

Response

Following the exhibition of the Amendment Document, a total of 726 submissions were received by DP&E, including 708 public submissions. The public submissions included 116 submissions of support and 588 submissions in objection, as outlined in **Section 3**. Four submissions were received as comments.

There are approximately 331,000 persons currently living in the Central Coast Council Local Government Area and a further 692,000 living in the five adjoining LGAs (ABS, 2016). That is, the equivalent of only 0.18% of the population of the Central Coast LGA has objected to the Project. Further, the equivalent of only 0.06% of the population of the Central Coast LGA (plus the adjoining five LGAs) has objected to the Amended Project. This does not indicate a high degree of public opposition to the Project.

6.4.2 Climate Change

Issue

The NCC asserted that the coal produced by the Project will contribute significantly to climate change. The NCC asserts that significant greenhouse gas and climate change impacts of the project are downplayed and misleading, with a focus on only Scope 1 and Scope 2 emissions.

NCC asserts that it is fundamentally irresponsible for the NSW Government to continue to approve new or expanded coal mine projects at a time when thermal coal prices are at record lows (meaning low royalty returns to the State) and Australia's GHG emission trajectory is moving in the opposite direction to that required for Australia to meet its international GHG emission reduction commitments.

Response

As outlined in Section 6.3.3 of the Amendment Document, the predicted annual direct emissions (Scope 1) represent less than 0.1% of Australia's commitment under the Kyoto Protocol (591.5 Mt CO₂-e). Given that Australia contributed 1.12% of global emissions in 2012 (PBL Netherlands Environmental Assessment Agency, 2015), the Project's contribution to greenhouse gas emissions will be very minor.

The National Greenhouse and Energy Reporting Scheme (NGERS) was introduced in 2007 to provide data and accounting in relation to greenhouse gas emissions and energy consumption and production. In order to avoid double-counting of emissions, NGERS only requires companies to report Scope 1 and Scope 2 emissions, as Scope 3 emissions are reported where the fuel is combusted.

GHG emissions in Australia are currently managed at a national level, through initiatives implemented by the current Australian Government (e.g. the Emissions Reduction Fund).

The issue of greenhouse gas emissions was considered by the PAC in its review of the Project. The PAC review concluded that *“if the recommendations concerning improved strategies to avoid, mitigate or manage the predicted impacts of the project are adopted, then there is merit in allowing the project to proceed”*. With respect to greenhouse gas emissions, the PAC recommended that:

“a condition be added requiring the implementation of methane gas capture and flaring within a specified timeframe and that a proposal be developed for beneficial use of the captured gas within three years of the commencement of longwall operations and to be implemented within a timeframe as required by the Director General”.

WACJV will develop an Air Quality and Greenhouse Gas Management Plan, which will include the reasonable and feasible measures to minimise the Project’s GHG emissions, including the measures recommended by the PAC.

Thermal coal prices have increased by more than 35% so far this calendar year in Australian dollar terms (Index Mundi, 2016). With demand for thermal coal predicted to increase over the next 30 years by the Government sponsored International Energy Agency, the royalties and other socio-economic benefits forecast to accrue to the region and the state of NSW are most likely to exceed that conservatively attributed to the Project in the Economic Impact Assessment.

6.4.3 Impacts to the Drinking Water Catchment

Issue 1

The NCC asserts that the Project will place the Central Coast’s water catchment area under risk. The NCC asserts that the Precautionary Principle should be applied due to the risk of a contaminated discharge into the drinking water catchment.

Response

This issue is addressed in **Section 6.3.10**.

Issue 2

The NCC asserted that the appropriate criterion for consent should be the same as that required under Reg. 10(1) of the *State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011*:

“A consent authority must not grant consent to the carrying out of development under Part 4 of the Act on land in the Sydney drinking water catchment unless it is satisfied that the carrying out of the proposed development would have a neutral or beneficial effect on water quality”

The NCC asserted that the Project will be unable to demonstrate a neutral or beneficial effect on water quality.

Response

The Amended Project is not located within the Sydney drinking water catchment, as defined under *State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011* (Sydney Water SEPP). Therefore, the requirement for a 'neutral or beneficial effect on water quality' under clause 10 of the Sydney Water SEPP does not apply to the Amended Project.

In any case, only treated water will be discharged from the Tooheys Road Site which is located outside of the Central Coast's drinking water catchment. WACJV will operate a water treatment plant to ensure that the quality of the water being discharged is consistent with the background water quality in the receiving watercourse. Therefore, the Amended Project will have a neutral or beneficial effect on water quality.

6.4.4 Impacts to Water Resources

Issue 1

The NCC is concerned that the Project will undermine several waterways causing subsidence, which could cause serious and permanent damage to local aquifers, surface water systems and water supplies. The NCC raises issues including drawdown and aquifer depressurisation, downstream river flow losses, water quality impacts and salinity. NCC asserts that the Project will impact upon water resources threatening water quality and availability in the region.

Response

The impacts referred to by NCC are impacts associated with subsidence. The Amendment did not include any changes to the underground mining activities associated with the Project. As a result, subsidence resulting from the Amended Project will be unchanged from the predictions for the Original Project. The impacts of subsidence due to the Original Project were considered by the PAC in its review of the Project.

The potential impacts of the Project on groundwater systems were assessed in the Groundwater Impact Assessment (Appendix I of the EIS). The potential impacts on surface water resources were assessed in the Surface Water Impact Assessment (Appendix J of the EIS). The impacts of the Original Project on water resources were considered by the PAC in its review of the Project.

Issue 2

NCC cites significant environmental impacts at the Metropolitan Colliery in Sydney's drinking water catchment and West Wallsend Colliery in Sugarloaf Conservation Area, where subsidence exceeded expectations.

Response

As explained in **Section 6.4.3**, the Amended Project is not located within Sydney's drinking water catchment.

Condition 5 under Schedule 3 of the Recommended Development Consent requires the preparation of an Extraction Plan. The Extraction Plan will include a Subsidence Monitoring Program. If subsidence monitoring results indicate greater than predicted levels of subsidence, adaptive management measures will be implemented to further minimise subsidence effects.

6.4.5 Health Impacts

Issue 1

The NCC notes that the Project will be located amid new growing suburbs, putting the health of these residents at risk. The development of the mine and extraction and transport of the coal will result in emissions of particulate matter (PM₁₀ and PM_{2.5}). NCC asserts that the Project should be refused based on the health risks associated with air pollution from mining, stockpiling and transporting coal so close to residential development.

Response

Both the size and composition of particulate matter are important in determining potential health impacts due to exposure. The assessment of impacts from exposure to PM was completed in accordance with the Approved Methods, which requires an assessment of all particles (regardless of composition) against impact assessment criteria for particle sizes PM₁₀ and PM_{2.5}.

Fine particles (PM_{2.5}) are derived primarily from combustion processes (such as vehicle emissions). In contrast, mechanically generated coal dust is composed of predominantly coarse particulates (i.e. greater than PM₁₀). Particulate emissions from underground mining operations contain a smaller fraction of fine particulate and a higher proportion of relatively inert (crustal) material when compared to diesel particulates.

As outlined in **Section 5.13.1**, the primary sources of emissions during the operations phase include coal handling activities at the Tooheys Road Site (e.g. conveyors and stockpiles) and the upcast ventilation shaft at the Buttonderry Site. All of these sources were considered in the dispersion modelling undertaken for the AQGGAA. The incremental PM₁₀ and PM_{2.5} concentrations generated by the Amended Project are predicted to be below the relevant impact assessment criteria at all private receptors. The Amended Project is also predicted to comply with the criteria for total suspended particulates (TSP) and dust deposition.

Additional responses to submissions concerning health impacts are provided in **Section 5.13**.

6.4.6 Stream Flow in Little Jilliby Jilliby Creek

Issue

The NCC asserts that the impacts of subsidence on Little Jilliby Jilliby Creek will lead to loss of water flow and cause significant impact to the fauna of the area including threatened frog species.

Response

The Amended Project does not change the already assessed potential impacts on Little Jilliby Jilliby Creek and other surface aquatic features in the mining area.

Previous assessment shows that flow volumes in Little Jilliby Jilliby Creek are unlikely to be affected by subsidence effects. Potential impacts on stream flows will be mitigated by the presence of alluvium. Even if subsidence results in fracturing of the bedrock at the base of the alluvium, the cracks are expected to be naturally in-filled by the alluvial sediments. The volume of water that may be diverted into fractures is negligible compared to the total flow in the stream.

The FLAC modelling of rock fracturing described in the EIS has predicted that there will be a significant constrained zone (free of connective cracking between the surface and the mine workings) that prevents free draining of surface water. This matter was considered by the PAC, which accepted the assessments undertaken for the Project. In the absence of significant impacts on stream flows in Little Jilliby Jilliby Creek, impacts to aquatic species are not expected to occur.

6.4.7 Adverse Impacts to Native Plants and Animals

Issue 1

The NCC raises concerns regarding impacts to native flora and fauna, particularly listed threatened species.

Response

As outlined in **Section 5.8.3**, OEH has reviewed the Amended Project and acknowledges that the Amendment reduces the disturbance footprint, which reduces the extent of impacts to native vegetation communities (including EECs).

OEH notes that the biodiversity offset strategy proposed for the Amended Project remains unchanged and that due to the reduction in the disturbance footprint, the offset ratios for the Amended Project are higher than the ratios presented in the EIS.

6.4.8 Economics Assessment

Issue

The NCC notes that an Economic Impact Assessment has been undertaken by Gillespie Economics. The NCC asserts that this assessment should be “*confirmed by a genuinely independent economic analysis produced by an independent and credible agency*”.

Response

The Economic Impact Assessment of the Amended Project has been undertaken in accordance with the NSW Government (2015) *Guidelines for the economic assessment of mining and coal seam gas proposals*. It was peer reviewed by Drew Collins, Managing Director of BDA Group and a former Executive Director of Economics at the NSW Environment Protection Authority.

6.5 LOCK THE GATE ALLIANCE

6.5.1 Public Health

Issue

The Lock the Gate Alliance asserts that even small increases in particulate pollution may have real impacts on local health and mortality.

Response

Refer to the response in **Section 5.13.1**.

6.5.2 Drinking Water Supplies

Issue

The Lock the Gate Alliance asserts that the Project will present risks to the safe drinking water supply of 150,000 residents of Wyong Shire.

Response

Refer to the response in **Section 6.3.10**.

6.6 THE AUSTRALIA INSTITUTE

6.6.1 Independence of TAI

Issue

TAI state that:

“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.

The Institute is wholly independent and not affiliated with any other organisation. As an Approved Research Institute, donations to its Research Fund are tax deductible for the donor”.

Response

Gillespie Economics notes that TAI is far from independent. It was founded two decades ago by a former Greens Party candidate. The last two Executive Directors are also former Greens Party staffers.

TAI is on the public record as opposing all coal mining projects and it has prepared submissions opposing numerous NSW coal mining proposals and criticising their Economic Assessments. Gillespie Economics is of the belief that TAI's views on the economic assessment of coal projects are without merit and at odds with the views of reputable economists and agencies including ACIL, Centre for International Economics, Deloitte, AIGIS Group, BAEconomics (Dr Brian Fisher OA), Economic Consulting Services, Gillespie Economics, BDA Group, Professor Jeff Bennett (ANU), Professor John Rolfe (Central Queensland University), the Department of Planning and Infrastructure and NSW Treasury. While economic assessments undertaken by Gillespie Economics for EISs are peer reviewed, often twice, "assessments" of the TAI are not and largely represent unsubstantiated statements and misrepresentations.

6.6.2 Benefits of the Project

Issue

TAI asserts that the economic assessment is flawed and overstates the benefits of the Project while understating its costs. While the economic assessment concludes that the Project would bring considerable net economic benefits, the Project is unlikely to be financially viable and would likely result in a net cost to the NSW community.

Response

The Economic Impact Assessment of the Wallarah 2 Project has been undertaken in accordance with the NSW Government (2015) Guidelines for the economic assessment of mining and coal seam gas proposals. It was peer reviewed by Drew Collins, Managing Director of BDA Group and a former Executive Director of Economics at the NSW Environment Protection Authority.

Mr Collins states in the peer review *"Gillespie Economics has prepared a sound report, employing methods and an approach to the presentation of results consistent with best practice economic assessment principles....I believe the requirements of the Secretary's Environmental Assessment Requirements (application SSD 4974) in relation to the economic analysis have been adequately addressed.I have also found the analysis and its documentation to be consistent with the NSW Government (2015) Guidelines."*

6.6.3 PAC Review of Previous Economic Assessment

Issue Overview

TAI asserts that the last economic assessment of the project was described by the Planning Assessment Commission as "not credible".

Response

In coming to this conclusion, Gillespie Economics notes that the PAC relied unquestioningly on the submission of Roderick Campbell, Economists at Large (EAL) (the same author of the TAI submission to the current project), despite the contrary view of the Department of Planning and Infrastructure (2014) in its Preliminary Assessment of the Project.

Each of the matters raised by EAL and relied on by the PAC in relation to the previous proposal have been found to be erroneous and each of these is considered below.

Issue 1

The estimated royalties of the project are an over-estimate as multiple deductions can significantly reduce the amount payable (by as much as \$3.50 per tonne, i.e. nearly 50%) and the claimed benefits are based on full production whereas NSW mines characteristically produce less per year than their authorized extraction limits. On this basis Campbell (2014) suggests that a reasonable lower estimate for royalties from the project would be 50% of those estimated for the Project

Response

This entire discussion is incorrect. Deductions do not reduce the royalty estimates by as much as \$3.50 per tonne. They have virtually no impact on royalties' payable since they are subtracted from total revenue before the application of the royalty rate rather than after the application of the royalty rate as claimed by EAL. EAL admitted this error on the front page of the Newcastle Herald, 15 September 2014.

Furthermore, the main deduction applicable to coal mines relates to the beneficiation ("washing") of coal. This is not relevant to the Project as the product coal does not require washing. The royalty calculation made in the previous (and current) Economic Impact Assessment of the Project included an appropriate allowance for deductions and the calculation of royalties was not based on full production (5 Mtpa) but on the expected production profile (which averaged 4 Mtpa).

Issue 2

The estimated tax revenue associated with the Project is overstated as it is based on a 30% company tax rate, but the effective tax rate for mining companies is generally well below this at 14-18%.

Response

An analysis of Australian Tax Office data by Dr Sinclair Davidson (2014), Professor of Institutional Economics at RMIT University and a Senior Fellow at the Institute of Public Affairs found that the Australian mining industry pays corporate tax at a rate close to 30% of its taxable income.

The studies referred to by EAL do not support its claimed effective tax rate. One study calculates the effective tax rate for the mining sector in relation to Gross Operating Surplus (GOS) NOT taxable income. The Australian Treasury has rejected GOS as an appropriate denominator for estimating effective tax rates (Clark et al, 2007). The authors of the other study, in response to the inappropriate quoting of their work, have issued a press release that states, among other things, that they have read the analysis of Professor Sinclair Davidson and do not disagree with his conclusions.

Refer to Attachment 11 of the current Economic Impact Assessment (Appendix J of the Amendment Document) for a detailed discussion of this issue.

Issue 3

The use of Input-Output modelling to generate estimates of flow-on employment creation is thoroughly discredited.

Response

Gillespie Economics asserts that this is incorrect. Input-output analysis continues to be an acceptable method in the current NSW Guidelines (2015), for assessing local effects of mining projects. Gillespie Economics is of the view that TAI has misrepresented the views of others. Refer to the detailed discussion below and Attachment 4 of the Economic Impact Assessment of the current Wallarrah 2 Project.

Issue 4

The economic analysis in the EIS largely ignores the externalities.

Response

This is incorrect. Gillespie Economics has confirmed that the potential reasonable worst case biophysical impacts of the Project as identified in the EIS were relied upon when considering the economic consequences of the Project.

Issue 5

The inclusion of the social value of employment is thoroughly discredited.

Response

This is incorrect. There is fundamental theoretical and empirical support for the inclusion of such values (refer to Attachment of 7 of the current Economic Impact Assessment (Appendix J of the Amendment Document)). TAI in its current submission to the Amended Project now acknowledges the potential for the existence of such values. Notwithstanding, in the Economic Impact Assessments for both the Original Project and the Amended Project, results are reported "with" and "without" the inclusion of these values. Hence, whatever a person's view is on the existence or magnitude of these values, the discussion of them cannot be considered to be a flaw of the Economic Impact Assessment.

Issue 6

The unreliability of the Proponent's estimates of project benefits across different Economic Impact Assessments as summarized by Campbell (2014) is staggering.

Response

Gillespie Economics is of the opinion that Campbell's comparison of project benefits for the Original Project and Amended Project was not a like for like comparison. Consecutive Project assessments related to different projects (e.g. life of mine and continually updated financial models) and the results reported by Campbell purportedly representing a comparison relate to different scales i.e. he compared the global benefits and costs of the 2008 Project to the national costs and benefits of the 2013 Project, rather than like for like.

6.6.4 Net Benefit Differences in 2008, 2013 and 2016 Analyses

Issue

TAI states that the huge differences in estimates of the Project net benefits between analyses of the Project in 2008, 2013 and 2016 is not adequately explained.

Response

No comparative analysis has ever been undertaken since it is neither relevant nor a requirement under the EP&A Act to compare current assessments to previous assessments.

What is relevant is the outcome of a robust assessment utilising contemporary government guidelines of the current Project for which approval is being sought. However, Gillespie Economics notes that the difference in results of the current Economic Impact Assessment (Appendix J of the Amendment Document) to the previous Economic Impact Assessments are simply a result of:

- Each assessment relating to different project descriptions (e.g. the 2008 analyses related to a project with an operating life of 37 years compared to the current project with a life of 28 years);
- Updating of the detailed financial model on which the Economic Impact Assessment is based using contemporary information, including different coal price assumptions; and
- Reporting of the results at different scales based on evolving requirements of guidelines (e.g. the 2008 Economic Impact Assessment reported the net benefits of the Project to whomever benefits accrued (globally) but also included discussion of benefits to NSW (not reported by TAI), whereas the 2013 and 2016 analyses reported the results globally, nationally and for NSW, although TAI compares the national results in the 2013 analysis to the NSW results in the 2016 analysis).

6.6.5 Criticisms of Other Economic Assessments

TAI asserted that there are flaws in assessments undertaken by Gillespie Economics for other projects. Whilst these criticisms are not directly relevant to the Project, they have been addressed for completeness.

Issue 1

Gillespie's flawed assessment of the Warkworth Extension Project was a key contributor to the LEC decision to overturn that projects approval.

Response

The Economic Assessment undertaken by Gillespie Economics of the Warkworth Extension Project was supported in the Director General's Environmental Assessment Report (2011), the Planning Assessment Commission's report (2012) and evidence to the Land and Environment Court (LEC) by Professor Jeff Bennett, Australian National University - Australia's leading academic in the area of cost benefit analysis and nonmarket valuation.

A discussion over the LEC's consideration of economic debate over the Warkworth Extension Project is summarised in the peer reviewed Journal paper *Gillespie, R. and Bennett, J. (2015) Challenges in including BCA in planning approval processes: Coal mine projects in New South Wales, Australia, Journal of Benefit Cost Analysis*, Vol. 6(2).

It is noted that a subsequent economic assessment of the Warkworth Continuation Project and Mt Thorley Continuation Project undertaken by BAEconomics also concluded that the benefits of the projects would outweigh the costs and that it would provide significant economic contributions to the region and State. This project was ultimately approved by the PAC.

Issue 2

Gillespie's assessment of the Ashton SE Open Cut project was abandoned by the proponents of Yancoal when the project was challenged in court.

Response

The Gillespie Economics assessment was not abandoned as claimed by TAI. Yancoal engaged an independent economist (Dr Fahrer from ACIL economics) to give evidence to the LEC in relation to the economics of the Ashton SE Open Court Project. Dr Fahrer's evidence states that the "*various criticisms made by Mr Campbell of the Gillespie CBA are, mostly, wrong.*" NSW LEC 129 (2014, p.161)

Issue 3

Gillespie's assessment of the Cobbora coal project estimated a net benefit of \$2 billion. The unviable project had to be abandoned by the proponents at a cost of tens of millions to the NSW taxpayer and the community of Dunedoo.

Response

It is the opinion of Gillespie Economics that TAI fails to understand the difference between economic and financial analysis (refer to the detailed discussion in **Section 6.6.6** in relation to the Project).

The Economic Assessment of the Cobbora Coal Project did not assess the financial viability of the project. Rather, it assessed the economic benefits of the Cobbora Coal Project, should it proceed as proposed by the proponent. The Director General's Environmental Assessment report (2014, p.3) agreed with the findings of Gillespie Economics stating that the "project's benefits outweigh any costs".

The NSW PAC's Determination Report (2014, p. 9) also agreed that "the project would generate economic benefits for the State and the region that outweigh the social costs", and the Project was approved.

Issue 4

Gillespie's assessment of the T4 coal terminal estimated net benefits of the T4 proved a huge overestimate, with an independent review by CIE concluding that "the assumptions adopted for the scenarios modelled by the Proponent are likely to present an optimistic view of the likely benefits to society arising from the Project. The project looks unlikely to proceed."

Response

The Economic Assessment of the T4 Project was based on forward take or pay contract bids at the time of the analysis. At the time of the review by the Centre for International Economics (CIE) almost two years later, the market had softened as had take-or-pay contract bids. Whether the estimated net benefits of the T4 Project ultimately ends up to be an overestimate will depend on future market conditions and is not known at this time.

However, the independent review of the Economic Impact Assessment by CIE concluded that *"even under the Proponent's most pessimistic assumptions (undertaken as part of the sensitivity analysis) the Project still generates around \$1 billion (in present value terms) in additional royalties and company tax."*

The CIE did not state that the project looks unlikely to proceed (as implied by TAI by providing no end to quotations marks), and there is no indication from the Proponent that the project looks unlikely to proceed.

6.6.6 Financial Viability of the Project

Issue

TAI asserts that the Project is unlikely to be financially viable. The economic assessment overestimates the financial viability of the Project.

Response

This comment erroneously confuses the Economic Impact Assessment reported in the EIS (Appendix V) with a financial assessment. The EIS presents an economic analysis in accordance with the requirements of the EP&A Act and associated guidelines, as distinct from a financial analysis. The former is about the aggregate benefits and costs of the Project to Australia and NSW, whereas the latter is about the financial implications to a specific entity, in this case Wyong Areas Coal Joint Venture. There is no requirement for the EIS to consider the financial implications of the Project for the proponent. The Economic Impact Assessment makes no comment on the financial viability or profitability of the Project.

As identified by the NSW Department of Planning and Environment (2015, p. 47-48):

"The profitability of the proposal is not a relevant matter for consideration under Section 79C of the EP&A Act.

International mining companies routinely make investment decisions across their portfolios that on the surface may appear sub-economic, but for other strategic reasons are attractive to the broader business. Even if [the proponent] does not make a significant profit from the mine, the State would still realise the royalties for each tonne of coal produced, a significant number of people would be employed, and there would be a range of associated flow-on benefits for the regional economy.

Ultimately, if the mine is truly not economically viable (as claimed in many submissions) the project would be unlikely to proceed. This would result in the claimed benefits of the project not being realised, but would equally mean that none of the impacts of the mine would eventuate either."

6.6.7 Purpose of Seeking the Amended Project

Issue

TAI asserts that the Project is unlikely to be financially viable currently or in the foreseeable future but consider that approval is being pursued not because it is profitable but for corporate strategic reasons such as:

- Banking approval for potential future development;
- Approval would add to the sale value of the project; and
- Lack of approval would result in an asset write down, with implications for the company balance sheet and the careers of the people responsible.

Response

All these corporate strategic reasons proffered by the TAI for the pursuit of the Project actually point to the financial viability of the Project. Gillespie Economics notes that banks do not lend funds without due diligence and would not knowingly fund financially unviable projects. The sale value of an asset reflects its potential future profits.

Approvals would only add to the sale value of the asset if the mining operation was profitable. Lack of approval would only result in an asset write down if the Project was profitable.

6.6.8 Project Operating Costs

Issue

TAI identify that the key reason the economic assessment overestimates the financial viability of the Project is its low figure for operating costs. TAI suggest that this makes the Project one of the cheapest mines to operate in the world and certainly cheaper than almost every mine in Queensland.

Response

As identified above, the Economic Impact Assessment (Appendix J of the Amendment Document) is not concerned with the financial viability of the Project.

With regard to operating costs, the Project will be a relatively low cost mine to operate. The mined coal requires no washing and hence coal handling and preparation costs per tonne are minimal and there is no loss of coal volume during processing (i.e. from ROM to product coal).

In addition, the Project is located close to the Port of Newcastle and hence rail costs are less than for projects located further away. This is in contrast to the mines in Queensland that TAI is comparing the Project's operating costs to.

6.6.9 Sensitivity Analysis

Issue

TAI asserts that Gillespie Economics' sensitivity analysis does not test the sensitivity of the net production benefits to a change in operating costs.

Response

This statement is incorrect. Gillespie Economics identifies that the net social benefits of the Project to NSW (which are almost entirely net production benefits) are tested for plus and minus 20% changes in the operating costs of the Project. It is found that under these scenarios the net social benefits of the Project to NSW range from \$246 M to \$303 M present value (at 7% discount rate).

6.6.10 Coal Price

Issue

TAI asserts that Gillespie Economics has used a coal price of AUD100 per tonne, substantially above the current AUD price of \$88, and far above the long term Treasury forecast of around \$80.

Response

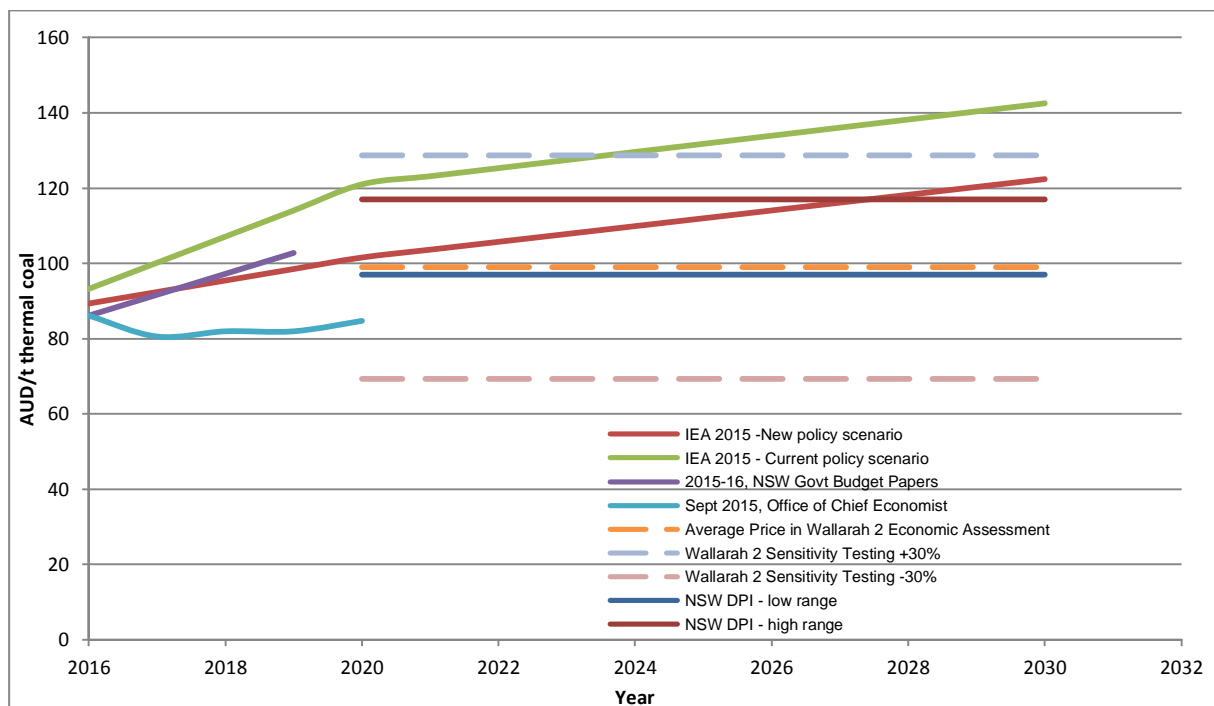
It is not current or historic coal prices that are relevant to the analysis but forecast prices during the 28 years of the mining operation, where coal production would not commence until around 2020. Hence the relevant coal price is the price from 2020 onwards.

The Economic Impact Assessment provides a clear analysis of coal prices and the forecast used. It was based on coal price forecasts of Wood Mackenzie and a USD/AUD exchange rate of 0.72. Wood Mackenzie is a leading global energy, metals and mining research and consultancy group.

A comparison was provided of this forecast and a range of other forecasts and assumed coal prices. Refer to **Figure 22** (Figure 4.2 of the Economic Impact Assessment, Appendix J of the Amendment Document).

The Wood Mackenzie forecast coal prices used in this analysis are at the lower end of most coal price forecasts/assumptions. Nevertheless, it is recognised that there is uncertainty around future coal prices (valued in USD) as well as the USD/AUD exchange rate. Therefore, the assumed coal prices (in AUD) have been subjected to sensitivity testing for +/- 30% changes in AUD coal price as part of the Economic Impact Assessment (see Section 4.8, Appendix J of the Amendment Document). This encompasses even the most pessimistic price forecasts from the Office of the Chief Economist.

Figure 22
Thermal Coal Price Forecasts/Assumptions



TAI refers to a 2014 Treasury Working Paper (Bullen et al, 2014) as an authoritative position on coal price forecast. However, the Commonwealth Treasury does not provide a long term coal price forecast in any of its budget papers and the views expressed in the referenced working paper were those of the authors not the Australian Government.

The TAI does not consider the International Energy Agency's (IEAs) modelling of scenarios as forecasts. However, the IEA (2015) entire report relates to demand, supply, price and quantity modelling of various energy sources under different policy scenarios. The IEA (2015, p. 269) report that "Steam coal prices are projected to rebound in the medium term, as global demand and supply adjust, to reach almost \$110/tonne in real terms by 2040".

By way of reference the spot price for thermal coal in October 2016 was US\$100 (i.e. AUD\$128 at an exchange rate of 0.78). The 10 year average monthly thermal coal price² is AUD102/t (Index Mundi, 2016).

² Australian thermal coal, 12000- btu/pound, less than 1% sulfur, 14% ash, FOB Newcastle/Port Kembla, Australian Dollar per Metric Ton

While the Economic Impact Assessment refers to the IEA forecasts and others, to demonstrate the reasonableness of the price assumptions used, the price forecast used in the Economic Impact Assessment were those of Wood Mackenzie (which is more conservative).

6.6.11 Transmission Lines

Issue

TAI identifies that the Project underlies high voltage transmission lines. TAI asserts that Gillespie Economics' assessments have not considered how this issue could affect the viability of the Project or its potential net benefit to the NSW community. Sensitivity analysis should be conducted to assess what volumes of coal might be affected, the timing of any sterilisation and how this affects the viability of the Project. Potential costs to infrastructure owners, governments and power users should also be considered.

Response

As explained in Section 6.3.9, WACJV recently entered into a Process Agreement with TransGrid.

The works under the Process Agreement would come at a cost to WACJV but any such cost would be negligible in the context of the overall Project costs and therefore would have little impact on the net benefits of the Project. Sensitivity testing in the Economic Impact Assessment (Appendix J of the Amendment Document) included a scenario of 20% increase in the development costs of the Project. This reduced the net benefit of the Project to NSW from \$274 M (present value) to \$269 M (present value).

Sterilisation of coal would only occur if other measures were found to be unsuitable. The sensitivity analysis included a 30% reduction in the value of coal, which is equivalent to assuming a 30% reduction in volume of coal (with no offsetting reduction in operating costs). The coal that would need to be sterilised in the vicinity of the transmission line towers, if other measures to protect the towers could not be found, would be considerably less than 30% of the coal resource. Nevertheless, even under this scenario the Project would have net benefits to NSW of \$148 M.

6.6.12 Water Resources

Issue

TAI asserts that the potential effects of the Wallarah 2 Project on water resources have been hugely controversial. It is inappropriate for the economic assessment to include no detailed consideration of these impacts and to assume that all impacts will be offset by mitigation measures.

Response

The biophysical groundwater and surface water impacts of the Project are considered in detail in Section 2.2 of the Economic Impact Assessment (Appendix J of the Amendment Document). This consideration is based on the analysis of water impacts in the EIS, the PAC (2014) Review Report and the DP&E Environmental Assessment Report (2014).

The consideration of water issues from an economic perspective are specifically addressed in Section 4.4.2 of the Economic Impact Assessment (Appendix J of the Amendment Document).

As identified in Section 4.4.2 groundwater modelling indicates that the effects on the alluvial groundwater system will be minor and transient. The Extraction Area of the Project covers only a small percentage of the entire combined Gosford Wyong Water Supply Scheme catchment area (about 5%), the majority of which lies within the Wyong State Forest. There will be some minor alterations to flows of drainage lines in these areas as a result of subsidence. However, the overall impact to the water supply will be negligible.

Nevertheless, WACJV will obtain WALs for 300 ML (see **Section 5.2.1**) which is the predicted maximum worst case redirection of surface runoff which will be temporarily stored in alluvial soils over longwall panels, thereby reducing potential runoff contributions until such time as the alluvial areas equilibrate and near normal runoff is re-established. By purchasing these WALs from other water users, the Project will result in no additional water take from the catchment. The Economic Impact Assessment includes the opportunity cost of holding these WALs.

Mine inflows are predicted to occur at a maximum rate of 912.5 ML per annum. Mine inflows are primarily sourced from the coal seam or the deep overburden strata within the fractured zone, rather than from streams or alluvial aquifers. WACJV will obtain WALs to account for the predicted groundwater take. It is proposed this groundwater will be pumped to the surface and treated in the water treatment plant in accordance with the Water Management Plan. The reject stream will be disposed of in the underground workings and the treated water product will be used for operational purposes and / or discharged into adjoining streams in accordance with an appropriate Environmental Protection Licence (EPL).

Groundwater modelling has shown that the effects on the alluvial groundwater system will be minor and result in negligible effects on stream flows. No impacts are expected from the Project on groundwater users within the regional aquifers due to the lack of connective cracking to the underground workings of the Project (Mackie Environmental Research, 2013).

6.6.13 DLALC's Proposed Residential Development

Issue

TAI asserts that a key part of the controversy around the Wallarah 2 Project has been its potential impacts on land owned by DLALC and the various developments existing and planned for this area. The economic assessment includes no consideration of costs that might be imposed on the Darkinjung in either the cost benefit analysis or the local effects analysis. This may serve to heavily understate the costs of the Project at a local level.

Response

The CBA is based on technical assessments in the EIS, including those of the noise impacts on surrounding land uses. The technical assessments of noise impacts on adjoining land is based on their current land zoning. Under this approach there is no impact on the vacant industrial and environmental protection zoned land owned by the DLALC, and hence no impact for inclusion in the economic analysis.

However, different noise criteria apply to residential land and the potential impact of the Project on DLALC's proposed residential development can be estimated based on the probability of rezoning, the uplift in land value from a rezoning and the area of land potentially rezoned to residential that would be impacted by the Project (and hence unable to be rezoned).

The proposal from the DLALC is to rezone land currently zoned IN1 – General Industrial and RU6 – Transition, to R2 – Low Density Residential.

The land zoned IN1 and RU6 is valued by the Valuer General at around \$10,000/ha and \$5,000/ha, respectively (based on NSW Globe Valuer Generals valuations for 2015). Undeveloped land immediately to the north of the rezoning proposal that is zoned R2 is valued by the Valuer General at around \$55,000 per ha (NSW Globe). Thus rezoning would result in an uplift of around \$50,000/ha.

The Project is estimated to impact 9.8 ha of land that is the subject of the entire rezoning application (not all of which is proposed to be residential) and 3.3 ha of land identified in the rezoning application as future residential lots. However, as the boundaries of the proposed residential land have not been finalised, nor has pre-rezoning consultation been undertaken by the Central Coast Council (as directed by DP&E), the WACJV, Boral or other surrounding existing or proposed industrial developments, a significant potential exists for the design to be adjusted to avoid any impacts without loss of land allocated to residential.

This is further supported by written advice to the Wyong Shire Council (now Central Coast Council) dated 2 May 2016 from Monica Gibson from DP&E regarding the rezoning proposal who stated *"The gateway allows the proposal to proceed to the next stage but given the need for further investigation and consultation, it is not possible to commit to a particular development footprint or planning provisions at present. Further investigations and consultation should be used as the basis for determining the appropriateness of the proposed planning provisions and the location of zone boundaries"*.

Notwithstanding, if it were assumed that the maximum 9.8 ha of future residential land is impacted and that rezoning occurred now, the economic value of the impact would be \$0.5 M. However, the probability of the rezoning being successful is not 100%. The risk weighted impact of the Project on the DLALC Proposed Residential Development at different probabilities of rezoning success is provided in **Table 13** and range from \$0 M to \$0.5 M. These impacts are lessened the further into the future that any rezoning occurs. Further discussion regarding DLALC's proposed residential development is included in **Section 5.1.6**.

Table 13
Impact of the Wallarah 2 Project on Land Proposed to be Rezoned

Probability of Rezoning	0%	20%	50%	80%	100%
Impact on Darkinjung Land	\$0.0	\$0.1	\$0.2	\$0.4	\$0.5

Even with substantial changes in the assumed land values, the omission of this impact from the Economic Impact Assessment does not materially affect the net social benefits of the Project to NSW and certainly does not "serve to heavily understate the costs of the Project at a local level" as suggested by TAI.

6.6.14 Company Tax

Issue

TAI identifies that there is no transparency around the calculation of \$220M in company tax from the Project and that given the complexities involved in company tax payments, this is inappropriate and serves to overestimate the benefits of the Project.

Response

The estimate of company tax was based on the application of the 30% corporate tax rate and the findings of Davidson (2014) to estimate the taxable income from the Project. An analysis of Australian Tax Office data by Dr Sinclair Davidson (2014), Professor of Institutional Economics at RMIT University and a Senior Fellow at the Institute of Public Affairs found that the Australian mining industry pays corporate tax at a rate close to 30% of its taxable income.

Taxable income was based on estimated revenues less operating costs less royalties less depreciation, with losses in any particular year carried forward in time. This information is commercial-in-confidence but can be made available to an independent reviewer commissioned by the NSW DP&E.

However, in accordance with the NSW Government (2015) guidelines which require a focus on the costs and benefits to NSW, only 32% of this accrues to NSW. Hence the major benefit to NSW from the Project is the royalties. Even if it were assumed that no company tax accrues to NSW, there would still be significant net benefits of the Project to NSW.

6.6.15 Employment Values

Issue

TAI asserts that it is debatable whether a nonmarket value for employment would exist for a coal mine in a sensitive catchment area and considers that the social value of employment for the Project is overstated. TAI compares the nonmarket value for employment used in the Economic Impact Assessment to the subsidy provided by the Government to Ford.

Response

TAI has previously vehemently denied the existence of a nonmarket value for employment despite overwhelming theoretical and empirical evidence for its existence, as provided in Attachment 7 of the Economic Impact Assessment (Appendix J of the Amendment Document).

In its submission, the TAI now embraces the concept but questions whether this value exists for a coal mine in sensitive catchment areas. This is despite at least two primary nonmarket valuation studies (reported in Attachment 7 of the Economic Impact Assessment, Appendix J of the Amendment Document) showing the existence of these values for coal mines operating within sensitive catchment areas and the absence of any studies that show that they do not exist.

The magnitude of the nonmarket values of employment referred to in the Economic Impact Assessment is based on benefit transfer from a primary nonmarket valuation study surveying NSW households in relation to a coal mine in a sensitive catchment in NSW. Gillespie Economics states that TAI has no basis on which to question their magnitude (e.g. another study suggesting a different quantum). Instead TAI compares the nonmarket values for employment to the government subsidy paid to Ford, one that attracted criticism from economists.

This is an illogical comparison since nonmarket values of employment are public good values (i.e. they are the aggregations of values held by individual households in NSW for the employment of others). They bear no relationship to the arbitrary level of subsidy that a government chooses to pay a car manufacturer.

Similarly, the Statement by TAI about economists' opposition to a subsidy to a car manufacturer says nothing about the level of nonmarket values that households have for the employment of others.

Notwithstanding, the Economic Impact Assessment recognises that estimation of the nonmarket values of employment is a new area in economic valuation and that some people may view this as contentious. To allow for this, the results of the CBA for the Project are reported "with" and "without" the nonmarket values for employment being included.

6.6.16 Local Effects Analysis

Issue

TAI asserts that the "Supplementary Local Effects Analysis" is based on thoroughly discredited input-output modelling.

Response

The Local Effects Analysis in the Economic Impact Assessment is undertaken in accordance with the NSW Government (2015) Guidelines. In addition, to capture flow-on effects a supplementary local effects analysis was undertaken using input-output analysis. This is consistent with the NSW Guideline (2015, p. 23) which states that *"second round effects can be extremely important for local communities and therefore considered as part of the LEA. A range of techniques are available for estimating second round or flow-on effects. These include CGE (computable general equilibrium)-modelling, Input-Output (I-O) or multiplier analysis."*

As well as being supported in the NSW Government (2015) Guidelines, IO analysis is identified by the World Bank economist Mustafa Dinc (2015) as providing a solid framework to analyse the interdependence of industries in an economy and as being one of the most widely used tools in regional economic analysis.

The method is further supported by independent peer reviews (commissioned by DP&E) of economic assessments of mining proposals. For example, CIE (2015, p. 28) states that:

"The IO methodology is reasonable but should be considered an upper bound of the regional effects".

TAI has repeatedly misrepresented the views of ABS, NSW Treasury and the Productivity Commission in relation to input-output analysis. This is addressed in detail in Attachment 4 of the Economic Impact Assessment.

As identified by the Peer Reviewer of the Economic Impact Assessment, Drew Collins, Managing Director of BDA Group:

"Both the LEA and Supplementary I/O analysis are premised on a number of assumptions. The LEA, consistent with the Guidelines, considers the wage impact on people employed by the project who are resident in the region at the time of the proposal; it assumes that these people were already locally employed; it ignores any employment effect in relation to the backfilling of their previous positions; and ignores the income spending of others who migrate into the region and are employed by the project. Collectively, these assumptions will result in the LEA understating actual impacts."

On the other hand, the I/O analysis relaxes the 'full employment' assumptions and better captures the impact of project employment on broader employment in the region and the effect of expenditures by those entering the region. However, by ignoring potential crowding out of economic activity in other sectors in the region, the I/O analysis will typically overstate actual impacts.

In short, the LEA and I/O analyses (presented in the supplementary local effects analysis) provide lower and upper estimates of local impacts, and this has been noted by Gillespie Economics."

6.7 CENTRAL COAST GREENS

6.7.1 Loss of Resident Amenity

Issue

The Central Coast Greens raised concerns regarding loss of resident amenity for those who move into this urban growth area, particularly DLALC's proposed residential development.

Response

Refer to the following sections for responses to specific issues raised:

- **Section 5.1.6** – potential impacts on DLALC's proposed residential development;
- **Section 6.1.7** – road traffic, particularly during construction stages with its effect on highly localised diesel pollution from trucks;
- **Section 5.7.1** – noise impacts, including from truck and train movements and coal loading activities;
- **Section 6.3.8** – stress due to increased ambient noise;
- **Section 5.12.4** – air quality impacts (including from coal transportation) and health implications;
- **Section 5.1.5** – Visual Impacts.

6.7.2 Impacts to Water Supply

Issue

The Central Coast Greens raised concerns regarding the potential impacts of the Project on the infrastructure comprising the Central Coast water supply scheme. The Central Coast Greens asserted that the Federal Environment Minister should utilise the 'water trigger' under the EPBC Act to stop this proposal from proceeding.

Response

The potential impacts to infrastructure due to subsidence were assessed in the Subsidence Predictions and Impact Assessments (Appendix H of the EIS). No components of the water supply scheme are located within the Subsidence Impact Limit.

Sections 24D and 24E of the EPBC Act provide that an approval is required for any 'large coal mining development' that is likely to have a significant impact on water resources. Sections 24D and 24E are not absolute prohibitions on coal mining developments, as suggested by the Central Coast Greens. Rather, sections 24D and 24E trigger the requirement to obtain an approval under Part 9 of the EPBC Act.

WACJV has submitted an application for approval under Part 9 of the EPBC Act. On 22 October 2013, the Minister for the Environment declared sections 24D and 24E to be controlling provisions for the Project. WACJV will not commence development until it has been granted an approval under the EPBC Act.

6.8 AUSTRALIAN CONSERVATION FOUNDATION

6.8.1 Economics

Issue 1

The ACF notes that the Economic Impact Assessment (Appendix J of the Amendment Document) assess the economic benefits of the Amended Project as a whole, rather than being confined to the Amendment alone.

Response

The Economic Impact Assessment was undertaken for the Amended Project as a whole, rather than the Amendment alone. The economic benefits of the Project as a whole were re-assessed to reflect the change in economic conditions since the previous assessment and to meet the requirements of an updated guideline on assessment methodology.

Issue 2

The ACF asserts that the predicted employment benefits are highly inflated and misleading.

Response

The employment impacts are not highly inflated and misleading but provide a range based on the highly conservative LEA methodology in the NSW Government (2015) Guideline and the less restrictive assumptions of input-output analysis. Input-output analysis is discussed further in **Section 6.6.3**.

Issue 3

The ACF asserts that the predicted employment benefits are unlikely to be realised as Kores is withdrawing from overseas development.

Response

Refer to the response in **Section 6.3.3**.

Issue 4

The ACF asserts that the value of royalties is inflated and when taking into account the costs of repair and rehabilitation, easily negates the benefits to the State and local authorities.

Response

Refer to the response in **Section 6.6.3**.

6.8.2 Coal Train Dust Impacts

Issue

The ACF raises concerns about impacts to the air quality at Blue Haven and Wyee, despite partial coverage of infrastructure. The ACF notes that the train wagons are not proposed to be covered.

Response

WACJV recognises the need to maintain the existing amenity for residents in Blue Haven and is committed to implementing best practice dust controls (refer to Table 2). The coal handling infrastructure for the Amended Project has been designed specifically to minimise the potential for dust impacts at Blue Haven. The air quality modelling undertaken for the Amended Project predicts that dust concentrations at Blue Haven and Wyee will be within the relevant air quality criteria.

Section 8 of the AQGGAA (Appendix D of the Amendment Document) calculated that total TSP emissions generated by coal transportation accounted for less than 0.5% of total Project emissions. As a result, any change in ground level concentrations due to this source would be extremely low.

WACJV has committed to water spraying of coal in train wagons to reduce dust emissions. A study of dust emissions from rail transportation at Duralie Coal Mine was completed for the approval of the Duralie Extension Project. The study found that the water spray system utilised at the train loading facility was very effective in controlling dust emissions from rail transport, achieving 99% control of emissions (Katestone Environmental, 2012).

6.8.3 Coal Train Congestion Issues

Issue

The submission raises concern that the Project will exacerbate congestion problems toward the Newcastle terminal. The added times of daily rail crossing closures at Adamstown and Islington need to be disclosed to the Newcastle community.

Response

As explained in **Section 5.1.1**, rail network modelling has determined that there is sufficient network capacity to accommodate the Project's train movements.

The impacts of the Amended Project on the level crossings at Adamstown and Islington were discussed in Section 6.6.3 of the Amendment Document. The train movements associated with the Amended Project are predicted to increase closure times at these level crossings by less than 3%.

6.8.4 Health Impacts

Issue 1

The ACF asserted that PM₁₀ emissions from the site are conservative and do not take into account the changing nature of wind and storm events in recent years. The ACF noted that the Blue Haven and Wyee townships are in close proximity to the Project and that there are schools, pre-schools and establishments within 5 km of the facility.

Response

Refer to the response in **Section 6.3.7**.

Issue 2

The ACF refers to the submission made by Dr. Peter Lewis, Area Director of Public Health for North Sydney and the Central Coast.

Response

The issues raised in the submission from NSW Health are addressed in **Section 5.13**.

6.8.5 Noise Impacts

Issue

The ACF raises concerns regarding the predicted noise exceedances for “residences to the north of Bushells Ridge Road at Wyee” and general noise for those living in Blue Haven and Wyee.

Response

Refer to the response in **Section 6.3.8**.

6.8.6 Subsidence Impacts

Issue

The ACF asserts that residences and infrastructure overlying the Extraction Area will be affected by “massive subsidence figures”. The ACF asserts that increases in flood impacts due to subsidence will degrade the area and result in long periods of separation from facilities and emergency services.

Response

The potential impacts of subsidence (including changes to flood regimes) were considered by the PAC in its review of the Project. The Amendment does not result in any changes to the subsidence effects that will result from the Project.

As discussed in Section 7.1.4 of the EIS, WACJV will develop PSMPs in consultation with landowners that are predicted to be affected by subsidence. PSMPs will be property specific and will include measures to mitigate and remediate the consequences of mine subsidence.

6.8.7 Central Coast Water Catchment

Issue

The ACF asserts that the Central Coast water catchment supply in the Wyong valleys is risk of destruction due to subsidence and loss of potable water to the mine.

Response

Refer to the response in **Section 6.3.10**.

6.9 BATEAU BAY – SHELLEY BEACH PROGRESS ASSOCIATION INC

6.9.1 Not in the Public Interest

Issue

The organisation asserts that whilst there may be some employment prospects for a limited number of Central Coast residents, the costs to health and to the environment will be suffered by far more people. The organisation believes it is against the public interest to approve the mine.

Response

The health issues associated with the Project are discussed in **Section 5.13**.

6.10 1ST ERINA HEIGHTS CUB SCOUTS

6.10.1 General Objection

Issue

Several members of the Erina Heights Cub Scouts wrote letters in opposition to the Project. Issues raised in the submissions relate to climate change and renewable energy.

Response

Noted. The issue of climate change is addressed in **Section 6.4.2**.

6.11 ENVIRONMENTAL JUSTICE AUSTRALIA

6.11.1 Air Quality

Issue 1

EJA asserts that the NSW EPA does not conduct independent air pollution monitoring in the Central Coast region.

Response

The NSW OEH commissioned a monitoring station at Wyong in December 2012 and as discussed in **Section 5.13.1**, particle levels have generally complied with the relevant criteria.

Issue 2

EJA asserts that the available PM₁₀ monitoring data is limited and has not been made available to the public. EJA also asserts that monitoring undertaken by coal mining companies has been found to be 'wildly in error' and that independent data is needed to establish baseline pollutant concentrations.

Response

Section 4.2 of the AQGGAA presented the air quality monitoring data that was used to establish existing air quality in the vicinity of the Project. PEL advises that when compared with the data from the Wyong OEH monitoring station, it is considered that this data has provided for a conservative assessment.

Issue 3

EJA questioned the basis of the emissions estimates for the construction phase of the Amended Project. EJA asserts that the emissions estimate is contrary to observations at other coal mines in NSW.

Response

The emission inventories presented in Table 6.1, Table 6.2 and Appendix C of the AQGGAA were developed based on all activities that will occur during the construction and operational phases of the Amended Project. As the Project is an underground mining operation, the emissions estimates would be expected to differ from other coal mining operations, many of which are open cut mining operations.

Issue 4

EJA asserted that coal mining is the largest source of coarse particle pollution in NSW. EJA also asserted that diesel vehicles and engines are a major source of ultrafine and fine particles. Both coarse and fine particles contribute to a range of health problems.

