepage from the Saddle Dam is discharged to Chilcotts Creek and subsequently Lake Liddell. Discharge from Lake Liddell meets the required criteria for discharge under EPL 779. A small amount of discharge also appears to occur south of the BWAD (to Eye Creek). Eye Creek is a tributary of Pikes Creek and it discharges ultimately to Bayswater Creek.

The water quality of the BWAD decant and waste stream water has a pH ranging from 7 to 8 and an electrical conductivity (EC) of between 4500 and 5000 $\mu\text{S}/\text{cm}$. Dissolved metals concentrations are elevated with exceedances of the ANZECC (2018) - slightly to moderately disturbed freshwater aquatic criteria for aluminium, arsenic, boron, barium, beryllium, cadmium, chromium, copper, iron, molybdenum, nickel, lead, selenium, vanadium, zinc and total nitrogen. No detects above limits of reporting were recorded in the BWAD for PAHs, TPHs, TRHs, BTEXN, PCBs, lead, mercury or cyanide. The correlation between total and dissolved metals, and the notable presence of inorganics such as sulphur, suggests the potential for leaching of minerals from the solid ash entering the ash dam.

Dissolved metals concentrations decrease with increasing distance from the BWAD. Dissolved metals concentrations and exceedances in the lower reaches of Pikes Creek were significantly lower than water samples at the Main Embankment seepage point. This is likely due to negatively charged clays in the ground at site having high surface to volume ratio enabling positively charged heavy metals to bind/sorb on its surface. Additionally, brackish and saline water can cause fine particles to settle out considerably faster than in fresh water (4-200 times, depending on particle size) (Flemming, Burghard & Delafontaine, 2016, and Ugwu and Igboke, 2019).

The range of pH of surface water is greater with increasing distance from the BWAD but remains within the criteria for ANZECC (2018) - slightly to moderately disturbed freshwater aquatic ecosystems. EC also increases with distance from the BWAD. This is likely due to a combination of discharge of brackish/saline water from adjacent seam subcrops and concentration due to evapotranspiration.

The contribution of metals due to rainfall run off is likely to be low. Water samples from four agricultural dams located adjacent the BWAD showed that collected run off is of neutral pH, low EC and low in metals concentrations.

Generally, pH and many trace metals were below recommended guideline values for protection of aquatic ecosystems and other nominated environmental values. There were however some trace metals that were above recommended ANZECC (2018) water quality guidelines at numerous sites and included chloride, copper, fluoride nickel, sodium, zinc. No waterways within the Project footprint area have been classified as sensitive receiving environments; therefore, the risk of negatively impacting the surrounding environment is low.

With the exception of potential salinisation associated with the proposed salt cake landfill, the Project is expected to generate negligible impacts to groundwater and risks to groundwater are assessed as low. This

conclusion is based on a detailed review of background groundwater level and quality data, along with an analysis of the existing environmental setting and an assessment of the Project elements. Saline/briny water may migrate to underlying and surrounding groundwater systems, if the salt cake landfill liner were to leak. A commitment has been added that the detailed design of the salt cake landfill would be in accordance with applicable guidelines and be undertaken in consultation with the EPA. Further, a trigger action response plan is proposed to address monitoring and responses in the event of liner failure.

Additionally, the seepage control upgrades associated with the Main Embankment and Saddle Dam walls will improve seepage recovery. It is proposed that a seepage collection system will be installed at the Saddle Dam seepage and that will return the loss, which is estimated to be between 0.05 ML/ day [35 L/min] and 0.14 ML/ day [95L/min]. Also, seepage control upgrades at the Main Embankment area will double the estimated lower limit of the water return to 26 L/min for the 3 hr daily pumping time.

5.5.4 Coal ash containment adequacy

The use of liners in new waste emplacement facilities is current standard practice. In the case of the BWAD, there is no feasible manner of installing liners below existing ash emplacement areas. Installing a liner on new areas would not reduce seepage from the BWAD because the currently emplaced material (predominantly, ash) is saturated and would constitute an ongoing source of seepage water. PRP 1 recommended that the BWAD Main Embankment Seepage Ponds be upgraded and/or have new seepage cut-off / collection ponds constructed. The existing ponds, and any additional ponds that are constructed, will be lined if considered beneficial in capturing and returning more seepage at the time of design.

The EIS outlines a proposed BWAD closure and rehabilitation plan. The EIS states that once the augmented BWAD has reached capacity, rehabilitation would be undertaken to integrate the BWAD within the existing landform, as far as possible. Rehabilitation would be undertaken in accordance with AGLM's Rehabilitation Management Plan and would include capping, measures to prevent any ponding or disruption to water flows, stabilisation and revegetation. Seepage from BWAD would not get worse post capping but ongoing seepage monitoring, and management if necessary, is likely to be required until such time as the regulator is satisfied that unacceptable environmental risks would not eventuate.

5.5.5 Salt cake landfill

The Project includes the construction and operation a salt cake landfill facility to dispose of salt cake waste from the Bayswater water treatment plant. The EIS stated that the key landfill risks were to surface water quality from the operation of the landfill facility are related to contaminated leachate from the landfill site or by uncontrolled stormwater flows containing sediments and contaminants entering downstream waterways. To reduce the risk of leachate and waste entering the surrounding environment, the landfill facility would be designed in accordance with EPA (2016) requirements and would include a liner. In the event of a liner failure, saline/briny water was modelled to migrate from the landfill beyond a distance of 40 m, such that the beneficial use category of the groundwater source may be lowered. Therefore, the Project is assessed to not meet the NSW Aquifer Interference Policy (DPI, 2012) minimal impact consideration with regards to groundwater quality. As committed to in the EIS, further consideration will be given to the selection of an appropriate salt cake landfill liner. This will be undertaken at the design stage of the landfill. Additionally, site management protocols will be developed to mitigate risks from erosion, uncontrolled stormwater flows, stockpiles and sediment transport.

6. Updated project description

This Chapter provides the full description of the Project including activities associated with construction, operation and decommissioning, where relevant, of each Project component based on current available design information.

6.1 Project summary

The purpose of the Project is to improve the management of Bayswater's ancillary processes over the remaining operating life of Bayswater and to facilitate an improved rehabilitation outcome for the ash disposal area. This would involve:

- Optimising and improving ash management including augmenting the existing ash disposal area, and augmentation of the existing ash harvesting and recycling facilities
- Creation of a salt cake disposal landfill as the current disposal location is nearing capacity and to complete the alternative process for managing water impurities and reduce the reliance on the HRSTS
- Improvements to water management around the CHP area.

A summary of project aspects for assessment is provided in Table 6-1 based on worst case consequences likely to result from overlapping project components. Further details of each Project element are provided in subsequent sections.

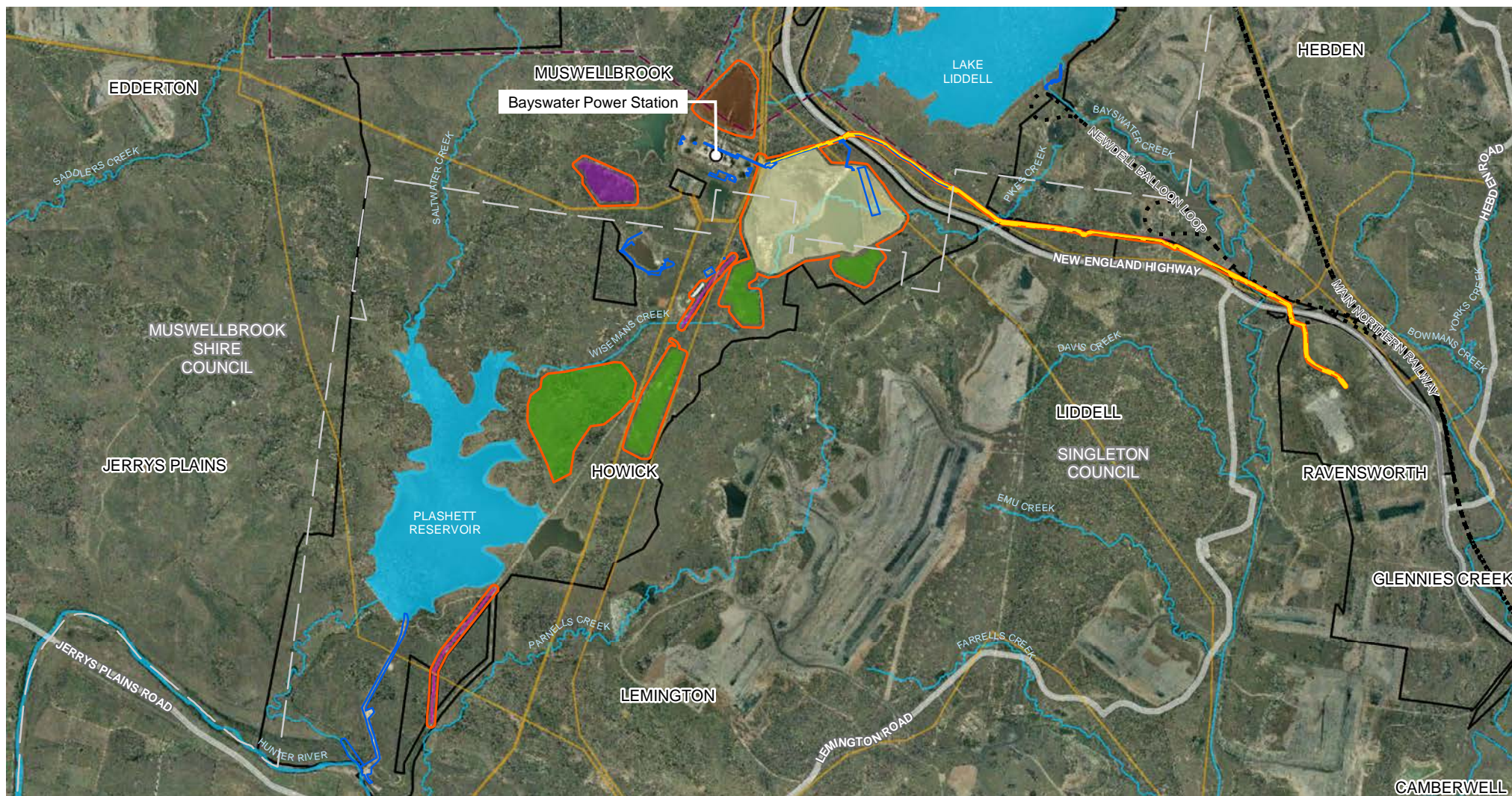
Table 6-1: Summary of Project

Project Element	Summary of the Project	
Site Description		
Local Government Area (s)	Singleton and Muswellbrook	
Project location	Bayswater Power Station operational area, with a component of works extending to the Ravensworth rehabilitation area. The majority of the works would be undertaken within the AGL Macquarie Landholding except for a small parcel of Crown land, Singleton Council owned land and TfNSW owned land.	
Formal identifier	Lot 601 DP 1019325 Lot 112 DP 1059007 Lot 2 DP 1095515 Lot 1 DP 113655 Lot 1 DP 1142103 Lot 2012 DP 1151790 Lot 1 DP 1158700 Lot 120 DP 1174907 Lot 1 DP 1175303 Lots 1 & 2 DP1193248 Lot 910 DP 1123501 Lot 3 DP 1193253 Lot 10 DP 1204457 Lots 4, 6, 9 & 11 DP 247943 Lot 13 DP 247945 Lot 1 DP 616025	Lot 2 DP 619383 Lot10 DP 700554 Lots 19, 30, 62, 75, 86, 88, 89, 150, 151 & 331 DP 752468 Lots 1 & 2; DP 774679 Lot 1 DP 369326 Lot 102 DP 1053098 Lot 14 DP 1193430 Lot 1 DP 252530 Lot 2 DP 327372 Lot 5 & 6 DP 966589 Lot 107 DP547864 Lot 4 DP 1193254 Lots 1 & 2 DP 574168 Lot 1 DP 616024
Zoning	SP2 Infrastructure (energy generation) and RU1 Primary Production	

Project Element	Summary of the Project
Permanent footprint	<p>Much of the permanent facilities associated with the Project would be limited to upgrades of existing infrastructure within areas associated with Bayswater operations, with the exception of:</p> <ul style="list-style-type: none"> ▪ Additional access tracks associated with increased ash harvesting and recycling ▪ Augmented ash disposal area which would occupy an additional area of approximately 167,000 square metres (m²). <p>While the salt cake landfill facility and Borrow Pits would be reinstated progressively, they would result in an altered landform with restricted rehabilitation and as such are considered to form part of the permanent footprint of the Project. Each area would be rehabilitated to an agreed landform.</p>
Access	<p>Access to and from Bayswater is provided by slip-lanes from the New England Highway into an existing site access road. Access to Ravensworth Ash line would be via Pikes Gully Road and Hebden Road.</p>
Construction	
Construction ancillary facilities	<p>Infrastructure including internal access roads, water supply and power services, laydown areas, temporary sheds incorporating offices and associated amenities would either be located within the maximum disturbance footprint or be part of the existing facilities at Bayswater.</p>
Project construction footprint (maximum disturbance footprint assessed)	<p>The study area for the Project is shown in Figure 6-1.</p> <p>This has been defined as the maximum construction footprint, plus an approximately 50-metre-wide buffer area, which has been included in the assessment to account for possible indirect impacts.</p> <p>Where possible, construction activities would be reduced to minimise disturbance of environmentally sensitive areas.</p>
Construction Workforce	<p>The Project would provide employment for up to 90 Full Time Equivalent workers (at peak) over the project duration.</p>
Construction Hours	<p>Works would be undertaken during standard and out-of-hours construction hours. Oversized deliveries would be undertaken in accordance with relevant legislative requirements which could require some works to be undertaken outside of standard hours. Some works may be required to coincide with scheduled outage periods.</p>
Construction schedule	<p>For the purposes of this assessment, it has been assumed that during peak construction periods, construction of all Project elements would be undertaken concurrently, and excavation would be undertaken from one of the four Borrow Pits.</p> <p>The finalised construction schedule would be further developed as part of design refinements, based on AGLM's operational requirements and in consultation with delivery contractors. Some works may be staged, as deemed necessary. It is anticipated that the staging of construction works would result in a reduction of construction related environmental impacts.</p>
Daily construction traffic volumes	<p>Traffic generated by the Project construction would involve employees' vehicles and the transportation of containers and construction materials.</p> <p>Light vehicles would be required for workers. It has been assumed that each worker would travel to site in a personal vehicle. However, it is possible that private buses may be used to transport workers.</p> <p>The peak traffic movements related to the Project (to and from Bayswater) are expected to be approximately:</p> <ul style="list-style-type: none"> ▪ 180 light vehicles (90 in and 90 out per day)

