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Submissions Received

REGULATORY AGENCIES



Australian Government
Department of the Environment

EPBC Ref: 2012/6378

Mr David Mooney
Senior Planner
Mining Projects
NSW Department of Planning & Infrastructure
GPO Box 39
SYDNEY NSW 2001

Dear Mr Mooney

Merit Review of Environmental Assessment
Continuation of Bengalla Mine Project (SSD 4974 / EPBC 2012/6378)

Thank you for your invitation to comment on the Environmental Impact Statement (EIS) for the proposed Continuation of Bengalla Mine Project, Muswellbrook, NSW (SSD 4974 / EPBC 2012/6378).

The Department of the Environment has reviewed the EIS for the proposed action with regard to the EPBC Act controlling provisions, including threatened species and communities, and water resources in relation to coal seam gas and large coal mining developments.

In particular, the Department notes that the EIS does not contain sufficient detail to allow a thorough assessment of the proposed impact mitigation measures, for either biodiversity or water related matters. The Department requests further detail and commitments be provided regarding impact mitigation and/or strict conditions be placed on any approval of the project to ensure appropriate mitigation, monitoring, and adaptive management. These and other matters are discussed in **Attachment 1**.

If you have any questions about the Department's comments on the EIS, please contact Tess Burdon on (02) 6274 1841 or email tess.burdon@environment.gov.au.

Yours sincerely

Mahani Taylor
Director – NSW Assessments
South-Eastern Australia Environment Assessments
4 November 2013

Attachments

- 1: Department's comments on the EIS
- 2: Independent Expert Scientific Committee (IESC) advice in relation to the proposal
- 3: Response from Bengalla Mining Company in relation to the IESCs advice
- 4: Notification of final decision on whether water resources is a controlling provision for the specified action

Proposed Continuation of Bengalla Mine, NSW (SSD-4974 and EPBC 2012/6378)

Attachment A – Detailed Comments on Environment Impact Statement, September 2013

Reviewer: The Department of the Environment

Document Title: **Bengalla Continuation of Mining Project** Environmental Impact Statement (In particular, *Main Report*; Appendix J *Surface Water Impact Assessment*; Appendix K *Groundwater Impact Assessment*; Appendix O *Ecological Impact Assessment*; Appendix X *Dry Creek Interim Management System and Conceptual Re-instatement Study*), September 2013.

Date of Review: October 2013

General comments on the EIS

Impacts on EPBC Act matters of national environmental significance (MNES)

The relevant controlling provisions for this proposal are:

- Listed threatened species and communities (sections 18 & 18A)
- Water resources, in relation to coal seam gas developments and large coal mining developments (sections 24D & 24E)

Listed threatened species and communities

The following are considered likely or potentially impacted by the proposed action:

- *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (Box Gum Woodland) - critically endangered
- *Bothriochloa biloba* - vulnerable
- Regent Honeyeater - endangered
- Swift Parrot - endangered
- *Prasophyllum* sp. Wybong - critically endangered
- Greater Long-eared Bat – vulnerable

- Spotted-tailed Quoll - endangered <u>Water resources</u> On 24 May 2013 the Independent Expert Scientific Committee (IESC) provided advice on the water related impacts of the proposed action. Their advice is included at Attachment 2. On 25 September 2013 Bengalla Mining Company provided a response to the IESCs advice. This response is included at Attachment 3. The Department notes that the IESCs advice was provided in relation to the draft EIS, and that some matters raised by the committee may have been addressed in the current revised EIS. Notwithstanding, the Department considers that the predicted and potential impacts of the proposed action include: - Diversion of Dry Creek - Impacts to Groundwater Dependent Ecosystems - Impacts to surface water Impacts to groundwater	
Section in EIS	Reviewer Comment
Threatened species and communities: Appendix O – Ecological Impact Assessment	Threatened species and communities: Appendix O – Ecological Impact Assessment; Appendix A (MNES Summary) to Appendix O – Ecological Impact Assessment
Appendix O - Chapter 4; Appendix A	Box Gum Woodland Clearing is predicted to remove 535.3ha of the critically endangered ecological community <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> (Box Gum Woodland) including 73.2ha of which constitutes the remnant woodland component of the community, and 462.1ha which constitutes derived native grassland. The Department considers the proposed clearing is likely to have a residual significant impact on Box Gum Woodland, for which offsets are required.
Chapter 4; Appendix A	<i>Bothriochloa biloba</i> The proposed action will remove approximately 881ha of known habitat for this species. While it is stated that the species has been recorded within the proposed action area, there is no clear information on how many individuals will be affected by the action. It is therefore not possible to determine whether or not the proposed action is likely to have a residual significant impact on the species. Further information is therefore required.

Chapter 4; Appendix A	Swift Parrot The proposed action will result in the loss of approximately 272ha of likely foraging habitat for the Swift Parrot. As a result of the widespread loss of native vegetation across the species' winter foraging range, foraging habitat such as that proposed to be cleared constitutes habitat critical to the survival of the species. The Department considers the proposed clearing is likely to have a residual significant impact on the Swift Parrot, for which offsets are required.
Chapter 4; Appendix A	Regent Honeyeater The proposed action will result in the loss of approximately 272ha of likely foraging habitat for the Regent Honeyeater. The species relies on the availability of foraging resources such as those proposed to be cleared, particularly during poor flowering seasons and/or in times of drought. The habitat proposed to be cleared constitutes habitat critical to the survival of the species. The Department considers the proposed clearing is likely to have a residual significant impact on the Regent Honeyeater, for which offsets are required.
Chapter 4; Appendix A	Spot-tailed Quoll The Fauna Species Profile incorrectly lists the Spot-tailed Quoll as vulnerable. The SE Mainland population of this species is listed under the EPBC Act as Endangered. The proposed action will remove approximately 272ha of potential foraging habitat for this species. While the proposed action area is likely to be within the home range of locally recorded Spot-tailed Quoll individuals, it is not likely to constitute important or high quality foraging habitat. Given the information presented in the EIS, the Department considers that the proposed action is unlikely to have a residual significant impact on the species.
Appendix O - Chapter 5; Appendix A	Impact mitigation, management and monitoring The EIS notes that a Biodiversity Management Plan regarding the management, mitigation and monitoring will be developed prior to the commencement of the project. The EIS has not included specifications for actions and responsible persons or agencies. The EIS outlines monitoring activities along with the frequency of monitoring and relevant parameters but does not include an explicit timeline. As previously advised, further detail is required including which MNES will be targeted and monitored, how, why, when, how often, by whom, for how long, baseline data/collection of baseline data, thresholds for corrective actions, or corrective actions. Measures to avoid, mitigate and offset impacts on EPBC Act listed species and ecological communities (ECs) must address each species or EC that is expected or likely to be significantly impacted by the proposed action.

Further, the EIS has identified the need to find reference sites for establishing baseline data, which will occur before construction activities and mining commence. It is highly desirable for baseline data to be collected over a series of years prior to the commencement of the action, to allow adequate capture of temporal and spatial variation.

Additional information is required to assess the likely effectiveness of the mitigation strategy in avoiding further impacts on matters of national environmental significance. Mitigation and management strategies should also consider all Threat Abatement Plans (TAPs) relevant to the action: A list of approved TAPs is available at: <http://www.environment.gov.au/topics/biodiversity/threatened-species-ecological-communities/threat-abatement-plans/approved-threat>.

In the event that such detail is not possible or appropriate to be provided prior to assessment and approval of the proposed action, the Department strongly recommends conditions of approval for the proposal include:

- a. specific measures to protect and conserve ecological communities and threatened species habitats in the study area to ensure the ongoing survival and recovery of these matters, through appropriate management. These measures must be clear, measurable, auditable and time bound;
- b. specific measures to protect ecological communities and threatened species (and their habitats) from indirect impacts, including but not limited to edge effects, weeds and feral animals, dust, noise and vibrations, changes to water regimes, vehicle strike, and human access;
- c. clear objectives and performance indicators for the mitigation measures;
- d. costing of measures required and demonstration that these will be fully funded for the life of the proposal;
- e. details of the monitoring and reporting to be undertaken to demonstrate the effectiveness of the measures, including the parameters to be monitored, methods, timing, frequency and location of monitoring;
- f. specific and measurable trigger levels that will result in corrective actions being implemented to prevent the objectives being compromised;
- g. corrective actions to be taken should the trigger levels referred be exceeded. These must be clear, measurable, auditable and time bound; and
- h. the person responsible for the management actions.

The department acknowledges and encourages the intention to undertake, as part of post mining rehabilitation, the re-establishment of the relevant vegetation communities. The department considers this a standard element in environmental best practice for the mining industry. However as rehabilitation can be a lengthy exercise, successful re-establishment of fully functional vegetation community is a high risk venture. Given the large temporal lag and uncertainty associated with post-mining rehabilitation, the Department does not consider this to be effective at mitigating the impacts of clearing on protected matters.

Biodiversity Offsets: Appendix O - Chapter 6; Appendix A	The Department notes that the proponent is participating in the Upper Hunter Strategic Assessment, and that the project's offsets in relation to biodiversity are proposed to be provided under the Upper Hunter Biodiversity Plan. While the details of the Plan, and in particular the Upper Hunter Offset Fund specifications, are still being negotiated, the Department understands this approach will be capable of providing adequate offsets to compensate for impacts to threatened species and communities. Notwithstanding, the Department recommends that a contingency condition be incorporated into any approval, should offsets be unable to be provided under the Upper Hunter Offset Fund, or its equivalent. For example: ○ If an Upper Hunter Offset Fund is unavailable, an alternative offset strategy must be developed, and must be consistent with the Department of the Environment's Environmental Offsets Policy, available at www.environment.gov.au/epbc/publications/environmental-offsets-policy The Department notes that offsets do not appear to have been considered in relation to impacts to water resources. Should the proposed action, after all avoidance and mitigation measures are assessed, be considered likely to lead to a residual significant impact on a water resource, including environmental and human users then offsets relating to these impacts will be required.
	On 17 October 2013 the Minister for the Environment, the Hon Greg Hunt MP, decided that water resources was a controlling provision for the Bengalla Mine Project (Attachment 4). The assessment for this controlling provision will rely on information that has already been collected throughout the existing process as much as possible, to ensure the assessment proceeds efficiently. However, the Department notes that the EIS does not: ○ Provide information on the stability of the overburden emplacement area. ○ Address the interaction of the reinstated Dry Creek with contamination sources, including acid-forming and sodic materials. ○ Provide information on the water quality in Dry Creek, pre and post realignment. ○ Provide an assessment of the proposal's contribution to heavy metal loading in the Hunter River. The provided reference to existing water quality data from the Hunter River does not include heavy metals other than iron and zinc. ○ Provide an assessment of the expected impact a flood would have if it should exceed the flood level that the project's mitigation measures have been designed to withstand. ○ Provide a "comprehensive assessment of final void water quality". Information addressing the above should be provided where possible. The Department acknowledges that it may not be practicable to address all issues related to water. In the absence of information, the Department will apply the precautionary principle to its assessment of the likely impacts to water resources.

Advice to decision maker on coal mining project

Proposed action: Continuation of Bengalla Mine (EPBC 2012/6378) – Expansion

Requesting agency	Department of Sustainability, Environment, Water, Population and Communities
Date of request	17 April 2013
Date request accepted	17 April 2013
Advice stage	Environment Impact Assessment (draft)
Summary of request from the regulator	The Department of Sustainability, Environment, Water, Population and Communities (the Department) is currently assessing the proposed project in accordance with the provisions of the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act). The Department notifies the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (the Committee) of an opportunity to comment on the draft Environmental Impact Statement. Specifically, the Department seeks the advice of the Committee on: 1. Does the Committee consider that the proponent has provided sufficient information on the water resources and its management to assess likely significant impacts from its proposed action? If the information is considered insufficient for that purpose, what advice regarding areas of inadequacy can the Committee provide? 2. What are the likely impacts of the proposed mine on surface and ground water resources, in particular, changes to surface and/or groundwater dynamics and resources that may support surface habitat for threatened species and communities? 3. Does the Committee find the water balance and conclusions relating to water management provided by the proponent and attached to this brief to be reasonable?

Advice

The Committee was requested to provide advice to the Commonwealth regulator on the continuation of Bengalla Coal Mine Project in New South Wales, at the draft Environmental Assessment stage. This advice draws upon aspects of information in the draft Environmental Impact Statement together with the expert deliberations of the Committee. The draft Environmental Impact Statement and information accessed by the Committee are listed in the source documentation at the end of this advice.

The Bengalla Coal Mine is located in the upper Hunter River catchment, approximately 4 km west of the township of Muswellbrook. The mine is currently licensed to produce up to 10.7 million tonnes per annum of

run-of-mine coal. The proposed extension would produce an additional 316 million tonnes of coal over a 24 year period, at a rate of up to 15 million tonnes per annum. As part of the proposed project, up to 70 million tonnes of coal rejects would be generated and encapsulated within an expanded overburden emplacement area. The disturbance boundary for the proposed project covers an area of approximately 796 hectares.

The Committee, in line with its Information Guidelines¹, has considered whether the proposed project assessment has used the following:

Relevant data and information: key conclusions

There is insufficient data and quantitative information for the Committee to assess the impacts of the proposed project. In particular, there is an unexplained lack of information and data about the presence, extent and condition of water-dependent species and ecosystems in the Hunter River; flood extent; the management and potential exposure of potential acid forming materials and leachate; seasonal variation in discharge scenarios and water extraction; water quality in Dry Creek; stability of the overburden emplacement area; and existing and proposed management measures and monitoring plans.

Appropriate methodologies which have been applied correctly: key conclusions

A regional water balance was not provided. While a site water balance was prepared, the validation process has produced uncertainty about its ability to accurately predict external water demand and the frequency and volume of discharges.

Groundwater drawdown from the Bengalla extension and Mt Arthur Coal Mine is predicted to partially intersect beneath the Hunter River Alluvium. However, the use of a constant head boundary condition for the Hunter River was not appropriate for determining the groundwater/surface water impacts of the mine and may have led to under-estimation of the cumulative impact of drawdown in the Hunter River Alluvium.

The project-specific and cumulative impacts of surface water extraction and discharges on the water quality and aquatic ecology of the Hunter River have not been adequately assessed; in particular, the impacts of increased water extraction, groundwater drawdown and water discharges on water quality and aquatic ecology. Further, the impact assessment has not considered the cumulative effect of surface water extraction and groundwater drawdown during low flow and drought periods.

The proponent's risk assessment does not provide a description of the consequence classes, nor does it provide sufficient information on proposed mitigation measures to justify the resulting residual risk ranking. Other than for groundwater, an assessment of cumulative risks is not evident in the documentation presented.

Reasonable values and parameters in calculations: key conclusions

The site water balance report provided limited and inconsistent information, making it difficult for the Committee to assess the adequacy of the water balance and to fully assess the potential impacts and proposed mitigation measures for the proposed project.

The assumptions and data used in the salt water balance may have led to underestimation of salt loading to the Hunter River as a result of the proposed project.

The proponent has elected to use a simulated rainfall dataset that provides a lower mean annual rainfall than that measured by nearby meteorological stations. Justification for the use of this data rather than measured data has not been provided. Adoption of this dataset may have implications for discharge scenarios, water demand from the Hunter River, and the sizing and operation of water management infrastructure.

It is unclear whether the design of the reinstated Dry Creek incorporates proposed discharges from the adjacent Mount Pleasant operation.

Question 1: Does the Committee consider that the proponent has provided sufficient information on the water resources and its management to assess likely significant impacts from its proposed action? If the information

is considered insufficient for that purpose, what advice regarding areas of inadequacy can the Committee provide?

1. The proponent has provided insufficient data and quantitative information to comprehensively assess the potential impacts from the proposed project. Assessment of the proposed project would be improved by the proponent addressing the recommendations identified in Questions 2 and 3 below; in particular:
 - a. revision of the groundwater model to relax the constant head boundary along the Hunter River to ensure an accurate estimation of the cumulative impact of drawdown in the Hunter River Alluvium;
 - b. further refinement of the water balance and salt balance;
 - c. assessing the project-specific and cumulative impacts on the Hunter River, particularly on groundwater dependent ecosystems and threatened species (e.g. amphibians);
 - d. assessing the potential for exposure of potentially acid forming materials and subsequent risks to water quality and water-dependent ecosystems;
 - e. undertaking flood modelling up to the 1:1000 year average recurrence interval flood event and protecting mine landforms from these events; and
 - f. considering the potential impacts from the planned future westward expansion of the Bengalla Coal Mine (not part of the current proposal) as part of the cumulative impact assessment.

Question 2: What are the likely impacts of the proposed mine on surface and ground water resources, in particular, changes to surface and/or ground water dynamics and resources that may support surface habitat for threatened species and communities?

2. The proposed project is likely to cause, and cumulatively contribute to, a number of changes in surface water and groundwater dynamics in the Hunter River and the Hunter River Alluvium. These changes, if realised, would affect the surface habitat for threatened species and communities. Key impacts include: groundwater drawdown; potential changes to water quality; a reduction in surface water flow resulting from water extraction; and loss of contributing catchment. In light of the numerous existing and proposed coal mining developments in the upper Hunter River region, the Committee considers that water related impacts of the Bengalla coal extension should be reviewed, as far as possible, as part of a cumulative assessment process.
3. The Committee has concerns relating to the validity of the groundwater modelling and drawdown predictions. Drawdown prediction in the Hunter River alluvium, both beneath and in the vicinity of the Hunter River, is of critical importance. This is vital for assessing surface water and groundwater connectivity, exchange fluxes, and impacts of depressurisation on river flows.
4. The Committee has major concerns about the groundwater modelling and its ability to make accurate drawdown predictions. Most notably, the use of a constant head boundary condition along the Hunter River forces constant river levels to apply at all times. The drawdown contours are therefore 'forced' to a value of zero at the location of the river to maintain constant head conditions. The model cannot be used to make predictions at and around the vicinity of the constant head boundary. An assessment of cumulative drawdown of Bengalla and Mt Arthur coal mines cannot be made using this erroneous model construction.
5. The Committee recommends that the model be revised to relax the constant head boundary along the Hunter River, so that it is an 'active' part of the model, enabling surface water/groundwater interaction to be reliably/accurately simulated so that robust estimates of cumulative drawdown can be made. Further, as a result of the inability to predict the extent and magnitude of groundwater drawdown, the Committee cannot accurately assess the impacts of groundwater drawdown on the surface habitat for threatened species and communities.

6. The proponent's literature review, and survey method and effort, were not sufficient to determine the presence of threatened species or their habitat; most notably for EPBC-listed threatened amphibian and fish species in the Hunter River. Further, the Committee notes that the Hunter River in the Muswellbrook local government area is designated as key fish habitat under the *Fisheries Management Act 1994*.
 - a. Key limitations of the proponent's approach include:
 - i. limited inclusion of literature review and database search results in the proponent's assessment. For example, while the proponent has assessed potential habitat for *Litoria booroolongensis* (the Booroolong Frog), the potential presence of *Litoria aurea* (the Green and Golden Bell Frog) has not been discussed, despite the recorded presence of this species less than 15 km from the proposed project². Similarly, a 2004 fish survey in the upper Hunter River is cited³ in support of a claim that suitable habitat for threatened fish species is not present in the Hunter River; however, the proponent does not mention that this study specifically notes the potential presence of *Prototroctes maraena* (the Australian Grayling) and recommends targeted searches for this species;
 - ii. habitat assessment for *Litoria booroolongensis* which does not consider potential habitat in the Hunter River;
 - iii. the exclusion of Dry Creek, which is to be diverted, and the Hunter River from targeted amphibian searches; and
 - iv. the exclusion of riparian and in-stream habitat assessment in the Hunter River from ecological surveys.
 - b. A more comprehensive assessment of the presence of water-dependent threatened species, their habitat and their reliance on surface water and groundwater is needed to enable an adequate assessment of the proposed project's impacts. In addition to addressing the limitations noted above, the scope of the assessment would benefit from consideration of the life-cycle habitat requirements of threatened species, the predicted extent of groundwater drawdown, the quantity of water expected to be extracted during seasonal low flow and drought conditions, and the mixing zone for water discharged from site.
7. The proposal does not provide sufficient information to fully assess the proposed project's impact on water quality in the Hunter River. In particular, detailed information about the existing and proposed management of potentially acid forming and sodic materials, flood impacts, and the frequency and quality of excess water discharges is lacking or inadequate. The uncertainties about water quality related impacts to threatened species and their habitat could be reduced by:
 - a. providing a conceptual design for the overburden emplacement area, which clearly identifies:
 - i. the proposed location and placement strategy for potentially acid forming and sodic materials,
 - ii. leachate seepage paths and containment mechanisms, and
 - iii. the proximity of the reinstated Dry Creek to potentially acid forming and sodic materials;
 - b. undertaking flood modelling for rainfall events up to and including the 1:1000 year average recurrence interval flood event and using this information to develop mitigation measures that reduce the risk of exposure of potentially acid forming and sodic materials during flood events;
 - c. using a factor of safety analysis and erosion modelling to demonstrate the stability of the overburden emplacement area, particularly in relation to the proposed placement of the reinstated Dry Creek within the overburden emplacement area footprint;

- d. incorporating an assessment of the proposal's contribution to heavy metal loading in the Hunter River;
 - e. confirming the capacity of the Hunter River Salinity Trading Scheme (HRSTS) to cope with additional saline discharges within the catchment;
 - f. providing sufficient information to enable a technical review of the salt balance and expanding its scope to:
 - i. quantify loading to the Hunter River under a range of discharge scenarios, including the 'worst case' scenario,
 - ii. more accurately ascertain and model the contribution of rehabilitated spoil to salt loading,
 - iii. quantify and predict salt loading from the operation of the CW1 dam and the reinstated Dry Creek channel,
 - iv. incorporate rehabilitation activities in Year 24 and beyond, and
 - v. demonstrate that the results of the revised water balance will comply with the aims of the HRSTS (i.e. limiting electrical conductivity in the Hunter River to 600 $\mu\text{S}/\text{cm}$).
8. The proponent's assessment of impacts on the aquatic ecology of Hunter River has not considered the proposed increase in water extraction, nor the site-specific cumulative interaction of this with groundwater drawdown. An assessment of the cumulative effect of groundwater drawdown, water extraction and any changes in water quality is needed to understand the potential risks to aquatic and riparian ecosystems generally, and threatened species and their habitats in particular.