Response

Particulate releases from underground mining activities contain a smaller fraction of fine particulate and a higher proportion of relatively inert (crustal) material. As outlined in **Section 5.13.1**, the modelling predictions presented in the AQGGAA indicate that the predicted incremental PM₁₀ concentrations at the closest residential receivers are all below the relevant criteria.

Diesel emissions were also considered in the AQGGAA. The AQGGAA predicted that PM_{2.5} concentrations resulting from the Project will be within the relevant criteria.

Issue 5

EJA asserts that the flaring of methane will result in elevated concentrations of oxides of nitrogen (NO_x).

Response

Emissions of NO_x were assessed in the Air Quality and Greenhouse Gas Assessment (Appendix L of the EIS) for the Original Project. These impacts are not affected by the Amendment.

As detailed in Section 3.5.8 of RTS1, the proposed gas capture and management system will involve pre-drainage (to reduce the methane content of the coal seam prior to mining) and post drainage (to extract gas left behind in the goaf after mining). Gas drainage will occur via in-seam and surface to in-seam drainage holes (pending access to private land). A proportion of the methane will be released via the mine ventilation shaft (in low concentrations).

Most of the gas will be flared in an enclosed structure. However, there may be free venting of methane under emergency conditions that prevent the operation of the flare. Venting of methane does not present a risk to health as a pollutant in ambient air, and would be controlled and managed in accordance with the AQMP to be prepared for the Project.

Issue 6

EJA raised concerns with air quality impacts as the proposed mine site is less than 4 kilometres from a densely populated suburban area. EJA asserted that during the winter months, the prevailing wind blows from the proposed mine site towards Blue Haven.

Response

As detailed in Section 4.1.2 of the AQGGAA, a full year of meteorological data (8,760 hours) was incorporated into the dispersion modelling completed. This takes account of all wind directions experienced and as shown in Section 7 of the AQGGAA, all predicted suspended particulate concentrations at the sensitive receptors are predicted to comply with the relevant criteria.

Issue 7

EJA asserts that the EIS “uses the wrong standards to interpret maximum pollution levels.”

Response

The relevant assessment criteria are those stated in the Approved Methods and detailed in Section 3.4 of the AQGGAA. The more stringent levels referred to in EJA’s submission are the standards set in the *National Environment Protection Measure (Ambient Air Quality)* and are not designed for use in the assessment of Projects of this nature.

Issue 8

EJA asserts that whilst a range of coal dust control measures will be implemented, these measures will not maintain particulate concentrations below the national standards.

Response

As discussed in **Section 5.1.3**, full details of dust management measures will be provided in an AQMP, which the proponent will prepare in accordance with the conditions of the development consent for the Project. The AQMP will describe all best practice dust control and monitoring measures to be implemented, including the measures required by the EPA. All measures will be quantifiable, auditable, measurable and enforceable. The AQMP will include Key Performance Indicators (KPIs) for determining compliance with the plan and conditions of development consent.

The dispersion modelling undertaken for the AQGGAA indicates that when the proposed dust controls are implemented, the dust concentrations at private residences are predicted to be within the relevant criteria.

6.12 HUNTER ENVIRONMENT LOBBY

6.12.1 Impacts of Train Movements

Issue

The HEL raises concerns relating to the cumulative impact of additional train movements and associated increase in dust emissions due to rail transportation of coal.

Response

The impacts of the proposed train movements on the rail network are addressed in **Section 5.1.1**. The air quality impacts associated with coal transportation are discussed in **Section 5.12.4**.

6.12.2 Water Resources

Issue

The HEL raises concerns regarding the impacts of the Project on water quality and supply.

Response

Refer to the response in **Section 6.3.10**.

6.12.3 Rehabilitation Following Subsidence

Issue

The HEL inquired about rehabilitation of impacts resulting from subsidence.

Response

Condition 5 under Schedule 3 of the Recommended Development Consent requires the preparation of an Extraction Plan, which describes how subsidence impacts will be managed, monitored and remediated.

6.12.4 Economic Benefits

Issue

The HEL asserts that the predicted economic and employment benefits are inflated and only feasible for the whole Project, rather than the Amendment alone.

Response

The Economic Impact Assessment was undertaken for the Amended Project as a whole, not for the Amendment alone. The economic benefits of the Project as a whole were re-assessed to reflect the change in economic conditions since the previous assessment.

6.12.5 Health Issues

Issue

The HEL expressed concerns regarding the health risks associated with dust levels at Blue Haven and Wyee.

Response

Refer to the response in **Section 6.3.7**.

6.12.6 Unresolved Issues from the 2014 EIS

Issue

HEL raised a number of issues related to the Original Project including subsidence impacts to residences, the potential for long periods of separation from facilities and emergency services during a flood event, and the role of the Mine Subsidence Board.

Response

Refer to the response in **Section 6.8.6**.

6.13 COMMUNITY ENVIRONMENT NETWORK INC

6.13.1 Financial Position of the Proponent

Issue

The CEN asserts that the Project may not extend for as many years as assessed and that Wyong Coal Pty Ltd is ...*“a \$400 paid up company and therefore under law is limited to the value of its assets. Any claim in the future for reparation or compensation is not likely to be realised under law.”*

Response

Refer to the response in **Section 6.3.3**.

6.13.2 Benefits of the Project

Issue

The CEN asserts that the long terms costs far outweigh the economic benefits of the Project.

Response

Refer to the response in **Section 6.6.3**.

6.13.3 Health Impacts

Issue

The CEN expressed concerns regarding the health risks associated with dust and noise levels at Blue Haven and Wyee.

Response

Refer to the responses in **Section 6.3.7** and **Section 6.3.8**.

6.13.4 Contamination Following Brine Disposal

Issue

The CEN is concerned about the disposal of semi-solid brine underground and asserts that *“The proponent needs to fully explain how the underground aquifers will not be contaminated and how the Wallarah Creek system will not be compromised over the life of the mine.”*

Response

This issue is related to the Original Project, as the Amendment does not alter the method of brine disposal. The potential impacts of brine disposal were assessed in Section 3.2.7 of RTS1.

As explained in Section 3.2.15 of RTS1, the hardrock groundwater system is not considered to be a highly productive aquifer.

6.13.5 Application of the Precautionary Principle

Issue

The CEN asserts that due to the threat to the Central Coast drinking water catchment, the Project should be rejected by virtue of the precautionary principle and other principles of ecologically sustainable development.

Response

Refer to the response in **Section 6.3.10**.

6.14 CORRECT PLANNING & CONSULTATION FOR MAYFIELD

Issue

The organisation asserted that *“Coal mining in the Hunter should be phased out to allow for more sustainable agriculture and protect our environment by minimising greenhouse gases, transportation and burning of the coal.”*

Response

As explained in **Section 5.1.3**, WACJV will develop an Air Quality Management Plan, which will include measures to reduce greenhouse gas emissions. However, greenhouse gas emissions are more appropriately managed at the national level through the implementation of government initiatives.

6.15 MANNERING PARK PROGRESS ASSOCIATION

6.15.1 Approval Process

Issue

The MPPA asserted that the NSW government's decision to extinguish the community's right to merit appeal is unacceptable.

Response

Noted. Under section 23F of the EP&A Act, a merit appeal cannot be made against a decision of the PAC if that decision was made following a public hearing.

6.15.2 Economics

Issue

The MPPA questions the royalties payable to the State over the "*proposed and improbable 28 years' life*" and highlights the falling coal prices.

Response

Refer to the response in **Section 6.6.3**.

6.15.3 Noise Impacts

Issue

The MPPA raises concerns regarding the predicted noise exceedances for residences to the north of Bushells Ridge Road at Wyee and general noise for those living in Blue Haven and Wyee.

Response

Refer to the response in **Section 6.3.8**.

6.15.4 Dust Impacts

Issue

The MPPA asserted that PM₁₀ emissions from the site are conservative and do not take into account the changing nature of wind and storm events in recent years. The ACF noted that the Blue Haven and Wyee townships are in close proximity to the Project and that there are schools, pre-schools and establishments within 5 km of the facility.

Response

Refer to the response to **Section 6.3.7**.

6.15.5 Air Quality Monitoring

Issue

The MPPA asserts that proposals to install an air quality monitor at Wyee have been diverted to an out-of-influence area at Wyong Racecourse thereby distorting air quality readings for the region.

Response

The air quality monitor at Wyong was commissioned by NSW OEH in December 2012. The intent of the station is to measure and record concentrations of air quality for comparison against the NEPM standards. The NEPM is a national monitoring and reporting protocol. The NEPM standards are applicable to urban background monitoring sites which are broadly representative of population exposure.

The OEH monitor at Wyong has no connection to the Project. However, data from this monitor confirms that the air quality impact assessment for the Project is conservative.

6.15.6 Brine Disposal

Issue

The Association asserts that "The consultant's suggestion that *"after more than 500 years, water levels in the workings (in the Jilliby Creek/Wyong creek catchment) are predicted to have recovered (and not be of concern)"* is unacceptable, these both form part of the Wyong River catchment and hence feed in to the Coast's water supply."

Response

Issues related to the Central Coast water supply are addressed in **Section 6.3.10**. Mine water conditions in the extraction zone are neither relevant nor connected to the surface water catchment functions.

6.15.7 Role of the Mine Subsidence Board

Issue

The MPPA raises concerns regarding the adequacy of compensation schemes facilitated by the MSB.

Response

The proponent has no control over the management processes of the MSB.

As discussed in Section 7.1.4 of the EIS, WACJV will develop PSMPs in consultation with landowners that are predicted to be affected by subsidence. PSMPs will be property specific and will include measures to mitigate and remediate the consequences of mine subsidence.

6.15.8 Community Consultation

Issue

The MPPA asserts that WACJV has failed to adequately consult with the community regarding the Amended Project.

Response

As outlined in Section 4.1 of the Amendment Document, WACJV implemented a stakeholder engagement program for the Original Project.

A community newsletter (Issue #29) was distributed in May 2016 to notify the community and local businesses of WACJV's recent mining lease application, ongoing project planning activity and a variety of ongoing social, education and community support initiatives. A further newsletter (#30) in early August 2016 fully summarised the proposed Project Amendment and advertised WACJV's call for expressions of interest from prospective employees and suppliers to the Wallarrah 2 Coal Project.

Both newsletters had distribution of 12,500 hard copies in the broader project interest area between Doyalson in the north to Yarramalong in the west and to Berkeley Vale in the south. Over 100 newsletter copies were distributed electronically as well as placed on the Project website. Newsletters were also distributed to businesses, clubs and cafés especially in the Wyong/Tuggerah district.

A *Facts Not Fiction* brochure was distributed in Blue Haven and surrounding areas during August 2016 to address various concerns and misinformation raised by Project opponents.

Further, WACJV undertook direct consultation with government authorities, adjoining landowners, the community and local businesses as listed in **Table 14**. Consultation with DLALC is provided separately in **Table 12**.

Community consultation sessions were held on 1 and 4 August 2016 at the Doyalson RSL Club; and on 9 and 13 August 2016 at WACJV Tuggerah offices, following advertisements on in the local newspaper on 27 and 29 July 2016. These sessions included booked appointments and 'walk-in' type meetings. WACJV continues to consult with the local community and impacted landholders through a variety of methods.

Table 14
Community and Regulatory Consultation Register

Date	Stakeholder	Nature of Engagement
Government Agencies		
5 January 2015	RMS	Consultation - M1 upgrade
19 May 2015	TransGrid	Consultation regarding subsidence of transmission lines
5 June 2015	Office of Minister for Resources and Energy	Project update
24 July 2015	Office of Minister for Planning	Consultation Project update
July 2015	MSB	Review referred building development applications and provision of subsidence data
July 2015	DRE	Drilling application consultation, confirm policy requirements and application information
July 2015	DPI-Water (formerly NOW)	Drilling application consultation, Consultation for Groundwater Modelling and Monitoring Plan to NOW (3/7/15 & 7/7/15)
July 2015	DRE	Surface Disturbance Notice and accompanying environmental assessment documents
13 August 2015	DRE	Approval of Surface Disturbance Notice for EL4911
22 September 2015	DTI	Project update
23 September 2015	DRE	Project update
23 September 2015	DP&E	Project update
23 September 2015	TfNSW	Project update
30 September 2015	RMS	Meeting onsite to discuss St Johns Road site
14 October 2015	DP&E	Project update
21 October 2015	DTI	Project Update
5 November 2015	RMS	Project briefing and discussions regarding use of RMS land
6 November 2015	Federal Member for Dobell	Project update
18 November 2015	DRE	Project update
25 November 2015	DP&E	Amendment process discussion
25 November 2015	Office of Minister for Planning	Consultation Project update

Date	Stakeholder	Nature of Engagement
25 November 2015	DRE	Project update
25 November 2015	NSW Mining	DRE Drilling Guideline
27 November 2015	TfNSW / Sydney Trains	Project update and discussions train path modelling requirements
27 November 2015	DTI	Project update
2 December 2015	RMS	Consultation – Discussions regarding use of RMS land
9 December 2015	DPI Lands	Discussions Crown Road closure application requirements
6 December 2016	WSC	Project Update
27 January 2016	DRE	Progress Update of DA Amendment
2 February 2016	DP&E	Project update
2 February 2016	TfNSW	Telephone enquiry discussions
24 February 2016	DRE (Maitland)	MLA Lodgement
25 February 2016	Sydney Trains	Project update and interactions Sydney Trains and DA amendment requirements
29 February 2016	WSC	Crown Roads closure application discussions
3 March 2016	Industry and Investment	Project Update
8 March 2016	DP&E	Presentation of DA Amendment/EIS Addendum concept to DoP
9 March 2016	RMS	Discussion of Risk Related Assessments and Deed of Access
22 March 2016	OEH (Newcastle)	Project update, DA amendment and offset package discussions
30 March 2016	TfNSW	Meeting regarding MLA and access Sydney Trains Rail Spur. A further meeting is to be organised
4 April 2016	WSC	Enquiry re MLA522 advert. Further maps delivered to WSC
4 April 2016	Federal Member for Dobell	Project update
2 May 2016	TfNSW / Sydney Trains	Meeting and discussions regarding access to rail corridor, agreements, insurances and risk management process
25 May 2016	DP&E	Meeting at DP&E Sydney offices
3 June 2016	DP&E	Teleconference
20 July 2016	Central Coast Council	Project Briefing
28 July 2016	DoE (Commonwealth)	Amended s156 Application discussions
5 August 2016	Central Coast Council	Property discussions
16 August 2016	DPI	Planning Reform Meeting

Date	Stakeholder	Nature of Engagement
22 August 2016	DP&E	Response to DLALC request
30 August 2016	Central Coast Council	Project update
7 September 2016	DPE	Meeting Deputy Director – Consultation discussions DA amendment
7 September 2016	MSB	Briefing on changes to mine subsidence districts
27 September	Office of Minister for Planning	Project update
27 September	Industry and Investment	Project update
21 September 2016	MSB	Meeting MSB submission and Project update
29 September 2016	TfNSW	Discussions rail access capacity for other users MNR line Bushells Ridge
30 September 2016	DP&E	Follow up for outstanding submissions
6 October 2016	TransGrid	Consultation regarding submission to DA amendment and finalisation of commitments being made by both parties as documented in the “Modification Processes Agreement now signed
6 October 2016	Parliamentary Secretary for the Central Coast	Project update
17 October 2016	MSB	Changes to Mines Subsidence Compensation Act
24 October 2016	DPE	Meeting Secretary DPE – Consultation discussions DA amendment Project update
Community Stakeholders / Groups (excluding DLALC*)		
July 2015	Guringai Tribal Link Aboriginal Corporation (GTLAC)	Meeting to formalise relationship and provide financial support (scholarships program)
17 July 2015	NSW Indigenous Chamber of Commerce	Project update, discussions synergies
July 2015	CC Poultry Club (CCPC)	Assist CCPC to expand facilities and activities in WCPL shed Shed inspection and development options 8/7/15
July 2015	Wallarah 2 Community Foundation Grants	2015 Grant program (ongoing)
July 2015	Jiliby Landowner	Land Access Agreement, as modified to reflect proposed drilling activity
July 2015	NSW Aboriginal Land Council (NSWALC)	Development application consent to lodgement
July 2015	NSW Indigenous Chamber of Commerce	Discussions with Deb Barwick re Guringai MOU
July 2015	CCPC	Project update
July 2015	Guringai Tribal Link Aboriginal Corporation (GTLAC)	Finalised Mutual Advancement Covenant (MAC) and planned cultural awareness presentation to W2CP staff
July 2015	Guringai Tribal Link Aboriginal Corporation (GTLAC)	Steering Committee Meeting

Date	Stakeholder	Nature of Engagement
July 2015	Central Coast Group Training (CCGT)	Apprenticeship program
July 2015	CCPC	Project update
4 August 2015	Guringai Tribal Link Aboriginal Corporation (MAC)	Official signing of Mutual Advancement Covenant
16 October 2015	Central Coast Outreach Services	Coreshed storage area inspection
16 October 2015	Guringai Tribal Link Aboriginal Corporation (GTLAC)	Steering Committee Meeting
20 October 2015	D J Quarries	Site inspection
12 November 2015	Guringai Tribal Link Aboriginal Corporation (GTLAC)	Steering Committee Meeting
1 December 2015	Shannon Kelly	Abusive email received from individual Shannon Kelly
15 December 2015	Guringai Tribal Link Aboriginal Corporation (GTLAC)	Steering Committee Meeting
27 January 2016	CCGT	Photo
28 January 2016	Kerry Mountain	Project update and general consultation
7 January 2016	Guringai MAC	MAC Steering Committee
7 March 2016	Boral	Project update and general consultation
9 March 2016	Guringai Tribal Link Aboriginal Corporation (MAC)	MAC Steering Committee
10 March 2016	CCPC	Project Update
18 March 2016	Kerry Mountain	Project update and general consultation
4 April 2016	Blue Haven Resident	Enquiry regarding MLA522 advert wanting to know if subsidence was going to impact. KB explained no subsidence only for infrastructure - Resident happy with response
4 April 2016	Rod (Property Developer)	Property developer in LGA with an MLA enquiry from Newspaper advert MLA522 KB advised it was mining/infrastructure and Rod was happy with response
18 May 2016	David Hannan	Re Bryant Drive Property
1 June 2016	Guringai TLAC MAC	MAC Steering Committee meeting
30 May 2016	Mitchell Clifford	Telephone response to newsletter received in the post
21 June 2016	Meet the Candidates Federal Election Forum	2016 Election Forum @ Mingara
21 July 2016	Kerry Mountain Pty Ltd	Noise Consultation
20 August 2016	Mrs N Manley & Jim Manley (son)	Project briefing, especially re noise
20 August 2016	Mr Ray Coles	Project briefing, especially re noise

Date	Stakeholder	Nature of Engagement
25 August 2015	CCGT	2016 Apprenticeship discussions
August 2016	General Community Blue Haven and surrounds	Facts not Fiction letterbox drop
1 August 2016	Marjorie & Don Burns Bluehaven	Community Consultation Session - Doyalson RSL - Discussions regarding noise, dust, trains, traffic, Tooheys Rd Site, Property Values, Zoning.
	Gary Blascke - Lake Munmorah	
	Bob Brooks, John Barrow, Dezirae Byrne	
4 August 2016	Bruce & Jenice Cross (Walk in) Wyee	Community Consultation Session - Doyalson RSL - Discussions regarding water, noise, dust, trains, Tooheys Rd Site, Council
	Mal & Lynette Wheeler (Walk in) San Remo residents	Community Consultation Session - W2CP Office DA Amendment - electronic information provided
	Ken & Sue Drake (Walk in) Tooheys Rd Cnr of Bushells Ridge	Community Consultation Session - W2CP Office Layout of mine facilities
	Liliana Nunez & Tom Byrne (Walk in) Wyee	Community Consultation Session - W2CP Office - concerns regarding air vents and subsidence
9 August 2016	Sandra Norman -Lemon Tree	Discussion of concerns - son has property at North end of Treelands Drive
10 August 2016	Guringai Tribal Link Aboriginal Corporation (MAC)	MAC Steering Committee
13 August 2016	Mrs Willis & Daughter - Berkeley Vale	Community Consultation Session - Doyalson RSL - concerns regarding noise, dust, traffic, Tooheys Rd Site, property values and zoning
13 August 2016	Alan Bivard Jilliby	Community Consultation Session - Doyalson RSL Discussions regarding water, noise, dust, trains, Tooheys Rd Site, Council
17 August 2016	Bill & Kerry Sammit Jilliby	Community Consultation Session - W2CP Office DA Amendment – provided project information on USB
1 September 2016	Colin Pursehouse	Meeting to address concerns regarding his property and the Project, including mapping and property flood status
2 September 2016	Doris Micallef, Blue Haven resident	Met with Mrs Micallef, her brother and neighbour to discuss scaremongering issues raised by the ACA. Matters of dust, noise, train movements and distance of coal stockpile to Blue Haven were discussed over plans. All were satisfied with Wyong Coals response and wished the project well for the future.
2 September 2016	Colin Pursehouse	Follow-up email consultation
15 September	Colin Pursehouse	Information provided on USB including environmental documentation
11 October 2016	Raelene Booth – resident of Waterhen Close Blue Haven	Consultation at residence to address concerns regarding potential dust

Date	Stakeholder	Nature of Engagement
		impacts.
1 November 2016	Guringai Tribal Link Aboriginal Corporation (MAC)	Meeting and discussions regarding MAC progress and project update.
2 November 2016	Raelene Booth – resident of Waterhen Close Blue Haven	Follow-up consultation by phone to answer further enquiries regarding existing local mines and industry in the area and WACJV modelling showing no impacts from dust or noise on Blue Haven.
3 November 2016	Shannon Kelly	Email consultation
4 November 2016	Shannon Kelly	Email consultation
Interest Groups / Business		
24 July 2015	NSWMC	Project update
29 July 2015	NCIG	Site visit of NCIG organised
12 August 2015	HVCC	Meeting at Newcastle Office
12 August 2015	GHD	Meeting Newcastle Office
12 August 2015	ARTC	Meeting at Newcastle Office
25 August 2015	CCGT	2016 Apprenticeship discussions
25 September 2015	ARTC	Capacity Analysis Discussion
7 October 2015	Monteath Powys	Project Update
7 October 2015	Pacific National/Asciano	Rail Options
8 October 2015	Boral	Project Update
13 October 2015	GHD	Project Update
14 October 2015	NSW Mining	Teleconference-Review of strategic release framework
15 October 2015	Monteath Powys	Site Inspection
21 October 2015	Boral	Project Update
22 October 2015	Hunter Land	Bushells Ridge Rd Land
28 October 2015	NSW Mining	Teleconference
17 November 2015	NSW Mining	Teleconference
22 December 2015	GHD	Train configurations
5 January 2016	Carbon Based Environment	Project Update
22 January 2016	Hunter Lands	Project Update
17 February 2016	Centennial Coal Mandalong	Mandalong/Wallarah 33kV Overhead line Application Update
23 February 2016	NCIG	Project Update

Date	Stakeholder	Nature of Engagement
3 March 2016	NSW Minerals Council	Project Update
7 March 2016	Boral	Project update
9 March 2016	RMS	Project update
24 March 2016	HSF Lawyers	Lawyers for and on behalf of Sydney Trains - MLA522 details - Maps provided
29 March 2016	ARTC	Project Update
14 April 2016	Pacific National	Project Update
10 April 2016	Boral	Conveyor discussions
13 May 2016	CFMEU	Project Update
10 May 2016	Boral	Project update
17 May 2016	ARTC	Teleconference
31 May 2016	Ford Communications	Communications Briefing
23 & 30 June; 7 July 2016	Ford Communications	Communications Briefing
12 July 2016	Central Coast Express Advocate	Interview for W2CP story in CCEA
21 July 2016	Central Coast Express Advocate	Interview for W2CP story in CCEA
26 July 2016	NBN	Project Update
9 August 2016	Hunter Lands	Project Update
9 August 2016	Boral	Project Update
16 August 2016	NSWMC	SIA workshop
7 September 2016	NSWMC	Attend briefing MSB changes
9 Sept 2016	CPB (Ex Leighton)	Discuss RMS M1 upgrade related options at Buttonderry site
14 September 2016	Hunternet Infrastructure and Asset Management Forum	Presentation and project update to forum members
20 September 2016	Boral	Project Update
13 October 2016	Downer Rail	Project update and rail discussions
14 October 2016	Boral	Project Update

* Consultation with DLALC is included separately in **Table 12**.

6.16 COMMUNICATION PARTNERS INTERNATIONAL

Communication Partners International raised a number of issues that were identical to issues raised by other SIGs.

Response

Refer to the following sections for responses to specific issues raised:

- **Section 6.6** – Employment and economic benefits;
- **Section 6.3.7** – Health impacts associated with dust;
- **Section 6.3.8** – Health impacts associated with noise; and
- **Section 6.8.6** – Subsidence impacts.

6.17 FULL CIRCLE FARM

6.17.1 Subsidence Impacts

Issue

Full Circle Farm expressed concern that their farm will be affected by subsidence, which will have a detrimental impact on their business and livelihood.

Response

As discussed in Section 7.1.4 of the EIS, WACJV will develop PSMPs for all private properties that are predicted to be impacted by subsidence. PSMPs will be developed in consultation with land owners and will include measures to manage, mitigate and remediate the consequences of subsidence.

6.17.2 Environmental Impacts

Issue

Full Circle Farm raises concerns regarding the dust, noise, health, visual and water impacts of the Project and the implications for the Central Coast Community

Response

Refer to the following sections for responses:

- **Section 6.3.8** – Noise impacts,
- **Section 6.3.7** – Air quality and health impacts;
- **Section 5.1.5** – Visual impacts; and
- **Section 6.3.10** – Impacts to the water supply scheme.

6.18 BYLONG VALLEY PROTECTION ALLIANCE

6.18.1 Consultation with DLALC

Issue

The Bylong Valley Protection Alliance (BVPA) asserts that there has been a “*blatant disregard of the wishes of the local Darkinjung people and an attempt to circumvent them as natural stakeholders.*”

Response

The consultation that has taken place between WACJV and DLALC is described in **Section 6.1.14** (including a summary in **Table 12**).

The issue of access to DLALC’s property is addressed in **Section 5.1.2**. The potential interactions with DLALC’s proposed residential development are discussed in **Section 5.1.6**.

6.18.2 Objection to the Project

Issue

The BVPA states that they object to the Project, based on the strength of objection by locally affected communities.

Response

Refer to the response in **Section 6.4.1**.

6.19 KERRY MOUNTAIN PTY LTD

Kerry Mountain Pty Ltd endorsed the submissions from DLALC. The issues raised by DLALC are addressed in **Section 6.1**.

6.20 CLIMATE FUTURE

6.20.1 Greenhouse Gas Emissions

Issue

Climate Future asserted that the Economic Impact Assessment does not include costs of greenhouse gas emissions from the burning of coal overseas.

Response

Greenhouse gas emissions from the burning of coal overseas are not relevant to the CBA for the Project (i.e. the mining of coal and delivery to port). Only Scope 1 and Scope 2 emissions are relevant to this CBA.

The exported coal then becomes an input into a production process at its destination nation. In the case of thermal coal produced by the Project, this production process is concerned with the burning of coal to generate electricity. This production process has its own set of costs and benefits.

Costs of coal fired power generation include the costs of coal, labour, land and capital inputs, electricity distribution costs and environmental costs, such as the impact of greenhouse gas emissions. Benefits include the community's willingness to pay for electricity. There may also be externality benefits of electricity for economic development, education, and medical care. All of these costs and benefits, not just the greenhouse gas costs, are relevant considerations to a CBA concerned with a proposal to develop increased electricity supply.

Even if the Project does not proceed, the global demand for coal (for electricity generation) will be satisfied by other suppliers. Hence, the approval of the Project will have little or no influence on global emissions from the burning of coal.

6.21 PELL'S CONSULTING

Pell's Consulting prepared a submission on behalf of the Environmental Defenders Office. Pell's Consulting notes that due to time constraints, the Amendment Document was not considered during the preparation of this submission. Instead, Pell's Consulting refers to its 2013 submission on the Project.

This issues raised in this submission relate to the Original Project rather than the Amendment. Nevertheless, Kalf and Associates has provided a detailed response to the issues raised by Pell's Consulting. This response is provided in **Appendix D**

7 PUBLIC SUBMISSIONS

*This section summarises the issues raised in public submissions and responds to these issues (or references other sections of this document where that issue has already been addressed). The submissions that are being addressed in each response are identified using the stakeholder IDs (as allotted to stakeholders in **Appendix A**).*

*Ten form letter submissions were received. Individuals who made form letter submissions are also included in **Appendix A**.*

7.1 AIR QUALITY

Submission: P13, P15, P41, P64, P86, P103, P117, P130, P131, P139, P185, P188, P189, P191, P223, P224, P243, P250, P265, P268, P269, P278, P294, P304, P322, P323, P327, P332, P333, P340, P341, P442, P450, P480, P541, Form Letter 1, Form Letter 2, Form Letter 4, Form Letter 7, Form Letter 8, P577, P578, P593, P628, P635, P662

7.1.1 General

Issue

Submissions from the public assert that it is not possible to prevent dust emissions from the site and raise concerns with the health impacts of coal dust. The submissions assert that coal dust is carcinogenic and responsible for respiratory problems.

Response

As outlined in **Section 5.13.1**, the modelling results presented in the AQGGAA (Appendix D of the Amendment Document) indicate that the incremental PM₁₀ and PM_{2.5} concentrations at the closest residential receivers are all predicted to be below the impact assessment criteria for PM₁₀ and advisory reporting standards for PM_{2.5}.

Particulate releases from underground mining activities contain a smaller fraction of fine particulate and a higher proportion of relatively inert (crustal) material compared to diesel particulate. Additional responses to submissions concerning health impacts associated with dust are provided in **Section 5.13.1**.

7.1.2 Respirable Crystalline Silica

Submission: P250

Issue

The submission was concerned with the transport and storage of crystalline silica dust particles generated by blasting and believes that there is no risk management strategy to make informed decision as to what the real effects will be.

Response

As outlined in Section 3.5.18 of RTS1, silica (SiO₂) is a naturally occurring mineral composed of silicon and oxygen. It exists in crystalline and amorphous forms depending on the structural arrangement of the oxygen and silicon atoms. Fibrogenic dust refers to dust that causes increases in fibrotic (scar) tissue after deposition in the gas exchange region of the lung. Only the crystalline forms are known to be fibrogenic and only the respirable particles (those which are capable of reaching the gas exchange region of the lungs) are considered in determining the health impacts of crystalline silica. The three most common types of crystalline silica are quartz, tridymite and cristobalite. Human exposure to crystalline silica occurs most often during occupational activities that involve the working of materials containing crystalline silica products (e.g. masonry, concrete and sandstone). Activities that involve cutting, grinding or breaking of these materials can result in the liberation of fine respirable particles.

Crystalline silica is not a key emission for this Project and there are no activities (such as blasting) that are likely to generate significant emissions of respirable particles (e.g. cutting or grinding). The DGRs did not require a quantitative assessment of respirable crystalline silica.

7.1.3 Impacts to Vegetation

Submission: P251

Issue

This submission expressed concern that coal dust will impact upon natural vegetation by reducing photosynthesis and that the coal dust (on the underside of leaves etc.) cannot be blown or washed off.

Response

As discussed in **Section 5.12.6**, the predicted dust deposition rates are significantly below the criteria and are unlikely to be more noticeable than background dust levels. The predicted deposition rates are orders of magnitude lower than the levels that are known to result in impacts on vegetation. Similarly, there is no evidence to suggest that the predicted dust deposition levels would adversely impact fauna and biota in nearby rivers.

7.1.4 Air Quality Impacts within 4 km of the Project

Submission: P80

Issue

A resident within 4 km of the Project expressed concern about coal dust particulates because they contain heavy metals, which are toxic at low concentrations.

Response

The AQGGAA was completed in accordance with the Approved Methods and has predicted that concentrations at sensitive receivers will comply with the relevant assessment criteria. Any locations outside the area considered in the AQGGAA (including those several kilometres away from the Project) would experience even lower impacts from the Project.

7.1.5 Modelling Does Not Consider All Emission Sources

Submission: P250

Issue

This submission asserted that the effect of passing traffic on the M1 Motorway has not been assessed in the EIS.

Response

The data used to characterise the existing air quality (discussed in **Section 5.13.1**) includes emissions from all sources, including the M1 Motorway.

7.1.6 Impact on Solar Panels

Submission: P304, P306

Issue

Submissions from residents who have installed solar panels expressed concern that deposited coal dust may reduce available sunlight to the panels, reducing their efficiency and requiring them to be cleaned more regularly.

Response

The deposition rates predicted in the AQGGAA are low and unlikely to be more noticeable than background dust levels in neighbouring residential areas. As such, there will be no change in the sunlight available for the operation of solar panels.

7.1.7 Air Quality Monitor at Wyong Racecourse

Submission: P92, P193, P253, P269, P294, Form Letter 2

Issue

A number of submissions raised concerns that proposals to have an air monitor installed at Wyee have been diverted to an out-of-influence area at Wyong Racecourse, which would result in misleading air quality data for the region.

Response

Refer to the response in **Section 6.15.5**.

7.2 NOISE

Submission: P15, P64, P117, P131, P188, P189, P190, P191, P268, P269, P294, P304, P306, P320, P322, P323, P327, P329, P340, P341, P442, P479, P480, Form Letter 1, Form Letter 2, Form Letter 4, Form Letter 7, Form Letter 8, P578, P635

7.2.1 General

Issue

A number of individual submissions and form letters raised concerns regarding the overall noise impacts of the Project.

Response

Refer to the response in **Section 5.7.1**.

7.2.2 Impacts to Bushells Road Residential Sites

Issue

A number of submissions state that *“The amended DA shows the daytime noise levels for Bushells Road Residential Sites as ranging between 40 – 50 dBA for both daytime and night-time levels. The Amended DA states that a Bushells Ridge Road residence (receptor) has predicted levels that exceed the PSNC by up to 4dBA.*

Response

Attachment 2 of the NVIAA presents the predicted noise levels for a range of meteorological conditions. These plots show that the residences near Bushells Ridge Road may experience noise levels ranging between 40-45 dBA during adverse meteorological conditions. During calm meteorological conditions, the predicted noise levels are less than 40dBA. WACJV has consulted directly with individual property owners identified where exceedances are predicted by up to 4 dBA.

Refer also to the response in **Section 5.7.1**.

7.2.3 Impacts on Adjoining Land

Issue

Several submissions raised concerns that unsatisfactory noise levels will be generated for people on adjoining land, outside their homes or to the amenity of their land generally.

Response

Refer to the response in **Section 5.7.1**. The application of the INP is to address noise at the receptors property boundary or within 30 m of a dwelling constructed more than 30 m from the property boundary.

7.2.4 Impacts from Train Movements

Issue 1

A neighbouring landowner asserted that the coal trains will be approximately 700 metres long and there will be a rail cross over to a siding to load coal approximately 300 metres south, downhill from their property boundary. This would mean that trains travelling south would be passing their property when they are braking to enter the rail spur.

Response

Trains entering the rail spur from the Main Northern Rail Line will be required to maintain an appropriate speed to both reduce noise impacts and maintain timetable requirements. During loading, the trains will traverse the spur at a consistent speed of 0.9 km/h. Noise levels generated by the rail operations associated with the Project are not expected to be greater than noise generated from existing freight and passenger operations on the Main Northern Rail Line. TfNSW has advised that this section of the Main Northern Rail Line currently caters for more than 100 daily train movements (freight and commuter combined) on weekdays, and more than 50 movements per day on weekends. There are also additional ad hoc paths that are used intermittently as demand dictates.

Issue 2

A neighbouring landowner asserted that loaded trains will be facing uphill and under full acceleration to shunt up through the crossover to gain optimum speed for the Main Northern Rail Line.

Response

Trains re-joining the Main Northern Rail Line will be operated at an appropriate speed to reduce noise impacts, whilst avoiding disruptions to other services. The noise associated with the locomotives 'powering up' will be reduced due to the speed limitations associated with the tie-in and crossover to the Main Northern Rail Line.

Noise levels generated by the rail operations associated with the Project are not expected to be greater than noise generated from existing freight and passenger operations on the Main Northern Rail Line. TfNSW has advised that this section of the Main Northern Rail Line currently caters for more than 100 daily train movements (freight and commuter combined) on weekdays, and more than 50 movements per day on weekends. There are also additional *ad hoc* paths that are used intermittently as demand dictates.

7.2.5 Impacts from Train Loading

Issue

An individual submission asserted that shunting of train wagons will occur whilst the trains are being loaded on the rail spur.

Response

‘Shunting’ refers to the process of sorting items of rolling stock into complete train sets or consists, or the reverse. As the Project’s trains consist of fixed wagons and locomotives that will remain in a permanent configuration, shunting will not occur during rail operations associated with the Project. Noise controls associated with trains entering and leaving the rail spur will be implemented for the Amended Project, as described in **Table 3**. The train wagons for the Project will be rigid dual wagon units, which effectively halves the number of points where contact could occur, reducing noise associated with couplings impacting together. In addition, the trains for the Project will utilise advanced locomotive operating systems. These systems distribute the propulsion between the front and rear locomotives to maintain tension between the wagons throughout loading and transport which mitigates the risk of coupling impacts.

7.3 COAL TRANSPORTATION

Submission: P191, P641, P250, P278, P326, Form Letter 1, Form Letter 6, Form Letter 7

7.3.1 Level Crossings

Issue

The submissions asserted that the train movements generated by the Project will result in further congestion at the level crossings in Newcastle.

Response

Refer to the response in **Section 6.8.3**.

7.3.2 Rail Transportation

Issue

The submissions asserted that the train movements generated by the Project will impact upon existing passenger and freight services.

Response

Refer to the response in **Section 5.1.1**.

7.3.3 Coal Transportation by Road

Issue

One submission raises concern that “*that there is nothing stopping the coal being transported by road to Port.*”

Response

WACJV has not sought approval to transport any coal to port via the road network, and as such, this will not be undertaken. The Project has also committed to a “No Road Transport” policy in accordance with Government expectations.

7.4 ECONOMICS

7.4.1 Kores Withdrawal from Overseas Interests

Submission: P96, P136, P173, P253, P265, P269, Form Letter 1, Form Letter 2, Form Letter 7, P628

Issue

The submissions asserted that Kores is in the process of withdrawing from overseas development.”

Response

Refer to the response in **Section 6.3.3**.

7.4.2 Inflated Employment and Economic Benefits

Submission: P35, P64, P69, P92, P164, P173, P177, P191, P250, P269, P323, P339, P479, P554, Form Letter 1, Form Letter 6, Form Letter 7, Form Letter 8

Issue

The submissions assert that the calculated royalties are unlikely to be realised because the Project is unlikely to operate for the proposed 28 year duration. The submissions also assert that the value of royalties is inflated due to falling coal prices and Government concessional rebates.

Response

Refer to the response in **Section 6.6.10**.

7.5 BLUE HAVEN AMENITY IMPACTS

Submission: P6, P15, P43, P50, P93, P131, P141, P150, P176, P185, P188, P193, P208, P214, P223, P224, P240, P245, P268, P269, P292, P306, P314, P322, P327, P329, P403, P442, P446, P450, P543, Form Letter 1, Form Letter 6, Form Letter 7

Issue

A number of submissions objected to the proposed development of the Project (particularly the conveyor and stockpile) due to its proximity to Blue Haven and the dust, noise, health risks and environmental impacts. The submissions asserted that the Project should be rejected due to application of the precautionary principle.

Response

The potential impacts to the amenity of Blue Haven are discussed in Section 6.11 of the Amendment Document.

The AQGGAA was completed in accordance with the Approved Methods and included a cumulative assessment (refer to Section 7.3 of the AQGGAA) which considered the existing air quality plus any increment resulting from the Project.

The AQGGAA considered impacts at sensitive receptor P12, which is representative of Blue Haven, as well as at additional sensitive receptors (P33 to P43) in the vicinity of the Project (see **Figure 16**). As explained in Section 7 of the AQGGAA, dust concentrations at all sensitive receptor locations are predicted to be less than the relevant assessment criteria.

As discussed in **Section 5.12.6**, there is no evidence that dust from coal mining operations will have a detrimental impact on the water quality in water tanks. Furthermore, the predicted dust deposition levels are significantly less than the relevant assessment criteria. Annoyance and amenity impacts due to dust emissions are therefore not expected to occur.

The NVIAA assessed the potential noise impacts at receptor P13, which is representative of Blue Haven. The noise model predicts that the Amended Project will comply with the PSNC at Blue Haven during the operational phase. There may be some exceedances of the construction noise management levels during certain stages of the construction phase, however a Construction Noise and Vibration Management Plan will be developed to minimise the impacts during the construction phase.

7.6 COMMUNITY CONSULTATION

Submission: P41, P193, P291, P294, P327, P457, Form Letter 2

Issue 1

A number of submissions asserted that the local community was not consulted over the Amended Project.

Response

As detailed in Section 5 of the EIS and Section 4 of the Amendment Document, an extensive stakeholder engagement program has been undertaken to inform the community of the Project. In addition, both the EIS and Amendment Document have been placed on public exhibition. A summary of the consultation undertaken to date is provided in **Table 14**.

Issue 2

A number of submissions state that the Project should not go ahead due to the direct opposition from local communities.

Response

Refer to the response in **Section 6.4.1**.

7.7 DRINKING WATER SUPPLY

Submission: P35, P41, P64, P96, P115, P130, P132, P137, P142, P148, P150, P154, P156, P157, P159, P164, P165, P177, P181, P188, P191, P208, P234, P243, P245, P250, P253, P256, P268, P278, P282, P294, P303, P322, P323, P326, P327, P329, P333, P379, P380, P401, P431, P441, P450, P456, P480, P554, Form Letter 1, Form Letter 3, Form Letter 8, P577, P635

7.7.1 Impacts to Mardi Dam

Issue

One submission is concerned that “*runoff from the mine in Jilliby and Dooralong valleys will run directly into the natural water source that feeds the only water storage facility on the Central Coast*”. Several submissions raise concerns that impacts from mining will compromise the quality of water entering Mardi Dam.

One of the Form Letters states that “*The recently completed Mardi-Mangrove pipeline also relies upon the sustainability of the water catchment district to transfer water from this system to the Mangrove Dam for water banking*”. Others express general concern that longwall mining is located beneath the aquifers that supply Mardi Dam.

Response

The only aspect of the Project located within the Dooralong Valley is the underground mining area. As such, there is no potential for pollution of surface runoff within the Dooralong Valley. Mine water will be pumped from the underground workings to the water management system at the Tooheys Road Site. All mine water will be treated at the proposed Water Treatment Plant prior to being reused on site or discharged to Wallarah Creek in accordance with an EPL. The Project will not discharge any untreated mine water.

7.7.2 Increased Water Charges

Issue

One submission believes that a reduction in the water supply, caused by damage from the Project will cause a major rise in cost of water over the long term.

Response

As discussed in **Section 6.3.10**, the Project will be required to achieve an outcome of ‘*no net impact on potential catchment yield*’ (PAC, 2014). Therefore, the Project will not have any impact on the water supply scheme that would result in an increase in water prices.

7.8 WATER CATCHMENT IMPACTS

Submission: P13, P15, P165, P207, P208, P235, P240, P253, P278, P326, P334, P340, P341, P403, P426, P456, P479, P480, P554, P635, P662

Issue

Several submissions raised concerns that mining will cause permanent damage to the drinking water catchment.

Response

Refer to the response in **Section 6.3.10**.

7.9 SURFACE WATER

Submission: P52, P77, P134, P165, P329, P641, P425, P456, P557, Form Letter 5, P577

7.9.1 Infrastructure Impacts on Spring Creek and Tuggerah Lakes

Issue

A number of form letter submissions raised concerns that the Amendment Document does not address the risk of pollution to Spring Creek and Tuggerah Lake arising from the washing of coal, grease or oil. The submissions noted that Spring Creek is the breeding ground for millions of fish.

Response

The proposed infrastructure located in the vicinity of Spring Creek include the rail spur, bin feed conveyor and train load out facility. Small volumes of grease or oil will occasionally be used during maintenance of these infrastructure elements. Appropriate spill prevention and containment measures will be implemented as required. The Project does not involve any washing of coal.

7.9.2 Water Control Measures

Issue

A form letter raised concerns that there is no detail on the location or design of water quality control devices on Nikko Rd, adjacent to coal loading infrastructure, to ensure that runoff does not impact waterways.

Response

As outlined in Section 6.1.4 of the Amended document, WACJV will implement appropriate erosion and sediment controls during construction and operation of the proposed rail and coal loading infrastructure. Diversion bunds and swales will be installed so that all runoff is directed to sediment basins and pollution control devices. This will ensure that there are no untreated discharges to Spring Creek.

A detailed Erosion and Sediment Plan will be included in the Water Management Plan that will be developed for the Project.

7.10 IMPACTS TO AQUIFERS

Submission: P6, P92, P117, P256, P314, P320, P322, P475, P634

Issue

Many submissions raised concerns that aquifers beneath the longwall mining areas will be damaged.

Response

Refer to the response in **Section 6.3.10**.

7.10.1 Groundwater and Brine

Submission: P193, P269, P291, P294, P641, Form Letter 2

Issue

A number of form letters raised concerns regarding the disposal of brine in the underground mine workings.

Response

Refer to the response in **Section 5.7.6**.

7.11 SUBSIDENCE IMPACTS

Submission: P53, P76, P91, P92, P96, P137, P250, P309, P641, P253, P265, P291, P294, P306, P307, P314, P322, P339, P405, P408, P430, P431, P446, P450, P475, P479, P541, P543, P554, Form Letter 1, Form Letter 6, Form Letter 8, P577, P628, P635, P662

7.11.1 General

Issue

Many submission raise general concerns regarding the impacts of subsidence and reference numbers from the Original EIS. One submission states “*The subsidence impacts are too great and more controls are needed.*”

Response

Refer to the response in **Section 6.8.6**.

7.11.2 Flooding

Issue

The submissions expressed concerns that increased flooding of the Dooralong Valley due to subsidence will “*condemn*” the area to degradation and long periods of separation from facilities and emergency services.

Response

Refer to the response in **Section 6.8.6**.

7.11.3 Damage to Powerlines

Issue

The submissions expressed concerns about potential impacts of subsidence on electricity transmission towers. There are concerns that the three towers at Jilliby Rd could be displaced by a single subsidence event.

Response

The Subsidence Predictions and Impact Assessments (Appendix H of the EIS) identified the transmission towers that are potentially to be affected. As discussed in **Section 5.15**, WACJV has entered into an agreement with TransGrid to investigate suitable mitigation measures to prevent impacts to these towers.

7.11.4 Jilliby State Conservation Area

Issue 1

Numerous submissions raised concerns about the subsidence impacts to the Jilliby SCA, including ridgelines, creeks and rainforest gullies. Also concerns are raised regarding access to the SCA following subsidence.

Response

As explained in **Section 5.8.1**, there are 11 longwall panels underlying the Jilliby SCA which are not included in the current proposal. The potential impacts of these longwall panels are not relevant to the assessment of the Amended Project. Notwithstanding, the Amended Project does involve some mining beneath the Jilliby SCA.

As outlined in Section 3.1.10 of RTS1, the proposed mining beneath the Jilliby SCA will occur at depths of cover ranging from 395 m to 690 m. These depths are considerably greater than the depths of cover at other mines within the Newcastle Coalfield.

Mining induced surface cracks are expected to be limited to:

- The opening of existing natural joints; or
- An occasional tension crack located on steeply sloping terrain; or
- Cracking within exposed bedrock in valley floors.

Few mining induced surface cracks are expected to occur in areas in the base of the valleys where deep or alluvial soils overlie the bedrock.

Detailed assessments of the streams within the Jilliby SCA have indicated that the streams occur mainly in alluvial and boulder filled gullies and that bedrock outcrops are uncommon. Due to the plasticity of the alluvial and colluvial deposits, it is unlikely that subsidence will cause cracking that exacerbates erosion.

There is not expected to be any mining related impacts which will inhibit or affect access to the Jilliby SCA.

Issue 2

Concerns that the predictions for subsidence could be underestimated leaving the Jilliby SCA destabilised and hazardous for decades.

Response

As outlined in Section 7.1.3 of the EIS, a sensitivity analysis was conducted to determine the consequences that may occur if actual subsidence exceeded the predicted subsidence. An ultra-conservative approach was adopted, with consideration of the possible impacts if actual subsidence effects are double the predicted values.

Condition 5 under Schedule 3 of the Recommended Development Consent requires the preparation of an Extraction Plan. The Extraction Plan will include a Subsidence Monitoring Program. If subsidence monitoring results indicate greater than predicted levels of subsidence, adaptive management measures will be implemented to further minimise subsidence effects. The longwall panels underlying the Jilliby SCA will be some of the last panels to be mined.

Monitoring data collected for the earlier longwall panels will provide empirical data used to measure actual subsidence against predictions, and allow calibration of the model to improve predictions and enhance stakeholder confidence and subsidence management processes.

7.11.5 Role of the Mine Subsidence Board

Submission: P269, P294, Form Letter 1, Form Letter 2, Form Letter 7

Issue

A number of submissions raised concerns regarding the adequacy of compensation schemes facilitated by the MSB.

Response

Refer to the response in **Section 6.8.6**.

7.12 ECOLOGY

Submission: P142, P153, P231, P333, P423, P426, P475, P480

Issue

Some submissions raised general concerns for ecology. Others raised specific issues such as *“The area is a home to unique and endangered flora and fauna. In particular there is a great need to preserve all watercourses, wetland and shore areas for the declining numbers of local and migratory shore birds.”*

Response

As discussed in Section 6.5.4 of the Amendment Document, WACJV has proposed a Biodiversity Offset Strategy to compensate for residual impacts to native species and ecological communities.

7.13 BUSHFIRE

Submission: Form Letter 4, Form Letter 8

Issue 1

The form letters state that there has been no assessment of bushfire risks.

Response

The risk of bushfires was considered in the Preliminary Hazard Analysis (Appendix AB of the EIS). Refer to the response in **Section 6.1.6**.

Issue 2

A number of form letter submissions expressed concerns that subsidence will reduce ground moisture levels making bushfires more prevalent.

Response

This issue relates to the Original Project and was addressed in Section 3.27.13 of RTS1. This issue is not relevant to the Amendment, as the underground mining aspects of the Project are not altered by the Amendment.

As explained in Section 6.2 of the GIA (Appendix H of the EIS), the rate of leakage of groundwater from shallow groundwater systems is very low due to the lack of connected cracking and the extremely low permeability of the bedrock strata. As outlined in Section 3.2.12 of RTS1, the total leakage loss is predicted to be 7.3 ML/year from alluvial aquifers and 29.2 ML/year from the hardrock groundwater system. The rate of leakage is negligible when compared to the rate of rainfall recharge. Therefore, the Project is not expected to reduce ground moisture.

Issue 3

A number of form letter submissions asserted that the Project does not allow for Asset Protection Zones around any of the development footprint.

Response

Refer to the response in **Section 6.1.6**.

Issue 4

A number of form letter submissions asserted that the removal of Nikko Road and its replacement with a 3 m wide easement will not be adequate for fire trucks, particularly to access land on the eastern side of the Main Northern Rail Line, south of the Motorway Link Road.

Response

Refer to the response in **Section 5.1.2**.

