

SPECIAL INTEREST GROUPS



RECEIVED
16 OCT 2013
Director-General

11th October, 2013

The Director-General
NSW Department Planning & Infrastructure
GPO Box 39,
Sydney, NSW 2001.

Dear Sir,

RE- BENGALLA CONTINUATION PROJECT

The Bengalla Mine, with its 358 workers, is a major contributor to the economy of Muswellbrook. The Bengalla Continuation Project presents an opportunity for that contribution to continue beyond 2017 and the Muswellbrook Chamber of Commerce & Industry supports the proposal.

Based on the data presented in the Hanson Bailey Environmental Assessment as well as our own experience over the last 21 years, the Chamber identifies the following facts and understandings as the basis for our support –

- Utilisation of the existing workforce for mining operations and growth to a total of 1822 direct and indirect jobs in the local economy.
- Utilisation of existing infrastructure and equipment fleet.
- Minimal disruption of agricultural activities in the area with economic gains from the project far outweighing the loss of some agricultural production. However, any loss of agricultural production should be addressed by the proponent and consent authorities and should be kept to an absolute minimum.
- Creation of approximately 4868 direct and indirect jobs in NSW.
- The reliance of many Muswellbrook businesses on the existing Bengalla Mine with its high demand for engineering supplies and support services as well as the flow on effects in the retail, professional and service sectors.
- The absence of significant negative impacts on the environment, subject to the determinations of the relevant agencies and consent authorities.
- The continuation and growth of royalties to the NSW Government.
- Continuation of an existing operation imposes less demand on public infrastructure when compared to a 'green field' project. However, Chamber relies on Muswellbrook Shire Council to determine a realistic contribution to local infrastructure under a Voluntary Planning Agreement with Bengalla. Chamber also trusts that Federal and State Infrastructure needs will be addressed by those authorities and that appropriate provision is made in their future budgets.

On behalf of the Muswellbrook business community, the Muswellbrook Chamber of Commerce and Industry 'supports and encourages business enterprise in Muswellbrook and its districts'. Our support for this project is consistent with our Charter and recognises our reliance on the coal mining industry, particularly in our local area. Bengalla Mine is an important and respected member of the Muswellbrook business community and enjoys the Chambers support.

The Muswellbrook Chamber of Commerce & Industry would welcome the opportunity to answer any questions or expand on this submission if required.

Yours Sincerely,

M.J Kelly
President MCCI



Mining and **Energy** Division

Review of Environmental Assessment

Bengalla Continuation Project

SSD-5170

Submission

Construction Forestry Mining and Energy Union

(Mining and Energy Division)

Northern District Branch

October 2013

On 17 December 2012 Bengalla Mining Company Pty Limited applied to the Minister, Department of Planning seeking approval for the continuation of Bengalla Mine. The proponent is seeking a new Development Consent under Division 4.1 of the Environmental Planning and Assessment Act 1979 to enable mining to continue for an additional 24 years at a maximum production rate.

The Director General made the Environmental Assessment publicly available on the 4 September 2013 at the DP & I Information Centre Sydney, Muswellbrook Shire Council and Nature Conservation Council.

The Union is pleased to take the opportunity to comment on the Bengalla Continuation Project and related activities Environmental Assessment.

The Mining and Energy Division is a Division of the CFMEU under the Federal Workplace Relations Act 1996, with over 120,000 members, one of the largest in Australia. The Division covers several industries including the coal industry, coal ports, metalliferous mining industries, electrical power generation, oil and gas and the Nation's small coking industry.

The Northern Mining & NSW Energy District Branch of the CFMEU Mining and Energy Division, being the branch that on behalf of the organisation which is making the submission is the principal Union representing coal miners in the Northern District coalfields of New South Wales. The Bengalla Coal Mine operation is located approximately four kilometres east of the township of Muswellbrook and is wholly within the State's Northern District coalfields.

The Union is familiar with the Bengalla coal facility site and has engaged the services of an Environmental Consultant with extensive experience in local government and environmental assessments on coal mining related projects.

After reviewing all the material and taking advice, the Union supports the Bengalla Continuation Project as proposed.

Project Overview

Bengalla Mining Company is seeking Development Consent to facilitate the continuation of open cut mining for 24 years largely within current mining authorities and within the Project Boundary to facilitate:

- Open cut mining towards the west at a rate of up to 15 Mtpa to a total of 316 Mtpa of ROM coal;
- Continued use of the existing dragline, truck fleet and excavator fleet with progressive replacement or substitution with equivalent equipment;
- An out of mining area Overburden Emplacement Area to the west of Dry Creek which may be utilised for excess spoil material until it is intercepted by mining;
- Continued use, extension or relocation of existing infrastructure, including administration and parking facilities, in-mining area facilities, helipad, tyre laydown area, explosives and reload storage facility, core shed workshop, roads, reject bin, ROM Hopper, stockpiles, conveyors, water management infrastructure, supporting power infrastructure, rail and rail loading infrastructure and ancillary infrastructure;
- Construction and use of various items of new infrastructure and construction of the Mount Pleasant Staged Discharge Dam;
- Processing, handling and transportation of coal via the (upgraded) Coal Handling and Preparation Plant and rail loop for export and domestic sale;
- Continued reject and tailings co-disposal in the Main Overburden Emplacement Area and temporary in-mining area reject management;
- Relocation of a 6 kilometre section of Bengalla Link Road at approximately Year 15 near the existing mine access road to facilitate coal extraction;
- The diversion of Dry Creek via dams and pipe work with a later permanent alignment of Dry Creek through rehabilitation areas when emplacement areas are suitably advanced;
- Relocation of water storage infrastructure as mining progresses through existing dams (including the Stage Discharge Dam and raw water dam); and
- A workforce of approximately 900 full time equivalent personnel (plus contractors) at peak production.

Stakeholder Engagement

A range of stakeholders were identified to be consulted in relation to the Project based on Bengalla Mining Company's existing stakeholder relationships and a review of existing databases developed during the preparation of previous modifications. Consultation occurred with various Local, State and Commonwealth government agencies to provide an understanding of the Project and some key findings of the technical studies.

Environment Impact Statement Project briefings were offered to neighbouring land owners and the wider local community via telephone, personal letters and community newsletters. Near neighbours were provided with a personal letter outlining the details of the Project and extending an invitation to attend one of the upcoming Project community information sessions. Advertised, specific community information sessions were in Muswellbrook each Thursday in March 2012. The information sessions were designed to provide a Project Team member to which members of the community would find more readily accessible to meet and discuss the Project. In total, nine people attended the information sessions where they had the opportunity to meet and discuss potential concerns with Project personnel.