Project Element	Summary of the Project
	<ul style="list-style-type: none"> 50 heavy vehicle movements (25 in and 25 out per day). <p>In addition, up to 8 oversized vehicle movements would be expected for the delivery of weighbridges and the ash silo.</p> <p>It is considered that adequate contractor parking is provided on site capable of accommodating the additional construction workforce. Should additional parking be required then this would be made available within the disturbance footprint assessed.</p>
Plant and Equipment	<p>A range of plant and equipment would be used during construction. The final equipment and plant requirements would be determined by the construction contractor. Indicative plant and equipment has been broadly categorized into the following activities:</p> <ul style="list-style-type: none"> Equipment required for earthworks, which would be associated with the BWAD augmentation, salt cake land fill and Borrow Pits, is likely to include: <ul style="list-style-type: none"> Front end loaders Dump trucks Road trucks Excavators Compactors Water trucks. Equipment associated with upgrades to existing infrastructure (ash recycling/harvesting, and ash pipeline): <ul style="list-style-type: none"> Graders Elevated work platforms Crane Concrete saws and grinders Compactors and rollers Scrapers Backhoe Concrete trucks Generators. Equipment associated with vegetation removal: <ul style="list-style-type: none"> Chainsaws Tractors Light vehicles Wood chippers/mulchers. <p>Vegetation removal would be required at various locations across the Project area during the early stages of construction to create access where necessary.</p>
Materials and components	<p>Materials required for the BWAD augmentation and salt landfill works would be sourced from the proposed Borrow Pits. The suitability of extracted materials is dependent on additional geotechnical investigations and testing. Material that is not suitable for BWAD augmentation and salt cake landfill works could be used in areas of landscaping or other works. Should contaminated material be encountered, this material would be managed appropriately in line with relevant legislative requirements.</p> <p>Additional materials required would include:</p> <ul style="list-style-type: none"> Ash and effluent pipeline segments Rockfill Concrete and other materials required to complete the works Portable buildings.

Project Element	Summary of the Project
	<p>Oversized deliveries would be associated with the delivery of the weighbridges and ash silo.</p> <p>Water would be required during construction for wash down and dust suppression and would be sourced from the site water supply network and existing water allocations.</p>
Operations	
Operational life expectancy	Components of the Project would operate through to the anticipated closure of Bayswater. Activities associated with the decommissioning and rehabilitation works for the Project would extend beyond the closure of Bayswater for approximately five years or until rehabilitation and closure activities have been adequately completed.
Operational workforce	Over the duration of the Project it is anticipated employment would be provided for about 25 additional staff.
Daily Operation Traffic Movements	It is expected the Project would generate approximately 360 heavy vehicle movements (ie 180 trucks in and 180 out) and 50 light vehicle movements on a daily basis. Operational truck movements would be associated predominantly with ash recycling.
Decommissioning	
Strategy	<p>Built infrastructure associated with the Project would be removed following closure of Bayswater and the site footprint graded and rehabilitated to a safe, sustainable and non-polluting landform in accordance with the project specific rehabilitation management plan. Generally, this would include returning the site to as near to pre-development condition as practicable, such as removing buildings and infrastructure.</p> <p>Materials required for rehabilitation would be sourced either from within Bayswater, or from Ravensworth compost facility.</p> <p>Decommissioning of the salt cake landfill would be in accordance with the requirements of <i>NSW EPA Environmental Guidelines for solid waste landfills</i> (Second Edition, 2016).</p>
Rehabilitation objectives	Rehabilitation monitoring and management would be undertaken for the Salt cake landfill and BWAD until such time as a safe and sustainable landform is confirmed.



- | | |
|--|---|
| Study area | Project elements: |
| Local government area boundary | Ash dam augmentation, ash harvesting and water management works |
| Footprints of approvals to be surrendered | Ravensworth ash pipeline |
| AGL owned land | Coal handling plant water and wastewater infrastructure upgrades |
| Railway | HP pipe clearing |
| Electricity transmission line | LSP sludge line clearing |
| Coal supply conveyor | Clay borrow pits |
| | Salt cake landfill |

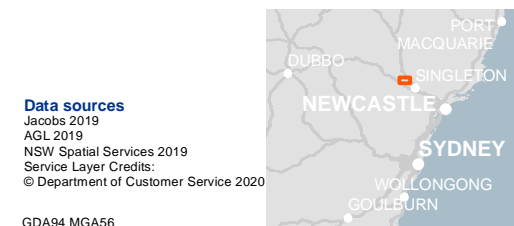


Figure 6 - 1 AGL Site Plan and Project Elements

6.2 Ash Management

The Project includes the following ash management optimisations and improvements:

- Increase in ash recycling activities to reduce ash volumes requiring disposal
- Improvements to the ash transfer system to Ravensworth Ash Disposal Site for disposal under separate approval
- Augmentation of the BWAD to increase capacity and accommodate anticipated volumes requiring disposal.

6.2.1 Ash Dam augmentation and Water Management Improvement Works

The BWAD forms part of the ash disposal system for Bayswater. The projected total annual ash production rate for Bayswater is currently just over two million tonnes. The BWAD initially received both fly ash and bottom ash from Bayswater, but currently receives (mostly) bottom ash, as the majority of fly ash is deposited at Ravensworth.

The existing BWAD is located south east of Bayswater and comprises of a 39 m high zoned earthfill embankment with a six-metre-wide crest and relative level (RL) of 174 m. The main embankment of the BWAD is located on the eastern boundary, and the saddle dam extends westwards. A 780 m long saddle dam forms the northern, and part of the western, boundary of the BWAD and has a 6 m wide crest and (L of 172.8 m. An emergency spillway with RL of 172 m is located in the north east of the saddle dam. The spillway discharges into Chilcotts Creek, and overflows eventually end up in Lake Liddell.

The current ash disposal system consists of bottom ash being transported from Bayswater in slurry form via three above ground basalt lined pipelines and is deposited in the north-western side of the dam. Three pipeline extensions have been added to the pipes, to move the discharge point around within the BWAD for optimal filling. The fly ash dispersion line is currently placed out as a duplication pipeline along the southern most dispersion line.

The process of ash deposition relies on ash dropping out of the slurry to form a delta, or 'beach' radiating out from the discharge point. This technique allows flexibility in the locations of discharge points around the ash storage to enable more efficient deposition of ash. The beaching angle is estimated to be less than 1 % in the areas above water, steepening up to approximately 3.5 % once under water.

Slurry water drains to the lower points of the BWAD and is either lost through evaporation and seepage or is drawn from the BWAD via an intake tower, located towards the right abutment of the main embankment. Water from the intake tower is transferred via return water pipelines around the northern perimeter of the BWAD to the return water tanks, located at the western ridgeline for reuse. The return water pipelines are connected to the return water pumps in the pumping station at the toe of the main embankment. Seepage from the BWAD is collected in one of two Seepage Collection Ponds (SCP) to manage discharge to Pikes Creek. SCP1 is located directly adjacent to the dam wall and SCP2 is approximately 500 m downstream of the dam wall. Further downstream of SCP2 is Pikes Creek.

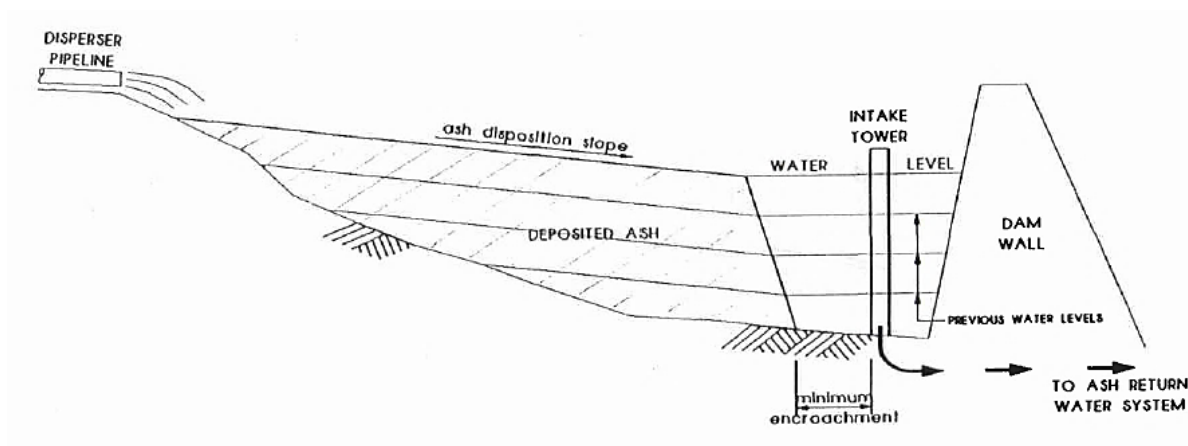


Figure 6-2 Typical ash dam cross section (Source (AECOM, 2017a))

The BWAD augmentation construction works would consist of:

- A levee embankment on the western perimeter to a (L of 185.5 m (an 11.5 m high earth embankment from existing ground level)
- Increasing the existing saddle dam levee embankment on the northern perimeter to RL 185.5 m at the western end down to RL 174 m at its eastern end (an approximate 9.5 m increase at the western and 3.5 m increase at its existing western end)
- Construction of a 1.5 m high concrete parapet wall along the main embankment crest to increase flood attenuation
- Construction of two new southern saddle dams to prevent ash from spilling out of a low point along the southern ridgeline
- Raising of the spillway to RL 173.7 m
- Extensions to the ash dispersion and water supply and management systems within the BWAD footprint
- Installation of ash dam divider walls allowing ash discharge to be undertaken in alternating cells and deployment of dust suppression (water sprays or polymers) during dust events where necessary in accordance with existing dust management processes
- Potential relocation/replacement of existing pipelines to current standards
- Upgrade to ancillary infrastructure associated with ash disposal such as pumps, pipelines and power infrastructure
- Water management improvement works associated with the main and saddle dam walls including diversion of clean runoff around the site, installation of new seepage capture and return infrastructure and upgrading existing seepage capture and return infrastructure.

An abandoned 1.3 kilometre (km) long coal conveyor that runs along the western perimeter of the ash storage would require removal as part of these works, and the relocation of approximately four timber power poles within the proposed ash inundation area would also be required.

The augmentation of the BWAD may be undertaken in stages. This staged augmentation would allow ash deposits to consolidate gradually, which would improve the bearing capacity of the BWAD. For the purposes of this assessment, it has however been assumed that the full augmentation would be undertaken.

The ultimate BWAD augmentation has been designed to provide storage for approximately 12.5 million m³ of fly ash and bottom ash. AGLM are proposing to increase the scale of current coal ash recycling activities (see Section 6.2.2) which would reduce the volume of ash requiring deposition on site. The staged construction of the BWAD would mean that only the capacity required would be constructed.

6.2.1.1 Construction

Construction of the augmented BWAD is anticipated to involve the following activities:

- Establishment of appropriate environmental controls including water diversions and protection of existing waterbodies in the vicinity of works, and erosion and sediment controls in accordance with *Managing Urban Stormwater: Soils and construction - Volume 1* (the Blue Book) (Landcom, 2004)
- Clearing works, including the removal and relocation of infrastructure within the ash emplacement footprint
- Construction of foundations at the base of the levee embankments
- Earthworks and construction of levee embankments and internal cell walls
- Construction of a concrete parapet wall
- Earthworks and minor civil works associated with the establishment of the additional southern saddle dams
- Connection of extensions to the existing ash and water management infrastructure.

It is expected that clay materials for augmentation works would be sourced from the proposed Borrow Pits (see Section 6.4 for further information). Other materials required which would be purchased and brought to site include:

- ash and effluent pipelines
- rockfill
- concrete and other materials required to complete the works.

Construction would be undertaken as required by the deposition rates of the ash which is dependent on Bayswater's output, ash recycling rates and availability of the Ravensworth ash line and pumping station. It is assumed that construction of the BWAD augmentation would take up to three years to complete.

6.2.1.2 Operation

The continued operation of the BWAD would remain generally unchanged. Water levels within the BWAD would be maintained at an appropriate level to ensure an adequate freeboard is maintained as required under the *Dams Safety Act 2015* noting that discharge from the spillway is licensed under EPL 779.