7.14 DLALC ISSUES

Submission: P52, P69, P139, P150, P173, P177, P181, P253, P329, P340, P341, Form Letter 3, P628

7.14.1 Land Access and Compensation

Issue

Several submissions assert that DLALC's land will become 'landlocked' by the Amendment and that the use of Aboriginal land should be paid for.

Response

As explained in **Section 5.1.2**, access to DLALC's land via Nikko Road will be maintained with DLALC gaining improved all-weather access to their land that they do not presently have. DLALC's land is also accessible via a number of other access points (as shown on **Figure 3**).

7.14.2 Consultation

Issue

Some submissions asserted that WACJV has not adequately consulted with DLALC.

Response

Refer to the response in **Section 6.1.14**.

7.14.3 Impacts on the Commercial Interests of DLALC

Issue

Some submissions are concerned that the DLALC land will not be able to be developed as a result of the Amended Project.

Response

Refer to the response in **Section 5.1.6** and **Section 6.1.21**.

7.15 HEALTH IMPACTS

Submission P35, P64, P77, P86, P93, P103, P157, P164, P165, P223, P224, P226, P234, P238, P250, P306, P334, P401, P403, P405, P425, P426, P441, P457, P479, P541, Form Letter 7, P578, P635

Issue 1

Many submissions concerning health risks associated with the impacts of the Amended Project.

Response

Refer to the following responses to the various health issues:

- Air Quality – refer to **Section 5.13.1**;
- Water supply contamination – refer to **Section 5.12.6**; and
- Noise impacts – refer to **Section 5.7.1**.

Issue 2

Several submissions asserted that “1 in 100 000 people will die as a result of the mine.”

Response

This issue of the misinterpretation of the criterion for health risk analysis relates to the Original Project and was addressed in Section 3.7.2 of RTS1.

Issue 3

Some submissions expressed concern for residents who have installed rainwater tanks and notes that rainwater storage units are compulsory for new homes.

Response

Refer to the response in **Section 5.12.6**.

7.16 CLIMATE CHANGE

Submission: P63, P64, P88, P93, P115, P130, P164, P166, P197, P330, P358, P450, P480, Form Letter 9, P577

Issue

These submissions assert that the EIS does not consider the impact of the coal to be mined on climate change.

Response

The greenhouse gas emissions attributable to the Amended Project were assessed in Section 9 of the AQGGAA and summarised in Section 6.3 of the Amendment Document.

7.17 REHABILITATION

Submission: P136, P146, P326

Issue

Some submissions raised concerns that the public may be forced to pay the costs of rehabilitation, in the event that WACJV is unable to meet its rehabilitation obligations.

Response

Part 12A of the Mining Act requires the holder of a mining authority to lodge a rehabilitation security deposit (i.e. bank guarantee). This security deposit will be held by DRE to ensure that the legal obligations in relation to rehabilitation and safety of the site will be met following mine closure.

7.18 IMPACTS ON TOURISM

Submission: P153, P242

Issue

Two submissions raised concerns about the impacts on tourism in the Northern Central Coast.

Response

The Central Coast Council website states that *“Beaches, water ways and lakes, national parks and other recreational areas, together with urban centres full of local charm and character, offer abundant activities and experiences on the NSW Central Coast.”* The Amended Project is not anticipated to have any impact on these tourist attractions.

As explained in **Section 6.1.21**, the Amended Project is not incompatible with other proposed developments.

7.19 IMPACTS ON HISTORIC HERITAGE

Submission: P251

Issue

This submission was concerned about impacts to the heritage values of:

- Lot 129 DP 755721 Boyds Lane, Wyong Creek; and
- Wyong Creek Community Hall.

Response

As outlined in Section 7.15 of the EIS, a Historical Heritage Assessment (OzArk, 2012) was undertaken to determine the potential impacts on items of historical heritage significance located within and adjacent to the Project Boundary. The Wyong Creek Community Hall was identified as an item of heritage significance. This item is located outside of the Subsidence Impact Limit and as such, is not expected to be impacted by the Project.

Lot 129 DP 755721 is not listed as an item of heritage significance under the Wyong LEP. However, the dwelling known as “Bangalow” (also on Boyds Lane, Wyong Creek) is listed under the Wyong LEP. This site is located within the Subsidence Impact Limit. Mitigation measures for this item will be included in the Historic Heritage Management Plan to be prepared for the Project.

7.20 IMPACTS ON TURF FARMING

Submission: P641

Issue

This submission asserted that the Project will impact upon a turf farm overlying the Extraction Area.

Response

This issue relates to the Original Project and was addressed in Section 3.19.2 of RTS1.

7.21 IMPACTS TO 555 BUSHELLS RIDGE ROAD, BUSHELLS RIDGE

Submission: P30

This submission states that *“My farm location is unique to the proposed rail coal loading process in that it is the only residential property in the design that will be directly impacted by the proposal.”*

7.21.1 Noise Impacts

Issue 1

The submission raises a number of concerns associated with braking noises from trains traveling south and trains being loaded, particularly at night. The submission also states that *“Loaded trains will be facing uphill and under full acceleration to shunt up through the crossover and past my property to gain optimum speed for the northern line.”* The landholder believes the noise impacts will affect both quality of life and degrade the resale value of the property.

Response

The controls that will be implemented to minimise noise from rail activities are outlined in **Section 5.1.4.**

Issue 2

The landowner is concerned that any increases in random nuisance noise levels will affect both quality of life and reduce the resale value of the property.

Response

The NVIAA predicted that operational noise levels at this property may exceed the PSNC by up to 4 dBA. This is deemed to be a ‘moderate’ degree of affectation based on the criteria in the VLAMP. WACJV will consult with this stakeholder and offer to implement acoustic treatments to the affected residence.

7.22 IMPACTS TO 4 CRESTWOOD ROAD, JILLIBY

7.22.1 Subsidence Impacts

Submission P32 & P33

Issue

This landowner asserts that the subsidence numbers provided to him and the information in the EIS are not consistent and asserts that the impacts of flooding on his property have not been fully quantified. The landowner asserts that minor flooding will now impact the property and asks if he will be compensated for the reduction of usage on the property.

Response

This issue relates to the Original Project, as the underground mining aspects of the Project are not altered by the Amendment.

The potential impacts of the Original Project on flooding were assessed in the Flood Impact Assessment (Appendix K of the EIS). Figure 6.5 of the Flood Impact Assessment shows the predicted 1 in 100 year flood extent for Hue Hue Creek. This figure shows that although part of the property at 4 Crestwood Road, Jilliby is predicted to be inundated during a 1 in 100 year flood event, the dwelling on this property is outside of the flood extent.

WACJV will develop PSMPs for all private properties that are predicted to be impacted by subsidence. PSMPs will be developed in consultation with land owners and will include measures to manage the consequences of subsidence, including increases in flood impacts.

7.23 IMPACTS TO 40 SMITHS ROAD, JILLIBY

Submission: P641

7.23.1 Lack of Consultation

Issue

This resident advised he purchased the property in 2013 and had no consultation with WACJV until he approached them for information.

Response

The public consultation undertaken by WACJV is outlined in **Table 14**.

WACJV held a meeting with the owner of 40 Smiths Road, Jilliby on 1 September 2016. WACJV clarified the predicted subsidence impacts for the property and provided other EIS figures and the most recent newsletter. The parties discussed the issues raised in the email from the landowner on 29 August 2016.

Further information regarding subsidence and flooding impacts was provided to the landowner on 2 September 2016 and 15 September 2016.

7.23.2 Public Exhibition of the EIS

Issue

This submission asserts that the original application was not on display and that he had to request it be bought out for review. This submission asserts that *“it is not appropriate to attempt to constrain submissions by only disclosing or exhibiting part of a proposal.”*

Response

This issue relates to the Original Project. The EIS was placed on public exhibition from 26 April 2013 to 21 June 2013. The EIS and all other publicly available documents relating to the Project have been continuously accessible via DP&E's website: http://majorprojects.planning.nsw.gov.au/page/project-sectors/mining--petroleum---extractive-industries/mining/?action=view_job&job_id=4974

7.23.3 Other Impacts

Issues

This submission raised a number of general issues or objections to the Project.

Responses

Responses to the general issues raised are outlined in the following sections:

- Subsidence – refer to **Section 6.8.6**;
- Impacts on water resources – refer to **Section 6.3.10**;
- Loss of Property Values – refer to **Section 7.32.1**;
- Coal Transport and rail capacity – refer to **Section 5.1.1**;
- Dust impacts on water tanks – refer to **Section 5.12.6**; and
- Rehabilitation costs – refer to **Section 5.12.6**.

7.24 IMPACTS TO 224 BUSHHELLS RIDGE ROAD, WYEE

7.24.1 Property Acquisition

This submission asserts that a Wyong Council Chambers hearing by the Department of Planning on the 28 October 2010, indicated that the mining company *“would have to acquisition our property as we would have to move if this mine was developed because of the dust, noise and the close proximity of our house to the pit head as stated by Howard Reeves to me on that day.”*

Response

Noise and air quality modelling was conducted for both the Original Project and Amended Project. No exceedances of relevant noise or dust criteria are predicted to occur at this property and as such, there is no requirement under the VLAMP to acquire this property.

WACJV has no knowledge of this conversation, nor has seen documented minutes from this meeting which support this claim.

7.24.2 Dust Impacts to Water Tanks

Issue

This submission asserted that the domestic water collected from the roof of the house will be contaminated by coal dust.

Response

Refer to the response in **Section 5.12.6**.

7.24.3 Impacts from Traffic

Issue

This submission expressed concerns regarding traffic impacts.

Response

This issue relates to the Original Project, as the Amendment does not alter the quantity or nature of vehicle movements associated with the Project. The potential traffic impacts were assessed in the Traffic and Transport Impact Assessment (Appendix Q of the EIS).

7.24.4 Business Impacts

Issue

This submission states the property has supported Red Angus Stud for a number of years and that the property will need to be replaced.

Response

As discussed in Section 7.1.4 of the EIS, WACJV will develop Property Subsidence Management Plans (PSMPs) for all private properties that are predicted to be impacted by subsidence. PSMPs will be developed in consultation with land owners and will include measures to manage the consequences of subsidence.

7.24.5 Light Impacts

Issue

This submission asserts that night lighting will impact upon sleep patterns.

Response

As outlined in **Section 5.1.5**, WACJV has designed the surface infrastructure such that the requirement for external lighting is minimised. Where they are required, external lights will generally be directed downwards and fitted with low lux lamps.

7.24.6 Impacts on Ecology

Issue

This submission asserted that there has been not been an impact assessment on Bushells Ridge Road for fauna, particularly Sugar Gliders, Echidna, Water Hens and Wombat.

Response

The Infrastructure Boundary (see **Figure 1**) does not include any areas along Bushells Ridge Road. Accordingly, there will be no impact on fauna along Bushells Ridge Road. Flora and fauna surveys were undertaken within the Hue Hue Road Offset Area, which has a boundary along a section of Bushells Ridge Road.

A Biodiversity Management Plan (BMP) will be prepared in accordance with any development consent granted and relevant government authorities will be consulted during the preparation of the management plan.

7.24.7 Other Impacts

Issue

The submission listed a number of general issues or objections to the Project.

Responses

Responses to the general issues raised are outlined in the following sections:

- Dust impacts on water tanks – refer to **Section 5.12.6**; and
- Rehabilitation costs post production – refer to **Section 5.12.6**.

7.25 IMPACTS TO PROPERTIES AT DUNKS LANE, JILLIBY

Submission: P246

Issue

This submission was made by the owner of the properties at 143 and 131 Dunks Lane, Jilliby and 87 Dunks Lane, Jilliby. The landowner asserts that the Project *“puts my whole property at risk and my cattle operation also. Having built a new house on my property some 7 years ago, my builder estimated that the requirements of the Mine Subsidence Board at the time added between \$250,000 - \$300,000 additional construction cost to the build. I was disgusted by this requirement and now the whole property is being put at risk by the proposal being considered”*. ”

Response

This issue relates to the Original Project, as the underground mining aspects of the Project are not altered by the Amendment.

Given that the building was constructed in accordance with the MSB's requirements, the structure would be expected to tolerate foreseeable levels of subsidence. In any case, WACJV will develop PSMPs for all private properties that are predicted to be impacted by subsidence. PSMPs will be developed in consultation with land owners and will include measures to manage the consequences of subsidence.

7.26 IMPACTS TO 140 DURREN ROAD JILLIBY

Submission: P444

7.26.1 Water Supply

Issue

This submission states that water restrictions are placed on the property every year. The landowner is concerned that the Project will cause them to lose their water supply.

Response

Refer to the response in **Section 5.13.3**.

7.26.2 Subsidence and Flooding Impacts

Issue

This submission notes that after heavy rain the property access can be cut for up to four days. This submission raised concerns about subsidence impacts to the property and asserted that subsidence will increase flooding and the duration of flood events.

Response

As discussed in Section 7.1.4 of the EIS, WACJV will develop PSMPs for all private properties that are predicted to be impacted by subsidence. PSMPs will be developed in consultation with land owners and will include measures to manage the consequences of subsidence, including increases in flood impacts.

7.26.3 Dust due to Coal Transportation

Issue

This submission expressed concerns regarding the health impacts caused by dust emissions from coal trains.

Response

Refer to the response in **Section 5.12.4**.

7.27 IMPACTS TO PROPERTY BORDERING WYONG CREEK

Submission: P251

Issue

This submission asserts there is a map showing that the Project is located within 18 m from the vertical line of Wyong Creek, some 550 m below the surface. This submission asserts that the map contradicts any other maps circulated and distributed as marketing material.

Response

As shown in **Figure 1**, there are no reaches of the Wyong River within the Project Boundary or which will be undermined in any way. However, there are locations where the stream is in close proximity to the Project Boundary.

7.28 IMPACTS TO 1708 YARRAMALONG ROAD, YARRAMALONG

Submission: P634

Issue

A landowner at Yarramalong notes that the farm has an approved irrigation licence. The landowner is concerned that if the mine is approved, the mine will be taking a significant proportion of the available water and questions whether he will be required to “give up” part of the farm water licence so that the mine can fulfil its water requirements?

Response

WACJV will obtain the required WALs under the WM Act to account for the water taken by the Project. WALs can be purchased or traded between parties at negotiated prices; however there is no requirement for any current licence holders to surrender their WALs. WACJV currently holds a WAL with a share component of 185 units. This WAL enables WACJV to take up to 185 ML of water, with the exact volume determined by the available water determination.

7.29 IMPACTS TO PROPERTY BORDERING JILLIBY SCA

Submission: P309

Issue 1

This submission expresses concerns regarding subsidence impacts to property improvements such as underground water tanks, a dam and a concrete bridge at this property.

Response

This issue relates to the Original Project, as the underground mining aspects of the Project are not altered by the Amendment.

WACJV will develop PSMPs for all private properties that are predicted to be impacted by subsidence. PSMPs will be developed in consultation with land owners and will include measures to manage the consequences of subsidence.

Issue 2

This submission expresses concerns regarding the impacts of subsidence on the Jilliby SCA.

Response

Refer to the response in **Section 7.11.4**.

7.30 DESIGN OF THE TRAIN LOAD OUT FACILITY

Submission: P88, P164, P162, P306, P404, P457

Issue 1

The submissions assert that the EIS and Amendment Document do not provide enough details of the train load out facility and do not assess the noise and visual impacts of this structure.

Response

The train load out facility has been included as a noise source in the modelling undertaken for the NVIAA. Therefore, the noise levels predicted by the NVIAA include the contribution of the train load out facility.

The potential visual impacts of the train load out facility are discussed in **Section 5.1.5**.

Issue 2

Another submission states the properties on Bushells Ridge Road and Hue Hue Road at Wyee are not assessed in the EIS.

Response

The NVIAA assessed the noise levels at locations P16 and P17 (see **Figure 17**). These assessment locations are representative of properties in the southern extent of Wyee.

7.30.1 EIS Fails to Identify Properties Impacted by Subsidence

Submission: P92

Issue

This submission asserts that the EIS does not identify the properties that are predicted to be impacted by subsidence.

Response

This issue is related to the Original Project and was addressed in the Subsidence Predictions and Impact Assessments (Appendix H of the EIS).

7.31 APPROVAL PROCESS

Submission: P193, P253, P269, P291, P294, P442, P456, Form Letter 1, Form Letter 7

Issue 1

These submissions asserted that the NSW government's decision to extinguish the community's right to merit appeal is unacceptable.

Response

Refer to the response in **Section 6.15.1**.

7.31.1 All Project Documentation Not Exhibited With Amendment

Issue

A number of submissions state that the original EIS was not made available during the exhibition of the Amendment Document.

Response

The public exhibition of the Amendment Document was aimed at eliciting comments on the Amendment, rather than the Original Project.

In any case, the EIS and all other publicly available documents relating to the Project remain accessible via DP&E's website: http://majorprojects.planning.nsw.gov.au/page/project-sectors/mining--petroleum---extractive-industries/mining/?action=view_job&job_id=4974 .

7.31.2 PAC Findings

Issue

These submissions asserted that "*None of the PAC's recommendations for improved strategies have been implemented.*"

Response

Refer to the response in **Section 6.3.1**.

7.32 GENERAL ISSUES

7.32.1 Depreciation of Property Values

Submission: P164, P177, P240, P641

Issue

These submissions expressed concerns that property prices will reduce as a result of the Project.

Response

This issue relates to the Original Project and was addressed in Section 3.16.12 of RTS1.

7.32.2 Opposition from the EPA

Issue

Some submissions asserted that the EPA has objected to the Project.

Response

Although the EPA has raised issues in relation to the Project, it does not oppose the Project. The issues raised by the EPA are addressed in **Section 5.7**.

7.32.3 Public Transport Infrastructure

Submission: P304

Issue

This submission expressed concern that the Project will inhibit future growth of public transport infrastructure and that future planning of a rail and bus interchange would be compromised by the Project.

Response

As discussed in **Section 6.1.21**, the Project is not incompatible with potential uses of the surrounding land. In particular, transport infrastructure is unlikely to be sensitive to noise impacts.

The Regional Plan does not identify any proposed rail or bus interchanges in the vicinity of the Project. The Project will not impact upon any transportation infrastructure associated with the proposed Warnervale Town Centre.

7.32.4 Impact to Food Sources

Submission: P153, P256

Issue

Some submissions state that the Central Coast is an important food source through fishing, oyster farming and market gardening.

Response

This issue relates to the Original Project, as the Amendment does not affect any land that used for agriculture.

The potential impacts of the Project on agricultural enterprises were assessed in the Agricultural Impact Statement (Appendix Y of the EIS). As outlined in Section 3.19.1 of RTS1, DPI – Agriculture acknowledges that the AIS adequately identifies the agricultural enterprises that could potentially be impacted by the Project.

The Project will not impact upon any waterbodies that support commercial fishing and oyster farming. The location of any market gardens will be identified during the preparation of PSMPs and will be appropriately managed in consultation with the landowner.

7.32.5 Impacts to Grass Based, Ethical Based Farming

Submission: P63, Form Letter 9

Issue

These submissions assert that Project will affect the site of a grass based, ethical farming practice run by Shannon and Kylie Kelly.

Response

Should this farming practice be located within the Subsidence Impact Limit (see **Figure 1**), a PSMP will be developed for the property. WACJV will develop PSMPs for all private properties that are predicted to be impacted by subsidence. PSMPs will be developed in consultation with land owners and will include measures to manage the consequences of subsidence.

7.32.6 Coal Unnecessary As Renewables Are Economical

Submission: P76, P103; P117, P165, P259, P554

Issue

These submissions assert that coal is an outdated energy source. These submissions support the use of renewable energy sources over coal.

Response

Refer to the response in **Section 6.4.2**.

7.32.7 Dumping Mine Debris in Lake

Submission: P115

Issue

This submission raised concerns that mine debris will be dumped into the Lake.

Response

The proposed waste management system for the Project was described in Section 7.24 of the EIS. No waste materials will be disposed of in water bodies. All waste management will be undertaken in accordance with consent conditions, licences and relevant management plans.

7.32.8 Allegations of Corruption

Submission: P51

This submission made allegations of political corruption. This is not relevant to the merits of the Project and as such, is not being responded to.

8 MANAGEMENT AND MONITORING SUMMARY

Table 15 summarises the additional management and monitoring measures that have been committed to in this document. This section should be read in conjunction with Section 8 of the EIS, Section 4 of RTS1 and Section 7 of the Amendment Document.

Table 15
Management and Monitoring Measures

Ref	Commitment	Section
General		
1.	WACJV will develop an access road (minimum width of 6 m) alongside the proposed infrastructure on Nikko Road.	Section 5.1.2
2.	WACJV will register an easement over the section of Nikko Road within the Project Boundary to provide legal access to other users.	Section 5.1.2
3.	Prior to undertaking works within the Motorway Link Road reserve, WACJV will undertake a comprehensive risk assessment in consultation with RMS consistent with the draft <i>Technical Guide to Mine Risk Assessment IAM-AM-TP1-160-G01 - Version 1</i>	Section 5.6.1
4.	WACJV will enter into a deed with RMS for works within the road reserve for Motorway Link Road.	Section 5.6.1
5.	WACJV will obtain the approval of MSB prior to construction within a mine subsidence district.	Section 5.4.2
6.	WACJV will prepare a Rehabilitation Management Plan in consultation with the relevant regulatory authorities.	Section 5.3.5
7.	WACJV will develop a Complaints Management Protocol.	Section 5.13.11
8.	WACJV will ensure that the site is suitably equipped to respond to bushfire emergencies and will assist emergency services in the event of a fire.	Section 6.1.6
Subsidence		
9.	WACJV will prepare PSMPs for all private properties that are predicted to be impacted by subsidence. PSMPs will be prepared in consultation with the affected landowners.	Section 5.13.2
10.	WACJV will prepare an Extraction Plan in consultation with the relevant regulatory authorities.	Section 5.13.3
Water		
11.	WACJV will obtain the necessary WALs to account for its predicted impacts to water resources.	Section 5.2.1
12.	Development on waterfront land will be undertaken in accordance with DPI-Water's <i>Guidelines for Controlled Activities on Waterfront Land</i> .	Section 5.2.4
13.	WACJV will prepare a Water Management Plan, including a Brine Treatment Management Plan, in consultation with the relevant regulatory authorities.	Section 5.7.1
14.	Potable water required on site will meet the relevant drinking water standards.	Section 5.13.2
15.	WACJV will repair or replace any private water supply works that are damaged by subsidence.	Section 5.13.3
Air Quality		
16.	WACJV will prepare an AQMP in consultation with the relevant regulators.	Section 5.1.3
17.	WACJV will implement the dust controls listed in Table 2 .	Section 5.1.3

Ref	Commitment	Section
18.	Measures to reduce greenhouse gas emissions will be included in the AQMP.	Section 5.12.5
Noise		
19.	WACJV will prepare a Noise Management Plan, including a Construction Noise and Vibration Management Plan, in consultation with the relevant regulatory authorities.	Section 5.1.4
20.	WACJV will implement the noise controls listed in Table 3 .	Section 5.1.4
21.	WACJV will continue to consult with private landowners that are predicted to experience exceedances of the PSNC.	Section 5.7.1
Visual		
22.	Infrastructure near publicly accessible areas will be constructed using a 'natural' colour scheme.	Section 5.1.5
23.	To minimise the impacts of night lighting, WACJV will ensure that: <ul style="list-style-type: none"> • External lighting will be designed in accordance with 'Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting'; • new external lights will face downwards and employ low lux lamps; and • No lighting will be directed towards public roads and any potential residual nuisance lighting will be shielded to minimise impacts. 	Section 5.1.5
Biodiversity		
24.	WACJV will adopt an appropriate mechanism for securing the land included in the Biodiversity Offset Strategy.	Section 5.8.5
25.	Pre-clearance surveys for orchid species will be undertaken in accordance with the Biodiversity Management Plan to be prepared for the Project.	Section 5.11.6
Heritage		
26.	WACJV will prepare a Historic Heritage Management Plan in consultation with the relevant regulatory authorities.	Section 5.5.1

*

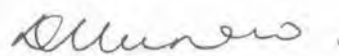
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For
HANSEN BAILEY



Andrew Wu
Environmental Engineer



Dianne Munro
Principal Environmental Consultant

9 ABBREVIATIONS

Term	Definition
ACHMP	Aboriginal Cultural Heritage Management Plan
ADWG	Australian Drinking Water Guidelines
AEP	Annual Exceedance Probability
AHIMS	Aboriginal Heritage Information Management System
ANZECC (2000)	Australian and New Zealand Guidelines for Fresh and Marine Water Quality
AQGGA	Air Quality Greenhouse Gas Assessment
AQGGAA	Air Quality Greenhouse Gas Assessment Addendum
AQMP	Air Quality Management Plan
ARTC	Australian Rail Track Corporation
AS	Australian Standard
BPL	Bushfire Prone Land
BMP	Biodiversity Management Plan
BOS	Biodiversity Offset Strategy
BTMP	Brine Treatment Management Plan
CBA	Cost Benefit Analysis
CCC	Central Coast Council
DA	Development Application
dBA	Decibels
DLALC	Darkinjung Local Aboriginal Land Council
DP&E	Department of Planning and Environment
DPI-Agriculture	Department of Primary Industries, Agriculture
DPI-Water	Department of Primary Industries, Water
DRE	Department of Industry, Division of Resources and Energy
EARs	Environmental Assessment Requirements
EECs	Endangered Ecological Communities
EIS	Environmental Impact Statement
ENM	Environmental Noise Model
EP	Extraction Plan
EPA	Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
ha	Hectare
HHMP	Historic Heritage Management Plan
HRA	Health Risk Assessment
HVAS	High Volume Air Sampler
ICNG	<i>Interim Construction Noise Guideline</i>
INP	<i>Industrial Noise Policy</i>
km	Kilometre
Km/h	Kilometres per hour

Term	Definition
kW	Kilowatt
LEA	Local Effects Analysis
LEC	NSW Land and Environment Court
LEP	Local Environmental Plan
LGA	Local Government Area
LMCC	Lake Macquarie City Council
M	Million
MLA	Mining Lease Application
mm	Millimetres
MNES	Matters of National Environmental Significance
MSB	NSW Mine Subsidence Board
Mt	Million tonnes
Mtpa	Million tonnes per annum
NMLs	Noise Management Levels
NMP	Noise Management Plan
NWSSP	North Wyong Shire Structure Plan
NSWSS	North Wyong Shire Settlement Strategy
NVIA	Noise and Vibration Impact Assessment
NVIAA	Noise and Vibration Impact Assessment Addendum
OEH	Office of Environment and Heritage, NSW Department of Premier and Cabinet
PAC	Planning Assessment Commission
PEL	Pacific Environment Limited
PM	Particulate Matter
Project	Wallarah 2 Coal Project
PSMP	Property Subsidence Management Plan
PSNC	Project Specific Noise Criteria
RMS	Roads and Maritime Services
RTS1	<i>Wallarah 2 Coal Project Response to Submissions</i>
RTS2	This document
Jilliby SCA	Jilliby State Conservation Area
SIG	Special Interest Group
SEPP	State Environmental Planning Policy
SSD	State Significant Development
t	tonne
TfNSW	Transport for NSW
tph	tonnes per hour
TSC Act	<i>Threatened Species Conservation Act 1997</i>
TSP	Total Suspended Particulates
VLAMP	<i>Voluntary Land Acquisition and Mitigation Policy</i>
WACJV	Wyong Areas Coal Joint Venture
WSP	Water Sharing Plan

10 REFERENCES

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APPENDIX A
Stakeholder Submissions Received

Wallarah 2 Coal Project RTS2
Appendix A – Stakeholder Submissions Received

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
REGULATORY AGENCIES				
NSW Office of Water		RA1		
NSW Environment Protection Authority		RA2		
Office of Environment & Heritage - Heritage Branch, Regional Operations Group		RA3		
Office of Environment & Heritage, NSW Department of Premier and Cabinet		RA4		
Division of Resources and Energy, Trade and Investment NSW		RA5		
Wyong Shire Council		RA6		
Lake Macquarie City Council		RA7		
NSW Health		RA8		
Department of Primary Industries		RA9		
Hunter Central Rivers CMA		RA10		
Fisheries NSW		RA11		
Central Coast Water Corporation		RA12		
Transport for NSW		RA13		
Roads and Maritime Services		RA14		
Mine Subsidence Board		RA15		
Transgrid		RA16		
Australian Rail Track Corporation		RA17		
Department of Sustainability, Environment, Water, Population and Communities		RA18		
Crown Land		RA19		
Forestry Corporation NSW		RA20		
SPECIAL INTEREST GROUPS				
Australian Trucks & 4WD Rentals Pty Ltd		156571	Gosford	
Monteath and Powys		156345	Newcastle West	
R&D Technology		156023	Cardiff	
C S Trade Pty Ltd		155833	Morisset	
Storeplan Group		156058	Tamworth	

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Concrete Mine Structures		155872	Morisset	
A C Whalan		156032	Singleton	
LMATS		156015	Wallarrah	
Hardy Bros Mining & Civil Construction Pty Ltd		155852	Tuggerah	
Australian Conservation Foundation - Central Coast Branch		157260	Central Coast	
Red Hat Cleaning Pty Ltd		156029	Budgewoi	
Bateau Bay - Shelly Beach Progress Association Inc		156926	Bateau Bay	
ATCO LS		156403	Heatherbrae	
Collective E1perience		156879	Maitland Vale	
Alpine Air Compressors		157195	Morisset	
RUS Mining Services		156034	Rathmines	
CoalBed Energy Consultants		156881	Morisset	
Ontrak Engineering Pty Ltd		156986	Maraylya	
Surepipe		156883	Zillmere	
Xenith Consulting		156877	Singleton	
Australian Coal Alliance		160710	Tuggerah	
Auston Consulting & Engineering Services		157497	Morisset	
C & S Investments		157473	Morisset	
Nature Conservation Council of NSW		161141	Sydney	
Carbon Based Environmental Pty Ltd		161291	Cessnock	
Concrete Mine Structures		157437	Morisset	
Central Coast Poultry Club		158384	Wyee	
1st Erina Heights Cub Scouts		158933	Erina	
Environmental Justice Australia		158795	Islington	
Hunter Environment Lobby Inc		160980	East Maitland	
Community Environment Network Inc		161037	Ourimbah	
Correct Planning & Consultation for Mayfield Group		157626	Mayfield East	
Mannerling Park Progress		158388	Ourimbah	
Solid Engineering		160684	Kurri Kurri	

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Darkinjung Local Aboriginal Land Council		160716	Watanobbi	
Lock the Gate Alliance		161366	Hamilton East	
Communication Partners International		157924	Erina	
HunterNet		157501	Newcastle	
Westlakes Maintenance		157475	Morisset	
Full Circle Farm		160238	Jilliby	
Bylong Valley Protection Alliance		161413	Bylong	
Central Coast Greens		161370	Wamberal	
Kerry Mountain Pty Ltd		161376	Doyalson	
Downer		161795	Hexam	
The Australia Institute		162397	Canberra	
Darkinjung Local Aboriginal Land Council		164741	Wyong	
PUBLIC				
Aaron Johnson	P1	156019	Toronto	
Benjamin Salisbury	P2	156010	Teralba	
Chris Vaschetto	P3	155945	Yarrawonga Park	
Christopher Ellis	P4	155910	Mayfield East	
Craig Dunshea	P5	155870	Morisset	
Gordon Lardner	P6	156063	Hamlyn Terrace	
Julie Barry	P7	155886	Hamilton South	
Lindsay Webb	P8	156050	Blue Haven	
Malcolm Harrison	P9	156038	Lambton	
Michael Clark	P10	156099	Redhead	
Shane Mcquisten	P11	156080	Dora Creek	
Shengjia Zeng	P12	155953	Wallsend	
Simone Griffiths	P13	156012	Gorokan	
Susan Blundell	P14	160853	Jilliby	1
Troy Carey	P15	155994	Blue Haven	

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Virginia Mall	P16	160314	Kulnura	8
Byron Gavenlock	P17	156027	Woy Woy	
John Morgan	P18	155981	Arcadia Vale	
Name withheld	P19	155831	Morisset	
Name withheld	P20	158901	Point Calre	
Name withheld	P21	156044	Marmong Point	
Andrew Emery	P22	156111	Warabrook	
Anthony Fardell	P23	156391	Umina Beach	
Criag Nosworthy	P24	156482	Wallsend	
David Middleton	P25	156103	Red Hill	
Dean Amos	P26	156194	Woongarrah	
Geoffrey Kent	P27	156415	Niagara Park	
Jason Murray	P28	156144	Wyee	
Mal Smith	P29	160304	Erina	
Nita Manley	P30	156371	Bushells Ridge	
Rafael Brymora	P31	156766	Lakelands	
Rodney Smith	P32	156803	Jilliby	
Rodney Smith	P33	156805	Jilliby	
Shane Matheson	P34	156387	Toukley	
Tricia Fortier	P35	160296	Lisarow	
Troy Straker	P36	156664	Abernethy	
Mark Stone	P37	156848	Blue Haven	
Mark Stone	P38	156850	Blue Haven	
Mark Stone	P39	156852	Blue Haven	
Shannon Dransfield	P40	156242	Long Jetty	
Name withheld	P41	156101	Gorokan	
Amy Thomson	P42	157035	New Lambton	

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Bradley Cross	P43	157064	Blue Haven	
Colleen O'Dowd	P44	156917	Unknown	1
Duncan Thomson	P45	157037	New Lambton	
K Barry	P46	157151	Hamilton South	
Scott Thomson	P47	157041	Morisset	
Sean Melville	P48	156952	Morisset	
Simone Griffiths	P49	156919	Gorokan	1
Siobain Fairbanks	P50	157185	Blue Haven	
Warren Simmons	P51	156921	Yarramalong	1
Mark Stone	P52	156854	Blue Haven	
Name withheld	P53	156915	Charlestown	
Name withheld	P54	156937	Warabrook	
Name withheld	P55	156990	Newcastle	
Name withheld	P56	156988	Wyong Creek	
Name withheld	P57	157191	Aberglasslyn	
Name withheld	P58	157181	Blue Haven	
Name withheld	P59	157050	Blue Haven	
Name withheld	P60	157039	Mirrabooka	
Name withheld	P61	157058	Mirrabooka	
David Cleaver	P62	157422	Noraville	
Janine Ravenwood	P63	157288	MacMasters Beach	9
Jordyn Mitchell	P64	160581	Budgewoi	1
Kelly Hutchion	P65	157264	Hamlyn Terrace	1
Kelly Hutchion	P66	157303	Hamlyn Terrace	1
Kevin Reed	P67	157418	Valentine	
Lindsay Auston	P68	157208	Mirrabooka	
Megan Benson	P69	157439	Bundeena	
Min Park	P70	157327	Rhodes	

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Sandra Dunshea	P71	157477	Morisset	
Scott Bradford	P72	157499	Newcastle West	
Margaret Auston	P73	157401	Morisset	
Renee Parker	P74	157213	Sunshine	
Name withheld	P75	157449	Gorokan	
Name withheld	P76	157447	Little Jillyby	
Name withheld	P77	157416	Blue Haven	
Name withheld	P78	157375	Harrington	9
Name withheld	P79	157219	Erina Heights	9
Name withheld	P80	157215	Woongarra	
Name withheld	P81	157349	Harrington	9
Andrew Fenwick-Clarke	P82	157527	Lake Haven	
Brendan Berlach	P83	157680	Umina Beach	9
Glen Crompton	P84	157805	Kariong	
Greg Shields	P85	157661	Caves Beach	
Guiseppe Amato	P86	157653	Blue Haven	
Heather Ingram	P87	157797	Wyoming	2
Hugh Halcrow	P88	157789	Kincumber	
Jean Werk	P89	157773	Lisarow	2
Jenny Hughes	P90	157832	Pearl Beach	1
Karma Wilson	P91	157537	Little Jillyby	
Kevin Armstrong	P92	157910	Unknown	1
Kirk Newman	P93	157818	Blue Haven	
Lisa Shields	P94	157666	caves Beach	
Mark Karaklic	P95	157860	Lithgow	
Robert Brooks	P96	157793	Doyalson North	
Tim Guise	P97	157812	Glenmore Park	
Charlotte Mccabe	P98	157741	Tighes Hill	1

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Mark Crossing	P99	157890	Narrabri	
Name withheld	P100	157762	Watanobbi	
Name withheld	P101	157511	Wyong Creek	3
Bruce Robinson	P102	158199	Mereweather	
C Des Champs	P103	158261	Watanobbi	
Christopher Downes	P104	158185	Jiliby	1
D Williamson	P105	158063	Wamberal	2
Derek Byrne	P106	158197	Blue Haven	1
Ed Valk	P107	157916	Forresters Beach	2
John Holmquest	P108	158213	Mayfield West	
Joy Cooper	P109	158189	Green Point	2
Kim Byrne	P110	158195	Blue Haven	1
Lisa Mattiussi	P111	158187	Blue Haven	1
Mark Smith	P112	158398	Bar Beach	
Michael Yeo	P113	158225	Nords Wharf	
Sarah Box	P114	158382	Adamstown Heights	1
Sidonie Gnauck	P115	157914	Budgewoi	
Susan Northridge	P116	157912	Durren Durren	1
Ray Rauschef	P117	158039	East Gosford	
Name withheld	P118	158091	The Hill	
Name withheld	P119	158145	Portland	
Name withheld	P120	158275	Blue Haven	3
Name withheld	P121	158273	Blue Haven	3
Allan Neal	P122	158454	Barnsley	
Bruce Taylor	P123	158597	Blue Haven	1
Ingrid Clark	P124	158599	Wyong	1
Jennifer Neal	P125	158456	Barnsley	
Kathleen Lovatt	P126	158793	Long Jetty	3

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Keith Bartlett	P127	158404	Thornton	
Lanie Parker	P128	158452	Hamilton South	
Lauren Neal	P129	158458	Barnsley	
Rachel Craig	P130	158807	West Gosford	
Ron and Robyn Borg	P131	158607	Blue Haven	
Sharon McRohan	P132	158797	Saratoga	
Sharyn Munro	P133	158605	Upper Lansdowne	1
Susan Wynn	P134	158444	Mannering Park	1
William Mann	P135	158803	Halekulani	
Sandra Stone	P136	158614	Blue Haven	
Name withheld	P137	158679	Blue Haven	
Name withheld	P138	158693	Blue Haven	
Name withheld	P139	158683	Blue Haven	
Name withheld	P140	158436	Blue Haven	
Name withheld	P141	158488	Blue Haven	
Christina Armstrong	P142	158837	Point Clare	3
Darlene Thornton	P143	158811	Ourimbah	3
Faith Hudson	P144	158853	Blue Haven	3
Glen Merrett	P145	158885	Tumbi Umbi	3
Helen McInnes	P146	158841	Terrigal	
Jenny Hughes	P147	158843	Pearl Beach	3
Karri Morgan	P148	158833	Terrigal	3
Neil Bevege	P149	158821	Kanwal	3
Neville Threlfall	P150	158887	Bateau Bay	
Samantha Pethen	P151	158809	Terrigal	3
Ellen Rubbo	P152	158839	Avoca Beach	3
Name withheld	P153	158819	Davistown	
Name withheld	P154	158817	Bateau Bay	

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Name withheld	P155	158831	Bateau Bay	
Name withheld	P156	158930	Buff Point	
Name withheld	P157	158899	Yattalunga	
Name withheld	P158	158849	Eleebana	
Name withheld	P159	158845	Gosford	
Name withheld	P160	158867	Gorokan	
Name withheld	P161	158855	Gorokan	
Aaron Trew	P162	158969	Wyong Creek	3
Andrew Hodgson	P163	159077	Blue Haven	1
David Slee	P164	161493	Blue Haven	
Emma McBride	P165	161485	Tuggerah	
Harry Shedden	P166	158959	Terrigal	
Jeanette Hodgson	P167	159085	Blue Haven	1
Joshua Cusumano	P168	159020	Palm Grove	
Ken Bate	P169	158945	Point Clare	
Mariela Powell Thomas	P170	159040	Petersham	
Paul Donnellan	P171	158994	Long Jetty	2
Peter Allonby	P172	158973	The Entrance	
Robert McLaughlin	P173	161489	Bulga	
Ryan Heath	P174	158989	Halekulani	
Damian Gordon	P175	158957	Forresters Beach	2
Keith Royle	P176	158981	Jilliby	
Lisa Adoma	P177	159050	Wallarah	
Name withheld	P178	159034	Kincumber	
Name withheld	P179	159046	Lane Cove	2
Name withheld	P180	158979	Camp Mountain	
Name withheld	P181	158977	Point Clare	
Name withheld	P182	158967	Avoca Beach	

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Allan Smith	P183	159134	Jilliby	1
Colin Crofts	P184	159172	Blue Haven	1
D Dale	P185	159144	Blue Haven	
Denise Crofts	P186	159174	Blue Haven	1
Dennis Dale	P187	159190	Blue Haven	
Don and Anne Craig	P188	159116	Ourimbah	
Hendrik Holtman	P189	159188	Blue Haven	
J Wood	P190	159158	Blue Haven	
Joanne Eyes	P191	159148	Wyong Creek	6
Joyce Martin	P192	159146	Wyong	6
Les Fuller	P193	159182	Blue Haven	
Ililiana and Tom Nunez	P194	159138	Wyee	1
Mavis Dale	P195	159162	Blue Haven	1
N E Sroothoff	P196	159168	Gosford	1
Nathan	P197	159152	Erina	
Robyn Borg	P198	159186	Blue Haven	1
Rodney Losh	P199	159128	Jilliby	1
Tanya Bord	P200	159192	Toukley	1
Zyanya Walker	P201	159154	Palm Grove	
Name withheld	P202	159194	Wyoming	3
Ash-lea Borland	P203	159206	Bateau Bay	
Bruce Gibbs	P204	159454	Wyong	
Cecile Morgan	P205	159262	Jilliby	1
Earl Watson	P206	159256	Blue Haven	1
J & U Karsch	P207	159466	Forresters Beach	
Jason Gregory	P208	159440	Blue Haven	3
John Giampino	P209	159336	Blue Haven	3
Julian Bassett	P210	159478	Wollstonecraft	

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Kaylah Quay	P211	159260	Blue Haven	1
Matt Gregory	P212	159210	Bateau Bay	
Norma Biggs	P213	159266	Blue Haven	1
P Stewart	P214	159198	Blue Haven	
Robert Biggs	P215	159264	Blue Haven	1
Ron Borg	P216	159252	Blue Haven	1
Tennyle Quay	P217	159270	San Remo	
Tim Borg	P218	159196	Toukley	
Name withheld	P219	159204	Northgate	
Name withheld	P220	159208	Lake Munmorah	
Name withheld	P221	159347	Brisbane	
Name withheld	P222	159469	Fassifern	
Brenna Sarkis	P223	159915	Blue Haven	
Brenna Sarkis	P224	160171	Blue Haven	
Cody Sarkis	P225	159927	Blue Haven	
Echo Sarkis	P226	159925	Blue Haven	
Leigh Sarkis	P227	159921	Blue Haven	
M Sarkis	P228	159929	Blue Haven	
Michael Sarkis	P229	159923	Blue Haven	
Michael Haigh	P230	160248	Jewells	
Patricia Sarkis	P231	159919	Concord West	
Kylie Kelly	P232	160244	Jilliby	1
Rhye Kelly	P233	160242	Jilliby	
Shannon Kelly	P234	160240	Jilliby	
Name withheld	P235	159931	Merriwa	
Name withheld	P236	160228	Wyee	
Name withheld	P237	160226	Wyee	
Name withheld	P238	160234	Wallarrah	

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Name withheld	P239	160232	Wallarah	
Name withheld	P240	159917	Blue Haven	
Name withheld	P241	159739	Brisbane	
Name withheld	P242	160224	Wyee	
Alan Baynham	P243	160362	Jilliby	
Barbara Donaldson	P244	160378	Blue Haven	1
Beverly Durkin	P245	160374	Blue Haven	
Bob Mansfield	P246	160349	Jilliby	
John Cohen	P247	160370	Blue Haven	1
John Hammett	P248	160353	Tarragindi	
K & G Blunden	P249	160343	Kellyville	1
Ken Scales	P250	160376	Blue Haven	
Mark Moffett	P251	160364	Jilliby	
Nivienne Cohen	P252	160372	Blue Haven	1
Peggy Mansfield	P253	160345	Jilliby	
Richard Clarke	P254	160334	Elanora Heights	3
Shirley Goodbar	P255	160347	Lisarow	1
Sue Davies	P256	160368	Toukley	
Tabitha Tucker	P257	160366	San Remo	1
Tracy Mathison	P258	160351	Blue Haven	1
Amie Clarke	P259	160289	Dareton	
Name withheld	P260	160291	Eleebana	
Name withheld	P261	160252	Chitaway Bay	2
Name withheld	P262	160250	Chitaway Bay	8
Allan Carpenter	P263	160591	Budgewoi	1
Amy McHatton	P264	160593	Blue Haven	1
Andrew Fookes	P265	160575	Jilliby	
Brett Ewer	P266	160390	Charlestown	

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Bryan Carter	P267	160473	Jilliby	1
Faye and Lindsay McNamara	P268	160563	Jilliby	
Garry Malone	P269	160573	Blue Haven	
George Barnett	P270	160470	Gosford	
Georgia Malone	P271	160567	Blue Haven	1
Gloria Allen	P272	160585	Jilliby	1
Greg Marshall	P273	160583	Blue Haven	1
Irene Fay Marshall	P274	160587	Blue Haven	1
Isabella Malone	P275	160565	Blue Haven	1
Kay Wilson	P276	160539	Holgate	
Maddison Malone	P277	160569	Blue Haven	1
Ray Eaton	P278	160557	Blue Haven	
Shelley Ewer	P279	160388	Charlestown	
Terence Marshall	P280	160589	Blue Haven	1 & 2
Thea Malone	P281	160571	Blue Haven	
Name withheld	P282	160561	West Gosford	
Angela McHatton	P283	160601	Blue Haven	1 & 2
Angus Walker	P284	160619	Blue Haven	
Ahslee Watson	P285	160625	Blue Haven	1
B Adams	P286	160616	Noraville	1
Carolyn Kightley	P287	160633	Blue Haven	1
Ceonella Grassano	P288	160612	Kanwal	1
Hanah Watson Walker	P289	160621	Blue Haven	1
Joan Moffett	P290	160610	Blue Haven	1
Joseph Kightley	P291	160635	Blue Haven	1
K Higgins	P292	160608	San Remo	
Karen Sawtell	P293	160627	Blue Haven	1
Keiran McHatton	P294	160599	Blue Haven	1

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Kelly McHatton	P295	160595	Blue Haven	1
Kelly Sawtell	P296	160614	Blue Haven	1
Kevin Lambert	P297	160629	San Remo	1
Laura Watson	P298	160623	Blue Haven	1
Peter McHatton	P299	160605	Blue Haven	1
Sarah McHatton	P300	160597	Blue Haven	
T Wilkins	P301	160639	Turrerawong	
Terry Lambert	P302	160631	San Remo	
Beryn Jewson	P303	160706	Kanwal	
David Holland	P304	160894	Blue Haven	
Fiona Neville	P305	160704	Wamberal	
Janice Fowle	P306	160963	Jilliby	
Kodi Tupper	P307	160949	Little Jilliby	
Natalie Wilson	P308	160734	Terrigal	8
Nigel Tupper	P309	160945	Little Jilliby	
Rae Davenport	P310	160694	Jilliby	1
Ronald Fowle	P311	160961	Jilliby	1
Tracey Cooke	P312	160688	Kanwal	1
Vic Davenport	P313	160692	Jilliby	1
Viv and Rae Davenport	P314	160696	Jilliby	
J Chafe	P315	160698	Glenning Valley	1
J Chafe	P316	160700	Glenning Valley	1
Name withheld	P317	160675	Morisset	
Name withheld	P318	160673	Morisset	
Name withheld	P319	160959	Katoomba	2
Name withheld	P320	160877	Wyee	
Name withheld	P321	160857	Blue Haven	
Beth Davies	P322	161075	Palmdale	

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Beverley Smiles	P323	160968	Wollar	
Christopher Barrett	P324	161123	Ourimbah	
Geoffrey Swann	P325	160990	San Remo	
Holly Creenaune	P326	161102	Dulwich	
Jason Pauls	P327	161057	Wyee	
Jerzy Pniewski	P328	160982	Watanobbi	
Lynne Hamilton	P329	161017	Wyong	
Miriam Robinson	P330	161129	North Fitzroy	
Peter Cook	P331	160998	Bolwarra Heights	
Steven Nolan	P332	161121	Woongarra	
Susan Farrell	P333	161125	Ettalong Beach	
Judith Leslie	P334	160994	Bulga	
Name withheld	P335	161071	Eleebana	
Name withheld	P336	161069	Blue Haven	
Name withheld	P337	161108	Blue Haven	
Name withheld	P338	161035	Jilliby	2
Name withheld	P339	161031	South Melbourne	
Name withheld	P340	160978	Gloucester	
Name withheld	P341	160976	Gloucester	
Barb Harris	P342	161167	Glenning Valley	4
Beau Ingram	P343	161169	Blue Haven	4
Beth Soensen	P344	161157	Gwandalan	4
Beth Soensen	P345	161171	Gwandalan	4
Brad Harris	P346	161173	Glenning Valley	4
Brooke Harb	P347	161175	Blue Haven	4
Cara Lake	P348	161177	Blue Haven	4
Cathy Davison	P349	161179	Springfield	4
Chernita West	P350	161187	Gorokan	4

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Celsea Honey	P351	161183	Loganholme	
Corine Thomas	P352	161189	Wyee	5
Corrine Hodson Hodson	P353	161191	Bateau Bay	
Dal Walters	P354	161199	Chitaway Bay	
Dal Walters	P355	161203	Chitaway Bay	
Glynis Newberry	P356	161181	Wyee	
Grant Ellis	P357	161165	Watanobbi	4
Jorge Tlaskal	P358	161135	Bulga	
Tab Pittman	P359	161145	Charlestown	4
Corrine Hodson	P360	161195	Bateau Bay	5
Name withheld	P361	161137	Gosford	
Dan Benton	P362	161207	Wyong	4
Daniel Adams	P363	161239	Tamarama	2
Douglas Moon	P364	161211	Gorokan	4
Feona Sales	P365	161213	Killarney Vale	4
Fred Sales	P366	161215	Killarney Vale	5
Gary Bourke	P367	161217	Hamlyn Terrace	4
Grant Ellis	P368	161221	Watanobbi	4
Jason West	P369	161223	Gorokan	
Jody Nicholson	P370	161225	Unknown	
John Ingram	P371	161229	Blue Haven	4
Julie Shannon	P372	161231	Blue Haven	4
Katarina Sales	P373	161237	Lake Haven	5
Karen Peter	P374	161209	Berkeley Vale	
Lillian Gordon	P375	161247	Horseshoe Bend	
Loretta Grauner	P376	161243	Ourimbah	4
Loretta Grauner	P377	161245	Ourimbah	4
Jodi Shannon	P378	161227	Blue Haven	4