Question 3: Does the Committee find the water balance and conclusions relating to water management provided by the proponent and attached to this brief to be reasonable?

9. Review of the site water balance has raised uncertainty about the ability to accurately predict the frequency and magnitude of discharges and the volume of water to be sourced from the Hunter River. The proponent should review and address the following matters to improve confidence in the water balance's predictions and enable a more thorough assessment of the level of risk posed to water resources and aquatic ecosystems by the proposed project:
- a. under-estimation and over-estimation against recorded site inventory data during the water balance validation process;
 - b. justification for the use of a simulated rainfall dataset rather than measured data from nearby meteorological stations has not been provided. The simulated dataset provides a lower mean annual rainfall than the measured meteorological station data, which may lead to underestimation of the amount of water to be retained or managed on site. The sensitivity of water management infrastructure to use of this dataset is not discussed by the proponent;
 - c. provision of limited and inconsistent input and output data in the water balance report. In particular, the report: does not provide information on the seasonal variation of discharges and water demand; does not provide a detailed output for the 99th percentile rainfall scenario; inconsistently provides results as a mix of 'median' or 'average' outputs; and does not clearly identify total site water demand and the amount of this demand that can be sourced internally; and
 - d. lack of a comprehensive regional water balance, limiting the Committee's ability to assess the impacts of the proposed project in a regional context.
10. In addition to the concerns with the groundwater model outlined in Question 2, the following areas of uncertainty remain and should be addressed:

- a. recovery times for affected aquifers have not been assessed; and
 - b. there appears to be a decrease in flow to the Hunter River alluvium after mining has ceased, however no explanation is provided for this.
11. The proponent has not undertaken detailed flood modelling for the proposed project. To protect downstream water resources and ecosystems from flood related impacts, it is recommended that flood modelling is undertaken for flood events up to and including the 1:1000 year average recurrence interval flood event and that measures are incorporated into the project design to protect mine landforms during these events. This assessment should also identify discharge scenarios for the CW1 dam and the receiving location of decant water from this dam.
 12. It is unclear whether the design for the reinstatement of Dry Creek has provided for discharges from the Mount Pleasant Mine. Clarification of this issue should be sought, and if necessary, the design should be amended to incorporate the maximum anticipated discharge volumes from the Mount Pleasant Mine.
 13. While the Committee considers that there is a minimal risk of decant from the final void, it is noted that water quality in the final void, other than salinity, has not been assessed. As noted consistently in the Committee's previous advice, the backfilling of voids and the minimisation of pit lakes represent best environmental practice for post-mining management. If this cannot be accomplished, it is recommended that the proponent undertakes a comprehensive assessment of final void water quality, which includes an assessment of the risks to fauna which may attempt to use the void as a water source.
 14. In addition to the measures outlined elsewhere in this Advice, adoption of the following strategies would increase the level of protection for water-dependent biota:
 - a. committing the proponent to meeting the ANZECC guidelines (2000) for protection of aquatic ecosystems (95 % protection levels) for discharges from the sediment and clean water dams. Where monitored upstream concentrations exceed these values, discharges should not exceed the 80th percentile of background (upstream) concentrations;
 - b. amending the water management plan to ensure that water in sediment dams, particularly those receiving runoff from coal rejects or Archerfield Sandstone in the overburden emplacement area, can be contained on site if the quality of this water is not suitable for release; and
 - c. making sure that mechanisms are in place to confirm that discharges from the proposed project comply with the electrical conductivity limits under the HRSTS. While it is assumed that the current project has such mechanisms in place, these have not been discussed in the environmental impact statement. Therefore, the Committee is unable to comment on the appropriateness of these arrangements under the amended proposal.
 15. It is noted that the proponent has developed a water management plan for their current operation but has not yet updated this plan for the proposed project. The Committee considers that the updated plan would benefit from incorporation of the following measures and strategies:
 - a. adopting the groundwater monitoring program criteria provided in the Information Guidelines for Proposals Relating to the Development of Coal Seam Gas and Large Coal Mines where there is a Significant Impact on Water Resources¹;
 - b. adopting a collaborative approach to groundwater monitoring with other mines in the region and regularly revising the groundwater model as additional monitoring information is received. Provision of this information for inclusion in a regional, cumulative groundwater model would be beneficial;
 - c. structuring the baseline Dry Creek monitoring program to include water quantity (hydrograph) and the water quality parameters currently collected for the Hunter River, and to capture seasonal and inter-annual variation before further disturbance in this catchment;

- d. revising the surface water quality monitoring program to facilitate a better understanding of the contribution of sediment dams to the recorded increase in salinity downstream of the Bengalla Coal Mine. This may include undertaking volumetric and water quality monitoring of discharges from sediment dams. The results should be discussed in the context of compliance with the aims of the HRSTS;
- e. undertaking rehabilitation and monitoring to assess channel integrity, stability, and rehabilitation success in the reinstated Dry Creek as described in Appendix X of Hansen Bailey (2012). The monitoring program should be continued until results demonstrate that the channel is effectively stabilised and rehabilitation / water quality objectives are being met;
- f. identifying and monitoring suitable indicators of aquatic ecological health in the Hunter River; and
- g. making monitoring results publicly available to assist in determination of cumulative impacts on threatened species and communities in the Hunter River catchment.

16. The Northern Sydney Basin has been identified as a Bioregional Assessment priority region. Data and relevant information from the proposed project should be made accessible for this Bioregional Assessment to assist the knowledge base for regional scale assessments.

Date of advice	24 May 2013
Source documentation available to the Committee in the formulation of this advice	Hansen Bailey, 2012. Continuation of Bengalla Mine Environmental Impact Statement, prepared for the Bengalla Mining Company.
References cited within the Committee's advice	¹Information Guidelines for Proposals Relating to the Development of Coal Seam Gas and Large Coal Mines where there is a Significant Impact on Water Resources available at: http://www.environment.gov.au/coal-seam-gas-mining/project-advice/pubs/iesc-information-guidelines.pdf ²Department of Environment and Climate Change (NSW), 2007. Management Plan for the Green and Golden Bell Frog Key Population in the Upper Hunter, Department of Environment and Climate Change (NSW), Sydney ³Howell, T.D., and Creese, R.G., 2010. Freshwater Fish Communities of the Hunter, Manning, Karuah and Macquarie-Tuggerah Catchments: a 2004 Status Report. Industry and Investment NSW, Sydney



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25 September 2013

James Tregurtha
Assistant Secretary, South-Eastern Australian Assessment Branch
Environmental Assessment and Compliance Division
Department of Sustainability, Environment, Water, Population and Communities
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CANBERRA ACT 2601

Dear Mr Tregurtha,

BENGALLA MINING COMPANY (EPBC 2012/6378) ADVICE OF THE INDEPENDENT EXPERT SCIENTIFIC COMMITTEE ON COAL SEAM GAS AND LARGE COAL MINING DEVELOPMENT

1 INTRODUCTION

Bengalla Mining Company (BMC) is seeking development consent for a State Significant Development (SSD) under Division 4.1 of Part 4 of the NSW *Environmental Planning & Assessment Act 1979* (EP&A Act) for the Continuation of Bengalla Mine (the Project).

BMC is also concurrently seeking approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). A referral under section 68 of the EPBC Act was made on 31 March 2012. On 7 June 2012, the Project was declared to be a controlled action and as such it requires approval under the EPBC Act. The Minister's delegate decided that the Project would be assessed through accreditation of the NSW assessment process under the EP&A Act.

In accordance with section 78A(8A) of the EP&A Act, the 'Continuation of Bengalla Mine Environmental Impact Statement' (EIS) has been prepared by Hansen Bailey Environmental Consultants (Hansen Bailey, 2013). The draft EIS was provided to the NSW Department of Planning and Infrastructure (DP&I) and other regulators (including the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC)) for regulatory review on 20 December 2012. Comments were provided to BMC by DP&I on 4 April 2013 requesting issues be addressed prior to the final EIS being approved for exhibition.

Hansen Bailey has revised the draft EIS to address DP&I's and other regulators (including SEWPaC's) comments. A revised version of the draft EIS (draft 2 EIS) was submitted to DP&I on 26 July 2013 for a second regulatory review. DP&I has now also confirmed that the EIS is adequate for Public Exhibition which is scheduled to take place from 4 September 2013 to 18 October 2013.

SEWPaC referred the draft EIS to the Independent Expert Scientific Committee (IESC) for its advice on matters pertaining to water resources. The IESC provided its advice on 17 April 2013 (IESC Advice) which identified issues that in its opinion require further attention.

The IESC has based its advice on the draft EIS rather than the final EIS. As a result, there are aspects of the final EIS that the IESC has not considered.

Where new or additional matters have been raised, detail is required from the IESC to clarify their expectations for additional assessment. This letter considers each matter raised by the IESC and outlines the relevant information that is provided in the final EIS or where additional direction is sought.

We would appreciate being able to discuss our technical queries directly with the IESC or representatives to ensure our technical experts fully understand the scale and scope of what is required and to assist SEWPaC in considering the advice in its submission to the exhibition of the EIS.

2 RESPONSE TO THE IESC ADVICE

The following section addresses the issues raised by the IESC and explains how these issues have been addressed in the final EIS or includes a detailed justification as to why these requests were deemed not appropriate for their inclusion.

2.1 IESC ADVICE SUMMARY

'In line with its Information Guidelines¹, the IESC has considered whether the Project has used the following:'

'Relevant data and information: key conclusions

There is insufficient data and quantitative information for the Committee to assess the impacts of the proposed project. In particular, there is an unexplained lack of information and data about the presence, extent and condition of water-dependent species and ecosystems in the Hunter River; flood extent; the management and potential exposure of potential acid forming materials and leachate; seasonal variation in discharge scenarios and water extraction; water quality in Dry Creek; stability of the overburden emplacement area; and existing and proposed management measures and monitoring plans.'

Response

BMC is confident that there is sufficient data and qualitative information presented in the EIS to assess the impacts of the Project, particularly in relation to water resources. The data presented has been deemed to adequately address the Project DGRs by both the Department of Planning and Infrastructure (DP&I) and other relevant regulators. In particular, Section 9 of the EIS presents a summary of all the management and monitoring measures proposed for the Project.

Additional detail in relation to the above is provided in **Section 2.2** and **Section 2.8** below.

'Appropriate methodologies which have been applied correctly: key conclusions

A regional water balance was not provided. While a site water balance was prepared, the validation process has produced uncertainty about its ability to accurately predict external water demand and the frequency and volume of discharges. Groundwater drawdown from the Bengalla extension and Mt Arthur Coal Mine is predicted to partially intersect beneath the Hunter River Alluvium. However, the use of a constant head boundary condition for the Hunter River was not appropriate for determining the groundwater/surface water impacts of the mine and may have led to under-estimation of the cumulative impact of drawdown in the Hunter River Alluvium. The project-specific and cumulative impacts of surface water extraction and discharges on the water quality and aquatic ecology of the Hunter River have not been adequately assessed; in particular, the impacts of increased water extraction, groundwater drawdown and water discharges on water quality and aquatic ecology. Further, the impact assessment has not considered

the cumulative effect of surface water extraction and groundwater drawdown during low flow and drought periods. The proponent's risk assessment does not provide a description of the consequence classes, nor does it provide sufficient information on proposed mitigation measures to justify the resulting residual risk ranking. Other than for groundwater, an assessment of cumulative risks is not evident in the documentation presented.'

Response

The following NSW Water Sharing Plans (WSPs) under the *Water Management Act 2000* are relevant to the Project:

1. 'Hunter Unregulated and Alluvial Water Sources Water Sharing Plan 2009'; and
2. 'Hunter Regulated River Water Sharing Plan 2003'.

The relevant WSPs represent plans for the management of all water use within the relevant catchments. Provided that water is taken in accordance with the relevant WSPs, the impacts on a regional scale will be within the levels that are considered by the WSPs to be acceptable.

Any surface water taken by the Project would be licensed under the WSPs and accessed in accordance with WSP requirements to ensure that any impacts are within the range of impacts accepted under the WSPs. As such a regional water balance was required for the Project. Additional detail is presented in **Section 2.10**.

The boundary conditions associated with the Project Groundwater Impact Assessment were set to be consistent with the conceptual groundwater model. A third party peer review of the groundwater model and predicted outcomes undertaken by Dr Franz Kalf (see Appendix B of Appendix K of the EIS), deemed the boundary conditions of the model to be plausible, sufficiently unrestrictive and found to have a minimal impact on key model outcomes, including groundwater drawdown distribution predictions. Additional detail is presented in **Section 2.5**.

The model adopted a conservative worst case scenario accounting for the impacts of the Project operating over a 24 year period at a rate at up to 15 Million tonnes per annum and the cumulative impact of Mt Arthur Coal Mine and the Mount Pleasant Project (which has not yet commenced) based on the available data in the public domain. Additional detail is presented in **Section 2.4**.

The EIS approved for exhibition has been deemed by NSW Office of Water (NOW) and DP&I to adequately address the potential impacts on threatened species and communities with regards to changes in surface water and groundwater dynamics in the Hunter River and the Hunter River Alluvium, in particular groundwater dependent ecosystems and water dependent species listed under the *NSW Threatened Species Conservation Act 1995* and the EPBC Act. Additional detail is presented in **Section 2.3**.

'Reasonable values and parameters in calculations: key conclusions

The site water balance report provided limited and inconsistent information, making it difficult for the Committee to assess the adequacy of the water balance and to fully assess the potential impacts and proposed mitigation measures for the proposed project. The assumptions and data used in the salt water balance may have led to underestimation of salt loading to the Hunter River as a result of the proposed project. The proponent has elected to use a simulated rainfall dataset that provides a lower mean annual rainfall than that measured by nearby meteorological stations. Justification for the use of this data rather than measured data has not been provided. Adoption of this

dataset may have implications for discharge scenarios, water demand from the Hunter River, and the sizing and operation of water management infrastructure. It is unclear whether the design of the reinstated Dry Creek incorporates proposed discharges from the adjacent Mount Pleasant operation.'

Response

A summary salt balance is presented in Section 6.7.8 of Appendix J of the EIS. The results show that for the worst case scenario (Year 4), the Project will continue to have a negligible impact (less than 0.1%) on the Hunter River salt load. The Hunter River Salinity Trading Scheme (HRSTS) has been prepared on the basis of comprehensive assessment of salt concentrations and loads in the Hunter River. Provided that water discharges from the Project continue to be made in accordance with the HRSTS and that the Project holds sufficient credits under the scheme, then the downstream salinity targets will be met. Additional detail is presented in **Section 2.8**.

The justification for adopting the synthetic rainfall dataset is provided in Section 3.3 of the Surface Water Impact Assessment (Appendix J of the EIS). Recorded rainfall data includes periods of missing data, as well as accumulated rainfall totals over periods when the rain gauge is not read (for example, weekends and public holidays). The synthetic dataset is also interpolated between rain gauges, potentially improving the accuracy of the rainfall at a given location where a rainfall gradient between two rain gauges exists. The difference between the mean annual rainfall recorded at Muswellbrook and the synthetic dataset is less than 5%. Additional detail is presented in **Section 2.8**.

The Surface Water Impact Assessment (Appendix J of the EIS) indicates that BMC will construct the Mount Pleasant Project Discharge Dam and associated pipeline to the west of approved operations at Bengalla to mitigate the Project's disruption of the Mount Pleasant Project's approved discharge route. This dam does not form part of the Bengalla water management system and is subject to use by the adjoining Mount Pleasant Project following the receipt of appropriate approvals to allow discharges from that site in accordance with the HRSTS. Should the Mount Pleasant Project require the use of the reinstated Dry Creek, it will seek the appropriate approval at that time.

Following the decommissioning of CW1, the construction of the reinstated Dry Creek has been designed to accommodate the entire catchment north of CW1. This is considered to be the worst case as any future disturbance in the north of the Dry Creek catchment associated with the not yet constructed Mount Pleasant Project would require an independent water management system. Additional detail is presented in **Section 2.13**.

2.2 ISSUE 1

'Question 1: Does the Committee consider that the proponent has provided sufficient information on the water resources and its management to assess likely significant impacts from its proposed action? If the information is considered insufficient for that purpose, what advice regarding areas of inadequacy can the Committee provide?'

1. *The proponent has provided insufficient data and quantitative information to comprehensively assess the potential impacts from the proposed project. Assessment of the proposed project would be improved by the proponent addressing the recommendations identified in Questions 2 and 3 below; in particular:*
 - a. *revision of the groundwater model to relax the constant head boundary along the Hunter River to ensure an accurate estimation of the cumulative impact of drawdown in the Hunter River Alluvium;*

- b. *further refinement of the water balance and salt balance;*
- c. *assessing the project-specific and cumulative impacts on the Hunter River, particularly on groundwater dependent ecosystems and threatened species (e.g. amphibians);*
- d. *assessing the potential for exposure of potentially acid forming materials and subsequent risks to water quality and water-dependent ecosystems;*
- e. *undertaking flood modelling up to the 1:1000 year average recurrence interval flood event and protecting mine landforms from these events; and*
- f. *considering the potential impacts from the planned future westward expansion of the Bengalla Coal Mine (not part of the current proposal) as part of the cumulative impact assessment'.*

Response

A response to these issues is provided in the following sections.

2.3 ISSUE 2

'Question 2: What are the likely impacts of the proposed mine on surface and ground water resources, in particular, changes to surface and/or ground water dynamics and resources that may support surface habitat for threatened species and communities?

2. *The proposed project is likely to cause, and cumulatively contribute to, a number of changes in surface water and groundwater dynamics in the Hunter River and the Hunter River Alluvium. These changes, if realised, would affect the surface habitat for threatened species and communities. Key impacts include: groundwater drawdown; potential changes to water quality; a reduction in surface water flow resulting from water extraction; and loss of contributing catchment. In light of the numerous existing and proposed coal mining developments in the upper Hunter River region, the Committee considers that water related impacts of the Bengalla coal extension should be reviewed, as far as possible, as part of a cumulative assessment process.'*

Relevant Sections of the EIS

Significant assessment in relation to the content of the above statement can be found in the following sections of the final EIS:

- Groundwater Dependent Ecosystems (GDE) and threatened species;
 - Section 8.7.3, 8.11.3 and 8.12.3 and of the EIS;
 - Section 11.6, Appendix K of the EIS;
 - Section 2.3, 3.3 and 4.4, Appendix O of the EIS; and
 - Section 7, 8 and 9, Appendix P of the EIS.
- Groundwater drawdown (Project alone and cumulatively);
 - Section 8.7.3 of the EIS; and
 - Section 11.2, 11.4 and 12.1, Appendix K of the EIS.
- Impacts on water quality;
 - Section 8.6.3 and 8.7.3 of the EIS;

- Section 5.4, 5.5, 5.6 and 5.7, Appendix J of the EIS; and
- Section 11.8, Appendix K of the EIS.
- Loss of catchment;
 - Section 8.6.3 of the EIS; and
 - Section 5.3, Appendix J of the EIS.

Response

The EIS approved for exhibition has been deemed by NOW and DP&I to adequately address the potential impacts on threatened species and communities with regards to changes in surface water and groundwater dynamics in the Hunter River and the Hunter River Alluvium, in particular groundwater dependent ecosystems and water dependent species listed under the NSW *Threatened Species Conservation Act 1995* and the EPBC Act.

The Stygofauna Impact Assessment undertaken for the Project (Appendix P of the EIS) provides that, the presence and high numbers of six taxa in the immediate vicinity of current mining operations at Bengalla indicate the current level of drawdown has had minimal impact on the local stygofauna community. Furthermore, mining associated with the Project is not expected to significantly increase drawdown in the Hunter River alluvial aquifer beyond existing conditions. With the westward direction of mining away from the Hunter River, aquifer water levels are predicted to return towards the pre-mining state. In this regard, it is unlikely that the Project will impact endemic species whose distribution is confined solely to the narrow band of alluvium predicted to be dewatered by the Project.

The Ecological Impact Assessment undertaken for the Project (Appendix O of the EIS) determined that the riparian community Hunter Floodplain Red Gum Woodland is considered to be a GDE that may rely on groundwater resources during periods of drought or low rainfall. The drawdown in the Hunter River alluvium is most extensive during the early years of the Project when mining is in close proximity to the alluvial aquifer. The simulated drawdown is largely less than 1 m at the Hunter River and therefore no impact on the remnant Hunter Floodplain Red Gum Woodland is considered likely. . The releases of water from the Glenbawn Dam under the Hunter River regulated system are also expected to maintain groundwater levels in dry periods, which will further support riparian GDEs.

No threatened fish or amphibian species have been recorded or are predicted in the area. As such, changes in ground or surface water should not have an impact on threatened species within these groups.

BMC has committed to the preparation of a Biodiversity Management Plan to manage and mitigate the potential impacts for all recorded and potentially occurring listed threatened species. BMC also intends to enhance the condition of GDEs and broader ecological communities in the vicinity of the Project through the reinstatement of Dry Creek and selected rehabilitation along the Hunter River frontage in accordance with the 'Upper Hunter Strategic Assessment' process currently being developed. Furthermore, where impacts cannot be avoided, BMC has committed to participating in the 'Upper Hunter Strategic Assessment' (or other suitable offset strategy) as a compensatory measure to secure a suitable biodiversity offset.

Broader water related impacts associated with the Project, including groundwater drawdown, changes to water quality, reduction in surface water flow and loss of contributing catchment have been assessed for the Project alone and cumulatively in the Groundwater Impact Assessment (Appendix K of the EIS) and the Surface Water Impact Assessment (Appendix J of the EIS). These impacts are discussed in further detail throughout this response.

2.4 ISSUE 3

3. *'The Committee has concerns relating to the validity of the groundwater modelling and drawdown predictions. Drawdown prediction in the Hunter River alluvium, both beneath and in the vicinity of the Hunter River, is of critical importance. This is vital for assessing surface water and groundwater connectivity, exchange fluxes, and impacts of depressurisation on river flows.'*

Relevant Sections of the EIS

Details regarding the content of the above statement can be found in the following sections of the EIS:

- Section 8.7.3 of the EIS; and
- Section 9 and 12.2, Appendix K of the EIS.

Response

The Groundwater Impact Assessment undertaken for the Project (Appendix K of the EIS) included detailed conceptualisation and development of a three-dimensional transient groundwater model. This model adopted FEFLOW which is a computer based modelling package that is capable of simulating two and three-dimensional, groundwater flow. This model was used to predict the Project's drawdown in the potentiometric surface, change in groundwater flux to the Hunter River Alluvium and seepage rates into mining areas.