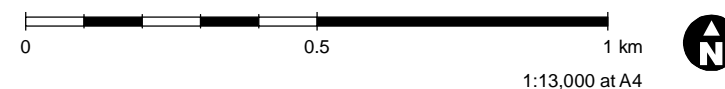
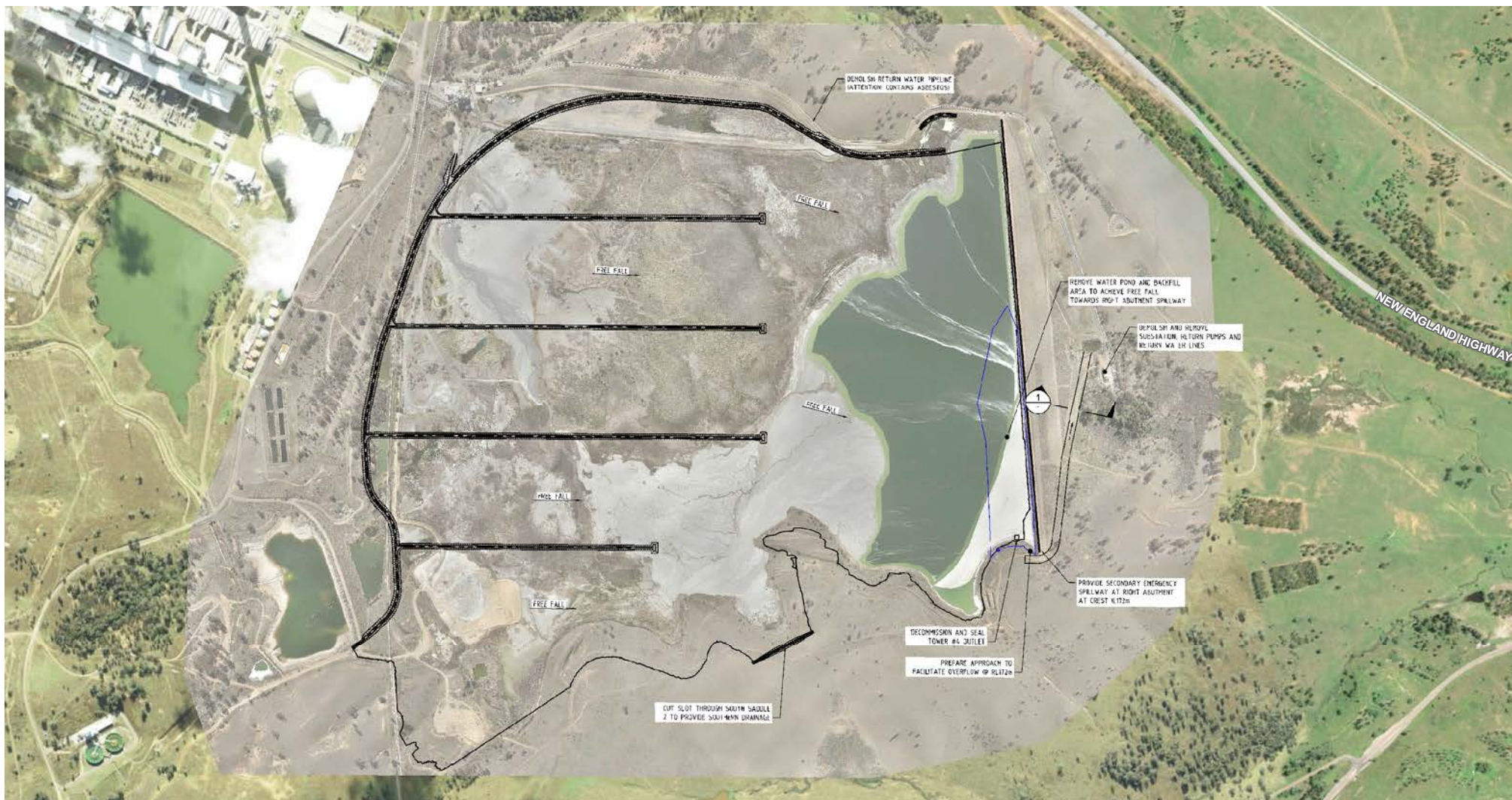
6.2.1.3 Decommissioning

Once the augmented BWAD has reached capacity, rehabilitation would be undertaken to integrate the BWAD within the existing landform as far as possible. Rehabilitation would be undertaken in accordance with AGLM's Rehabilitation Management Plan and would include capping, measures to prevent any ponding or disruption to water flows, stabilisation and revegetation.

Post closure, AGLM would look at alternative land uses for the site and where these are not appropriate, limit land use to either grazing or native pasture. Any more intensive land use or development would most likely require separate approval.

Decommissioning would occur over an agreed timeframe and would be followed by rehabilitation monitoring and management until such time as a safe, sustainable and non-polluting landform is confirmed.

Assuming currently modelled ash generation rates, the final landform would consist of a generally flat but free draining landform sloping from west to east. At its western extent the landform would have a maximum height of approximately RL of 186 m, to incorporate a minimum 0.5 m capping layer, and be graded down to a RL of 173 m at the northern abutment of the main embankment and RL 172 m at the southern abutment. The area would be vegetated with grass species. The concrete parapet along the main embankment would be removed and the ponded water allowed to evaporate, drained or otherwise managed in accordance with its water quality at the time. The landform would be regraded to provide free draining to the south. A new spillway would be provided around the main embankment wall to the south to allow surface flows to be returned to Pikes Gully post rehabilitation. The indicative final landform is provided in Figure 6-3.



Data sources
 Jacobs 2019
 AGL 2019
 NSW Spatial Services 2019

GDA94 MGA56

Figure 6 - 3 Indicative BWAD final landform

6.2.2 Additional Coal ash recycling and Fly ash harvesting upgrades

AGLM currently recycles up to 170,000 t of coal ash per annum from Bayswater including bottom ash from the BWAD. The ash is either extracted from the silos associated with the Ravensworth Fly ash system or extracted using mobile plant and equipment within the BWAD boundary. Fly and bottom ash can be used as fill in selected road projects and as a fine aggregate in cement and masonry blocks.

In order to meet the growing demand for coal ash and coal ash blended products, it is proposed to increase the scale of current coal ash recycling activities from Bayswater to enable the beneficial reuse of up to 1,000,000 t per annum of ash during periods of peak demand. It is currently envisaged that average production values would reach around 600,000 t per annum depending on activity within the construction industry and proximity to AGLM. The existing ash recycling facilities would be incorporated into this process where feasible and scaled to suit requirements.

Ash recovery operations onsite would be powered by a generator or connected to the electricity mains. A mobile fuel cart would be used to store diesel products as required. Expanding the capacity of the operation to a peak rate of 1,000,000 t per annum would require the following works:

- Provision of updated mobile plant and equipment used in the ash handling process
- Installation of up to two weighbridges (B-double)
- Construction of new internal access routes to improve safe truck movements onsite
- Installation of additional portable buildings (amenities and a laboratory)
- Connections with onsite utilities (e.g. potable water, sewerage, electrical)
- Associated ancillary equipment located within the disturbance footprint.

In addition, the existing approved fly ash harvesting plants at Bayswater would be upgraded as part of the Project. The proposed upgrades would include:

- Installation and operation of an additional silo
- Construction of new formalised internal access roads and water management structures
- Construction of associated ancillary equipment located within the disturbance footprint, including truck wash facilities, weighbridges, amenities and parking.

The indicative location of coal ash recycling infrastructure upgrades and fly ash infrastructure upgrades are shown in Figure 6-4. The final layout of the upgrades would be confirmed as part of detailed design, and would be maintained within the Project area, as shown on Figure 6-1.



- Electricity transmission line
- Indicative vehicle turning area
- Existing silos
- Existing weighbridge
- Location of proposed fly ash infrastructure
- Proposed entry & exit roads
- Washdown area



Data sources

Jacobs 2019, AGL 2019
NSW Spatial Services 2019

GDA94 MGA56



Figure 6- 4 Indicative location and site layout of ash harvesting upgrades

6.2.2.1 Construction

Construction of the new coal ash recycling and fly ash harvesting facilities would commence following Project approval. It is expected the majority of materials would be supplied to site as pre-fabricated materials with only minor assembly and installation works expected to be undertaken on site. Formalised gravel access roads would be provided to allow for additional vehicles entering and exiting the coal ash recycling and fly ash harvesting facilities. There would not be any additional vegetation clearance beyond what has been assessed in the maximum disturbance footprint as a result of these access roads.

6.2.2.2 Operation

Operation of the coal ash recycling facilities would occur over the remaining operational life of Bayswater. Additional workers would be employed, and expanded operations would generate a maximum of 360 (180 round trips) additional daily vehicle movements.

The operation of the fly ash harvesting infrastructure would continue to be managed in accordance with existing environmental management systems.

6.2.2.3 Decommissioning

Built infrastructure would be removed following closure of Bayswater and the site footprint graded and rehabilitated to a safe, stable and non-polluting landform.

6.2.3 Ash pipelines from Bayswater to Ravensworth Void No. 3

The existing Ravensworth fly ash transfer pipeline consists of two high pressure steel pipelines. Replacement of the existing Ravensworth fly ash transfer pipeline(s) are proposed for the transfer and disposal of ash from the Ravensworth Fly Ash Plant at Bayswater to Ravensworth Void No. 3 (**Ravensworth ash line**). The majority of these pipeline(s) would be installed above ground, with sections of trenching or underboring proposed to be installed below ground at Pikes Creek, Pikes Gully Road and various other existing infrastructure corridors. Where the pipelines cross under the New England Highway, the pipelines may be positioned above or below ground or on existing structures that attached to the underside of bridge workings. Where the pipelines cross Bayswater Creek, Chilcotts Creek and the New England Highway, the pipeline(s) would be raised above ground. The new pipeline(s) would connect to the existing recently extended ash pipelines which run from Ravensworth Void 3 to Void 5 to limit further impacts.

The pipeline(s) would be installed adjacent to the existing ash pipelines in previously disturbed areas where possible. Where construction activities are required within Chilcotts, Pikes and Bayswater Creeks, appropriate erosion and sediment controls would be installed to minimise impacts to these waterways as far as practicable.

6.2.3.1 Construction

The installation of the transfer pipeline(s) would consist of the following activities within the assessed Project footprint:

- Vegetation clearance along the pipeline alignments. It has been assumed that all vegetation would be cleared, however opportunities to minimise clearance would be considered where feasible
- Crib facilities and laydown areas as required, which will be positioned in previously disturbed areas or areas consisting of exotic grasses along the ash line and are likely to shift as construction progresses
- Temporary access via additional internal access tracks and access points to construct the pipeline(s) additional to existing established access points as required.
- Laying above ground pipeline(s) onto concrete plinths, steel work or existing structures. Earthworks will be required to complete this work

- Trenching (earthworks) or underboring below ground sections of the pipeline(s). Depending on the trench depths, shoring or benching the trench may be required
- Concrete works and earthworks along the length of the pipeline(s), which is limited to the in-situ construction of footings and ancillary infrastructure
- Infrastructure for maintenance of the pipeline(s)
- Maintenance and or upgrade of inspection tracks as required
- Drainage works along the length of the pipeline(s) as required
- Removal of any disused pipeline(s) as required.

Construction materials would be limited to pipe segments, concrete plinths, concrete, reinforcement, quarry materials, onsite borrow material, drainage materials and steel delivered as necessary.

Access to the alignment would be provided via Lemington Road (Ravensworth), Pikes Gully Road, Old New England Highway or via internal access roads from Bayswater and or Liddell. Existing internal roadways would be maintained as required.

6.2.3.2 Operation

The operation of the new pipe(s) would be as per the existing pipeline with the disposal of ash at Ravensworth approved separately and not subject to this application.

6.2.3.3 Decommissioning

Above ground infrastructure would be removed following the retirement of Bayswater.

6.3 Salt cake landfill facility

The existing Bayswater water treatment plant removes naturally occurring salts and solids from the cooling water before the water is used in the power station. Salt is currently stored in the brine concentrator decant basin and Lake Liddell using the HRSTS to discharge to the Hunter River via Bayswater Creek. A salt caking plant will be constructed as part of the water treatment plant upgrade (Project approval 06_0047, as modified), which would produce a salt cake by-product.

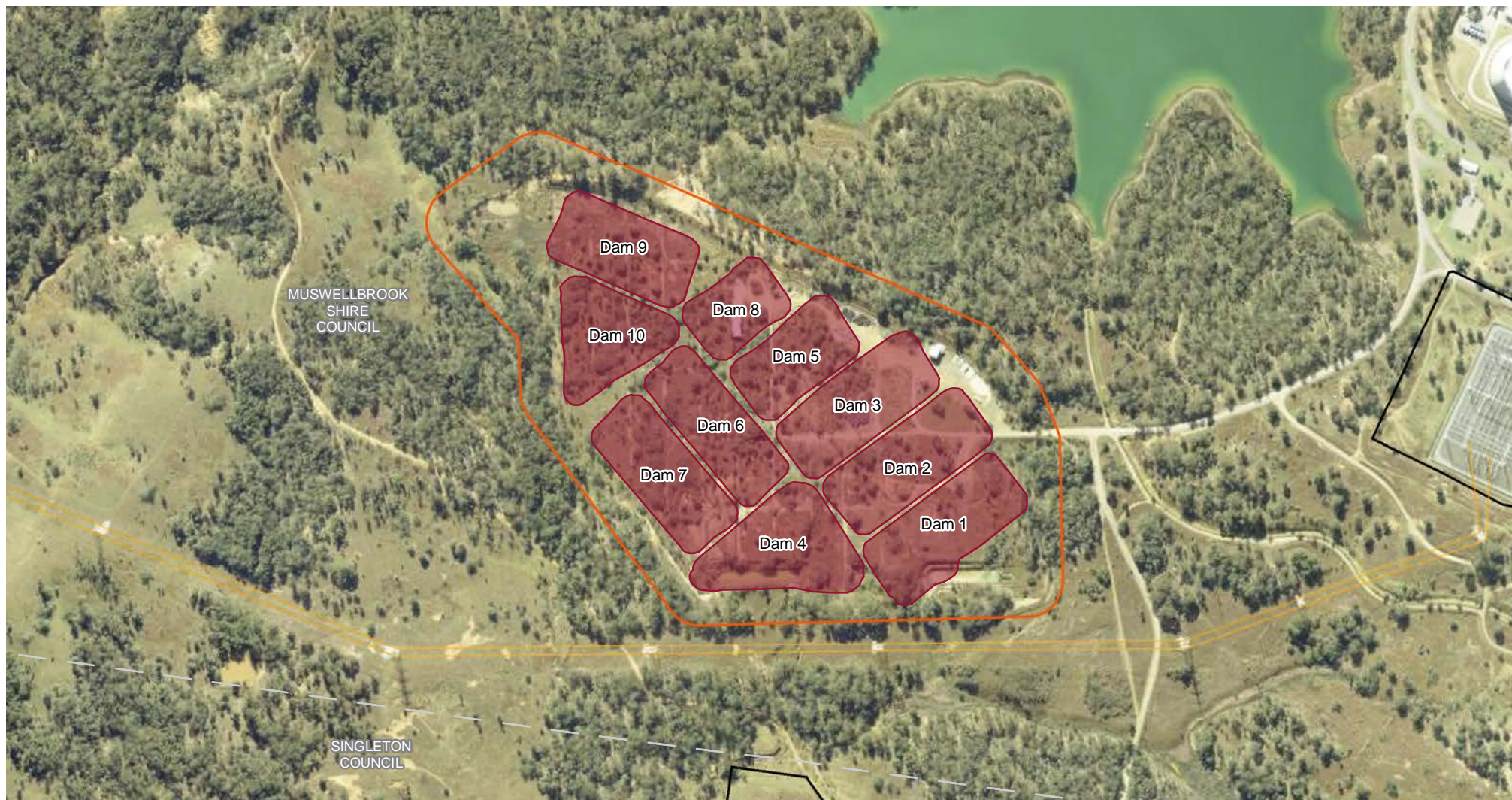
The Project includes the construction and operation of a salt cake landfill facility on site to store the salt cake produced from the approved caking plant. The salt cake landfill facility is required to enable the approved caking plant to commence operation and complete the water treatment upgrades.