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Julie Shields	P379	161233	Wadalba	
Julie Shields	P380	161235	Wadalba	
Name withheld	P381	161241	Loftus	
Carl Sheedy	P382	161277	Shortland	2
Darryl Fry	P383	161257	Coolum	
Loretta Grauner	P384	161249	Ourimbah	5
Loretta Grauner	P385	161251	Ourimbah	5
Loretta Grauner	P386	161253	Ourimbah	5
Lyn Sutton	P387	161255	Hamlyn Terrace	4
M A Campbell	P388	161259	Jilliby	5
Mark Summers	P389	161263	Lake Haven	4
Matt West	P390	161261	Blue Haven	4
Matt West West	P391	161265	Blue Haven	4
Matthew Morris	P392	161267	Mardi	5
Matthew West	P393	161269	Blue Haven	4
Melinda Watson	P394	161271	Kariong	5
Peter Reeves	P395	161273	Woy Woy	4
Rachel Annetts	P396	161275	Blue Haven	5
Shannon Ford	P397	161279	Booker Bay	5
Sharon Tindall	P398	161281	Hamlyn Terrace	
Shaun Mc Niveu	P399	161289	Wangi Wangi	4
Simone Johnstone	P400	161293	Mannering Park	4
Name withheld	P401	161283	Tuggerah	
Corinne Berry	P402	161350	Pretty Beach	
David Harris	P403	161327	Wyong	
Greg Piper	P404	161338	Toronto	
Janet Fenwick	P405	161372	Bulga	
Maree Giusti	P406	161362	Wyee	

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Peggy Fisher	P407	161323	Kilara	
Ron Fenwick	P408	161360	Singleton	
Simone Thomas	P409	161295	Lake Haven	
Susan Walters	P410	161302	Chitaway Bay	
T Pitman	P411	161307	Charlestown	
Tab Pittman	P412	161305	Charlestown	
Tiana Harb	P413	161311	Blue Haven	
Tina West	P414	161313	Gorokan	
Vanessa Williams	P415	161315	Mardi	
Vesta Harris Harris	P416	161317	Glenning Valley	4
Vicki Manning	P417	161319	Mardi	
Name withheld	P418	161356	Macclesfield	
Name withheld	P419	161348	Narraweena	
Name withheld	P420	161354	Little Jilliby	
Name withheld	P421	161352	Terrigal	
C Smith	P422	161399	Balgowlah Heights	
Carolyn Barry	P423	161469	Jilliby	
Helen Kvelde	P424	161405	Sydney	
Kelia Keogh	P425	161465	Wyoming	
Les Coventry	P426	161471	Tuggerah	
Maria Zotos	P427	161463	Gorokan	
Veronika Pearson	P428	161407	South Hobart	
Will Eastlake	P429	161467	San Remo	1
Name withheld	P430	161449	Little Jilliby	
Name withheld	P431	161443	Elizabeth Bay	
Name withheld	P432	161441	Mereweather	
Name withheld	P433	161427	Wyee	
Name withheld	P434	161425	Wyee	

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Name withheld	P435	161403	Adamstown	
Name withheld	P436	161401	Dawesville	
Name withheld	P437	161397	Balgowlah Heights	
Name withheld	P438	161395	MacMasters Beach	
Name withheld	P439	161393	Wyee	
Name withheld	P440	161385	Little Jilliby	
Name withheld	P441	161381	Lemon Tree	
Alan Hayes	P442	161524	Dooralong	
Annemaree McLaughlin	P443	161495	Bulga	
Begwarchry Family	P444	161546	Jilliby	
Cinta Dudley	P445	161479	San Remo	1
Darren Hoolihan	P446	161499	Jilliby	
Dennis Dewbent	P447	161528	Jilliby	1
Don White	P448	161497	Woolahra	1
Emily Fraser	P449	161532	Berkeley Vale	1
John Gorman	P450	161507	Bateau Bay	
Karen Fisher	P451	161475	Chain Valley Bay	1
Karen Lanzini	P452	161542	Blue Haven	1
Kate Lanzini	P453	161536	Blue Haven	1
Kimberley Masters	P454	161477	Blue Haven	1
Lynette Campbell	P455	161520	Little Jilliby	1
Michael Conroy	P456	161516	Booker Bay	
Paul Robert Burton	P457	161534	Erina	
Reinhard Lach	P458	161481	Blue Haven	1
Sam Elliott	P459	161473	Blue Haven	1
Michael Campbell	P460	161518	Little Jilliby	2
Aileen Van Vliet	P461	161562	Blue Haven	1
Aubrey Odell	P462	161593	Hamlyn Terrace	

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Craig Ingram	P463	161556	Unknown	
Daryl Thomas Lanzini	P464	161558	Blue Haven	1
Donna Carey	P465	161574	Unknown	1
Elizabeth Pettit	P466	161552	Toukley	1
Gerald Lanzini	P467	161548	Blue Haven	1
J Cohen	P468	161579	Blue Haven	1
Kathleen Lanzini	P469	161554	Hamlyn Terrace	1
Kim Chhew	P470	161589	Blue Haven	1
Larry Ashman	P471	161591	Blue Haven	1
Laurie Eyes	P472	161583	Wyong Creek	
Lesley Warman	P473	161581	Blue Haven	1
Maureen Lanzini	P474	161550	Blue Haven	1
R Sokolowski	P475	161568	Jilliby	
Rudolf Van Vliet	P476	161566	Blue Haven	1
S McG	P477	161585	Blue Haven	1
Tailah Ann Ireland	P478	161587	Charmhaven	1
Tanya Hoolihan	P479	161577	Jilliby	
Ursula Silva	P480	161572	Ourimbah	
A Wear	P481	161619	Blue Haven	1
Bradley Rowe	P482	161609	Gorokan	1
Frances Burnes	P483	161627	Blue Haven	1
Garry Popple	P484	161621	Blue Haven	1
Jay Grandell	P485	161625	Blue Haven	1
Joan Thurston	P486	161631	Blue Haven	1
Joshua Randall	P487	161633	Blue Haven	1
K Bright	P488	161623	Blue Haven	1
P B	P489	161629	Blue Haven	1
P Unknown	P490	161599	Blue Haven	1

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Ray Cooper	P491	161607	Blue Haven	1
Sam A	P492	161595	Blue Haven	1
Sarah Davis	P493	161613	Blue Haven	1
Stephen Morgan	P494	161603	Blue Haven	1
Tahnae Van Gelder	P495	161617	Forresters Beach	1
Tess Ward	P496	161611	Canton Beach	1
Thomas Norman	P497	161605	Saratoga	1
Trish Chapman-Maybe	P498	161601	Norah Head	1
William Rogers	P499	161615	Blue Haven	1
Yvonne Sternbeck	P500	161597	Noraville	1
Aime Beeton	P501	161657	Charmhaven	1
Alecia Barnes	P502	161651	Blue Haven	1
Alison Daniel	P503	161653	Lake Haven	1
Belinda Leard	P504	161641	Blue Haven	1
Bianca Compton	P505	161635	Blue Haven	1
Brenda and Jeffrey Delamont	P506	161665	Blue Haven	1
Brittney Connor	P507	161645	Unknown	1
Damien Mylchreest	P508	161661	Blue Haven	1
Dannielle Moore	P509	161663	Buff Point	1
Darren and Tania Hamilton	P510	161671	Blue Haven	1
Hayley Eckford	P511	161639	Blackwall	1
Jenny and Ian Menteith	P512	161667	Watanobbi	1
Leanne Sillick	P513	161649	Mt Hutton	1
Maddison Kelly	P514	161637	Blue Haven	1
Natalie Mylchreest	P515	161655	Blue Haven	1
Sharon Ryder	P516	161659	Chain Valley Bay	1
Tania and Robert Rodger	P517	161673	Woongarra	1
Taryn Thomas	P518	161675	Woongarra	1

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Unknown Unknown	P519	161643	Unknown	1
Whiteman Family	P520	161647	Gorokan	1
Belinda Moran	P521	161679	Woongarra	1
Ian Hayes	P522	161681	Blue Haven	1
Jessica Field	P523	161683	Blue Haven	1
Kurt Grigg	P524	161677	Woongarra	1
Lee Kilmore	P525	161687	Blue Haven	1
Mark Limder	P526	161685	Blue Haven	1
Mazda Dalisay	P527	161719	Shortland	1
Melody Harris	P528	161721	Meadowie	1
Mitchell Greenan	P529	161717	Cameron Park	1
Murray Davies	P530	161689	Blue Haven	1
Nidoro Unknown	P531	161715	Wallsend	1
Nikki Dixon	P532	161713	Smiths Lake	1
Robyn Taylor	P533	161711	Norah Head	1
Rod Sternbeck	P534	161709	Noraville	1
Safia Khan	P535	161707	Warwick Farm	1
Scott Howlett	P536	161705	Wyoming	1
Serena Carney	P537	161703	Elemore Vale	1
Sharron Courte	P538	161701	Norah Head	1
Susan Mellrose	P539	161695	Noraville	1
Sydney Steward	P540	161693	Umina	1
Angela Bailey	P541	161731	Dooralong	
Ben Cortrell	P542	161759	Unknown	1
Cath Connor	P543	161723	Forrester's Beach	
Dan Clink	P544	161749	Blue Haven	2
Don and Lyn Suthers	P545	161753	Little Jillyby	2 & 7
Gary Wills	P546	161755	Lake Haven	1
Kate Carman	P547	161741	Mereweather	1

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Kathryn Hines	P548	161739	Wyongah	7
Kieran Hughes	P549	161737	Empire Bay	1
Krissi Sheridan	P550	161733	Norah Head	1
L Barrett	P551	161757	Tumbi Umbi	1
Lyanya Walker	P552	161729	Palm Grove	
Merryn Duckinson	P553	161761	Gorokan	1
Mikala Dind	P554	161727	Jilliby	
Pamela and Travis Ward	P555	161725	Blue Haven	8
Peter Williams	P556	161747	Jilliby	7
Robert Bradhurst	P557	161751	Blue Haven	7
Sandra Norman	P558	161743	Dooralong	7
Tim Bailey	P559	161735	Dooralong	7
Valerie Williams	P560	161745	Jilliby	7
Alison Mortiss	P561	161783	Jilliby	7
Brian Davies	P562	161789	Palmdale	7
Greg Sellers	P563	161803	Norah Head	7
J and J Suthers	P564	161799	Claremont Meadows	1
Jalce Bateman	P565	161793	Saratoga	1
James Andrews	P566	161787	Kiar	1
Jay Chapman-Mayne	P567	161785	Canton Beach	1
Jesse Cluer	P568	161781	Tugun	1
Jessica Hartley	P569	161777	Green Point	1
Jessica Rose Scannell	P570	161773	Copacabana	1
Jessica Thomas	P571	161771	Umina Beach	1
Jill Church	P572	161779	Blue Haven	1
Joshua Cusumano	P573	161769	Palm Grove	1
Karen Manson	P574	161763	Hamlyn Terrace	1
Kasey Smiles	P575	161767	Fletcher	1
Lisa Jackson	P576	161775	Blue Haven	1

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
M K Baxter	P577	161801	Blue Haven	
Margaret Dunn	P578	161797	Blue Haven	
Michael J	P579	161765	Blue Haven	1
Michael Mortiss	P580	161791	Jilliby	1
Abby Hugman	P581	161833	Blue Haven	1
Ainslie Selway	P582	161831	Rutherford	1
Amy Owen-Cooper	P583	161829	Saratoga	1
Anne Reynolds	P584	161827	Kurraba Point	1
Anthony Murray	P585	161886	Blackwall	1
Anthony Te Rangi	P586	161825	Birmingham Gardens	1
Ben Clarke	P587	161823	Norah Head	1
Bree Chapman-Mayne	P588	161821	Norah Head	1
Brett Courte	P589	161819	Norah Head	1
Bryce Adamson	P590	161817	Hamilton	1
Debbie Sue Harris	P591	161882	Wyong	1
Deborah Landsdowne	P592	161815	Wyoming	1
Emilee Deal	P593	161813	Blue Haven	1
Emma Clarke	P594	161811	Norah Head	1
Erin Fahey	P595	161809	Wamberal	1
Gary Arnott	P596	161807	North Gosford	1
Greg Mayne	P597	161805	Norah Head	1
K Musty	P598	161884	Gorokan	1
Nikolas Kenny	P599	161837	Copacabana	1
Sarah Egginton	P600	161835	Dora Creek	1
Aljo George	P601	161944	Wyee	1
B Cotter	P602	161950	Unknown	1
Cheryl Noonan	P603	161952	Mardi	1
Deep Unknown	P604	161894	Gosford	1
Georgia Matterson	P605	161907	Copacabana	1

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
Ian and Liz Hemphill	P606	161898	Wyee	1
Jamieson Melbourne	P607	161909	Killarney Vale	1
Jane Grantham	P608	161896	Saratoga	1
Jeremy Fogg	P609	161903	Davistown	1
Joshua Preston	P610	161911	Gosford	1
Luke Coleman	P611	161958	Wyoming	1
M Yarga	P612	161986	Blue Haven	1
Mary Jackson	P613	161984	Blue Haven	1
Megan Richards	P614	161890	Kariong	1
Ron Jackson	P615	161988	Blue Haven	1
Ronah Whitney	P616	161954	Green Point	1
Sally Haynes	P617	161946	Killarney Vale	1
Satnam Siwain	P618	161905	Morisset	1
Steve Papadony	P619	161988	Yarramalong	1
Taylor Meyn	P620	161892	Long Jetty	1
Chris Proctor	P621	162156	Unknown	1
Corinne Bradhurst	P622	162168	Blue Haven	1
E Wilding	P623	162128	Blue Haven	1
Jackie Day	P624	162174	Blue Haven	1
Jake Proctor	P625	162152	Wyee	1
Joy Wood	P626	162136	Blue Haven	1
Judith Taylor	P627	162138	Blue Haven	1
Lindsay and Fay McNamara	P628	162126	Jiliby	1
M G	P629	161990	Blue Haven	1
Mary Watson	P630	162146	Hamilton	1
Mischelle Stevenson	P631	162172	Blue Haven	1
Nathan Proctor	P632	162154	Wyee	1
Robert Mark Love	P633	162162	Unknown	1
Robert Stacy	P634	162116	Yarramalong	

Stakeholder	ID	DP&E Submission ID	Origin - Town	Form Letter (#)
S J Clay	P635	162118	Blue Haven	
Sally Proctor	P636	162158	Wyee	
Tony Armstrong	P637	162142	Lake Munmorah	
Wane Unknown	P638	162170	Blue Haven	
Name withheld	P639	162074	Lake Munmorah	
Name withheld	P640	162010	Kiar	
Colin Pursehouse	P641	162550	Jilliby	
Daphne Russell	P642	162200	Tuggerah	6
Hannah Greenshields	P643	162196	Wyong Creek	
Jarrold Beven	P644	162188	Watanobbi	6
Jeanette Elford	P645	162706	Buff Point	1
Jennifer Vaupel	P646	162548	Darlinghurst	6
John Bradley Storey	P647	162176	Blue Haven	
John McQuarrie	P648	162182	Blue Haven	1
Karen Nagle	P649	162552	Jilliby	1
Karl Vaupel	P650	162708	Darlinghurst	6
L Frame	P651	162194	Alison	6
Loreley Storey	P652	162178	Blue Haven	1
Melanie Parsons	P653	162402	Berkeley Vale	1
Pauline Connell	P654	162190	Wyong	6
Rosslyn Rix	P655	162704	Booker Bay	6
Skye Hodges	P656	162192	Wyong Creek	6
Tracey Farthing	P657	162186	Wyong Creek	6
V Evans	P658	162198	Kanwal	6
Wendy Rix	P659	162702	Booker Bay	6
Name Withheld	P660	162546	Blue Haven	
Beryn Jewson	P661	163017	Kanwal	
Sandra Norman	P662	163013	Dooralong	

APPENDIX B
Issues Raised in Submissions

No.	Stakeholder Name	ID	Issue
1.	Heritage Council	REG	The revised application has not identified any additional historic heritage issues which required additional consideration as part of this amendment. The Heritage Division recommends the application of the previous advice provided to the Department of Planning and Environment in February 2013 for this project is still valid. This advice recommended conditioning an Historic Heritage Management Plan (HMMP) for this project.
2.	Heritage Council	REG	The HHMP should include: Stop works procedures for any unexpected archaeological relics/objects within the project land which were not identified and considered in the original EIS. This procedure should identify the input of an appropriately qualified heritage professional to identify and advice on management of the item by heritage significance should occur, where it will be impacted by the project. The HHMP should contain a map with all known and potential heritage items within the subject area. It should also include a summary of the proposed mitigation measures for the known impacted items.
3.	Transport for NSW	REG	TfNSW has reviewed the submitted information and has no further comment on the development application. TfNSW supports the continued engagement between the transport agencies and Wyong Areas Coal Joint Venture.
4.	EPA	REG	EPA notes that the operational noise impacts at assessment locations P1 to P10 are reduced by between 0.1 and 1.1 dB in comparison to the previously proposed rail loop (Table 14). The NVIAA needs, however, to include predicted noise emission levels from the revised proposal at these locations, to inform the recommendation of general terms of approval.
5.	EPA	REG	The relocation of the rail spur and load-out facility will result in exceedances of the project-specific noise level at assessment locations P14, P15, P16 and P17 by up to 4 dB under some prevailing meteorological conditions (Tables 15 and 16), which in some cases will trigger a requirement for mitigation under the NSW Government Voluntary Land Acquisition and Mitigation Policy (VLAMP).
6.	EPA	REG	The NVIAA sets amenity noise criteria for assessment locations P13, P14 and P15 based on a 'urban' amenity category under the NSW Industrial Noise Policy (INP). The EPA does not accept this to be an appropriate amenity category for these receivers based on the information in the Wyong Council Local Environmental Plan 2013. The EPA considers that appropriate amenity categories for the above assessment locations under the INP would be P13 - 'Suburban', P14 - 'Rural' and P15- 'Rural'. The NVIAA should revise the assessment to account for these changed categories and provide justification to support other amenity categories being considered more appropriate for these locations.
7.	EPA	REG	Table 10 of the NVIAA assigns meteorological conditions of 20 degrees C and 60% relative humidity for night-time noise modelling, these values are identical to those for the daytime scenarios and their use should be justified or more appropriate night-time values used.
8.	EPA	REG	The NVIAA predicts significant construction noise impacts at surrounding receivers, particularly during out of hours activities. Any works outside the standard hours in the Interim Construction Noise Guideline (ICNG) should be supported by clear justification as per Section 2.3 of the ICNG. The EPA also considers that the NVIAA should include more detailed information regarding how the predicted construction noise impacts will be mitigated and managed, together with their expected effectiveness in reducing overall construction noise emissions from the proposal. The EPA considers that the impacts of traffic associated with construction noise will not be significant, based on the vehicle numbers provided in Section 7.2 of the NVIAA.
9.	EPA	REG	The notes that rock hammering is proposed where required, however a rock hammer is not listed as an item in Table 2.4 of the NVIAA. It is also not clear whether a 5 dB penalty has been added to some construction activities with increased potential for annoyance as per Section 4.5 of the ICNG, such as rail saws, grinders, rail tamping and regulating, vibratory rollers, etc. The proponent should also check the exceedance entries for work stages 2, 3 and 10 in Table 27 of the NVIAA for accuracy.
10.	EPA	REG	The results of the dispersion modelling indicate that the predicted incremental ground level concentrations for PM10, PM2.5, TSP and dust deposition at the closest residential receptors are all below the impact assessment criteria. A cumulative assessment, incorporating existing background levels, indicates that the Project is unlikely to result in any additional exceedances of relevant impact assessment criteria at the neighbouring receivers.
11.	EPA	REG	Table 7.1 of the assessment presents a summary of modelling results for PM2.5, PM10 and TSP. In some instances, maximum PM2.5 predictions are marginally higher than the maximum PM10 predictions. As PM2.5 is a sub-fraction of PM10, these results appear to be in error. The proponent should check and confirm the modelling results presented in the air assessment are correct.
12.	EPA	REG	The EPA provides the following advice that remain under consideration as part of the previous consent condition including suitable water quality discharge limits. In general the previous consent conditions are appropriate and consideration should be given to the issues set out below to update the conditions for the amended development.
13.	EPA	REG	Stormwater management The sizing and management of stormwater systems appear to be appropriate which aims to avoid managed overflows from the site.
14.	EPA	REG	Any flocculants or coagulants discharged that may cause actual or potential pollution (non-trivial risk of harm) and affect downstream water uses or the environment

No.	Stakeholder Name	ID	Issue
			should be appropriately regulated by licence limits and other standard section 45 considerations apply such as the practical measures that can be taken to prevent, control, abate or mitigate the pollution and protect the environment from harm, e.g. low toxicity flocculent options.
15.	EPA	REG	Discharges from the Water treatment plant Discharge limits should be derived with reference to the ANZECC (2000) guidelines and the full range of considerations under section 45 of the <i>Protection of the Environment Operation Act</i> .
16.	EPA	REG	The background water quality in Wallarah Creek has not been demonstrated to provide suitable reference conditions for developing site specific trigger values consistent with ANZECC (2000) requirements as the current water quality at the monitoring location may be adversely affected by mining or other catchment activities. ANZECC (2000) states that: "the reference condition should represent a substantial achievement in environmental protection that is agreeable to the majority of stakeholders", and, "It is not acceptable to allow poor environmental performance or water pollution, simply because a waterway is degraded". In accordance with the ANZECC (2000) guidelines, for a slightly to moderately disturbed system (which is level of protection goal that should apply in this case), the reference site(s) should be only slightly modified. In the absence of appropriate reference conditions the default trigger values should be used.
17.	EPA	REG	For toxicants such as metals, the trigger values can be adjusted using the decision tree for toxicants in the ANZECC (2000) guidelines.
18.	EPA	REG	Where ANZECC (2000) Volume 1 does not provide an aquatic ecosystem trigger value for a particular analyte, then reference should be made to Volume 2 to determine if an interim trigger value is available as a basis for decision making, or international literature can be reviewed.
19.	EPA	REG	The use of 99% species protection levels applies to some analytes for slightly to moderately disturbed ecosystems to account for potential bioaccumulation effects, e.g. mercury, selenium.
20.	EPA	REG	The EPA in the absences of compelling reasoning proposes to set the discharge limits from the Water Treatment Plant in the table below;
21.	EPA	REG	Brine disposal The previous consent condition for a Brine Treatment Management Plan stated that the Plan must include a detailed description of processes for managing brine treatment on site and disposal of brine and salt in underground mine workings, including: <ul style="list-style-type: none"> • the volumes of brine and salt produced; • the capacity of on-site and underground storages for brine and salt; and • measures to monitor and mitigate any impacts of underground brine and salt storage on and surface water resources.
22.	EPA	REG	Additionally there needs to be the inclusion of appropriate construction and monitoring of surface brine storages to ensure surface water and groundwater is protected.
23.	EPA	REG	The EPA has not reviewed the groundwater section, however, support the condition for the Plan to cover mitigation and monitoring of underground brine storage. Brine disposal into mine workings may have future surface water implications including the following issues that should be considered in the Brine Management Plan: <ul style="list-style-type: none"> • The general impacts and potential for cumulative increases in risk to groundwater from brine discharges requires a robust and detailed assessment to consider any potential environmental impacts. • After mining is completed there may be potential to create highly concentrated groundwater (salinity and other pollutants) in the void areas that eventually build up and overflow back to surface waters and or shallow aquifers. Post-mining groundwater levels may drive mixing and upward movement of brine contaminated groundwater.
24.	EPA	REG	The EPA does not have the expertise to provide advice on the potential impacts of brine disposal on surface waters including groundwater dependant ecosystems. NSW Office of Water (NOW) could be consulted when reviewing the Brine Management Plan, in particular in relation to the aquifer interference assessments.
25.	OEH	REG	OEH has reviewed the amended DA in relation to Aboriginal cultural heritage and threatened biodiversity matters. OEH notes that the current mine plan excludes 11 longwall panels in the far west of the original mine plan area. However, it is noted that although it is not specifically mentioned or mapped, the current mine plan still undermines part of the Jilliby State Conservation Area. Landholder's consent will be required from the Minister administering the <i>National Parks and Wildlife Act 1974</i> once the final mine plan details are known. Further details, including recommended conditions of consent, are provided in Attachment 1 .
26.	OEH	REG	Recommended conditions of consent for Aboriginal cultural heritage management:
27.	OEH	REG	1. The proponent must consult with and involve all the registered local Aboriginal parties for the project, in the ongoing management of the Aboriginal cultural heritage values. Evidence of this consultation must be collated and provided to the consent authority upon request. The proponent must update the existing Aboriginal Cultural Heritage Management Plan (ACHMP) for the project area in consultation with the registered Aboriginal parties to detail procedures for managing all Aboriginal cultural heritage values associated with the project area. This process must be undertaken prior to commencing any ground disturbance or development works subject to the development.
28.	OEH	REG	2. Survey Unit 3 (as identified in Ozark 2016) should be inspected by a suitably qualified archaeologist and registered Aboriginal party representatives prior to commencing any ground disturbance or development works subject to the development. The results of this inspection should be incorporated into the ACHMP with

No.	Stakeholder Name	ID	Issue
			suitable management recommendation as required.
29.	OEH	REG	3. In the event that ground disturbance locates previously unidentified Aboriginal objects within the project area, all works must halt in the immediate area to prevent any further impacts to the object(s). A suitably qualified archaeologist and representatives of the local Aboriginal community must be contacted to determine the nature, extent and significance of the finds. The site is to be registered in the Aboriginal Heritage Information Management System (AHIMS) and the management outcome for the site included in the information provided to AHIMS. The proponent must consult with representatives of the local Aboriginal community, and the archaeologist to develop an appropriate management strategy for all objects/sites which complies with the requirements of the <i>National Parks and Wildlife Act 1974</i> .
30.	OEH	REG	4. If any human remains are located, all works must halt in the immediate area to prevent any further impact to the remains. The NSW Police are to be contacted immediately. No action is to be undertaken until the NSW Police provide written notification to the proponent. If the skeletal remains are identified as Aboriginal, the proponent must contact OEH's Environment Line on 131 555 and representatives of the local Aboriginal community. No works are to continue until OEH provides written notification to the proponent.
31.	OEH	REG	5. All Aboriginal sites impacted by the project must have an Aboriginal Site Impact Recording form completed and be submitted to OEH's AHIMS Register within three months of being impacted.
32.	OEH	REG	6. An Aboriginal Cultural Education Induction Program must be developed for the induction of all personnel and contractors involved in the construction activities on site. Records are to be kept of which staff/contractors were inducted and when for the duration of the project. The program should be developed and implemented in collaboration with the registered Aboriginal parties.
33.	OEH	REG	THREATENED BIODIVERSITY ASSESSMENT (APPENDIX F) OEH has reviewed the amended DA in relation to changed development footprint, the offset package and impacts on Jilliby State Conservation Area (SCA). The revised DA reduces the disturbance footprint of the Toohey's Road site by 26 hectares (ha) (from 89 ha to 63 ha), as the rail loop is no longer required. This reduces the amount of clearance of several native plant communities, some of which are endangered ecological communities. However, the offset package remains unchanged and this provides a higher offset ratio than the one described in the original Environmental Impact Statement (EIS).
34.	OEH	REG	Proposed longwall panels west of the current project area The new EIS has a map of the mine layout for the current DA (Figure 2 of the Main Report of the EIS) which includes 11 longwall panels in the far west of the project area that are identified as 'Potential Future Mining Areas'. These 11 longwall panels were part of the original mine plan when the first development application for the mine was lodged in 2006. However, during the assessment of this proposal the Planning Assessment Commission (PAC) (November, 2010), the PAC recommended against secondary extraction (i.e. longwall mining) under Jilliby SCA, at least not until after a comprehensive assessment of surface features and mine subsidence impacts and effects had been conducted to the satisfaction to the Director General of the Department of Planning and Environment (OPE). Further, the PAC recommended that any changes to the proposed mine layout would first require a comprehensive assessment to the satisfaction to the Director General of OPE.
35.	OEH	REG	While the proponent may seek a subsequent development application to undertake longwall mining in these western portions underlying Jilliby SCA, OEH requests that longwalls not be shown in the 'Future Mining Areas' section of the map because: (a) there is no certainty that these longwalls will be approved in the future; (b) if longwalls are proposed in the future, their dimensions and location may be different; and (c) OEH notes the position taken by OPE that should mining proceed in the western section, sensitive areas need to be avoided.
36.	OEH	REG	Given this position, OEH believes that the location of the unapproved longwalls should not be shown and that only the 'boundary' of the area intended for further development should be indicated.
37.	OEH	REG	Securing offset land Chapter 6 of the EIS for the revised DA includes a description of the proposed offset package for the Wallarah 2 Coal Mine. However, unlike the Preliminary Assessment Report for this project it does not include details of the mechanism(s) that may be used to secure the offset land, or when the offset package would be secured. Several options for securing the offset package have already been discussed with the proponent and these are included as one of OEH's recommended conditions of consent (see below).
38.	OEH	REG	Landowner's consent for proposed mining under Jilliby State Conservation Area The mine plan for the modified DA includes longwall mining under part of Jilliby SCA. That is despite the removal of 11 longwall panels in the far west of the original mine plan. The undermining of national park estate requires landholder's consent from the Minister administering the <i>National Parks and Wildlife Act 1974</i> . Such consent would only be considered once the final form of the project is known.
39.	OEH	REG	Recommended conditions of consent for threatened biodiversity:

No.	Stakeholder Name	ID	Issue
			Following OEH's review of the proposed change to the development application for the Wallarah 2 project OEH recommends the following conditions of consent:
40.	OEH	REG	1. Biodiversity offsets must be secured within 12 months of any consent being granted by an appropriate permanent mechanism, such as: a. a Biobanking Agreement under Part 7 A of the <i>Threatened Species Conservation Act 1995</i> ; b. dedication of land under the <i>National Parks and Wildlife Act 1974</i> ; c. a Trust Agreement under the <i>Nature Conservation Trust Act 2001</i> ; or d. a Property Vegetation Plan registered on title under the <i>Native Vegetation Act 2003</i> .
41.	OEH	REG	2. The proponent will require landholder's consent from the Minister administering the <i>National Parks and Wildlife Act 1974</i> prior to being allowed to mine under Jilliby State Conservation Area.
42.	DPI	REG	<input type="checkbox"/> The proponent should provide updated information on water licensing for the project, including reference to new and amended water sharing plans and information on how the predicted take of groundwater within these water sources will be licensed.
43.	DPI	REG	<input type="checkbox"/> The proponent should provide information on the water management components of the project as a whole, including any changes that may affect the original Surface Water and Groundwater Impact Assessments, the groundwater monitoring program (including baseline data) and the proposed water management arrangements for the project.
44.	DPI	REG	<input type="checkbox"/> The predicted take of surface water for the original Wallarah 2 Coal Project was 270 ML/year from the Jilliby Jilliby Creek Water Source and 30 ML/year from the Wyong River Water Source of the <i>Central Coast Unregulated WSP</i> . The proponent currently holds an entitlement of 185 units/ML in the Jilliby Jilliby Creek Water Source. The proponent should provide updated information regarding how the predicted take of surface water will be accounted for in licensing.
45.	DPI	REG	<input type="checkbox"/> The proponent should ensure all works on waterfront land are consistent with DPI Water <i>Guidelines for Controlled Activities on Waterfront Land</i> .
46.	DPI	REG	<input type="checkbox"/> The proponent should liaise with DPI Water regarding the water licensing strategy for this project.
47.	DPI	REG	<input type="checkbox"/> The Crown roads identified by the Proponent as being required for the development, being part Nikko Road and part Tooheys Road, Wallarah must be closed and acquired by the Proponent prior to the Proponent undertaking any works on this land.
48.	DPI	REG	The proposal is for amendment of the previously submitted Wallarah 2 Coal Project. The amended project involves changes to coal transportation and sewer infrastructure, including removal of the previously proposed rail loop, re-location of the previously proposed rail spur to the eastern side of the Main Northern Rail Line, re-location of the train load out facility to the eastern side of the Main Northern Rail Line, a conveyor system to deliver product coal from the stockpile to the new location of the train load out facility, and realignment of the sewer connection.
49.	DPI	REG	There do not appear to be significant additional impacts associated with the proposal on water resources from that which was assessed by the Planning Assessment Commission. The proponent has only provided information on the proposed amendments and has not provided comment on whether the information submitted as part of the original project (including the Surface Water and Groundwater Impact Assessments) are still current and relevant.
50.	DPI	REG	In particular, DPI Water notes that there have been changes to water licensing arrangements since the previous project was submitted. The <i>Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources</i> has recently commenced and the <i>Water Sharing Plan for the Central Coast Unregulated River Water Sources</i> was recently amended to include water from the alluvial aquifer. The proponent has not provided any details regarding the water licensing arrangements for the amended project. DPI Water requests that the proponent provide updated information on water licensing for the project, including reference to the new and amended water sharing plans and information on how the predicted take of groundwater within these water sources will be licensed.
51.	DPI	REG	DPI Water also requests that the proponent provide information on the water management components of the project as a whole, including any changes that may affect the original Surface Water and Groundwater Impact Assessments, the groundwater monitoring program (including baseline data) and the proposed water management arrangements for the project.
52.	DPI	REG	The Environmental Impact Statement for the previous Wallarah 2 project predicted a maximum take of approximately 1124.2 ML/yr from the hard rock aquifer (now within the Sydney Basin Lower Hunter/Central Coast Groundwater Source of the <i>North Coast Fractured and Porous Rock WSP</i>) and approximately 7.3 ML/yr from the alluvial aquifer (now within the Jilliby Jilliby Creek Water Source and Wyong River Water Source of the <i>Central Coast Unregulated WSP</i>).
53.	DPI	REG	DPI Water notes that a water licence application was submitted on 17 March 2016 to account for the above predicted water take. This application was submitted after the embargo for the <i>Hunter Water Shortage Zone</i> (covering the hard rock aquifer) and the embargo for the <i>Coastal Floodplain Alluvial Groundwater Sources and Highly Connected Alluvial Groundwater Sources of Coastal Catchments – Regional NSW</i> (covering the alluvial aquifer) came into effect, with the proponent requesting an exception to the embargos. It is requested that the proponent continue to liaise with DPI Water regarding this application and the water licensing strategy for the project. The proponent should subsequently update its water licensing strategy in respect of these outcomes.
54.	DPI	REG	The predicted take of surface water for the original project was 270 ML/yr from the Jilliby Jilliby Creek Water Source and 30 ML/yr from the Wyong River Water Source of

No.	Stakeholder Name	ID	Issue
			the <i>Central Coast Unregulated WSP</i> . The proponent currently holds an entitlement of 185 units/ML in the Jilliby Jilliby Creek Water Source. DPI Water requests updated information regarding the licensing approach to account for the predicted take of surface water.
55.	DPI	REG	Riparian Corridor The re-design of the rail infrastructure has resulted in fewer interactions with watercourses and riparian vegetation to that previously proposed. The rail spur for the amended project requires three crossings of Spring Creek (and its tributaries), which are located directly adjacent to the existing crossings for the Main Northern Rail Line.
56.	DPI	REG	It is recommended that all works on waterfront land are consistent with DPI Water <i>Guidelines for Controlled Activities on Waterfront Land</i> .
57.	LMCC	REG	Council has reviewed the document 'Wallarah 2 Coal Project Amendment to Development Application SSD-4979'. The following advice is provided for consideration. Additional Information Required Council is not satisfied that the following issues have been adequately addressed. It is recommended that further investigation be undertaken prior to determination of the development application.
58.	LMCC	REG	The movement of coal from the development to the Newcastle Port may impact sensitive receptors in the City of Lake Macquarie.
59.	LMCC	REG	The LGA's rail network comprises the Main Northern Railway line and several unloading/loading loops. The amended Rail Study accompanying the amended development application models additional train cycles for delivery of coal to port terminals at Kooragang at 3-4 cycles per day, or on demand for ship loading (6 cycles per day for 6 days), with projections of coal production up to 2026. The report states that rail modelling allows for capacity of six available train cycles per day, achieving sufficient network capacity without the need for additional rail infrastructure.
60.	LMCC	REG	However, the modelling assumes no increase in existing passenger and non-coal freight train frequency south of Newcastle. This is in direct conflict with the stated objectives of Lake Macquarie City Council Lifestyle 2030 Strategy below: Other than bulk movement of coal, in 2010 the rail network is generally not used for freight transport by businesses located within the LGA. LS2030 encourages the consideration of rail freight as a transport alternative that should be considered in the design of industrial areas near the rail system. The potential Killingworth employment land provides an opportunity to incorporate rail access if the foreshadowed Newcastle rail freight bypass route is built nearby.
61.	LMCC	REG	The nine railway stations in the LGA provide access to the passenger rail service to the Central Coast, Sydney, and Newcastle. The public transport interchanges at Morisset, Fassifern, and Glendale will become increasingly used as the urban intensification, mixed use and sustainability policies of LS2030 are implemented.
62.	LMCC	REG	Three major priorities exist for the rail system, implementation of which will require the coordinated activities of Council, City Rail, Transport NSW, Hunter Buses and the Roads and Maritime Services. Delivery of an improved rail system is on-going, with improvements anticipated in the next 10-15 years. <input type="checkbox"/> Ensuring local and commuter needs of the community are met by providing frequent, reliable, convenient, and safe services, together with supportive interchange and cycling infrastructure. <input type="checkbox"/> Minimising environmental impacts, such as noise and vibration, on surrounding land uses should be incorporated where necessary. <input type="checkbox"/> Encouraging freight with an origin or destination in the LGA to use rail as a mode of transport.
63.	LMCC	REG	Council is concerned that in the event that the rail network fails or is not functional, road transport is not a viable alternative given the significant social, environmental and economic impacts of road haulage.
64.	LMCC	REG	The amended development application does not take into account future variations in commuter and non-coal freight use. Capacity projections made within the amended Rail Study are based on current commuter and non-coal freight services, with future capacity estimations only recording coal freight use. Therefore, the capacity projections conflict with the aims of Council's Lifestyle 2030 Strategy. These aims include encouraging non-coal freight use within industrial areas south of Newcastle and increasing passenger rail services situated around transport interchanges as urban intensification and mixed use policies are implemented.
65.	LMCC	REG	The amended Rail Study states a third transport option of a 30TAL wagon train with 54 wagons is likely to require the use of a proposed Awaba Rail Loop.
66.	LMCC	REG	The proposed infrastructure improvement in Lake Macquarie is one additional freight-passing loop and signals at North Awaba. This is not considered adequate to address all the potential pressures on the existing rail services south of Newcastle.
67.	LMCC	REG	In addition, there is no consideration given to the environmental impacts of the new Awaba Loop, particularly if it was necessary to build on land zoned E2 Environmental Conservation. Further, there is no clear indication of who will design, fund or construct the new infrastructure.
68.	LMCC	REG	Emissions that may impact sensitive receptors in the City of Lake Macquarie, are largely related to rail freight. The proposed amendment to the development will see an increase in coal rail movements through the City of Lake Macquarie, from 38 rail movements (120 tonne wagons, previous applications), to 44 rail movements (100 tonne wagons for the first three years of operations) and 60 rail movements (100 tonne wagons) for the remaining 21 years of operation.
69.	LMCC	REG	The increase in coal transport through the City is of interest to Council, as is the period of the rail movements. In order to allow for a comprehensive understanding of the proposal as amended, Council requests that the units for rail movements be clarified (e.g. movements per month/year, etc.). Council notes that rail movements will

No.	Stakeholder Name	ID	Issue
			increase by ~15% and 60% for the two stages of operation and the impact on sensitive receptors around the rail corridor has not been thoroughly investigated.
70.	LMCC	REG	As such, Council requests that the proponent comment on the impact of dust and particulate matter from the current scenario and the two stages of development, due to increased rail movements and stirring of dust in the rail corridor. The investigation should relate to cumulative impact and should be undertaken with reference to the findings of the following reports which concluded that, among other things, the vast majority of particulate matter from the rail corridor is due to stirring from passing trains (coal and otherwise): 1) <i>Re-analysis of ARTC Data on Particulate Emissions from Coal Trains</i> (Ryan L., 2014 – on behalf of the NSW EPA); 2) <i>Additional Analysis of ARTC Data on Particulate Emissions in the Rail Corridor</i> (Ryan L., 2015 – on behalf of the NSW EPA); and 3) Other relevant studies undertaken by the NSW EPA.
71.	LMCC	REG	Should the revised investigation conclude that cumulative emissions will not impact sensitive receptors above relevant impact assessment criteria, then Council recommends that a suitable condition be imposed on any consent granted to ensure that dust from coal wagons is controlled and managed appropriately. Refer below for detail.
72.	LMCC	REG	Proposed Conditions of Approval Should the Department countenance approval of the application, Council recommends the following conditions be imposed.
73.	LMCC	REG	Prior to the transport of any coal along the rail network to the port of Newcastle, the proponent shall prepare a comprehensive Air Quality Management Plan that includes the assessment and management of rail freight emissions (fugitive and otherwise). At a minimum, the proponent shall commit to the number of maximum rail movements as prescribed in the approved project documentation and to Level 1 watering of coal wagons prior to haulage.
74.	LMCC	REG	Complaints concerning particulate matter and other pollutants from rail movements shall be thoroughly investigated and revisions to operations to address complaints shall be formalised in a revised Air Quality Management Plan. Complaints regarding air pollution emanating from the rail corridor (and other emissions as relevant to the project), shall be discussed with the appropriate regulatory authority and managed accordingly.
75.	LMCC	REG	In the interest of protecting the public health of residents within the City of Lake Macquarie, Council recommends the imposition of a condition of consent which requires the development to comply at all times with applicable NSW acceptable criteria levels and guidelines for environmental health (including noise).
76.	LMCC	REG	Council recommends that a condition be imposed on any consent granted to ensure that the Biodiversity Offset Package includes a legally binding mechanism and funding provision that ensures offset areas are conserved in perpetuity.
77.	LMCC	REG	Should the proposed conveyor infrastructure require power (either full or partial power), Council recommends the use of renewable energy.
78.	LMCC	REG	Council's Mayor received the following comments and concerns raised by local residents. These are conveyed to the Department for consideration:
79.	LMCC	REG	1) "Bushells Ridge Road and Hue Hue Road was not mentioned in the Environmental Impact Study.
80.	LMCC	REG	2) Dust to our home and drinking water – tank water is the main supply of water for domestic use eg: Drinking, bathing and washing. The water is collected from the roof of our dwellings and this will be affected by the dust from this mine in Tooheys Road Road, which runs off Bushells Ridge Road
81.	LMCC	REG	3) Noise associated with the construction and then the operation of the mine 24 hours every day (24/7). The stockpile is in the same place as before so we will still get the same amount of dust. We are approx. 200 metres from this stockpile of coal.
82.	LMCC	REG	4) Glare of lights all night from this mine which will affect our sleep and this in turn will affect our health.
83.	LMCC	REG	5) Traffic to and from the mine along Bushells Ridge Road will affect the residents and the normal traffic flow now. Bushells Ridge Road is a rural road and even two school bus have difficulties passing each other on Bushells Ridge Road.
84.	LMCC	REG	6) Trains the impact on commuters travelling on the train to Newcastle or Sydney with additional eight coals trains will impact to the time and length of train journey for commuters and not to mention the breakdowns that occur with this additional trains on the railway line.
85.	LMCC	REG	7) The impact on Wyong Hospital and we were not included in the Health Report (Bushells Ridge Road & Hue Hue Road Residents) that was written by Dr Peter Lewis Area Director of Public Health for North Sydney and the Central Coast.
86.	LMCC	REG	8) Animals there has been no study into the fauna and flora species in this area and the impact that will take place to these species.
87.	LMCC	REG	9) I wonder if the new development in Bushells Ridge Road have any knowledge of this development?
88.	LMCC	REG	10) On the first EIS for Wallarah 2 project Wyee did not exist in the first EIS and was bought to the attention of MP Greg Piper, now the amendment only mentions the change to rail loop.
89.	LMCC	REG	11) As per article on NEWS ABC on the 4th August 2016 on the clean-up bill to Queenslanders will this occur at the Coal mine – Wallarah 2 in 28 years time after the closure of the mine?
90.	LMCC	REG	12) On Professor Pell information the coal mine will frack the aquifers which supply Wyong and Gosford council for their town water.

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91.	LMCC	REG	13) The KORES EIS mentions that 100,000 people will die from health related illness cause by the mine and this has by admitted by the KORES (the public health report did not mention the residents of WYEE).
92.	LMCC	REG	Our property is 224 Bushells Ridge Road, Tooheys Road runs off Bushells Ridge Road at the end of our house paddock therefore we will be affected by the dust from the coal stock pile which is only 200 metres from our front door. Therefore this will impact on all resident in Bushells Ridge and Hue Hue Road residents and Wyee which is only 0.5km from my front gate to Wyee Railway Station which will be included in the High Dust Area."
93.		REG	
94.	MSB	REG	As the proposed development is located in the Hue Hue and Wyong Mine Subsidence Districts, in accordance with S15 of the Mine Subsidence Compensation Act, 1961 (MSC Act) the MSB's approval is required to subdivide, erect or alter any improvements on land within a Mine Subsidence District.
95.	MSB	REG	The <i>Mine Subsidence Compensation Act 1961</i> has recently been reviewed. In light of this review, the Mine Subsidence Board proposes that a clear condition of consent requires the Colliery to accept responsibility for any damaged to existing surface improvements by mine subsidence and the associated cost to repair, due to its extractive works. This requirement is in consideration of; <input type="checkbox"/> This proposed development, including recent changes. <input type="checkbox"/> The large number of existing structures not owned by the Colliery, which are located within the project area and expected to be damaged by mine subsidence <input type="checkbox"/> The reliability of predicting the impacts and damage caused by mine subsidence <input type="checkbox"/> Imminent changes to MSC Act;
96.	MBS	REG	Where the Colliery proposes to relocate surface improvements such as telecommunication, transmission or pipelines, to eliminate the risk of mine subsidence the MSB's approval is required under S15 of the MSC Act. In consideration of this, it would be necessary to demonstrate the relocation would eliminate the risk of mine subsidence.
97.	MSB	REG	Please note the consent condition requirements in this letter supersede those previously advised in the MSB's letter dated 21 June 2013.
98.	Crown Lands	REG	xxxxxx
99.			
100.			
101.			
102.			
103.	DLALC	SIG	In summary, Darkinjung has substantive interests in the area the subject of the proposed development set out in the Amended DA. Darkinjung is directly and adversely affected by the proposed development. Darkinjung submits that the Amended DA should be refused for the following reasons:
104.	DLALC	SIG	(a) The Amended DA is not an amendment. The alteration is substantial and is in effect a new proposal which should be dealt with as a new development proposal.
105.	DLALC	SIG	(b) The Environmental Impact Assessment (EIS) that purports to support the Amended DA, does not satisfy the Director-Generals Requirements or the Supplementary Director-General's Requirements.
106.	DLALC	SIG	(c) The documents comprising the Amended DA are inadequate to allow a proper assessment, and more fundamentally, are inadequate to allow the public to properly comment on the proposal in a fair and open manner.
107.	DLALC	SIG	(d) Darkinjung has been denied procedural fairness by having basic information withheld from it during the course of the notification period, including information directly relevant to the manner in which its interests are affected.
108.	DLALC	SIG	(e) The proposed development is premised on an inappropriate interference with public access to land which is contrary to public policy and is racially discriminatory in the manner in which it targets Darkinjung's land. It requires instead that the public to share a proposed 3m strip of land with an operating coal loading and rail facility.
109.	DLALC	SIG	(f) The proposed development in the Amended DA is a flawed design that is inappropriate for land that is bushfire prone land adjacent to a residential area. The narrow corridor of Nikko Rd is manifestly inadequate for major infrastructure associated with a coal mine. There is no room for the construction of an adequate road, let alone one which has to be shared by the public. There is insufficient room for the safe construction and operation of coal loading facilities as well as providing for security, employee parking, and employee facilities. There is inadequate room for appropriate buffers or set-backs to protect the amenity of adjoining land, or to protect adjoining E2 - Environmental Protection land. It would be inappropriate for a development application to proceed on the basis that other people's lands provide a buffer.
110.	DLALC	SIG	(g) It inappropriately, and irresponsibly, involves constructing coal loading and rail infrastructure in a bushfire buffer zone immediately adjacent to Category 1 - Vegetation which the former Wyong Shire Council (WSC) identified as the most hazardous vegetation category for bushfires. There is no provision for an asset protection zone (APZ), buffer zones or any consideration of bushfire risks either for the project, for neighbouring properties, or the members of the public who will be traversing the site.
111.	DLALC	SIG	(h) There is no description, let alone assessment, of how the site will be accessed during either the construction or the operational phases.
112.	DLALC	SIG	(i) The assessment of the impact of noise and dust in the Amended DA is inadequate.

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113.	DLALC	SIG	(j) The risks associated with the Amended DA have not been properly assessed.
114.	DLALC	SIG	(k) There is no assessment of management of water or drainage on site.
115.	DLALC	SIG	(l) There is no rehabilitation plan.
116.	DLALC	SIG	(m) There are adverse economic impacts of the Amended DA which have not been properly identified or assessed. The proposal is inappropriate given that the area has been identified as a growing residential area.
117.	DLALC	SIG	(n) The Amended DA pays insufficient regard to the objects and purposes of the ALRA and the impact on Aboriginal people.
118.	DLALC	SIG	(o) There has been no effective consultation with affected land owners.
119.	DLALC	SIG	18. The Amended DA is premised on the closure of Nikko Rd and the construction of a coal conveyor, coal loading facility and rail siding on that land.
120.	DLALC	SIG	19. Fig 5 (p.12) of the Amended DA shows an "indicative" locations of where infrastructure will be located. This shows that there will be a "New Train Load Out Facility", a "New Drive" a "New Bin Feed Conveyor" and a Rail Spur and New Transfer facility, Noise Barrier on various parts of Nikko Rd. No diagrams of the Transfer or the Noise Barrier are provided.
121.	DLALC	SIG	20. The Rail Loading system is not described in detail other than that the bin is nominally 12m in diameter, 29m in height and has a maximum nominal capacity of approximately 1,000tonne. The conveyor system is not described in detail. The only mitigation identified is there will be shielding for the "roof and one side wall" (p.40)
122.	DLALC	SIG	21. Darkinjung is directly impacted by the Amended DA, including by the following:
123.	DLALC	SIG	(a) The proposal to put mine infrastructure on Nikko Rd, and the proposal to close Nikko Rd will deprive Darkinjung of the only existing practical legal access to its land. The proposed removal of the existing road reserve will limit Darkinjung's use of its land into perpetuity.
124.	DLALC	SIG	(b) The 3m access easement put forward as an alternative is ill-conceived, insufficient, dangerous and impractical.
125.	DLALC	SIG	(c) The Amended DA proposes to place mine infrastructure immediately adjacent to Darkinjung's land with no buffer or set back.
126.	DLALC	SIG	(d) The Amended DA places the mine infrastructure in close vicinity to other land which is the subject of a Gateway Determination was subsequently issued for Darkinjung Sites 3 & 4 – approximately 900 residential lots. The proposal will impact on that development.
127.	DLALC	SIG	22. Each of these matters is a significant impact on Darkinjung's land. It is manifestly apparent, that Darkinjung is substantially, directly affected and more so than any other land holder.
128.	DLALC	SIG	(a) The Amended DA does not include an EIS that contains "all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the Environmental Planning and Assessment Regulation 2000" as required by the Director General's Requirements. The Director-General's Requirements required that these documents "be included as part of the EIS rather than as separate documents".
129.	DLALC	SIG	(b) The Amended DA contains no detailed plan views of how the proposed rail siding, transfer station and coal loading facility will be contained within the 20m wide Nikko Road corridor.
130.	DLALC	SIG	(c) The Amended DA contains no reference points to access cross sections provided in Appendix B - Designed Drawings.
131.	DLALC	SIG	(d) The Amended DA provides no detail on proposed retaining works along the common boundary of the Nikko Rd reserve and western boundaries of Lot 204 and Portion 60;
132.	DLALC	SIG	(e) In relation to the Nikko Rd area, there is no site plan that indicates the existing levels of the land in relation to buildings and roads. Nor is there any plan that shows the proposed finished levels of the land in relation to existing and proposed buildings and roads.
133.	DLALC	SIG	(f) In relation to Nikko Rd there is no plan showing:
134.	DLALC	SIG	(i) proposed parking arrangements, entry and exit points for vehicles, and provision for movement of vehicles within the site (including dimensions where appropriate), or
135.	DLALC	SIG	(ii) proposed landscaping and treatment of the land (indicating plant types and their height and maturity), or
136.	DLALC	SIG	(iii) proposed methods of draining the land.
137.	DLALC	SIG	(g) The Amended DA contains no detail on height of conveyor over Tooheys Road.
138.	DLALC	SIG	(h) The Amended DA has no preliminary concept construction management plan.
139.	DLALC	SIG	(i) The Amended DA contains no detail on how extensive cut/fill will be managed within a 20m wide corridor.
140.	DLALC	SIG	(j) The Amended DA provides no detail on the proposed sewer system, including an absence of any description of whether it will be a private line, or built to Council specifications consistent with the relevant Development Services Plan (DSP), and intended to provide upgradeable capacity for future planned development in the locality.
141.	DLALC	SIG	(k) The Amended DA contains no detail on the location or design of water quality control devices presumably required within the Nikko Road, adjacent to the coal loading infrastructure, to ensure any stormwater or other run-off generated with the development (e.g. dust suppressant system) does not impact on nearby waterways.