Six newsletters were distributed in relation to the Project to near neighbours, regulators and other interested parties, with two distributed to over 8,500 residences in the Muswellbrook area.

Aboriginal community consultation for the Project was conducted in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents in 2010 with 30 Aboriginal organisations registering an interest and participating through the process.

Air Quality

An Air Quality Impact Assessment was undertaken by consultants Todroski Air Sciences to predict the air quality impacts on receptors in the vicinity of the Project and to recommend measures to account for these impacts. In total, the Project is predicted to impact four private receptors (106, 110S, 110N and 156S) and five private properties (109 and 245/246/249/250) above relevant air quality criteria excluding those that are currently entitled to acquisition by other mining companies.

The cumulative annual average PM₁₀ is predicted to be exceeded at three privately owned receptors 106, 110N and 110S. In addition, there are six properties owned by three landholders which do not have a residence (109, 111, and 245/246/249/250) where more than 25% of the property area is predicted to experience exceedances of relevant criterion.

The maximum 24-hour average PM₁₀ is predicted to exceed relevant criteria at least one day per year under worst case weather conditions at six private receptors (29, 156S, 161, 222, 230 and 286) in addition to those which are currently entitled to acquisition by other mining companies. Of these six receptors, only receptor 156S alone is expected to experience Project exceedances on more than five days in any year.

There are not predicted to be any exceedances of the annual average TSP and dust deposition criteria at private receivers, excluding receptors which currently have a right to acquisition upon request. Similarly, there are not predicted to be any exceedances of the advisory reporting standards for PM_{2.5}.

The assessment determined that air quality impacts caused by construction activities would be short and sporadic, and that the total dust generated by construction is minor compared to operational dust emissions. As a result, construction activities are not expected to cause any discernible impacts above the predicted operational impacts.

Impacts arising from the transportation of coal by rail were assessed by predicting TSP and PM₁₀ at a distance of 50 metres from the rail line. In rural areas and urban areas, the 24-hour average TSP and PM₁₀ are predicted to be well below levels known to cause adverse impacts on human health and amenity.

A cumulative sensitivity analysis was completed to consider the Mt Arthur Coal and Xstrata Mangoola Coal Mine's recently submitted modifications to their respective approvals. This analysis confirmed that there are no additional private receptors predicted to be impacted as a result of the Project and currently proposed modifications beyond NSW Government amenity guidelines.

The proponent will update its existing Air Quality and Greenhouse Gas Management Plan in consultation with the relevant regulators and shall include all reasonable and feasible mitigation measures to minimise air quality impacts. Bengalla Mining Company will continue to operate its air quality monitoring network, including real time dust monitors and a meteorology station. The existing dust and blast management systems will be upgraded with a real time air quality management system combined with predictive meteorological forecasting.

Noise

An Acoustic Impact Assessment was undertaken by consultants Bridges Acoustics for the Project. It included an assessment of the noise impacts resulting from the Project. The noise levels generated by the Project during the operational phase were assessed using the intrusiveness criteria.

Significant noise impacts (greater than 5dB above the intrusive criteria) are predicted to occur at six private receptors (110N, 152, 153, 154, 156E and 156S) owned by five landholders that are not currently subject to acquisition by other mining companies, upon the request of the landowner.

An additional 11 private receptors (105, 106, 108, 110S, 126N, 146, 156W, 161, 186N, 180 and 184) owned by nine landowners would be moderately affected (between 2 and 5 dB above the intrusive criteria) by the Project under a worst-case noise modelling scenario. In total, 12 private receptors have been predicted to experience mild noise impacts (between 1 and 2 dB above the intrusive criteria) from the Project.

Cumulative noise levels generated by the Project and other sources were assessed to the amenity criteria. Although the Project will contribute to cumulative noise impacts at some receivers, there are not predicted to be any cumulative exceedances of the amenity criteria at any private receiver.

There are two additional properties (111 and 211) predicted to experience a significant noise impact from the Project in one or more modelled years over more than 25% of the vacant land in contiguous landownership that are not currently subject to acquisition by another mining company on request.

An additional four properties (109, 121/125 and 167) owned by three landholders would also be moderately affected by noise over more than 25% in contiguous landownership. A further three properties (99/100 and 101) owned by two landholders are predicted to be mildly affected by noise over more than 25% of contiguous landownership. All other private receptors and properties are predicted to receive noise levels within intrusive criteria.

The modelled noise contours for construction activities indicate there are no additional receptors significantly or moderately affected by construction noise levels more than 10 dBA above the noise criteria under prevailing weather conditions.

The existing background road traffic noise levels along Denman Road are presently above relevant criteria at some residences and will not increase materially as a result of the Project. The maximum predicted increase in road traffic noise is 1.8 dB during the construction phase and 1.5 dB during the operational phase of the Project.

The rail traffic noise is predicted to continue to exceed relevant criteria at various locations near Muswellbrook along both the Main Northern Railway Line and the Ulan Railway Line. Additional train movements associated with the Project are predicted to increase noise levels by approximately 0.7dB near the Ulan Railway Line between the Project and Muswellbrook and by approximately 0.5 dB at residences near the Main Northern Railway Line south-east of the Ulan Line Junction.

The proponent will continue to implement engineering controls to minimise the noise levels generated by heavy mobile equipment and coal processing facilities. The proponent will also upgrade the existing real time noise monitoring program to include a predictive system to reduce impacts at private receivers.

Blasting

All residences within 1500 metres of active mining areas are owned by mining companies or entitled to acquisition by mining companies. Exceedances of the overpressure and ground vibration criteria are not predicted to occur at distances of more than 1500 metres from mining areas. Therefore, the blasting associated with the

Project will not impact any privately owned receptors that are not currently entitled to acquisition by mining companies.

Blasting impacts on heritage structures and communications masts are predicted to be within acceptable limits. Blasting will continue to be undertaken within 500 metres of the Muswellbrook-Ulan Railway Line in the early years of the Project. The proponent will continue to consult with the ARTC to ensure that there are no impacts on passing trains.

Visual

A Visual Impact Assessment was undertaken by JVP Planning and Design to identify the potential visual and lighting impacts caused by the Project.

Most locations in Muswellbrook will be shielded from the Project by the rehabilitated eastern areas at the existing Bengalla Mine. However, some locations in South Muswellbrook will experience limited views of the mining area. Although these locations are sensitive, the visual impact will be low as the visible component of the mining areas represents only a small percentage of the view.

The Project is not visible from Aberdeen due to the screening provided by rehabilitated areas. The township of Denman will also be shielded from the Project. The visual sensitivity of these locations is low due to the significant distance from Denman to the Project. As a result, the visual impact on Denman will be low.