The Salt cake landfill facility has been designed to include 10 individual cells which would be constructed progressively. Each cell would be able to hold more than three years of salt cake, assuming that around 50,000 t of salt cake is generated per year. The salt cake landfill would have capacity to hold approximately 600,000 t of salt cake over its operational life.

In accordance with the *NSW EPA Environmental Guidelines for solid waste landfills* (Second Edition, 2016) a leachate barrier system would be required to contain leachate and prevent the contamination of surface water and groundwater over the life of the landfill. Each cell would be lined with at least one metre of clay, or other suitably impermeable material, as per the *EPA Environmental Guidelines* (EPA, 2016).

As most of the proposed cells would be of turkey's nest style construction, no natural stormwater runoff would enter these cells except for direct rainfall. Diversion structures would be constructed to prevent stormwater entering the cells.

The Salt cake landfill facility would be located on previously disturbed land, currently used as a contractor facility with plant parking, laydown, material stockpiles and gypsum drying.



- Study area
- Local Government Area
- AGL owned land
- Salt Cake Landfill
- Electricity transmission line



Data sources

Jacobs 2019, AGL 2019
NSW Spatial Services 2019

GDA94 MGA56

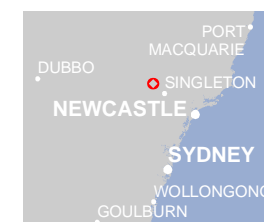


Figure 6 - 5 Proposed Salt cake landfill cell design

6.3.1 Construction

The construction of the Salt cake landfill facility would be undertaken progressively and construction activities would include:

- Site clearing, including the removal of contractor facilities and materials. It is assumed that these materials would be relocated to other areas of AGLM land, as required
- Establishment of clean water diversions
- Establishment of erosion and sediment controls in accordance with *Managing Urban Stormwater: Soils and construction - Volume 1* (the Blue Book) (Landcom, 2004)
- Excavation and minor earthworks to create landfill cells, including installation of appropriate lining, and surface water diversion structures, where required.

Clay materials for construction of cells, and capping, would be sourced from the proposed Borrow pits (see Section 6.4 for further information). Other materials needed would be brought to the site as required. Excavated materials would be stockpiled within the proposed disturbance footprint and beneficially reused on AGLM lands where possible. Stockpile management procedures for segregating spoil, dust suppression, erosion and sediment control would be implemented.

6.3.2 Operation

The salt cake would be delivered to the cells via existing internal access roads. Transfer and placement would occur as required. *EPA Environmental Guidelines* (EPA, 2016) would be adhered to throughout operation of the Salt cake landfill facility, which would include provision of appropriate coverage of each active landfill cell to minimise dust and rainwater infiltration.

6.3.3 Decommissioning

Final capping of each Salt cake landfill cell would be in accordance with the *EPA Environmental Guidelines* (EPA, 2016), and would comprise of a compacted clay layer (or other suitable material) at least 600 millimetres (mm) thick, and then a one metre thick revegetation layer comprising of clean soils, top soil and vegetation. Clay materials for decommissioning and rehabilitation would be sourced from the proposed Borrow Pits, and clean soils and topsoil would be utilised.

When constructing the final capping, consideration would be given to grading the final surface in such a direction so as not to impede on future landfill cells. As more cells are constructed, filled and then capped, this final landform may be amended to suit the topography where required.

Post closure, land use would be determined with the most suitable land use adopted. Any more intensive land use or development would most likely require separate approval.

Final decommissioning of the Salt cake landfill disposal area would be followed by rehabilitation monitoring and management until such time as a safe and sustainable landform is confirmed.

6.4 Borrow Pits

Four Borrow Pit sites are proposed to provide excavated material for use in construction of the Project and for other suitable projects such as subsequent land forming and rehabilitation at Bayswater and Liddell. It is expected that material from these Borrow Pit sites would be used for the BWAD augmentation works, use in the Salt cake landfill and other areas of AGLM land as required.

The proposed locations of the Borrow Pits are shown in Figure 6-1.

The final landform would be designed to blend into surrounding landform to the extent possible and would be managed in accordance with existing guidelines to ensure a safe and sustainable landform remains upon Project completion. Drainage catchments would remain generally consistent with the existing situation. Construction

It is expected the Borrow Pits would be accessed consecutively as the need for material arises. Construction is expected to commence from those locations closest to the BWAD and would proceed generally as follows:

- Site clearance, including vegetation removal where necessary
- Establishment of clean water diversions
- Establishment of erosion and sediment controls in accordance with *Managing Urban Stormwater: Soils and construction - Volume 1* (the Blue Book) (Landcom, 2004)
- Clearing vegetation and either mulching for onsite reuse or used to create habitat piles
- Stripping of topsoil for later use in rehabilitation. Operation

The Borrow Pits operational stage would comprise:

- Excavation of clay material using benching techniques
- Transport of material to point of use using existing internal access tracks
- Progressive rehabilitation, or soil binding, of exposed areas to manage dust and sediment runoff.

The final design of the Borrow Pits would be self-draining in order to prevent surface water ponding within them. During operation, any surface water ponding within the Borrow Pits would be appropriately managed in accordance with the Blue Book, with suitable retention times and treatment provided before being discharged or re-used in operations. Excavation within the Borrow Pits would not intercept with groundwater table, and no dewatering works would be required except following rainfall events.

It is expected that existing internal access tracks would be maintained as required throughout operation, and in accordance with existing environmental management procedures.

6.4.1 Decommissioning

Once material within each Borrow Pit has been exhausted, the pits would be recontoured to form a safe and sustainable landform. Fencing may be required if necessary, to meet appropriate health and safety requirements. Disturbance areas would be covered with stockpiled topsoil and revegetated as required.

6.5 Coal handling plant water and wastewater infrastructure upgrades

CHP water and wastewater infrastructure upgrades are proposed as part of an Environmental Improvement Program (EIP) at Bayswater to improve the quality of discharges from the sediment basin and associated systems into Tinkers Creek (AECOM, 2017a).

Water from the following sources is currently collected and treated in the CHP sediment basin:

- Runoff from coal stockpiles as a result of direct rainfall on the CHP
- Wash down / process water from the CHP
- Catchment runoff from surrounding roads and batter slopes
- Discharge from the treated process water pond located to the south of the CHP
- Overflows / excess from water treatment processes i.e. oil water separator system and process water pond located to the south of the CHP.

The CHP sediment basin currently overflows daily to Tinkers Creek.

Additional water and wastewater management infrastructure works would include:

- Construction of clean water diversions to reduce stormwater inflows to the CHP sediment basin

- Reuse of water within the coal plant water system where possible for operational purposes which could include water treatment and
- Changes to the water management structures, including the enlargement/reconfiguration of the CHP sediment basin to allow for a larger volume of water to be stored with increased detention time and improved settlement of coal fines to better enable the treatment of water.

For the purposes of this assessment it is assumed that the volume and frequency of water discharged to Tinkers Creek would not change. The aim of the water management improvement works is to improve the water quality of discharges from the system. It is assumed that water quality in Tinkers Creek would be improved in accordance with the requirements of EPL 779.

6.5.1 Construction

Construction activities would include minor civil works and plant modifications related to the water management improvement works. Activities would be limited to the existing operational areas of the CHP and the disturbance footprint presented in Figure 6-1. Where earthworks are required, for example for the construction of the clean water diversions, appropriate erosion and sediment controls would be established to manage any potential impacts to the surrounding environment.

6.5.2 Operation

Following the construction of upgraded infrastructure, there would be minor changes to the operation of the CHP associated with improving water management and the water discharging from the system.

6.5.3 Decommissioning

The decommissioning of water management upgrades would be undertaken consistently with any future approvals to facilitate Bayswater's retirement.

6.6 Ancillary works

Routine clearing of vegetation along the alignments of the Lime Softening Plant (LSP) Sludge Line and High Pressure (HP) Pipeline would be undertaken to provide ongoing access for maintenance and management within the disturbance footprint. Ancillary infrastructure works would include repositioning of underground pipelines to above ground, replacement or upgrading of ageing pipelines, vegetation clearing associated with maintaining existing infrastructure, including along pipeline corridors.

6.7 Summary of operational changes

Beyond the BWAD, Salt cake landfill facility and additional Ash harvesting works, there are no expected changes to the existing approved operations of Bayswater as part of the Project. This approval would not directly impact on the main generation activities carried out at Bayswater including the combustion of coal to produce electricity or any air emissions resulting from that. Coal consumption, water consumption and ash generation would not increase as a result of the Project.

6.8 Consolidation and surrender of other approvals

AGLM is committed to continual environmental improvement at Bayswater and has conducted a detailed review of its planning approvals for opportunities for consolidation and improvement. As part of the Project, AGLM propose to consolidate seven existing water and wastewater development approvals (as listed in Table 6.2 below) into a single, contemporary planning approval. Following consolidation of these development consents as part of the Project, these approvals would be formally surrendered. The Project includes the continuation of the development authorised by these development consents and includes the ongoing maintenance of relevant works pertaining to these authorisations. The Project will not impact on any other planning approvals pertaining to Bayswater or Liddell.

Table 6.2: Approvals to be consolidated

DA Reference	Description	Additional information
<p>138/93 as modified</p> <p>Development consent DA 138/93 (as modified) granted on 16 December 1993 by Muswellbrook Shire Council for ash transfer and water return infrastructure components that occur within the MSC LGA</p>	<p>Original Approval</p> <p>The the approved works under DA 138/93 involves the removal of fly ash from the fabric filter hoppers at Bayswater Power Station and subsequent transport by pipeline to the Ravensworth No. 2 Site noting that this consent is only relevant to those aspects within the MSC LGA.</p> <p>The the approved works cover the construction, operation (24 hours per day, seven days a week) and maintenance of the following:</p> <ul style="list-style-type: none"> ▪ Pneumatic system to convey fly ash from the fabric filter hoppers to the Ravensworth Ash Plant at Bayswater Ash Dam ▪ Surge bin ▪ Storage silos (sealed truck access around silos, floor wash down facility, truck weigh bridge/s, extraction ports, access and truck) ▪ Ash mixing plant ▪ Return water tanks and associated pipelines ▪ Vehicular and maintenance access tracks ▪ Facilities for ash sales by truck ▪ High pressure ash slurry pumps and pipelines ▪ Return water pipeline system ▪ Back up water supply system from Bayswater Power Station ▪ Corrosion and scale inhibitor plant ▪ Site offices and amenities, buildings to house control and electrical systems 	<p>Construction works have been completed. The operational and maintenance activities associated with this approval have been integrated into site operation environmental management plans. This would be reviewed and updated as required to ensure all environmental controls and mitigation measures have been identified and implemented as required. These will be carried over to the WOAOW Project.</p>

DA Reference	Description	Additional information
	<ul style="list-style-type: none"> Ancillary infrastructure i.e. power supply, water supply, sewer etc Contaminated water drainage system from the Ravensworth Ash Plant to Bayswater Ash Dam Drainage, settlement ponds and other soil erosion control works and Access to the ash pipelines from New England Highway for construction, maintenance and operational purposes. 	
	<p>Modification Approval:</p> <p>Installation, operation and maintenance of additional capacity of the Return Water System at the Ravensworth Ash Disposal Site to cater for the increased return water recycling capacity requirements. The approved works included the following:</p> <ul style="list-style-type: none"> Upgrade to the Return Water System flow rate by 60 litres/sec to a new flow rate of 120 litres/sec Retain and refurbish the existing 60 litres/sec pumping infrastructure Installation, operation and maintenance of an additional 200mm diameter pipeline and pumps to cope with the required increase in capacity The pipe will be a combination of Ductile Iron Cement Lined with a short length of High Density Poly ethylene at the Ravensworth end and match the existing pipeline The existing controlled water discharge pump is to be removed and replaced by an additional return water pump with a capacity of 60l/s An additional 60 l/s booster pump is to be installed parallel to the existing booster pumps 	

DA Reference	Description	Additional information
	The new pumps will be interconnected into the existing pipeline. The existing pumps are to be left in place.	
<p>2017-12</p> <p>Development consent 2017-12 issued by Muswellbrook Shire Council on 7 April 2017 for pipeline replacement works on a section of the BWAD return water pipeline</p>	<p>Approved works</p> <p>Reliability issues associated with a 600 m section of the BWAD return water pipeline necessitated its replacement to ensure the continued supply of water from the ash dam to the power station and the ongoing transportation and storage of ash created by power generating operations.</p> <p>The approved works consist of the construction, operation and maintenance of a High-Density Polyethylene pipe to replace an approximate 600 m section of the original return water line in order to avoid reliability and environmental issues associated with the existing pipeline. The works involved the removal and disposal of two sections of the existing asbestos cement pipeline, to provide for connection of the new high-density polyethylene pipeline with the existing pipeline and pump station.</p>	<p>Construction of the new section of pipeline has been completed.</p> <p>Continued operation and maintenance of this pipeline will be carried over to the new SSD consent.</p> <p>The operation and maintenance activities associated with the approved works have been integrated with the site operation environmental management plans. These will be reviewed and updated as required to ensure all environmental controls and mitigation measures have been identified and implemented as required.</p>
<p>2017-89</p> <p>Development consent 2017-89 issued by Muswellbrook Shire Council on 25 January 2018 for New Effluent Drain Sump</p>	<p>Approved works</p> <p>As part of the operations of the power station, cooling water is dosed with sulphuric acid and stored at two sites within the power station. The cooling water dosing area is a bunded area which drains into a sump (¾ effluent drain sump). The ¾ effluent drain sump is an intermediate storage tank for collecting waste cooling fluid from the cooling water dosing area. Once the level in the sump reaches a trigger level, the effluent sump pump transfers the content to a larger effluent sump through underground pipework. The original effluent sump was constructed using a 2.1 m diameter precast concrete pipe and in situ concrete lid and base slab. The concrete was protected from chemical attack with a fiberglass lining.</p>	<p>Construction of the approved works is ongoing.</p> <p>The management measures outlined in the Statement of Environmental Effects (SEE) for this DA will be carried over to the WOAOW Project. These include:</p> <ul style="list-style-type: none"> ▪ Installation and maintenance of appropriate erosion and sediment control measures ▪ The testing of excavated soil for contamination and to determine if it can be beneficially re-used in land uses appropriate to the outcome of the testing ▪ AGL's existing Waste Minimisation and Management Plan ▪ CEMP