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142.	DLALC	SIG	24. Furthermore, in relation to the visual impact, the Amended DA fails to accurately represent the significant industrial shed (transfer station) adjacent to the Motorway Link Road or the 27m high (8-9 storeys) coal loading facility which is approximately 262m from Darkinjung's proposed developments.
143.	DLALC	SIG	25. In relation to the proposed easement, the Amended DA fails to properly identify where the easement will be located, how it will link to existing access points, and how existing access will be maintained when the existing access traverses the proposed route of the conveyor belt and the rail spur.
144.	DLALC	SIG	26. No description is provided as to how the facility will be constructed within the road corridor, and how that land will be accessed for the purposes of construction.
145.	DLALC	SIG	27. The Amended DA is also deficient for the failure to properly consider the matters set out as paras [56] - [109] below.
146.	DLALC	SIG	28. The deficiencies in plans and lack of information in the Amended DA means that Planning NSW (the Department) does not have the benefit of appropriate studies to assess the project and the public do not have the benefit of accurate information in relation to comment.
147.	DLALC	SIG	29. These deficiencies are exacerbated for Darkinjung by the fact that a critical part of the Amended DA is the road closing application for Nikko Road (Closure Application W562973) which is referred to a para [3.2.2] of the Amended DA. Closure Application W562973 was lodged on behalf of WACJV. It is apparent the matters set out at para's [39]-[54] below that proposal will have a significant impact on Darkinjung. On 16 May 2016 Darkinjung made a request that this information be provided pursuant to s 36(14), ALRA. By letter dated 24 June 2016 the Department of Primary Industries - Lands (DPI) advised that it required an application under the Government Information (Public Access) Act 2009 (GIPA Application). A GIPA Application was made on 1 July 2016. On 14 July 2016 the DPI advised that Closure Application W562973 was to be provided, but that its production was objected to by WAJCV. As at the date of this submission Closure Application W562973 has not been provided. On 1 2016 a separate request was made to Wyong Coal for a copy of Closure Application W562973. On 14 August 2016 Wyong Coal advised that they will not be providing the application.
148.	DLALC	SIG	30. Darkinjung is directly and substantially affected by Closure Application W562973. It is a critical part of the proposal in the Amended DA and referred to in it. Darkinjung is entitled to know the basis of that application so that it can make a response to the proposal. Darkinjung has been denied procedural fairness in the exhibition process through a failure to provide it.
149.	DLALC	SIG	31. The notification period is unreasonable to the extent that the Government is going to insist on GIPA Applications instead of providing the information pursuant to s 36(14), ALRA and the time does not allow for basic documentation to be provided and commented upon.
150.	DLALC	SIG	32. Darkinjung maintains that the Amended DA cannot properly be considered an amendment of SSD-4974, and is instead a new development which requires the lodgement of a new development application.
151.	DLALC	SIG	33. The proposal the subject of SSD-4974 involved a project on specific identified land. The Amended DA proposes a development whereby a coal conveyor, rail, and coal loading infrastructure on different land and is such a substantive variation to the project, the subject of SSD-4974.
152.	DLALC	SIG	34. Placing mine infrastructure on Nikko Rd is a project on different land which is substantially outside of the footprint of the project described in SSD-4974. It involves locating that infrastructure over 2kms from where it was originally proposed and well outside the project boundary, and project infrastructure boundary identified in the development application. It now directly affects two other major projects being the Wyee Road Residential Site and the Bushells Ridge Residential Site.
153.	DLALC	SIG	35. None of the stages of the planning approval process that has occurred to date have anticipated, or required consideration of, mine infrastructure being located in a different location, let alone on Nikko Rd. The Director General's Requirements were not issued on this basis. A long coal conveyor was not part of the original development proposal. The Director-Generals requirements that were issued for SSD-4974 do not properly set a framework for the consideration of the issues that arise from such a proposal. In particular, it did not consider what issues were relevant to the consideration of a proposal to construct a coal conveyor and loading facility on a 20m corridor on bushfire prone land. Nor do they consider the full range of issues associated with constructing a lengthy coal conveyor in close proximity to major roads and crossing the main Sydney to Newcastle rail line. They do not address the range of issues that arise for the road network around Nikko Rd. Furthermore, it does not set a proper framework to consider the impacts on the Wyee Road Residential Site or the Bushells Ridge Residential site which are in close proximity to the area the subject of the Amended DA.
154.	DLALC	SIG	36. There are a large number of people in the residential area of Blue Haven including Darkinjung's 11 existing residential properties and 11 proposed residential properties which are now affected in ways not previously identified. Despite what is said in the Amended DA, the environmental and planning issues that would be raised by the construction of a coal conveyor, and rail and coal loading infrastructure along the narrow road corridor of Nikko Rd are substantial.
155.	DLALC	SIG	37. The extent of the variations needs to be understood in the context that the project is not occurring in a remote location. It is occurring in close proximity to residential area that are part of a rapidly growing population centre, and where changes to the location of the project impact of a large number of people.
156.	DLALC	SIG	38. The extent of these issues highlight that Amended DA is outside the scope of what can properly be regarded as an amendment and is in fact a new development that requires a new development application.
157.	DLALC	SIG	39. Of particular concern to Darkinjung is that the Amended DA is premised on the closure of Nikko Rd. Nikko Rd is a formed dirt road that fronts Lots 60, 196, 197 and

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			204. It is the only road access to those parcels.
158.	DLALC	SIG	40. Nikko Rd is a Crown Road and the public currently have a right to access it.10 Darkinjung is currently able to access Nikko Rd through Lot 1 DP 1192889, Bushells Ridge. Darkinjung accesses Lots 196 and 197 as part of its use and enjoyment of the land as well as to comply with environmental monitoring requirements imposed by the WSC as a condition of separate development consent. See Fig. 1.3 below.
159.	DLALC	SIG	41. Nikko Rd also forms an important access point for the maintenance of transmission lines located in an easement over Lot 196. The transmission lines are accessed and maintained by Ausgrid. The vegetation clearing around these transmission lines is apparent from aerial imagery. The need to maintain vegetation clearing around these areas is not insignificant given the vegetated nature of the land and its proximity to the Blue Haven residential area.
160.	DLALC	SIG	42. There is also a separate transmission line that runs down Nikko Rd from near the Motorway Link Rd towards Warnervale.
161.	DLALC	SIG	43. Nikko Rd is also required for access to a rising sewer main which is located on Lot 196 which Darkinjung understands is Central Coast Council infrastructure maintained by the Council.
162.	DLALC	SIG	44. Access to Nikko Rd by these government agencies is by the same route that Darkinjung takes. This is the only access to Nikko Rd because, as is apparent from aerial imagery, the other potential approaches from the southern section of Nikko Rd and Spring Creek Road, while in road reserves, are not functional because of Spring Creek in the east and Wallarah Creek in the south. These are wide, deep and permanent creeks that prevent road access. Lots 60, 196, 197 and 201 will become effectively land locked if the access by Nikko Rd becomes unavailable.
163.	DLALC	SIG	45. Refer to Fig 1.4 and Fig 1.5 below which are photographs of the road reserve for Spring Creek Road showing two creeks which prevent the use of Spring Creek Road.
164.	DLALC	SIG	46. Nikko Rd is also a strategically important part of the road network in the Wyee / Warner Vale area. As noted above, Wyee and Warnervale have been identified as residential growth areas. Darkinjung's involvement with the NSW Government inter-agency taskforce has led to the potential development of the Wyee Road Residential Site and the Bushells Ridge Residential Site through the Gateway Process. Fig. 1.6 shows the proposed growth of both centres and the clear linkage known as Nikko Road.
165.	DLALC	SIG	47. When those areas are developed, Nikko Rd would have the potential to provide an important road corridor which would allow movement of traffic between Wyee and Warnervale without the need for residents to enter on to the express way. If this proposal proceeds the linkage of Nikko Road will be lost.
166.	DLALC	SIG	48. The Amended DA is premised on the closure of Nikko Rd and the placement of private coal loading and rail infrastructure on that land. It is said that there will be a single 3m access track which will also operate as a maintenance road and the sole road for the daily operation of the facility. The Amended DA also appears to assert that authority will also be sought pursuant to s 138 of the Roads Act.11
167.	DLALC	SIG	49. There is no layout plan for the infrastructure. Fig 5 (p.12) of the Amended DA shows an "indicative" locations of where infrastructure will be located. The shows that there will be a "New Train Load Out Facility", a "New Drive" a "New Bin Feed Conveyor", rail spur, transfer facility, noise barrier on various parts of Nikko Rd. The Amended DA states: "There are privately owned lots with frontage along Nikko Road, including lots owned by DLALC. The proposed infrastructure on Nikko Road has been designed so that physical access to these lots is maintained. Furthermore, the lots to the north of the Motorway Link Road are legally accessible via Thompson Vale Road, Spring Creek Road and Wyee Road (in the case of Lot 204 DP 1117900). Thompson Vale Road is a formed road and is considered to be the primary access road to these lots, as opposed to the largely unformed Nikko Road and Spring Creek Road."12
168.	DLALC	SIG	50. In relation to the sewerage pipeline the Amended DA states that the "pipeline will be installed so as to ensure that they will not present any impediment to the use of Nikko Rd". At para 2.4.2 the Amended DA states that the rail spur will require earthworks and the construction of a retaining wall. It notes that 60,000m3 of additional fill material will be required for the rail spur.
169.	DLALC	SIG	51. As noted above, Darkinjung has not been provided with a copy of Closure Application W56973. The precise area that it relates to has not been disclosed.
170.	DLALC	SIG	52. What is apparent from the description in the Amended DA is that there is no intention to allow Darkinjung, Ausgrid or any other person to continue to access Nikko Rd in the manner in which it has done to date. The proposal to remove the existing Crown Road is inappropriate and discriminatory for a number of reasons.
171.	DLALC	SIG	(a) For the reasons explained above, Darkinjung cannot access its land via Thompson Vale Rd or Spring Creek Rd.
172.	DLALC	SIG	(b) Nikko Rd has already been identified by WSC as bushfire prone land (vegetation buffer). It is adjacent to Category 1 vegetation. In the context of urban development in rural areas it has been noted that: "The purpose of the public road system is to: <ul style="list-style-type: none"> • provide firefighters with easier access to structures, allowing more efficient use of firefighting resources; • provide a safe retreat for firefighters; and • provide a clear control line from which to conduct hazard reduction or back burning operations.

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			<i>Roads should provide sufficient width to allow firefighting vehicle crews to work with fit would be irresponsible to remove that function. It would also be irresponsible to do by allowing the construction of a coal conveyor and loading facility which creates its own fire risks. firefighting equipment about the vehicle. "13</i>
173.	DLALC	SIG	(c) Nikko Rd has been set aside for road purposes as part of the long-term strategic planning of the area. As is apparent from its on-going use, it remains an important part of the road network.
174.	DLALC	SIG	(d) It is likely to be needed for road purposes in the future. As noted above, Wyee and Warnervale and the central coast generally are rapidly expanding residential areas. Maintain the existing road network is important to accommodate that expansion. If the Wyee Residential Development Area proceeds, then as shown on Figure 1.6, Nikko Rd, will have the potential for development as an important link road between Wyee and Warnervale which will provide an alternative to residents having to travel in a circular route on the expressway to commute between those areas.
175.	DLALC	SIG	(e) The removal of Nikko Rd will leave Darkinjung's land landlocked. It is contrary to good public policy to deprive a land owner of existing lawful legal access, so as to provide another person with indulgence of being able to develop on the land.
176.	DLALC	SIG	(f) Darkinjung is entitled to have benefit of the legal access that was available when the land was transferred to it under the ALRA. The members of Darkinjung are entitled to be able to access the land freely, and safely, without having the risk or inconvenience of having to traverse an operating coal transporting facility.
177.	DLALC	SIG	(g) Removing legal access will have a clear immediate financial impact on the value of the land to Darkinjung. The absence of appropriate access, will also limit the ability of Darkinjung to utilise the land in future.
178.	DLALC	SIG	(h) Darkinjung maintains that proposed interference with Nikko Rd is inequitable and inconsistent with the remedial and beneficial objects of the ALRA. Under the ALRA, land is transferred to Aboriginal land councils as a means of compensation for the past dispossession of Aboriginal people of their traditional lands and is intended to be an economic resource to assist Aboriginal communities to achieve economic self-sufficiency. It is inconsistent with that scheme for land to be transferred to Aboriginal land councils and then for the Government to remove legal access to the land by conferring interests on third parties.
179.	DLALC	SIG	(i) Furthermore, it is clear that the removal of access to Nikko Rd has primary impact on Darkinjung's land only. No other land owners will become land locked by the proposal. It treats Darkinjung's interests as expendable while carefully avoiding the interests of all other land owners, and in this regard it is inequitable and discriminatory.
180.	DLALC	SIG	53. The Amended DA proposes to provide access through the creation of a 3m wide easement. The Drawing 22-17704-C206 in Appendix B shows the assumption of a 3 m wide easement. The proposed easement is ill-conceived and manifestly inadequate for a number of reasons:
181.	DLALC	SIG	(a) The land is not Wyong Coal's land. It cannot provide an easement unless the road is closed and it purchases the land. Darkinjung does not believe that the road should be closed.
182.	DLALC	SIG	(b) The provision of a 3m wide easement is not a reasonable or adequate substitution for the existing access that Darkinjung enjoys. The proposed easement will be a shared area as part of an operating coal loading facility.
183.	DLALC	SIG	(c) Contrary to what is said in the Amended DA, the proposed easement does not allow for the existing access to continue. The existing access from the western side of the Sydney / Newcastle Rail line will be blocked by the rail siding. The Amended DA assumes that access will be available through Spring Creek Road and Thompson Vale Rd. As noted above, Thompson Vale Rd is not formed all the way to Nikko Rd. It also crosses a creek. Spring Creek Rd is also not formed and cannot be used because Spring Creek crosses it twice. No part of Amended DA relates to any works on Thompson Vale Rd or Spring Creek Rd. They are not part of the Project Area identified in the DA. They are not part of an Amended DA.
184.	DLALC	SIG	(d) A 3m wide easement is inadequate. The reason why road reserves are 20m wide is that it allows space for appropriate road construction when required. A 3m easement is not wide enough for that purpose. The absence of adequate access will constrain the use of Darkinjung's land into the future.
185.	DLALC	SIG	(e) The 3m wide easement is impractical as an alternative access for private land owners or members of DLALC who want to access the land. It is not wide enough to allow safe use by a range of vehicles that may need to access land. Even a standard single lane road would not fit within that corridor, let alone allowing for space for vehicles to pass, or stop and allow safe exit where required.
186.	DLALC	SIG	(f) The easement is unsafe, in that in large sections of it will be a narrow channel wedge between a retaining wall and a fence. The excavation is said in one location to be "at least 2 metres and up to 3.4 metres deep."14 This provides no room for vehicles to pass. At best it will provide 50cm on either side of the car if there is a need to exit the car in an emergency. If there is an accident, it will leave in sufficient room to access the car. These problems are even more acute for larger vehicles.
187.	DLALC	SIG	(g) The deficiency in the width of the easement become even more apparent when it is considered that the easement also operates as the maintenance track for both the rail and coal loading facility. Maintenance of these will conceivably require large machinery to be on the access easement. Where parking of staff and visitors is proposed and how it will impact on the free access of the easement is not explained. Darkinjung does not believe it can safely occur in such a confined space.
188.	DLALC	SIG	(h) The easement is inadequate for a road which comprises bushfire prone land (vegetation buffer). It does not provide adequate access, let alone a safe turn around area. For example a standard Isuzu FTS750 Crew Cab Tanker Class 1 4 x 4 which is used by Fire and Rescue NSW has a 2.5m width which leaves just 25cm on either

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			side to stay within the easement let alone room to access and use equipment stored on the sides. It has a width of 2.5m and a turning circle of 17m. The Isuzu FTR 800 4 x 2 has a turning circle of 16m. A 3m wide access road with a retaining wall on one side and a fence or coal load facility on the other side is not a defensible space for emergency services. It does not provide sufficient width to allow firefighting vehicle crews to work with firefighting equipment about the vehicle.
189.	DLALC	SIG	(i) It should be noted that the project the subject of the original SSD-4974 anticipated a private maintenance road on either side of the entire length of the rail corridor. ¹⁵ There is now no private access road on any side of the rail line. There is now only a 3m wide road (which presumably has to be fenced off from the rail line and which has to be shared with the public.
190.	DLALC	SIG	54. To the extent that the DA refers to s 138, <i>Roads Act</i> , Darkinjung maintains that provision does not entitle the development of permanent coal and rail infrastructure that removes the rights of the public and adjoining land owners to access the land.
191.	DLALC	SIG	55. Darkinjung submits that the proposal in the Amended DA to construct the facility in a 20m wide road corridor is an inappropriate and flawed design proposal. In particular:
192.	DLALC	SIG	(a) Nikko Rd itself is variously zoned SP2 - Infrastructure (Road and Traffic Facility), RU6 - Transition and E2 - Environmental Conservation under the <i>Wyong Local Environmental Plan 2013</i> . A rail and coal loading facility is a prohibited development under each of those zonings. It is also inconsistent with its zoned purpose.
193.	DLALC	SIG	(b) The Amended DA provides for no buffer or setbacks to the land adjoining Nikko Rd. Coal loading and rail facilities should be designed with appropriate buffers and setbacks from adjoining land. Indeed having regard to Drawing 22-17704-C205 in Appendix B of the Amended DA, there will be a 27m high construction placed within 4 metres of the boundary of the land, and immediately adjacent to bushfire prone land with an environmental protection zoning.
194.	DLALC	SIG	(c) Nikko Rd is bushfire prone land (vegetation buffer) and is adjacent to Category 1 - Vegetation which WSC has identified as the most hazardous vegetation category for bushfires. It is inappropriate, and irresponsible to construct coal loading infrastructure in such an area. See fig. 1.7 below.
195.	DLALC	SIG	(d) As discussed in more detail below, there is no provision for an asset protection zone. An APZ should be provided on the proponent's land, not neighbouring land. Nor is it in any event appropriate to place such infrastructure in such a narrow corridor and assume that a neighbour has to remove vegetation on E2 – Environment Conservation land to provide an APZ.
196.	DLALC	SIG	(e) The Amended DA proposes to place a coal conveyor, and rail and coal loading infrastructure within 400m of the residential suburb of Blue Haven, and would be immediately adjacent to E2 Environment Conservation land and coastal protection land for the purposes of SEPP 71.
197.	DLALC	SIG	(f) Parts of the Amended DA appear to assume that WACJV will be able to access the site by Thompson Vale Road or Spring Creek Road. ¹⁶ As noted above, neither of these roads is formed. Both are impassable due to being traversed by Spring Creek which is a deep permanent watercourse. There is no proposed development of these roads. They are in any event outside the project boundary described in the Amended DA.
198.	DLALC	SIG	(g) There is no description of the nature of the fencing for the project area to protect the site from trespass or set-backs from the fencing. Given the proximity to the facility to a residential area, it is not unforeseeable that there will be children in the vicinity from time to time. Nor is there an explanation with how the need to enclose the area will be achieved if public access is provided by way of an easement.
199.	DLALC	SIG	(h) It is said that the facility will be controlled locally and remotely (p.15) Drawing 22-17704-C205 shows the existence of a "control room". However how individuals could be stationed there is unclear. There is no indication of worker's facilities, toilets or other basic amenities. If such are to be provided there is no indication as to how they will be constructed within the corridor or how they will impact on the proposed easement. More fundamentally: (i) there is no provision for parking; (ii) no provision for appropriate access for emergency vehicles; (iii) it is not even clear how the employees will access the site, given the lack of current access on Spring Creek Road and Thompson Vale Rd, is inadequate, no other road works are proposed or described in the development application.
200.	DLALC	SIG	(i) Drawing 22-17704-C206 in Appendix B shows 1 in 30 gradients from rail level across the proposed 3m wide access road and into a substantive cut away which will significantly alter the existing levels of the land. ¹⁷ This shows that there will be a substantial drainage issue which will need to be addressed. No drainage is planned, or referred to. The alteration of the land contours in turn create unassessed issues as to the impacts on the water quality in Spring Creek from runoff from around the loading facility where coal dust and other pollutants such as oil and grease will no doubt accumulate.
201.	DLALC	SIG	(j) The 3m wide access road is manifestly inadequate and dangerous. In particular:
202.	DLALC	SIG	(i) There is no explanation as to how existing access will be maintain on a single 3m wide easement that has to be shared with coal loading and rail operations.
203.	DLALC	SIG	(ii) A single 3m wide easement will not allow for vehicles to pass. It is insufficient to safely allow for emergency vehicles, noting that the length of the rail siding containing the conveyor and other infrastructure will exceed 1.1km.
204.	DLALC	SIG	(iii) There is no information as to how the access road will be constructed or to what standards, or how those standards can be achieved in a 3m wide easement.

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205.	DLALC	SIG	(k) It is unreasonable to remove existing public access and then require land owners to traverse an operating coal facility in order to enjoy their land. It unnecessarily and unfairly exposes them to risks which they should not have in order to access their property.
206.	DLALC	SIG	(l) The Amended DA identifies no contingency for spillage or the need for an emergency stockpile area in the event that there is a mechanical failure. Nor does it identify how such an area would be managed.
207.	DLALC	SIG	56. The Amended DA does not contain any clear construction plan.
208.	DLALC	SIG	57. At para 2.4.2 the Amended DA states that the rail spur will require earthworks and the construction of a retaining wall. It notes that 60,000m3 of additional fill material will be required for the rail spur. It does not provide any further information in relation to how construction will occur.
209.	DLALC	SIG	58. Amended DA, p.48 states:
210.	DLALC	SIG	"Construction Noise" <i>The residences on Thompson Vale Road (P14 and P15) and Bushells Ridge Road (P16) are predicted to experience exceedances of the NMLs for standard work hours and work outside standard hours. The Amended Project is predicted to comply with the NMLs for standard work hours in the Blue Haven area. However, residences in Blue Haven may experience exceedances of the NMLs for work outside standard hours. Exceedances of NMLs are generally short term in nature and will be managed to acceptable levels.</i> <i>To reduce potential road traffic noise during the construction phase, personnel will be transported to the site of the rail spur via bus, rather than commuting to the site individually.</i> <i>This will substantially reduce vehicular movements in the vicinity of Blue Haven and the two residences on Thompson Vale Road. Road traffic noise associated with the Amended Project is predicted to be within the 60 dBA target for collector roads."</i> (p.48)
211.	DLALC	SIG	59. As the construction works are not identified, there is no basis to identify how the 60 dBA figure is derived. To the extent that heavy machinery is to be used on the site, it is unclear how that machinery is going get to the 20m corridor, how they can be safely used in a 20m corridor. Nor is it clear how the construction materials will be transported to the site.
212.	DLALC	SIG	60. Access to the site for construction is not explained. As noted above Thompson Vale Rd is not formed all the way to Nikko Rd. No part of the Amended DA relates to any works on Thompson Vale Rd. Spring Creek Rd is also not formed and cannot be used. The rail underpass currently used by Darkinjung and Ausgrid floods in heavy rain and therefore does not provide adequate all weather access necessary for an operating coal facility.
213.	DLALC	SIG	61. The Amended DA does not identify how Darkinjung's access is to be safely maintained while the construction is being undertaken.
214.	DLALC	SIG	62. The Section 5 of the DA headed "Risk Assessment" (p.30) is unintelligible. It does not identify any of the matters that were taken into account. It refers to reevaluation in relation to 'controls'. The controls are not identified. Nor is it clear why any of the controls in the original assessment are relevant to the matters raised by the Amended DA.
215.	DLALC	SIG	63. The Risk Assessment does not refer to (or assess) bushfire risks, which are obviously relevant given that the Amended DA proposes the development of a coal loading facility in bushfire prone land (vegetation buffer) and immediately adjacent to Category 1 Vegetation. Nor does it identify the risks that arise from there being no buffer to the infrastructure and no APZ.
216.	DLALC	SIG	64. There is no identification of the risks arising from the coal conveyor. The Risk Assessment does not address the risks associated with moving coal by a conveyor system over the Sydney to Newcastle rail line.
217.	DLALC	SIG	65. Nor is there any assessment of the risks associated with the concurrent use of a 3m access road, by coal staff and members of the public. That includes both in terms of risks of harm to the public, as well risks to machinery by accidents involving the public, or risks associated with difficulties in responding emergencies or through only having a single 3m access.
218.	DLALC	SIG	66. Given the deficiencies in information in the Amended DA, it is unclear how the risks can be properly assessed.
219.	DLALC	SIG	67. The Risk Assessment is deficient, and does not comply with the Director-General's requirements which required the EIS to pay "particular attention to public safety, and including bushfires".
220.	DLALC	SIG	68. Despite being a proposal to undertake a development on bushfire prone land (vegetation buffer), the Amended DA is silent on the issue. There is no assessment of bushfire risks.
221.	DLALC	SIG	69. It does not provide any APZs. It is premised on the removal of a public road which assists in the management of bushfire risks. It proposes to replace that public access with a 3m wide easement which is not connected to any traversable road. The 3m wide easement is not adequate for emergency vehicles. In fact, it creates a fire trap, particularly as the length of the rail siding containing the conveyor and other infrastructure will exceed 1.1km. I refer you to the Department's own publication "Planning For Bush Fire Protection December 2006" Which clearly states the minimum requirements for access roads including Fig 1.8 Property access road

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			requirements (rural areas). Darkinjung repeats the matters set out at paragraph [55] above.
222.	DLALC	SIG	70. Bushfires are not a remote possibility in the area. There are significant residential areas in the vicinity. WSC took the responsible planning measure of identifying bushfire prone vegetation areas. The construction of a coal loading and coal conveyor in such an area without any buffer to the adjoining E2 Environmental Conservation land and without an APZ is irresponsible and cannot be justified from a planning perspective.
223.	DLALC	SIG	71. The Amended DA is deficient, and does not comply with the Director-General's requirements which, among other things, required " <i>consideration of all relevant environmental planning instruments, including identification and justification of any inconsistencies</i> " with those instruments and also required " <i>particular attention to public safety, and including bushfires</i> ".
224.	DLALC	SIG	72. The assessments of noise and dust in the Amended DA are inadequate. There is no assessment of the impact of dust and noise for the people who have to use the access track and who are required to pass within 3 metres of the rail spur, the coal loader and the conveyor in order to access their land.
225.	DLALC	SIG	73. Paragraph [7.4] (p.43) of Appendix D to the Amended DA discusses the potential air quality impacts on proposed Jilliby Subdivision Stage 2 Land Owners Action Group. While this site has been identified in the WSC Settlement <i>Strategy</i> , this is a long term strategic document. The locality has not proceeded into the formal rezoning process. However, and by contrast, Darkinjung has been part of a NSW Government inter-agency taskforce since 2012 regarding it's landholding across the Bushells Ridge area, which has culminated in the lodging of a multi-site rezoning application in June 2014 for the Wyee Road Residential Site and the Bushells Ridge Residential Site. Those developments have since received a Gateway Determination. Despite this, the Amended DA does not assess or discuss impacts in relation to either the Wyee Road Residential Site or the Bushells Ridge Residential Site.
226.	DLALC	SIG	74. Fig.13 and Fig 14 (pp.50-51) of the Amended DA shows the day time noise levels for Darkinjung's land, including the Bushells Ridge Residential Site and the Wyee Road Residential Site as ranging between 40-50dBA for both daytime and night time noise levels. The Amended DA and pp.47-48 discusses impacts on land neighbouring Darkinjung's. Appendix E to the Amended DA (p.49) states that at a Bushells Ridge Road residence (receptor P16 – adjoining Darkinjung's land to the north), has predicted levels that exceed the PSNC by up to 4dBA. The impacts on the Wyee Road Residential area or the Bushells Ridge Residential area are not discussed.
227.	DLALC	SIG	75. Page vi of the Amended DA recognises that mitigation is required for the single residence (receptor P16), and that the proponent " <i>will consult with these landowners and offer to apply appropriate acoustic treatments in accordance with the Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Developments (NSW Government, 2014).</i> " No similar consideration is made in relation to the impacts on Darkinjung's land that comprises the Bushells Ridge Residential Site and the Wyee Road Residential Site and, as noted below, no consultation has occurred in relation to those effects.
228.	DLALC	SIG	76. The nature of the recommendations set out in Appendix E (p.47) highlight the extent of the impacts on residences in the vicinity and highlights the level of noise that will be generated. People in rural / residential areas do not live their lives as prisoners in their homes. They are entitled to enjoy their land without noise pollution of the kind generated by this project. The Amended DA offers no solution for the unsatisfactory noise levels that will be generated for people on adjoining land outside their homes or to the amenity of their land generally.
229.	DLALC	SIG	77. In addition, because the Amended DA does not explain what vehicles will need to access the Nikko Rd site once it becomes operational, or how they will get to the site during construction, and when it becomes operational, off-site road impacts have not been assessed. Nor is there any assessment of the " <i>construction, operational, and transport noise impacts</i> ", for the area around Nikko Rd as required by the Director-General's requirements.
230.	DLALC	SIG	78. The assessment visual impacts of the Development Application are inadequate. The Amended DA fails to accurately represent the significant industrial shed (transfer station) adjacent to the Motorway Link Road or the 27m high (8-9 storey) coal loading facility, or elevated conveyor required to reach the top of the loading facility.
231.	DLALC	SIG	79. The coal conveyor will be in an elevated position where it traverses the Sydney-Newcastle ail line and will be an eyesore for traffic on the Motorway Link Road. 27m high coal loading facility exceeds height limits for buildings which would otherwise be permitted in the area and will sit well above the tree line and will be able to be seen from a considerable distance.
232.	DLALC	SIG	80. The visual impact assessment does not describe how the project will look from Darkinjung's land, and in particular Lot 16 DP120468 and Lot 204 DP117900. The people identified as the only " <i>people who will be potentially exposed to the proposed structure</i> " ¹⁸ do not include the people who currently use Nikko Rd or the owners of the adjoining land who will have to look at the structures while on their land. Indeed, in relation to " <i>Viewshed 3b</i> " which is next to Darkinjung's land, the Amended DA states: " <i>This Train Load Out Bin structure will be visible from Viewshed 3b within the Immediate Vicinity Viewing Zone. This view will be from a passenger train travelling north and south along the Main Northern Rail Line. This view will be limited as the passenger train will be moving at high speeds as it passes the Train Load Out Bin structure. Although the structure will be of a large scale, it will have similar character to other rail infrastructure found along rail lines.</i> " ¹⁹
233.	DLALC	SIG	81. The land ownership of Darkinjung is completely ignored. The visual impact on the Wyee Residential Land Site and the Bushells Ridge site is also ignored.

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234.	DLALC	SIG	82. The visual impact analysis is deficient, and does not comply with the Director-General's requirements which, among other things, required "potential visual impacts of the project on private landowners in the surrounding area as well as key vantage points in the public domain ".
235.	DLALC	SIG	83. The visual assessment is also deficient in that it is premised on the visual impacts being ameliorated through vegetation on adjoining land, not considering how the development impacts on the amenity of the property when the owners are enjoying it. The visual assessment does however consider the need for a visual barrier on the railway side, but then says: "There is no screening landscape between the structure and rail line. However, the structure is consistent with the character of its immediate location (i.e. other industrial structures). ²⁰
236.	DLALC	SIG	84. This ignores the fact that in this location the immediate location would otherwise be E2-Nature Conservation land. It also ignores the fact that if land owners have E2 Nature Conservation land, which they have to manage, they are entitled to be able to enjoy that land, and the amenity of it, without large coal mining infrastructure, being built right up to the boundary, without any set-back or visual buffer being required for the development.
237.	DLALC	SIG	85. The Director-General's Requirements required "a detailed assessment of the project on the capacity, efficiency and safety" on the "...local road network". The Amended DA does not address the issues which arise for the loss of Nikko Rd. Nor does it address impacts for Spring Creek Rd or Thompson Vale Rd, if that is how the coal loading facility is to be accessed.
238.	DLALC	SIG	86. The project does not identify how vehicles will access the site during construction and what the issues are for traffic movements. It also does not identify how vehicles will access the site when it is operational and how they will access the site.
239.	DLALC	SIG	87. The only existing access is through the rail underpass next to Spring Creek. The road becomes impassable in heavy rain when Spring Creek floods. On its face the Amended DA does not even identify how all weather road access will be maintained to the site. Refer Fig. 1.9 below
240.	DLALC	SIG	89. The Amended DA does not adequately assess socio-economic impacts on the Aboriginal community.
241.	DLALC	SIG	91. The economic assessment needs to consider impacts on adjoining land uses and opportunities lost on land moving into the future. Fig. 1.10 identifies Darkinjung's identified opportunities in the immediate area.
242.	DLALC	SIG	92. As noted above, Darkinjung has two residential projects which have received Gateway approval. In contrast to the project in the Amended DA, the development of the Wyee Road Residential Site and the Bushells Ridge Residential Site are consistent with existing residential developments in the area such as other residential developments at Wyee. There is significant economic injection associated with the residential development – exceeding \$300M in 1st round direct expenditure excluding any multiplier effects. There are also significant outcomes for the Aboriginal community from those potential land uses.
243.	DLALC	SIG	93. The impacts of the Amended DA on these developments, or the capacity to use the land for those developments, have been completely ignored. It fails to address the social and economic impact on the Aboriginal community as the proposal limits Darkinjung's potential on its proposed residential developments.
244.	DLALC	SIG	94. Where land is immediately adjacent to, or affects, land held by Aboriginal land councils, the assessment of the impacts should include an assessment on the impacts on the ability of the land council to achieve the social and economic objectives of the ALRA.
245.	DLALC	SIG	95. The economic analysis does not comply with the Supplementary Director-General's Directions which required "A description of the short-term and long-term social and economic implications and/or impacts of the project".
246.	DLALC	SIG	96. Darkinjung has sought opinion on the potential financial impact of the amended proposal upon future residential estates being located so close to significant coal loading infrastructure. It is estimated that retail lot values would be adversely affect by approximately \$10,000/lot - equals an \$8,700,000 loss over the life of the project. A copy of the advice received from MDA Property Consultants dated 23 August 2016 is attached.
247.	DLALC	SIG	97. The amended proposal may also sterilise any additional rail siding opportunities adjacent to the Darkinjung land zoned industrial, located to the west of the amended Proposal. This land is one of the few large (greater than 100ha) industrial zoned parcels located adjacent to a main rail line, and particularly between the Ports of Sydney & Newcastle.
248.	DLALC	SIG	98. Darkinjung has been working in partnership with a local company, Waste Enterprises over the past 18 months to prepare a Business Plan for a resource recovery facility to be located on the southern portion of lot 195 DP 1032847. The facility will (potentially) take waste from areas within a radius of 150 kilometres, sort it and sell it to waste recycling enterprises. An essential part of the plan is rail access to the development. The amended development application will remove future rail access to all Darkinjung land within Bushells Ridge.
249.	DLALC	SIG	99. Darkinjung LALC has entered into an Agreement to Lease with Casar Supporters Inc., a consortium of local business persons who intend to develop a motorsports precinct and social enterprise over a large part of lot 195 DP 1032847. The long term plan is for Casar to have permanent access to the development over lot 1 DP 1192889. There are insufficient details of the proposed conveyor system (incl. details about height) within the development application to determine how this access will be restricted.

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250.	DLALC	SIG	100. The Amended DA does not provide any rehabilitation strategy for the Nikko Rd site as required by the Director-General's requirements.
251.	DLALC	SIG	101. The infrastructure to be place on Nikko Rd is adjacent to Spring Creek. The Amended DA does not address the risk of pollution to Spring Creek arising from the washing of coal, grease or oil into Spring Creek.
252.	DLALC	SIG	102. The Amended DA contains no detail on the location or design of water quality control devices presumably required within the Nikko Road, adjacent to the coal loading infrastructure, to ensure any stormwater or other run-off generated with the development (e.g. dust suppressant system) does not impact on nearby waterways.
253.	DLALC	SIG	103. The Amended DA states that "WACJV has undertaken direct consultation with adjoining landowners and businesses"(p.28) . It also states that "DLALC was consulted regarding the proposed concept for the Amendment in February 2016"(p29).
254.	DLALC	SIG	104. Whilst Darkinjung's cultural heritage officers were contacted in relation to potential impacts on cultural matters (a requirement under OEH guidelines), Darkinjung as a landowner, was not consulted.
255.	DLALC	SIG	105. Darkinjung's submission to the Planning Assessment Commission in relation to SSD-4974 included concerns about the lack of consultation by Wyong Coal and a complaint that while Darkinjung was consulted in relation to heritage issues, it was not consulted as a landowner in relation to the project itself. Furthermore, the lodging of SSD-4974 without the consent of Darkinjung when it was required is the reason for the Court Orders in <i>Walarah No 2</i> .
256.	DLALC	SIG	106. Darkinjung did participate and was consulted in relation cultural heritage in relation to a survey undertaken in 2015. It was not however, consulted in relation to any other aspect of the project or the Amended DA. In February 2016 representative of the WACJV met with the CEO and Planning and Development Manager of Darkinjung. At the meeting Darkinjung was told generally of what was being considered and was provided with a single plan drawing. The details were not disclosed. The fact that a road closing application had been lodged had not been disclosed. There was no consultation.
257.	DLALC	SIG	108. The Amended DA does not comply with this requirement. It does not identify any of the issues raised by the public authorities it says it consulted in relation to the Amended DA. The requirement to consult with adjoining land owners did not occur in a way that allows compliance with this requirement. That is presumably why the Amended DA does not address the issue in the way required by the Director-Generals requirements.
258.	DLALC	SIG	109. For completeness, it can be noted that the Supplementary Director-Generals' Requirements also required an explanation of: "14. Any consultation about the action, including: (a) Any consultation that has already taken place; (b) Proposes consultation about relevant impacts of the action; (c) If there has been consultation about the proposed action – any documented response to, or result of, the consultation". And "15. Identification of affected parties, including a statement mentioning any communities that may be affected and describing their views." The details of consultation with Darkinjung identifying how it is affected and describing their views, is not included, because it did not occur.
259.	DLALC	SIG	110. In enacting the ALRA, Parliament was informed by the Report of the Parliamentary Joint Committee on Aboriginal Land Rights (the Keane Report) which looked at the circumstances of Aboriginal people across the State and the disadvantage that they suffered. In relation to how planning schemes operated, the Keane Report noted the difficulties they had in "opposing land use schemes that detrimentally affect their own area of residency". It also notes that as towns were spreading out to reserves the Aboriginal "communities were being ignored by local and State Government planners on questions of land usage and development". It explained that: "Aborigines of New South Wales by virtue of their general position of socioeconomic disadvantage stand in a position of relative inequality to non-Aborigines, in regard to access to local and State government land planning authorities. Additionally to this position of inequality, Aboriginal communities are forced to accept and abide by the decisions of the non-Aboriginal Government agencies regardless of whether they adequately accommodate the views, proposals, or expectations of the Aboriginal people. As a result, the Aboriginal people of New South Wales suffer discrimination from various Government decision makers in relation to land development and planning. Thereby the ability of Aboriginal group to progress as self determining communities can be stifled."21
260.	DLALC	SIG	111. Thirty five years after the enactment of the ALRA, it is unsatisfactory that the same problems remain. Both the WACJV and the Department of Planning are fully aware of the extent of Darkinjung's land holdings in the area. The strategic importance of Nikko Rd to Darkinjung is also apparent. Darkinjung's reliance on Nikko Rd is clear the importance of the Wyee Residential Development and the Bushells Ridge Residential development is also manifestly apparent. The potential impact of the Amended DA on Darkinjung's interests is self-evident.
261.	DLALC	SIG	112. The Amended DA states the Amended DA "will avoid development on land owned by Darkinjung Local Aboriginal Land Council".22 Although it is not on land owned by Darkinjung, it is premised on the removal of the existing road access to Darkinjung's land, and places coal loading and rail infrastructure immediately adjacent to the

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			land. Despite the extent of Darkinjung's land interests, the impacts of the proposal on those interests are ignored by the Amended DA. The interests of Darkinjung are reduced to only an interest in cultural heritage. The interests of Darkinjung as an adjoining land owner, with an interest in developing its land, are ignored.
262.	DLALC	SIG	113. The disregard for Darkinjung's interests as an adjoining land owner is discriminatory and contrary to the Director-General's requirements.
263.	DLALC	SIG	114. The Amended DA, at point 2.5 provides limited consideration of alternatives, however grossly inadequate for a project of this scale. Darkinjung responds to each of the alternate in the following table;
264.	DLALC	SIG	115. As noted above, there are numerous matters that have not been addressed, in the Amended DA, which the Director-General's Requirements issued for the original project required to be addressed in an EIS. The EIS is meant to be publicly exhibited so that the public can comment on them. The failure to address those matters in the EIS and allow public comment on them has undermined the public consultation process. It means that neither the public, or relevant Departments and agencies can properly consider, and respond to the project.
265.	ACA	SIG	The original Environmental Impact Statement (EIS) for the Project was prepared in April 2013 by Wyong Areas Coal Joint Venture. In 2014, the Planning Assessment Commission (PAC) reviewed the Project and conducted a public hearing in Wyong. The PAC then prepared a Review Report, which made a number of recommendations and concluded as follows: “... the Commission considers that, if the recommendations, concerning improved strategies to avoid, mitigate or manage the predicted impacts of the project are adopted, then there is merit in allowing the project to proceed. However, if the recommendations are either not adopted, or adopted only in part, then the Commission's position would probably change in favour of the precautionary approach. This particularly applies to water-related impacts.”
266.	ACA	SIG	None of the PAC's recommendations for improved strategies have been implemented.
267.	ACA	SIG	The Amended DA does not propose to change the number, depth or location of the longwalls. Therefore, our submission in relation to the Wallarah 2 Coal Project is made on the basis of the entire DA (copy of original submission attached), which includes both the Original DA and Amended DA documents. In general terms, our objections to the Project remain largely the same, with some exceptions, as set out in this document, which is an annexure to our original submission. We further object to the Amended DA on the grounds set out in this attached annexed document.
268.	ACA	SIG	The mine proponents Wyong Coal Pty Ltd, who trade as Wyong Areas Coal Joint Venture, hold the exploration lease for the Wallarah 2 Coal Product and the same proponent would likewise hold any licence to mine. It should also be noted that the major shareholder (82.25%) is Kores Australia Pty Ltd, a wholly owned subsidiary of South Korean Government-owned Korea Resources Corporation.
269.	ACA	SIG	The Korean Times published in June 2016 that the project's parent company, South Korean Government-owned Korean Resource Corporation (KORES), will quit its overseas resources development operations. KORES became actively engaged in overseas resources development during the former President Lee Myung-bak administration, but a price plunge for global resources has dealt it a deathly blow. KORES's debt ratio stands at a staggering 6,905%. According to the Korean Board of Audit and Inspection, a total of 35.8 trillion won was invested in overseas resources development, with little gains so far. KORES will also be slashing 118 international jobs.
270.	ACA	SIG	The announcement came as part of a government-led plan to rationalize and reorganize its bloated state-run energy businesses. According to the plan the South Korean government will now open its power supply market in phases to the Korean private sector and allow the listing of power-generating subsidiaries on the stock exchange. The South Korean government hopes that the new business model will be able to invest in new energy businesses, on top of paying off their debts and enhancing transparency. This is a major strategic shift by the South Korean Government and a puts in doubt the ability of the proponents of the Wyong Coal Project to sufficiently carry out any remedial work or rehabilitation, in particular in the water catchment area where a high degree of subsidence is forecast.
271.	ACA	SIG	This problem of remedial work and rehabilitation could well be unrealized because the proponents, Wyong Coal Pty Ltd, only have a paid-up capital of \$400. Therefore, the total liability of this company is limited to the total amount of its paid-up capital. They could simply walk away and leave the Central Coast community and the State Government having to bear the burden of cost.
272.	ACA	SIG	However, given the reported financial woes of the parent Company and their move to withdraw from overseas resource development, it is highly unlikely that the current proponent would be wanting to develop this mine, but merely on sell an approved licence.
273.	ACA	SIG	<u>Darkinjung Local Aboriginal Land Council</u> The Darkinjung Local Aboriginal Land Council (LALC), via a Planning Proposal, intend to initially subdivide 500 building lots on land directly adjacent to the mine project boundary. From legal advice received by the Australian Coal Alliance it is our view that the Department is bound to take into account the proposed development under the Planning Proposal, given that it has progressed to a stage where the Department has determined that the Planning Proposal should proceed, and has directed Central Coast Council to make the LEP.

No.	Stakeholder Name	ID	Issue
274.	ACA	SIG	It is our further view that the requirement to consider the Planning Proposal falls within section 79C(1)(e), which requires the Department to consider the “public interest” when assessing applications.
275.	ACA	SIG	Likewise, the Department is also required to consider the Planning Proposal under section 79C(1)(b), which requires the Department to consider the social and economic impacts in the locality of the development.
276.	ACA	SIG	In both cases, it is necessary to show that the impacts of the Coal Project on the development proposed under the Planning Proposal is relevant, and that the Department is bound to take it into account because of its relevance and has so far failed to do so.
277.	ACA	SIG	<ul style="list-style-type: none"> In June 2014, Darkinjung LALC lodged a multi-site rezoning proposal to Wyong Shire Council seeking to facilitate residential and employment development and conservation outcomes on five sites in northern Wyong.
278.	ACA	SIG	<ul style="list-style-type: none"> Relevantly, Council resolved to support Site 3 Doyalson but deferred consideration of Site 4 Bushells Ridge.
279.	ACA	SIG	<ul style="list-style-type: none"> Darkinjung LALC then submitted a pre-Gateway review request for Site 4 Bushells Ridge, which was considered to have merit by the Deputy Secretary in proceeding to the Gateway determination stage. The Site 4 Bushells Ridge proposal was then referred to the Joint Regional Planning Panel (JRPP) for advice.
280.	ACA	SIG	<ul style="list-style-type: none"> In November 2015, the JRPP reviewed the Site 4 Bushells Ridge proposal and recommended that it be submitted for Gateway determination. The JRPP also advised Council to consider combining Site 3 Doyalson and Site 4 Bushells Ridge into one planning proposal.
281.	ACA	SIG	<ul style="list-style-type: none"> On 19 April 2016, the Department received a planning proposal to rezone land at Bushells Ridge Road, Bushells Ridge and Wyee Road, Doyalson (Planning Proposal). It is relevant to note here that the land the subject of the Planning Proposal adjoins the Wallarah 2 Coal Project boundary in as much as both Site 3 Doyalson and Site 4 Bushells Ridge lie adjacent to the Main Northern Rail Line which will be used to transport the coal from the mine to the port, as well as three flooding assessment locations.
282.	ACA	SIG	<ul style="list-style-type: none"> The objective of the Planning Proposal is to enable low density and large lot residential development, development for the purposes of a neighbourhood centre and environmental conservation.
283.	ACA	SIG	<ul style="list-style-type: none"> On 2 May 2016, the Department determined that the Planning Proposal should proceed, subject to conditions (Determination).
284.	ACA	SIG	The Darkinjung proposal, which includes the CASAR Motor Park development, which will encourage tourism similar to Bathurst to the Region, will return to the Region over a twenty-five period \$900,000,000 and will provide far more local job opportunities than can be provided by the Wallarah 2 Coal Project.
285.	ACA	SIG	It should be noted that the Wallarah 2's job figure after construction of the mine, which is overstated, is 300. They claim that 60-70% would be local employment, with a proviso that applicants be qualified in mining. There would not be very many Central Coast residents that would be miners. In any event, the CFMEU would demand that retrenched workers from the Hunter Region, whether they currently reside on the Central Coast or not, take up those positions. Therefore, the new jobs being touted by Wallarah 2 are false and of no significance to the local economy compared to the financial flow on guaranteed by the Darkinjung proposal.
286.	ACA	SIG	A 1 Annexure to Coal Dust, Health & Noise Sections 15 & 16 of our original submission
287.	ACA	SIG	A1.1 Coal Dust and Health New data has shown the air quality across Australia has deteriorated to alarming levels, with the coal industry clearly the nation's worst polluter!
288.	ACA	SIG	The most concerning rise in air pollution is from PM10, a coarse pollution particle about the width of a human hair. Nationally, total PM10 emissions have increased 69 per cent in one year, and 194 per cent in five years.
289.	ACA	SIG	The figures come from the National Pollutant Inventory's 2014-15 report, which collects information about toxic pollution. Air pollution kills more than 3000 people in Australian every year, almost three times the annual road toll, and costs the nation more than \$24 billion in health care costs each year. The economic return from coal mining is no longer viable, and its high cost to human health - mortality and morbidity – is unacceptable.
290.	ACA	SIG	Dust will be a real issue for health in the Blue Haven and Wyee precincts, despite partial coverage of infrastructure by the Wallarah 2 mine proponents. There is no attempt to cover coal wagons, which will travel through one of the largest growing residential settlements in NSW, and through the southern suburbs to Newcastle affecting all those communities long the route as has been demonstrated in the Hunter to Port line. There has been great concern about the mapping of coal dust and the lack of authorities to control those emissions.
291.	ACA	SIG	PM10 emissions from the site are conservative and do not take into account the changing nature of intense wind and storm events in the recent years. Blue Haven and Wyee townships are now as close as 200 and 400 metres from the conveyor belt respectively, and the nine-story coal loader is 300 metres from the new Darkinjung LALC housing subdivision, which will bring even far greater problems for families living in the area from both constant dust and noise 24 hours per days seven days a week. The northern area, of what was previously Wyong Shire, is designated for housing development under the current Regional Plan. The encompassed precinct has many

No.	Stakeholder Name	ID	Issue
			schools, pre-schools and retirement villages and hospital within 5 kilometres of the proposed coal conveyance, coal stockpiles and coal loading facility.
292.	ACA	SIG	With the construction of new homes and the steady influx of large numbers of young families it is not appropriate for this type of development, which would have an adverse and long-term impact of human health. Dr. Peter Lewis, previous area director of public health had grave concerns in his previous two submissions of the increase in morbidity arising from airborne coal dust exposure. In particular the impact in younger children and the elderly with increased visits to the doctor. In his report to the PAC hearing on the Wallarah 2 coal project in April 2014 he said, "that their would be an alarming and unacceptable increase in health problems associated with coal dust particulate exposure for people living in the northern parts of Wyong Shire." That was when the coal loading facility was to be sited on the coal miner's land adjacent to Tooheys Road. By their own admission Wallarah 2, in the executive summary of their "Environmental Impact Statement" in April 2014, stated that 1 in 100,000 people would die from coal dust particulate exposure. This problem would be exacerbated many times over sited so close to a suburban housing estate.
293.	ACA	SIG	Wallarah 2 consultants, in Appendix C of their (pages 2 and 3) said: "Fugitive emissions can be expected during operation from loading stockpile to conveyor, wind erosion and maintenance of stockpiles and from up-cast ventilation shafts".
294.	ACA	SIG	Of all the air pollutants produced by coal mining activities, particulate matter is the most significant health threat. This threat would only be exacerbated by the transport of the coal to the loader by partially covered conveyor belts.
295.	ACA	SIG	As a major component of outdoor air pollution, particulates, such as PM10, can trigger heart attacks and strokes. The World Health Organisation has deemed that coal dust particulate matter is carcinogenic! Fine particles travel deep into the lungs and pass into the blood stream, posing a risk of heart attack and stroke. There is no threshold below which particle exposure is not harmful to human health. (Dr. James Whelan, Environmental Justice Australia).
296.	ACA	SIG	A1.2 Noise Noise levels as admitted by the proponent for "residences to the north of Bushells Ridge Road at Wyee" will cause severe health problems. With the conveyance, coal loading and train movements now within hundreds of metres of existing suburbs the extent of that general noise 24 hours per day, seven days week, for those living in Blue Haven and Wyee areas would become unbearable. Insomnia, stress related illness and depression will become a debilitating problem for people living next door and in the surrounding suburbs.
297.	ACA	SIG	It is noted, Wyong Coal (Wyong Areas Coal Joint Venture (WACJV)) and TransGrid have reached a commercial agreement to deal with potential issues relating to the Project's impact on electricity transmission towers, poles and wires. In the Agreement, WACJV have agreed to bear the costs of any transmission line adjustments or repairs that arise as a consequence of carrying out the Project. Furthermore, WACJV accept responsibility for the issues surrounding the reduction in ground clearance, being an electricity safety issue.
298.	ACA	SIG	WACJV has also agreed to remunerate TransGrid for any damage caused to its transmission lines and towers, or for mitigation and management measures that it needs to carry out.
299.	ACA	SIG	It is noted in the Department of Planning's Proposed Conditions that Power lines and timber poles need only to be 'always safe'. However, the poles and lines should be functioning where possible, and any loss is to be compensated. Any damage is to be fully repaired, replaced or fully compensated.
300.	ACA	SIG	It is further noted in the Planning and Assessment Commission Report that WACJV has entered into a commercial agreement with TransGrid to pay for any damage caused to the latter's infrastructure.
301.	ACA	SIG	Given that the proponent only has a paid up capital of \$400, and that its parent company is withdrawing from overseas resource development and is currently carrying a massive debt ratio of 6905%, it is highly unlikely, should the proponent receive a mine approval and proceed with its development, that any significant damage caused to the TransGrid system would be fully realised. Despite agreements and reassurances by WACJV, there is no liability beyond their paid up capital and certainly no liability in excess of that paid up capital by their shareholders to cover the cost to rectify any damage, especially if it was excessive.
302.	ACA	SIG	Injurious and debilitating health problems, loss of the fresh water catchment, subsidence of a grand scale and contamination of waterways will have a degrading effect of people's lives and the environment.
303.	ACA	SIG	Loss of the water catchment will not only impact on Central Coast residents but just as severely on industry and the growth of new industry. Water is essential for the survival of the Central Coast and in driving the Region's economy. Likewise, loss of air quality through airborne coal dust particulates not only creates an unhealthy future for residents, but will also cause a decline in population expansion and the construction of new homes. The underlying theme being voiced by many people and visitors in respect of the northern region of the Central Coast is "who would want to come here and buy a home and live in Coal Dust Central".
304.	ACA	SIG	The Central Coast Council, the State Members for Wyong, The Entrance, Gosford, Swansea and Lake Macquarie, along with the Federal Member for Dobell, all vehemently oppose this destructive development. It has no real benefit to the Region when balanced against what will be lost.