The Project is screened from sensitive locations on the Mt Arthur Coal owned Pukara Estate by olive trees, resulting in low visual impact. However, there will be high visual impacts at the working areas at Pukara Estate. These working areas are generally not accessed by the public.

The nearest privately owned vineyard is located approximately 12 kilometres south west of the Project Boundary. Due to the significant distance from the Project the visual impact is predicted to be low.

There are not expected to be any significant impacts on rural residences to the north and east of the Project. Views from these locations will be screened by the rehabilitated areas at the existing Bengalla Mine.

Rural residences to the south and south-west are subject to views of the existing Bengalla Mine. These locations will continue to experience views of the Overburden Emplacement Area and active face. To the west of the Project, the rural residences that are currently impacted will continue to experience moderate to high visual impacts from the active face.

The lighting effects produced by the Project will be similar to the effects generated by the existing Bengalla Mine. Since mining will progress to the west, lighting impacts are expected to decrease for receptors to the east and increase for receptors to the west.

In order to reduce visual impacts, progressive rehabilitation of the Overburden Emplacement Areas will continue to be undertaken. This will reduce the contrast between the components of the Project and the surrounding landscape. Landscape plans will ensure that rehabilitated areas emulate the surrounding pasture land and open woodland.

Surface Water

A Surface Water Impact Assessment was undertaken by consultants WRM Water and Environment.

During the Project life, the catchment area draining to Dry Creek will be reduced by 983 hectares. The final landform will reduce the Dry Creek catchment by 22 per cent compared to the pre-mining catchment. The reduction in the Hunter River catchment both during and after mining will be negligible at around 0.1 per cent.

The reduction in catchment areas will result in reduced flow volumes in the Hunter River and Dry Creek. Flow volumes in the Hunter River will be reduced by between 458 ML per year to 923 ML per year during mining and by 423 ML per year after mining which represents approximately a 0.2 per cent reduction in the Hunter River's flow volume. Bengalla Mining Company will hold all relevant licences, share component and

allocation required to comply with the Water Management Act 2000 and Water Act 1912 requirements.

A water balance was undertaken to determine the volumes of water that will need to be extracted from and/or discharged into the Hunter River. Raw water will need to continue to be extracted from the Hunter River to meet operational water demands. The median external water requirement is predicted to be 1500 M:/year. Bengalla Mining Company holds share components totally 6011 units for the Hunter Regulated River Water Source comprising 1449 High Security Units and 4562 General Security Units to account for any potential impacts.

Excess water accumulated on site will continue to be discharged into the Hunter River in accordance with the rules of the Hunter River Salinity Trading Scheme. Under average rainfall conditions, the Project will not need to discharge any water.

All components of the Project are located outside of the 1 in 100 year flood extent of the Hunter River as the Project mines further away to the north-west from the Hunter River than the existing Bengalla Mine. Therefore, the Project is not expected to impact the flood behaviour of the Hunter River.

The Bengalla Water Management System has been designed to minimise the impacts on flow volumes in the Hunter River, avoid uncontrolled releases of contaminated water and minimise raw water usage.

Ground Water

A Ground Water Impact Assessment was undertaken by consultants Australasian Groundwater and Environmental Consultants.

The only significant aquifer in the vicinity of the Project is the Hunter river alluvial aquifer. Mining occurs closest to the Hunter River alluvium at the beginning of the Project, and further away than the currently approved Bengalla Mine. In Year 1, the Hunter River alluvial aquifer in the immediate vicinity of the Project will continue to experience drawdown of less than 2 metres. The drawdown of the alluvial aquifer will

reduce as mining progresses towards the north-west. This water will be accounted for by allocation attached to relevant licences which are already held.

Under pre-mining conditions, groundwater inflows from the Permian to the alluvium. The Project will cause Permian groundwater to flow to the open cut mining areas thereby reducing the alluvium. The maximum reduction in the flow to the alluvium is approximately 0.63 ML/day at the beginning of Year 1. The maximum annual reduction in the flow to the alluvium is approximately 220 ML/year in Year 1. As mining moves away from the alluvium, the reduction in flow decreases to approximately 0.25 ML/day in the later years of the Project life.

The volume of groundwater inflows into the mining area is predicted to average 110 ML/year. Maximum groundwater inflow rate is predicted to be 365 ML/year.

There are a number of registered mine-owned bores within the zone of depressurisation. However, only one impacted registered bore is located on privately owned land and the drawdown at this bore is predicted to be less than 2 metres. This is the same as the minimal impact requirement under the Aquifer Interference Policy.

Water will accumulate in the final void following mine closure. The water level of the final void is predicted to reach up to RL 37 metres. This water level is significantly below the crest of the final void, making it very unlikely that the final void will overflow.

A peer review of the Groundwater Impact Assessment was undertaken by Kalf and Associates. The peer review concluded that the groundwater model was fit for purpose and that the impacts predicted by the model were reasonable.

Aboriginal Archaeology and Cultural Heritage

An Aboriginal Archaeology and Cultural Heritage Impact Assessment were undertaken for the Project by consultants AECOM Australia.

A total of 289 Aboriginal sites were identified within the Study Area. The Project will impact 263 of these sites, comprised of 259 artefact scatters or isolated artefacts, one stone quarry and three potential scarred trees. The stone quarry is considered to be of high archaeological significance. The three scarred trees and two of the artefact

scatters are considered to be of moderate archaeological significance. The remaining artefact scatters and isolated artefacts are of low archaeological significance.

The identification of stone artefacts and archaeological sites notwithstanding, Aboriginal stakeholders involved in the assessment process have not disclosed any specific knowledge related to these artefacts or sites. However, during the archaeological survey, Aboriginal stakeholders noted the importance of B10 quarry site for its rarity in the Hunter Region, being one of only a handful of these site types found locally. In addition, Aboriginal stakeholders highlighted several key landscape features as important on the basis of their associated archaeological record.

In order to account for the impacts to Aboriginal cultural heritage, the existing Aboriginal Cultural Heritage Management Plan will be revised in consultation with registered Aboriginal parties and relevant regulators. The Aboriginal Cultural Heritage Management Plan will outline mitigation measures, including surface collection of artefacts, scarred tree investigation and removal and fencing of sites that are not impacted by the Project. The management plan will also include procedures for the care and control of salvaged artefacts.

Historical Heritage

The assessment identified five historic sites within the Project Boundary. The Project will directly impact three historic sites: House Site 1, House Site 2 and the Stockyard with only the Stockyard determined to be of local significance. House Site 3 is located within the Project Boundary but will not be impacted by the Project.