DA Reference	Description	Additional information
	<p>The approved works consist of construction, operation and maintenance of the new $\frac{3}{4}$ effluent sump at an alternative location. The sump is to be located away from other buildings to allow standard bottom up construction in an open excavation with relocation of the pipe and pump infrastructure.</p>	<p>The operation and maintenance activities associated with the approved works will be integrated with the site operational environmental management plans. This will be reviewed and updated as required to ensure all environmental controls and mitigation measures have been identified and implemented as required.</p>
<p>12/2018</p> <p>Development consent 12/2018 issued by Muswellbrook Shire Council on 15 June 2018 for new water transfer pipeline transferring water from Bayswater Ash Dam to the Ravensworth Ash Pipelines to enable water transfer to Ravensworth Void 4 for storage and reuse</p>	<p>Approved works</p> <p>The purpose of the approved works is to manage and maintain storage capacity in the Bayswater Ash Dam by providing a pipeline from the BWAD to the Ravensworth Ash Pipelines for transfer of water to Void 4 for storage and reuse and to maintain freeboard within the Bayswater Ash Dam.</p> <p>The approved works involve the construction, operation and maintenance of a new transfer pipeline, installation of a pump at the ash dam, a secondary pipeline containment in sections outside of the Bayswater Ash Dam catchment, and a basin at the connection of the new pipeline with the existing pipeline.</p> <p>The transfer pipeline consists of the following elements:</p> <ul style="list-style-type: none"> ▪ Installation of a new pump and pipeline from the Bayswater Ash Dam to an existing water transfer pipeline that connects to Ravensworth Void Number 4 ▪ The new pipeline would be approximately 500 metres long from its commencement at the Bayswater Ash Dam to the connection point to the existing transfer pipeline ▪ The pipeline material for the new pipeline is 280 mm diameter flexible Polyethylene 	<p>Construction approved under this consent is yet to commence. The management measures outlined in the SEE for this DA will be carried over to the WOAOW Project. These include:</p> <ul style="list-style-type: none"> ▪ Preliminary Erosion and Sediment Control Plan ▪ CEMP development <p>The operation and maintenance activities associated with the approved works will be integrated with the operation environmental management plans for the site. This will be reviewed and updated as required to ensure all environmental controls and mitigation measures have been identified and implemented as required.</p>

DA Reference	Description	Additional information
	<ul style="list-style-type: none"> ▪ The pipeline is to be laid over cleared grassland and there would be no clearing or ground disturbance for the purposes of the pipeline ▪ The pipeline would be laid directly above ground and directly on the ground surface. There would not be any restraint placed on the pipe in order to allow the pipe to thermally expand and contract ▪ A manually operated pump would be installed at the Bayswater Ash Dam. The new pump would be provided with a small bund for the purpose of containing any hydrocarbon spills ▪ A secondary containment bund would be constructed for the section of pipe outside of the ash dam catchment. This would be constructed in cleared areas using in situ soil material. The soil would be compacted and grassed to form a shallow slope allowing for maintenance slashing to protect the pipeline for fire risk ▪ The basin would be located in a disturbed, cleared area at the connection of the new pipeline to the existing transfer pipeline. The basin would be constructed using in situ soil and have a volume capable of containing at least 200% of the full volume of the pipeline in the event of a leak at the bottom end of the pipeline 	
<p>06_0047</p> <p>Part 3A project approval 06_0047 (as modified) granted on 6 April 2006 by the Minister for Planning and Public Spaces for upgrades to the Bayswater water treatment plant.</p>	<p>Original Approval:</p> <p>The approved works are to increase the salt removal capacity of the existing WTP from the current performance of around 13,000 t per year and the current design capacity of 28,000 t per year to an effective removal capacity of approximately 38,200 t of salt removed per year to provide optimum plant performance.</p>	<p>Construction approved under the original approval and in modification 1 has been completed.</p> <p>Continued operation and maintenance will be carried over to the new SSD consent.</p> <p>The operation and maintenance activities associated with the approved works have been integrated with the site operational environmental management plans. These will</p>

DA Reference	Description	Additional information
<p>Modification 1 was approved on 3 June 2006.</p> <p>Modification 2 was approved on 13 April 2018.</p> <p>This project approval was transitioned to a SSD consent via an order made on 28 August 2018</p>	<p>The approved works include the construction, operation, maintenance, decommissioning and rehabilitation.</p> <p>The original approved works included the following elements:</p> <ul style="list-style-type: none"> ▪ Lime Softening Plant: ▪ Upgrades to the lime softening plant to treat Hunter River water which is then fed to Lake Liddell. ▪ Refurbishment of the hydrated lime feed system, including installation of a new feeder. ▪ Installation of an acid dosing system, including a bunded 60,000 L bulk acid storage tank and acid dosing pumps. ▪ Minor changes to the lime dosing and storage equipment. ▪ Circulating Water Treating Plant: ▪ Permeate directed to the existing reverse osmosis flush water tank and overflow to the circulating water basin. ▪ Alkalinity reduction plants returned to service, with a clarification step prior to the suspended solids filters. Processed water from the alkalinity reduction plant provides feed for the reverse osmosis plant. Excess process water is recirculated to the main cooling towers. ▪ Installation of new membranes within the existing reverse osmosis plant. ▪ Replacement of the reverse osmosis chemical dosing system. ▪ Brine Concentrator Units ▪ Upgrade of the two brine concentrator units and installation of a third brine concentrator for optimal concentration capacity. 	<p>be reviewed and updated as required to ensure all environmental controls and mitigation measures have been identified and implemented as required.</p> <p>Construction approved under modification 2 is ongoing.</p> <p>The management measures outlined in the EA for modification 2 will be carried over to the WOAOW Project. These include:</p> <ul style="list-style-type: none"> ▪ Construction Environmental Management Plan ▪ Erosion and Sedimentation Control Plan

DA Reference	Description	Additional information
	<ul style="list-style-type: none"> ▪ Installation of a new flood box distribution system for each existing brine concentrator to eliminate blockages in the brine recirculation system. ▪ Installation of new pre-heaters and de-aerators. ▪ Waste Brine Disposal System ▪ Installation of a mechanical vapour recompression brine crystalliser to concentrate waste brine from the BC plant. The resulting slurry waste is directed to the brine concentrator decant basin. 	
	<p>Modification 1:</p> <p>Modification of the approved works was obtained to change the hours of construction and post-construction commissioning and testing phases of the approved works.</p>	
	<p>Modification 2:</p> <p>This modification includes upgrades to the existing water treatment plant to increase the capacity of the water treatment plant to remove salts from the cooling water and provide for a more efficient process to dispose of salt wastes generated. The key components of the upgrades include:</p> <ul style="list-style-type: none"> ▪ Construction of a brine return pipeline, storage tanks and associated infrastructure at the brine concentrator decant basin, connected to the existing waste brine transfer pipeline, including storage tanks, pumps and associated power supply. ▪ Construction of two dewatering cells at the eastern end of the brine concentrator decant basin, with an overflow into the main brine concentrator decant basin cell. 	

DA Reference	Description	Additional information
	Construction of a salt caking plant and for conversion of concentrated brine from the brine concentrator into a solid waste cake for disposal.	
<p>06_0259</p> <p>Part 3A project approval 06_0259 (as modified) granted on 23 May 2007 by the Minister for Planning and Public Spaces for upgrades to the Bayswater water pumping station upgrade to increase water extraction capacity.</p> <p>Modification 1 approved 26 November 2007</p> <p>This project approval was transitioned to be a SSD consent via an order made on 28 August 2018.</p>	<p>Original Approval</p> <p>The approved works consisted of the construction, operation and maintenance of a new low pressure pump station to work in conjunction with the existing pumping station. The following components are included:</p> <ul style="list-style-type: none"> ▪ New low-pressure pump station ▪ Pump station consisting of up to 10 submersible pump sets with a total extraction capacity of 800 ML/day. ▪ Water Supply Pipeline(s) ▪ Above ground pipeline with a nominal diameter of 2,300 mm (or equivalent dual pipelines) to transfer water from the new Hunter River Pump Station to the discharge point above the Plashett storage. ▪ Pipeline(s) would have a nominal length of 3,500m between the pumping station and the flow discharge structure at Plashett Dam. ▪ Permanent gravel access track for the length of the majority of the pipeline for the construction and long-term maintenance use. ▪ Surge mitigation equipment installed at the pumping to control water hammer and water operating conditions. ▪ Water discharge structure at Plashett Dam ▪ Energy dissipation structures at the discharge in to Plashett Dam to prevent scouring of the dam embankment over a range of dam levels. ▪ Power supply works ▪ An additional substation and switchroom. 	<p>Construction of the approved works has been completed. Continued operation and maintenance will be carried over to the new SSD consent.</p> <p>The operation and maintenance activities associated with the approved works are covered in specific management plans which have been integrated with the operation environmental management plans for the site. This will be reviewed and updated as required to ensure all environmental controls and mitigation measures have been identified and implemented as required.</p> <p>Specific management plans that will be carried through to the WOAOW Project include:</p> <ul style="list-style-type: none"> ▪ Operational Environmental Management Plan ▪ Ecology Management Plan ▪ Vegetation Management Plan

DA Reference	Description	Additional information
	<ul style="list-style-type: none"> Upgrade to the existing 33kV power supply. Oil filled transformer contained within in appropriately sized bunding or dry transformer. <p>Modification:</p> <p>The modification to the approved works focused on the following:</p> <ul style="list-style-type: none"> Location of the pipeline below ground A new outlet position, leading to a reduced pipeline length and change in the location of the discharge point Inclusion of a pair of additional surge mitigation tanks Consolidate compliance reporting Altered platypus management methods 	
<p>2019/37</p> <p>Development consent 2019/37 issued by Muswellbrook Shire Council on 4 May 2020 for Lake Liddell Seepage Works</p>	<p>Approved works</p> <p>The works includes two pumping stations, Pumping Station 1 and Pumping Station 2 along with associated seepage capture and transfer infrastructure designed to return seepage from the Lake Liddell Dam Wall back to Lake Liddell.</p>	<p>Construction approved under this consent is yet to commence. The management measures outlined in the SEE for this DA will be carried over to the WOAOW Project. These include:</p> <ul style="list-style-type: none"> Erosion and Sediment Control Plan CEMP development <p>The operation and maintenance activities associated with this approved works will be integrated with the operation environmental management plans for the site. This will be reviewed and updated as required to ensure all environmental controls and mitigation measures have been identified and implemented as required.</p>

7. Management and monitoring measures

This chapter provides a consolidated summary of all the proposed environmental management and monitoring measures, identifying all the commitments arising out of the EIS and response to submissions and how these measures would be integrated with the existing environmental management, monitoring and reporting regime for Bayswater. This Chapter supersedes the commitments made in Chapter 20 of the EIS with additional commitments highlighted in Bold and no EIS commitments removed.

7.1 Existing Management Arrangements

Bayswater operates under an Environmental Management System (EMS) that is integrated with AGLM's information management system. The EMS is currently ISO 14001 equivalent. The EMS includes a series of management plans and procedures to assess and mitigate risks associated with air, water, waste, biodiversity, heritage and land management issues. Other important documents include the Pollution Incident Response Management Plan required under EPL 779, the Emergency Management Plan and Emergency Response Plan. EPL 779 stipulates the discharge points to air and water. It also stipulates monitoring requirements and limits for discharges from these points.

All site specific plans and procedures are developed to address AGL standards which include:

- AGL-HSE-STD-009.1 – Land Standard
- AGL-HSE-STD-009.2 – Groundwater Standard
- AGL-HSE-STD-009.3 – Surface Water Standard
- AGL-HSE-STD-009.4 – Air Emissions Standard
- AGL-HSE-STD-009.5 – Noise Emissions Standard
- AGL-HSE-STD-009.6 – Biodiversity Standard
- AGL-HSE-STD-009.7 – Waste Standard
- AGL-HSE-STD-009.8 – Cultural Heritage Standard
- AGL-HSE-STD-009.9 – Greenhouse Gas emissions Standard.

The following management plans of relevance to the Project are implemented on site:

- AGLM-HSE-PLN-009.01 Land Management Plan
- AGLM-HSE-PLN-009.02 Water Management Plan
- AGLM-HSE-PLN-009.02.1 Tinkers Creek Trigger Action Response Plan
- AGLM-HSE-PLN-009.02.2 Groundwater Trigger Action Response Plan
- AGLM-HSE-PLN-009.02.3 LD EPL_12_13 Trigger Action Response Plan
- AGLM-HSE-PLN-009.04 Air Quality Greenhouse Gas and Noise Management Plan
- AGLM-HSE-PLN-009.04.1 Dust Trigger Action Response Plan
- AGLM-HSE-PLN-009.07 Waste Management Plan
- AGLM-HSE-PLN-010.02 Pollution Incident Response Management Plan Version 18
- AGLM-HSE-PLC-008.01 Environment Directory
- Power Stations Standing Instruction No. HSE 40/1 Bushfire Risk Management Plan
- AGL Macquarie Bayswater Power Station – Water Treatment Plant Upgrades – Construction Environmental Management Plan
- Bayswater Power Station - Upgrade to Increase Water Extraction Capacity – Ecology Management Plan
- Bayswater Power Station - Operation Environmental Management Plan – Hunter River Pump Station Augmentation
- Bayswater Power Station Upgrade to Increase Water Extraction Capacity – Vegetation Management Plan
- Ravensworth Mining Operations Plan for Ravensworth Ash Disposal Area (Rehabilitation Management Plan)
- Bayswater Ash Dam Ash Management Plan.