The FEFLOW model was calibrated using transient monitoring data collected at Bengalla and verified against the groundwater model developed for the Wantana Extension (2007). Outcomes of this work allowed for the model to be enhanced through recalibration using the PEST automated parameter estimation code and additional monitoring data.

The model adopted a conservative worst case scenario accounting for the impacts of the Project operating over a 24 year period at a rate at up to 15 Million tonnes per annum and the cumulative impact of Mt Arthur Coal Mine and the Mount Pleasant Project (which has not yet commenced) based on the available data in the public domain.

Based on the classification system developed by Barnett et al (2012) for determining the confidence-level for groundwater models, the Project model achieves the majority of Class 2 criteria by means of:

- Available data:
 - Numerous studies have been undertaken to define the proximal/regional aquifer systems and hydraulic parameters; and
 - Streamflow and baseflow estimates and several locations have been undertaken to ensure consistency.
- Calibration:
 - Scaled Root Mean Squared error is below prescribed limits;
 - Long-term trends replicated in majority of monitoring bores; and
 - Recent transient calibration data used.
- Key indicators:
 - Calibration statistics meet agreed targets;
 - Model parameters are consistent with conceptualisation; and
 - Appropriate computational methods and spatial discretisation used.

Models are classified as Class 1, Class 2 or Class 3 in order of increasing confidence. A Class 2 confidence level classification is considered suitable for predicting groundwater impacts of proposed developments in medium value aquifers and evaluation/management of medium risk projects.

Currently approved mining is located closer to the Hunter River Alluvium than the proposed continuation which extends westward away from the alluvium. Measured drawdowns from these current mining activities have been verified using the developed model. This simulation of current drawdowns shows the suitability of the development model for predicting drawdowns for the mine continuation. As mining moves to the west, drawdowns are predicted to reduce from the effects of currently approved operations.

The predictive capability of the model has been supported by external peer review of the modelling study by Dr Franz Kalf of Kalf and Associates (Appendix K of the EIS) who concluded that "*predictions of drawdown within the adjacent alluvium and inflow rates to the pit over time are plausible*".

2.5 ISSUE 4

4. *'The Committee has major concerns about the groundwater modelling and its ability to make accurate drawdown predictions. Most notably, the use of a constant head boundary condition along the Hunter River forces constant river levels to apply at all times. The drawdown contours are therefore 'forced' to a value of zero at the location of the river to maintain constant head conditions. The model cannot be used to make predictions at and around the vicinity of the constant head boundary. An assessment of cumulative drawdown of Bengalla and Mt Arthur coal mines cannot be made using this erroneous model construction.'*

Relevant Sections of the EIS

Details regarding the content of the above statement can be found in the following sections of the EIS:

- Section 8.7.2 of the EIS; and
- Section 9.4, 9.5 and Appendix B Third Party Review Report, Appendix K of EIS.

Response

The Groundwater Impact Assessment undertaken for the Project (Appendix K of the EIS) defined the north western and northern boundaries of the groundwater model by Western Sandy Creek and Northern Sandy Creek with the southern boundary defined by Saddlers Creek (see Figure 54 of final EIS). These ephemeral creeks were used as arbitrary model limits, rather than hydraulic boundaries and were selected at a suitable distance from Bengalla so that hydraulic stresses associated with scenarios would not impact them. The south-western border was set along the Mount Ogilvie Fault, which with a horizontal displacement of 200 m is assumed to be a barrier to groundwater flow in the coal seams. Previous hydrogeological experience within Permian Coal Measures suggests such a large displacement on a fault will form some impedance to groundwater flow, forming a suitable hydraulic boundary. Even if there is minor groundwater flow across the Mount Ogilvie Fault, it is still considered a suitable boundary to the model domain due to the distance from Bengalla and associated hydraulic stresses. The eastern boundary of the model is formed by the outcrop of the low permeability Saltwater Creek Formation and the Hunter River.

The boundary conditions within the model domain were set to replicate the conceptual groundwater model. The Hunter River to the south and east of Bengalla was simulated as a fixed hydraulic head boundary (1st kind Dirichlet boundary condition) in the upper layer of the model. This boundary condition allowed for the infiltration of surface water into the groundwater system or drainage of the groundwater system, depending on the hydraulic gradient between the river and the surrounding

model layers. This type of boundary condition does not use any type of bed conductance term (transfer rate in FEFLOW), rather the hydraulic conductivity of the model layer defines the rate of water movement during each time step.

Outside the Hunter River, the secondary creeks within the model domain were assumed to drain the thin associated alluvial deposits. Recharge from these creeks was conceptually not considered a major recharge source. Therefore, drainage boundary conditions were assigned in the model along the major creek beds that did not allow infiltration of surface water into the alluvial deposits. These were implemented using constrained fixed hydraulic head boundaries (1st kind Dirichlet boundary condition) with a constraint only letting water discharge from the boundary condition (drains). No flux out rate constraint was set for this boundary condition, with hydraulic conductivity the only limitation to discharge at each time step.

The surface storage dams within the Project Boundary are well above the groundwater surface and are assumed to be hydraulically isolated from the groundwater systems and were therefore not represented in the model.

A third party peer review of the groundwater model and predicted outcomes undertaken by Dr Franz Kalf (see Appendix B of Appendix K of the EIS), deemed the boundary conditions of the model to be plausible, sufficiently unrestrictive and found to have a minimal impact on key model outcomes, including groundwater drawdown distribution predictions.

The groundwater model predicted a maximum drawdown to occur at the beginning of the Project, when the mining area is closest to the alluvium. In Year 1, the 1 m and 2 m drawdown contours extend below the Hunter River alluvium and combine with the drawdown induced by Mt Arthur Coal Mine's operations.

Mining at Bengalla will continue to advance in a westerly direction. As mining moves away from the Hunter River alluvium, the drawdown will progressively decrease. By Year 4, the drawdown generated by the Project ceases to combine with the drawdown generated by Mt Arthur Coal Mine. The area of the Hunter River alluvium within the 1 m and 2 m drawdown contours will continue to decrease as mining progresses to the west.

A sensitivity analysis applied to the groundwater model indicated that the Hunter River and alluvial aquifer acted as a controlling boundary condition, with the 1 m drawdown contour remaining along the edge of the alluvium when model parameters were varied.

The IESC Advice is correct in the statement that drawdown in the alluvium, at the 1st kind boundary nodes will not be possible, although drawdown in adjacent model nodes within the alluvium is possible. In the simulation this does limit the potential cumulative drawdown within the alluvium, beneath the Hunter River from both Bengalla Mine and Mt Arthur Mine. Although due to the managed nature of flows (and stage) in the Hunter River by regulated releases from Glenbawn Dam the river will always maintain a constant head in the environment. Due to the potential interconnection between the alluvium and the river and the maintained river stage, actual drawdown in the alluvium beneath the river is unlikely. It should be also noted the fixed head boundary is only implemented in Layer 1 of the model and drawdown in the underlying model layers representing the Permian Coal Measures is possible.

The 1st kind boundary condition was chosen as it suitably represents the conceptualisation, increases numerical stability and reduced model run times. The following points outline why the use of this boundary condition is considered an acceptable approach for this type of study and why further modelling is not required using an alternative approach. Firstly, the accurate prediction of

groundwater levels within the alluvium against current mining stresses has been achieved. This demonstrates actual drawdowns in alluvium are not greater than predicated. Secondly, the use of a 1st kind boundary condition does not allow for river bed conductance to be implemented with a resultant free and movable connection between the river and groundwater system. This lack of a lower permeability river bed conductance may have the effect of over-predicting the take of water due to mining, so the water take due to mine dewatering is thought a very conservative over prediction.

2.6 ISSUE 5

5. *'The Committee recommends that the model be revised to relax the constant head boundary along the Hunter River, so that it is an 'active' part of the model, enabling surface water/groundwater interaction to be reliably/accurately simulated so that robust estimates of cumulative drawdown can be made. Further, as a result of the inability to predict the extent and magnitude of groundwater drawdown, the Committee cannot accurately assess the impacts of groundwater drawdown on the surface habitat for threatened species and communities.'*

Relevant Sections of the EIS

- Not applicable.

Response

See response to Issue 4.

2.7 ISSUE 6

6. *'The proponent's literature review, and survey method and effort, were not sufficient to determine the presence of threatened species or their habitat; most notably for EPBC-listed threatened amphibian and fish species in the Hunter River. Further, the Committee notes that the Hunter River in the Muswellbrook local government area is designated as key fish habitat under the Fisheries Management Act 1994.'*
 - a. *Key limitations of the proponent's approach include:*
 - (i) *limited inclusion of literature review and database search results in the proponent's assessment. For example, while the proponent has assessed potential habitat for Litoria booroolongensis (the Booroolong Frog), the potential presence of Litoria aurea (the Green and Golden Bell Frog) has not been discussed, despite the recorded presence of this species less than 15 km from the proposed project 2. Similarly, a 2004 fish survey in the upper Hunter River is cited 3 in support of a claim that suitable habitat for threatened fish species is not present in the Hunter River; however, the proponent does not mention that this study specifically notes the potential presence of Prototroctes maraena (the Australian Grayling) and recommends targeted searches for this species;*
 - (ii) *habitat assessment for Litoria booroolongensis which does not consider potential habitat in the Hunter River;*
 - (iii) *the exclusion of Dry Creek, which is to be diverted, and the Hunter River from targeted amphibian searches; and*
 - (iv) *the exclusion of riparian and in-stream habitat assessment in the Hunter River from ecological surveys.*
 - b. *A more comprehensive assessment of the presence of water-dependent threatened species, their habitat and their reliance on surface water and groundwater is needed to*

enable an adequate assessment of the proposed project's impacts. In addition to addressing the limitations noted above, the scope of the assessment would benefit from consideration of the life-cycle habitat requirements of threatened species, the predicted extent of groundwater drawdown, the quantity of water expected to be extracted during seasonal low flow and drought conditions, and the mixing zone for water discharged from site.'

Relevant Sections of the EIS

Details regarding the content of the above statement can be found in the following sections of the EIS:

- Section 3.7, 4.5 and 4.6 of the Main EIS; and
- Appendix O of the EIS.

Response

A detailed habitat appraisal of the Project Boundary was conducted by Cumberland Ecology for the preparation of the Ecological Impact Assessment. The habitat appraisal looked for key elements of habitat that could afford habitat to threatened species including birds, bats, frogs, fish and plants.

The land within the Project Boundary is grassland and dry woodland. Dry Creek is a small and largely ephemeral creek that does not have aquatic habitats of the type frequented by the two aforementioned threatened frogs. Similarly, farm dams in the area are impacted by cattle and lack emergent macrophytes that could shelter threatened frogs. Therefore, the threatened frog species *Litoria booroolongensis* and *Litoria aurea* would not occur and are highly unlikely to be impacted by the Project.

Historically, *Litoria booroolongensis*, may have occurred along the Hunter River in the vicinity of the Project Boundary, but currently habitats have been so extensively modified that the species does not occur and there have been no recent records in the vicinity of the Project Boundary or downstream that could be impacted.

The Australian Grayling (*Prototractes maraena*) does not have habitat within the Project Boundary for the same reasons threatened frog habitats are absent. Dry Creek is an ephemeral creek and cannot support the species.

Similarly, the Australian Grayling does not occur in the Hunter River adjacent the Project Boundary. Moreover, no significant impacts to the Hunter River have been predicted to occur as a result of the Project. For this reason, no significant impacts are predicted to occur on this threatened fish species as a result of the Project.

There are no other water dependent threatened or migratory species that inhabit the Hunter River immediately downstream of the Project Boundary. Groundwater drawdown and water to be extracted during seasonal low flow and drought conditions are not likely to have an impact on any threatened or migratory species.

2.8 ISSUE 7

7. *'The proposal does not provide sufficient information to fully assess the proposed project's impact on water quality in the Hunter River. In particular, detailed information about the existing and proposed management of potentially acid forming and sodic materials, flood impacts, and the frequency and quality of excess water discharges is lacking or inadequate. The uncertainties about water quality related impacts to threatened species and their habitat could be reduced by:*

- a. *providing a conceptual design for the overburden emplacement area, which clearly identifies:*
 - (i) *the proposed location and placement strategy for potentially acid forming and sodic materials,*
 - (ii) *leachate seepage paths and containment mechanisms, and*
 - (iii) *the proximity of the reinstated Dry Creek to potentially acid forming and sodic materials;*
- b. *undertaking flood modelling for rainfall events up to and including the 1:1000 year average recurrence interval flood event and using this information to develop mitigation measures that reduce the risk of exposure of potentially acid forming and sodic materials during flood events;*
- c. *using a factor of safety analysis and erosion modelling to demonstrate the stability of the overburden emplacement area, particularly in relation to the proposed placement of the reinstated Dry Creek within the overburden emplacement area footprint;*
- d. *incorporating an assessment of the proposal's contribution to heavy metal loading in the Hunter River;*
- e. *confirming the capacity of the Hunter River Salinity Trading Scheme (HRSTS) to cope with additional saline discharges within the catchment;*
- f. *providing sufficient information to enable a technical review of the salt balance and expanding its scope to:*
 - (i) *quantify loading to the Hunter River under a range of discharge scenarios, including the 'worst case' scenario,*
 - (ii) *more accurately ascertain and model the contribution of rehabilitated spoil to salt loading,*
 - (iii) *quantify and predict salt loading from the operation of the CW1 dam and the reinstated Dry Creek channel,*
 - (iv) *incorporate rehabilitation activities in Year 24 and beyond, and*
 - (v) *demonstrate that the results of the revised water balance will comply with the aims of the HRSTS (i.e. limiting electrical conductivity in the Hunter River to 600 $\mu\text{S}/\text{cm}$).'*

Relevant Sections of the EIS

Details regarding the content of the above statement can be found in the following sections of the EIS:

- (a) and (c) Section 4 and Appendix X of the EIS;
- (b) Section 5.8, Appendix J of the EIS(c);
- (d) Section 3.6, Appendix J of the EIS; and
- (e) and (f) Section 6.7.8, Appendix J of the EIS.

Response

- (a) and (c) The Project Description (Section 4 of the EIS) describes the appropriate design and emplacement strategies for the Project mine plan and Dry Creek Reinstatement. The Dry Creek

Interim Management and Conceptual Re-establishment Study (Appendix X of the EIS) describes the design criteria proposed for the Project to ensure a stable final landform is developed.

- (b) A flood impact assessment for Dry Creek and the Hunter River is presented in Section 5.8 of Appendix J of the EIS. For the Hunter River, the flood impact assessment is based on the 1955 historical flood extent, which is estimated to have an average recurrence interval of greater than 100 years. With the exception of a small area near the Bengalla Homestead, all mine infrastructure and overburden emplacements are outside the 1955 flood extent. The small area affected by the 1955 flood extent has been assessed and approved as part of a previous consent (DA 211/93 MOD 4). For these reasons, the risk of exposure of potentially acid forming and sodic materials during flood events is low.
- (c) A detailed assessment of the hydraulic characteristics of the reinstated Dry Creek has been completed by Parson Brinkerhoff ("Dry Creek Interim Management System and Conceptual Re-establishment Study", Parsons Brinkerhoff Australia Pty Limited, 2012).
- (d) A summary of available water quality data is provided in Section 3.6 of Appendix J of the EIS. The available data for the Hunter River, although relatively limited, does not indicate an impact on downstream metals concentrations. Note that the median flow rate of the Hunter River is approximately 380 ML/d. In contrast, the mean annual discharge of mine water from the site under the HRSTS from 2006 to 2011 was only 71 ML/a. In addition, water releases from the site are normally made under wet weather conditions, providing a high dilution factor to mine water discharges.
- (e) and (f) A summary salt balance is presented in Section 6.7.8 of Appendix J of the EIS. The results show that for the worst case scenario (Year 4), the Project will continue to have a negligible impact (less than 0.1%) on the Hunter River salt load. The HRSTS has been prepared on the basis of comprehensive assessment of salt concentrations and loads in the Hunter River. Provided that water discharges from the Project continue to be made in accordance with the HRSTS and that the Project holds sufficient credits under the scheme, then the downstream salinity targets will be met.

2.9 ISSUE 8

- 8. *'The proponent's assessment of impacts on the aquatic ecology of Hunter River has not considered the proposed increase in water extraction, nor the site-specific cumulative interaction of this with groundwater drawdown. An assessment of the cumulative effect of groundwater drawdown, water extraction and any changes in water quality is needed to understand the potential risks to aquatic and riparian ecosystems generally, and threatened species and their habitats in particular.'*

Relevant Sections of the EIS

Details regarding the content of the above statement can be found in the following sections of the EIS:

- Section 8.11.3 of the EIS; and
- Section 3.3, 4.4 and 4.6 of Appendix O of the EIS.

Response

As provided in the Surface Water Impact Assessment (Appendix J of the EIS), the existing water management system for Bengalla is designed to minimise the use of fresh water from the Hunter

River. Amendments to the water management system will be integrated to account and facilitate optimal collection, use, recovery and recycling of water on site.

BMC hold Water Access Licences (WALs) with sufficient share component totalling 6,017 units (comprising 1,455 high security units and 4,562 general security units) to account for the existing and predicted take for the life of the Project from the Hunter Regulated River Water Source (Management Zone 1A). BMC also holds WALs with sufficient share component totalling 490 units (year) for the take of water from the Hunter Unregulated and Alluvial Water Source (Hunter Regulated River Alluvial Water Source).

Given that there will be no change to the existing water allocation from the Hunter Regulated River Water Source (Management Zone 1A) or the Hunter Unregulated and Alluvial Water Source (Hunter Regulated River Alluvial Water Source), there will be no additional impact to aquatic ecology that rely on water from the Hunter River.

Given that BMC does not currently hold a WAL for the Hunter Unregulated and Alluvial Water Source (Muswellbrook Water Source), water will not be taken from this source until BMC has secured a WAL(s) over and above the Harvestable Rights allocation for the site (or alternate mechanism as agreed with relevant regulators) with sufficient share component to authorise the take for the Project.

As discussed in the response to Issue 2 and 4 (also see Appendix K and O of the EIS), there is potential for the Project to impact on the riparian community Hunter Floodplain Red Gum Woodland, which is considered to be a GDE, due to the drawdown in the Hunter River aquifer. The depressurisation of the Permian sequence that will occur as a result of the Project will reduce the groundwater discharge rates into the Hunter River alluvium, and therefore has potential to impact on the amount of groundwater entering the river.

The drawdown in the Hunter River alluvium is most extensive during the early years of the Project when mining is in close proximity to the alluvial aquifer. The simulated drawdown is largely less than 1 m at the Hunter River and therefore no impact on the remnant Hunter Floodplain Red Gum Woodland is considered likely. This finding is supported by ongoing monitoring at Bengalla that has not detected any significant decline in groundwater levels adjacent to the Hunter River. The releases of water from the Glenbawn Dam are also expected to maintain groundwater levels in dry periods, which will further support riparian GDEs.

Accordingly, the drawdown in Hunter River alluvium is not expected to reduce levels of water in the Hunter River so as to impact on native species that rely on the river for habitat. This includes fish, macroinvertebrates and crustaceans. As indicated above, the riparian vegetation along the Hunter River proximate to the study area is also unlikely to be impacted by drawdown. As discussed in Section 3.7 of the Ecological Impact Assessment (Appendix O of the EIS), the riparian zone of the Hunter River near the study area is highly degraded and provides limited habitat for native species. Nevertheless, it comprises a GDE, and these values will not be compromised by the Project.

The Surface Water Impact Assessment undertaken for the Project (Appendix J of the EIS), provides that mine water discharged into the Hunter River will be undertaken in accordance with the HRSTS and the applicable flow conditions. BMC currently holds an allocation of 35 credits under the HRSTS. In this regard, there will be no additional impact to aquatic ecology as downstream water quality is controlled by the HRSTS. Note that the median flow rate of the Hunter River is approximately 380 ML/d. In contrast, the mean annual discharge of mine water from the site under the HRSTS from 2006 to 2011 was only 71 ML/a. In addition, water releases from the site are normally made under wet weather conditions, providing a high dilution factor to mine water discharges.

All other releases from site to the existing environment is associated with designed overflows from sediment dams or controlled releases from clean water dams into tributaries of the Hunter River, including Dry Creek. In this regard, such releases are not considered likely to adversely impact water quality downstream and the aquatic ecology that relies on the associated water sources.

No permanent aquatic community currently exists in Dry Creek and limited aquatic habitat is only available following rainfall. As the releases of water into Dry Creek are expected to be of clean water, these releases would provide more aquatic habitat relative to normal conditions and would not be considered to be detrimental to the aquatic ecological values of this creek (currently very low). Similarly, as the water to be released is expected to be clean, there is not anticipated to be any impacts of water releases on aquatic ecology in the Hunter River. As outlined in the Ecological Impact Assessment (Appendix O of the EIS), the quality of water in the Hunter River is currently relatively poor; however the Project is unlikely to exacerbate these impacts.

The IESC has requested an assessment of the cumulative effect of groundwater drawdown, water extraction and any changes in water quality to understand the potential risks to aquatic and riparian ecosystems generally, and threatened species and their habitats in particular.

The inputs from the surface water and groundwater impact assessments (relating to drawdown, water quality and extraction) have been addressed in the Ecological Impact Assessment (Appendix O of the EIS) conducted for the Project, and the assessment pertaining to the aquatic ecology is deemed adequate. The cumulative impact of these processes is the sum of all the processes acting together. As outlined above (and in the Ecological Impact Assessment), the impacts of the processes of drawdown, water quality and extraction have been assessed and considered unlikely to impact aquatic and riparian ecosystems, or threatened species and their habitats. Accordingly, the cumulative impact of these processes is considered to be minimal.

2.10 ISSUE 9

'Question 3: Does the Committee find the water balance and conclusions relating to water management provided by the proponent and attached to this brief to be reasonable?