Due to the air quality and noise impacts of the Project, the Bengalla and Overdene homesteads will continue to remain vacant. The visual impacts of the Project on the Bengalla, Overdene, Edinglassie and Rous Lench homesteads will be similar to the impacts currently experienced. Therefore, the Project will continue to indirectly impact these homesteads. There are not expected to be any indirect impacts on House Site 3, Dalama Stud, Blunt's Butter Factory or the Keys Family Private Cemetery.

Impacts on historic heritage items will be managed in accordance with the European Heritage Management Plan, which will be revised in consultation with relevant regulators.

Ecology

An Ecological Impact Assessment was undertaken by consultants Cumberland Ecology for the Project.

The Project will result in the disturbance of approximately 881 hectares of native vegetation, including forest and woodland communities and large areas of open grassland and scattered trees. An additional 69 hectares of non-native vegetation will be removed, including tree and shrub plantations, exotic grasslands and Low Diversity Derived Native Grassland/Exotic Pasture.

The Project will remove approximately 554 hectares of Threatened Ecological Communities including 535 hectares of critically endangered Box Gum Woodland. The area of Box Gum Woodland to be impacted represents 9 per cent of the community in the Hunter Region and 0.2 percent in the community in New South Wales.

Two threatened flora species were identified within the Project Boundary; Lobed Blue Grass and tiger Orchid.

Nine species of threatened fauna were identified within the Project Boundary, consisting of four woodland bird species and four microbat species and the Squirrel Glider. An additional 12 species have the potential to occur in this area. All of the native vegetation within the Project Boundary is considered suitable habitat for the threatened fauna species that have the potential to occur in this area. Therefore, the Project will remove approximately 881 hectares of potential habitat for threatened fauna species.

The Study Area is essentially dry and lacks aquatic habitats other than a sparse series of ephemeral pools along what is appropriately called Dry Creek. Consequently, Dry Creek support very little in the way of aquatic habitat and does not support major occurrences of macrophytes, or fish habitat.

The Project will result in the clearance of approximately 9.4 hectares of Hunter Floodplain Red Gum Woodland. The drawdown of the Hunter River alluvial aquifer has the potential to impact terrestrial groundwater dependent ecosystems in the floodplain. However, the Project is not considered likely to pose a direct threat to any stygofauna community that may be present in the groundwater.

The proponent will enhance the areas of Dry Creek to be retained to the south of the Project and north of the Bengalla Lind road and also adjacent to the Hunter River and will include the planting of the regionally endangered River Red Gum.

In addition, Bengalla Mining Company will undertake Biodiversity Offsetting in accordance with the proposed 'Upper Hunter Strategic Assessment' process. Bengalla will provide a financial contribution to the 'Upper Hunter Offset Fund' to compensate for the removal of 950 hectares of vegetation, including 881 hectares of native vegetation. Upon finalisation of an acceptable 'Upper Hunter Strategic Assessment' process, Bengalla will recalculate the credit requirements for the Project in consultation with relevant regulators and contribute the commensurate financial contribution to the 'Upper Hunter Offset Fund'.

Traffic and Transport

A Traffic and Transport Impact Assessment was undertaken for the Project by consultants DC Traffic Engineering.

All access to the Project will be via the Bengalla Link Road and Bengalla Mine Access Road. The Bengalla Lind road will be realigned in approximately Year 15 to allow mining to progress to the west.

The Denman Road/Bengalla Link Road and Denman Road/Thomas Mitchell Drive intersections were found to be performing satisfactorily under existing traffic conditions. However, the New England Highway/Thomas Mitchell Drive intersection is currently performing poorly during the AM peak (6-7am). Mt Arthur Coal Mine is currently upgrading this intersection to a seagull configuration. Mt Arthur Coal Mine is also obligated to upgrade the Denman road/Thomas Mitchell Drive intersection to a seagull configuration by 2019.

The upgrade of the New England Highway/Thomas Mitchell Drive intersection will have been completed before the construction phase of the Project. The traffic modelling for the peak construction period has accounted for the upgrade to this intersection. All of the key intersections are expected to perform at a good or acceptable level of service during the construction phase.

The realignment of the Bengalla Link Road will increase the length of this travel route by approximately 900 metres. Assuming a travel speed of 90 kilometres/h this means travel times will increase by approximately 36 seconds.

The Project is predicted to increase the product coal output of the Bengalla Mine to approximately 12.3 Mtpa. As a result, the number of loaded train movements per year will increase to 1435 however this remains within existing approved levels. The number of daily train movements associated with the Bengalla Mine will increase to 10 (including unloaded inbound trains). The commencement of mining operations at the Mt Pleasant Project will generate an additional six train movements per day.

An assessment of the Project impacts to the existing rail network was also undertaken. When assessed against rail traffic forecast for the Muswellbrook Junction in 2016, rail traffic associated with the haulage of product coal from the Project will make up 9.8 per cent of the total volume of coal trains only. The area of significant influence of the Project on the wider rail network is therefore not significant, being considered to extend from Bengalla Mine rail loop to the Muswellbrook Junction.

Economics

The Project will result in the following economic benefits to the New South Wales economy:

- \$2408 million in annual direct and indirect regional output or business turnover;
- \$1223 million in annual direct and indirect regional value added;
- 4868 indirect jobs. The Project will result in the following economic benefits to the regional economy (Muswellbrook, Singleton and Upper Hunter Local Government Areas):
- \$1486 million in annual direct and indirect regional output or business turnover;

- \$789 million in annual direct and indirect regional value added;
- \$155 million in annual direct and indirect household income; and
- 1745 direct and indirect jobs.

The cessation of Bengalla Mine under the existing approval would lead to a reduction in economic activity in the region. Given the current uncertainty in the coal mining sector, it is important that government continue to effectively utilise the economic benefits, skills and expertise generated by Bengalla Mine to further strengthen and broaden the region's economic base.

Project Justification

During its operation, Bengalla Mining Company has been a major employer of the local community, employing 358 full time equivalent workers as at September 2011 of which 46 per cent are currently residing in the Muswellbrook LGA; and 89 per cent within the combined Muswellbrook, Upper Hunter and Singleton LGA's.

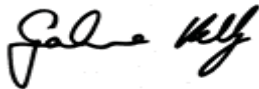
Approval of the Project will allow up to 316 Mtpa of ROM coal to continue to be mined at Bengalla Mine, ensuring security of employment for the existing workforce and continuity of socio-economic benefits currently experienced in the Hunter Region, New South Wales and Australia. The Project will facilitate the recovery of a valuable coal resource in an area that has long been set aside for mining by the NSW Government on land acquired by Bengalla Mining Company for the specific purpose of continuation of coal mining.