These plans would be reviewed to incorporate the environmental management commitments and any conditions of approval for the Project.

7.2 Project environmental commitments

7.2.1 Ongoing design process

Full details of the design for the Project have yet to be completed. The EIS is based on a current design status for each Project component which may be amended through the detailed design process. Construction methods may also vary subject to design refinements and the selection of the construction contractor.

The assessment of the Project within the EIS is based on consideration of reasonable worst case environmental impacts to allow flexibility in design and construction methodology. The ongoing design of Project components would adopt the identified performance outcomes for the Project as identified in the EIS.

Following the engagement of a contractor for each Project component, a risk assessment would be completed on the actual methods to be implemented and an environmental management plan prepared that incorporates the Project commitments and conditions of approval. Further consultation with relevant agencies would be undertaken and necessary approvals of final designs and methods sought. AGLM will comply with any pre-construction compliance obligations prior to the commencement of all Project components. The risk assessments, final design plans and management plans would be used to confirm that no greater impact than that assessed in this EIS would eventuate. Should additional impacts be identified, any necessary modifications to the approval and/or EPL would be sought.

7.2.2 Construction Environmental Management Strategy

Due to the various Project components, it is likely that individual construction packages would be tendered and potentially delivered by different contractors. Each contractor is likely to implement construction works differently and in accordance with their own management systems and processes. As such AGLM proposes to develop an overarching Construction Environmental Management Strategy (CEMS) for the Project that would be adopted and implemented through the development of contractor's Construction Environmental Management Plans (CEMP). As such the CEMS would document the required environmental performance outcomes arising from the Project approval and EPL for the Project, and each CEMP would document reasonable and feasible measures for the Project component to achieve these required outcomes.

7.2.3 Operational Environmental Management Plan

The existing operational environmental management framework for Bayswater would be reviewed to incorporate commitments and approval conditions associated with the Project. In particular, the following Project components represent new or expanded operations that warrant new or revised management plans:

- Salt cake landfill operation
- Ash harvesting and recycling operations and
- Borrow Pits.

All other Project components are the subject of existing operational management plans which would be updated to accommodate any new commitments and procedures as necessary.

7.3 Consolidated summary of mitigation measures

A summary of the proposed environmental mitigation measures is provided in Table 7.1. These measures have been adapted from, and reflect the intent of, the recommended measures of the specialist assessments provided in Appendix C to K of the EIS whilst adopting the overarching environmental management approach adopted for the Project by AGLM.

Table 7.1: Summary of environmental management measures

Reference	Environmental management measures	Implementation Timing
General and design commitments		
D01	The ongoing design of Project components would adopt the identified performance outcomes for the Project as identified in the EIS.	Pre-construction of applicable components
D02	The detailed design of the Ravensworth Ash Line would consider and address subsidence risks.	Pre-construction of applicable components
D03	The detailed design of each Project component would consider and address seismic risks.	Pre-construction of applicable components
D04	The detailed design of the ash dam augmentation would involve the reassessment of the societal risk and individual risk and consequence category of the BWAD. The detailed design and supporting assessments would be provided to Dams Safety as per the requirements of the <i>Dams Safety Act 2015</i> and associated guidelines and methodologies. Copies of assessments would be provided to Transport for NSW.	Pre-construction of applicable components
D05	The design of the salt cake landfill would comply with the EPA's Environmental Guidelines: Solid Waste Management in consultation with the EPA as the appropriate regulator. Risks to liner degradation due to geochemical interactions with saline leachate would be considered and addressed in detailed design as per commitment GW03.	Pre-construction of applicable components
D06	Seepage improvement works would be sized and design to maximise seepage collection and return in accordance with the outcomes of ongoing pollution reduction investigation process under EPL799. Seepage improvement works would produce improved environmental outcomes on a do nothing scenario. Seepage improvement works would be undertaken prior use of expanded capacity of the ash dam augmentation.	Pre-construction of applicable components
D07	Coal handling and preparation plant water management improvements would be implemented in accordance with the outcomes of the ongoing pollution reduction investigation process under EPL799.	Pre-construction of applicable components
D08	A risk assessment would be completed on the actual methods to be implemented and an environmental management plan prepared that incorporates the Project commitments and conditions of approval. Further consultation with relevant agencies would be undertaken and necessary approvals of final designs and methods sought.	Pre-construction of applicable components
D09	The design and implementation of works within waterfront land would be undertaken in accordance with Guidelines for Controlled Activities on Waterfront Land (NRAR, 2018).	Pre-construction of applicable components
D10	An overarching Construction Environmental Management Strategy (CEMS) would be developed for the Project that would be adopted and implemented through the development of contractor's Construction Environmental Management Plans (CEMP) for each	Pre-construction of applicable components

	component. The CEMS would document the required environmental performance outcomes for the Project and each CEMP would document reasonable and feasible measures for the Project component to achieve these outcomes.	
D11	Risk assessments, final design plans and management plans for each component would be made publicly available and be used to confirm that no greater impact than that assessed in the EIS would eventuate. Should additional impacts be identified, any necessary modifications to the approval and/or EPL would be sought.	Pre-construction of applicable components
D12	<p>The existing operational environmental management framework for Bayswater would be reviewed to incorporate commitments and approval conditions associated with the Project. In particular, the following Project components represent new or expanded operations that warrant new or revised management plans:</p> <ul style="list-style-type: none"> ▪ Salt cake landfill operation ▪ Ash harvesting and recycling operations ▪ Borrow Pits. <p>All other Project components are the subject of existing operational management plans which would be revised to accommodate any new commitments and procedures as necessary.</p>	Pre-construction of applicable components
D13	If during detailed design any impacts to existing utilities are identified, the relevant authorities will be contacted.	Pre-construction of applicable components
Biodiversity		
BD01	Opportunities to limit the extent of vegetation (including hollow-bearing trees and stags) clearance required would be considered as part of detailed design and construction planning.	Pre-construction of each stage
BD02	<p>A Biodiversity Management Plan would be prepared as part of the CEMS and include the following requirements:</p> <ul style="list-style-type: none"> ▪ Clearly delineate the boundaries of the Project area to prevent any unnecessary clearing beyond its extent ▪ Ensure vehicle and equipment parking areas and stockpile areas are identified and sited to avoid areas containing ecological value ▪ Install appropriate signage such as 'No Go Zone' or 'Environmental Protection Area' ▪ Identify and communicate the location of any 'No Go Zones' in site inductions ▪ Speed limits within the Project area would be limited to 40 km/hr to minimise the risk of vehicle collision with fauna. <p>The Biodiversity Management Plan would also consider measures to mitigate impacts on flora and fauna from noise, vibration, waste, and air pollution, in accordance with the mitigations identified in this EIS.</p>	Construction
BD03	<p>Prior to the removal of hollow-bearing trees / habitat trees, a pre-clearing protocol would be implemented which would include the following requirements:</p> <ul style="list-style-type: none"> ▪ Pre-clearance surveys would be undertaken to determine if any inhabiting fauna are present ▪ A suitably qualified and trained fauna handler would be present during hollow-bearing tree clearing to rescue and relocate displaced fauna 	Construction

	<ul style="list-style-type: none"> Appropriate exclusion fencing around trees and woodland that are to be retained within the Project area would be erected, considering allowance for Tree Protection Zones in accordance with the Standards Australia (2009). 	
BD04	<p>Clearing would be avoided, where practicable, during breeding and through egg hatching periods for the Striped Legless Lizard, November to February. If clearing is to occur during this period (November to February):</p> <ul style="list-style-type: none"> Pre-clearing surveys within areas of Striped Legless Lizard habitat will be conducted Any individuals captured during these pre-clearing surveys will be relocated into similar habitat outside the Development Site. 	Construction
BD05	<p>Weeds and pathogens would be managed in accordance with applicable legislative requirements including and not limited to the <i>Biosecurity Act 2015</i> (NSW). The following measures would be implemented to prevent the transfer of weeds and pathogens:</p> <ul style="list-style-type: none"> Plant and equipment would be required to arrive at site clean Soil and seed material transfers would consider the risks of weeds and pathogens being present and the sensitivity of the receiving area. No transfers are to occur to relatively less disturbed areas of site unless material can be determined to be from a non-weed infested area and not contain pathogens Weed infestations within the construction footprint are to be identified and mapped prior to construction. <p>Methods to be implemented for the control of noxious weeds would be included in the CEMS and adopted as necessary in each CEMP. This is to include weed control works to be conducted throughout the construction phase of the Project, and follow-up weed control within the Development Site post construction.</p>	Construction
BD06	<p>If it is identified there is a Salt cake landfill lining failure and an associated increase in salinity in the groundwater, above background levels, then monitoring of vegetation within the predicted impact area would occur.</p> <p>If during the monitoring of vegetation there is an identified impact on the vegetation due to the increased salinity from the Salt cake landfill, additional offsetting measures would be implemented where required.</p> <p>Credits retirement would be calculated based on the area of impact and the ratio of credits generated within the closest equivalent vegetation zone within the impact area.</p>	Operation
BD07	<p>Upon the completion of extraction works within each Borrow Pit location, these areas would be rehabilitated. A rehabilitation plan for each Borrow Pit would be prepared prior to completion.</p> <p>Where the areas are to be returned to native vegetation, locally endemic species will be used for rehabilitation of appropriate vegetation communities, using locally sourced seeds/plants where possible.</p>	Decommissioning
BD08	<p>Biodiversity offset credits would be retired in accordance with BC Act and EPBC Act requirements. The number and type of credits would be refined as part of further survey and detailed design.</p>	Prior to clearing for each Project component.

	A clearing staging plan would be prepared prior to the commencement of works. From this plan the required biodiversity credits for each stage would be determined based on areas of impacts to each vegetation zone, and the retirement of biodiversity credits would occur prior to the commencement of each stage. This plan will be set out in a separate document to the BDAR and would be approved by DPIE prior to commencement of disturbance works.	
Surface Water		
SW01	<p>An overarching Construction Environmental Management Strategy (CEMS) would be prepared for the Project and would require the preparation of a Construction Environmental Management Plan (CEMP) for each Project component. The CEMS would outline measures to manage soil and water impacts associated with the construction works.</p> <p>The CEMS would require that each CEMP would provide:</p> <ul style="list-style-type: none"> Measures to minimise/manage erosion and sediment transport both within the construction footprint and offsite including requirements for the preparation of erosion and sediment control plans for all progressive stages of construction Measures to manage stockpiles including locations, separation of waste types, sediment controls and stabilisation Measures to manage groundwater dewatering and impacts Processes for dewatering of water that has accumulated on site and from sediment basins, including relevant discharge criteria Measures to manage accidental spills including the requirement to maintain materials such as spill kits Measures to manage potential saline soils Details of surface water and groundwater quality monitoring to be undertaken prior to, throughout, and following construction Controls for receiving environments including: Designation of 'no go' zones for construction plant and equipment Creation of catch/diversion drains and sediment fences at the downstream boundary of construction activities where practicable to ensure containment of sediment-laden runoff and diversion toward sediment sump treatment areas (not sediment basins) to prevent flow of runoff to nearby waterways. 	Pre-construction Construction
SW02	Erosion and sediment control measures will be implemented and maintained at all work sites in accordance with the principles and requirements in <i>Managing Urban Stormwater – Soils and Construction, Volume 1</i> (Landcom 2004) and Volume 2D (Department of Environment, Climate Change and Water, 2008), commonly referred to as the "Blue Book". Additionally, any water collected from worksites would be treated and discharged (where able) to avoid any potential contamination or local storm water impacts. Measures would be designed in accordance with the relevant guideline where appropriate.	Construction
SW03	Alternative water supply options to potable water would be investigated, with the aim of using recycled water where feasible.	Construction Operation

	<p>Measures would be implemented to reduce reliance on potable water use for both construction and operational phases of the Project where possible noting that AGLM obtains the majority of its water from the Hunter River under AGL's existing Macquarie Generation Water Licensing Package dated April 2011. No additional water is required for the Project outside of this Water Licensing Package.</p> <p>Water use requirements and sources would be reviewed during the detailed design and construction planning, documented in each CEMP and implemented throughout the Project. Any existing Water Management Plans would be updated to incorporate any altered water use requirements during operational stages of the Project.</p>	
SW04	<p>Stockpiles would be managed to minimise the potential for mobilisation and transport of dust, sediment and leachate in runoff. This would include:</p> <ul style="list-style-type: none"> Minimising the number of stockpiles, area used for stockpiles, and time that they are left exposed Locating stockpiles away from drainage lines, waterways and areas where they may be susceptible to wind erosion or flooding <p>Stabilising stockpiles, establishing appropriate sediment controls and suppressing dust as required.</p>	Construction Operation
SW05	<p>A construction water quality monitoring program would be developed where appropriate and included in each CEMP for the Project to, observe any changes in surface water and groundwater during construction, and inform appropriate management responses.</p> <p>The program would be based on the water quality monitoring methodology, water quality indicators and the monitoring locations outlined in the CEMS.</p> <p>Sampling locations and monitoring methodology to be undertaken during construction would be further developed in detailed design in accordance with the <i>ANZECC water quality guidelines</i> (ANZECC/ARMCANZ (2000)). It may include collection of samples for analysis from key locations, visual monitoring of other points of release of construction waters and monitoring of downstream waterways where appropriate.</p> <p>The monitoring frequency during construction would be confirmed during detailed design however would include at least monthly construction monitoring at all monitoring sites which would be preferentially monitored following wet weather events.</p> <p>Should the results of monitoring identify that the water quality management measures are not effective in adequately mitigating water quality impacts, additional mitigation measures would be identified and implemented as required.</p>	Prior to construction, and during construction and operation
SW06	<p>The Bayswater site operational water quality monitoring program would be updated and implemented as required.</p>	Prior to operation and during operation
SW07	<p>The specific requirements for water quality controls would be confirmed as the detailed design develops and prior to commencement of construction of each Project element to ensure the objectives of the Project are achieved.</p>	Prior to Construction