9. *Review of the site water balance has raised uncertainty about the ability to accurately predict the frequency and magnitude of discharges and the volume of water to be sourced from the Hunter River. The proponent should review and address the following matters to improve confidence in the water balance's predictions and enable a more thorough assessment of the level of risk posed to water resources and aquatic ecosystems by the proposed project:*

- a. *under-estimation and over-estimation against recorded site inventory data during the water balance validation process;*
- b. *justification for the use of a simulated rainfall dataset rather than measured data from nearby meteorological stations has not been provided. The simulated dataset provides a lower mean annual rainfall than the measured meteorological station data, which may lead to underestimation of the amount of water to be retained or managed on site. The sensitivity of water management infrastructure to use of this dataset is not discussed by the proponent;*
- c. *provision of limited and inconsistent input and output data in the water balance report. In particular, the report: does not provide information on the seasonal variation of discharges and water demand; does not provide a detailed output for the 99th percentile rainfall scenario; inconsistently provides results as a mix of 'median' or 'average' outputs;*

and does not clearly identify total site water demand and the amount of this demand that can be sourced internally; and

- d. *lack of a comprehensive regional water balance, limiting the Committee's ability to assess the impacts of the proposed project in a regional context.'*

Relevant Sections of the EIS

Details regarding the content of the above statement can be found in the following sections of the EIS:

- Section 3.3, Appendix J of the EIS.

Response

- (a) The site water balance is a complex system with numerous unknown inputs, particularly surface runoff. Due to the limitations of numerical models and variability in site rainfalls, it will never be possible to match recorded site data with 100% accuracy. The comparison between the observed and model simulated water balance is within the level of accuracy which is normally achievable with such models.
- (b) The justification for adopting the synthetic dataset is provided in Section 3.3 of the Surface Water Impact Assessment (Appendix J of the EIS). Recorded rainfall data includes periods of missing data, as well as accumulated rainfall totals over periods when the rain gauge is not read (for example, weekends and public holidays). The synthetic dataset is also interpolated between rain gauges, potentially improving the accuracy of the rainfall at a given location where a rainfall gradient between two rain gauges exists. The difference between the mean annual rainfall recorded at Muswellbrook and the synthetic dataset is less than 5%.
- (c) The reporting of seasonal results would add to the complexity of the report and it is doubtful whether this additional information would add value in the appreciation of the impacts of the Project. The 99th percentile of model results is shown in Figure 6.15 to 6.18 of the Surface Water Impact Assessment (Appendix J of the EIS). The adopted modelling methodology does not include a "99th percentile rainfall scenario", but provides a statistical representation of results based on all years of historical rainfall. Table 6.20 of the Surface Water Impact Assessment (Appendix J of the EIS) shows model results for 1980 climatic conditions, the driest year on record, which would result in the highest off site water demand for the Project. Total site water demands are presented in Section 6.6.6 of the Surface Water Impact Assessment (Appendix J of the EIS). A statistical representation of the annual volume of water required from an external source is shown in Figure 6.15 of the Surface Water Impact Assessment (Appendix J of the EIS).
- (d) The following NSW WSPs under the *Water Management Act 2000* are relevant to the Project:
3. Hunter Unregulated and Alluvial Water Sources Water Sharing Plan 2009; and
 4. Hunter Regulated River Water Sharing Plan 2003.

The relevant WSPs represent plans for the management of all water use within the relevant catchments. Provided that water is taken in accordance with the relevant WSPs, the impacts on a regional scale will be within the levels that are considered by the WSPs to be acceptable.

Any surface water taken by the Project would be licensed under the WSPs and accessed in accordance with WSP requirements to ensure that any impacts are within the range of impacts accepted under the WSPs.

2.11 ISSUE 10

10. *'In addition to the concerns with the groundwater model outlined in Question 2, the following areas of uncertainty remain and should be addressed:*
- a. recovery times for affected aquifers have not been assessed; and*
 - b. there appears to be a decrease in flow to the Hunter River alluvium after mining has ceased, however no explanation is provided for this.'*

Relevant Sections of the EIS

Details regarding the content of the above statement can be found in the following sections of the EIS:

- Section 11.7, Appendix K of the EIS.

Response

The Groundwater Impact Assessment undertaken for the Project (Appendix K of the EIS) indicates that the water level in the final void will stabilise well below the crest line and the localised regional water table and act as a sink. Post mining the evaporative losses from the final void lake will result in a constant flux of groundwater into the final void. This will result in a permanent zone of depressurisation around the final void within the Permian Coal Measures, which will reduce the natural rate of groundwater flow from the Permian to the Hunter River alluvium. There is a permanent zone of depressurisation in the groundwater regime post mining, although less extensive than during mining due to flatter hydraulic gradients associated with the forming pit lake.

The flux to the alluvium was calculated to be reduced by a maximum of 0.6 ML/day (220 ML/year) at 1,000 years post mining. This is greater than the amount of 0.27 ML/day (100 ML/year) calculated towards the end of mining. This loss post mining is equal to the maximum rate estimated for the mining phase, and will be accounted for by the security of WALs. The difference between the mining phase and post mining phase water take (0.6 ML/year versus 0.27 ML/year) is due to the modelling approach. Spoil within the recovery simulation was modelled as a single body of elevated permeability compared to the mining phase where spoil was not simulated. The elevated permeability of the spoil results in differences, although as noted above the total take in the long term post mining is the same as the maximum simulated during mining.

2.12 ISSUE 11

11. *'The proponent has not undertaken detailed flood modelling for the proposed project. To protect downstream water resources and ecosystems from flood related impacts, it is recommended that flood modelling is undertaken for flood events up to and including the 1:1000 year average recurrence interval flood event and that measures are incorporated into the project design to protect mine landforms during these events. This assessment should also identify discharge scenarios for the CW1 dam and the receiving location of decant water from this dam.'*

Relevant Sections of the EIS

Details regarding the content of the above statement can be found in the following sections of the EIS:

- Section 8.6.3 of the EIS;
- Section 5.8, Appendix J of the EIS.

Response

The IESC has requested flood modelling be undertaken for flood events up to and including the 1:1,000 year average recurrence interval flood event. It is recommended that measures are incorporated into the Project design to protect mine landforms during extreme events.

The Surface Water Impact Assessment undertaken for the Project (Appendix J of the EIS) identified that the largest recorded flood event for the Hunter River in the vicinity of Bengalla was the February 1955 flood. The Flood Frequency Analysis undertaken for the Project indicates that the February 1955 flood was approximately equal to a 100 year Average Recurrence Interval (ARI) event. The maximum extent of a similar flood would not impact on any activities associated with the Project. Furthermore, the February 1955 flood occurred prior to the construction of Glenbawn Dam and regulation of the Hunter River.

The 100 year ARI flood extent of the Hunter River after the construction of Glenbawn Dam is likely to be smaller than the extent of the February 1955 flood. Therefore, the Project is not expected to affect the behaviour of flood flows in the Hunter River.

In accordance with the *Floodplain Development Manual* (2005), flood planning levels for typical residential development would generally be based around 1% AEP flood event plus an appropriate freeboard (typically 0.5 m). Proposed infrastructure associated with the Project is located several metres above the highest recorded historical flood level, which was larger than a 1% AEP flood event. Hence, the Project will have no measurable impact on downstream water resources and ecosystems during flood events.

The discharge location for CW1 dam is shown in Figure 5.3 of the Surface Water Impact Assessment (Appendix J of the EIS). The operational strategy for dam CW1 will be to maintain the dam at a low level so that it has capacity to capture event runoff. Hence, the dam will be continuously dewatered.

2.13 ISSUE 12

12. *'It is unclear whether the design for the reinstatement of Dry Creek has provided for discharges from the Mount Pleasant Mine. Clarification of this issue should be sought, and if necessary, the design should be amended to incorporate the maximum anticipated discharge volumes from the Mount Pleasant Mine.'*

Relevant Sections of the EIS

Details regarding the content of the above statement can be found in the following sections of the EIS:

- Section 4.9.3 and 8.6.1 of the EIS;
- Section 4.2, Appendix J of the EIS; and
- Appendix X of the EIS.

Response

The Surface Water Impact Assessment (Appendix J of the EIS) indicates that BMC will construct the Mount Pleasant Project Discharge Dam and associated pipeline to the west of approved operations at Bengalla to mitigate the Project's disruption of the Mount Pleasant Project's approved discharge route. This dam does not form part of the Bengalla water management system and is subject to use by the adjoining Mount Pleasant Project following the receipt of appropriate approvals to allow discharges from that site in accordance with the HRSTS. Should the Mount Pleasant Project require the use of the reinstated Dry Creek, it will seek the appropriate approval at that time.

Following the decommissioning of CW1, the construction of the reinstated Dry Creek has been designed to accommodate the entire catchment north of CW1. This is considered to be the worst case as any future disturbance in the north of the Dry Creek catchment associated with the not yet constructed Mount Pleasant Project would require an independent water management system.

2.14 ISSUE 13

13. *'While the Committee considers that there is a minimal risk of decant from the final void, it is noted that water quality in the final void, other than salinity, has not been assessed. As noted consistently in the Committee's previous advice, the backfilling of voids and the minimisation of pit lakes represent best environmental practice for post-mining management. If this cannot be accomplished, it is recommended that the proponent undertakes a comprehensive assessment of final void water quality, which includes an assessment of the risks to fauna which may attempt to use the void as a water source'.*

Relevant Sections of the EIS

Details regarding the content of the above statement can be found in the following sections of the EIS:

- Section 8.6.3 of the EIS;
- Section 8.21.7 of the EIS; and
- Section 6.8, Appendix J of the EIS.

Response

Section 8.21.7 describes the options for final void development and rehabilitation that were considered during the development of the Project mine plan. An assessment of each option considered the economic costs and environmental constraints associated with each, including overburden volumes, overburden rehandle requirements and the potential coal resource sterilisation. The options considered the following alternatives for the development of a final void:

- Option 1 – 'Blast and Doze' to a stable final landform;
- Option 2 – Backfill the void to the original surface level; and
- Option 3 – Backfill to re-establish natural drainage.

Option 1 - 'Blast and Doze' method was nominated for the development of the final void in consideration of economic cost and environmental constraints associated with each, including overburden volumes, overburden rehandle requirements and the potential coal resource sterilisation.

The Surface Water Impact Assessment undertaken for the Project (Appendix J of the EIS) predicted that the salinity of the final void lake is set to increase at a rate of 5 $\mu\text{S}/\text{cm}$ for the first 1,000 years post mining and ultimately stabilising below 20,000 $\mu\text{S}/\text{cm}$ and is not predicted to pose a significant threat to fauna species.

2.15 ISSUE 14

14. *'In addition to the measures outlined elsewhere in this Advice, adoption of the following strategies would increase the level of protection for water-dependent biota:*
- a. *committing the proponent to meeting the ANZECC guidelines (2000) for protection of aquatic ecosystems (95 % protection levels) for discharges from the sediment and clean water dams. Where monitored upstream concentrations exceed these values, discharges should not exceed the 80th percentile of background (upstream) concentrations;*

- b. *amending the water management plan to ensure that water in sediment dams, particularly those receiving runoff from coal rejects or Archerfield Sandstone in the overburden emplacement area, can be contained on site if the quality of this water is not suitable for release; and*
- c. *making sure that mechanisms are in place to confirm that discharges from the proposed project comply with the electrical conductivity limits under the HRSTS. While it is assumed that the current project has such mechanisms in place, these have not been discussed in the environmental impact statement. Therefore, the Committee is unable to comment on the appropriateness of these arrangements under the amended proposal.'*

Relevant Sections of the EIS

Details regarding the content of the above statement can be found in the following sections of the EIS:

- Not applicable.

Response

Should the Project be approved, consultation will be undertaken with relevant regulatory agencies to ensure compulsory requirements and recommendations, will be considered in the preparation of the Water Management Plan.

2.16 ISSUE 15

15. *'It is noted that the proponent has developed a water management plan for their current operation but has not yet updated this plan for the proposed project. The Committee considers that the updated plan would benefit from incorporation of the following measures and strategies:*
- a. *adopting the groundwater monitoring program criteria provided in the Information Guidelines for Proposals Relating to the Development of Coal Seam Gas and Large Coal Mines where there is a Significant Impact on Water Resources1;*
 - b. *adopting a collaborative approach to groundwater monitoring with other mines in the region and regularly revising the groundwater model as additional monitoring information is received. Provision of this information for inclusion in a regional, cumulative groundwater model would be beneficial;*
 - c. *structuring the baseline Dry Creek monitoring program to include water quantity (hydrograph) and the water quality parameters currently collected for the Hunter River, and to capture seasonal and interannual variation before further disturbance in this catchment;*
 - d. *revising the surface water quality monitoring program to facilitate a better understanding of the contribution of sediment dams to the recorded increase in salinity downstream of the Bengalla Coal Mine. This may include undertaking volumetric and water quality monitoring of discharges from sediment dams. The results should be discussed in the context of compliance with the aims of the HRSTS;*
 - e. *undertaking rehabilitation and monitoring to assess channel integrity, stability, and rehabilitation success in the reinstated Dry Creek as described in Appendix X of Hansen Bailey (2012). The monitoring program should be continued until results demonstrate that the channel is effectively stabilised and rehabilitation / water quality objectives are being met;*

- f. *identifying and monitoring suitable indicators of aquatic ecological health in the Hunter River; and*
- g. *making monitoring results publicly available to assist in determination of cumulative impacts on threatened species and communities in the Hunter River catchment.'*

Relevant Sections of the EIS

Details regarding the content of the above statement can be found in the following sections of the EIS:

- Section 8.6.4 of the EIS; and
- Section 8.7.4 of the EIS.

Response

BMC will update the existing Water Management Plan for the Project for the approval of relevant regulators to include the commitments in the EIS and in consideration of the above recommendations.

2.17 ISSUE 16

- 16. *The Northern Sydney Basin has been identified as a Bioregional Assessment priority region. Data and relevant information from the proposed project should be made accessible for this Bioregional Assessment to assist the knowledge base for regional scale assessments.*

Relevant Sections of the EIS

- Appendix O of the EIS.

Response

The Ecological Impact Assessment undertaken for the Project (Appendix O of the EIS) identified that the Study Area is located in the Hunter subregion of the Sydney Basin Bioregion, a large and complex area that extends from Batemans Bay in the south to Nelson Bay in the north and includes parts of the Blue Mountains.

The IESC has requested relevant information associated with the Project be made accessible for a Bioregional Assessment. The Ecological Impact Assessment and its associated data (Appendix O of the EIS) was made publicly available upon exhibition of the EIS.

BMC would be happy to facilitate any further data requirements upon request.

3 CONCLUSION

We trust that the above response is satisfactory to SEWPaC. We note that the EIS is on exhibition from Wednesday, 4 September to Friday, 11 October 2013. Should you require any additional information in this time to assist you in providing your response to the publicly exhibited EIS, we look forward to the opportunity to meet with you at your convenience.

Please do not hesitate to contact me on (02) 6542 9669 if you have any questions.

Yours sincerely

BENGALLA MINING COMPANY

A handwritten signature in black ink, appearing to read 'C White', written over the company name.

Craig White

Project Approvals Specialist

cc Mr David Kitto, Director Major Development Assessments Branch, NSW Department of Planning & Infrastructure



Notification

FINAL DECISION ON WHETHER WATER RESOURCES IS A CONTROLLING PROVISION FOR THE SPECIFIED ACTION

Bengalla Mine Project (EPBC 2012/6378)

This decision is made under item 23 of Schedule 1 to the *Environment Protection and Biodiversity Conservation Amendment Act 2013* (the EPBC Amendment Act).

Proposed action	To continue open cut coal mining operations at the Bengalla Mine, approximately 4 kilometres west of Muswellbrook in the Upper Hunter Valley, NSW, for a further 24 years (EPBC 2012/6378).
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Decision on proposed action	Sections 24D and 24E of the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (the EPBC Act) are controlling provisions for the proposed action.
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Note: This decision includes new controlling provisions for the proposed action. The new controlling provisions (sections 24D and 24E) relate to the impacts of coal seam gas development and large coal mining development on water resources. The consequence of this decision is that the proposed action must be approved for the purposes of this controlling provision before it can proceed.

Person proposing to take the action	Bengalla Mining Company Pty Limited ACN: 053 909 470
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Decision-maker

Name and position	The Hon Greg Hunt MP Minister for the Environment
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Signature

Date of decision	17 October 2013
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2. Public road access shall comply with section 4.1.3 (1) of Planning for Bush Fire Protection 2006.

Evacuation and Emergency Management

The intent of measures is to provide suitable emergency and evacuation (and relocation) arrangements for occupants of special fire protection purpose developments. To achieve this, the following conditions shall apply:

3. Arrangements for emergency and evacuation are to comply with section 4.2.7 of Planning for Bush Fire Protection 2006.

For any enquiries regarding this correspondence please contact Matthew Apps on 1300 NSW RFS.

Yours sincerely



Mark Hawkins

Acting Team Leader, Development Assessment and Planning



PMU029783

All communications to be addressed to:

Headquarters
15 Carter Street
Lidcombe NSW 2141

Headquarters
Locked Bag 17
Granville NSW 2142

Telephone: 1300 NSW RFS
Email: csc@rfs.nsw.gov.au



Director General
Department of Planning & Infrastructure
GPO Box 39
Sydney NSW 2001

Your Ref: SSD 5170

Our Ref: S13/0038

Attention: Matthew Sprott

RECEIVED
26 SEP 2013
Director-General

19 September 2013

Dear Sir/Madam,

Re: State Significant Development Application and Environmental Impact Statement for Bengalla Mining Company Pty Ltd

I refer to your correspondence dated 2 September 2013 seeking the NSW Rural Fire Service (RFS) to comment on the Environmental Impact Statement (EIS) prepared for a major modification to the existing Bengalla Open Cut Mine.

The RFS notes that the proposal is within a bush fire prone area and subsequently a hazard analysis has been undertaken identifying bushfire being a risk to the Mine. The hazard analysis addresses the requirements of maintaining asset protection zones and land management in general, but does not mention anything about water supply, evacuation arrangements or public road access.

Therefore the RFS provides the following recommended conditions to be applied to the Mine;

Water and Utilities

The intent of measures is to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building. To achieve this, the following conditions shall apply:

1. Water, electricity and gas are to comply with section 4.1.3 of Planning for Bush Fire Protection 2006.

Access – Public Roads

The intent of measures for public roads is to provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area. To achieve this, the following conditions shall apply:



Department of Primary Industries

OUT13/26061

22 OCT 2013

Mr Matthew Sprott
Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Dear Mr Sprott

Thank you for your email of 2 September 2013 concerning Review of the Agricultural Impact Statement for the proposed Bengalla Coal Mine – Continuing Operations.

The Office of Agricultural Sustainability & Food Security (OAS&FS) has reviewed the AIS provided by Bengalla Mining Company Pty Ltd dated July 2013. Specific issues are included in Attachment 1 enclosed. A brief summary follows:

The details regarding agricultural land resource issues are adequate. Aspects include:

- landforms and topography, and current land use;
- investigation of soils and capability; and
- soil material available for land rehabilitation.

It is noted that a review of the mapped Biophysical Strategic Agricultural Lands (based on the Strategic Regional Land Use Plan for the Upper Hunter 2012) indicates 28 ha is within the project area, while the verification investigation shows that only 1 ha is to be affected in the disturbance area. Based on the 2012 CIC maps, none of the 35 ha of equine CIC in the project area is to be disturbed and 369 ha of the 494 ha of viticultural CIC land identified will be disturbed. The amended CIC maps as per the NSW Government announcement in "Getting the Balance Right – NSW Land Use" of early October 2013, indicate that there is less viticultural CIC land in the project area. This land is currently used for grazing activities and does not support any existing viticultural enterprises, so this loss is not considered a concern given the proposed remediation.

The socio-economic aspects have been assessed reasonably including:

- regional community and agricultural support services, processing and value adding industries and regional employment; and
- agricultural lands enterprises and infrastructure, landscape values and impacts on tourism infrastructure.

The Office recommends that:

- a tree planting program at the boundary of the mine expansion be undertaken in consultation with the olive grove management to reduce the impact on that enterprise; and
- an assessment be undertaken on the issues raised by the community (such as decline of land values in the area) and how these concerns have been rated and dealt with.

This advice from the Office of Agricultural Sustainability & Food Security is forwarded directly to the Department of Planning & Infrastructure in accordance with agreed arrangements for mining applications that affect agricultural land.

Additional advice from the other divisions within the Department of Primary Industries may be forwarded by separate letter.

If you wish to discuss the issue further please call Rob Williamson on telephone 02 6391 3166 or by email robert.williamson@dpi.nsw.gov.au

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Regina Fogarty'.

Dr Regina Fogarty
Director Office of Agricultural Sustainability & Food Security

Encl

Specific Agricultural Impact Assessment Issues

A. Agricultural issues

There is adequate detail that deals with current land use in the area, landscape description and a suitable level of detail associated with the investigation of soil and land capability addressing soil materials available for reclamation use.

It is noted that mapped Strategic Regional Land Use Plan Lands (SRLUP) indicate 28 hectares is within the project area, while the verification investigation shows that only 1 ha is to be affected in the disturbance area. None of the 35 hectares of equine CIC in the project area is to be disturbed and 369 ha of the 494 ha viticultural CIC land identified by verification will be disturbed. The amount of these lands is considered to now be less with the amended maps available per the DP&I announcement in 'Getting the Balance Right – NSW Land Use' in early October 2013. This aspect and the fact that the land is used for grazing with the nearest vineyard 6 kilometres south of the project area leads us to determine that the impact on the viticultural industry is minimal.

B. Socio-economic Assessment:

The following provides a review of the socio-economic components of the Agricultural Impact Statement (AIS) provided as part of the Continuation of Bengalla Mine Environmental Impact Statement (EIS). The AIS and supporting documentation were reviewed with reference to the following material: Strategic Regional Land Use Policy Delivery Guideline – Guideline for AISs (March 2012), AIS Fact Sheet (September 2012), and the Strategic Regional Land Use Policy Guideline for AISs (Re-issued October 2012).

1. Impacts on agricultural enterprises, including farm productivity, land values and flow on impacts to regional communities and the environment.

a) Farm productivity

The AIS Executive Summary outlines that "approximately 964 ha will be temporarily removed from agriculture (Disturbance Boundary)"; that "land within the Disturbance Boundary has a relatively low productivity"; and that the "gross value of production from the beef enterprises within the Disturbance Boundary is estimated to be \$129,313 per annum" (p.3). This is discussed in detail in AIS Section 8.1.1. This impact is considered minimal.

b) Land values

The proposed development is an expansion of an existing mine within the area for which the proponent has an exploration licence, in a landscape dominated by mining. Community consultation reported in EIS Section 6 – Stakeholder Engagement indicates that the community is concerned about the potential impact of the Project on "Property devaluation in the local area" (p.111, Table 23). The proponent claims to have addressed this issue in EIS Section 8.14 – Social, but this is not the case. Hence, no assessment can be made.

c) Flow on impacts to regional communities

The AIS presents information regarding the flow on impacts to the regional agricultural community and concludes that there would be minimal adverse impacts (AIS Section 8.1.4). We consider that sufficient information has been provided and that this claim is reasonable given that the proposed development would result in minimal loss of arable land.