There are environmental costs which have been identified and which are capable of being acceptably managed by operational controls, land acquisition and management plans that would be established and adopted as approved by the Director-General of Planning and Infrastructure and other appropriate Government agencies and Authorities. Ecological and long term costs have been minimised and will be accounted for by management strategies to maintain and improve vegetation and ecological outcomes and values in the long term.

The Project's social and environmental impacts have been minimised as far as practicable by implementing all reasonable and feasible management and mitigation measures.

In Summation

The Union considers the Bengalla Continuation Project is consistent with the objectives of the EP&A Act, and therefore supports the proponent's application and asks that the consent be granted in the term sought.

A handwritten signature in black ink, appearing to read "Grahame Kelly". The signature is written in a cursive style with a large initial 'G'.

Grahame Kelly

DISTRICT SECRETARY

Bengalla coal project

Submission to Environmental Impact Statement
October 2013

Rod Campbell

About TAI

The Australia Institute is an independent public policy think tank based in Canberra. It is funded by donations from philanthropic trusts and individuals, memberships and commissioned research. Since its launch in 1994, the Institute has carried out highly influential research on a broad range of economic, social and environmental issues.

Our philosophy

As we begin the 21st century, new dilemmas confront our society and our planet. Unprecedented levels of consumption co-exist with extreme poverty. Through new technology we are more connected than we have ever been, yet civic engagement is declining. Environmental neglect continues despite heightened ecological awareness. A better balance is urgently needed.

The Australia Institute's directors, staff and supporters represent a broad range of views and priorities. What unites us is a belief that through a combination of research and creativity we can promote new solutions and ways of thinking.

Our purpose—'Research that matters'

The Institute aims to foster informed debate about our culture, our economy and our environment and bring greater accountability to the democratic process. Our goal is to gather, interpret and communicate evidence in order to both diagnose the problems we face and propose new solutions to tackle them.

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Introduction/Summary

The Australia Institute welcomes the opportunity to make a submission on the Environmental Impact Statement (EIS) of the Bengalla extension project, particularly relating to Appendix S: Economic Impact Assessment. The economic impact assessment contains a number of shortcomings that make it unsuitable for decision making purposes. The results of this appendix are misleading and are repeated throughout the EIS. The key shortcomings are:

- **Use of input-output modelling.** These models create inflated estimates of impacts such as employment. The claim of 1,745 local jobs being created is contradicted by more realistic modelling commissioned by other Hunter coal mines. Based on other coal mine models, we suggest this figure would be closer to 320, 1 percent of the local workforce. 80 percent of these jobs would be filled by people commuting from outside the region, according to the EIS.
- **Scope of assessment.** The cost benefit analysis fails to present the costs and benefits to the state of NSW, despite this being one of the Director General's Requirements for assessment of the project and the recommended approach of the NSW Treasury.
- **Overstated financial benefits.** Estimate of royalty revenue of present value \$778 million appears an overestimate, based on undisclosed calculations. Our estimate based on the EIS is \$615 million. Tax revenue estimates are impossible to replicate and seem optimistic. There is no discussion of calculation of private financial benefits or distribution.
- **Understated external costs.**
 - The economic assessment assumes that all mitigation and offset measures will perfectly compensate for environmental impacts. This approach has been rejected by the NSW Planning and Assessment Commission.
 - Some non-market values are based on studies which have been rejected by the NSW Land and Environment Court.
 - Greenhouse gas emissions associated with the project have been underestimated.

As a result of these shortcomings, decision makers are unable to get a clear picture of the economic effects of the project. This is of concern due to the increased scrutiny that economic assessment of projects have been facing in planning and court decisions and the increased weight that project economics is to be given under new state government regulations. Increasing the quality of economic assessment is important for public confidence in the planning system. We recommend the rejection of this project until suitable economic assessment has been conducted.

Input-output model results

The EIS main volume places great emphasis on the economic impacts of the project both in the executive summary and the body of the EIS:

In summary, the Project will result in the following economic benefits to the New South Wales economy:

- \$2,408 Million in annual direct and indirect regional output or business turnover;
- \$1,223 Million in annual direct and indirect regional value added;
- \$441 Million in annual indirect household income; and
- 4,868 indirect jobs.

The Project will result in the following economic benefits to the regional economy (Muswellbrook, Singleton and Upper Hunter Local Government Areas):

- \$1,486 Million in annual direct and indirect regional output or business turnover;
- \$789 Million in annual direct and indirect regional value added;
- \$155 Million in annual direct and indirect household income; and
- 1,745 direct and indirect jobs. (page xix)

These claims are repeated in whole or in part on page:

- xxiii (regional jobs miscopied here as 1,822)
- 252
- 302
- 306
- 307
- 312

These claims are based on *Appendix S Economic Impact Assessment* by Gillespie Economics. To derive these results, Gillespie Economics use a modelling approach called input-output (IO) modelling. IO models estimate the “flow on” or “downstream” economic impacts of a project or policy on other industries - ie that when one industry spends more money or employs more people, it buys things from other industries which increases their output, in turn increasing activity in yet more industries and so on. These effects are estimated through “multipliers” which are higher or lower depending on the degree to which the analyst believes industries are integrated.

While IO modelling has been common in Australia for many years, this does not reflect on its reliability and accuracy. Economists and public institutions have criticised its use for many years. The ABS stopped publishing IO multipliers in 1998-99 as the data was mostly used to support “bids for industry assistance”. The ABS details the shortcomings of this “biased estimator of the benefits or costs of a project”¹:

¹ (ABS, 2011)

Lack of supply-side constraints: *The most significant limitation of economic impact analysis using multipliers is the implicit assumption that the economy has no supply-side constraints. That is, it is assumed that extra output can be produced in one area without taking resources away from other activities, thus overstating economic impacts. The actual impact is likely to be dependent on the extent to which the economy is operating at or near capacity.*

Fixed prices: *Constraints on the availability of inputs, such as skilled labour, require prices to act as a rationing device. In assessments using multipliers, where factors of production are assumed to be limitless, this rationing response is assumed not to occur. Prices are assumed to be unaffected by policy and any crowding out effects are not captured.*

For an example of the ABS's first point, IO analysis assumes there is no "constraint" to the amount of construction labour available in the Hunter Valley. They assume that there is a large "ghost workforce" of skilled construction and mining workers ready to work on the project who will not be taken away from some other project either in the Hunter Valley or in NSW more broadly.

The ABS's point about fixed prices refers to the assumption that the new demand for inputs such as construction workers can be satisfied without increasing the price of their wages. This is clearly unrealistic, as mining wages have increased considerably during the mining boom as is regularly emphasised by the mining industry.