SW08	<p>The following measures would be undertaken to manage activities in proximity to waterways:</p> <ul style="list-style-type: none"> Works within waterfront land would be managed in accordance with the relevant guideline as deemed appropriate Implementing practices to minimise disturbance of banks and undertaken bank stabilization. <p>Appropriate drainage features would be incorporated into the design of the Project elements by a suitably qualified and experienced professional. All Project elements would be designed and constructed in accordance with relevant guidelines.</p>	Prior to construction and during construction
SW09	Borrow Pits would be designed to comply with design specifications to minimise interference and disruption of natural surface water flows and water quality, particularly impacts on turbidity.	All
SW10	<p>Current Ravensworth ash line system monitoring includes sensors and automatic shut off of ash pumping in response to triggers indicative of a leak which would continue to be operated for the Project. If no leak is identified in above ground sections, this would trigger investigations of underground sections of pipeline. Routine inspections and monitoring of the Ravensworth Ash line would be undertaken to ensure any leakages are promptly identified and fixed.</p>	Operation
SW11	A Trigger Action Response Plan would be prepared in consultation with the EPA, DPIE Water Group and NRAR prior to the operation of the salt cake landfill.	Operation
Flooding		
F01	Temporary works would consider flood risks during construction. Should construction staging require a temporary departure from the design (e.g. higher embankments for preloading, temporary diversions or temporary crossings of waterways), flood impacts would be assessed before finalising the approach.	Construction
F02	Where stockpiles are to be located in the floodplain, they would be located and sized to ensure no adverse impacts on flood behaviour.	Construction Operation
F03	<p>Flood management controls would be included as part of each CEMP. The controls would consider likelihood of flooding, flood evacuation routes, warning times and potential impacts from flooding from the Project. It would include, but not be limited to:</p> <ul style="list-style-type: none"> Any monitoring requirements to provide advance notice of a flood event Procedures (e.g. dam safety emergency plan) to be implemented in the event of a flood <p>Required training and staff inductions.</p>	Prior to Construction Construction
F04	Temporary crossings on water courses would be designed with consideration of flooding during construction and removal and rehabilitation following completion of construction.	Prior to Construction Construction
F05	Dam break inundation maps would be prepared based on two-dimensional hydraulic modelling software based on the current relevant guidelines presented in Australian Rainfall and Runoff (Ball J et al, 2019), ANCOLD and guidelines acceptable to Dams Safety	Prior to Construction

	NSW. The inundation maps would be utilised to confirm the consequence category for the dam.	
F06	A detailed assessment of the flood handling capacity for the BWAD would be undertaken for each of the augmentation stages based on the current guidelines presented in Australian Rainfall and Runoff (Ball J et al, 2019). The consequence categories for each of the augmentation stages would be reassessed and inundation maps prepared to inform the Dam Safety Emergency Plan.	Prior to Construction
F07	A flooding assessment based on current guidelines from the Australian Rainfall and Runoff and using a two-dimensional hydraulic modelling software would be undertaken for: <ul style="list-style-type: none"> ▪ The proposed Borrow Pits, to consider possible re-distribution of flood flows due to diversion and which may impact on scouring and bank erosion ▪ The Salt cake landfill, to demonstrate that the salt cake landfill facility would have no adverse impacts on flood behaviour up to and including the 1% Annual Exceedance Probability (AEP) event. 	Prior to Construction
F08	The design of the Ravensworth Ash line would confirm that the pipeline would have no adverse impacts on flood behaviour and the pipeline would be unlikely to be damaged or destroyed up to the designed storm event.	Prior to Construction
Groundwater		
GW01	Design Borrow Pit areas to avoid areas with shallow groundwater.	Prior to construction
GW02	If groundwater is unexpectedly intersected during Borrow Pit excavations, excavations should cease in that area and the date, location, level and depth of groundwater interception should be documented and conveyed to a hydrogeologist to determine an appropriate course of action.	Construction
GW03	During detailed design, salt cake landfill design should ensure leachate and salt cakes would not geochemically compromise the elected liner type due to reactions. Since the salt is reported by the proponent to predominantly comprise gypsum, there may be a risk that this material (and leachate) could interact with clay liners and result in compromised liner integrity.	Prior to construction
GW04	If drilling fluids are required, where possible, freshwater would be used. Where this is not possible, environmentally friendly biodegradable drilling fluid would be used where possible.	Construction
GW05	Current Ravensworth ash line system monitoring includes sensors and automatic shut off of ash pumping in response to triggers indicative of a leak which would continue to be operated for the Project. If no leak is identified in above ground sections, this would trigger investigations of underground sections of pipeline.	Construction and operation
GW06	To minimise the risk of spills/leaks of hazardous materials, the following would be undertaken: <ul style="list-style-type: none"> ▪ Regular plant maintenance and checks ▪ Onsite spill kits and established spill clean-up procedures, which would include: 	Construction and operation

	<ul style="list-style-type: none"> ▪ Having adequate spill prevention and absorbent materials (including absorbent pads, absorbent booms, granular absorbent and disposal bags) onsite to manage spills and leaks of potential pollutants ▪ Provision of appropriate equipment and materials to capture any drips and spills which occur during the transfer of potential pollutants, and when carrying out maintenance of hydrocarbon filled plant and equipment ▪ Procedures which ensure that spills of potential pollutants are contained and cleaned up immediately. Such spillage must not be cleaned up by hosing, sweeping, or otherwise releasing contaminants to any watercourse, waterway or groundwater ▪ Routine toolbox talks and safe work method statements which cover spill management protocols. <p>Remediation of potential contamination sources and where possible removal of the contamination source (e.g. through offsite removal and disposal to an appropriately licensed waste facility).</p>	
GW07	<p>The BWAD seepage flow rate should be monitored during construction and operation, as well as the effectiveness of the twoash dam seepage collection dams. If monitoring indicates that after implementation of the proposed upgrades to the seepage collection dams that the dams are not effectively collecting seepage, then additional seepage collection dam upgrades should be made, or alternatively, the seepage collection system be re-designed and re-constructed.</p>	Construction and operation
Air Quality		
AQ01	<p>The CEMS would include requirements to monitor and manage potential air quality impacts associated with the construction of the Project.</p> <p>Each CEMP would identify project construction activities with the potential to have air quality impacts and the controls required to avoid, minimise and mitigate these impacts.</p> <p>The following measures would be implemented as required:</p> <ul style="list-style-type: none"> ▪ Where possible, limit the extent of exposed areas and quantity of stockpiled dispersible materials; ▪ Minimise dust generation from stockpiles, haulage routes, work activities and exposed ground surfaces; ▪ Minimise generator and vehicle emissions; ▪ Apply suitable speed limits on site haulage routes to minimise dust emissions; ▪ Undertake watering of all unsealed trafficked haulage routes to minimise visible dust emissions; ▪ Apply watering to activities involving the loading and unloading, compaction and handling of soil materials as required; ▪ Cover or minimise truck loads; ▪ Modify or cease dust generating works during unfavourable weather conditions; and <p>Inspect and address corrective actions.</p>	Construction

AQ02	<p>During operation of the augmented BWAD, the following additional controls would be implemented:</p> <ul style="list-style-type: none"> Conduct routine inspections of the ash dam to identify whether cenospheres (floating ash) have accumulated in dry areas beyond the decant pond; Where identified promptly bury, harvest or move dried cenospheres into the decant pond; Where feasible, use less dispersive bottom ash to 'cap' fly ash deposits in the ash dam before they dry out; As possible, restrict discharge from fly ash pipelines to one cell at a time, and utilise bottom ash to 'cap' before moving to the next cell; Where feasible utilise temporary 'flooding' of individual ash dam cells prior to unfavourable meteorological conditions As applicable make use of new access tracks to apply water or dust suppressing agents. 	Operation
AQ03	Undertake revegetation of rehabilitation areas at decommissioning.	Decommissioning
Soil and contamination		
SC01	Appropriate demarcation and restriction of access to previously identified asbestos impacted areas in the CHP Coal storage area and along the pipelines with the BWAD augmentation area should be undertaken to reduce potential exposure to workers in the short term.	Construction
SC02	Each CEMP would identify appropriate control measures to mitigate the potential for pollution incidents occurring that could lead to contamination of study areas. Each CEMP would also be required to include an unexpected finds protocol to manage actual or potential contamination encountered during construction. The protocol would include measures for appropriate sampling, analysis and interpretation of results by a qualified environmental consultant.	Construction
SC03	The Asbestos Management Procedure would be updated as required to provide appropriate control measures during the construction phase (as well as the operational phase if maintenance activities are required) to mitigate any risks of worker exposure to airborne asbestos fibres during work activities.	Construction/ Operation
SC04	A rehabilitation plan would be developed covering all Project elements, which would include measures to remediate the land where required following decommissioning in accordance with State Environmental Planning Policy No 55—Remediation of Land.	Decommissioning
Aboriginal heritage		
AH1	The management strategy included as Chapter 12 of the ACHAR would be included in an Aboriginal Cultural Heritage Management Plan (ACHMP) for the Project, prepared in consultation with RAPs, and to the satisfaction of the Heritage NSW and the DPIE. Subject to the grant of a Development Consent under Division 4.7 of the EP&A Act and DPIE approval, this ACHMP will guide the management of the known and potential Aboriginal archaeological resource of the Project area, as well as identified cultural values.	Pre-construction

AH2	Establish 'no-go' areas, through fencing or other appropriate measures, to protect all sites and areas of PAD (or portions thereof) that have been assessed as subject to potential indirect (inadvertent) impact.	Pre-construction
AH3	Community collection for all impacted surface sites would be completed for the Project prior to the commencement of any ground disturbance within the study area and following Development Consent. Community collection would be undertaken by a qualified archaeologist and RAP field representatives and a report prepared detailing the results of the community collection. Aboriginal Site Impact Recording (ASIR) forms for all salvaged sites should be submitted to Heritage NSW at the completion of the collection.	Pre-construction
AH4	All collected artefacts (including stone artefacts recovered from the study area as part of the test excavation program) would be stored at the Bayswater Power Station site. Details surrounding the long term management of Aboriginal objects recovered will be outlined in the Project's ACHMP with consultation undertaken with RAPs over the proposed long term management of these items.	Pre-construction
AH5	Cultural awareness induction for any personnel involved in ground breaking activities. This could include a Cultural Awareness Training Program.	Construction
AH6	An unanticipated finds protocol would include the following steps if an Aboriginal object is identified or harmed: 1. Immediately cease all work at the particular location. 2. Secure the area to avoid further harm to the Aboriginal object. 3. Seek advice from a qualified archaeologist on appropriate management considering the nature, type and significance of the object. 4. Should it be determined the object is Aboriginal, it should be registered on Heritage NSW's AHIMS database as soon as practicable. 5. The following management should apply for previously unrecorded objects identified within the study area: a. Open artefact sites (i.e., isolated artefacts and artefact scatters) assessed of low significance subject to Project related direct surface impacts should be subject to community collection. Sites assessed of moderate significance should be subject to surface collection and other forms of mitigation (i.e., detailed recording, test or open area excavation), regardless of impact type (i.e., including direct surface and subsidence related). Management of sites assessed of high significance would be determined through consultation with AGLM and RAPs; b. Scarred trees identified within the study area subject to project related impacts would be managed through discussions between a qualified archaeologist, AGLM and RAPs and may include removal and relocation; c. Grinding grooves identified within the study area subject to project related impacts would be managed through discussions	Construction / operation

	<p>between a qualified archaeologist, AGLM and RAPs and may include removal and relocation;</p> <p>d. Other sites (i.e., stone quarries, ochre quarries, stone arrangements, engravings) identified within the study area subject to project related impacts would be managed through discussions between a qualified archaeologist, AGLM and RAPs.</p> <p>6. A record of the find and management completed should be included in annual reporting.</p> <p>7. If the site is within the surface development area (i.e., would be impacted), an ASIR form would be completed and submitted to Heritage NSW, prior to disturbance.</p>	
AH7	<p>In the event that potential human skeletal remains are identified at any point during the life of the development, the following standard procedure (NSW Police Force 2015; NSW Health 2013) should be followed.</p> <ol style="list-style-type: none"> 1. all work in the vicinity of the remains should cease immediately; 2. the location should be cordoned off - work can continue outside of this area as long as there is no risk of interference to the remains or the assessment of the remains; 3. where it is reasonably obvious from the remains that they are human, the Project Manager (or a delegate) should inform the NSW Police by telephone (prior to seeking advice from a forensic specialist); 4. where uncertainty over the origin (i.e., human or non-human) of the remains exists, a physical or forensic anthropologist should be commissioned to inspect the exposed remains in situ and make a determination of origin, ancestry (Aboriginal or non-Aboriginal) and antiquity (pre-contact, historic or modern); 5. if the remains are identified as modern and human, notify NSW Police; 6. if the remains are identified as pre-contact or historic Aboriginal, notify Heritage NSW using their Environment Line (131 555); and 7. if the remains are identified as historic (non-Aboriginal), notify the NSW Heritage Division. <p>An Aboriginal community representative must be present where it is reasonably suspected burials or human remains may be encountered. If human remains are unexpectedly encountered and they are thought to be Aboriginal, the Aboriginal community must be notified immediately.</p> <p>Recording of Aboriginal ancestral remains must be undertaken by, or be conducted under the direct supervision of, a specialist physical anthropologist or other suitably qualified person.</p> <p>Archaeological reporting of Aboriginal ancestral remains must be undertaken by, or reviewed by, a specialist physical anthropologist or other suitably qualified person, with the intent of using respectful and appropriate language and treating the ancestral remains as the remains of Aboriginal people rather than as scientific specimens.</p>	Construction
AH8	<p>In the event that a previously unidentified Aboriginal site is discovered within the study area at any point during the operational life of the Project, an AHIMS site card for that site</p>	Construction / operation

	would be submitted to Heritage NSW as promptly as possible. Timing protocols for the submission of AHIMS site cards would be included in the ACHMP for the Project.	
AH9	An Aboriginal Site Database for the study area and its immediate environs would be established upon commencement of the Project. AGLM would be responsible for the creation and maintenance of this database which will, at a minimum, contain the name, type, size (where applicable), MGA coordinates and status of all Aboriginal sites within and directly adjacent to the study area. The database would be updated throughout the operational life of the project as necessary.	Construction / operation
Traffic		
TT1	An oversized vehicle permit would be sought for all oversized vehicle movements. Oversized vehicles would be escorted by an appropriately qualified subcontractor and would endeavour to travel outside of peak traffic periods.	Pre-construction
TT2	The haulage contractor to prepare and implement a traffic management plan for oversize vehicle movements, which would include: <ul style="list-style-type: none"> ▪ Identification of the routes ▪ Measures to provide an escort for the loads ▪ Times of transporting to minimise impacts on the road network ▪ Communication of strategy and liaising with emergency services and police. 	Construction
TT3	The CEMS and general site induction would inform construction and operational personnel of the risk of collisions, particularly with animals during rain or periods of low light.	Construction / operation
TT4	WaterNSW access to water monitoring site 210110 Bayswater Creek @ Liddell must be maintained along Pikes Gully Road, or alternative access arranged in consultation with WaterNSW.	Construction / operation
Noise and Vibration		
NV01	Each CEMP would identify project construction activities with the potential to have noise impacts and the controls required to avoid, minimise and mitigate these impacts. Each CEMP would adopt the following measures where reasonable and feasible: <ul style="list-style-type: none"> ▪ Conduct construction activities during standard hours of construction, and noisy operational works during day time hours ▪ Schedule deliveries during standard hours of construction ▪ Ensure on-site and public speed limits are adhered to ▪ Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site, such as by including drive-through for parking and deliveries ▪ Use mains power supply rather than use generators; ▪ Switch off generators when not in use ▪ Wherever possible and practical, select low noise plant and equipment 	Construction