2. Any water that is transferred or will no longer be available for agricultural use.

The AIS indicates that the Project would require up to 2,420 ML per annum from Hunter River surface and ground water sources, for which the gross value of lost production from irrigated agriculture has been estimated would be \$1,003,597 per annum, assuming 100% allocation (AIS Section 8.1.2). We consider that this claim is reasonable.

3. Impacts on agricultural support services, processing and value adding industries and regional employment.

a) Agricultural support services

The AIS indicates that minimal adverse impact is expected (AIS Section 8.9). We consider that this claim is reasonable given that the Project would result in minimal loss in agricultural activity.

b) Processing and value adding industries

The AIS indicates that minimal adverse impact is expected (AIS Sections 8.1.3, 8.1.4 and 8.9). We consider that this claim is reasonable given that the Project would result in minimal loss in agricultural activity.

c) Regional employment

Regional employment is addressed in AIS Section 4.4. The AIS indicates that the Project would result in minimal loss in agricultural employment due to the change in land and water use (p.56, Table 23, AIS Section 8.1.4). We consider that this claim is reasonable.

4. Impact on visual amenity, landscape values and tourism infrastructure relied upon by local and regional agricultural enterprises.

The proposed development is an expansion of an existing mine within the area for which the proponent has an exploration licence, in a landscape dominated by mining.

a) Visual amenity

The potential impact of the Project on visual amenity is addressed in AIS Section 8.6 and EIS Appendix I – Visual Impact Assessment. There are already cumulative adverse impacts on visual amenity due to mining in the locality. The proponent claims that limited additional adverse impact on visual amenity is expected. However, there would be significant visual impact on the adjacent Pukara Estate olive grove. The proposed development would be in full sight of visitors approaching this tourist attraction. It is recommended that the proponent plant trees along the boundary of the proposed mine

expansion and the olive grove to minimise adverse visual impacts. This tree planting should be designed, established and managed in consultation with Pukara Estate. The proponent has committed to implement landscape strategies to achieve visual screening in consultation with affected landholders and land management agencies (p.97, Appendix I – Visual Impact Assessment, Section 8.1.2).

b) Landscape values

The potential impact of the Project on landscape values is addressed in AIS Section 8.6 and EIS Appendix I – Visual Impact Assessment. There are already cumulative adverse impacts on landscape values due to mining in the locality. The proponent claims that limited additional adverse impact is expected. We consider that this claim is reasonable.

c) Tourism infrastructure

The potential impact of the Project on agricultural related tourism is addressed in AIS Section 8.10 and EIS Appendix I – Visual Impact Assessment. The proponent indicates that minimal adverse impact is expected. We consider that this claim is reasonable.

5. Mitigation measures for minimising adverse impacts on agricultural resources, including agricultural lands, enterprises and infrastructure at the local and regional level.

a) Agricultural lands

The potential impact of the Project on agricultural lands is addressed in AIS Section 8. The proponent indicates that minimal adverse impact is expected. The proponent has committed to sustainable farming practices on the agricultural land that it owns, during the life of the Project and post-rehabilitation (Section 8.1.1).

b) Agricultural enterprises

The potential impact of the Project on agricultural enterprises is addressed in AIS Section 4.1. The proponent indicates that minimal adverse impact is expected. We consider that this claim is reasonable. As recommended in point 4 a), the proponent should plant trees along the boundary of the proposed mine expansion with the Pukara Estate olive grove to minimise adverse visual impacts.

c) Agricultural infrastructure

The AIS indicates that minimal adverse impact is expected (AIS Sections 8.1, 8.9 and 8.10). We consider that this claim is reasonable given that the Project would result in minimal loss in agricultural activity.

6. Documented consultation with adjoining land-users and Government Departments.

Consultation reported in EIS Section 6 – Stakeholder Engagement indicates that the community is concerned about the potential impacts of the Project (p.111, Table 23). However, no information is provided about the degree of concern for the issues raised. Details should be provided (e.g., a table detailing the number of times that an issue has been raised), so that an assessment can be made.

Matthew Sprott - Bengalla Mine Continuation

From: Heather Middleton <heather.middleton@damsafety.nsw.gov.au>
To: Matthew Sprott <Matthew.Sprott@planning.nsw.gov.au>
Date: 11/7/2013 4:56 PM
Subject: Bengalla Mine Continuation

Matthew,

Re: Bengalla Mine Continuation
Project Application 5170

The DSC has received the Environmental Assessment Report for the Bengalla Mine Continuation project (BMCP), the report has been reviewed and the following comments are provided:

- The BMCP application area impacts the existing Bengalla Staged Discharge dam a prescribed dam and the notification area that surrounds it. Bengalla Coal Mine have been in discussion with the DSC about the need to apply to the DSC prior to mining within this area.
- The BMCP application includes the construction of three new dams, the first two of which are likely to be prescribed by the DSC:
 - a replacement 'Bengalla Staged Discharge Dam,
 - Mount Pleasant Discharge Dam, and

CW1

- Concept designs for theses proposed dams, including assessments of dam "Consequence Category" will need to be submitted to the DSC prior to construction. The consequence category assessment should include consideration of changing activities downstream of the dams in an active mining area.
- The proposed dams should be designed to withstand impacts of mining.

Notification Areas will be delineated around any prescribed dams on the site and the Mine will need to contact DSC regarding mining within these Notification Areas.

If there are any queries in regard to the above please do not hesitate to contact Heather Middleton on 98428076.

kind regards,

Heather Middleton | Mining Regulation Officer

Dams Safety Committee | Level 3, 10 Valentine Avenue, Parramatta NSW 2150 Postal: PO Box 3720, Parramatta NSW 2124 / Australia

email: heather@damsafety.nsw.gov.au | Ph: (02) 9842 8076 | Fax: (02) 9842 8071 www.damsafety.nsw.gov.au



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Our reference: DOC13/78542, EF13/2634
Contact: Emma Paull (02) 4908 6828
Electronic correspondence to: hunter.region@epa.nsw.gov.au

NSW Department of Planning & Infrastructure
GPO Box 39
SYDNEY NSW 2001

Attention: Mr Matthew Sprott – matthew.sprott@planning.nsw.gov.au

Dear Mr Sprott

BENGALLA MINING COMPANY PTY LTD - BENGALLA OPEN CUT COAL MINE

I refer to your email of 30 August 2013 and the document titled "*Continuation of Bengalla Mine Environmental Impact Statement*" ("the EIS"), prepared by Hansen Bailey Environmental Consultants, and dated September 2013 and requesting assessment and comment from the Environment Protection Authority (EPA).

The EPA has reviewed the EIS, and provides the following comment and recommended conditions (noting comments below that recommended conditions of approval in relation to noise impacts are not able to be provided at this time) at **Attachment A**. Please note that these conditions do not repeat conditions which are already a part of Environment Protection Licence 6538 ("the EPL") issued to Bengalla Mining Company.

The EPA understands that the proposed project includes:

- a westward expansion of the open cut pit to extract an additional 316 million tonnes of run of mine (ROM) coal;
- extension of the life of the Bengalla Coal Mine by 20 years;
- increased maximum annual production from 10.7 million tonnes per annum (Mtpa) to 15 Mtpa of ROM coal;
- an increased operational workforce from 400 to 900 full time equivalent personnel;
- increased blast frequency from 2 to 4 per day and from 4 to 12 per week, and changes to approved blast times;
- modifications of the existing rail loading infrastructure, but no change to maximum approved coal train movements;
- relocation of a 6 km section of the Bengalla Link Road; and
- ancillary changes to mine infrastructure.

PO Box 488G Newcastle NSW 2300
Email: hunter.region@epa.nsw.gov.au
117 Bull Street, Newcastle West NSW 2302
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Noise Impact Assessment

The assessment predicts exceedances of the Project Specific Noise Levels ("PSNL") that must be addressed by the proponent in accordance with Chapters 8 and 9 of the Industrial Noise Policy ("the INP"). The EPA will then be in a position to recommend noise limits for all residences predicted to receive noise levels up to and including the PSNL. For any other receivers predicted to receive noise levels above the PSNL, the Department of Planning and Infrastructure ("DPI") is best positioned to weigh the social and economic benefits of the proposal against potential adverse noise impacts and to determine if a higher noise limit is justified. If a higher noise limit is accepted by DPI following this assessment and consent is granted, the EPA will include these limits in the EPL.

The adopted background noise levels in Table 3 of the Acoustic Impact Assessment ("AIA") are generally lower than those in Table 4. It is unclear how the levels in Table 3 have been derived, and there appears to be little relationship to the Table 4 values except to support the assertion that the Table 3 levels are conservative and should be used in the assessment. While the EPA is happy to accept a conservative assessment, further information should be provided on what noise sources are giving rise to the elevated measured background levels in Table 4, given that they are not audibly from Bengalla operations.

Section 4.7 of the AIA states that modifying factors have been applied to the source sound power levels of individual plant and equipment items. This has been done to simplify the assessment of a large number of sources that do not require the same modifying factors. The EPA considers that this approach is contrary to the requirements of Section 4.3 of the INP. This clearly states that 'the modifying factors are to be applied to the noise from the source measured/predicted at the receiver and before comparison with the criteria.' Any modifying factors applied in the AIA should be amended accordingly and the results, outcomes and actions arising from this change should be revised in the AIA.

The EPA notes that the proposed increase in frequency of blasting proposed for the project is significantly higher than the ANZECC blasting guidelines. Any increase in the frequency of blasting beyond that recommended in the guidelines may cause significant community concern.

Air Quality Impact Assessment

The Air Quality Impact Assessment ("the AQIA") has generally been undertaken according to the requirements of the Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales, August 2005 (Approved Methods) and has generally addressed the issues previously raised by the EPA.

Specifically, the AQIA has been amended to address the issues raised at the adequacy review stage by including further details of:

- the method used to determine cumulative 24-hour average PM10 (particulate matter with an aerodynamic diameter of less than 10 microns) and actual 24-hour average PM10 impacts;
- 1-hour average nitrogen dioxide (NO₂) impacts;
- current and proposed dust mitigation strategies;
- predicted impacts at all impacted receptors including mine owned receptors; and
- cumulative impacts when including new or recent mining proposals surrounding the Bengalla mine.

Air impacts are predicted to exceed EPA assessment criteria for 24-hour and annual average PM10, total suspended particulates (TSP), deposited dust (DD) and NO₂ despite the incorporation of best practice management measures

Dispersion modelling predicts air quality impacts may exceed EPA assessment criteria at:

- 16 privately owned residence for 24-hour average PM10, based on Project only (incremental) impacts;
- 17 privately owned residence for annual average PM10;
- 4 privately owned residence for annual average TSP;
- one privately owned residence for deposited dust;
- one privately owned residence for 1-hour average NO₂, due to diesel emissions; and
- a number of privately owned receptors for 1-hour average NO₂, due to blast emissions.

A commitment to the following measures to reduce the risk of impacts exceeding EPA criteria at affected receptors has been included:

- best practice dust management measures;
- improvements to the current air quality monitoring network; and
- updating the existing dust and blast management systems with a real time air quality management system combined with predicted meteorological forecasting.

The EPA has significant concerns with the predictions of NO₂ included in Appendix H "*Isopleth Diagrams – Blast emissions*" of Appendix G of the EIS.

Several of these predictions indicate impacts of blast fume at sensitive receptors above appropriate standards. The EPA also noted that modelled results are based on 1 hour averages and, as the inherent nature of blasts result in short term impacts, actual results may be higher.

The EPA recommends that prior to the determination of this project that DPI consult with the Department of Health to determine appropriate standards for post blast gases including, but not limited to, NO₂, NO, SO₂ and CO. The proponent should then be required to prepare a Blast Management Plan that appropriately demonstrates how compliance with the identified standards will be achieved.

If you require any further information regarding this matter please contact Emma Paull on 4908 6828.

Yours sincerely

 1.11.13

BILL GEORGE
A/Head Regional Operations Unit – Hunter
Environment Protection Authority

ATTACHMENT A
RECOMMENDED CONDITIONS OF APPROVAL – BENGALLA OPEN CUT MINE

Air Conditions

1. Air Quality Management Plan

- 1. 1** The Proponent must develop, implement and maintain air quality emission control measures for all air pollutant generating activities. The air quality emission control measures must be consistent with best available technology and best environmental practice for emission control.
- 1. 2** The Proponent must document details of all proposed air quality emission control measures. The information must include:
 - explicit linkage of proposed emission controls to the site specific best practice determination assessment;
 - timeframe for implementation of all identified emission controls;
 - key performance indicator(s) for emission controls;
 - monitoring method(s) including location, frequency and duration;
 - response mechanisms;
 - responsibilities for demonstrating and reporting achievement of key performance indicator(s);
 - record keeping and complaints response register; and
 - compliance reporting.
- 1. 3** Prior to commencement of operations, the Proponent must appoint a recognised air quality specialist to review and approve the air quality emission control measures. The review of the air quality emission control measures must include a review against each of the mitigation measures and management practices recommended and described in the documents submitted to support the Project development application.
- 1. 4** The air quality emission control measures must be implemented prior to the commencement of any dust generating activities associated with the Project.

2. Operating Conditions – Dust and other air pollution

- 2.1** All areas in or on the premises must be maintained in a condition that prevents or minimises the emissions of dust to air;
- 2.2** Any activity carried out in or on the premises must be carried out by such practicable means to prevent or minimise the emissions of dust to air;
- 2.3** Any plant operated in or on the premises must be operated by such practicable means to prevent or minimise dust or other air pollutant; and
- 2.4** All blasting activities in or on the premises must not cause or permit an impact from gases, smoke, fume or mist caused by a blast or blasts to any person not on the premises.

Definition of “impact from gases, smoke, fume or mist caused by a blast or blasts” includes by reason of the strength, nature, duration, character or quality of the gases, smoke, fume or mist:

- (i) any impact that is harmful to (or likely to be harmful to) a person; or
- (ii) any impact that interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person.



**Office of
Environment
& Heritage**

Your reference: SSD 5170
Our reference: DOC13/49784; FIL12/12724
Contact: Robert Gibson, 4908 6851

Mr Matthew Sprott
Planning Officer - Mining Projects
Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Dear Mr Sprott

**RE: BENGALLA MINE CONTINUATION PROJECT (SSD 5170) – ASSESSMENT AND
RECOMMENDED CONDITIONS OF APPROVAL**

I refer to your email dated 30 August 2013 seeking comment and recommended conditions of approval for the proposed Bengalla Mine Continuation Project, which is a State Significant Development (SSD) under Part 4 of the *Environmental Planning and Assessment Act 1979*.

The Office of Environment and Heritage (OEH) has reviewed the Environmental Impact Statement (EIS) for the proposed development with regards to Aboriginal cultural heritage and threatened biodiversity. OEH has identified some issues of Aboriginal cultural heritage in the project area and has also identified errors and inconsistencies in details provided in the 'Aboriginal Archaeology and Cultural Heritage Impact assessment' (Appendix M) of the EIS.

OEH understands that the proponent is considering offsetting the impact of the proposed development on biodiversity primarily by paying into the Hunter Offset Fund in accordance with the Upper Hunter Strategic Assessment. OEH has reviewed the assessment in this context. These matters are discussed in **Attachment 1**.

If you require any further information regarding this matter please contact Robert Gibson, Regional Biodiversity Conservation Officer, on 4908 6851.

Yours sincerely

30 OCT 2013

RICHARD BATH
A/Regional Manager, Hunter Central Coast
Regional Operations

Enclosure: Attachment 1

ATTACHMENT 1

OEH REVIEW OF THE PROPOSED CONTINUATION OF BENGALLA MINE (SSD 5170)

The Office of Environment and Heritage (OEH) has been requested to provide comment on Aboriginal cultural heritage and threatened biodiversity matters in relation to the proposed project to extend the mine life and footprint of the Bengalla Mine at Muswellbrook. The modification involves expanding existing open cut mining operations to the west of the current open pit over a disturbance footprint of about 950 hectares (ha). OEH has reviewed the information provided in the Environmental Impact Statement (EIS) titled 'Continuation of Bengalla Mine: Environmental Impact Statement: September 2013' prepared by Hansen Bailey environmental consultants, with particular reference to Appendix M 'Aboriginal Archaeology and Cultural heritage Impact assessment' and Appendix O 'Ecological Impact Assessment'. OEH's comments are provided below:

ABORIGINAL CULTURAL HERITAGE ASSESSMENT

OEH has reviewed the Aboriginal Archaeology and Cultural Heritage Impact Assessment (Appendix M of the EIS) for the Continuation of Bengalla Mine Project and has identified a number of issues with this assessment. OEH notes that archaeological assessments by multiple consultants over the Bengalla Mine Lease Area (MLA) have identified the entire Bengalla MLA as being of moderate to high scientific and cultural significance. For instance the results of investigations conducted by ERM (2008) under Aboriginal Heritage Impact Permit (AHIP) #2621 confirm the significance of the archaeological signature of the Bengalla MLA. As noted on Page 16 of that report most of the artefacts found at the site "*are not commonly recorded in camp scatters along the creek*" (ERM 2008). This study confirmed White's (nee Rich's) conclusions that quarry site complex B10 (AHIMS 37-2-0579) represents a major silcrete extraction location and possible raw material source for the surrounding region. (White 1998). OEH has significant concerns regarding the assessment of, and management proposals for, Aboriginal Heritage Information Management System (AHIMS) quarry site complex B10 (AHIMS 37-2-0579). OEH considers that the assessment has not accurately quantified the known nature and historical assessments of this site complex nor adequately identified its potential scientific significance. OEH considers that, based on historical correspondence and consultation with the local Aboriginal community that the cultural significance of AHIMS 37-2-0579 has not been adequately identified within the EIS. OEH notes that due to the significance of this site complex it has historically been identified as warranting full protection of all remaining areas and as such was specifically excluded from further impact under AHIP #2621. The exclusion zones identified in AHIP #2621 constituted both the extant northern and southern section of the site and were clearly identified to Bengalla in a letter by OEH, dated 11 October 2007, to Mr. Jeff Torkington (Project Development Manager Bengalla Mine). That letter clearly identified those areas OEH had excluded from impact. The variation to AHIP #2621 that accompanied the letter contained text and maps (provided in Attachment 1 to that letter) identifying the areas that should not be impacted. The decision to vary the AHIP to allow partial impact was largely based on the fact that the section of the site applied for had been subject to previous impacts and therefore overall damage to the site was minimised. OEH considers that those sections of AHIMS 37-2-0579 identified as 'Exclusion Zones' in Attachment #1 to the varied AHIP #2621 should remain undisturbed for the life of the Bengalla mine project.

OEH is currently undertaking investigations into some recent works which are associated with quarry site complex B10 (AHIMS 37-2-0579). Until such time as these investigations are complete the entire northern extent of AHIMS 37-2-0579 must be considered as possible evidence and remain in its current state.

OEH provides examples of further inconsistencies and apparent errors in the Aboriginal cultural heritage assessment in Appendix M of the EIS which are summarised below:

Key Aboriginal cultural heritage issues

1. Executive Summary (p. 1) – “High significance was attributed to the southern section of B10 quarry (37-2-0579)”

OEH notes the arbitrary distinction between the northern and southern sections of this site are invalid. They are based on the fact that recent activity by Bengalla mine has destroyed a large and significant section of the site. AHIMS 37-2-0579 should continue to be treated as one unit regardless of the previous impacts by Bengalla mine. A variation to AHIP #2621 discussed in a letter issued by OEH to Bengalla Mine signed on 11 October 2007, and accompanying documentation, clearly identified a discrete area of this site which was authorised for impact. Conditions of the AHIP clearly identified that no other part of the site (north or south) was permitted for impact. The proposed impacts authorised by that AHIP were consistent with those originally identified by White (1993) as proposed for the mine. Various references within the EIS to the results of salvage and investigations in the northern section are questioned. No impact to any surface or subsurface object in the northern section of AHIMS 37-2-0579 has been authorised and OEH has no record of any salvage excavations in that area. Furthermore reports from all authorised salvage projects within the middle section of the site categorically state that they have not categorised the site nature. White (1998) clearly states that the two discrete locations tested are unlikely to be representative of the entire site and Neuweiger (ERM 2008) clearly notes that based on soil consistency the excavations conducted at the site under authority of AHIP #2621 were unlikely to have accurately identified the extent and nature of Aboriginal objects within the salvage areas. There is a high potential for subsurface and surface material of high scientific value to remain throughout the entire area of the site (all sections).

The result of consultation with the local Aboriginal community, for previous approvals, has identified the site as being of high cultural sensitivity. Based on the level of concern raised by the Aboriginal community, and the potential scientific value of the site, the original AHIP #2621 excluded the entire site from impact. It was only as a result of extensive consultation with the Aboriginal community and a commitment by Bengalla Mine to preserve all other areas within the site, as originally mapped by Beth White (nee Rich), that OEH determined in favour of a variation that authorised limited and specific impacts to the centre portion of the site which were consistent with those originally identified as likely to occur as a result of the project (Rich 1993).

Given the high scientific and cultural value of AHIMS 37-2-0579 and the results of previous discussions and agreements with Bengalla mine regarding the preservation of these areas, OEH recommends that the northern and southern sections of this site remain undisturbed.

2. Executive Summary (p. 1) – “The northern part of quarry site (37-2-0579) where no Aboriginal heritage objects have been previously identified”

- The entire site was mapped by Beth Rich as being sensitive. Only small portions of the central section have been subject to subsurface investigation. Surface surveys have been hampered by low visibility. This is confirmed in comments raised by Registered Aboriginal Parties (RAP's) in response to this EIS. Both the Northern and Southern sections of the site were identified as 'no impact areas' for the life of the mine under the process for AHIP #2621 variation.
- A number of Aboriginal objects have been identified as present on the surface of the northern section of AHIMS 37-2-0579. OEH notes that these were identified during surveys when ground surface visibility was quite low and the actual density of surface objects is most likely heavily underrepresented in the survey results. Currently no understanding of the nature of subsurface deposits in this area exists.