Wariness about the application of IO modelling to project applications is not limited to the ABS. A recent Productivity Commission research papers describes the Commission's concern about "well recognised abuses" over several decades²:

The lack of accounting for the opportunity costs in input-output multiplier analysis has resulted in persistent expressions of concern over many years regarding the applicability of multiplier analysis in a public policy context. As noted, a common focus of the concern is on the use of multipliers to make the case for government intervention (either to preserve prevailing output or employment under threat or to support the set up or expansion of a designated activity).

The economic assessment of the Warkworth expansion project also relied on IO modelling, which was criticised by Preston CJ³:

The IO analysis is a limited form of economic analysis, assessing the incremental difference in economic impacts between approving or disapproving the extension of the Warkworth mine. The deficiencies in the data and assumptions used affect the reliability of the conclusions as to the net economic benefits of approval. More fundamentally, however, the IO analysis does not assist in weighting the economic factors relative to the various environmental and social factors, or in balancing the economic, social and environmental factors. (p155)

The IO analysis assumes that there are unemployed resources available within the Hunter region to meet any increase in workforce demand, and that the workforce will not be drawn away from any other activity. I accept [The Australia Institute's]

² (Gretton, 2013)p10

³ (Preston, 2013)

evidence that the assumption of the IO model that there is a ghost pool of highly skilled yet unemployed people in the Hunter region, from which labour for the extension of the existing mine would be drawn, is unrealistic. I accept [the Institute's] evidence that, to a considerable extent, employment generated from the extension of the Warkworth mine would involve currently employed skilled workers transferring from other industries, but the vacancy thereby created in the other industries may not necessarily be filled, partly because of a shortage of skilled workers and partly because the remuneration is inferior to that offered in the mining industry. (p159)

Preston CJ is not alone in his criticisms. Following his decision, coal industry major Yancoal reassessed the IO modelling of their Ashton South East Open Cut project, also facing an appeal before the Land and Environment Court. Yancoal commissioned ACIL Allen to review the IO modelling and to re-evaluate the project's impacts using another model⁴:

[In] the Warkworth case IO modelling was criticised by the chief judge and ... for good reason. [This] modelling is fine for some purposes but it's not the best technique ... for this kind of purpose [evaluating a coal mine]. The reason is that IO modelling takes no account of the fact that there are limited productive resources [in the economy] principally people to be employed. So it always makes the amount of output, income, jobs, bigger than would likely be the case, unless you're in the Great Depression, or a very deep recession.

Instead of IO modelling, ACIL Allen used more sophisticated computable general equilibrium (CGE) modelling to assess the project. They estimated that while the Ashton project would employ 162 people, local employment would increase by only 78. This means that 84 jobs in other projects and industries are "destroyed" at a local level. At a state level, downstream jobs estimated by Yancoal were only 2 jobs greater than the direct employment number of 162. (See court transcripts)

Because of the flaws inherent in IO modelling counsel for the Minister for Planning has dropped the earlier IO modelling of that project from their case and rely on Yancoal's CGE modelling.

While detailed modelling of the impacts of the Bengalla project is beyond the scope of this submission, applying the Yancoal modelling to the Bengalla project can give some estimate of the likely impacts on local employment, including the reductions in other industries. Rather than an increase of over 1700, we estimate a net increase in employment of 320:

	Ashton	Bengalla	Notes and sources
Direct employment	162	665	See Ashton court transcripts and (Gillespie Economics, 2013)(Gillespie Economics, 2009)
IO model estimate of local direct and indirect employment	682	1745	(HVRF, 2009) (Gillespie Economics, 2013)
CGE model estimate of net change in local employment	78	320	Ashton court transcripts and TAI calculation.

⁴ (see court transcripts, p546)

To put this in context, at the 2011 census there were 28,671 people in the labour force working in Singleton, Muswellbrook and Upper Hunter Local Government Areas⁵. The project would increase employment in the area by around 1 percent. This will not affect unemployment, however, with only 647 people looking for full time work in these areas at the census. Instead, they will come from outside the area, as is made clear in EIS appendix S⁶, who estimate the project will employ only 20 percent local workers, with 80 percent commuting from outside the area.

Note also that Appendix R Social Impact Assessment bases its multiplier assessment on the Gillespie Economics study, Appendix S⁷. Their multiplied employment estimates, summarised in EIS main volume⁸ also share the flaws of IO modelling, outlined above. Their results from Gillespie Economics' multipliers feed into their estimates of population change and housing requirements, which are also overstated.

In summary, decision makers should be sceptical of the economic impacts emphasised in the EIS due to the flaws in IO modelling . While the project proposes to employ on average 665 people, the project's impacts on the local markets for labour, land, capital and inputs will crowd other industries out, meaning the net increase in employment considerably lower, likely around 320, based on Yancoal modelling. The increase in employment will be sourced 80 percent from outside the local area according to the EIS, meaning there will be minimal impact on local unemployment and a negligible increase in employment at a wider level. The results of the Social Impact Assessment also share these flaws and should also be met with scepticism.

⁵ Sourced through ABS Tablebuilder, Census 2011

⁶ (Martin & Associates, 2013)

⁷ see (Martin & Associates, 2013)(p47)

⁸ (Hansen Bailey, 2013)p247

Cost benefit analysis

More important for decision makers than the results of IO modelling or more accurate economic impact assessment is the cost benefit analysis of the project⁹:

Model based economic impact assessment is not a substitute for a thorough economic analysis of a policy. The appropriate method for analysing policy alternatives is benefit cost analysis (BCA). BCA considers the best use of resources and as such treats labour inputs as a cost. An I-O based economic impact analysis is best seen as a complement to a BCA and does not provide evaluative guidance. An I-O model will estimate flow on impacts irrespective of the qualities of the policy triggering those impacts.

The benefit cost analysis (BCA) provided in Appendix S by Gillespie Economics also contains flaws that overstate the value of the project for NSW decision makers. Note that in the current Ashton case original BCA of that project by Gillespie Economics has been dismissed by proponents, Yancoal, and is no longer being considered as part of that project assessment process.

Scope

An important step in any BCA is setting the scope of the assessment and ensuring that scope is used consistently¹⁰:

Let us now turn to ... issues that challenge and bedevil practitioners of social benefit-cost analysis. The first challenge is deciding "whose benefits and costs count" It sometimes is called the issue of standing--that is, who has standing in the analysis of benefits and costs? This is an issue of scope. Should the analysis include only those costs and benefits affecting residents of the local community? The state or province? The nation? The world? Whether the net benefits of a project are positive or negative often depends on how narrow or broad the scope of the study is.