	<ul style="list-style-type: none"> Operate and maintain plant and equipment in an efficient and proper manner Turn off plant and equipment when not in-use Consider the application of alternative, low-impact construction techniques Avoid dropping materials from a height Avoid dragging equipment and materials Dampen or line metal trays as necessary Ensure that road plates are installed as per specifications Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible. 	
Socio-economic		
SE1	<p>To manage the increase in construction traffic, including heavy and oversize vehicles, on the New England Highway:</p> <ul style="list-style-type: none"> Implementation of a traffic management plan for management of construction traffic, including oversized loads Consider the timing of key tourist activities and events in the planning of major haulage tasks Communication with key stakeholders and communities about potential changes in construction traffic and major haulage tasks. 	Construction
SE2	Identify opportunities to maximise the use of local suppliers and businesses in the provision of goods and services for construction.	Pre-construction
Visual		
VI01	Visual impacts would be considered in the detailed design to minimise visual impacts where compatible with biodiversity and heritage management measures and Project requirements.	Design
VI02	A rehabilitation management plan would be developed and include prioritising screening vegetation in areas able to support larger vegetation around permanent, unnatural landforms.	Operation
Non-Aboriginal heritage		
NAH01	<p>Should any historical archaeological remains be discovered during construction, all works would stop, the area cordoned off and a heritage professional engaged to examine and advise on the significance of the archaeological finds.</p> <p>If deemed to be of significance, under section 146 of the <i>Heritage Act 1977</i> (NSW), a section 146 form would be submitted to notify the Heritage Council of the discovery of relics. Further investigation may be required, and appropriate management would be agreed through consultation with Heritage NSW.</p>	Construction
NAH02	<p>In the unlikely event that human remains are uncovered, all work must cease immediately in the vicinity of the remains and the area cordoned off. The local NSW Police must be notified, who would make an initial assessment as to whether the remains are part of a crime scene, or Aboriginal remains.</p> <p>If the remains are thought to be Aboriginal, Heritage NSW must be contacted as per AH7.</p>	Construction
Waste		

WR01	<p>The existing Waste Management Plan would be updated to include the Project and would be implemented prior to each stage. The plans would be developed with the following criteria:</p> <ul style="list-style-type: none"> ▪ A hierarchical waste management approach would be used, from the most preferable (reduce, reuse or recycle wastes) to the least preferable (disposal) to prioritise waste management strategies to avoid waste generation ▪ The plans would promote the use of materials with minimal packaging requirements, removal of packaging offsite by suppliers and fabrication of parts offsite ▪ Where waste cannot be avoided, waste materials would be segregated by type for collection and removal (for processing or disposal) by licensed contractors ▪ All waste types would be separated at source for recycling and apply a system of colour-coded waste storage containers to ensure the segregation of waste is affected as far as possible ▪ A licensed service provider would be appointed to collect general solid waste and hazardous waste during construction and operation ▪ Each waste type would be classified for transport to ensure correct handling. <p>Any waste that cannot be recovered or recycled would need to go to a licensed treatment or disposal facility where it would be treated and disposed of according to its classification</p>	Construction
WR02	Cleared vegetation would be either mulched for onsite reuse or used to create habitat piles, noting that any weeds and pathogens would be managed according to requirements under the <i>NSW Biosecurity Act 2015</i> .	Construction
WR03	The Salt cake landfill would be designed, constructed and operated in accordance with <i>EPA Environmental Guidelines: Solid Waste Landfills</i> (EPA, 2016).	All
WR04	Ash recovery for off-site use would be undertaken in accordance with the coal ash order and exemption and approved sampling plans.	Operation
WR05	The onsite disposal or reuse of materials generated through construction and operation would be undertaken in accordance with the EPL 779, POEO Act and applicable waste orders and exemptions as in force at the time.	All
Hazards		
HR1	Risks associated with the Project would be managed through a Management of Change process. AGLM implements an Asset Change Management Standard, and any major change (defined as a change that has major implications to the strength, stability, operation and design of the asset and/or health and safety of employees) must undergo a detailed risk assessment using AGLM's Risk Management and Assessment Framework to assess the risks that may be introduced by the proposed change. This would be undertaken for all Project components and appropriate controls implemented to reduce the risk to an acceptable level.	Prior to construction

HR2	Completion of all actions arising out of the management of change process.	Prior to construction/ Construction / Post construction.
HR3	Bushfire risks would be considered in the detailed design of each Project component and the bushfire management plan updated to address identified risks.	Prior to construction
HR4	Temporary construction compounds would be maintained in a tidy and orderly manner to minimise potential fuel loads in the event that any construction compounds are affected by fire.	Construction
HR5	Construction activities involving flammable materials and ignition sources (for example, welding) would be proactively managed to ensure that the potential for fire is effectively minimised. High risk construction activities, such as welding and metal work, would be subject to a risk assessment on total fire ban days and restricted or ceased as appropriate. Construction personnel would be inducted into the requirement to safely dispose of cigarette butts.	Construction
HR6	Storage and management of dangerous goods and hazardous materials would occur in a safe, secure location consistent with the requirements of applicable Australian Standards.	Construction and Operation

8. Conclusions

Chapter 21 of the EIS provides an overall evaluation of the merits of the Project and concluded as follows:

This EIS provides a description of the Project, existing information on environmental context and potential for environmental impacts. This EIS has been prepared addressing the SEARs issued by the NSW DPIE on 30 November 2018 and addendum SEARs issued 20 April 2020 and focuses on key issues of biodiversity, heritage, water, traffic, noise and vibration, air and socio-economic impacts. Based on the findings of the EIS the Project is considered able to be approved by the consent authority. The overall Project benefits, including improved environmental outcomes for the ongoing operation of Bayswater, are considered to outweigh the environmental and limited social impacts.

This RtS report addresses the requirement to consider and respond to all submissions received. The RtS report also describes minor clarifications made to the Project description and provides additional information to address submissions. Updated management and monitoring measures are included to provide greater confidence that the Project detailed design for each component would consider applicable guidelines, meet performance outcomes assessed in the EIS and avoid, minimise and offset residual impacts to the extent reasonable and feasible. The revised management measures would be implemented to minimise potential negative impacts of the Project. Where supporting technical assessments have been updated post exhibition in response to consultation and recommendations these are also addressed and appended to this Report.

The outcome of the response to submissions process is that the overall Project benefits, including improved environmental outcomes for the ongoing operation of Bayswater, continue to be considered to outweigh the overall environmental and limited social impacts.

References

- AECOM. (2016). *Water Management Investigation: Bayswater Ash Dam - Bayswater and Liddell PRP*.
- AECOM. (2017a). *Bayswater Coal Handling Plant Sediment Basin Assessment of Water Quality and Water Management*. Report to AGL Macquarie.
- BG&E. (2015). *Bayswater Power Station Strategy Development—Ash in Bulk Use Construction Material Applications*.
- Department of Environment, Climate Change and Water. (2008). *Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom 2004) and Volume 2D*.
- EPA. (2016). *NSW EPA Environmental Guidelines for solid waste landfills (Second Edition)*. Sydney South: Environment Protection Agency.
- Landcom. (2004). *Managing Urban Stormwater: Soils and construction - Volume 1 (4th edition)*. NSW: Landcom.
- Ugwu I. M. and Igbokwe O. A. (2019). *Sorption of Heavy Metals on Clay Minerals and Oxides: A Review*. Published: January 10th 2019. DOI: 10.5772/intechopen.80989

Appendix A. Register of Submissions

Submission Id	Submitter ID	Submitter type	Date (last modified)	Classification	Suburb	Cross Reference
SE-127680	S-127066	Public Authority (Fisheries NSW)	24/06/2020	Comment	Taylors Beach	Section 5.1.1
SE-127762	S-127147	Public Authority (Heritage Council of NSW)	26/06/2020	Comment	PARRAMATTA	Section 5.1.2
SE-128194	S-127574	Public Authority (Subsidence Advisory NSW)	2/07/2020	Comment		Section 5.1.3
SE-8457852	S-8457851	Public Authority (Crown Lands)	14/07/2020	Comment	Newcastle	Section 5.1.4
SE-8475428	S-8475427	Public Authority (WaterNSW)	14/07/2020	Comment	PARRAMATTA	Section 5.1.5
SE-8531215	S-8531214	Public Authority (Dams Safety)	17/07/2020	Comment	Parramatta	Section 5.1.6
SE-8655335	S-8655334	Public Authority (DPI Agriculture)	27/07/2020	Comment	NEWCASTLE	Section 5.1.8
SE-8655341	S-8655340	Public Authority (DRG)	27/07/2020	Comment	Maitland	Section 5.1.9
SE-8655487	S-8655486	Public Authority (EPA)	27/07/2020	Comment		Section 5.1.7 and Appendix B
SE-8698772	S-8698771	Public Authority (Transport for NSW)	30/07/2020	Comment	NEWCASTLE	Section 5.1.10
SE-8715794	S-8715793	Public Authority (Muswellbrook Council)	31/07/2020	Comment		Section 5.1.12
SE-8718519	S-8718518	Public Authority (BCD)	31/07/2020	Comment	NEWCASTLE	Section 5.1.11
SE-8718567	S-8718566	Public Authority (DPIE Water & NRAR)	31/07/2020	Comment		Section 5.1.13
SE-8721669	S-8721668	Public Authority (Singleton Shire Council)	3/08/2020	Comment		Section 5.1.14

SE-8770211	S-8770210	Public Authority (TfNSW)	5/08/2020	Comment	Chippendale	Section 5.1.10
SE-8833951	S-8833950	Public Authority (RFS)	11/08/2020	Comment	SYDNEY OLYMPIC PARK	Section 5.1.17
SE-8838113	S-8838112	Public Authority (Heritage NSW)	11/08/2020	Comment	Parramatta	Section 5.1.16
SE-8518815	S-8518814	Organisation (Transgrid)	16/07/2020	Comment	EASTERN CREEK	Section 5.2.1
SE-8689689	S-8689688	Organisation (The Coal-ash Community Alliance Inc)	29/07/2020 (4/08/2020)	Object	LAKE MUNMORAH	Section 5.2.9
SE-8563679	S-8563678	Organisation (Wilco)	21/07/2020	Support	BEAUMARIS (VIC)	Section 5.2.2
SE-8691475	S-8691474	Organisation (Vecor)	30/07/2020	Support	ROZELLE	Section 5.2.3
SE-8696381	S-8696380	Organisation (EJA)	30/07/2020	Object	Carlton (VIC)	Section 5.2.4
SE-8699849	S-8699848	Organisation (Hunter Environment Lobby Inc.)	30/07/2020	Object	EAST MAITLAND	Section 5.2.8
SE-8700972	S-8700971	Organisation (Hunter Community and Environment Centre)	30/07/2020	Object	HAMILTON EAST	Section 5.2.6
SE-8700977	S-8697522	Organisation (Correct Planning & Consultation for Mayfield Group)	30/07/2020	Object	MAYFIELD	Section 5.2.7
SE-8704210	S-8704209	Organisation (Nature Conservation Council of NSW)	30/07/2020	Object	CHIPPENDALE	Section 5.2.5
SE-8529500	S-8529499	Public	17/07/2020 (20/07/2020)	Comment		Section 5.3.1
SE-8689035	S-8689034	Public	30/07/2020	Object	MOUNT ROYAL	Section 5.3.2
SE-8689407	S-8689406	Public	29/07/2020	Object	EAST MAITLAND	Section 5.3.3
SE-8689916	S-8689915	Public	29/07/2020	Object	Bulahdelah	Section 5.3.4
SE-8690012	S-8690011	Public	29/07/2020	Object	MOUNT HUTTON	Section 5.3.5
SE-8694753	S-8694752	Public	30/07/2020	Object	VALENTINE	Section 5.3.3
SE-8695498	S-8695497	Public	30/07/2020	Object	HAMILTON	Section 5.3.3

SE-8696109	S-8696108	Public	30/07/2020	Object	STOCKTON	Section 5.3.6
SE-8697398	S-8697397	Public	30/07/2020	Comment	WARRAGUL (VIC)	Section 5.3.7
SE-8701357	S-8701356	Public	30/07/2020	Comment	Orange	Section 5.3.3
SE-8703344	S-8703343	Public	30/07/2020	Object	WILBERFORCE	Section 5.3.8
SE-8704036	S-8704035	Public	30/07/2020	Object	WINSTON HILLS	Section 5.3.9
SE-8824827	S-8824826	Public	10/08/2020	Object	Scone	Section 5.3.10

Appendix B. Review of seepage and water assessments

Appendix C. Updated BDAR

Appendix D. Updated ACHAR

Appendix E. Coal Ash Characterisation