No.	Stakeholder Name	ID	Issue
305.	ACA	SIG	<u>Original Submission 2013</u> The extraction area is part of a major water supply catchment.
306.	ACA	SIG	• The mine footprint is directly under water supply streams and the water supply aquifer.
307.	ACA	SIG	• Potential for interruption to water supply.
308.	ACA	SIG	• Disruption of the aquifer feeding water supply streams. It is directly beneath the major water flow-through of the underground aquifers. The aquifer provides approximately 68% of the water recharge to Jilliby Jilliby Creek and the Wyong Creek (River).
309.	ACA	SIG	• Water quality will be impacted.
310.	ACA	SIG	• Significant dependence on Groundwater by residents and agriculture in the extraction area and by Central Coast residences as the major harvesting area for the suburban water supply.
311.	ACA	SIG	• The dependence of the newly completed Mardi-Mangrove pipeline link on the continual availability of water from the catchment area.
312.	ACA	SIG	• Potential environmental impact on: Wetlands. <input type="checkbox"/> Cliff/formation subsidence. <input type="checkbox"/> Tree root impacts leading to dieback. <input type="checkbox"/> Vegetation and ecosystems. <input type="checkbox"/> Stream morphology and erosion and sedimentation processes.
313.	ACA	SIG	• Structural damage to water supply infrastructure, such as weirs, irrigation pipelines, pump stations has not been ruled out. Domestic infrastructure: dams, farm bridges, grazing areas and loss of service water.
314.	ACA	SIG	• Reduction and/or destruction in farm produced income from subsidence and water loss.
315.	ACA	SIG	• Wyong weir and the Mardi pump-pool are all within the horizontal subsidence zone.
316.	ACA	SIG	• Jilliby Jilliby Creek and Little Jilliby Jilliby Creek that have been mapped are fault lines (trending west to east towards Mt. Alison) and Aquifers are directly above the proposed mine. Subsidence will create additional transient pathways when intersecting these fault lines. It is reasonable to assume that these fault lines and other similar geological structures have been allowing water to seep from surface to coal seam post volcanism, which is how the water reached the coal seam in the first instance. Proof has been found on the bore cores, which show discreet areas of 'rust' (iron oxide).
317.	ACA	SIG	• Wyong River and Wyong Creek are within the horizontal subsidence zone.
318.	ACA	SIG	• Loss of the drinking water catchment. (The Dooralong and Yarramalong Valleys are the major water catchment area for the entire Central Coast.)
319.	ACA	SIG	• Unacceptable subsidence impacts to 245 homes, outbuildings, agricultural industry, (including turf farms, livestock breeding, orchards, vegetables, bees, cattle) dams and roads within the mine footprint, and without appropriate mitigation strategies.
320.	ACA	SIG	• Mining is a "key threatening process" for the extensive vegetation communities in the region that includes many threatened species. There are likely impacts arising on: <input type="checkbox"/> Wetlands. <input type="checkbox"/> Corridors. <input type="checkbox"/> Threatened species and habitats
321.	ACA	SIG	• The development is likely to have far reaching impacts on vegetation beyond the immediate area of the mine head and stock piles, eg., the complete rail loop, introduction of Phytophthora.
322.	ACA	SIG	• A likelihood of pollution in Tuggerah Lakes, which would cause an unacceptable loss of its biodiversity.
323.	ACA	SIG	• Unacceptable loss of the biodiversity of the two valleys and the pristine nature of the environment.
324.	ACA	SIG	• Potential destruction of the two major riparian corridors.
325.	ACA	SIG	• A development of this scale has significant impacts on local training, community facilities and services, housing, schools, hospital, etc.
326.	ACA	SIG	• It significantly increases demands on social/cultural/recreational services.

No.	Stakeholder Name	ID	Issue
327.	ACA	SIG	<ul style="list-style-type: none"> Coal loader will be built adjacent to the largest growing urban area on the Central Coast and NSW, including the planned new city of Warnervale and the Wyong Employment Zone.
328.	ACA	SIG	<ul style="list-style-type: none"> Undue angst for people affected by subsidence and coal dust emissions.
329.	ACA	SIG	<ul style="list-style-type: none"> Wallarah 2 have not obtained a social licence (acceptance from the community) and have failed to adequately address community concerns or consult with them. In particular there has been a total failure by the proponent to engage in a one-on-one discussion programme with landowners within the mine footprint. Distributed newsletters have done no more than promote Wallarah 2 propaganda, lulling landowners into a false sense of security that there will be no impact upon there properties.
330.	ACA	SIG	<ul style="list-style-type: none"> Potential for significant stack emissions.
331.	ACA	SIG	<ul style="list-style-type: none"> Potential for dust generation throughout construction and operation of the project, including along the entire rail corridor, and wide spread emissions of fine dust particles across the urban growth area of the North Wyong Region when the mine is operating.
332.	ACA	SIG	<ul style="list-style-type: none"> The potential for release of methane gas despite programmes to extract it in advance of mining operations.
333.	ACA	SIG	<ul style="list-style-type: none"> Problems associated with coal dust (respiratory and skin disease) being transported on the wind. (The Central Coast already has one the highest incident of respiratory ailments in NSW and in Australia due to the proximity of the power stations).
334.	ACA	SIG	<ul style="list-style-type: none"> Mortality from fine airborne coal dust emissions as clearly stated in the Wallarah 2 Executive Summary (page xi) and Appendix M, pages 6 - 17 of the Health Assessment Risks.
335.	ACA	SIG	<ul style="list-style-type: none"> There is significant potential for generation of noise and vibration arising from construction, operation and coal transport.
336.	ACA	SIG	<ul style="list-style-type: none"> This would be occurring in a quiet rural setting and adjacent to the largest growing urban area on the Central Coast.
337.	ACA	SIG	<ul style="list-style-type: none"> Potential for noise and vibration impacts on local fauna.
338.	ACA	SIG	<ul style="list-style-type: none"> Local creeks flood rapidly.
339.	ACA	SIG	<ul style="list-style-type: none"> There is generally poor access for residences in the area of proposed extraction.
340.	ACA	SIG	<ul style="list-style-type: none"> Increased flooding for many properties due to subsidence and five homes being pushed into the 1 in 100 flooding zone. Since 1981 there has been the equivalent of six 1 in 100 floods in the Dooralong Valley.
341.	ACA	SIG	<ul style="list-style-type: none"> Detailed assessment of soil and land resources insufficient. Does not meet DCR.
342.	ACA	SIG	<ul style="list-style-type: none"> Survey scale of soil and agricultural resources across the Project Area is not reported. <i>Minimum action required by the proponent: report survey scale for transparency.</i>
343.	ACA	SIG	<p>KORES proposals are incompatible with the Threatened Species Conservation Act 1995, the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999) and the NSW Water Act 2000. Longwall coalmining will also destroy wildlife of National and International significance (registered under protective ordinances) within the Catchment district, and the ecological integrity of the Wyong Water Catchment. High conservation values must be paramount and practised as <i>stream health and environmental flows</i> are critical to ensuring the continuity of potable water resources. These essential public water resources are immediately threatened by longwall mining subsidence occurring in the catchment.</p>
344.	ACA	SIG	<p>Ecological processes maintain the biological diversity and ecosystems in the Tuggerah Estuary are dependent upon periodic inundation of the flood plains and wetlands and a continuity of the movement of aquatic organisms between fresh water inflow and estuarine habitats. Subsidence will cause pollution of these habitats, which are of National and International significance as food resources for international migratory avifauna waders. Coal seam waters that will destroy sedimentary organisms within the Tuggerah Lakes Barrier Estuary will pollute the two riparian corridors of Wyong River and Jiliby Creek.</p>
345.	ACA	SIG	<p>The Strategic Assessment Report - <i>Coal Mining Potential in the Upper Hunter valley December 2005 Department of Planning</i> - describes the potential short and long term impacts of mining in the Upper Hunter Valley, which is considered relevant to the Yarramalong and Dooralong Valleys. The ecological integrity of stream corridors and their flow regimes is predicated upon the assessment and management of activities in the catchment, which would otherwise have recognised adverse impacts throughout the coal zones.</p>
346.	ACA	SIG	<p>The Commonwealth Minister for Sustainability, Environment, Water, Population and Communities has determined the Wallarah 2 Coal Project, involving the development and operation of the Wallarah 2 underground coal mine, is deemed to be a 'controlled action' under Section 75 of the Environment Protection & Biodiversity Conservation Act 199/EPBC Act.</p>
347.	ACA	SIG	<p>As such, the action is likely to have a significant impact on the EPBC Act listed threatened species including Charmhaven Apple (<i>Angophora inopina</i>) and Black-eyed Susan (<i>Tetratheca juncea</i>), listed as vulnerable under the Act and Spotted-tail Quoll (<i>Dasyurus maculates</i>) and Giant Barred Frog (<i>Mixophyes iteratus</i>) listed as</p>

No.	Stakeholder Name	ID	Issue
			endangered under the Act.
348.	ACA	SIG	We also draw your attention to statements by John Williams, former NSW Land and Water Conservation Department (1999), from his document <i>Coal Mining and Groundwater Management</i> . <i>"Mining the coal resource has potential to result in a number of environmental and social impacts most of which is related to aquifer depressurisation. Groundwater impacts include reversal of flow directions, increased aquifer infiltration, water quality changes, potential impacts on stream base flow conditions and possibly aquifer collapse due to removal of fluid void pressure."</i>
349.	ACA	SIG	Attention is also drawn to the Mineral Resources Department's own document <i>"Strategic Study of Northern New South Wales Coalfields - Executive Summary (Nov 1999) (3)." We refer you to page 10, last paragraph:</i> <i>"... mining that is likely to adversely impact either the agricultural potential or groundwater integrity to a significant degree, will not be permitted."</i>
350.	ACA	SIG	Wyong Water Supply Catchment District was Proclaimed in NSW Government Gazette No.153 29/11/1950 under the Local Government Act, 1919 p.533-534 Section 401 Division 7 Local Government Act Catchment districts and ordinances. 401(2) (b), (2)(h) are still relevant and enforceable . . . (2b) <i>"The protection of the Catchment district, or any watercourse therein, from pollution, and the protection of any property of the Council on such catchment district and (2h) Preventing the diversion of or the taking of water from any natural or artificial watercourse the water of which flows into the Council's works except by or under authority of the Council or of any Statute"</i> .
351.	ACA	SIG	Documentation of subsidence damage in the Northern, Southern and Western coalfields of NSW from longwall mining indicates that this project cannot satisfy these protective statutes and recent reassurances by this company - <i>the security and continuity of potable water resources would be maintained and protected. Recurring residual, active and horizontal subsidence is inevitable below Jilliby Jilliby Creek and flood plains, the Yarramalong flood plains and will also intercept Wyong River with a potential loss of potable water resources - some 53% currently supplying Wyong communities and Gosford City.</i>
352.	ACA	SIG	It is stated in the Wallarah 2 EIS that it will take almost 40 years to complete all the planned longwalls. It must be realised that the workings will remain depressurised until the last longwall is completed.
353.	ACA	SIG	Figure 1 gives the statistical analyses of the flows in Jilliby Jilliby Creek, upstream of the Wyong River, from records since 1972.
354.	ACA	SIG	The median flow rate is 4.5 Megalitres per day (ML/day). However, the flow is less than 1 ML/day for 24% of the time of record, and less than 0.1 ML/day for 10% of time.
355.	ACA	SIG	The data in Figure 2 shows that for 190 days, flows were less than 2ML/day (less than half the average), and again for different periods of 180, 168, 166 and 135 days.
356.	ACA	SIG	The Mackie 3D groundwater model assumes that there will remain a 150m to 300m thick layer with a very low vertical permeability even after mining is completed. This assumption that there will be a Constrained Zone dictates the findings of the Wallarah 2 model. This assumption that there will be a Constrained Zone of unaffected permeability more than 220m above the level of extraction cannot be justified on the basis of data from the Southern Coalfields and at Ulan.
357.	ACA	SIG	The assumptions regarding permeability in the Mackie 3D model are contradicted by calculations given in the MSEC/SCT report in Appendix F to the EIS. The calculations show some disruption of the strata throughout the 350m profile above the level of extraction.
358.	ACA	SIG	The hydraulic conductivity values adopted in the Wallarah 2 model are substantially on the low side of reality. Therefore, the computed mine inflows and the rate at which depressurisation progresses through the strata are substantially on the low side of reality. If Mackie had adopted the parameters recommended in the previous chapter in the same EIS, then depressurisation would have been calculated at occurring much faster and to a much greater extent.
359.	ACA	SIG	This reduction in permeability has a very important impact on the computed mine inflows and the rate of depressurisation. There is no information in the EIS and in particular Appendix G that sets out what assumptions have been made in the model in respect to permeability reduction in the desaturated zone in the goaf. Therefore, it is impossible for a measured review to be made of the model results. It would have been proper for the assumptions to be validated against field data from Mandalong Colliery, where there has been substantial depressurisation above the extracted longwalls, viz:
360.	ACA	SIG	The following is from the Mandalong, August 2012 Longwall 12 report – <i>Mining of the longwall panels has however resulted in depressurization of the deeper overburden.</i> <i>Whereas at some depths this may be a temporary depressurization due to bedding parting, at deeper levels the bedrock has probably been permanently depressurized/dewatered when mining intersected a fault and/or goafing provided hydraulic connection with the mine.</i> <i>The data also indicates that the Great Northern Seam to the south of the Mandalong Mine may have been depressurized as a result of mining in the area, but that the deeper Fassifern Seam has not been impacted. HB – refer to EIS RTS</i>
361.	ACA	SIG	The permeability values adopted for Wallarah 2 model are given in Figure 3 (taken from Appendix G of EIS).
362.	ACA	SIG	The physiography of this Catchment records Wyong River Weir Catchment of 436sq. km and Jilliby Jilliby Creek Catchment of 101sq. kms. A series of steep strike ridges and deep gullies are considered the ground water recharge areas (Northern Geosciences, 2005), which form part of the water catchment district boundary under the Water Management Act 2000. Wyong River is a Regulated River and receives a supplementary supply in seasonal needs from Mangrove Creek Dam via the Boomerang

No.	Stakeholder Name	ID	Issue
			Creek Tunnel to maintain Wyong River and environmental flows. <i>Subsidence conditions will destroy these groundwater recharge areas.</i>
363.	ACA	SIG	Land Resources – including a detailed assessment on the potential impacts on: Soil and land capability (including land contamination); Landforms and topography, including cliffs, rock formations, steep slopes etc; Land use; Agricultural resources and/or enterprises in the local area, including: • Any change in land use arising from requirements for biodiversity offsets; • A detailed description of measures that would be implemented to avoid and/or minimize the potential impacts of the project on agricultural resources and/or enterprises; and • Justification for the long-term changes to agricultural resources, particularly if highly productive agricultural resources (e.g. alluvial lands) are proposed to be affected by the project.
364.	ACA	SIG	Relevant policies and Guidelines listed in DGRs Draft Agricultural Assessment Guidelines 2011 (DP&I) AgFact AC25: Agricultural Land Classification (NSW Agriculture)
365.	ACA	SIG	Required: Detailed assessment of soil and land resources. This baseline data is used for an assessment of potential impacts and feeds into the Agricultural Impact Statement. The Draft Agricultural Assessment Guidelines 2011 specify that detailed information on soil and land resources is required.
366.	ACA	SIG	• Survey scale of soil and agricultural resources across the Project Area is not reported.
367.	ACA	SIG	Survey scale is a maximum of 24 observations over 4,558 ha. This equates to 0.005 obs per hectare and in accordance with the reference listed in Section 5 of the report, <i>Guidelines for Surveying Soil and Land Resources (Second Edition)</i> , means that this observation density is a broad low intensity survey scale of ~ 1:500,000. This scale is the opposite of what is considered to be a detailed assessment and therefore does not satisfy the DGRs.
368.	ACA	SIG	<i>Minimum action required by the proponent</i> should have been to undertake a detailed soil and land resources assessment at an appropriate scale commensurate with the potential project impacts and agricultural resources of the area.
369.	ACA	SIG	Survey observations consisted of 20 Soil and Land Information System (SALIS) data points and 4 ground truthed sites. SALIS data is not provided and therefore the level of detail provided by the SALIS records is unknown. There are various levels of data that can be entered into the SALIS system and the dataset used for the project may cover some or all of the parameters listed in the reports Table 1. Further, SALIS data may not have been collected by verified CPSS soil scientists or by technically accredited government staff member as the database is open for submission by the general public. Eg. Farmer Joe Blogs can add data to the file. Therefore transparency on the level of detail provided by the SALIS records and the technical competency of the data collector is required to accompany the use of SALIS data.
370.	ACA	SIG	Section 8.2 states that opportunist ground-truthed observations were assessed in accordance with the parameters listed in the reports Table 1. No evidence has been provided to support this. Further, the authors state that information was collected only down to a maximum of 0.3 – 0.4 m and that no chemical analysis was undertaken on the profiles to assess soil pH, salinity or sodicity characteristics, which are significant drivers of a soils assessment with regards to applying the Australian Soil classification nomenclature and recommending appropriate soil erosion controls.
371.	ACA	SIG	The proponent should have appended soil log data sheets used in the field. If no chemical laboratory data is available and verifiable (e.g. field chemical data collected by a CPSS scientist or laboratory Certificate of Analysis) then a detailed soil and land resources assessment at an appropriate scale commensurate with the potential project impacts and agricultural resources of the area, including provision of sufficient laboratory data should have been undertaken.
372.	ACA	SIG	The dominant soil type in the Project Area is listed in the report as a Kurosol. This soil type by definition has a strong acidic subsoil. No data has been presented to verify that the soils in the Project Area are strongly acidic.
373.	ACA	SIG	The second dominant soil type in the Project Area is a Sodosol. This soil type has strongly sodic subsoil. No data has been presented to verify that the soils in the Project Area are strongly sodic.
374.	ACA	SIG	Insufficient details on each representative soil type
375.	ACA	SIG	The soil types are inadequately described. There is none to limited reference to soil texture, soil structure, consistency, effective rooting depth, colour etc. The assessment has not been written up to show that it has been conducted in accordance with the <i>Australian Soil and Survey: Field Handbook</i> as specified in the methodology. Conversely the assessment contains less information than the desktop reference <i>Soil Landscapes of the Gosford-Newcastle region</i> . The soil types have been rudimentarily classified to family level, which does not provide enough information for an inherent fertility assessment, a land capability assessment (which is weighted by soil erodible characteristics, such as topsoil texture) or for topsoil salvage assessment.

No.	Stakeholder Name	ID	Issue
376.	ACA	SIG	<i>Minimum action required by the proponent</i> should have been to provide full profile descriptions of the representative soil types, including valid field and or laboratory data to support the ASC naming.
377.	ACA	SIG	The Yarramalong landscape has alluvial soils as well as red gradational soil, yellow and brown duplex soils and some solodics/soloth soils on terraces (<i>Soil Landscapes of the Gosford-Newcastle region</i>). However, the report has identified all of the nonchannel land associated with the Yarramalong soil landscape unit as containing sodic subsoil (solodics/soloth soil types). Solodics/Soloths are considered to be a minor soil type by the reference material; however, the report identifies it as being a dominant soil type, which subsequently downgrades the land's potential agricultural productivity.
378.	ACA	SIG	There is no data provided to support the presence of sodic subsoils and the report's mapping conflicts with the reference material. Given that the report's survey scale is significantly broader than the reference material, which is 1:100,000, then the background reference material needs to be used otherwise the assessment is invalid.
379.	ACA	SIG	The proponent should re-assess the land covered by the Yarramalong soil landscape unit using information from a detailed survey. Particular importance to be placed on this unit, as it may be Class II land and is in the disturbance zone of the Project. Therefore a survey scale of 1:25,000 is the standard practice and in line with the best practice guideline <i>Biophysical Strategic Agricultural Land Verification Guidelines</i> (OEH, 2013)
380.	ACA	SIG	Land Capability system applied is outdated
381.	ACA	SIG	The NSW strategic regional land use policy and associated Strategic Regional land Use Plans have adopted the Land and Soil Capability classification system (OEH 2011, 2012) to appropriately classify rural land for agricultural potential. The Rural Land Capability system applied in the report is not using the latest endorsed assessment guideline, which has been developed specifically to improve the agricultural classification system used to assess land with competing land uses.
382.	ACA	SIG	<i>Minimum action required by the proponent</i> should have been to assess the Project Area using the Land and Soil Capability classification system.
383.	ACA	SIG	The Kandasol soil type has been assessed as Rural Land Capability Class VI. The information provide in section 9.2 describes a soil type and landform commensurate with a Rural Land Class IV or V classification.
384.	ACA	SIG	Land capability classification should have been associated with the Kandasol soil type.
385.	ACA	SIG	The Gorokan landscape typically has undulating low hills and rises with slope gradients of less than 15% and has low limitation for grazing and high limitations for cultivation. This information, which has come directly from the authors background reference - <i>Soil Landscapes of the Gosford-Newcastle region</i> , describes a soil landscape unit that has a Rural Land Capability classification of Class IV or V – refer Table 3 of the report.
386.	ACA	SIG	The assessment potentially incorrectly classifies the Gorakon landscape unit as being Class VI, which is generally commensurate with land that has slopes >20%.
387.	ACA	SIG	Land capability classification assessment should have been associated with the Gorokan soil landscape unit.
388.	ACA	SIG	The Yarramalong landscape typically has low limitations for both cropping and grazing. This information, which has come directly from the author's background reference - <i>Soil Landscapes of the Gosford-Newcastle region</i> , describes a soil landscape unit that has a Rural Land Capability classification of Class II or III – refer Table 3 of the report.
389.	ACA	SIG	The assessment potentially incorrectly classifies the Yarramalong landscape unit as being Class III rather than Class II. The existing land use of a turf farm within this vicinity validates that land is capable of being regularly cultivated.
390.	ACA	SIG	Land capability classification assessment should have been associated with the Yarramalong soil landscape unit.
391.	ACA	SIG	The proponent should have assessed land capability classification associated with the Yarramalong soil landscape unit.
392.	ACA	SIG	The land area classified as Agricultural Suitability Class 3 land that is associated with the Jilliby Jilliby Creek (refer Figure 8 of the report) does not correlate with the assigned classification Rural Land Capability Class III land (refer Figure 6 of the report). This Agricultural Suitability Class classification means that it is considered suitable to grazing and limited for cropping whereas the assigned Rural Land Capability classification means that is highly suited to cropping.
393.	ACA	SIG	These two assessments using the two classification systems are contradictory and highlights that the report has not been authored by a technically competent person. No validation has been provided, such as the lack of transport links, with the exception of one sentence in Section 10.2.3, which says, "human elements such as viability of regional infrastructure to support activities are also taken into account". Further detail on these human element(s) is required to justify the agricultural downgrading of the land.
394.	ACA	SIG	The proponent re-assess Agricultural suitability classification of the Class 3 land!
395.	ACA	SIG	The land area classified as Agricultural Suitability Class 5 in the west of the site (refer Figure 8 of the report) does not correlate with the classification Rural Land Capability Class VI land (refer Figure 6 of the report). This Agricultural Suitably Class 5 capability classification means that the land is considered <i>unsuitable</i> for almost any agricultural use whereas the Rural Land Capability classification means that is suited to light grazing.
396.	ACA	SIG	These two assessments using the two classification systems are clearly contradictory.
397.	ACA	SIG	The proponent re-assess Agricultural suitability classification of the Class 5 land!

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398.	ACA	SIG	The DGRs do not specify that verification of Biophysical Strategic Agricultural land (BSAL) is required; however, it is highly likely that some of the alluvial derived landscapes will be BSAL. Therefore it would be deemed reasonable and appropriate for the proponent to verify if BSAL is present such that mitigation and/or avoidance strategies can be employed.
399.	ACA	SIG	The Project Area should have been assessed for BSAL in line with a precautionary principled approach.
400.	ACA	SIG	The topsoil balance only includes rehabilitation of 14 ha of land as it is assumed that the proposed land use of industry at the Tooheys Road Site will be approved. Given, that there is no rehabilitation strategy a full topsoil balance should have been undertaken to ensure that sufficient resources are available for full rehabilitation of the site, and developed in consultation with the community and government stakeholders.
401.	ACA	SIG	The proponent should have developed a rehabilitation strategy and revised the top soil balance. Strategy should have been developed in consultation with both community and government stakeholders.
402.	ACA	SIG	There is no description of soil pedality, structure, texture to back up the topsoil salvage assessment in Section 11. Specific soil characteristics, as detailed in the reports Table 7, are required for assessing topsoil suitability using the Elliot & Venness procedure. The report does not provide supporting information to verify the assessment and given the lack of information provided for each soil type in Section 9 of the report it is likely that the Elliot & Venness procedure has not been applied properly.
403.	ACA	SIG	The proponent failed to provide full profile descriptions in accordance with the ASC nomenclature (Isbell, 1996) and the <i>Australian Soil and Survey: Field Handbook</i> as specified in the reports methodology to support the topsoil stripping assessment.
404.	ACA	SIG	The soils differ in their suitability for stripping and re-use in rehabilitation operations. These limitations are based on soil structure, soil texture, pH, dispersibility, etc. characteristics. There has been no assessment that details the limitations of each soil type and which ones are to be preferentially stripped.
405.	ACA	SIG	The proponent has not provided information to support the recommended soil depth stripping assessment, nor provided preferential stripping information to support rehabilitation success.
406.	ACA	SIG	The soil management measures are inadequate and generic.
407.	ACA	SIG	For example the Kurosols detailed in section 9 is as being moderately to highly erodible and possibly dispersive. This soil type will require soil amelioration measures such as gypsum and organic amendments to improve soil structure and prevent/reduce dispersion when stockpiled.
408.	ACA	SIG	For example the Sodosols will likely have hard setting surface characteristics, which means that the stripped soils will require special handling.
409.	ACA	SIG	The proponent did not provide soil management measures that are applicable to the soil types as described for the Project Area.
410.	ACA	SIG	The soil type associated with the Wyong landscape unit is described in the reports reference material (<i>Soil Landscapes of the Gosford-Newcastle region</i>) as being a potential acid sulphate soil. This soil type comprises a significant portion of the Tooheys Road Site, which is to be disturbed – refer Figure 5 of the report.
411.	ACA	SIG	The report states in section 12.2 that areas of acid sulphate potential are outside of the disturbance area. This is in direct contrast to the reference material that the desktop assessment has been predominately based on..
412.	ACA	SIG	The proponent did not assess the potential for acid sulphate soil to occur within the Project Area correctly.
413.	ACA	SIG	Invalid Agricultural Impact Assessment as the soil and agricultural information used to assess agricultural impact is obtained from the soil and land capability report.
414.	ACA	SIG	Invalid Rehabilitation strategy as the return to post-mining classes is dependent upon an appropriate pre-mining assessment. Further topsoil balances will be incorrect and invalid.
415.	ACA	SIG	Surface water report if it has referenced alluvial information derived from the soil and land capability report will also be invalid unless significant in field testing was undertaken by the surface water specialists.
416.	ACA	SIG	Rehabilitation - including the proposed rehabilitation strategy for the site, having regard to the key principles in the Strategic Framework for Mine Closure , including: --- rehabilitation objectives, methodology, monitoring programs, performance standards and proposed completion criteria; --- nominated final land use, having regard to any relevant strategic land use planning or resource management plans and policies; and --- the potential for integrating this strategy with any other rehabilitation and/or offset strategies in the region.
417.	ACA	SIG	Required: Rehabilitation objectives, methodology, monitoring programs, performance standards and proposed completion criteria
418.	ACA	SIG	No rehabilitation strategy has been provided. The main EA document and the soil and land capability report provides limited information on proposed decommissioning strategies. No rehabilitation objectives, methodology, etc have been provided. The commitment to develop a strategy within 5 years of mine closure is not sufficient given the Mining Operations Plan will need to address rehabilitation actions through time.
419.	ACA	SIG	Further, the post-mining land capability and land use assessment for the Project are required to be integrated with the rehabilitation strategy otherwise post-mining land capability/land use cannot be nominated and verified. The absence of a rehabilitation strategy means that the nominated land use/land capability classifications in the soils and land capability report lack a supporting validation and require further assessment.

No.	Stakeholder Name	ID	Issue
420.	ACA	SIG	Valley areas are of consolidated segments of Triassic Hawkesbury Sandstone and Gosford Formation within Hornsby Plateau subdivision of the Sydney basin. Extensive areas of unconsolidated alluvial soils occur along major valleys and streams. Several sets of high angle (near vertical), well-developed joints are identified in the valleys crush zones of permeable Hawkesbury Sandstone to create <i>transit pathways for horizontal and vertical water distribution</i> . A thick sequence of deeply weathered gravels alluvial scree residual clay and sandy soils at 10-20m overlay fractured and faulted weathered and fresh sandstone of the Hawkesbury and Gosford formation to a depth of 400m.
421.	ACA	SIG	Geological factors influence stability and instability within soil profiles. Longwall mining creates major stress factor changes, within soil profiles, which are considered permeable . . . “ <i>tectonic activity opened up overlying strata which provided an escape route to the possibility of groundwater flow between the coal seams and the shallow aquifers. The role of meteoric water migration through the coal seams in the enhancement of methanogenesis processes carrying bacteria and nutrients, has ready access to flow through the coal seams</i> ” . . . (Faiz et. al. 2003, Evans, R. 2005). Connectivity is clearly established!
422.	ACA	SIG	A major geological feature of Jilliby Creek is a fault zone approximately 1.3km west of Mount Alston. The drainage runs along this fault line in almost a direct line south for approximately 1.5km midway along this feature Little Jilliby Creek converges into Jilliby Creek. The whole of the Little Jilliby Creek is at right angles from Jilliby Creek and is interpreted as a <i>conjugate fault zone. The significance of this feature is that it provides a significant pathway to groundwater movement and discharge into surface stream flow regimes of Jilliby Creek. Subsidence has the potential to destroy this flow and intercept polluted coal seam waters prior to final discharge (after the confluence of Jilliby Creek with Wyong River) into Tuggerah Lakes estuary. Northern Geosciences, 2005).</i>
423.	ACA	SIG	Jilliby Creek, Wyong River, flood plains and drainage zones will be undermined by longwall coal panels resulting in surface subsidence - <i>a significant pathway to potable groundwater movement before confluence</i> . Interception, arising from “subsidence and cracking”, will divert these waters into a lower polluted coal seam aquifer. Longwall coal panels are <i>located dangerously close to Wyong River creating a high probability that horizontal subsidence will intercept this river and provide transit pathway/s to heavily polluted coal seam aquifer and natural drainage into the estuarine sediments of Tuggerah Lake.</i>
424.	ACA	SIG	Attention is drawn to the <i>State Scientific Committee report</i> commissioned by NSW government, regarding the Threatened Species Conservation Act 1995 (Chairperson Dr. L. Hughes) in relation to longwall coal mining in NSW. Their Final Determination listed <i>Alteration of Habitat</i> , following subsidence due to longwall coalmining, a <i>Key Threatening Process in Schedule 3 Part 2 of the Threatened Species Conservation Act 1995. (Gazetted 15/07/05)</i> . Members of the Expert Panel are invited to familiarise themselves with determinations by the <i>State Scientific Committee</i> that are considered relevant to KORES project proposals for Wyong Water Catchment District. Long-term studies of LWM in USA also indicate reductions in diversity and abundance of aquatic invertebrates may still be evident 12 years after mining.
425.	ACA	SIG	The Australian Coal Association Research Programmes (ACARP) research reports: C8005 Stage 1 March 2001, C9067 Stage 2 June 2002, and C1023 of September 2003 details serious impacts arising from longwall coal mining subsidence in the Northern, Southern and Western coal fields of NSW. Particular reference is drawn to <i>strata and hydrology of river valleys and river systems, lithology, sub-surface fracturing bed cracking and groundwater analysis</i> . Determinations in these two reports could be applied to proposals for coalmining in Yarralong and Dooralong Valleys within Wyong Water Catchment.
426.	ACA	SIG	A Department of Primary Industry (DPI) publication PRIMEFACTS MINE SUBSIDENCE February 2006 is also relative to this submission due to explicatory considerations on longwall coalmining pertinent to the Wyong Water Catchment District supplying potable water resources to and from Mardi Dam. Longwall underground panels 4.4 km long x 250/300m.wide x 4-4.5m.high will penetrate 8km. westerly into the Catchment District within the Yarralong and Dooralong Valleys. <i>Repetitive longwall “coal panel air voids” (excavated coal areas) will cause major subsidence to undermine flood plains, drainage lines, creeks and rivers which supply some 50% of potable water resources to Mardi Dam for community services.</i>
427.	ACA	SIG	Kores state in their May 2013 newsletter that, “ <i>The only direct impacts from the project will occur on suitability zoned land generally owned by W2CP at Buttonderry and Tooheys Road.</i> ” This statement is deceptive and would lead the lay person to believe that there will be no subsidence impacts on private land. The Department of Planning and Infrastructure has further exacerbated this confusion by declaring in a recent press release, “ <i>The mining area is predominantly underneath Wyong State Forest</i> ”. Only one-fifth of the mine will be beneath the State Forest.
428.	ACA	SIG	Approximately 25% of the mine footprint will be under the Jilliby Conservation Area, and the balance of the mine (more than 50% of the mine surface area) will be directly under private property and the water catchment. New brick homes in the Hue Hue area subdivision through to the houses and farms of Jilliby, Dooralong and Wyong Creek will be affected by subsidence.
429.	ACA	SIG	Walarah 2 state in their EIS 245 private homes will be impacted by subsidence. In their newsletter and in presentations to local government they state, “ <i>The large majority of these (homes) will experience only negligible to minor impacts from subsidence</i> ”.
430.	ACA	SIG	The way in which the subsidence information has been presented makes it impossible for property owners to determine which houses will be impacted by subsidence and to what extent. Kores distributed a leaflet that had on one side a map which could not be deciphered and therefore had no real benefit for property owners in the affected mine area. On the reverse side no mention was made as to the substantial impacts contained in their own Appendix H of the EIS. They merely said, “ <i>homeowners should</i>

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			<i>lodge a submission to the EIS</i> . Without any supporting data as to the true facts and without any personal consultation meant little to the person receiving it. The Wallarah 2 Project has not made any direct approach for consultation with local groups (ie. Dooralong Valley Residents Association), and the property owners within the mine footprint.
431.	ACA	SIG	Analyses of Appendix H subsidence data by our geo technical engineer, has revealed that the subsidence impacts will be catastrophic. 118 homes will be subsided from one metre up to 2.3 metres, 65 homes will be subsided from 200mm to 950 mm, and the balance of the homes by a lesser amount. (See Appendix 3)
432.	ACA	SIG	The EIS also reveals that insufficient consideration and mitigation strategies have been given to impacted properties, agricultural industry and Council assets, such as roads. Wallarah 2 merely states that the impact is within a subsidence zone and that Mine Subsidence Board will make good on the damages. History clearly reveals the problems and difficulty foisted upon property owners in trying to extract compensation from the Mine Subsidence Boards. Lives are destroyed for a generation or more.
433.	ACA	SIG	There has also been given no consideration to the impact of subsidence of the local agricultural industry. Page 17 of the Wallarah 2 EIS Executive Summary says, "...a turf farm could require mitigating works and have a reduced production capability after subsidence impacts... The complete loss of turf farm production over a two-year period is estimated to have a maximum value of \$0.86 Million per annum." The document further doesn't place any significance of the impact that the disruption from subsidence has caused to ongoing viability of the turf farm and other agricultural businesses. It says, "The overall total impacts to the agricultural contribution of the Disturbance Area, Subsidence Impact Limit and the biodiversity offset area is very small when compared to total agricultural production on a regional, state and national scale." This is nothing more than arrogance on the part of the proponent in demeaning the worth of those businesses and what their worth is to the local community and the business owner. Any disruption, such as described, would make it extremely difficult, if not impossible, to recover from loss of clientele during the disruption period, and who would be forced to establish alternate business arrangements.
434.	ACA	SIG	It is also noted that there has been no mitigating strategies from subsidence in respect of the transmission lines that cross the valley floor. The proponent merely says that they will continue to talk with Transgrid, but offer no viable solution to towers that may collapse, nor say how they would be re erected on unstable ground.
435.	ACA	SIG	Dr. Gang li, Principal Subsidence Mining Engineer, Department of Primary Industry NSW, clarified Dr L Holla's empirical curve determinations in assessing mining subsidence arising from longwall coalmining, i.e. ... "that calculations cannot take account of the constant unknown factors of the geophysical change and range of soil types within a mining lease". Irrespective of any new sophisticated assessment technology, this unknown factor must, and will always dominate in subsidence assessments - an assumption and hypothetical determination subjected to unknown variants that can cause unidentified serious major geophysical changes in the overburden above the valleys longwall coal panels within the 37sq. km of mining areas.
436.	ACA	SIG	The question of a dichotomy does not arise. Dr. L. Holla's subsidence predictions were based upon perceived geophysical correlation between the Wallarah 2 coal zone areas and those of the Southern Coalfields of NSW at recorded mining depths of 300m-650m. Dr. L. Holla (1996) divided Wallarah 2 coal areas into 8 subsidence assessment zones ranging from 0.6m- 2.9m and declared, "there are no geological anomalies or topographical features modifying the standard subsidence behaviour". Subsidence levels were assessed at coal depths of 2x600-650m, 1x500-600m and 5x 250-500m at a coal seam thickness of 2-6m and Pillar widths were @ 10% of mining depths. KORES statement . . . "subsidence over longwall panels could be expected to cause transient (temporary) changes in groundwater storage components in shallow aquifers systems which will lead to very short term depletion of alluvial groundwater storage followed by a rapid recovery"... is extraordinary and misleading in view of excessive subsidence levels that were determined by Dr L. Holla. No research has been produced in support of this determination, which we consider erroneous and uncertifiable. KORES confirmation of safety of catchment water supplies conflicts with indisputable evidence, which demonstrates a catastrophic loss and severe destruction of water resources.
437.	ACA	SIG	Subsidence predictions for areas in these two valleys reinforce an understanding of the "common system of procedural interpretation by empirical curves' assessments". The ACA has no reason to question these assessments in the knowledge that Holla's assessments were as a result of some 30 years experience in the industry in which he was held in very high esteem. They are at best, only a guide to events, providing that associated factors are relevant, and that is the unknown factor and will always be so.
438.	ACA	SIG	Research undertaken by Australian Coal Associations Research Programme (ACARP) and NSW State Scientific Committee clearly enunciate the damaging consequences arising from longwall coal mining. In a NSW publication - <i>Primefacts 2 Mining Subsidence Department of Primary Industry NSW February 2006</i> - details of this damaging mining procedure are discussed. <i>Ecological Sustainable Development</i> (ESD) and the <i>Precautionary Principles</i> are compromised if longwall mining occurred in this Proclaimed Catchment.
439.	ACA	SIG	Horizontal subsidence is recorded extending to some 3km. This would negatively impact upon catchment areas and establish "additional" permeable transit water conduit pathways (identified in earlier geophysical surveys). These new "conduits" facilitate the ingress and drainage of raw water, which would adversely impact upon the dynamic water balance. The occurrence of subsidence was acknowledged although KORES have stated a) "we will see and deal with this matter when it occurs and we will see what happens in the rock similar to those in the valleys where research is continuing" and b) "the local water catchment would not be damaged and subsidence

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			<i>was not expected to damage nearby rivers and aquifers</i> ". These are misleading statements and have no validity. Detailed published evidence from the experience in the northern and southern coalfields of NSW is contrary to KORES statement/s.
440.	ACA	SIG	Diega Creek in Lake Macquarie LGA is a classic example of the destruction of a creek system as a result of longwall coal mining. A recent Hunter-Central Rivers Management Authority report on Diega Creek (<i>Diega Creek Rivercare Plan, October 2003</i>) revealed that subsidence from longwall coal mining cracked the creek's rivers and beds, leaving it now no more than a dry river bed. <i>Cracks of up to 10cm wide formed after longwall mining under the creek between 1999 and 2005. (Impacts of Longwall Coal Mining in NSW. Total Environment Centre, January 2007. See appendix 4).</i>
441.	ACA	SIG	Even the mining company, Oceanic Coal, has acknowledged in the Newcastle media its contribution to the serious decline in the health of the creek.
442.	ACA	SIG	The Rivercare Plan addresses the result of longwall mining starting at Part 3.3 on page 30 "3.3 Mine Impacts Underground longwall mining commenced beneath certain sections of Diega Creek in 2000. Changes to the creek hydrology and geomorphology (geo=earth, morph=shape) took place as a result of subsequent land subsidence and tension cracking. These changes included creek bed fracture, subsequent creek flow interruption, bed-lowering and bank erosion. The most noticeable change to the creek setting, which has taken place as a result of those impacts in the loss of pools over more than half the study area. Holla and Barclay, 2000 state that cracks due to mine subsidence are associated with edges of longwall panels. The loss of flow and pools in the creek is caused by the effects of subsidence cracking on surface permeability and an increase in infiltration of precipitation and runoff. The impacts of the mining on Diega Creek became an increasing concern to the Department of Planning and Infrastructure. In its draft guidelines for mining operations on riverine corridors, DoPI lists the following as potential impacts of underground mining on stream systems: <ul style="list-style-type: none"> • Fracturing in stream beds and capture of stream flows • Bed cracks and fractures leading to incision, bed lowering and bank erosion • Sedimentation of stream systems as a result of induced erosion on bed and banks • Groundwater movement away from streams and alluvium"
443.	ACA	SIG	The response from Kores to this issue is that - "The risk has been avoided in the case of Wyong River by excluding longwall panels under or in immediate proximity to the river."
444.	ACA	SIG	The assertion regarding the geological setting of the overburden is not that there will be no subsidence. The assertion is a confirmation that there will be subsidence the magnitude of which is presently not known. It is cold comfort to the community to know that the geological setting "enhances the accuracy of subsidence prediction" when the magnitude is not known, but is likely to exceed 2.4 metres.
445.	ACA	SIG	In 2001, the issue of water loss and damage was highlighted at the Commission of Inquiry into the proposed Dendrobium Mine. In its submission, Sydney Catchment Authority said <i>"There is evidence of pools being drained, reduced flows and a reduction in water quality . . . a potential for cracking beneath swamps to drain a significant amount of water contained in the swamps. This could lead to drying of swamps - adversely affecting their ecological integrity but also reducing water flows down-stream. Practical means of remediation are generally not available"</i> .
446.	ACA	SIG	Recorded damage too many creek and river systems has been associated with <i>subsidence induced cracking within the stream bed. This was followed by significant dewatering of permanent pools and in some cases complete absence of flow, due to longwall coal mining. Water that re-emerged downstream was notably deoxygenated and heavily contaminated with iron deposits; no aquatic life was found in these areas. Reduction of surface river flow was accompanied by the release of gas, fish kills, iron bacteria mats and deterioration of water quality. (Everett et.al. 1998).</i>
447.	ACA	SIG	At the June 2006 Wallarah 2 Coal Project community liaison meeting, Mr Graham Cowan, a senior engineer with the Department of Primary Industries, said (which appears in the minutes of that meeting) this about subsidence predications and subsequent damage: <i>"Until it (the longwall coal mine) is mined you won't know, things will change and they will be dealt with"</i> .
448.	ACA	SIG	The coal industry portrays longwall subsidence impacts as being a short-term problem, but subsidence problems, which has caused cracking of creeks and riverbeds and the subsequent compromise of their integrity, has been well recorded as a long-term problem (see Appendix Four). Once subsidence begins, the majority of the ground movement does usually occur within the first three to nine months, however, experience has shown that sufficient ground movement to damage structures and thwart repair efforts often continues for many years. In the case of disrupted water tables and aquifers, no one can accurately forecast how long it will be, if ever, before usable water will once again be available.
449.	ACA	SIG	The surface cracking associated with longwall mining degrades streams and groundwater resources. The cracking causes a large volume of rainfall and stream flow to sink into the ground; history shows that groundwater levels drop.
450.	ACA	SIG	Given the documented experiences in recent years of the impacts of longwall coal mining on river and creek systems, such as Diega Creek, river bed cracking associated with the Dendrobium Mine, the Cataract River, the Upper Cataract River, and the Georges River, and as recently as the Mandalong mine in 2012, it beggars belief that in

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451.	ACA	SIG	<ul style="list-style-type: none"> • any responsible mining company • any competent mining engineer • any reputable hydrogeologist • any subsidence expert • any properly advised inquiry panel • any responsible Minister
452.	ACA	SIG	with any concern for the environment and properly understanding their respective functions could propose, support, recommend or approve a longwall mining proposal within, or even in proximity to, the riverine corridor of two streams that account for some 53% of the combined Central Coast Water Supply.
453.	ACA	SIG	The material available reporting the experiences of the effect on longwall coal mining in the last decade leads to the inevitable conclusion that such mining under and immediately adjacent to Wyong Creek and Jiliby Jiliby Creek will cause catastrophic creek bed fracture, creek flow interruption, bed lowering and bank erosion.
454.	ACA	SIG	In short, there will be a devastating loss of a vitally important water supply.
455.	ACA	SIG	Subsidence damage to the floodplain (Dooralong and Yarramalong Valleys) area can range from sinkholes to more than two-acre water traps. Large widespread troughs over mined out panels can severely disrupt surface drainage patterns making fields too wet to farm or carry out the various rural activities such as organic vegetable growing, orcharding, cattle grazing, turf farming and usefulness for the various horse studs and spelling facilities.
456.	ACA	SIG	Farm dams and major impoundments can have banks and shorelines disrupted and can even be drained. Cracks and deep fissures arising from subsidence would pose hazards to livestock, farm equipment, and vehicles on damaged roadways.
457.	ACA	SIG	Within the valleys catchment mining zones cracking, fracturing and faulting, arising from subsidence in these weakened geological areas, would create further “conduits” into the lower aquifers that would be subjected to “forced feeding” by volumetric water displacement and pressure gradients during seasonal flooding conditions and compounded by ponding in association. The major flood-prone low lying areas of Jiliby Jiliby Creek and Wyong River are subjected to extensive flooding from abnormal heavy recurring precipitation or from repetitive prolonged general rainfall periods when soil saturation is evident causing destructive and increased drainage flows, extensive scouring and property damage.
458.	ACA	SIG	Major subsidence throughout the catchment would compound flooding and ponding on access roads and properties. Geological faulting is exacerbated by “flood water pressure penetration” through “vertical drainage subsidence cracking” would open up further conduits to create weakness in the sub-strata and compounding the “draw angle”(limit of mining influence outside an extraction panel). Although longwall mining is designed to final collapse, fault lines and cracking areas would present a pathway for an uncontrollable “driving water force pressure” of some 1-tonne per cubic metre to penetrate and exploit these weakened areas. Depressed subsided landforms will retain, divert or impede raw water drainage and contribute to flooding hazards and increased water retention throughout both valleys. <i>The magnitude of such an occurrence will contribute adversely to the dynamic water balance within longwall mining areas.</i>
459.	ACA	SIG	At a minimum five homes would be forced into the 1 in 100-year flood zone. This situation is further exacerbated by the fact that since 1981 there has occurred the equivalent of six 1 in 100-year flood events.
460.	ACA	SIG	“A small change in effective stress of an engineering soil at depth is accompanied by a small change in volume when considering a column of soil. The application of a sustained “constant head” draw down to a groundwater regime triggers a subsidence process, which does not occur immediately. The response of the <i>porous sediment, that forms the subsidence rate</i> , will taper off gradually <i>and can take many years before stability is re-established</i> . The magnitude of the “draw down head” influences the resulting duration of subsidence and its limits conditioned by joints, reactivated joints, fractures and mining induced cracks etc.
461.	ACA	SIG	Geological factors influence the stability, or instability of the site even in the absence of mining activities. Natural changes in the level and lateral movement of the ground surface are features that arise from seasonal changes. The type of geological conditions encountered at the surface overlying LWM operations strongly influences the general character and magnitude of the resulting subsidence. The presence of faults and natural fissured rocks can appreciably influence the nature of subsidence and strain profiles. Strength and rock type Conditions can greatly influence the magnitude and limits of longwall mining”. (<i>Whittaker, B.N. & Reddish, D. J. Dept of Engineering University of Nottingham U.K. Elsevier Science Publications Amsterdam, Oxford, New York, Tokyo1989 ISBN 0-444 8724-4. Vol56</i>).
462.	ACA	SIG	“In lowering of the water table, drainage leaves “soil pore spaces” which allows particles to settle into voids vacated by water and the permeability is dependent upon soil type. <i>A subsidence process is not reversible even on restoration of the water table to its original position and a fluctuating water table can weaken soil structures to induce structural collapse of soils resulting in subsidence.</i> Further, soil shrinkage arising from reduced moisture content results in changes overall”. (<i>Holla, L. Empirical Predictions Subsidence Movement Southern Coalfields NSW Int. Congress1985a</i>).
463.	ACA	SIG	Detailed research by L Razowska of the Polish Geological Institute, Upper Silesian Branch, recorded in the <i>Journal of Hydrology No.244 6th December 2000 the Changes</i>