As this project relates to the extraction of resources which belong to the State of NSW, it is appropriate that the Director General's Requirements (DGRs) and guidelines from Planning and Treasury specify:

*A detailed assessment of the costs and benefits of the development as a whole and whether it would result in a net benefit for the NSW community;*¹¹

*[Project] benefits and costs should be estimated where possible as those that accrue for New South Wales. In the first instance, it will generally be most practical to assess all major costs and benefits to whoever they accrue and then adjust to estimate the proportion of these attributable to residents of the State.*¹²

However, The BCA of the Bengalla project is conducted from a global perspective and then narrowed down to a national level, as explained by Gillespie Economics:

BCAs of mining projects are therefore often undertaken from a global perspective i.e. including all the costs and benefits of a project, no matter who they accrue to, and

⁹ (NSW Treasury, 2009)p4

¹⁰ . Eggert (2001) (p27)

¹¹ (DGRs reported in EIS main volume p108)

¹² (NSW Treasury, 2012)p5

then truncated to assess whether there are net benefits to Australia. A consideration of the distribution of costs and benefits can then be undertaken to identify the benefits and costs that accrue to NSW and other regions. (p9)

Gillespie Economics do not undertake this consideration of costs and benefits that accrue to NSW, claiming:

BCA at a sub-national perspective is not recommended as it results in a range of costs and benefits from a project being excluded, making BCA a less valuable tool for decision-makers.(p8)

While we agree that there can be added difficulties to conducting sub national BCA, and that relying on rigidly state-based analysis may be misleading, these difficulties are not sufficient reason to contravene the DGRs and Treasury guidelines. In fact, the principal of Gillespie Economics was able to produce exactly this kind of state-level analysis when before the Land and Environment Court in the Warkworth case¹³.

Furthermore, the approach to scope taken by Gillespie Economics is not applied consistently through their analysis. Two examples are their valuation of impacts on cultural heritage at a state level and impacts on greenhouse gas emissions at a global level.

Impacts on aboriginal heritage are estimated at \$16 million based on a “choice modelling” (see below) studies which estimated:

the sum of the [aboriginal heritage] values held by all households in NSW (footnote on p18)

The same approach was adopted in the Warkworth case and found to be inadequate by Preston CJ:

I accept the evidence of Mr Campbell [now at The Australia Institute] that confining the distribution of surveys to NSW households was too limited, and that the broader Australian community could well place values on the ecological and Aboriginal cultural heritage impacts of the Project (Exhibit W5, para 6, 15). The value of Aboriginal cultural heritage and endangered ecological communities and their biota is not restricted to NSW but extends throughout Australia. (Preston, 2013)p163

At a global level, the project will have an impact on greenhouse gasses well in excess of those quantified by Gillespie Economics. By expanding the global supply of coal, the project will have a marginal impact on world coal prices, which in turn creates a marginal increase in the quantity of coal consumed in the world. Emissions associated with this marginal increase should be considered in the BCA of the project. See greenhouse gas section below for further discussion.

Royalty and tax revenue

Both the EIS main volume and appendix S Economic Assessment make numerous references to the royalty revenue that will be generated by the project, claimed at a present value of \$778 million. No working is shown for this calculation. We suggest this is an overestimate. We estimate this figure at \$615 million, based on:

¹³ See (Bennett & Gillespie, 2012)

- Production schedule on EIS main volume p49, assuming a linear ramp up to year 4.
- Long term real price of \$AUD99/t, as per EIS appendix S p14.
- Royalty rate of 8.2 percent (NSW DII, 2008).
- Deductions of \$3.50/t for a full wash cycle and \$0.05/t for the Australian Coal Association Research Program levy¹⁴.
- Discount rate of 7 percent

\$615 million likely represents an overestimate, as several other types of deduction for which the project may be eligible¹⁵. Furthermore, this estimate assumes that production will begin and continue at the planned rates of extraction throughout the life of the project. Given the current difficulties for the coal industry and long term uncertainty around markets for thermal coal, this is not a conservative assumption.

As royalty revenue is the main benefit of the project for the state of NSW, it is essential that decision makers have confidence in these calculations. The EIS should clearly outline the assumptions used in their estimates. See our full modelling in appendix.

Calculation of federal tax revenues is also opaque. Gillespie Economics estimate revenues at present value \$580m, but no confirmation of this figure is possible without some understanding of the underlying data and assumptions. It seems likely that Gillespie Economics have assumed an effective tax rate of 30 percent, while other researchers find that rates faced are lower - 17 percent and 13.9 percent - rather than the theoretical 30 percent¹⁶. As such, the estimate of \$580m seems likely to be an overestimate.

Very little consideration is given to the private financial benefits of the project. In a footnote on page 19 the assessment states that it assumes 42 percent Australian ownership. No source for this estimate is provided. This is inappropriate given the importance of this assumption to the calculations of benefits to Australia and NSW. The discussion of how these benefits are distributed is literally a “box ticking” exercise on page 22. This gives decision makers little understanding of the distribution of the benefits of this project.

Non market values

Gillespie economics include no value in the CBA for impacts on noise, air quality, visual amenity, ecology and biodiversity beyond those incurred in mitigation measures and offsets. This assumes that these mitigation measures and offsets will perfectly compensate local communities loss of amenity and the impacts on the local environment. We do not believe this is likely to be the case and as such this approach serves to understate the costs of the project to the NSW community and overstate its final value.

The same approach was taken by Gillespie Economics in their assessment of the Coalpac Consolidation Project. The NSW Planning and Assessment Commission for that project found¹⁷:

[The] assertion in the economic analysis that the biodiversity impacts of the project are fully accounted for in the rehabilitation and offset proposals is clearly wrong. Not only does it not stand up to any level of scrutiny from a biodiversity protection

¹⁴ (NSW DII, 2008)

¹⁵ (NSW DII, 2008)

¹⁶ (Markle & Shackelford, 2009; Richardson & Denniss, 2011),

¹⁷ (PAC, 2012)

perspective, but there have also been substantial changes to these proposals in response to criticism of the EA. The RTS simply adds \$1m to the project costs and reasserts the Proponent's original position. The problem is that the Commission does not consider that there is any credible evidence available that the rehabilitation will work in the longer term and there is no conclusive evidence that even the revised Biodiversity Offset Package is adequate.

It is also arguable whether property offsets can be seriously asserted to 'offset the biodiversity values that will be lost from the Project' and that there 'would be no additional ecological costs for inclusion in the BCA'¹⁸. This may be a convenient economic fiction, but the fact is that destroying biodiversity in one area cannot be compensated for by 'protecting' it in other areas where it was not under threat.

We agree with the PAC that this approach serves to understate the costs of the project to the community of NSW and therefore overstates its value. The Department of Planning and Infrastructure recently agreed with the PAC, finding¹⁹:

While the Department accepts that the project would undoubtedly result in a range of substantial economic benefits, overall the Department is satisfied that these benefits do not overcome the significant and irreversible impacts on the biodiversity, scenic and geological values of internationally significant pagoda landform complex, and hence the project is ultimately not in the public interest.