3. Executive Summary (p. 1) – “The northern portion of the ridgeline originally mapped by Rich (1993) as B10 quarry (37-2-0579) will be impacted by the Project. This portion of B10 has been assessed as of low significance due to a lack of identified surface archaeology in the area...no mitigation is proposed for this area”

- This area was assessed by Beth White (White 1993) as part of a significant site complex.

- Recent surface surveys have been hampered by low visibility.
- Aboriginal community concerns have identified this area as sensitive.
- No disturbance has been authorised in this location. OEH has no record of disturbance in this location.
- This area was set aside as conservation area under the process for AHIP #2621 variation.

4. Section 1.2.1 – OEH Submission (third dot point) “*The EIS should identify the nature and extent of impacts on Aboriginal cultural heritage values.....clear justification for such impacts should be provided*”

The nature and extent of impacts to Aboriginal objects in the northern section of AHIMS 37-2-0579 has not been identified nor has clear justification been provided. Discussion in the EIS regarding impacts to objects in AHIMS 37-2-0579 appears to be based on invalid information.

5. Section 3.4.2 – Responses to RAP Comments

- Response to Wonnarua Local Aboriginal Land Council (WLALC) Comments Point 2. Previous Processes regarding the preparation and ongoing maintenance of the ACHMP have been identified by OEH as inadequate. In particular on 20 Feb 2012 OEH provided a letter to Hanson Bailey (doc12/2901; addressed to Mr Jason Martin) which outlined a number of failures with the consultation process which resulted in OEH being unable to provide comment on the document. OEH requires that the revised management plan referred to in this point addresses all previous concerns raised by OEH and fulfils all the standard requirements expected in an Aboriginal Cultural heritage Management Plan (ACHMP).
- Response to DFTU Enterprises Comments Point 1. OEH notes the lack of visibility due to ground cover will have significantly affected the outcomes of the survey and in particular the attribution of significance ratings based on surface expression of Aboriginal objects.
- OEH would expect the proposed ‘chance finds procedure’ to be finalised prior to project approval. This would ensure that this aspect of the final ACHMP meets industry standards and that inappropriate impacts to Aboriginal objects do not occur as a result of the project.

6. Section 4.6 – Geomorphology

- “*Archaeologically, areas of erosion and exposure are of particular importance as they provide the greatest visibility and subsequently the greatest chance of identifying surface artefacts*”. This statement is misleading. Although the chances of locating surface finds is often increased in areas of visible erosion, as noted in this section, the subsurface integrity at these locations is invariably compromised and therefore the archaeological significance reduced. Areas of little to no erosion, that can be identified through contextual and landscape analysis as likely to contain *in-situ* deposits, are generally of much higher archaeological significance regardless of whether testing identifies deposits or not. A negative result from testing is of high value as it informs the predictive model dataset and a positive result (in the form of intact deposits) returns valuable information on traditional habitation and subsistence patterns.
- “*Dry Creek and its tributaries likely offer the only depositional environment within the study area*”. Although the study area is composed of duplex soils with high levels of erosion a number of areas of potential deposit have been identified (e.g. Site B10 and Site B33). In particular areas of AHIMS 37-2-0579 have been identified (White 1993, Rich 1998 and ERM 2008) as containing subsurface archaeological deposits which have been rated as of moderate to high scientific value.

7. Section 5.1 –Wonnarua

- “*While there is general acceptance of the boundaries of the Wonnarua*”. Although this statement may be true of the non-Aboriginal community there is significant disagreement amongst Hunter Valley Aboriginal groups as to the boundaries of the Wonnarua country.

- *“irregular ceremonial band aggregations”*. A large number of traditional Aboriginal ceremonies were conducted on a regular basis.

8. Section 6.3.1 – Rich, E.R. (1993)

“The most significant site recorded was a silcrete quarry B10 associated with tertiary ridge gravels”. AHIMS 37-2-0579 is the most significant site found within the project area. It has been identified as representing a number of technological phases and also various activity areas. Subsequent subsurface salvage has confirmed the significance. In 2008 Bengalla mine was granted a Partial AHIP (#2621) for a previously disturbed section of this site on the understanding that the rest of the site would remain undisturbed for the life of the mine. OEH has grave concerns with granting any approval that would result in further impact to this site.

9. Section 10.5 – Subsurface Archaeological Sensitivity of the Study Area

Table 31 - AHIMS 37-2-0579 has historically been identified as having high potential for *in-situ* subsurface deposits. No reference to this is provided in Section 10.5 of the EIS.

10. Section 10.6 – Evaluation of Predictive Model

Table 32 identifies that the predictive model indicated that *“Quarry sites may occur where exposed silcrete and mudstone outcrops occur”*, the result provided is that *“No new quarry sites were identified during the archaeological survey”*. It is unclear whether unquarried silcrete and/or mudstone outcrops were located or whether no such outcrops were located. This has direct bearing on the contextual local significance and representativeness of AHIMS 37-2-0579.

11. Section 11.1.2 – Research Potential

This section notes that *“...in the Hunter Valley such questions will revolve around stone tool manufacture; settlement patterning; how regional resources were used; how uses changed throughout the Holocene; and how these changes manifested in the archaeological record”*. AHIMS 37-2-0579 has been identified as likely to contain subsurface deposits. A likelihood exists that these deposits may provide information regarding the evolution of the use, and procurement, of boulder silcrete in the upper Hunter Valley. The limited subsurface excavation done to date at this site has indicated the potential for significant sub-surface deposits that may further inform our understanding of these aspects of traditional Wonaruah life.

12. Section 11.1.5 – Application of the Scientific Significance for the Project

Table 34 - This table indicates that Site B10 has been split into north and south section and assessed independently. This is an inappropriate and invalid distinction. Site B10 constitutes a single site based on landform. The attribution of low significance to the northern section of the site is based on the results of a surface survey where ground surface visibility was rated as low. Subsurface investigation would be necessary in order to qualify this rating. If low artefact numbers were encountered this would contribute to the overall understanding of the site particularly with regard to the distance decay study required by OEH (then NPWS) as part of consent conditions for the 1998 salvage project. Prior to disturbance resulting from mining activities there were no north and south sections of this site. Any impacts to the northern Section of B10 were specifically prohibited by AHIP #2621.

13. Section 13.1.1 – Intergenerational Equity - Cumulative Impact of the Project on Aboriginal heritage

- In order to address Cumulative Impact Assessment and Ecological Sustainable Development issues and the identified significance of the site, both the northern and southern Sections of AHIMS 37-2-0579 were excluded from any impacts for the life of Bengalla Mine as part of the process for AHIP #2621.

- Page 84 notes previous mine related impacts and subsurface investigations to the northern section of 37-2-0579. No such impacts have been authorised and since 2007 any such impacts have been specifically prohibited under AHIP #2621.
- A letter from OEH to Mr. Jeff Torkington at Bengalla (DOC07/40231), which accompanied a variation to AHIP#2621, identifies the specific protections provided to these sections both visually and in writing. Page 84 of the EIS notes that none of the sites impacted have been attributed a high scientific significance. This is false as B10 (37-2-0579) was originally ascribed a high significance in 1993. All studies of the site since have confirmed the high scientific value of this location.

14. Section 13.1.2 - The precautionary principle

Contrary to the statement on p. 85 of the EIS, OEH considers that AECOM has not adopted a precautionary approach for the purposes of this evaluation.

15. Section 14.2.2 – Archaeological Salvage Program

OEH notes that no subsurface salvage program is proposed in this section for any site within the project area. As noted by AECOM in Appendix A, Section 4.7 (p. 109) *"As demonstrated by numerous Aboriginal archaeological investigations in the Upper Hunter Valley, surface artefacts at most open artefact scatter sites represent only a portion of the total number of artefacts present."* A subsurface salvage methodology should be developed in consultation with the RAP's, OEH and DP&I prior to any determination being made regarding this project. Part of the justification for the position of 'no salvage' is a reference to *"Turvey"* (in White 1998:28). Page 28 of White (1998) contains only tables do not contain any comments by any *"Turvey"*. The justifications for 'no salvage' at Site B10 (37-2-0579) refer to excavations at this location. No excavations have ever occurred at this location and it forms part of a site complex/landform that has been clearly identified and confirmed as being of high scientific significance. This location was also specifically protected from any impact by Bengalla mine as part of the process for the issue of AHIP #2621.

16. Section 14.2.6 – Management of Previously Unrecorded Aboriginal Objects

This section provides no discussion or proposal for the management of a number of site types that may be found in the area such as Quarry Sites and Grinding Grooves. A more comprehensive chance finds protocol is necessary to ensure that unforeseen Aboriginal objects are afforded the appropriate mechanisms for protection and management.

17. Appendix A – RAP Correspondence Section 3.1 AHIMS Search

Table 3.1 is not an accurate representation of the AHIMS results for the area as it does not include any reference to the Quarry Sites. This constitutes false information provided to the Aboriginal stakeholder groups for the project.

18. Appendix F – Arborist Scar Tree Assessment

OEH has reviewed the document. OEH notes the constant reference to an arbitrary date of 150 years for the latest possible traditional tree scarring. This is not scientifically or ethnographically valid.

19. Existing Approval for the Bengalla Mine (DA211/93)

OEH notes that Condition 29 of the existing approval (DA211/93) requires the development of an ACHMP by the end of February 2012. OEH further notes that the current ACHMP appears incomplete and has not been endorsed by OEH. The last record of correspondence regarding this matter is a letter dated 20 February 2012 from OEH to Mr Jason Martin of Hanson Bailey which advises that OEH considers the ACHMP incomplete. OEH advises DP&I that this may constitute a breach of condition of approval number 29 of the existing approval.

Summary and Conclusions

OEH has identified several significant issues that need to be addressed before this project may be approved, and as such is not in a position to be able to provide any recommended conditions of approval for Aboriginal cultural heritage matters at this stage.

THREATENED BIODIVERSITY ASSESSMENT

According to the EIS the proposed development would have a footprint of about 950 ha, of which 881 ha currently comprises native vegetation (see Table 1, below). The project, if approved would clear about 551 ha of endangered ecological community (EEC) vegetation, and 2.9 ha of Vulnerable Ecological Community (VEC) vegetation as listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act) and about 535 ha of Critically Endangered Ecological Community (CEEC) as listed under the Australian Government *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Table 1 Summary of vegetation communities in the project area and their conservation status (from Table 67 in the Main Report).

Vegetation Community	Status	Area (ha)
Hunter Floodplain Red Gum Woodland	EEC, GDE	9.4
Grey Box – White Box Intergrade Grassy Woodland (HU905)	CEEC (EPBC Act), EEC (TSC Act)	27.9
Upper Hunter White Box – Ironbark Grassy Woodland (HU905)	CEEC (EPBC Act), EEC (TSC Act)	45.3
Central Hunter Ironbark – Spotted Gum Forest	EEC	6.7
Narrabeen Foothills Slaty Box Woodland	VEC	2.9
Upper Hunter Hills Exposed Ironbark Woodland	Not listed	167.9
TOTAL Native Woodland & Open Forest		260
DNG (Box – Gum Woodland) (HU905)	CEEC (EPBC Act); EEC (TSC Act)	462.1
DNG (Slaty Box)	Not listed	0
DNG (Upper Hunter Hills Exposed Ironbark)	Not listed	159.2
TOTAL Derived Native Grassland		621
Tree & shrub plantation	Not listed	11.4
Low diversity DNG/ exotic pasture	Not listed	57.5
Exotic/ Riparian Vegetation	Not listed	0
TOTAL Non-native vegetation		69
TOTAL AREA OF VEGETATION		950

The vegetation to be cleared includes plants of Tiger Orchid (*Cymbidium canaliculatum*) which forms an endangered population in the Hunter Valley, and would also clear about 881 ha of actual or potential habitat of Lobed Bluegrass (*Bothriochloa biloba*) – an Australian Government listed Vulnerable species. Nine threatened animals have been recorded from the project area: Brown Treecreeper, Speckled Warbler, Black-chinned Honeyeater, Grey-crowned Babbler, Yellow-bellied Shearwater, Eastern Bent-wing Bat, Large-footed Myotis, Eastern Cave Bat, and Squirrel Glider.

BCAM Assessment for Offset by way of payment into the Upper Hunter Offset Fund

The proponent is participating in the Upper Hunter Strategic Assessment and which will provide the opportunity to offset the impact of the development on threatened biodiversity primarily by paying into the

Upper Hunter Offset Fund which will be established as part of the Upper Hunter Biodiversity Plan. The amount to be paid into the Fund will be determined by the Biodiversity Certification Assessment Methodology (BCAM)(OEH, 2011) and two calculators to convert credits to hectares then hectares to dollars. The details of the Upper Hunter Offset Fund are to be finalised in 2014 when the final offset package for the Continuation of Bengalla Mine project will be able to be calculated.

OEH has reviewed most of the BCAM data behind the assessment presented in the EIS, and has discussed the issues raised from that assessment during a teleconference with the proponent on 25 October 2013. A few issues remain, which may be addressed during the review of submissions for this project. Those remaining issues are summarised below:

1. The White Box vegetation communities, including the Derived Native Grasslands after White Box woodland were matched to a Narrow-leaved Ironbark vegetation BVT (HU905) in which White Box is very rare. The EIS seems to indicate that a more appropriate White Box – dominated woodland BVT (which OEH has identified as HU820) could not be flagged as an EEC in BCAM, and thus a Narrow-leaved Ironbark vegetation community (HU905) was used instead (EIS, App. L of App. O, p. L.5.2). The BCAM calculator does not give any additional weighting to EEC vegetation communities for the main driver of credits generated per vegetation zone is instead based on the percentage that any given vegetation community is cleared within a given CMA subregion. A consequence of choosing HU905 rather than HU820 has been a slight reduction in the number of ecosystem credits generated by the three White Box vegetation zones. OEH found that it would increase the number of credits for White Box communities by about 106 per cent which would increase the total number of credits generated by the project (as per Table 5.3 in App. L of App. O of the EIS) by 1025 ecosystem credits for a new total of 28,545 ecosystem credits;
2. 109.7 ha of 'Low Diversity Derived Native Grassland/Exotic Pasture is described from the project area but not included in the BCAM assessment (e.g. Table 3.1 in App. L of App. O of the EIS). OEH understands that this grassland, which occurs on the Hunter River floodplain will not be cleared by the project. Thus for the BCAM assessment the native element of this grassland must either be assigned to a BVT, adequately sampled and included in the BCAM calculator, or have justification provided as to why that area is excluded from the project area assessed by BCAM
3. The vegetation community 'Derived Native Grassland after Upper Hunter Hills Exposed Ironbark' (HU819) was not sampled sufficient as per BCAM guidelines. OEH understands that this was done due to the highly variable species composition of this grassland in the project area. Not sampling in full accordance with BCAM weakens the robustness of BCAM results, and for transparency OEH recommends additional field quadrat data is provided so that this issue is resolved.

OEH awaits further details from the proponent about these matters whilst the proponent is reviewing all submissions received for the exhibited EIS.

Similarly, OEH found that the EIS did not fully document the thought process involved in matching vegetation communities within the project area to the BVTs used in BCAM assessment, which made it difficult to check that the process was done correctly. Whilst some vegetation communities readily match only one available BVT in current database (e.g. Narrabeen Footslopes Slaty Box Woodland), many other vegetation communities (particularly those with Narrow-leaved Ironbark in the canopy) have many BVT options that they may match. Since selecting the most appropriate BVT generally involves finding the one with the most number of shared species in a particular vegetation community, once factors such as geographic location, soil type and position in landscape have been taken into account. However, the vegetation community descriptions in exhibited EIS are light on details of the dominant plant species that they contain. This lack of detail makes OEH's role difficult in checking that the most appropriate BVTs were selected for the vegetation communities in the project assessment area, and the calculations that followed in the calculator. This data must be provided for the Bengalla continuation of mining project to show that the process was done correctly and in a transparent manner, and can be provided whilst the review of submissions process is being conducted. In this case it appears that this is an issue for the White Box

communities, and, as discussed above, this has been raised with the proponent and will be addressed shortly.

OEH is asking for the provision of more detailed floristic details in vegetation communities identified on a site and assessed by BCAM. The required details include a description of the position in the landscape and the soil type(s) on which each vegetation community occurs, and the habitat features they contain, in addition to floristic details that include the listing of at least the top three dominant shrubs, groundcover forbs, groundcover vines, groundcover sedges and rushes and grasses, and the identity of plants in the following grass genera: *Aristida*, *Austrostipa* and *Rytidosperma* (*Austrodanthonia*) to species level. Such details are needed to support the matching of a vegetation community to the most appropriate available BVT, and its condition which were then run in the BCAM calculator. Where a vegetation community may not have a single best fit BVT then a decision of which one of a shortlist of options was used must be justified, including any assumptions made. Where the information provided does not allow OEH to fully assess the decisions made in data used in the BCAM calculator then this will prevent OEH from being able to fully carry out its assessment role for the UHSA. As raised above, OEH raised this issue with the proponent during the recent teleconference and since in this case the data can be provided during the assessment of submissions.

In future OEH recommends that BCAM files and associated GIS files are made available on the DP&I website so that not only OEH, but other interested parties can access this data so as to provide transparency for the full environmental assessment process.

The Biodiversity Plan for the Upper Hunter Strategic Assessment is still being prepared, and is not scheduled to be finished until 2014. Policy decisions are being developed to help inform this process, and once they are completed OEH will need to revisit the ecosystem credit calculations for the Bengalla Project when reviewing all projects covered by the Upper Hunter Strategic Assessment.

Proposed planting of River Red Gums on part of the Project Area

The proponent has a Statement of Commitment to rehabilitate part of its Hunter River frontage, and to include River Red Gums (*Eucalyptus camaldulensis*) in the planting mix (Table 101, EIS Main Report and s. 5.2.2 of App. O of the EIS). River Red Gums in the Hunter Catchment form a state-listed Endangered Population. OEH has identified 11 priority actions to help recover this endangered population (OEH, 2013) and supports those efforts in assisting the survival of this species in the Hunter Catchment.

Recommended conditions of approval for threatened biodiversity

1. That proposed offsets for this proposal, if approved would be provided in accordance with the Upper Hunter Biodiversity Plan, including contributing money to the Upper Hunter Offset Fund using appropriate OEH calculators.
2. That if for any reason the offsets were unable to be provided in accordance with the Upper Hunter Biodiversity Plan then they would be provided in accordance with other OEH offsetting policy.
3. That proposed planting of River Red Gum (*Eucalyptus camaldulensis*) trees as part of the maintenance of the Hunter River frontage of the project area must only use propagules collected from within the Hunter Catchment, so as to retain the genetics of the local and endangered population. Further, seed collection from source trees must be done in accordance with FloraBank guidelines (www.florabank.org.au/).

References:

ERM obo Hansen Bailey (Baker Neville) (2007) *Bengalla Mine Section 90 #2621, Aboriginal Heritage Salvage Collection Report*, August 2007. ERM unpublished report for Hansen Bailey.

ERM obo Hansen Bailey (2008) *Bengalla Mine Section 90 #2621, Aboriginal Heritage Salvage of Area B10 Collection Report*, July 2008. ERM unpublished report for Hansen Bailey.

OEH (2011) Biodiversity Certification Assessment Methodology. February 2011. NSW Office of Environment and Heritage, Sydney. www.environment.nsw.gov.au/resources/biocertification/110170biocertassessmeth.pdf

OEH (2013) *Eucalyptus camaludulensis* population in the Hunter catchment – Threatened Species Profile. NSW OEH, Sydney. www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10968

Rich, E. (1993) *Proposed Bengalla Coal Mine, Muswellbrook NSW: Summary of Aboriginal Heritage*, January 1993. Unpublished report for Wayne Perry & Associates.

White, E. (1998) *Archaeological Salvage of Sites B10 & B33, Bengalla Mine, Hunter Valley, NSW*, February 1998. Unpublished report for Bengalla Mining Company.



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File: 10/25009
Our Ref: A1647409
Your Ref: SSD 5170

Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Attention: Matthew Sprott

Dear Mr Sprott

RE: CONTINUATION OF BENGALLA MINE PROJECT – SSD 5170 – COMMENT ON EIS

The Heritage Division on behalf of the NSW Heritage Council is writing in reference to correspondence received from Hansen Bailey regarding the public exhibition of the EIS for the above project.

Section 8.10 specially addresses the European Heritage Impacts for this project noting that heritage impacts will be addressed in the revised European Heritage Management Plan (EHMP). It is unclear from the EIS whether the revised EHMP has been prepared but it seems that it has not yet been done.

It is noted the Heritage Division has previously provided comments directly to Hansen Bailey on an earlier version of the EHMP making the following recommendations:

- *It is considered that the recommendations outlined in the two Dilapidation Reports (dated 2012) for Bengalla and Overdone Homesteads should be specifically included for actioning, along with a timeframe for these works in Table 4 (Bengalla European Heritage Site Management Measures) and Table 5 (Management Measures and Responsibilities) to ensure that the homesteads do not fall into further disrepair.*
- *The NSW Health Policy Directive (Burials- Exhumation of Human Remains) dated April 2008 must be referenced in Section 4.3.3 of the Bengalla EHMP (Management of Human Remains) and the procedures listed in it must be referenced as part of this management scenario.*
- *Management measure 6 in Table 5 requires a timeframe to be included to allow the owners of Edinglassie and Rous Lench some certainty regarding when these vegetation screening measures for these State Heritage Listed properties will be in place.*
- *The plan contained minor errors such as spelling errors, mistakes, missing words and in some cases, missing information. It is assumed that these minor errors will be picked up after a thorough editing has been undertaken of the document.*

As a revised version of the EHMP has not been provided the Heritage Division is not able to provide specific comment on the adequacy of this heritage management document or whether previous comments have been incorporated.

Based on the above the following recommendations are made:

- The EHMP must be updated to reflect the earlier Heritage Division comments.

- A condition of consent should be included to the effect that works are not to commence until the EHMP has been revised to the satisfaction of the Heritage Council or its delegate.

If you have any further enquiries regarding this matter, please contact Gary Estcourt at the Heritage Division on (02) 9873 8562.