No.	Stakeholder Name	ID	Issue
			<i>in Groundwater Chemistry caused by flooding of iron mines (Czestochowa Region, Southern Poland). The emphasis is of course to water regimes and flooding arising from mining which can be applied to the KORES project: The hydro geological environment is always altered by mining activities due to drainage of the aquifer, which results in the formation of a cone of depression.(Rubio and Lorca 1993) and the reduction of groundwater resources. The lowering of the groundwater table changes groundwater recharge and discharge(Pigati and Lopez 1999) and causes catchment modifications (Dudgeon 1999). Flooding of the mines causes the rebound of the cone of depression but it also leads to significant pollution.</i>
464.	ACA	SIG	The object of recording this study in this submission is to identify the dominant hydro geo0logical and hydro geochemical processes <i>operating in a disturbed aquifer</i> and the attempt to predict any quality changes of ground waters. Most certainly, this KORES project <i>will cause serious subsidence and upsidence of valley floors and cracking of creek beds over the 37sq. km. mining zones.</i>
465.	ACA	SIG	Subsidence will also destroy the riparian corridors in the Yarramalong and Dooralong Valleys due to interruption to the aquifers and the termination of normal flow regimes within these two corridors and their “drainage feeder creeks”. It is also recognised that <i>an environmental flow regime</i> may not necessarily be a constant flow when such a flow, may be ecologically unsound as it fails to recognise natural variability - species in terrestrial and aquatic environments may be dependant upon seasonal variability, i.e., interrupted flow regimes but not cessation of flow in perpetuity, from a disturbed aquifer.
466.	ACA	SIG	Subsidence threatens biodiversity, ecological integrity, habitats, rivers, streams, creeks, flood plains, wetlands and species of national and international significance in the terrestrial and/or aquatic environments. <i>Subsidence will cause major destruction and permanent changes</i> to refuge areas, transit zones, food resources, habitats, ecosystems, community structures and composition in two major riparian river corridors of Yarramalong and Dooralong valleys. <i>A dramatic loss of aquatic species will occur from “drying out of critical aquatic habitats as normal and/or environmental flows are displaced or diverted into subsidence areas. Soil erosion, turbidity and changed stream chemistry will arise from subsidence impacts.</i>
467.	ACA	SIG	The Hunter-Central Rivers Catchment Management Authority expressed concern on the impact of longwall coal mining on Jilliby Jilliby Creek and Little Jilliby Jilliby Creek in the Jilliby Rivercare Plan, 2005.
468.	ACA	SIG	“Conditions permitting longwall coal mining may be carried out in the future and this may have implications to the functioning of Jilliby and Little Jilliby Creeks . . . The impacts of the mining on Jilliby Creek are consistent with those which have become an increasing concern to the Hunter-Central Rivers Catchment Management Authority (HCRCMA). In its draft guidelines for mining operations on riverine corridors, HCRCMA lists the following as potential impacts of underground mining on stream systems: <ul style="list-style-type: none"> • Fracturing in stream beds and capture of stream flows • Bed cracks and fractures leading to incision, bed lowering and bank erosion • Sedimentation of stream systems as a result of induced erosion on bed and banks • Groundwater movement away from streams and alluvium
469.	ACA	SIG	The Minister for Mineral Resources (1988) instructed curtailment and authorised only partial extraction of coal resources in the Hue Hue Mine Subsidence Zone due to perceived subsidence problems arising. There was a clear understanding of serious deficiencies in general knowledge of hydrological and hydro geological characteristics of these two valleys. The quantifiable level and time frame for recharge, from precipitation into these valley aquifers, in unknown but is considered to be over an extensive period. Current water balance and maintenance of this need still remains to be defined although it is recognised that seasonal precipitation over the Watagan Mountains, is the “recharge supply engine” to the catchment aquifers and coal seams together with natural flood plain surface and sub-surface drainage and permeation.
470.	ACA	SIG	The recommended two-year water study, as recommended by the previous State Government before any consideration to the approval of longwall coal mining be given, was not undertaken by the proponent to quantify the dynamics of the surface and sub surface aquifers inter relationships over this period. This required the refurbishment of more than 200 bore holes. The proponent ignored this requirement! Instead they drilled five cluster bores on property owned by the proponent for the two-year study. It would seem that none of these results were used and submitted in the EIS. A study of the EIS bore mapping does not reveal any reference to these bore hole results having been used.
471.	ACA	SIG	Media statements by KORES that “ <i>subsidence will happen but self sealing of subsidence cracking will automatically occur from “plastic sedimentary deposition” of alluvium, during sub-surface water movements,</i> is un certifiable, assumptive and inconclusive in a major fractured subsidence zone at mining depths of 320-500m. <i>This supposition is flawed, without foundation and can be dangerously misleading in a sensitive high risk and critical public water supply resource zone.</i> Temporary sealing is “prone to collapse and wash out” from trapped water pressures compounded by leaking aquifers in “cracking fracture zones” within subsidence areas. Subsidence will also significantly and adversely impact on the natural dynamic water balance in local and regional groundwater regimes. Longwall coalmining can be likened to an “engineered discharge” causing subsidence and connectivity between these water regimes as “panel voids” are repetitively established after coal recovery throughout the coal fields. Very high conductivity and subsequent losses in water flow is a major feature arising from a dynamic subsidence wave. (ACARP)

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472.	ACA	SIG	Subsidence cracks, joint sets and discrete fractures allow surface waters to mix with subsurface waters of altered chemical properties. <i>Loss of terrestrial and aquatic species will occur as a result of iron toxicity pollution i.e. . . . “bacteria commonly occur in Hawkesbury Sandstone where seepage through the rock is rich in iron compounds and able to grow in water lacking dissolved oxygen” (Jones & Clark 1991). Subsidence induced cracking within a stream bed was followed by water that emerged downstream “was notably deoxygenated and heavily contaminated with iron deposits; no aquatic life was found and the reduction of surface river flow was accompanied by release of gas, fish kills, iron bacteria mats and deterioration of water quality”. . . (Everett, et. al. 1998).</i>
473.	ACA	SIG	Longwall mining (LWM) subsidence can dramatically change the diversity and abundance of aquatic organisms, which occur in rivers/streams. The recovery of in-stream biota communities in <i>our rivers, creeks and streams, which form part of the ecosystem and supporting food chain, must be considered as highly improbable. There will also be a further dramatic loss of aquatic organisms if the salinity and the electrical conductivity of these waters are changed as many organisms are stenohaline - tolerant of only small variations in salinity.</i>
474.	ACA	SIG	A heavily polluted “coal seam methane saturated saline, and highly mineralised (with anolytes) aquifer, represents a dangerous threat from “subsidence cracking.” “Cracking” will permit alluvial aquifer flow to intercept polluted coal seam waters prior to their discharge into the Wyong River. Natural drainage flow is not trapped by alluvium translocation during surface/sub-surface drainage flow. The ecological health of water resources is predicated upon land use management, protecting stream health and the environmental flows requiring management and maintenance of high conservation and environmental values. <i>Subsidence will compromise/destroy the ecological health of potable water resources drawn from this catchment and seriously impact upon the environmental integrity within the catchment.</i>
475.	ACA	SIG	The Tuggerah Lakes Barrier Estuary is a major food resource habitat for nineteen International and National avifauna migratory waders protected under NSW State and Commonwealth Regulatory Acts and the China/Australia and Japan/Australia International Bird Treaties (CAMBA and JAMBA) under the Bonn Convention. <i>The pollution of Wyong River will occur (from subsidence and cracking) at the interception of heavily polluted coal seam water, which will poison aquatic organisms during discharge into the estuarine sediments and aquatic habitats of Tuggerah Lakes.</i>
476.	ACA	SIG	An independent enquiry into the NSW Coastal Lakes - Healthy Rivers Commission April 2002 - reports Tuggerah Lakes as at extreme risk, modified, of high conservation value with a potential for rehabilitation of modified ecosystem processes. <i>Longwall coal mining would negate, and compound progressively proposed rehabilitation processes as longwall coal panels penetrate westerly beneath valley flood plains, rivers and creeks. Ecological processes, which maintain the biological diversity, are dependent upon periodic inundation of the flood plains and wetlands and continuity of movement of aquatic organisms between fresh water inflow and estuarine habitats. These requirements are compromised by longwall coalmining.</i>
477.	ACA	SIG	Estuarine benthic habitats depend upon ecologically sustainable foreshore management and Catchment management - <i>two critical pivotal roles to maintain this interdependency between the catchment, the barrier estuary and Tuggerah Bay (identified as an ecological sensitive habitat within the estuary). Polluted coal seam waters will destroy this sensitive environment.</i> It is clearly evident that the ecological integrity of stream corridors and their flow regimes must be protected and actively managed if these water resources are to maintain their qualitative ecological integrity. It is clearly evident that <i>Ecological Sustainable Development and the Precautionary Principles will be compromised by longwall coalmining.</i>
478.	ACA	SIG	Protection of raw water in the catchment, and flow regimes within the two Riparian Corridors (providing transit lanes, habitat, food and refuge areas) is paramount in any catchment management plan. The need for <i>ecological sustainable development (ESD)</i> and applications of <i>the precautionary principle (PP)</i> are compromised by <i>longwall mining (LWM)</i> . When researched by Department of Primary Industry NSW and the State Scientific Committee in 1994/95 it was determined that LWM is a <i>Key Threatening Process</i> under the <i>Threatened Species Conservation Act 1995</i> in view of the excessive environmental damage it creates.
479.	ACA	SIG	Maintaining the ecological integrity of riparian corridors is critical as these waterways also assist in controlling drainage flow from excessive flood levels after heavy seasonal precipitation. A healthy corridor of native vegetation including grasses, rushes, trees shrubs and vines, assists in maintaining river bank stability against high stream flows and also reduces turbidity within the flow. Native vegetation provides an important food source (for macro vertebrates and terrestrial animals) and acts as a buffer and filter assisting to prevent contaminant movements. <i>LWM subsidence will destroy critical sensitive environmental areas.</i>
480.	ACA	SIG	Connectivity between pools provides refuge for aquatic fauna and aquatic flora - the latter are a stabilisation factor of sediment and oxygenated waters to form the basis of aquatic food chain and channel stability - the Geomorphic factors - which may be reduced from recurring subsidence. Changing water balance influences' soil shrinkage behaviour, its permeability and lowers a water table creating instability. <i>Subsidence will destroy these attributes and environmental flows, which are essential for maintenance and protection of wildlife, ecosystems and habitats within these two essential wildlife corridors.</i>
481.	ACA	SIG	The polluted coal seam waters Mine Operations Storage Dam will be responsible for the retention of some 30ML/per month rising to some 900ML/per month. <i>These extraordinary high levels of heavily polluted coal seam waters present “a life of mine immediate danger” from leakage within their storage area and consequent interception of natural drainage flow into Wallarah Creek wetlands to discharge into Budgewoi Lake. There is no evidence of “failsafe secure containment” and/or “protective impervious sealing procedures” to prevent leakage of these stored polluted coal waters.</i>

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482.	ACA	SIG	A storm event, such as that which occurred on the June 2007 long weekend, could present problems in the containment of this contaminated mine water and preventing it from entering the Porter's Creek wetlands. Storm and flooding events of similar magnitude, 1/100 year events, have occurred in recent times in 1974, 1981, 1989, 1991 and 1996. The Insurance Australia Group web site now predicts those previous 1/100 storm events (such as was experienced in June 2007) can now be expected every 17 years. However, from the climatic changes now occurring due to global warming and the evident previously recorded dates, this type of event is likely to be far more frequent.
483.	ACA	SIG	The granting a license to operate longwall coal mining in these two valleys <i>would be in direct conflict with the NSW Government decision in April 2003 to introduce "A new Approach to Natural Resource Management"</i> . This decision resulted in the appointment, by The Hon. Premier B. Carr M.P. of a Native Vegetation Reform Implementation Group (NVRIG) Chaired by the Right Honourable Ian Sinclair AC together with NSW Farmers' Association, peak environmental interests, the Wentworth Group and representatives of key Government agencies. The object was to "... ensure a solid foundation for better protection of our native vegetation and natural resources" with an allocation of \$406.3 million dollars to fund locally driven organisations and land managers. Most certainly, the authoritative responsibility of this new body must be clearly directed to maintaining the <i>Charter</i> , clearly laid down in a number of determinations in the document - <i>A New Approach to Natural Resource Management</i> - and particularly regarding: <i>"providing protection for significant areas of native vegetation, including areas that are classified as endangered or vulnerable under current arrangements"</i> and <i>"providing exemptions which will be restricted to clearly defined routine agricultural activities"</i>
484.	ACA	SIG	Attention is drawn to Page 1. Section 1 of The Proclaimed Wyong Water Catchment Statutes 401(2)(b) and 2(h) and the following Threatened Species Protection legislation for species protected under the Commonwealth EPBC Act 1999 and the NSW State Act 1995 (Refer Section 17 below).
485.	ACA	SIG	This submission has indicated the adverse nature of longwall mining technology and the serious environmental degradation arising which must surely raise the question of due diligence being exercised by the Expert Panel, in advice to the NSW Government. The granting of a license to operate a coal mining operation in this proclaimed water catchment, in the full knowledge of the serious adverse outcomes which can arise, is in direct contradiction to the aims, expectations and need for maintaining intergenerational equity. It would also contradict clearly defined environmental standards both scientific and social in the protection of wildlife species of International and National Significance on the Australian continent. The Natural Resources Commission and Advisory Council is the consulting authority.
486.	ACA	SIG	Australia's international bird treaty obligations (Bonn Convention) to JAMBA, CAMBA and ROKCAMBA protecting 19 avifauna migratory waders of National and International and Significance whose fragile habitat is entirely dependent upon the health of the water catchment river systems.
487.	ACA	SIG	Ref: Data Exchange SIAS Group NPWS 16/07/07 advise: 23 species of fauna and 4 species of flora re registered under the TS Con. Act 1995. 9 species of fauna are also protected under the EPBC Act 1999 and are additional to the 19 species of migratory waders of International significance.
488.	ACA	SIG	It should be noted that westerly and southerly sections, of the 37sq.km of longwall coal mining, pass under Jilliby State Conservation Area and Wyong State Forest. These exceptional communities of Vulnerable and/or Endangered wildlife will be threatened by LWM subsidence causing serious environmental degradation throughout the coal zones in the Yarramalong and Dooralong Valleys within the Proclaimed Wyong Water Catchment District. It would be considered an act of criminal negligence to permit coal mining, and then compound the situation by allowing venting of coal seam methane into environmentally species sensitive areas, of exceptional significance, for the Eastern Pygmy Possum, Greater Glider, Koala, Squirrel Glider and Yellow Bellied Glider (also refer 16.1).
489.	ACA	SIG	Kores had failed in their duty to obtain the "Social Licence to Operate" and win the hearts and minds of the affected populous. The subsidence parameters have never been discussed in open forum. Kores deliberately remain silent on this and many others issues.
490.	ACA	SIG	Various issues, unfavourable to the social amenity of Wyong and to residents who would be directly impacted by the Wallarah 2 mine, has now been uncovered from the recesses of the E.I.S, heavily camouflaged, and have conveyed a very distressing message to those who live over the footprint of the mine.
491.	ACA	SIG	The water study is consistent with that found within their first submission. Other essential material was also found.
492.	ACA	SIG	Kores demonstrate in their actions a belief that they are owed a mine by the State Government, and further believe that the water issue will go away if it is not discussed in open forum.
493.	ACA	SIG	They continually espouse their belief that aquicludes exist in the upper surface alluvials, which will prohibit vertical downward water migration. This myth has again been debunked by Professor Philip Pells, who clearly demonstrates that the water table will drop around 100 meters. Several other experienced geoscientists and water consultants have as well rallied against the aquiclude theory, including ERM Mitchell McCotter (consultants for the original proponents BHP Billiton) and have determined independently that longwall mining will destroy the surface aquifers.
494.	ACA	SIG	ERM Mitchell McCotter said that "silt and clay lenses are not anticipated to impede the transmission of bulk water" down to the coal seam.
495.	ACA	SIG	Clearly identified within the voluminous Wallarah 2 EIS was the following:
496.	ACA	SIG	<ul style="list-style-type: none"> 245 houses will be subjected to vertical subsidence of up to 2.3 metres. The breakdown being

No.	Stakeholder Name	ID	Issue
			<ul style="list-style-type: none"> 13 houses will subside more than 2 metres 105 houses will subside from between 1metre and 2metres 65 houses will subside from 200mm up to 1 metre. The balance of the houses to a lesser amount. 755 rural structures are listed in the EIS as being affected by subsidence. 420 farm dams will be affected by subsidence.
497.	ACA	SIG	Against this Kores have continued to publish statements proclaiming that this mine will not impact on the community. Water, dust, subsidence are manageable and pose no problems. An outright lie deluding no-one.
498.	ACA	SIG	Not once in the 8 years that the ACA have been involved in opposing the Wallarah 2 proposal has Kores produced logical, accurate and believable facts. Not once has Kores involved itself with the local valley populations as suggested within the E.I.S. Kores is apprehensive in meeting the local people.
499.	ACA	SIG	<ul style="list-style-type: none"> We believe Kores has not been candid in producing vital information to the general public.
500.	ACA	SIG	<ul style="list-style-type: none"> Kores should not be granted a mining licence.
501.	ACA	SIG	<ul style="list-style-type: none"> That the process of evaluation should involve the "Precautionary Principle".
502.	ACA	SIG	<ul style="list-style-type: none"> That failure to implement this procedure will have devastating consequences on the environment, the shallow surface aquifers providing water for over 300,000 people and the decimation of 1 if not 2 pristine valleys and their eco systems.
503.	ACA	SIG	<ul style="list-style-type: none"> That adaptive conditions should have no consideration in the decision making process as it did in the last submission where 42 latent conditions were tabled.
504.	ACA	SIG	<ul style="list-style-type: none"> That a public arena be provided in order to debate the real issues involved with this mine together with the Planning Assessment Commission.
505.	ACA	SIG	<ul style="list-style-type: none"> That longwall mining has no place in a burgeoning area such as the North Wyong Region with its exploding population, under a proclaimed water catchment area and its surface facilities impacting on the fastest growth area in the State.
506.	ACA	SIG	Against a backdrop of the increasing influx of young families and an aged population, there are other factors arising from the proposed coal development with the potential to affect the social capital of the newly created area. With reference to the NSW Health - Mine Dust and You - fact sheet, Issued January 2006 the potential for amenity impacts will become apparent.
507.	ACA	SIG	Dust settling on fresh laundry and car's duco will be some aspect of the proposed development that a resident will have to deal within the home, but of equal importance in a distance of 2.4 - 3.2 kilometres of the proposed stockpile facility are the schools of Blue Haven Public, Lake Haven, Woongarra and Warnervale. At times of high dust levels, the department's advice is to keep Windows and doors closed - outdoor activities should be limited.
508.	ACA	SIG	What advice does the Department of Planning and Infrastructure suggest should be given to the new schools, sporting groups and open space users that already will be in existence prior to any approvals given for an above ground facility? What monitoring will/could be done and what if levels of dust are unsafe and how will the open space users or be notified and/or restricted?
509.	ACA	SIG	<p>People who may be susceptible to the health effects of airborne coal dust are:</p> <ul style="list-style-type: none"> infants, children and adolescents (there is an increase of young families moving into Wyong Shire and an increase in child-care facilities) elderly (there a large aged population in Wyong Shire) people with respiratory conditions such as asthma, bronchitis and emphysema people with heart disease people with diabetes
510.	ACA	SIG	<p>The impact on your health from breathing in coal dust can be:</p> <ul style="list-style-type: none"> cough wheeze, or worsening of asthma increased need for medications (eg puffers, antibiotics) increased breathlessness
511.	ACA	SIG	High levels of Total Suspended Particulate Matter (TSP) may also cause coughing, sneezing and sore eyes.
512.	ACA	SIG	Coal Dust Pollutants, both respirable and inspirable suspended particulate matter indicates a health hazard as coal dust entering the respiratory tract may be further divided into respirable (very fine dust) which reaches the lower bronchiales and alveolar regions of the lung. Local Meteorology –wind speed direction and stability from the Tooheys Road rail loop coal dump and infrastructure site - would most certainly transport particulates from the 250,000 tonnes product stockpile, the 4000 tonnes' p/hr. constant traffic input from the minehead into Tooheys Road coal dump, a 2000t.p/hr. overhead tripper to stack crushed coal on the 250,000 tonne product stockpile

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			and a 4500t/phr. train loading system. Coal dust particulates will, under suitable wind pressures, extend to some 10kms from Tooheys Road rail loop, which will inundate Wyong Hospital, schools, the new Warnervale Township, and the urban expansion around it, and extending into the outer urban areas and Wyong Township. Coal loading, dust and noise will be a repetitive 24hr. cycle operation continuing for 42 years. The ACA has viewed coal dust problems in the Hunter mining area and note that although dust suppression requirements are in force, it is quite inadequate to control. We consider that these polluting conditions will prevail in the Wallarah 2 project and this will compounded by uncovered coal trains permitting continual release of coal dust particulates throughout their transit areas to Newcastle docks.
513.	ACA	SIG	Coalmine dust is heterogenous mixture containing more than 50 elements and their oxides, which cause severe lung disorders and other invasive registered dangerous medical conditions.
514.	ACA	SIG	The current National Environmental Protection Measures (NEPM) for ambient Air regarding particulate matter, specifies a goal of 50 ugm-3 with a diameter of less than 10 microns (PM10). Recent studies confirm that in urban areas, PM 2.5 is overwhelmingly the most significant fraction-60%- of total suspended particulates (TSP) taking into consideration particle size, weight and wind velocity, which determines distance to a receptor. Particle fractions (PM10 and PM2.5) are capable of entering the human respiratory tract whereas coarse particulates - larger particles - although considered a nuisance is unable to enter the human respiratory tract and are not generally considered to pose a health risk. It is recorded that sensitive receptors, at less than 3km. distance from active areas of the mine, is at risk as air quality standards deteriorate with greater concentrations of heavier particulates. Transport of fine particulates leads to higher proportionate of distribution at some distance from the RTS coal mine/ workings. The new Warnervale town site and other residential areas will be subjected to serious coal dust particulates/pollution.
515.	ACA	SIG	The experience in other areas has shown that it is impossible to control the spread of airborne coal dust. In Gladstone, Queensland, it has been clearly demonstrated that control of dust is not successful. Anger is growing in Central Queensland that black coal dust is blanketing the community of Gladstone.
516.	ACA	SIG	The medical profession views the potential risk of coal dust as serious and this would add to the already high levels of respiratory problems experienced by residents on the Central Coast. Avoidable deaths from respiratory system diseases are already above State and Australian averages. Central Coast children have high rates of Asthma. (<i>Population health profile, Central Coast NSW Division of General Practice: supplement. March 2007</i>).
517.	ACA	SIG	Page 11 of the Executive Summary candidly points to the expected death ratio associated with this development caused by exposure to dust and contaminants. It states, "Analysis provided conservative estimates of the increase in annual and daily mortality due to dust emissions from the Project at the most affected receiver on the worst day. The increase in risk of daily mortality on the worst day of the life of the Project is estimated to be approximately 1 in 100,000 and as such represents a small risk."
518.	ACA	SIG	Pages 9 to 17 of the Health Assessment Risk Report, again candidly points to the expected death ratio associated with this development caused by exposure to dust and contaminants. It again states there is a chance of an increase in mortality of 1 in 100,000 of the population. This is a conservative estimate only and does not take into account the increasing population growth of the northern suburbs of Wyong Shire, nor does it take into account people with diabetes, heart disease and respiratory ailments, all of who are extremely susceptible to debilitating and terminal illness from fine airborne coal dust particulates.
519.	ACA	SIG	Further, the EIS does not seem to be based on localised data even though for decades the medical profession has voiced its concern over the higher rates of respiratory diseases particularly in the northern areas of Wyong Shire. Surely the rate of mortality and morbidity would be greater given the following data being taken into account.
520.	ACA	SIG	As far back as 1985, Lake Munmorah Public School respiratory conditions were evident in about 40% of children, including 76 children having asthma. Doctors at Lake Munmorah recorded 30% of children attending their surgery had respiratory problems, which was double the national average, and they signed a letter to suggest that, from their own research, the source of this problem was the power industry (including coal stockpiling and handling) complexes existing in near proximity.
521.	ACA	SIG	Since that time the broad community has called on successive governments to begin a cumulative air quality study of the area but each time this has failed to emerge. This was clearly pointed out at the 2010 PAC Hearing into this same Wallarah 2 proposal.
522.	ACA	SIG	According to Wyong Council State of the Environment Report 2008/9 Total Suspended Particles (TSP) in the shire DOUBLED between 1994 and 2008.
523.	ACA	SIG	Dr. Peter Lewis, Director of Public Health for the Central Coast and Northern Sydney in his submission to the previous PAC in 2010 (which was incidentally hidden out of public view by the Department of Planning at the time) states: "A major concern is the level of increased particulate pollution experienced well beyond the boundaries of the land owned by the proponents at both Buttonderry and Tooheys Road sites. This concern exists because any increased exposure to particulate pollution is associated with increased adverse health outcomes, EVEN IF the levels are BELOW the current guidelines." "The predicted 10ug/cm increase in PM10 will produce increased respiratory and morbidity among residents. "Assessment focuses on deaths and hospitalisations, ignoring the more commonly seen increase in respiratory symptoms associated with increasing particulate pollution, e.g., children having chest colds, night-time cough and trips to the doctor. There is little acknowledgement of population growth in the areas with increased particulate pollution for the Health Risk Assessment".

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			"Projects of the scale of Wallarah 2 Coal Project must be considered in the context of the whole region, not as a standalone project". Doctor Lewis is highly qualified to comment as he did. He won the Medical Journal of Australia Wyeth Award for his research on the effects of particulate pollution on children in Newcastle and Wollongong.
524.	ACA	SIG	One would have thought that on the basis of history of health issues in the northern area of Wyong that the previous PAC would have rejected the project. It must be remembered that the previous Government in March 2011 eventually rejected this mine proposal on the basis of unacceptable impacts to the region.
525.	ACA	SIG	It continues to astound residents of this region that companies such as Kores and Governments themselves are prepared to push on regardless knowing full well that major impacts will almost certainly result in growth of respiratory diseases and other more serious diseases perhaps various cancers in the local population as time proceeds.
526.	ACA	SIG	Disappointingly, the current NSW Government, without any on ground consultation with those of us involved in expressing public health concerns over decades, decided to place an air monitor system to evaluate Wyong air quality on the Wyong Racecourse complex. This location is remote from emitting industries in the north, and is an isolated and benign atmosphere with only the nearby railway to impact upon it. Lower range pollutant readings are highly likely to result.
527.	ACA	SIG	The Tooheys Road complex is only 2klms from nearby Blue Haven which contains schools and several pre-schools and only 3klms to the new expanding Wyee township, where only recently a 1000 housing lot development has been planned right next to the railway upon which the coal trains will travel.
528.	ACA	SIG	The EIS states that Annual Coal Dust emissions from the Tooheys Road stockpiles, works and conveyor systems will total about 68,000 kilograms of TSP's and at Buttonderry another 23,337 kilograms of TSP's will emanate from the ventilation shaft.
529.	ACA	SIG	In both circumstances that is a huge impost into the air in which the associated population must endure. The EIS (in Appendix M page 6) states that:
530.	ACA	SIG	"Over the last few decades, there has been a substantial amount of research that added to the evidence that breathing PM is harmful to human health".
531.	ACA	SIG	The EIS lacks a proper map of probable deposition of dust particles encompassing the broad area including addressing the deposition of coal dust along the rail corridor. It is known that the coal trains will not be covered and so coal dust will be of a concern both in the loaded trip and the return trip. Recent revelations along the Hunter rail corridor emphasise that this problem is downplayed.
532.	ACA	SIG	The PAE Holmes report (Appendix L, page 55) suggests that the trip from Tooheys Road to the Port of Newcastle is "relatively short" (Relative to what, at trip through deserted regions of WA?). Any casual observer would laugh that this be considered a truthful statement and suggest that the author should take this trip through the southern suburbs of Lake Macquarie and Newcastle.
533.	ACA	SIG	The accumulated Greenhouse Gas Emissions from this project over an extent of 38 years are totalled as 360,866,275 tons of CO2 expressed as (t CO2-e). (Appendix L, page 59). It would seem that for the sake of future generations and for the general health of the planet, that this mine should never be considered. The costs are too great. The cost to our health and our environment is never expressed in valued cost to us now or for the future.
534.	ACA	SIG	Population projections in the northern suburbs of Wyong Shire (the area that would be most affected by airborne coal dust) show a staggering 100% increase in growth in the 10-year period to 2106. With diabetes for the Central Coast matching the NSW prevalence, the projected growth will place greater demands on the health system and that need must be supplemented. A NSW Health publication (issued January 2006) indicates that people such as those with diabetes may be <i>"more susceptible to the health effects of fine and coarse particles"</i> . Further, the department of Health advise that those more susceptible to health effects of dust emissions in the air as a result of mining activities include infants, elderly, those with respiratory conditions such as asthma and heart disease.
535.	ACA	SIG	The northern area of Wyong Shire has a high prevalence of young families moving into the area, and an extremely high aged population - the two groups most susceptible to disease and respiratory ailments from coal dust.
536.	ACA	SIG	Twenty years ago it was firmly established that the incidence of asthma and other respiratory ailments was high in the northern part of Wyong Shire due to the placing of the power stations and their coal facilities. A coal handling facility adjacent to the largest urban growth area in NSW would only exacerbate this problem.
537.	ACA	SIG	Another consideration in terms of noise must be on the employment activities of current and future residents. Residential suburbs such as Blue Haven have a high number of commuter residents. People choose to live there because of its proximity to the F3 Freeway. The people characteristically leave home early in the morning and return in the early evening. Many may also be involved in night work. Sleep patterns for these residents are very important and reduced sleep resulting in noise related activities may result in heightened levels of stress and associated productivity losses. The most consistent impact of insomnia is a high risk of depression. <i>(1. Insomnia: Epidemiology, Characteristics, and Consequences. Clinical Cornerstone Vol. 5, No. 3. 2003 Excerpta Medica, Inc.</i> <i>(2. Maria Thomas, Helen Sing, Gregory Belenky, Henry Holcomb, Helen Mayberg, Robert Dannals, Henry Wagner Jr., David Thorne, Kathryn Popp, Laura Rowland, Amy Welsh, Sharon Balwinski, Daniel Redmond (2000) – Neutral basis of alertness and cognitive performance impairments during sleepiness. 1. Effects of 24 h of sleep deprivation on waking human regional brain activity. Journal of Sleep Research 9 (4), 335-352.)</i>
538.	ACA	SIG	The topic of green house gas production is one that cannot be dismissed. Whilst the proposed final destination of the coal to be extracted is overseas, the proposed

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			development will generate as a final end, produced green house gas. The two forms of green house gas concerns lodged by the Alliance are the burning of the coal and the coal seam methane released as the coal is extracted. Australia has the highest per capita green house gas emission's figure in the world (Australian Institute Figures) and coal accounts for approximately 35% of Australia's greenhouse emissions (2003 Australian Greenhouse Office figures) with coal being the fastest growing source of greenhouse gas emissions in Australia.
539.	ACA	SIG	For the next 42 years of the proposed development, coal will be burnt, green house gas, both in the extraction and the burning of the product, will occur and the generations of successive Australians will suffer as result of this.
540.	ACA	SIG	The ruling, by Justice Nicola Pain, has ramifications when considering major projects such as the KORES proposal. The ruling requires that the Government will now have to take account of the greenhouse gas emissions from burning the mine's output. There seems to be no calculations made in regards to the Wallarah 2 proposal at this stage. The Panel might like to explore this area, as the final project would impact heavily on Climate Change issues, to determine the total amount of CO2 that will be produced and how the proponent seeks to modify or ameliorate the greenhouse gases as a result of this development.
541.	ACA	SIG	Similarly, Central Coast residents have raised very strong concerns by the use of desalination plants for water purifying. These water-purifying plants are themselves large users of power as well as noise production. The Alliance seeks more information on the total power consumption of the mine's operation.
542.	ACA	SIG	Intergenerational equality questions arise from the alienation of the State Forests for mine ventilation stacks for the proposed 42 years of the lease. How will these ventilation stacks be monitored and what impacts will they have on flora and fauna in the State forests? What height are these units and what noise do they produce from operation?
543.	ACA	SIG	Other intergenerational equality concerns are the proposed rezoning and alienation of 6(a) open space lands. Can the proponent outline the cost to the community of the alienation of these lands for 42 years?
544.	ACA	SIG	Further amenity issues arising from the preliminary report by the proponent are the use of lighting. Lighting in what areas and for what times? And how is the lighting to be diffused so as not to disrupt local amenity?
545.	ACA	SIG	Further concerns of intergenerational equality are the subsidence issues as a direct result of the proposed development. Whilst water is one area of potential damage by subsidence, the Alliance raises issues of road construction and maintenance, building construction and restrictions (reference is made to the Valleys Studies of Wyong Shire Council) and any damage done to local open space and recreational areas such as the State Forests and sporting fields.
546.	ACA	SIG	<ul style="list-style-type: none"> ▪ The mine is unacceptable from changes to climate. These impacts include: ▪ Increased global average temperatures – unacceptable ▪ Increased acidity of the ocean – unacceptable ▪ Direct economic cost – unacceptable ▪ Increased human suffering – unacceptable ▪ Decreased rainfall – unacceptable ▪ More intense drought – unacceptable ▪ Increased storm intensity – unacceptable ▪ Increased flooding / storm surge – unacceptable ▪ Loss of biodiversity – unacceptable ▪ Decreased water supply – unacceptable ▪ Decreased food supply – unacceptable ▪ Loss of coastal land / property – unacceptable ▪ Decreased human health – unacceptable ▪ Increased human disease – unacceptable ▪ Decreased fish and other ocean resources – unacceptable ▪ Political unrest – unacceptable ▪ Destabilization of human society – unacceptable
547.	ACA	SIG	The EIS and the Statement of Commitments does not adequately address the impact of the mine on global warming or on ocean acidification.
548.	ACA	SIG	It is noted that the conditions imposed on mines are not enforced and mines break their conditions as a matter of course. This makes the proposed mine even more unacceptable.
549.	ACA	SIG	The EIS has not provided sufficient justification for approval.

No.	Stakeholder Name	ID	Issue
550.	ACA	SIG	We consider there is plenty of evidence to support the following contentions that form the basis of our submission:
551.	ACA	SIG	a) Green house gases have been significantly increased in the atmosphere by human activities. In this case the green house gas under consideration is CO2 which has increased approximately 40% as a result of human burning of fossil fuels, mostly in the last 30 years.
552.	ACA	SIG	b) The scientific evidence is incontrovertible that increased CO2 in our atmosphere is causing increased global average temperatures, which will continue to rise into the future.
553.	ACA	SIG	c) There is sufficient scientific evidence that the increase currently threatens to be more than 2 degrees (average global temperature rise) and that under current policies 3 to 6 degrees is likely.
554.	ACA	SIG	d) The results of such a rise represent a catastrophe for the human race and must be avoided.
555.	ACA	SIG	A short list of the impacts under a warming global temperature, include all the objections listed above. It would appear to be madness to continue to increase our burning of fossil fuels under these conditions but that is exactly what is proposed under the Wallarah 2 Coal Mine project. In this case we are actually to expand the use of fossil fuels by opening up a new resource.
556.	ACA	SIG	Recent reports by Price Waterhouse Coopers, the International Energy Agency and the World Bank indicate that we are taking insufficient action to reduce emissions. A report issued in May 2013 (Unburnable Carbon) indicates that to have an 80% chance of remaining below the 2 degree threshold agreed by countries at the Copenhagen 2009 UN conference, total fossil carbon burned by 2050 must be less than 900 Gt. Current recognized global assets of fossil carbon amount to more than 2,500 Gt. This effectively means we must leave most of the currently 'banked' fossil fuel assets in the ground.
557.	ACA	SIG	In this submission we intend to focus on the economic costs of the mine but it should be borne in mind by the approver of this mine that the social, human and environmental impacts of our current path towards more and more combustion of fossil fuels are too huge to quantify.
558.	ACA	SIG	Just taking one example, how do we value the cost to a thousand generations into the future of the loss of land to sea level rise. A rise of more than 5 metres (likely in the longer term of hundreds of years if we continue on our current path) would result in the loss of all the major river deltas of the globe: Lower Egypt, Amazon delta, Bangladesh, Yellow River delta, and many more. Such losses would displace hundreds of millions of people from the most productive agricultural lands of this planet. We do not believe this could be evaluated purely on an economic basis.
559.	ACA	SIG	Many economists have estimated the economic impact of climate change! A reasonable range of estimates is from \$20 to \$150 per tonne. The value depends on the discount rate and the actual effort to reduce emissions that is undertaken.
560.	ACA	SIG	The Wallarah 2 mine intends to mine 150.9 million tonnes of coal which results in emit 369 million tonnes of CO2-e green house gas emissions. This value does not appear to include transport outside Australia. All but 2.5% of the 369 MtCO2-e comes from burning the coal (equivalent to 100.64 MtC).
561.	ACA	SIG	Adopting a value of \$40 /t for social cost of carbon gives a total of: \$4.03 billion.
562.	ACA	SIG	If the social cost of carbon were to be in the upper range of assessments (\$150/tC) the total cost of this mine relating to climate change would be: \$15.1 billion.
563.	ACA	SIG	To put this into perspective:- this single mine, not large when considered in the context of coal mines in Australia, could cause climate change costs equivalent to the entire military budget of a mid-sized developed country (e.g., Israel's military budget is \$15 billion).
564.	ACA	SIG	A decision to allow this mine will unleash costs of billions of dollars onto future generations. This must be taken into consideration in the economic assessment of this mine. This mine will see the likely costs per tonne of carbon to go up as will the likely trend in temperature increase into the next century and beyond. The costs associated with a rise of 4 degrees will be increased enormously over the costs of a 2-degree rise due to the disruption of society and collapse of nations.
565.	ACA	SIG	As the recent statements by the Chief Economist of the International Energy Agency, Fatih Birol (to the UN climate talks conference of parties in Bonn, June 2013) – Two-thirds of all proven reserves of oil, gas and coal will have to be left undeveloped if the world is to achieve the goal of limiting global warming at two degrees Celsius:
566.	ACA	SIG	"We cannot afford to burn all the fossil fuels we have. If we did that, it [average global surface temperature] would go higher than four degrees."
567.	ACA	SIG	"Globally, the direction we are on is not the right one. If it continues, the increase would be as high as 5.3 degrees and that would have devastating effects on all of us."
568.	ACA	SIG	It is better to leave this coal un-developed rather than expose future generations to huge costs for adapting to the impacts of climate change. It is highly likely that the State Government will to have to buy the mine back in 10 years time when we finally realize the madness of allowing it to start in the first place.
569.	ACA	SIG	Whilst the submission contains a detailed section of the use and potential damage of the groundwater supplies, similar concerns are raised on the potential damage to the local creeks such as Wallarah Creek from dust emissions and transfers. How are these emissions to be calculated? What effect will they have on the local streams and creek? How are they to be monitored for subsequent effects on the fauna in the area?
570.	ACA	SIG	Significant concerns are raised over the numbers proposed by the applicant. Startling figures show those job numbers in the coal industry are falling in the face of larger production and booming export numbers. "Between 1996 and 2001, the number of coal mining jobs in the Lower Hunter in NSW fell to 3,560, a drop of 27%. In the rest of the Hunter, the number fell 18% to 2,443.

No.	Stakeholder Name	ID	Issue
			<i>Mining of all kinds (which is mostly coal) makes up just 2% of the employment in the Lower Hunter (of 4,099 jobs) and 8% in the rest of the hunter (2,717 jobs)."</i> (www.australiancoal.com.au/industrystats.htm#employment).
571.	ACA	SIG	Remediation of the proposed ventilation sites, subsidence sites, road and open space damage, flora and fauna impacts, amenity (specifically including health costs) and property values are just some of the economic criteria that the proponent should be examining and forecasting some type of recompense to the community as a result of the proposed development if it were to proceed.
572.	ACA	SIG	The draft Central Coast Regional Plan provides for future growth in population of between 68,000 and 100,000 new residents. Underground mining and/or any surface facility would not be compatible with a large population interface and other desirable employment opportunities, but would be counter productive in attracting business and residential investment.
573.	ACA	SIG	Potential negative effects from coal dust and subsidence, in fact are not denied by proposed mining plans currently put forward for consideration. Instead the Preliminary Risk Assessment for the Wallarah 2 proposal talks about minimising and monitoring. This clearly indicates that it can't be prevented.
574.	ACA	SIG	The Wyong Employment Zone, which extends from Sparks Road through to the Link Road, (adjacent to the Kores coal handling facility site) has the potential to create 6,000 new jobs. Both the Wyong Council and the Wyong-Tuggerah Chamber of Commerce are campaigning to attract clean industry to this area, in particular the food industry to compliment the already existing Woolworths food distribution centre.
575.	ACA	SIG	The existence of a coal mine and coal loading facility close by would discourage industry into the area and would mean the sacrifice of many jobs for the sake of the few generated by the mining company.
576.	ACA	SIG	The Central Coast Regional Strategy states in regards to future employment growth: Key opportunities for the Region include –
577.	ACA	SIG	<ul style="list-style-type: none"> • Intensified economic activity and provision of quality office space to increase local business services such as accounting, financial management, IT service and legal firms • Significant retail growth, including more speciality shops, bulky goods outlets and department stores • Growth in health services, driven by population growth, lifestyle preferences, an aging population and growing sophistication and complexity of services. The number of health-related jobs is forecast to increase substantially over the life of the Strategy. • Growth in education services, with a corresponding increase in the associated employment in this sector. New schools, vocational education and higher education infrastructure will be required to support a growing population with participation in education and skills training • Development of business parks, which provide good building design and layout, emphasis on light industrial and value-adding industries and integration of industrial, warehousing and office activities. Significant opportunities also exist to expand technology-based jobs in the Region • Forecasted high rates of growth for cultural industries as well as accommodation and hospitality. The Region's tourism advantages are also likely to increase • Growth of home-based businesses.
578.	ACA	SIG	The Strategy also says: <i>The Department of Primary Industries, the Department of Energy, Utilities and Sustainability and the Department of Planning, in conjunction with the Department of Natural Resources, to review planning for the Central Coast plateaus and Wyong valleys to consider agriculture, extractive resources, water supply values and tourism uses and address any conflict between these uses.</i>
579.	ACA	SIG	The proposed mining activities and in particular the pit head near Blue Haven would be incompatible with the Strategy. It is reasonable to conclude that while it is predicted that mining will generated a limited number of jobs this type of industrial use will discourage other industries mentioned in "Key Opportunities" listed previously, including the proposed Wyong Employment Zone. Many of the proposed employed lands are within 2.5 kilometres of the Tooheys Road site and are well within zones for noise and coal dust issues.
580.	ACA	SIG	Further, the Strategy also states: <i>The Wyong Employment Zone is a major employment opportunity for the Central Coast Region. Planning for this area will include investigation of land to the immediate west of the Sparks Road - F3 Freeway interchange for future employment opportunities that take advantage of this key transport interchange.</i>
581.	ACA	SIG	The intent of the Central Coast Strategy is to create employment opportunities that meet the needs of the increased population. Using the principles of "sustainable communities", residential development needs to be close to transport hubs and employment opportunities. This type of employment use needs to also provide a healthy environment that is compatible with being close to residential development, making the area attractive to both business and potential population movement.
582.	ACA	SIG	An extractive resource industry, such as the Wallarah 2 coal proposal, would be in conflict with other possible employment/residential uses and in fact that land at Tooheys Road would be more valuable for other use that would be more compatible with interfacing residential developments at Blue Haven, Warnervale and proposals at Wyee.