Other non-market values – aboriginal heritage impacts and non-market value of employment – have been estimated through “choice modelling” studies conducted by Gillespie Economics for other coal mines. Choice modelling uses the results of a multiple choice survey to estimate environmental and social values. All choice modelling studies by Gillespie Economics use similar methodology. One of these studies was conducted for the Warkworth coal project. Preston CJ found²⁰:

I agree with the [project opponents] that the Choice Modelling study and the BCA undertaken for the Project have a number of deficiencies which lessen their usefulness. (p163)

These deficiencies include identified by Preston CJ include:

- Distribution of Choice Modelling survey too limited (quoted above in discussion of scope)
- Deficiencies in information provided to survey respondents:
The information provided to survey respondents was not, in my view, sufficiently accurate to enable them to make informed and meaningful choices. (p163)
- Values in Choice Modelling survey inadequate:
I agree with Mr Campbell that modelling a situation based on a willingness to pay of survey respondents presented with a range of levels that, as Professor Bennett described and Mr Gillespie accepted has nothing to do with the costs, is of limited assistance in the situation confronting a decision-maker. (p167)
- All relevant matters, at level of particularity required, not considered

¹⁸ Note the similar quote in Appendix S on p17.

¹⁹ (DPI, 2013)

²⁰ (Preston, 2013)

I have identified above matters relevant to biodiversity and ecological integrity, including the EEGs, noise and dust, and social impacts, which were not included in the Choice Modelling survey or BCA. (p167)

- Other non-market impacts and values not considered:

I agree with Mr Campbell that there are non-market values that have either not been, or have inadequately been, taken into consideration in the BCA, including impacts of noise and dust, impacts on amenity values, and ecosystem services (aff, second dot point). The omission of these non-market values is a deficiency of this BCA. (p168)

In light of Preston CJ's emphatic agreement with The Australia Institute's evidence on the choice modelling surveys, we suggest that decision makers place little weight on these estimates in this project which derive from these same surveys. They are likely to understate the costs to aboriginal heritage and overstate the external value of employment. The very existence of this latter value in relation to coal projects has been doubted for several years by a range of economists, including coal industry consultant and ANU professor Jeff Bennett²¹.

Greenhouse gas emissions

The project will cause a small increase in the amount of coal used in the world. Coal industry proponents often adopt the "drug dealer's defence" – that if we did not sell the coal/drug to the users, someone else would, and our actions therefore make no difference. This is true to a large extent - most coal that would be consumed in the world would be substituted from other mines, but not all of it. The expansion of the coal supply that the project represents will exert some downward pressure on prices which will result in an increase in the amount demanded.

In the absence of the project, not all of the coal exported would be offset by production in other mines. To argue otherwise is to suggest that coal supply is perfectly elastic and therefore that coal price should not vary. This is clearly not the case. Some estimate of this effect can be made from published sources and consideration of the price elasticities of supply and demand for coal. The standard analysis gives the equilibrium effect on aggregate quantity by the project as $\Delta(-\epsilon/(-\epsilon+\eta))$ where:

Δ is the initial change in supply

ϵ is the elasticity of demand

η is the elasticity of supply

The elasticity of demand for coal is estimated at -0.3²². Estimates of the elasticity of supply vary widely and are also frustratingly out of date. International authors cite a range of estimates from 0.3 to 2.0 and conclude that the best estimate is around 0.5²³.

Using the Light, Kolstad and Peterson estimate, if the project did not proceed, a reduction in supply would ensue of approximately 15 million tonnes per year. The equilibrium market outcome would be a reduction in total output and consumption of $15 \cdot (0.3 / (0.3 + 0.5)) = 5.6$ million tonnes, with associated emissions of around 16 million tonnes of CO₂. At a price of

²¹ (Bennett, 2011)

²² There seem to be no more recent estimates from ABARE/BREE than (Ball & Loncar, 1991)

²³ (Light, Kolstad, & Rutherford, 1999)

\$23/tonne, the implied social cost is over \$368 million per year, the present value of which substantially exceeds the estimated benefits of the project.

The greenhouse gas impacts of the project estimated in the economic assessment relate only to the direct emissions of the project. To understand the full impacts of the project Gillespie Economics need to incorporate the impact of the increase in coal consumed in the world. This impact is not equivalent to greenhouse from combustion of all of the product coal, as is sometimes contested by anti-coal groups. In the absence of the project, most of this consumption would have been sourced from other coal mines. The economic assessment should, however, include the emission from the additional coal burned as a result of the project.

Interestingly, in Washington State, USA, state government agencies are now beginning to include downstream emission as a part of project assessment processes. The Washington Department of Ecology is using its state environmental policy act to broaden the scope of its assessment beyond state and national boundaries. See:

- <http://www.eisgatewaypacificwa.gov/>
- <http://www.ecy.wa.gov/news/2013/238.html>

Conclusion

The economic impact assessment of the Bengalla extension project contains a number of flaws relating to:

- Input output modelling
- Cost benefit analysis
 - Scope
 - Overstatement of financial benefits
 - Understatement of environmental costs

It is not clear from this assessment that the project represents a net increase in the welfare of the NSW community. This is concerning as economic assessment of major projects has been under close scrutiny, a pattern set to increase under new state regulation. We recommend extensive revision of this assessment before any decision can be made on the future of the project.

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Appendix – Royalty revenue

Table 1: Royalty calculation

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Product coal	Mt	8.7	9.9	11.1	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3
Price	Real AUD/t	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
Revenue	Real AUD (m)	0.0	861.3	980.1	1098.9	1217.7	1217.7	1217.7	1217.7	1217.7	1217.7	1217.7	1217.7	1217.7	1217.7	1217.7	1217.7	1217.7	1217.7	1217.7	1217.7	1217.7	1217.7	1217.7	1217.7
Royalty rate	%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%
Gross royalties	Real AUD (m)	0.00	70.63	80.37	90.11	99.85	99.85	99.85	99.85	99.85	99.85	99.85	99.85	99.85	99.85	99.85	99.85	99.85	99.85	99.85	99.85	99.85	99.85	99.85	99.85
Deductio ns	\$/t	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
Net royalties	r=7%	0.00	39.74	45.22	50.70	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19	56.19
Present value		0.00	37.14	39.50	41.39	42.86	40.06	37.44	34.99	32.70	30.56	28.56	26.69	24.95	23.32	21.79	20.36	19.03	17.79	16.62	15.54	14.52	13.57	12.68	11.85
Total	\$615.00																								