Yours sincerely



18/10/2013

Vincent Sicari
Conservation Manager
Heritage Division
Office of Environment & Heritage
Department of Premier and Cabinet
As Delegate of the Heritage Council of NSW



Mr Matthew Sprott
Planning Officer
Mining Projects
Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Dear Mr Sprott

**Continuation of Bengalla Mine Project (SSD 5170)
Environmental Impact Statement**

I refer to your email of 2 September 2013 regarding the Bengalla Mining Company Pty Ltd application for a major modification to the consent for the Bengalla Mine to extend the mine life by 20 years and too increase coal production to 15Mtpa.

NSW Trade & Investment, Regional Infrastructure & Services, Division of Resources & Energy (DRE) has reviewed the *Continuation of Bengalla Mine Environmental Impact Statement* (EIS) dated September 2013 and provides the following comments which are directed at specific areas of DRE responsibility for this proposal.

MINING TITLE

As coal is a prescribed mineral under the *Mining Act 1992*, the proponent is required to hold appropriate mining titles from DRE in order to mine this mineral.

DRE understands the proposed mining activities are within Mining Lease 1397, 1450, 1569 and 1592, held by the Proponent, and that a mining lease application over Assessment Lease 13 and Authorisation 438 and a mining lease application for purposes over part of Authorisation 102, held by the Crown, will be submitted to DRE. DRE also notes that a plan of the proposed mining lease application for purposes is not included in the EIS.

In addition, the proponent also proposed the part transfer of Mining Lease 1645 held by Coal & Allied, but this will require the consent of the existing title holder.

Under the *Mining Act 1992*, mining and rehabilitation are regulated by conditions included in the mining lease, including requirements for the submission of a Mining Operations Plan (MOP) prior to the commencement of operations, and subsequent Annual Environmental Management Reports (AEMR).

REHABILITATION AND MINE CLOSURE

The EIS identifies general rehabilitation strategies and objectives and describes the functional domains of this project. Specific performance objectives and standards of each domain have been described.

DRE requires final landform design to be consistent with the surrounding topography. DRE accepts the conceptual landform design outlined in the EIS. However, the Proponent should be aware that as part of the MOP, DRE will require further information on final landform design, with specific reference to topographic relief and drainage.

DRE considers the following issues require additional information or clarification

- There appears to be conflicting information provided within the EIS regarding the intent and recommendations for proposed storage of both Archerfield Sandstone interburden and Wynn Seam washery waste material, which are likely to be Potentially Acid Forming (PAF). The EIS refers to PAF material being covered by at least 5 metres of acid neutralising and inert fill (Volume 1) but also recommends that this material should be covered by inert overburden to a depth of at least 60 metres (Volume 4).

The proponent should provide clear advice on the proposed depth of burial and the adequacy of that depth of burial to manage PAF waste materials.

- There appears to be conflicting statements in the EIS as to the maximum final slope of the low wall – both 18 degrees and 21 degrees are nominated. Clarity on maximum final low wall grade should be provided. The proponent should be aware that DRE has a preference for maximum 18 degree unless prior approval/discussion with DRE.
- A minimum of 10% vegetated cover over rehabilitated areas is nominated in the EIS. DRE consider that this would be insufficient vegetative cover on sloping ground to achieve an acceptable degree of risk for the prevention of erosion and topsoil loss. DRE notes that the Bengalla Rehabilitation Management Plan (2013) nominates a minimum of 70% vegetative cover over 80% of rehabilitation areas.

RECOMMENDED CONDITIONS OF APPROVAL

DRE recommends that the following conditions be incorporated into the Development Consent, if granted:

Rehabilitation Objectives and Commitments

The Proponent must rehabilitate the site to the satisfaction of the Director General of Department of Trade & Investment, Regional Infrastructure & Services.

Rehabilitation must be substantially consistent with the Rehabilitation Objectives described in the EA, the Statement of Commitments in Section 8 and the following objectives in Table 1.

Rehabilitation Feature	Objective
Mine site (as a whole of the disturbed land and water)	Safe, stable and non-polluting, fit for the purpose of the intended post-mining land use(s).
Rehabilitation materials	Materials (including topsoils, substrates and seeds of the disturbed areas) are recovered, appropriately managed and used effectively as resources in the rehabilitation.
Landforms	Final landforms sustain the intended land use for the post-mining domain(s). Final landforms are consistent with and complement the topography of the surrounding region to minimise the visual prominence of the final landforms in the post mining landscape. Final landforms incorporate design relief patterns and principles consistent with natural drainage.
Water Quality	Water retained on site is fit for the intended land use(s) for the post-mining domain(s). Water discharged from site is consistent with the baseline ecological, hydrological and geomorphic conditions of the creeks prior to mining disturbance. Water management is consistent with the regional catchment management strategy.
Native flora and fauna habitat and corridors	Size, locations and species of native tree lots and corridors are established to sustain biodiversity habitats. Species are selected that re-establishes and complements regional and local biodiversity.
Post-mining agricultural pursuits	The land capability classification for the relevant nominated agricultural pursuit for each domain is established and self-sustaining within 5 years of land use establishment (first planting of vegetation.)

Progressive Rehabilitation

The proponent shall carry out all surface disturbing activities (eg pre-stripping in advance of mining operations) in a manner that, as far is reasonably practicable, minimises potential for dust emissions and shall carry out rehabilitation of disturbed areas progressively, as soon as reasonably practicable, to the satisfaction of the Director General of Department of Trade & Investment, Regional Infrastructure & Services.

Rehabilitation Plan

1. The Proponent must prepare and implement a Rehabilitation Plan to the satisfaction of the Director General of Department of Trade & Investment, Regional Infrastructure & Services.
2. Rehabilitation Plan must:
 - a. be submitted and approved by the Director General of Department of Trade & Investment, Regional Infrastructure & Services prior to carrying out any surface disturbing activities of the development, unless otherwise agreed by the Minister;
 - b. be prepared in accordance with DRE guidelines and in consultation with the Department, Office of Environment and Heritage, Environmental Protection Authority, Office of Water, Council and the mine Community Consultative Committee;
 - c. incorporate and be consistent with the rehabilitation objectives in the EA, the statement of commitments and Table 1;
 - d. integrate and build on, to the maximum extent practicable, the other management plans required under this approval; and,
 - e. address all aspects of mine closure and rehabilitation, including post mining land use domains, rehabilitation objectives, completion criteria and rehabilitation monitoring and management.

Note: The approved Mining Operation Plan (which will become the REMP once the Mining Act Amendments have commenced), required as a condition of the Mining Lease(s) issued in relation to this project, will satisfy the requirements of this condition for a Rehabilitation Plan.

It is the intention of DRE that the Rehabilitation Plan fulfil the requirements of the Mining Operation Plan (which will become the Rehabilitation and Environmental Management Plan (REMP) once the Mining Act Amendments have commenced).

DRE does not object to the approval of the proposed modification provided the above recommendations are taken into account and implemented.

DRE is available to meet with the Proponent to assist in developing the above documents for their proposed operation. Should you have any enquires regarding this matter please contact Julie Moloney, Principal Adviser, Industry Coordination on (02) 4931 6549.

Yours sincerely


ADRIAN DELANY
ACTING DIRECTOR
INDUSTRY COORDINATION

25.10.13



31 OCT 2013

OUT13/31862

Mr Matthew Sprott
Mining Projects
NSW Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Matthew.Sprott@planning.nsw.gov.au

Dear Mr Sprott,

**Bengalla Mine Continuation Project (SSD 5170)
Response to exhibition of Environmental Assessment**

I refer to your email dated 30 August 2013 requesting advice from the Department of Primary Industries (DPI) in respect to the above matter.

Comment by NSW Office of Water

The NSW Office of Water advises the following key issues, and at Attachment A detailed comments on the groundwater assessment, a summary of licences and approvals required under the *Water Management Act 2000* and the *Water Act 1912*, and recommended conditions should the application be approved.

- (i) The diversion of Dry Creek will result in the loss of inflow into the Hunter River and consequently a loss of recharge into the Hunter Alluvial aquifer down gradient from the project site. The loss of catchment area (ie. including Dry Creek) from mining will result in reduced flow which is equivalent to 0.5% flow volume at Denman. In the EIS, 'this is considered negligible'. However, the EIS statement needs to clarify that 'it is negligible' under average rainfall condition but may be a significant loss during drought or extreme drought. Contingent water supply arrangements should be investigated.
- (ii) The EIS indicates that the mining company hold sufficient water access licences to account for water taken from water sources affected by operations. Modification to Dry Creek will result in reduction of its yield by 923 ML/y (page 182, EIS main report). Diversion of the Dry Creek may also result in partial loss of alluvial aquifer and alluvial groundwaters of the Muswellbrook Water Source. These water requirements are not included in the Table 56 of the main report.
- (iii) The loss of surface and groundwater due to mining operation within the Dry Creek Catchment need to be accounted for by holding sufficient shares of unregulated category access licences and aquifer access licences from the

- Muswellbrook Water Source of the *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources*. The proponent is required to estimate the shares (volumes of water) that need to be held to account for water taken from each water source. The proponent will be required to undertake water access licence dealings under the *Water Management Act 2000* to satisfy these requirements.
- (iv) The proponent should undertake a high-level risk assessment in relation to potential risks to water resources, to satisfy the requirements of section 3.2 (3) of the NSW Aquifer Interference Policy.

For further information please contact Hemantha Desilva, Senior Water Regulation Officer (Newcastle office) on 4904 2525, or at: hemantha.desilva@water.nsw.gov.au.

Comment by Office of Agricultural Sustainability & Food Security

As per arrangements for mining applications that impact on agricultural land, the Office of Agricultural Sustainability & Food Security will respond direct to your Department.

For further information please contact Rob Williamson, Leader Regional Services (Orange office) on 6391 3166, or at: robert.williamson@dpi.nsw.gov.au.

Yours sincerely,



Tony Heffernan
A/Executive Director Business Services

Attachment A

Bengalla Mine Continuation Project (SSD 5170)
Response to exhibition of EIS
Additional comments by NSW Office of Water (NOW)

1. Potential Groundwater Related Environmental Impacts

1. The additional Overburden Emplacement Area (OEA) to the west of Dry Creek may be utilised for excess spoil material until it is intercepted by mining. The EIS states that there may be scope for co-disposal of coal rejects in some areas that drain towards the pit but only if hydrogeological studies by the groundwater consultant clearly demonstrates a low risk of seepage connectivity to alluvial soils. The geochemical study has sufficiently and satisfactorily addressed this matter raised in previous NOW assessment.
2. Discharge of saline water from the site will be managed through the Hunter River Salinity Trading Scheme (HRSTS). The mine water balance indicates that under median rainfall conditions, there is no need to discharge saline water. Under extremely wet conditions, there is a 10% probability that 350 ML up to a maximum 1000 ML by Year 8 (due to a large increase in catchment area collecting into the mine water management system) would need to be discharged through the HRSTS.
3. The NSW Aquifer Interference Policy (AIP) requires that the proponent state the 'ability to demonstrate that adequate arrangements will be in place to ensure that the minimal impact considerations can be met' (AIP, s3.2, p11). The EIS refers to the (existing) groundwater management plan 'to be updated to account for impacts of the project' and included a brief discussion of the groundwater monitoring program. However, the groundwater management plan is not supplied, as such a technical review of the plan has not been carried out.

An assessment of the proposal against the AIP is provided in the Tables below.

Table 1: Does the activity require detailed assessment under the AIP?

Consideration		Response
1	Is the activity defined as an aquifer interference activity?	If NO , then assessment is complete. No assessment is required under the AIP. If YES , continue to 2.
2	Is the activity a defined minimal impact aquifer interference activity according to section 3.3 of the AIP?	If YES , then no further assessment against this policy is required. Volumetric licensing still required for any water taken, unless exempt. See the implementation manual for a more detailed discussion. If NO , then continue on for a full assessment of the activity.

Table 2: Has the proponent:

AIP Requirement		Proponent response	NOW Comment
1	Described the water source (s) the activity will take water from?	EIS - Refer to pages xii, 79, 90, 172, 173, 185 Groundwater Impact Assessment (GIA) – page 35 - 63	Addressed
2	Predicted the total amount of water that will be taken from each connected groundwater or surface water source on an annual basis	EIS – page 90, 307	Addressed

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	AIP Requirement	Proponent response	NOW Comment
	as a result of the activity?		
3	Predicted the total amount of water that will be taken from each connected groundwater or surface water source after the closure of the activity?	EIS – page 90, 92, 178, 186	Addressed
4	Made these predictions in accordance with Section 3.2.3 of the AIP? (refer to Table 3, below)	EIS – page 93, 94	Addressed
5	Described how and in what proportions this take will be assigned to the affected aquifers and connected surface water sources?	EIS – page 90	Addressed
6	Described how any licence exemptions might apply?	EIS – page 90	Addressed
7	Described the characteristics of the water requirements?	EIS – page 91	Addressed
8	Determined if there are sufficient water entitlements and water allocations that are able to be obtained for the activity?	EIS – page 91	Addressed – Identified sufficient entitlement provided AWD remains greater than 50%
9	Considered the rules of the relevant water sharing plan and if it can meet these rules?	EIS – page 91	Addressed
10	Determined how it will obtain the required water?	EIS – page 91	Addressed
11	Considered the effect that activation of existing entitlement may have on future available water determinations?	EIS – page 92	Addressed
12	Considered actions required both during and post-closure to minimize the risk of inflows to a mine void as a result of flooding?	EIS – page 92, 183, 281	Indicated that all mining activity shall be higher than the 1:100 ARI
13	Developed a strategy to account for any water taken beyond the life of the operation of the project?	EIS – page 92	Addressed
	<i>Will uncertainty in the predicted inflows have a significant impact on the environment or other authorized water users?</i> <i>Items 14-16 must be addressed if so.</i>	EIS – page 92 GIA – Section 11	Addressed
14	Considered any potential for causing or enhancing hydraulic connections, and quantified the risk?	EIS – page 92	Addressed
15	Quantified any other uncertainties in the groundwater or surface water impact modelling conducted for the activity?	EIS – page 92, 185-186 GIA – Section 12	Addressed
16	Considered strategies for monitoring actual and reassessing any predicted take of water	EIS – page 92, 94, 192 GIA – page 124	The EIS and GIA refers to an existing Groundwater Management Plan that is to

AIP Requirement	Proponent response	NOW Comment
throughout the life of the project, and how these requirements will be accounted for?		be updated to account for the impacts of the project. A very brief overview of what the plan involves is provided, however, it is not supplied and available for review.

Table 3: Determining water predictions in accordance with Section 3.2.3

(complete one row only – consider both during and following completion of activity)

AIP Requirement	Proponent response	NOW Comment
1 For the <i>Gateway</i> process: Is the estimate based on a simple modelling platform, using suitable baseline data, that is fit-for-purpose?	EIS – page 86	N/A
2 For <i>SSD</i> or <i>mining</i> or <i>CSG production</i> , is the estimate based on a complex modelling platform that is: • Calibrated against suitable baseline data, and in the case of a <i>reliable water source</i>, over at least two years? • Consistent with the Australian Modelling Guidelines? • Independently reviewed, robust and reliable, and deemed fit-for-purpose?	EIS – page 188 GIA – numerous places	Addressed
3 In all other processes, estimated based on a desk-top analysis that is: • Developed using the available baseline data that has been collected at an appropriate frequency and scale; and • Fit-for-purpose?		N/A

Other requirements to be reported on under Section 3.2.3**Table 4: Has the proponent provided details on:**

AIP Requirement	Proponent response	NOW Comment
1 Establishment of baseline groundwater conditions?	EIS – page 94 GIA - throughout	Addressed
2 A strategy for complying with any water access rules?	EIS – page 94 GIA throughout	Addressed
3 Potential water level, quality or pressure drawdown impacts on nearby basic landholder rights water users?	EIS – page 94 GIA page 105	Addressed
4 Potential water level, quality or pressure drawdown impacts on nearby licensed water users in	EIS – page 94 GIA page 105	Addressed

	connected groundwater and surface water sources?		
5	Potential water level, quality or pressure drawdown impacts on groundwater dependent ecosystems?	EIS – page 94	The proponent states in numerous instances that impact on stygofauna and other GDEs will be low.
6	Potential for increased saline or contaminated water inflows to aquifers and highly connected river systems?	EIS – page 94 GIA page 123	Addressed
7	Potential to cause or enhance hydraulic connection between aquifers?		Not explicitly addressed, but is low risk
8	Potential for river bank instability, or high wall instability or failure to occur?	EIS – page 94	Addressed in EIS and GIA
9	Details of the method for disposing of extracted activities (for CSG activities)?		Not applicable

Addressing the minimal impact considerations

Section 3.2.1 of the AIP describes how aquifer impact assessment should be undertaken.

Table 5: Minimal impact considerations

Aquifer	Alluvial aquifer – Hunter River Alluvium		
Category	Highly Productive		
Level 1 Minimal Impact Consideration		Assessment	
<u>Water Table</u> Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic “post-water sharing plan” variations, 40 m from any: (a) high priority groundwater dependent ecosystem; or (b) high priority culturally significant site; listed in the schedule of the relevant water sharing plan. OR A maximum of a 2 m water table decline cumulatively at any water supply work.		Level 1 - Acceptable EIS – page 94, 191, 192 GIA – page 105, 107 Note: Drawdown contours have not been given for the alluvial aquifer, however the conclusion is supported by the drawdown contours provided in the underlying and adjacent Permian coal measures and interburden.	
<u>Water pressure</u> A cumulative pressure head decline of not more than 40% of the “post-water sharing plan” pressure head above the base of the water source to a maximum of a 2m decline, at any water supply work.		Level 1 - Acceptable EIS – page 93, 191 GIA – page 91-96, 106	
<u>Water quality</u> Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 m from the activity. No increase of more than 1% per activity in long-term average salinity in a highly connected surface water source at the nearest point to the activity. No mining activity to be below the natural ground surface within 200m laterally from the top of high bank or 100m vertically beneath (or the three dimensional extent of the alluvial water source - whichever is the lesser distance) of a highly connected		Level 1 - Acceptable EIS – page 93, 191, 192 GIA – page 112, 113	

NSW Office of Water internal memo

surface water source that is defined as a "reliable water supply". Not more than 10% cumulatively of the three dimensional extent of the alluvial material in this water source to be excavated by mining activities beyond 200m laterally from the top of high bank and 100m vertically beneath a highly connected surface water source that is defined as a "reliable water supply".	
Aquifer	Porous rock or fractured rock – Permian coal measures and interburden
Category	Less productive
Level 1 Minimal Impact Consideration	
<u>Water Table</u> Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic "post-water sharing plan" variations, 40 m from any: (a) high priority groundwater dependent ecosystem; or (b) high priority culturally significant site; listed in the schedule of the relevant water sharing plan. OR A maximum of a 2 m water table decline cumulatively at any water supply work.	Assessment Level 1 - Acceptable EIS – page 93, 185, 188 GIA – page 105, 123
<u>Water pressure</u> A cumulative pressure head decline of not more than a 2m decline, at any water supply work.	Level 1 - Acceptable GIA – page 105, 123
<u>Water quality</u> Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40m from the activity.	Level 1 - Acceptable GIA – page 105, 123

Table 6: Has the proponent:

AIP Requirement		Proponent response	NOW Comment
1	Considered types, scale, and likelihood of unforeseen impacts <i>during operation</i> ?	EIS – page 93	Document referred to Groundwater Management Plan to be updated to account for the impacts of the project but the plan is not supplied and available for review
2	Considered types, scale, and likelihood of unforeseen impacts <i>post closure</i> ?	EIS – page 93	
3	Proposed mitigation, prevention or avoidance strategies for each of these potential impacts?	EIS – page 93	
4	Proposed remedial actions should the risk minimization strategies fail?	EIS – page 93	
5	Considered what further mitigation, prevention, avoidance or remedial actions might be required?	EIS – page 93	
6	Considered what conditions might be appropriate?		Can't make a comment on remedial actions because the groundwater management plan was not supplied.

Other considerations

These considerations are not included in the assessment framework outlined within the AIP, however are discussed elsewhere in the document and are useful considerations when assessing a proposal.

Table 7: Has the proponent:

AIP Requirement		Proponent response	NOW Comment
1	Addressed how it will measure and monitor volumetric take?	EIS – page 92	Document referred to groundwater monitoring to measure water take, however, it did not include method of measurement of inflows and mine water discharge or other methods of measuring water take such as water accounting, on-going mine water balance calculation or numerical modelling; and any record keeping of actual pumping rates.
2	Outlined a reporting framework for volumetric take?		No

2. Licence requirements

Water Act 1912

- All groundwater sources within the hardrock geological formations in the area are currently managed under the *Water Act 1912*.
- No exemptions for licences under the *Water Act 1912* apply as a result of approval under the *Environmental Planning and Assessment Act 1979*.
- Licences required for all bores under Part 5 (S112) of the *Water Act 1912* (definition of a bore is provided under s105).
- Monitoring bores may require licensing under Part 5 of the *Water Act 1912* unless the bores meet the criteria for exempt monitoring bores as defined in the *Water Management (General) Regulation 2011*.
- Flood control works will require licensing under Part 8 of the *Water Act 1912*.

Application forms for licences and approvals are available on the Office of Water website at: www.water.nsw.gov.au.

Water Management Act 2000 (WMA)

- Water Access Licences are required to take water from any water source managed under the WMA.
- Exemptions for access licences are provided in Clause 18 and the Schedule 5 of the *Water Management (General) Regulation 2011*.
- Section 54 of the WMA provides details on harvestable rights.
- Requirements for access licence dealings are provided in the following documents:
 - Section 71 of WMA
 - Access Licence Dealing Principles. Refer: www.legislation.nsw.gov.au/maintop/view/inforce/subordleg+433+2004+cd+0+N
 - Part 12 of the Water Sharing Plan www.legislation.nsw.gov.au/maintop/view/inforce/subordleg+347+2009+cd+0+N

Application forms for access licence and access licence dealings are available on the Office of Water website at: www.water.nsw.gov.au.

3. Recommended Conditions of Approval

1. The proponent is required to estimate the shares (volumes of water) need to be held to account for water taken from each water source. (Values of shares of water access licences will change due to changes in available water determination for the water source.)
2. The proponent must develop a contingency plan for drought conditions to address reduced flow into the Hunter River as a result of mining. This could be include scheduled mine water discharge (of reasonable quality) or redirecting runoff discharge directly into the Hunter River to provide recharge and maintain a healthy river environment. If mine water discharge is an option to be taken by the mine, then the mine water salinity levels will need to be reviewed and approved by OEH in consultation with NOW.
3. The proponent must consider alternate option for saline water management including an the transfer of water to other mines requiring additional water. Water transfer between mines will need to be accounted for in the mine water balance and reported in the annual environmental management report (AEMR).
4. The proponent must revise the groundwater management plan to include arrangements to give consideration to the minimal impacts criteria of the AIP, and to ensure they are being met as forecast in the EIS. This is to include a validation of the groundwater model using the latest monitoring results as part of AEMR. The groundwater management plan should include trigger levels, contingency measures and reporting of incidents when adverse impacts are detected. This should be supplied to NOW for review against the requirements of the AIP.

End Attachment A

Enquiries
Please ask for Steve McDonald
Direct 02 6549 3700
Our references
Your reference

28 October 2013

**Mining Projects
NSW Planning & infrastructure
GPO Box 39
SYDNEY NSW 2001**

Attention: Mr Mike Young

By email: mike.young@planning.nsw.gov.au

Dear Mr Young,

Re: Bengalla Coal Project

Please find enclosed Council's submission with respect to the Bengalla Coal Project.

I thank NSW Planning and Infrastructure for providing Muswellbrook Shire Council the opportunity to comment on this project and for granting an extension of time until today to lodge the submission.

Yours faithfully,



Steve McDonald
General Manager

Bengalla Coal Mine

[Application pursuant to Part 4 of the
Environmental Planning and Assessment Act 1979]

COUNCIL SUBMISSION



**muswellbrook
shire council**

The Application

1. By Application dated 17 December 2012 (the **Application**), Bengalla Mining Company Pty Limited (the **Proponent**) seeks, pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (the **Act**), a new development, approval having the effect of continuing the Bengalla Open-Cut Coal Mine (the **Project**).

Submissions in summary form

2. Council does not support the Application and notes that:
 - (a) The Project, taken individually and in aggregation with other proposals requiring road closures and road realignments will have a substantial impact on traffic efficiency in the local government area;
 - (b) The Project falls well short of 'best practice' insofar as final landform and rehabilitation is concerned. The Project fails to provide adequate micro relief of its overburden emplacement and proposes a deep final landform void;
 - (c) The Project would have an unacceptable impact on the provision of community services; and
 - (d) The Project would contribute to particulate matter in the Upper Hunter air shed in circumstances where the air shed is at capacity insofar as the National guideline is concerned. The Project makes no sufficient attempt to manage dust with best practice techniques.

For all the above reasons, Council submits that the Application should be refused.

Local roads

Background

3. In 1997, Council adopted a mining-related road strategy for the Shire known as the Western Roads Strategy. The document was developed in response to increasing requests from the coal industry for substantial road closures and realignments. The document was developed to strategically coordinate the orderly reconfiguration of the Shire's rural road network to meet the traffic efficiency and safety needs of all road users including the coal industry – which was located then, as now, substantially west of the New England Highway. The document was funded by those industry participants seeking network closures or realignments at the time.
4. It is important to note that each of the coal mining developments in the Shire is accessed by a local road. These roads include: Thomas Mitchell Drive, Bengalla Link Road, Wybong Road, Coal Road, and Muscle Creek Road. Some of these roads were purpose built¹ and others evolved from former rural roads².
5. In addition, there is increasing coal related traffic on local roads not used for primary access to coal mines. Edderton Road, which links coal mining developments in the

¹ Bengalla Link Road and parts of Thomas Mitchell Drive, Coal Road (and Muswellbrook Coal Road).

² Wybong Road, Thomas Mitchell Drive, Muscle Creek Road.

Shire with the Golden Highway and the Mount Thorley Industrial Estate, is one such road. The Bell and Market street over-dimensioned vehicle bypass of the National highway is another.

Road closures

6. While the Application refers to the "realignment" of Bengalla Link Road, the Proponent does not, in fact, propose a realignment at all (a process which realigns the road with its road reserve) but rather a road closure and the gazettal of a new road. The distinction is important because while an application under section 138 of the *Roads Act* 1993 (the **Roads Act**) must be applied consistently with any planning approval pursuant to planning law, an Application under Part 4 of the Roads Act, for a road closure, does not. It is the subject of a separate consultative and statutory process. The Minister or the Planning Assessment Commission does not have power to prejudge an Application the Parliament intended as the subject of a separate administrative process.
7. Council notes that it will be the consent authority for any road closure and accordingly, does not propose to comment on the merit or otherwise of the proposal to close a section of Bengalla Link Road. Council notes, however, that any approval by the Minister or the Planning Assessment Commission must:
 - (a) Have a pre-condition that the Road Act application for road closure be approved in substantially the same terms as any planning approval; and
 - (b) Must not seek to prejudge that separate statutory exercise.
8. Council notes that it has indicated to the Proponent that Council is unlikely to consider a Road Act application for the closure of a road until a mine affected road network study for the Shire is completed so that the cumulative effect of mine related closures can be understood. The study is unlikely to be concluded before April 2014. Council anticipates that the study will not support the realignment of the Bengalla Link Road but, rather, the construction of a new road crossing east of the Bengalla overburden emplacement.

Community services

9. Council notes that in Hunter Valley Energy Coal's (**HVEC**) application for expansion of the Mt Arthur coal mine, it noted³ that:

The potential cumulative impacts on the local region are likely to include:

[(a)] likely significant strains on health services, in particular hospitals;

[(b)] contribution to strains on the existing childcare services; and

[(c)] potential pressures on existing primary education services.

10. HVEC was right to make those concessions concerning health services. In the intervening period, the Hunter New England Local Health District (**HNELHD**) has confirmed that poor population health presentation statistics at Muswellbrook Hospital are partly because of grossly inadequate health service availability in the Muswellbrook area. Those poor population health statistics include:

³ See p. 12.55 of the EA for the proposed modification.

- (a) In "the period 2007 to 2009, 0-35 year-old people resident in the Muswellbrook postcode had higher rates of emergency department presentations for both asthma and overall respiratory illness than the remainder of the [HNELHD] and Sydney"⁴;
- (b) "For rates of asthma presentations, residents in the Muswellbrook postcode ranked highest among people aged less than 35 years of age"⁵;
- (c) "Muswellbrook area has high rates for emergency department presentation for asthma"⁶;
- (d) "Singleton and Muswellbrook local government areas have higher rates of cardiovascular disease hospital separations than all of the [HNELHD] or NSW"⁷.

Additionally, Muswellbrook has the highest preventable mortality rate in the Hunter and the emergency department at the hospital has been described by HNELHD as "grossly undersized". It is understood the floor area of the existing emergency department, for example, is 1/20th of the appropriate clinical standard.

11. At the time of the Mt Arthur approval, the Department of Planning accepted the impact but noted that royalty payments would be made to the State Government which was responsible for improving health services and health infrastructure in Muswellbrook and it was satisfied funds would flow as they were required. With respect, that finding was a convenient falsehood. The Department of Planning either knew or ought to have known that at the time the Department of Health had nothing in its budget, neither in its forward estimates, nor in its ten year planning to do anything to improve either health services or health infrastructure at Muswellbrook in any significant way.
12. Council submits that the health services strain will, in addition, be on general medical practitioner services, midwifery and other allied health services including ambulance services.
13. Council submits that the Project will have a deleterious effect on human health and should be refused. Council submits that assessed impacts on human health should not be "bundled up" with other considerations in a balancing exercise undertaken to assess public interest.
14. Council submits that HVEC's was also right to make concessions with respect to its assessed impact on childcare and early and primary education services. Council notes that it holds an independent Shire-wide children services study which confirms that assessment. Council subsidises childcare services, particularly costly out-of-hours day care services, in the Shire and the Project will place an unacceptable burden on Council and its community.

⁴ See p. 11, *Respiratory and cardiovascular diseases and cancer among residents in the Hunter New England Area Health Service*, NSW Health.

⁵ *Op Cit*, p.12.

⁶ *Op Cit*, p.11.

⁷ *Op Cit*, p.19.

Final landform

15. The Project includes a conceptual final landform that includes expansive planar slopes and a distinct lack of micro relief and natural appearance. This is particularly evident from the township of Muswellbrook. The landscape plan falls well short of best practice being deployed at neighbouring mines.
16. Council's mining rehabilitation policy encourages research into best practice rehabilitation techniques particularly in this field of emplacement geomorphology to attain stable and natural looking landforms.
17. Since developing the policy, a number of mining operations have employed software such as GeoFluv and others to develop much more natural looking plans. Such sophisticated landscape design and modelling should be employed by the proponent for final landform development so that mining rehabilitation strategies and management plans may be better informed and developed.
18. The eastern Overburden Emplacement Area (OEA) has been a concern to visual amenity since the mine was proposed in the early 1990s. Significant progress has been made over time since the mine has been approved, however it continues to be a large planar slope landscape feature that looms large on the view scapes from many parts of Muswellbrook.
19. The proposal on public exhibition is silent on the alleviation of the visual impact of the final landform from prominent vantage points. Council has a long held policy that rehabilitated landforms should look natural.
20. The proponent has provided Council with alternative landscape designs that may offer some relief, however these have not been placed on public exhibition.
21. Council is firmly of the view that it is a critical component of the social licence to operate that the community has confidence in the final landscape design put forward.
22. The final land form should include some additional visual relief that may have affect to any residence or vantage point to the east of the Hunter River or north or south of the operation. If necessary, the height of the emplacement should be increased but only for the purpose of providing a more natural final landform.

Final voids

23. The final landform includes a final landform void. No effort has been made to create a more natural looking void landscape. The Conceptual final landform appears as if there is no doubt that further mining approvals would be sought and granted.
24. Council submits that an achievable final landscape be provided for the case that no further mining is permitted following the end of this current proposed timeframe.
25. Council requests that in addition to the indicative detailed cross sections of the proposed void, indication of the depth of contained water, grade of all slopes approaching water body, catchment area, vegetation within the catchment area, areas of exclusion of stock, vehicles and pedestrians should also be provided.
26. Council submits that the proposed final landform voids represent a substantial and permanent environmental detriment and that the Project makes no sensible attempt

to minimise its use of voids and that it is legitimate to refuse development consent, in conjunction with other principles of public interest, for that reason.

Revegetation

27. Council submits that the landscape rehabilitation should be determined from the integration of potential land uses considering the proximity to road access, utilities, water supply, surrounding land uses, slope, aspect, outlook or visibility and elevation. The analysis of these factors should result in a series of sub-domains that meet the strategic objectives set out in Council's Land Use Development Strategy.
28. It is proposed that following the completion of rehabilitation, when the completion criteria is met, that the land be rezoned to appropriate land use zones in the Muswellbrook Local Environment Plan.
29. Any land that may be proposed for RU1 should be characterised by:
 - (a) having access to roads, water and utilities and the final land form must be of a suitable geomorphology to allow for functional association with adjacent high quality agricultural land; and
 - (b) infrastructure or utilities necessary to give effect to the land uses contemplated by the plan.
32. All land rehabilitation plantings should provide for biodiversity connectivity – that is no more than 3km spacing between minimum patches sizes of 10 hectares and interstitial tree plantings at 60-80m spacing (3-4 trees per hectare).
33. The planar slopes of the overburden emplacement facing the township of Muswellbrook should have a full coverage of high density tree plantings.
34. Council does not support the reconstruction of Dry Creek and notes that experience has shown the inability to reconstruct waterways to an appropriate standard.

Air quality

35. The National Environment Protection Measures, of no more than 50 micrograms per cubic metre of 10 micron particulate matter averaged over a 24 hour period (and having a target goal of no more than 5 breaches of that standard over a 12 month period) has already been exceeded in the Muswellbrook township and grossly exceeded in the Singleton township. The putative standard for the potentially more harmful 2.5 micron material has been exceeded substantially more in the Muswellbrook township.
36. The standard sets a limit beyond which experts agree that human population health is intolerably compromised.
37. The proposed development will contribute additional dust to the Upper Hunter air shed in circumstances where human health has already been intolerably compromised. The Proponent's air quality methodology avoids assessing the cumulative impact of its emissions on the tolerance threshold created by the standard in circumstances where the air shed has cumulatively exceeded the threshold. Council submits that the development will have an intolerable impact on human health and development approval should be refused.

38. Further, and in the alternative, Council submits that the Proponent's application falls well short of best practice dust management.
39. Further, Council notes that 12:00pm to 12:00am dust readings have typically been higher than daytime readings. A mix of different operational methods during the night together with air inversion compressions is likely to be contributing factors.
40. Council notes that the night mining close to townships is a challenging environment but notes that routine high levels of dust emission during the night offset by lower day emissions (so as to approach but not exceed the daily average) is not best practice.
41. Council notes that a condition requiring a maximum standard for night dust emissions be imposed.

Heritage

42. Council notes that a number of items of significant European heritage including Bengalla Homestead will have been inaccessible for a substantial period of time if the application is approved. Council submits that a detailed management and access plan for these items be drafted to the satisfaction of Council as part of any conditional approval.

Planning and regulatory capacity

43. While not being the consent authority, legislative change has repealed Part 3A, Council makes, on behalf of its community, comprehensive submissions as part of the approval process for all major developments – including recommending specific conditions of consent. Council's submission is invited by reason of statute and as consent authority for various attendant matters relating to the development.
44. The process is exhaustive of staff time. Council is not appropriately resourced to conduct the important task of evaluating complex and lengthy applications – particularly in the absence of cumulative data. Council receives no application fee to offset the cost of the assessment of mining applications and the direct cost of that process is therefore directly borne by the community.

15 October 2013

Matthew Sprott
Planning Officer – Mining Projects
NSW Department of Planning & Infrastructure
GPO Box 39
SYDNEY NSW 2001

Dear Mr Sprott,

CONTINUATION OF BENGALLA MINE PROJECT (SSD-5170)

I refer to the Environmental Impact Statement (EIS) exhibited on the NSW Department of Planning & Infrastructure web site in relation to the Continuation of Bengalla Mine Project.

The project is a continuation to the Approved development DA 211/93 and includes increasing the run-of-mine (ROM) coal extraction for 24 years from 10.7Mtpa to a maximum of 15Mtpa, relocating a section of Bengalla Link Road at approximately year 15, relocation of Dry Creek via dams and pipework through rehabilitation areas, minor modification to the coal handling and processing infrastructure and stockpiles and construction of an out of mining over burden emplacement area to the west of dry creek for excess spoil materials. The mine is located approximately four kilometres west of Muswellbrook.

Hunter New England Population Health has reviewed the EIS report paying particular attention to the management of air quality, noise, water and issues which may have an impact on public health. The following points are discussed and should be considered in the approval process for this project:

Noise and Blasting

The EIS notes activities associated with construction, operation and maintenance of the project will be carried out up to 24 hours a day, seven days a week. Blasting will primarily be limited between the hours 7:00 am and 5:00 pm, six days a week Monday to Saturday with restricted blasting on Sundays between 10:00am and 3:00pm when blasting is located within 500m of the infrastructure area.

It is noted that there are a number of privately owned residences that will be negatively affected by noise if the continuation of the Bengalla Mine Project is approved.

Hunter New England Local Health District
ABN 63 598 010 203

Hunter New England Population Health
Locked Bag 10
Wallsend NSW 2287
Phone (02) 4924 6477 Fax (02) 4924 6490
Email PHEnquiries@hnehealth.nsw.gov.au
www.hnehealth.nsw.gov.au/hnep

The EIS states that there are residences that will potentially be affected by noise and blasting which are currently owned by Bengalla Mine or other nearby mines. There are also a number of privately owned residential properties which are subject to acquisition by another mining company. It is unclear from the EIS whether these properties receive noise mitigation measures to protect current or future tenants.

It is recommended that the proponent clearly demonstrate that the community residing within the noise impacted area have been fully consulted and that the predicted noise levels and proposed mitigation measures are acceptable to them. A complaints mechanism for residents should be available and incorporated into the proposed noise monitoring program which enables both rapid assessment and corrective measures (if required) to be implemented.

Air Quality

The EIS predicts a deterioration in air quality across a wide area adjacent to the mine that will impact upon neighbours of the mine - including over 100 private properties. A total of 16 private receptors are predicted to experience exceedances of the maximum 24 hour average PM₁₀ criterion of 50 µg/m³ during the project life. The EIS proposes acquisition of properties subject to high PM₁₀ levels to address these exceedances. Acquisition of properties to achieve air quality goals is disruptive of the psychosocial fabric of the community and should be avoided where possible. If additional dust control measures are available and have not been included in the dispersion model, it is recommended that they are included before acquisition of properties is considered. Many mine owned properties will be greatly impacted by the proposal. It is unclear what impact this will have on human habitation and the viability of small residential clusters in the vicinity of the mine. Residents of mine-owned properties should be fully informed of the health risks of residing in houses where levels of particulates are above assessment criteria.

The emission factors underlying the PM10 modelling assume an emission factor of 85% for control of dust due to hauling on unsealed roads. We acknowledge this may be theoretically achievable but it exceeds current practice as described in the referenced Katestone report. Hence we recommend that a sensitivity analysis should be performed using a realistic range of inputs, e.g. 65-80%, to provide a plausible estimate of the development's potential impact.

We note the EIS assumes existing air quality criterion will be acceptable out to 24 years from the commencement of the project. Given that air quality criteria are likely to be revised downward within that time it would be reasonable to assume a more conservative air quality goal will be applied two decades hence.

Rainwater Tanks

The EIS does not provide comment on issues associated with drinking water, specifically for residents without a reticulated water supply and reliant on rain water tanks. A detailed analysis of issues associated with water quality from rainwater tanks at residences is recommended.

Hunter New England Population Health strongly supports the inclusion of measures to address impacts to drinking water quality from rainwater tanks. The installation of first flush systems for private rainwater tanks and implementing a tank cleaning program for properties affected by air quality impacts of the project are suggested strategies. The peak

reference document in Australia for information in relation to rainwater tanks is enHealth's *Guidance on use of rainwater tanks*, accessible at:

[http://www.health.gov.au/internet/main/publishing.nsf/Content/DD676FA1241CDD0DCA25787000076BCD/\\$File/enhealth-raintank.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/DD676FA1241CDD0DCA25787000076BCD/$File/enhealth-raintank.pdf)

It would be appropriate to utilise the above document and apply its recommendations and standards to rainwater tank systems within the vicinity of the mine in a proactive manner. A management system of taking complaints and rectifying issues identified should also be considered.

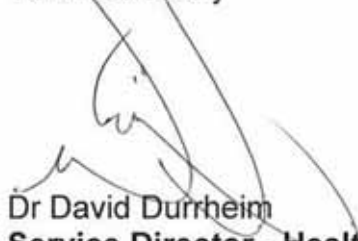
Social Impacts

The EIS considers a range of project specific and cumulative social impacts of mining in the area, including on demand for housing, education and health services, and to community identity and wellbeing. It is recommended that the proponent continue to monitor social impacts over time and make adjustments as necessary.

We note that while there is extensive description of the community and stakeholder engagement processes undertaken there is no information provided in the stakeholder engagement section of the EIS on the level of community satisfaction or dissatisfaction with the project.

If you require additional information, please contact Ms Cindy Gliddon, Environmental Health Officer, on 02 4924 6468.

Yours sincerely



Dr David Durrheim
Service Director - Health Protection
Hunter New England Population Health



25 October 2013

SF2012/004164/1
CR2013/006515
MD

Director, Mining & Industry Projects
Department of Planning & Infrastructure
GPO Box 39
SYDNEY NSW 2001

Attention: Mr Matthew Sprott

**DENMAN ROAD (MR209) & OTHER CLASSIFIED ROADS: EXHIBITION OF ENVIRONMENTAL
IMPACT STATEMENT (SSD 5170), BENGALLA**

Dear Mr Sprott,

I refer to a letter to Roads and Maritime Services dated 2 September 2013 from Hansen Bailey advising of the public exhibition of the Environmental Impact Statement (EIS) for the subject project. I apologise for the delay in responding.

Roads and Maritime Responsibilities

Transport for NSW and Roads and Maritime's primary interests are in the road network, traffic and broader transport issues. In particular, the efficiency and safety of the classified road network, the security of property assets and the integration of land use and transport.

In accordance with the *Roads Act 1993*, Roads and Maritime has powers in relation to road works, traffic control facilities, connections to roads and other works on the classified road network. Bengalla Link Road and Thomas Mitchell Drive are local roads. Denman Road (MR209), the New England Highway (HW9) and the Golden Highway (HW27) are classified (State) roads. Roads and Maritime concurrence is required for connections to these roads with Council consent, under Section 138 of the Act. The New England Highway is also part of the National Land Transport Network. Council is the roads authority for these roads and all other public roads in the area. Should road works be required on the classified (State) roads, Roads and Maritime would exercise the functions of roads authority under Sections 64 and 71 of the Act.

Roads and Maritime Response and Requirements

Roads and Maritime has reviewed the information provided, including the Traffic and Transport Impact Assessment (TTIA) prepared by DC Traffic Engineering Pty Ltd dated 10 July 2013. There many inconsistencies and errors in the TTIA (too many to detail). However, the overall requirements for intersection improvements on the State road network, to accommodate the additional workforce traffic, are accepted.

Roads & Maritime Services

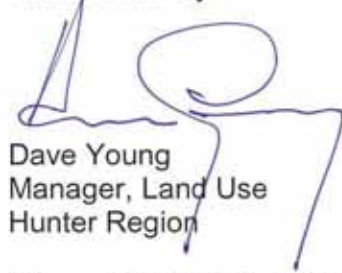
The intersection of Denman Road and Thomas Mitchell Drive is required to be upgraded to a seagull arrangement by BHP Billiton under Mt Arthur Coal Mine – Open Cut Consolidation Project Approval 09_0062 (Schedule 3, Condition 47) by the end of December 2019. Until this time, queuing and delays at the intersection are likely to worsen due to the subject proposal and the cumulative impacts of other existing and proposed mining activities in the area. The Department should consider requesting a contribution towards the cost of the intersection works by the proponent (Bengalla) and have the works brought forward. Bringing forward these works would significantly improve the performance and enhance road safety and the efficiency of the intersection for all users.

On the Minister's determination of this matter, it would be appreciated if a copy of the Project Approval is forwarded to RMS for record and / or action purposes.

Muswellbrook Shire Council should also be consulted regarding the adequacy of the TTIA.

Please contact me on 4924 0688 if you require further advice.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Dave Young', is written over the typed name and title.

Dave Young
Manager, Land Use
Hunter Region

Cc General Manager
Muswellbrook Shire Council

Ms Dorna Darab
Transport for NSW