No.	Stakeholder Name	ID	Issue
583.	ACA	SIG	Any potential mining and above surface related infrastructure by their mere nature has the potential to adversely effect the values of residential property. Subsidence, noise and dust can severely lower house and land values across the northern suburbs of Wyong and in those suburbs of Jiliby, Dooralong and Wyong Creek.
584.	ACA	SIG	This would occur at a particularly bad time with many residents already suffering from increased mortgage commitments and already falling house values. In many cases, a large number of people would owe more than their property is worth. This could have a serious impact on the Central Coast economy.
585.	ACA	SIG	This same problem could also impact on new housing developments, making them less attractive and not drawing necessary investment. The Central Coast does not have an existing mining culture mentality, and the general community would see so new mining projects in the Wyong LGA as a negative.
586.	ACA	SIG	The Wallarah 2 proposal would have its main surface facility in close proximity (2.4 kilometres) to the new Warnervale Township and hub. This development could be heavily impacted by a coal loading facility, pushing much needed investment elsewhere.
587.	ACA	SIG	Other considerations are: <ul style="list-style-type: none"> • Proximity of Tooheys Road site to Blue Haven and Wyee Schools • Proximity to new residential area at Warnervale and Charmhaven • Increased health impacts related to dust and noise in residential areas • Decreased tourism leading from adverse publicity and public perception • Location of Tooheys Road site to “gateway” off F3 to Northern Wyong Suburbs
588.	ACA	SIG	Closer rural settlements are envisaged in a selection over 15 sites in the Dooralong Valley and one site in the Yarramalong Valley.
589.	ACA	SIG	Adverse environmental impacts will arise from subsidence and <i>it will be impossible to maintain a healthy fresh water river system</i> , which is envisaged as and when <i>new Riparian Corridors are created</i> under this new management strategy. Subsidence will create addition flooding over the 37 sq. km of sub-surface mining zones. This will adversely impact upon groundwater levels, flood levels, wetlands, streams, and have potential impacts upon environmentally significant areas, which are vulnerable to land subsidence and changed groundwater levels. It is envisaged there will be serious pollution arising from fractures in the subsurface overburden allowing interception of heavily polluted coal waters to discharge into local streams and rivers. The potable water system will be destroyed by mining subsidence.
590.	ACA	SIG	The distribution of plant communities is strongly influenced by the geological features and soil types that are evident in the two valleys that contain five (5) soil landscapes. <i>The two valleys present an ecological overlap of two climatic zones</i> , which results in a “ <i>uniqueness of habitat</i> ” between species <i>of tropical areas from the North and the temperate areas from Southern Australia</i> . It is recorded that <i>the ecological phenomenon of plant and animal diversity is extremely high</i> . These attributes are considered to be of the highest conservation value and must be protected.
591.	ACA	SIG	The following points must be considered: <ul style="list-style-type: none"> • Will longwall coal mining activities be compatible with the aims and ideals of the water catchment? No. • Is it possible to constrain and/or manage subsidence? No, it is indeterminable. • Will this mining project satisfy the STATUTES of the Proclaimed Catchment Protective Act? No. • Can Kores quantify, qualify and satisfy <input type="checkbox"/> The Threatened Species Conservation Act 1995? No. <input type="checkbox"/> The Commonwealth Environment Protection and Biodiversity Conservation Act 1999? No. • Will coalmining pollution waters be controllable? No. • Will active, residual and horizontal subsidence perpetuate? Yes.
592.	ACA	SIG	The following business activities identified as occurring in the valleys and would be subject to adverse environmental impacts caused by subsidence (see 23). <ul style="list-style-type: none"> • Hydroponics vegetable growing • Organic Vegetable Farming and Orchards • Farm riding trails • Farm tours (lavender farm) • Stain glass manufacture • Vineyards • Macadamia farm • Turf farms • Cattle farms

No.	Stakeholder Name	ID	Issue
			<ul style="list-style-type: none"> • Horse studs • Horse spelling farms • Orange orchards • Apiaries
593.	ACA	SIG	Yarramalong and Dooralong Valleys are the rural hinterland of the Wyong LGA. Wyong Council and those who live and work in the valleys are committed to maintaining the rural character of the area.
594.	ACA	SIG	Within the valleys there are thoroughbred horse breeding, spelling and training establishments, turf farms, cattle breeding properties, a lavender farm, alpaca farms, riding schools, hydroponic farming and orchards. There are also tourist destinations such as Dooralong Valley Resort, Yarramalong Macadamia Farm and Cedar Park Lavender Farm. These destinations are attracting visitors not only from the Central Coast and Sydney, but increasingly inbound tourists from eastern Asian countries such as mainland China and South Korea.
595.	ACA	SIG	To a greater or lesser extent all of these activities are dependent, and rely, on an assured water supply from Wyong Creek, Jilliby Creek or the aquifers within the valleys.
596.	ACA	SIG	Reducing the streams in the valleys to the condition of Diega Creek, as shown in the Rivercare Plan would decimate these activities. Even assuming it were available, the purchase of water from the town water supply system would not be an economically viable option for most of these activities.
597.	ACA	SIG	Without the investment required to support ongoing agricultural and rural activities, in the absence of water, properties would fall into disrepair and become unkempt and overgrown. Noxious weeds would proliferate, as property owners would have no incentive to eradicate them. The attractive and scenic quality of the valleys would be lost and the area would cease to be a desirable attraction for tourists. The proprietors of the various business activities in the valleys and their staff will lose their livelihoods and the contribution made by these businesses to the economy of the Central Coast would be lost. In short, the two valleys would be devastated.
598.	ACA	SIG	There is concern as to whether the extra coal trains using the already busy Main Northern Rail line between Sydney and Newcastle would adversely affect current freight and passenger services. The Panel should examine in detail capacity issues and whether the current line could cope with additional coal trains, as well as increasing freight and passenger needs over the life of the project.
599.	ACA	SIG	Concern is also expressed that this coal is destined for foreign export. We have more than 50 ships sitting off our coast on a regular basis, waiting to be loaded. Even with the newly touted third coal loader in Newcastle, the port is already at capacity. Bringing on line a new coal mine on the Central Coast would further choke this system.
600.	ACA	SIG	The following analysis of Coal Seam Water was obtained from samples of water drawn from the two Sydney Gas test wells in the Dooralong Valley, and analysed by the University of New South Wales water testing laboratories.
601.	ACA	SIG	The two test wells, Jilliby 1 and Jilliby 2, were way outside limits on several parameters - Iodide, Total Dissolved Solids (TDS), Barium, Aluminium, Chloride and pH. A comparison of the results of the two Jilliby wells was made with the Australian Drinking Water Guidelines and water extracted from coal seam methane wells in the Powder River Basin, Wyoming, USA.
602.	NCC	SIG	NCC objects to the proposed Walarah 2 Project due to its significant environmental impacts. Our attached submission outlines our specific concerns in relation to: Climate change Impacts, Water resource impacts, Water quality impacts, Cumulative impacts, Social impacts, Threatened species, Economics
603.	NCC	SIG	NCC wishes to draw attention to the uncertainty and intent of the major partner of the Wyong Areas Coal Joint Venture (WACVJ). The project letter (dated 16th June 2016) to the NSW Department of Planning and Environment (DPE) in the front of the EIS notes that the major partner of WACVJ is KORES Australia, listed as owning 82.5% of the project. KORES (Korea Resources Corp) is owned by the South Korean government. In June 2016, an announcement was made in the Korea Times1 that: <i>"KORES will withdraw from overseas resources development"</i>
604.	NCC	SIG	The report in the Korea Times also notes that the KORES corporation is carrying a 'staggering' debt ratio.
605.	NCC	SIG	NCC believes that, given the environmental and other project problems discussed below, KORES is an unsuitable proponent for a NSW coal project on political and economic grounds. NSW DPE should reject the proposal on these grounds and not spend any more public resources assessing such an uncertain coal project proposal from a majority foreign owned corporation with an uncertain future and a significant debt problem.
606.	NCC	SIG	It should be noted that the amendment EIS clearly links back comprehensively to the 2013 EIS. Volume 1 of the Amendment EIS notes on at least 10 occasions that particular sections should be read in conjunction with specified sections of the 2013 EIS. Most of the major areas of concern to NCC relate to the 2013 development proposal rather than the amended proposal, so NCC will restate its concerns in these areas in the light of environmental and community developments over the last 3 years.
607.	NCC	SIG	There were over 600 public submissions opposing the development in 2013, which indicates a high degree of public opposition. The then Liberal Party Opposition Leader

No.	Stakeholder Name	ID	Issue
			promised the community before the 2011 NSW election that the Wallarah 2 project would not go ahead under a Liberal State Government. The fact that this project is still being considered 5 years later following the election of the Liberal Government represents a betrayal of the people of NSW, particularly in the Wyong and Central Coast areas.
608.	NCC	SIG	The purpose of the Wallarah 2 project is to supply up to 5 million tonnes of thermal coal per annum for 28 years, under long-term contracts, to South Korea. When burned this coal will contribute significantly to climate change.
609.	NCC	SIG	Increased CO2 levels are causing warming of the atmosphere and oceans, the breakup of ice sheets, glacial retreat, sea level rise, and ocean acidification. At present Australia is seeing the impacts of climate change with more severe and frequent events such as droughts, bushfires, heat waves, floods and cyclones. The Wallarah 2 coal project will generate new greenhouse gas emissions directly conflicting with state and federal policies to reduce climate change emissions.
610.	NCC	SIG	We are concerned that the significant greenhouse gas and climate impacts of the project are downplayed, with the key focus being on Scope 1 and Scope 2 emissions.
611.	NCC	SIG	It is the scope 3 emissions from the overseas burning of the coal that are the most concerning from a climate change perspective. The total scope 3 emissions for the life of the project are listed in Table 9.12 as 256.03 million tonnes of CO2 equivalent emissions – dwarfing the figure of 5.7 million tonnes from Scope 1 and Scope 2 sources.
612.	NCC	SIG	A comparison against the Scope 3 GHG emissions of other recent Hunter Valley coal mining proposals shows that the scope 3 GHG emissions of the Wallarah 2 Project are substantially greater than other recent proposals in the wider area.
613.	NCC	SIG	The Wallarah 2 Coal Project Amendment is being considered in the shadow of the historic agreement at the UN Conference of the Parties (the Paris Agreement) on 12 December 2015. The Paris Agreement was unanimously signed by 195 countries. The agreement commits all nations, including Australia, to keeping global average temperatures to below 2 degrees Celsius.
614.	NCC	SIG	The Climate Council of Australia has stated what this target means for Australian coal mining: <i>“For Australia to play its role in preventing a 2 degree C rise in temperature requires over 90% of Australia’s coal reserves to be left in the ground, unburned”.³</i>
615.	NCC	SIG	International researchers from the University College of London, following extensive modelling, have come to a similar conclusion ⁴ . They suggest that to have at least a 50% chance of keeping global warming below 2 degrees C throughout the twenty-first century, globally a third of oil reserves, half of gas reserves and over 80% of current coal reserves should remain unused. Even if carbon capture and storage was technologically and economically available (there is no credible scientific evidence to date that it will be), the report indicates that over 90% of Australasian coal reserves would have to remain unburnt before 2050 to meet the 2 degrees C warming ceiling.
616.	NCC	SIG	The Australian government has committed to reducing greenhouse gas emissions by 26 to 28 per cent by 2030. In spite of this commitment, it appears that Australia’s annual emissions are increasing while other developed economies are cutting their carbon pollution ⁵ .
617.	NCC	SIG	Australia is the second highest exporter of coal in the world, and Australia therefore punches well above its weight in terms of population in contributing to planetary climate change. The earth’s atmosphere is not concerned with national boundaries – it responds to carbon dioxide emissions from coal burning wherever the coal is burnt.
618.	NCC	SIG	NCC maintains that it is fundamentally irresponsible for the NSW Government to continue to approve new or expanded coal mine projects at a time when thermal coal prices are at record lows (meaning low royalty returns to the State) and Australia’s GHG emission trajectory is moving in the opposite direction to that required for Australia to meet its international GHG emission reduction commitments.
619.	NCC	SIG	In light of the unequivocal evidence that the burning of coal contributes to climate change and the international agreement to keep global average temperatures to below 2 degrees Celsius, we do not consider that the approval of the Amended Wallarah 2 Coal Project is in the public interest.
620.	NCC	SIG	The Wallarah 2 longwall coal mine would undermine drinking water catchments northwest of Wyong. The project will undermine several waterways causing subsidence, which could cause serious and permanent damage to local aquifers, surface water environments and water supplies.
621.	NCC	SIG	In its 2013 submission on this project the Office of Environment and Heritage (OEH) states that the mine layout poses significant environmental risk resulting from subsidence to the Jilliby State Conservation Area and this area warrants protection. Mining these sensitive areas has the potential to permanently damage ground water aquifers, surface water systems, threatened ecological communities and habitat for threatened species.
622.	NCC	SIG	Little Jilliby Creek is a particularly significant stream with high conservation value. Subsidence from coal extraction under this creek will lead to loss of water flow and cause significant impact to the fauna of the area including threatened frog species: <i>Litoria aurea</i> (Green and Golden Bell Frog), <i>Mixophyes balbus</i> (Stuttering Frog) and <i>Mixophyes iteratus</i> (Giant Barred Frog). Furthermore, subsidence is predicted to cause this creek to fracture and drain.
623.	NCC	SIG	The mine will be directly beneath the Central Coast’s major water catchment area. It puts approximately 300,000 people within the Wyong and Gosford area and 53% of the water catchment area supplying these residents at risk.

No.	Stakeholder Name	ID	Issue
624.	NCC	SIG	The key issues facing groundwater and surface waters from this development are drawdown and aquifer depressurisation, downstream river flow losses, water quality impacts and salinity. These impacts will have an effect on catchment water resources threatening water quality and availability in the region, which poses an inherent risk to the land, biota and community of the Central Coast.
625.	NCC	SIG	In 2011 OEH raised concerns that longwall mining could damage creeks in the Sugarloaf Conservation Area and urged Xstrata, to avoid mining this area. This advice was disregarded and on 2 October 2012 extensive mine subsidence occurred resulting in landslides, damaging creeks and creating large voids. To mitigate this damage, inadequate remediation work was carried out in an attempt to grout extensive cracks in the landscape and 75 cubic meters of grout was spilt into a stream within the conservation area.
626.	NCC	SIG	There have also been significant environmental impacts at the Metropolitan Colliery in Sydney's drinking water catchment and West Wallsend Colliery in Sugarloaf Conservation Area where subsidence exceeded expectations. These experiences should not be repeated at Wallarah 2.
627.	NCC	SIG	The 2013 OEH report on the Wallarah 2 Coal Project ⁶ noted that: <i>"The water resources being put at risk from mining at Wallarah 2 form part of the Gosford-Wyong Drinking Water Supply".</i>
628.	NCC	SIG	The risk referred to relates to the proposed regular discharge of treated mine water to Wallarah Creek, part of the Gosford-Wyong water supply. Wallarah Creek was described in 2013 as being in good condition ⁷ .
629.	NCC	SIG	OEH expressed significant concerns about the proposed discharges from the Wallarah 2 Coal Project into Wallarah Creek: <i>"OEH has concerns that the actual volume of water produced (and required to be disposed of) at Wallarah 2 may be underestimated in the EIS (particularly during wet weather events). It also noted that flows that exceed the dam design capacities will overflow to Wallarah Creek. At these times highly saline and potentially contaminated water will likely flow to Wallarah Creek."</i> ⁸
630.	NCC	SIG	The risk of severe consequences from a contaminated discharge into a drinking water catchment compels the triggering of the Precautionary Principle component of ESD (EPA Act, Section 5 – Objects).
631.	NCC	SIG	The appropriate criterion for consent should be the same as that required under Reg. 10(1) of the State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011: <i>"A consent authority must not grant consent to the carrying out of development under Part 4 of the Act on land in the Sydney drinking water catchment unless it is satisfied that the carrying out of the proposed development would have a neutral or beneficial effect on water quality"</i>
632.	NCC	SIG	If this standard is required for the Sydney Drinking Water Catchment ⁹ , it should be required for the Gosford-Wyong Drinking Water Catchment. The 2013 submission from the NSW Government's own Office of Environment and Heritage (still applicable to the 2016 Wallarah 2 Coal Project Amendment) indicates that the proposed development will be unable to meet the neutral or beneficial effect on water quality target.
633.	NCC	SIG	The project will contribute to the ongoing expansion of coal mining in the greater Hunter region, which is already having a devastating effect on the climate and local communities, and causing significant environmental damage and irreplaceable biodiversity loss.
634.	NCC	SIG	The cumulative impacts of mining operations in the greater Hunter region are likely to cause serious environmental and social problems now and into the future. Whilst the mines are in operation dust, noise impacts and traffic impacts will be immediate. Other impacts such as water contamination, loss of surface water, surface disturbance and loss of biodiversity will be cause serious and potentially irreversible impacts in both the immediate and long-term.
635.	NCC	SIG	The cumulative impacts of all mining activities in the region must be considered when determining these applications.
636.	NCC	SIG	This proposed mine will be placed amid new growing suburbs, putting the health of these residents at risk. The development of the mine and extraction and transport of the coal will cause the release of particulate matter (PM 10 and PM 2.5). Short-term exposure to particulate matter pollution can lead to diminished lung function, damage and inflammation of lung tissue, increased mortality rates in children and young adults, aggravation of asthma symptoms, heightened risk of cardiac arrhythmias, heart attacks and other cardiovascular issues.
637.	NCC	SIG	This project should be refused based on the health risks associated with air pollution from mining, stockpiling and transporting coal so close to residential development.
638.	NCC	SIG	The proposed mine could have a significant adverse impact on native plants and animals in the region. Thirty-seven recorded threatened and migratory fauna species and six vulnerable or endangered flora species are within the project site, including: Lathamus discolor (Swift Parrot), Xanthomyza phrygia, Tyto tenebricosa (Sooty Owl), Xenus cinereus (Terek Sandpiper), Pandion haliaetus (Osprey), Limosa limosa (Black-tailed Godwit), Ixobrychus flavicollis (Black Bittern), Haematopus longirostris (Pied Oystercatcher) and Haematopus fuliginosus (Sooty Oystercatcher). These species are protected under state and federal legislation.
639.	NCC	SIG	Furthermore, 19 species of avian migratory waders in the area are also protected under the Federal EPBC Act with binding agreements with China (CAMBA), Japan (JAMBA) and South Korea (ROKAMBA). There are also flora species listed as threatened under the Act and local fauna species listed as endangered under the Act with

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			the proposed mining area.
640.	NCC	SIG	The key threats to these species include land clearing, change in habitat due to subsidence and alteration of water flow, wetlands and floodplains and contamination of land and water.
641.	NCC	SIG	All of these threats are possible effects of this project. The cumulative loss of threatened species habitat in NSW means that many native flora and fauna species are facing an extremely high risk of extinction in NSW into the future.
642.	NCC	SIG	The Jiliby State Conservation Area was created on 1 July 2003 and protects important areas of remnant forest ecosystems at the head of major water catchments. Historically the area was used for logging however it contains important habitat and intact natural landscapes and is a significant ecological corridor stretching along the coastal ranges.
643.	NCC	SIG	The Jiliby State Conservation Area offers the community a diverse range of ecologically sustainable recreational opportunities, whilst ensuring that environmental values are protected. This area should not be undermined.
644.	NCC	SIG	In Section 6.9 of the EIS10, it is noted that this section on economics supersedes the 2013 EIS.
645.	NCC	SIG	NCC notes with concern that the updated economics impact assessment in the 2016 EIS has been undertaken by Gillespie Economics (Gillespie). This is the same organisation that prepared the economic analyses supporting the Warkworth mine expansion which were discredited by the Chief Judge of the NSW Land and Environment Court (LEC)11 (drawing on independent economic analyses by agencies having no connections with the NSW coal industry). All the findings in this case were subsequently confirmed on appeal by the proponent and the Minister to the NSW Supreme Court.
646.	NCC	SIG	The most relevant comments from the assessment of the economic issues by Gillespie Economics in the Bulga case12 are quoted below: <i>447: Warkworth relied on the two economic assessments of the Project ... prepared by Gillespie Economics.</i>
647.	NCC	SIG	<i>450: For the reasons which follow, I am not satisfied that the economic analyses provided on behalf of Warkworth support the conclusion urged by both Warkworth and the Minister, namely that the economic benefits of the project outweigh the environmental, social and other costs.</i>
648.	NCC	SIG	<i>451: ... The deficiencies in the data and assumptions used affect the reliability of the conclusions as to the net economic benefits of approval.</i>
649.	NCC	SIG	NCC requests that, based on the findings on economic analyses of a NSW coal project by Gillespie Economics in the Bulga case, NSW DPE should require the economic content of the EIS to be confirmed by a genuinely independent economic analysis produced by an independent and credible agency.
650.	Lock the Gate Alliance	SIG	This is a submission against the Amended Development Application for the Wallarah 2 coal project. The amended application does nothing to reduce the risks posed by the Project to public health and drinking water supplies in the Wyong shire.
651.	Lock the Gate Alliance	SIG	Public health agencies have raised serious concerns about the impacts of the project on the densely populated areas of Wyong shire. Even small increases in particulate pollution have real impacts on local health and mortality, and the Project can be expected to adversely affect both of those.
652.	Lock the Gate Alliance	SIG	The project is also opposed by water agencies including the Central Coast Water Corporation. It puts at risk the safe drinking water supply of 150,000 residents of Wyong Shire, and even its proponents acknowledge that some 2.5 million litres of water every day would be absorbed by the proposed mine void, for hundreds of years into the future. That's water that would otherwise be available to the catchment. One of the main tributaries of the catchment, Jiliby Jiliby Creek, is projected to suffer subsidence of 1.5m due to the project. This is the proponent's own estimate, of course, and experience suggests therefore that the damage will be far worse.
653.	Lock the Gate Alliance	SIG	None of these serious risks from the project are remotely justified by its benefits. It is arguable whether any benefits at all would flow from the project, considering the terminal decline that the global thermal coal industry is in the throes of. Even the ultimate owners of the Project, the Korean Government, have announced plans to get out of international coal projects.
654.	Lock the Gate Alliance	SIG	The pressures faced by the thermal coal industry are largely a result of global commitment to reduce greenhouse pollution, as well as the growing cost effectiveness of renewable energy. Both of these factors will only strengthen in the future.
655.	Central Coast Greens	SIG	Our primary reason for rejecting this ADA could be referred to as loss of resident amenity for those who move into this urban growth area, particularly the Darkinjung housing development. Loss of residential amenity encompasses the following: Increased levels of road traffic, particularly during construction stages with its effect on * highly localised diesel pollution from trucks, increased road mortality, destruction of local infrastructure assets, stress due to increased ambient noise;
656.	Central Coast Greens	SIG	*noise levels, from truck and train movements, coal loading activities;
657.	Central Coast Greens	SIG	*dust levels PM10, PM2.5 and PM1.0 are known to increase mortality levels, both in workers and residents. Although there are no limits to PM2.5 and PM1.0 in Australia, this is not world's best practice and we should be implementing USEPA standards (1997). In the Hunter Valley, the national standard for PM10 pollution was exceeded 171 times in 2013 (Environmental Justice Australia 2014). Even the proponents initial DA concedes that dust from this proposal will directly increase mortality rates in the

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			Central Coast airshed by up to 11 people p.a. for each of the thirty years proposed duration of this proposal. This is a completely unacceptable outcome of this proposal. That this increased mortality level shall fall disproportionately upon children, pregnant women, elderly people, asthmatics and people with chronic disease (especially heart and lung diseases) and low socio-economic groups (op.cit.) is further evidence of the unacceptability of this proposal.
658.	Central Coast Greens	SIG	*loss of visual amenity through the ability to see mine and associated operations over the treelike due to the height of associated facilities and equipment. This would extend to visible, bright light pollution during the 24 hr/day, 7 d/wk operations of this development.
659.	Central Coast Greens	SIG	Further objections are that uncovered (including unwashed empty) coal wagons will be moving through residential areas. This will again increase the dust loadings on these communities, with the effects outlined above. It is noted that despite repeated Hunter Valley community requests, over 100 coal trains continue to move through this area without covering of their load or washing out of empty wagons (op.cit.).
660.	Central Coast Greens	SIG	Finally, the threat of this proposal to the Central Coast's potable water supply and the investment of \$125 million on recently built facilities to supply this water to a population rapidly approaching 330 000 people warrants the use by the federal environment minister to exercise his rights to utilise the water trigger of the Environmental Protection and Biodiversity Conservation Act (Cwlth) (1999) to stop this proposal.
661.	NSW Health	REG	<p>The following comments relate to 'Wallahah 2 Coal Project Air Quality and Greenhouse Gas Assessment – Addendum' (AQGGA-A), published 4 July 2016. The comments provided in this letter are contingent upon the Environment Protection Authority's (EPA) confirmation that the modelling approach is appropriate. If this was found not to be the case, our findings would need to be reconsidered.</p> <p>The PHU notes that modelling predicts that incremental dust deposition and TSP, PM₁₀ and PM_{2.5} concentrations at the closest residential receivers are below impact assessment criteria. As health impacts can occur below guideline values, and there is no safe level of exposure to particulate matter (PM), it is important to consider all reasonable and feasible measures to reduce air quality impacts.</p> <p>Assessing air quality impacts requires high quality and complete data. It is noted that the monitoring data presented to establish existing air quality used high volume air samplers to measure PM₁₀. It is stated on p17, AQGGA-A, that data from these samplers were 68% and 77-79% complete. Dust deposition data were also incomplete – 'for most years, less than a full year of data was available' (p20, AQGGA-A). Data from other sources, such as from the EPAs routine ambient quality monitoring network in the areas may help supplement these data and ensure that conclusions drawn are valid. The Wyong site has PM₁₀ and PM_{2.5} data commencing in October 2012 to present, with over 95% completeness. These data provide considerable insight into local air quality, and the relationship between PM₁₀ and PM_{2.5}.</p> <p>Particulate pollution contour plots presented in sections 7.1 and 7.2 demonstrate increased ground level concentrations affecting nearby properties. Table 7.1 (p32) that some sites are estimated to experience increases in particulate pollution levels, including P8, P9 and P11, and a greater number of sites experience smaller increases in particulate pollution.</p> <p>This proposal will increase the frequency of higher air pollution days - figure 7.7, p41, shows the estimated number of days exceeding background 24hr PM₁₀ concentrations for two sites. The graph shows that these premises are expected to see 15 to 20 additional days with a PM₁₀ above the more moderate level of 20ug/m3. For susceptible individuals, there is a risk of more frequent health events. While serious events are less common, less severe health outcomes are more likely (as outlined in Appendix M of the original EIS – 'pyramid of health impacts' and our previous submission of 26 June 2013). The risks for individuals will be influenced by any underlying health conditions.</p> <p>Clarification is sought in relation to the risk of potential air quality impacts from the proposed overland conveyor (length over 3km) and new train load out facility. There does not appear to be any impact of these new infrastructures in any of the contour maps. Confirmation is sought that these potential sources of emissions were included in the model, and if so, an explanation of why they don't appear to cause any increase in particulate pollution.</p> <p>It is noted that there are existing communities within a kilometre of the new surface facility. Bluehaven is only 300 metres east of the conveyor new transfer point (near the intersection of the railway line and motorway link road). There are over 25,000 people in the Bluehaven, Lakehaven, and Gorokan area. The proposed Warnervale Town Centre will see a further 50,000 people living about 4km to the south east of the surface facility. This new development may attract a higher proportion of susceptible people, such as children.</p> <p>In summary, particulate pollution will be elevated beyond the boundaries of the proposal, which increases the risk of adverse health effects for people exposed to increased levels of particulate pollution. If this project is approved, there should be ongoing and high quality monitoring of PM₁₀ and PM_{2.5}, and an effective response to air quality criteria exceedance and significant incremental increases in air pollution. Best-practice particulate control measures should be implemented and maintained to minimise air quality impacts on surrounding communities, particularly protecting the most affected receptors.</p>

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			The PHU requests confirmation from the NSW EPA that the Air Quality Management Plan is appropriate, and the opportunity to review the plan before final approval.
662.	NSW Health	REG	<p>Water and Sewerage Services We note the amended application includes realignment of the sewer connection to the Tooheys Rd site. We assume that all the surface facilities at both Tooheys Rd and Buttonderry Rd will be connected to Council's mains water supply and sewerage systems. The proponent is advised to ensure that all potable water supplies, including for use during construction (previously implied as likely to be sourced from water carts) meet the relevant criteria of the <i>Australian Drinking Water Guidelines</i>. The proponent must consider its obligations under the drinking water provisions of the <i>Public Health Act 2010</i> (NSW) and the <i>NSW Health Private Water Supply Guidelines</i> in the management of potable water supplies that are not sourced from mains water. Consultation with the PHU is required should any wastewater reuse options involve potable uses, including connection to employee amenities. The EIS discusses anticipated increases in flooding as a result of the project. There are public health risks associated with flooding of onsite waste management systems, for example, septic tanks on properties impacted by the project. The proponent should develop and implement effective protocols to identify and mitigate risks from flooding.</p>
663.	NSW Health	REG	<p>Drinking Water Supplies The proposal includes mining underground beneath Jilliby Creek, and it is noted the subsidence impact zone includes Wyong River in part. Our concern about impacts from the project on the Central Coast's drinking water supply remains (see 2013 submission). Should the project proceed, approval conditions should be applied to ensure that the requirements of relevant agencies are met, and the risk to the drinking water supply adequately mitigated. We understand that some residences in the area are using groundwater as a drinking water supply. It is important to consider what may be the impact on these supplies ie having a clear process for identifying whether a bore is affected by the project. Methods to mitigate these potential impacts are essential.</p>
664.	NSW Health	REG	<p>Noise assessment Research reports an association between community noise and health outcomes in adults and children, including annoyance, sleep disturbance, cardiovascular disease, performance and learning, mental health and stress (Health Effects of Environmental Noise, EnHealth). Current measures of noise exposure may not necessarily capture the nature of the exposure that leads to adverse health effects. We defer to the NSW Environment Protection Authority (EPA) for validation of the Project Specific Noise Criteria (PSNC) modelling and the methods used to determine ambient noise levels, and request confirmation that these are acceptable. We are aware that the EPA has advised that further information to enable assessment of the amended project and we support this advice. The following comments are based on the information available.</p>
665.	NSW Health	REG	<p>Ambient noise assessment and modelling As ambient noise monitoring was conducted under limited meteorological conditions, further monitoring under different conditions may be required. Advice from the EPA would be appropriate regarding whether a longer monitoring period is required to provide confidence that the ambient noise levels are truly representative under the variety of expected local weather conditions. The noise amenity classifications for all noise assessment locations require justification to the satisfaction of the EPA. For example, the urban classification of sites P13, P14 and P15 is not consistent with the land use zoning and the ambient noise levels at these locations are arguably not indicative of an urban environment. A revised assessment will be required if the classifications alter. Further detail is required in <i>The Noise and Vibration Impact Assessment Addendum</i> (p6) regarding assumptions used and mitigation strategies included in the modelling. For example <i>Noise and Vibration Impact Assessment Addendum</i> (p5) is unclear on whether cladding is provided to the rail load out bin facility, and whether the conveyors are enclosed on all sides and the roof. If the modelling includes these strategies, then a clear statement regarding the commitment or not, to provide these should be made. If not included, consideration should be given to modelling their benefit, as cladding and fully enclosing the conveyors would likely be appropriate mitigation measures. The noise modelling appears to include two locomotives at idle. Clarification is required that modelling has accounted for the possibility of four locomotives being operated if this may occur.</p>
666.	NSW Health	REG	<p>Noise impacts The Amended DA notes that some properties (P14, P15 and P16) will experience increased noise levels and a moderate degree of affectation (<i>Noise and Vibration Impact Assessment Addendum</i> pp19 and 29). It is important that mitigation measures, at source or house, be implemented to ensure noise impacts are limited. Any remedial acoustic works to properties in the noise management zone should be to the satisfaction of the affected land occupier and the EPA.</p>

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			We assume that site M16 referred to in Tables 4, 5 and 6 of the <i>Noise and Vibration Impact Assessment Addendum</i> is actually site M15. Since the PSNC for location P17 are based on ambient noise levels measured at site M15, we seek confirmation that location M15 is indicative of the ambient noise levels in southern Wyee. Alternatively, additional ambient noise monitoring should be required at a representative location, and assessment conclusions adapted as necessary. Noise levels at P17 are expected to exceed the PSNC by up to 2 dB(A). While agreeing that the modeled noise increase is small, it is not insignificant because a number of residences are potentially affected. Should the project proceed we suggest that additional mitigation measures be undertaken so that the project meets the PSNC for residences in Wyee.
667.	NSW Health	REG	Construction noise Since the predicted construction noise levels have potential to impact a number of residences, the proponent should commit to a construction schedule that creates the least possible disruption to the community. From Table 27 of the Noise and Vibration Impact Assessment Addendum the NML exceedances seem to be expected with more than 10dB(A) during standard hours, and up to 20 dB(A) and frequently around 10 dB(A) outside standard hours. Consideration should be given to regulatory controls to minimise these exposures, such as limiting work outside of standard hours, or other appropriate mitigation measures.
668.	NSW Health	REG	Rail noise Since the rail load out facility configuration and rail spur noise barrier will be defined in the detailed project design phase, we question whether sufficient certainty exists around the configuration of infrastructure generally, to permit accurate impact assessment. The 2013 EIS noted that rail noise, while not expected to result in increases above existing levels, will result in a minor increase in the 24 hour noise level along on the Main Northern Rail line. Although the increase is small, it will likely affect households and businesses along the rail line for the Central Coast and the Hunter. The cumulative impact from the increased rail movements should be considered in relation to the Central Coast and Newcastle population, from a noise (human health) and traffic perspective. The management of train horn noise is a strategy adopted in the noise modelling but no detail is provided. Considering the potential for sleep disturbance, the contribution of train horns to the project's noise levels should be demonstrated in the assessment.
669.	NSW Health	REG	Noise management strategies The amendment EIS (p52) does not appear to acknowledge and commit to all the strategies included in the noise modelling the recommended engineering controls or the EIS recommendations. Clear commitment is required to ensure that these strategies at a minimum, are incorporated into the project design and operation, should it proceed. The amendment EIS (p52) undertakes to 'where necessary, operate only two of the four locomotives whilst the train is on the rail spur'. We require clarification on how the proponent will identify this necessity. The proponent has undertaken to 'explore the potential for additional noise controls from operational management approaches'. Operational noise controls should be identified and applied so that the impact on the community is minimised. In summary, the project's noise emissions have potential to affect a number of community members and so we believe the increased noise levels are not insignificant. We believe that more effective noise mitigation measures be implemented to avoid the described noise impacts to the Wyee and Blue Haven areas. These measures should be applied at the project, rather than to private properties. We defer to the EPA, but suggest that should the project proceed, as a minimum, the measures recommended in sections 7 and 11 of the <i>Noise and Vibration Impact Assessment Addendum</i> should be adopted and supported with appropriate approval and licensing conditions imposed.
670.	NSW Health	REG	Monitoring and Enforcement The NSW EPA has previously proposed approval conditions. Should the project proceed, management of the impacts on the environment and the local community will depend on effective implementation and monitoring of the many control measures, and enforcement of the approval conditions. Specifically, we seek confirmation that should the project proceed, the Noise Management Plan, including Construction Noise and Vibration Management Plan and Monitoring Program, and Air Quality Management Plans will be satisfactory to the EPA. We support the need for continuous real time monitoring of air quality and noise impacts, and the implementation of management strategies that are consistent with best practice, clearly quantifiable, measurable, auditable and enforceable. Methods for determining compliance must be to the satisfaction of the appropriate regulator. Further, the proponent will need to ensure that appropriate air quality and noise mitigation criteria are met for the life of the project, given the expansion of residential and employment lands planned for surrounding areas.
671.	NSW Health	REG	Resident Feedback The community must have a contact point for complaints if noise or air quality issues occur and the proponent must guarantee a prompt and genuine response to all

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			complaints. The previously proposed 'complaints management protocol' should be developed and implemented in consultation with the community so that the community can be confident that any concerns will be effectively addressed.
672.	Australian Conservation Foundation (ACF)	SIG	The application portrays the economic benefits and job figures clearly for the whole project and does not confie itself clarly to this Amendment alone.
673.	ACF	SIG	The proponent KORES is withdrawing from overseas development due to massive debt ratios, as recently expressed in the Korean press tells the community that the future job prospects, development and most importantly environmental repair, compensation and rehabilitation have little hope of being realised
674.	ACF	SIG	Page 85 of the ADA states that the royalties to the State over the proposed and improbable 28 years life of the mine is \$200 Million which equates to just over \$7 million per annum. With falling coal prices and Government concessional rebates this figure is inflated. Taking into account the costs of repair and rehabilitation, particularly in the Jilliby Valley water catchment and Hue Hue subdivisions following subsidence, easily negates the benefits to the State and local authorities. By adding the long term cost to public health and to greater airborne diseases in the population it begins to look like a costly enterprise for the public purse.
675.	ACF	SIG	Pages 86 and 87 state job creation beginning with 79 through to direct and indirect job figures in year 2 of 1,111 jobs. This application states very clearly that this assessment is only looking at this Amendment and not the whole Project yet the job figures are obviously being included for the whole project such as a larger "intersectoral linkages" job quotation during construction of 1605 direct and indirect jobs. Because the original rail spur is not being built and will be replaced by a conveyor system (essentially being the main thrust of this Amendment) does not create an additional 1605 jobs for the whole Project as configured above. As in the original EIS the job prospects are not defined and again highly inflated and misleading.
676.	ACF	SIG	Dust remains a real issue for health in the Blue Haven and Wyee precincts despite partial coverage of infrastructure. There is no attempt to cover coal wagons which will travel through the southern suburbs to Newcastle affecting all those communities of southern Lake Macquarie and Newcastle as has been demonstrated in the Hunter to Port line. There has been great concern about the mapping of coal dust and the lack of authorities to control those emissions. This project exacerbates the problem adding to that congestion toward the Newcastle terminal. The added times of daily rail crossing closures at Adamstown and Islington need to be disclosed to the Newcastle community.
677.	ACF	SIG	Pm10 emissions from the site are conservative as usual and do not take into account the changing nature of intense wind and storm events in the recent years. BlueHaven and Wyee townships are now as close as 200 and 400 metres respectively from the new proposal bringing even greater problems for families in the area for both constant dust and noise 24 h/per day. There are many schools, pre-schools and establishments within 5 kms of the facility and they will suffer from emissions from the site.
678.	ACF	SIG	Please refer back to the submission by Dr.Peter Lewis, Area Director of Public Health for North Sydney and the Central Coast wherein he outlines greater risks to children and health sufferers in this region should this project be approved.
679.	ACF	SIG	Noise exceedences are admitted to for "residences to the north of Bushells Ridge Road at Wyee" and general noise 24 h/per day for those living in BlueHaven and Wyee areas are issue of concern.
680.	ACF	SIG	Massive subsidence figures represented in the proponents EIS affect 245 homes and their infrastructure, 86 of which are destined to suffer a metre or more drop right up to 2.3 metres and the valley floor suffering subsidence up to 1.8 metres fall right up to 2.6 metres near the Jilliby Conservation Area provokes "inevitable uncertainty concerning subsidence predictions" as a PAC principal finding. The regular flooding of the Jilliby Valley means that this proposal condemns the area to degradation and to long periods of separation from facilities and emergency services. The woeful performance of the Mine Subsidence Board in refusing the vast majority of claims Statewide for subsidence year in year out does not protect residents as is claimed in the application. "The project predicts risk of reduced availability of water for the Central Coast Water Supply" according to the PAC wherein they... " recommended there should be no net impact on potential catchment yield". The Central Coast water catchment supply in the Wyong valleys is at real risk of destruction due to massive subsidence and loss of potable water to the mine area below. This Amendment should be rejected and the whole project put aside due to many areas of risk.
681.	Bateau Bay – Shelley Beach Progress Association Inc (BBSBPA)	SIG	As stated previously, the original application for this proposal was rejected by the Labor State Government. At the time, the then Planning Minister Mr Tony Kelly was reported as saying "the Wallarah 2 coal mine proposal had been refused due to "unresolved concerns" regarding water, subsidence, ecological and heritage impacts." He said that the proponent "failed to demonstrate the mine could proceed without "unacceptable environmental risk". (http://news.smh.com.au/breaking-news-national/nsw-govt-rejects-wallarah-2-coal-mine-20110304-1bheq.html).

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682.	BBSBPA	SIG	Since then, scientific methodologies and modelling techniques have become more robust. Reports of the damage done by mining have become more compelling. Mining is a risk to water supply, community health, environment, amenity, and to ecological and heritage assets. It also risks causing subsidence which impacts on residential properties, infrastructure (dams, roads and the like) as well as natural water courses and ecosystem function.
683.	BBSBPA	SIG	The above changes may well obviate the need for the Proponent to acquire the consent of the custodians of the Darkinjung Lands but it does nothing to address the unacceptable risks this proposal poses. Air and water are essential to life. This project threatens to seriously degrade both; for some people the damage may prove irreversible.
684.	BBSBPA	SIG	Our Association strongly and specifically objects to your government imposing these risks upon us. We consider that the predicted negative impacts are not only reasonably foreseeable, they are almost guaranteed.
685.	BBSBPA	SIG	Furthermore, we reject the claims that the proposal is going to be of great benefit to the Central Coast. We reject any attempt to portray this Proposal as some sort of benevolent exercise when it is purely a commercially driven enterprise. Whilst there may well be some employment prospects for a limited number of Central Coast residents, the costs to health and to the environment will be suffered by far more people.
686.	BBSBPA	SIG	In addition to the local disadvantages of this proposal, Australia's international reputation will be demeaned by approval of this mining proposal. We should be at the forefront of renewable energy generation not increasing our contribution to carbon emissions. Further, energy generation should be consistent with state and federal objectives to reduce our contribution to climate change. To conclude, it is against the public interest to approve the mine. It is contrary to principles of ESD, the precautionary principle, and both intergenerational and intragenerational equity. Your Department is obliged to make decisions made that will not burden the younger generations with the consequences of short-sighted, ill-conceived proposals. We would like to be able to rely on our elected representatives to make decisions of integrity. We consider it is entirely indefensible to approve the Wallerah 2 Coal Mine proposal and that any approval would demonstrate complete and utter contempt for Central Coast residents. We object to the Proposal in all its forms and call on your Department to reject it absolutely.
687.	1st Erina Heights Cub Scouts	SIG	Global warming/climate change and renewable energy, damage to water
688.	Environmental Justice Australia (EJA)	SIG	1. The NSW EPA conducts no independent air pollution monitoring in the Central Coast region, despite the region being home to two of the state's largest coal-fired power stations. 2. The Wallerah 2 EIS 'Air Quality and Greenhouse Emissions' report refers to air pollution monitoring conducted in the region by Wyong Areas Coal Joint Venture since 1996. Coarse particle PM10 concentrations have been monitored every 6 days, except from 2003 to late 2006 (p.17). The EIS notes that the data is incomplete, with only 66-79% of data available and that there is no continuous PM10 data for the area (p.39). Even the limited company monitoring data is not available to stakeholders from the project website or upon request from the company. 3. Elsewhere in NSW, self-monitoring of air pollution by coal mining companies has been found to be entirely unreliable (e.g. SMH 24/8/16 'Wildly in Error' http://www.smh.com.au/environment/wildly-in-error-dodgy-coal-pollution-data-fans-demand-for-independent-control-20160818-gqvhat). 4. Without independent data to identify baseline pollution concentrations (ie. pre coal mine), it is not possible to reliably assess the cumulative air pollution concentrations during the mine's construction or operation. The modelling conducted for this EIS is highly speculative. 5. The project proponents estimate that PM10 emissions during construction will represent no more than 48% - less than half – the anticipated emissions during operation (Air Quality and Greenhouse Gas Assessment p.v). During construction, the project will cause 27,669kg of PM10 and during operation it will cause 57.212kg per annum (p.26-27). This estimate appears without basis and contrary to observations of coal mine operation elsewhere in NSW. Removal, transportation and mounding of over-burden are intensely polluting activities.
689.	EJA	SIG	6. Coal mining is the largest single source of coarse particle pollution (PM10) in NSW. Coal stockpiles, conveyors, loading and unloading facilities including load-out facilities are all major

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			sources of particle pollution. Diesel vehicles and engines required for the proposed mining operation are a major source of fine and ultrafine particles (PM2.5 and PM1) which can be deeply inhaled and contribute to premature death and a range of cardiovascular and respiratory ailments. Diesel emissions have been listed by the World Health Organisation as carcinogens.
690.	EJA	SIG	The proposed mining operation entails continuous flaring (burning) of coal seam methane. The flaring process will create elevated concentrations of oxides of nitrogen (NOx) in the vicinity. According to the National Pollutant Inventory, "low levels of oxides of nitrogen can irritate eyes, nose, throat and lungs, possibly leading to coughing, shortness of breath, tiredness and nausea. Exposure can also result in a build up of fluid in the lungs for 1-2 days after exposure. Breathing high levels of oxides of nitrogen can cause rapid burning, spasms and swelling of tissues in the throat and upper respiratory tract, reduced oxygenation of tissues, a build up of fluid in the lungs, and maybe even death" (http://www.npi.gov.au/resource/oxides-nitrogen-0).
691.	EJA	SIG	8. The proposed mine site is less than 4 kilometres from a densely populated suburban area. During winter months, the prevailing wind blows from the proposed mine site towards Blue Haven. 9. The EIS uses the wrong standards to interpret maximum pollution levels. Australia's nine environment ministers, including NSW Environment Minister Mark Speakman, committed to a new annual standard for PM10 (coarse particle) concentrations in December 2015. This stricter standard of 25 micrograms per cubic metre is not used in the EIS (pages 8, 9). Instead, the project proponents refer to a NSW DEC guideline of 30ug/m3. The new national standards for PM2.5 (fine particles) will become somewhat stricter in 2025, shifting to a 24 hour average of 20ug/m3 and annual average of 7ug/m3. This is not acknowledged in the EIS.
692.	EJA	SIG	10. Annual PM10 concentrations in the area have exceeded the state and national standards in recent years (p.17). Annual average PM10 concentration reached 38ug/m3 in 2002 and 31ug/m3 in 2006 – well above the new national standard of 25ug/m3. At both reference monitoring sites, 24 hour average PM10 concentrations have exceeded the national standard of 50ug/m3 (p.18). The mine is predicted to increase PM10 concentrations by as much as 29.5ug/m3 (p.32). 11. Fine particle pollution in the vicinity is already at the national standard. There has been no fine particle (PM2.5) monitoring conducted within 40km of the proposed mine site. With no data to back up their methodology, Pacific Environment make the extraordinary 'guestimate' that background (no mine) PM2.5 concentrations in the region are already 7ug/m3 (p.22). This is the long-term (2025) standard set by ministers in December 2015. There is no safe level of exposure to fine particle pollution and adverse health impacts are caused at levels well below 7ug/m3.
693.	EJA	SIG	12. The EIS recommends a range of coal dust control measures described as Best Practice Management (BPM), citing a Katestone report published by Donnelly et al 2011. The implementation of many of these measures is still not going to keep particle concentrations below the national standards. 13. Coal wagons will not be covered. The Katestone 'Best Practice' report identifies covering coal wagons as best practice, but this is not proposed. Despite noting that recent studies including the Chief Scientist's report have found that unloaded coal wagons are a more significant source of particle pollution than loaded wagons, Kores propose to simply spray and profile wagons. Citizen science conducted by community groups in Newcastle has identified significant ongoing coal dust and associated coal loss and fugitive pollution despite spraying and profiling coal wagons that use the Hunter coal corridor.
694.	EJA	SIG	Recommendations: 1. The proposed coal mine should be rejected. 2. The NSW EPA should establish a network of no fewer than three air pollution monitors within 10km of the proposed mine site. 3. Ambient PM10 and PM2.5 concentrations should be continuously monitored for no less than 12 months to establish baseline particle pollution concentrations.
695.	Hunter Environment Lobby (HEL)	SIG	As a member of the Hunter Central Rivers Alliance of like-minded community and environmental groups, HEL feels it is amply qualified to comment on this project despite it being outside the Hunter Catchment zone. The cumulative impact of additional train movements and associated increase in dust emissions through Newcastle to the Port is a concern of Hunter residents.
696.	HEL	SIG	The issues of water quality and supply as well as subsidence issues are our main concern for this application for an amendment by the proponent Kores, a multi-national Korean company. This company, according to the Korean press has had liquidity problems in its business which seem fairly substantial, which gives HEL no confidence for the future of this project as a whole, and makes us nervous when looking at long term rehabilitation issues. Kores should be considered as not fit and proper to conduct the project under the provisions of the Mining Act.

No.	Stakeholder Name	ID	Issue
697.	HEL	SIG	Rehabilitation issues occur with under ground as well as open cut mining – and once again water issues figure highly. Major disruption of aquifers deep in underground layers of the earth can often result in major incidents of subsidence that can have dangerous and costly outcomes for communities in a wide radius of the original development.
698.	HEL	SIG	As well as water and subsidence issues, HEL notes that there are other serious issues that have been highlighted by the local community. One such issue is that of the contested economic benefits and job figures which seem to be inflated and quoted as being for this Amendment alone, whereas it seems only feasible for the whole project.
699.	HEL	SIG	The other issue that many other community groups have ongoing concerns over are the seemingly inflated costs/benefits ratio as stated in the proponents application. The statement that the royalties to the NSW State coffers over the proposed and improbable 28 years life of the mine is \$200 Million which equates to just over \$7 million per annum. With falling coal prices and Government concessional rebates this figure seems inflated. Taking into account the costs of repair and rehabilitation, particularly in the Jilliby Valley water catchment and Hue Hue subdivisions following subsidence, this easily negates the benefits to the State and local authorities.
700.	HEL	SIG	With the employment figures, this application states very clearly that this assessment is only looking at the numbers for employment in the Amendment and not the whole Project yet the job figures are obviously being included for the whole project such as a larger “intersectoral linkages” job quotation during construction of 1605 direct and indirect jobs.
701.	HEL	SIG	Dust and Noise remain real issue for health in the Blue Haven and Wyee precincts despite partial coverage of infrastructure. There is no attempt to cover coal wagons which will travel through the southern suburbs to Newcastle affecting all those communities of southern Lake Macquarie and Newcastle as has been demonstrated in the Hunter to Port line. There has been great concern about the mapping of coal dust and the lack of authorities to control those emissions. This project exacerbates the problem adding to that congestion toward the Newcastle terminal. The added times of daily rail crossing closures at Adamstown and Islington need to be disclosed to the Newcastle community. We believe Pm10 emissions from the site are conservative and do not take into account the changing nature of intense wind and storm events in the recent years. BlueHaven and Wyee townships are now as close as 200 and 400 metres respectively from the new proposal bringing even greater problems for families in the area for both constant dust and noise 24 h/per day. There are many schools, pre-schools and establishments within 5 kms of the facility and they will suffer from emissions from the site. We ask that you refer back to the submission by Dr.Peter Lewis, Area Director of Public Health for North Sydney and the Central Coast wherein he outlines greater risks to children and health sufferers in this region should this project be approved.
702.	HEL	SIG	Noise exceedences are admitted to for “residences to the north of Bushells Ridge Road at Wyee” and general noise 24 h/per day for those living in BlueHaven and Wyee areas are issues of concern.
703.	HEL	SIG	Unresolved issue from the EIS 2014 Massive subsidence figures represented in the proponents EIS affect 245 homes and their infrastructure,86 of which are destined to suffer a metre or more drop right up to 2.3 metres and the valley floor suffering subsidence up to 1.8 metres fall right up to 2.6 metres near the Jilliby Conservation Area provokes “inevitable uncertainty concerning subsidence predictions” as a PAC principal finding. The regular flooding of the Jilliby Valley means that this proposal could condemn the area to degradation and to long periods of separation from facilities and emergency services with a subsidence event. Some community groups feel that the role of the Mine Subsidence Board in refusing many claims Statewide for subsidence events does not auger well for continued protection of residents. Overall the project’s predicted risk of reduced availability of water for the Central Coast Water Supply is too great, according to the PAC Executive Summary, wherein they “recommended there should be no net impact on potential catchment yield”. The Central Coast water catchment supply in the Wyong valleys is at real risk of destruction due to massive subsidence and loss of potable water to the mine area below. Hunter Environment Lobby maintains that this Amendment should be rejected as well as putting aside the original proposal due to unacceptable risk to the health of environment and local communities along the coal chain from the development.
704.	Community Environment Network Inc (CEN)	SIG	The fact that the resources arms of the South Korean Government are restructuring and concentrating on energy systems other than coal means that this coal project is not likely to extend for a great many years but the damage that will be caused in the process is not likely to be repaired or compensated for due to lack of funds in the future. It is alarming to know that the actual proponent, Wyong Coal Pty Ltd, is in fact a \$400 paid up company and therefore under law is limited to the value of its assets. Any claim in the future for reparation or compensation is not likely to be realised under law.

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705.	CEN	SIG	Royalties to be paid over the supposed 28 years of operation only equate to \$7 million a year. With falling coal prices and Government concessional rebates, we believe that this figure is inflated. Taking into account the costs of repair and rehabilitation, particularly in the Jilliby valley water catchment and Hue Hue subdivisions following subsidence, this would negate the benefits to the State and local authorities. By adding the long term costs to public health and to greater airborne diseases in the population, we believe the long terms costs far outweigh any economic benefits
706.	CEN	SIG	Coal dust is a problem for the health of people in the Blue Haven and Wyee precincts despite partial coverage of infrastructure. There is no attempt to cover coal wagons which will travel through the southern suburbs to Newcastle affecting all the communities along the line through Lake Macquarie and Newcastle which has happened on the Hunter to Port line. The community based study of coal trains (Higginbottom et.al) recently showed alarming PM10 depositions particularly from empty wagons. Blue Haven and Wyee communities are within 200 and 400 metres respectively from the new conveyor system and near the 9 storey high loader on the rail line that will operate 24 hours per day, seven days a week. These communities have a very high child population and include schools and pre-schools which will be exposed to this risk. Please refer back to the submissions (2010 and 2013) by Dr.Peter Lewis, former Area Director for Public Health, that showed great concern about morbidity and trips to the doctor for many children and those already suffering from respiratory disease. Planning should recognise that this development is disastrous for long term public health and on this basis alone should reject the proposal.
707.	CEN	SIG	Noise exceedences are admitted to for "residences to the north of Bushells Ridge Road at Wyee" but will be problematic for all those living in the nearby communities. Health impacts such as insomnia and depression are associated with constant noise and should be taken into account more seriously than the proponent demonstrates.
708.	CEN	SIG	5,280 cubic metres of semi solid brine per annum is destined to be stored underground for at least the first 14 years. OEH has shown great concern about the lack of detail and effort by the proponent to explain details of this scenario and also the long term disposal of saline water into the Wallarah Creek system and possible overflows into Budgewoi Lake. The proponent needs to fully explain how the underground aquifers will not be contaminated and how the Wallarah Creek system will not be compromised over the life of the mine. The uncertainty about rehabilitation as expressed earlier is pertinent to this aspect of the proposal.
709.	CEN	SIG	Much has been put to the earlier Planning Assessment Commissions about the loss of potable water in the catchment valleys and also the subsidence of 245 homes and infrastructure. Please refer to the many submissions and that by Professor Philip Pells whose lengthy submission to the 2010 PAC explains the many risks involved in mining below the fresh water aquifers. CEN reiterates that any threat to fresh water supplies of the Central Coast should not be considered. The precautionary principle should apply to this development and the worldwide standard of Ecologically Sustainable Development, which is a core principle of CEN, should also be applied, and on that basis this ADA and the development of Wallarah 2 should be clearly rejected.
710.	CEN	SIG	The world governing body, United Nations, and the vast majority of countries have agreed that coal is linked with the rapidly changing climate. Many major financing bodies now reject loaning to any country funds that will allow expansion of the coal industry. Indeed as we stated South Korea is redirecting its efforts in energy away from coal burning as is China and others. This development is not compatible with this change in international efforts and so again this project should be rejected outright.
711.	Correct Planning & Consultation for Mayfield	SIG	Coal mining in the Hunter should be phased out to allow for more sustainable agriculture and protect our environment by minimising greenhouse gases, transportation and burning of the coal.
712.	Mannering Park Progress Association (MPPA) and Communicatio Partners International (CPI)	SIG	Page 85 of the ADA states that the royalties to the State over the proposed and improbable 28 years life of the mine is \$200 Million which equates to just over \$7 million per annum. With falling coal prices and Government concessional rebates this figure is inflated. Is that really worth compromising the water supply and health of over 350 000 residents?
713.	MPPA and CPI	SIG	The NSW government has removed our right to go directly to the Land and Environment Couit and argue our case on Merit Appeal. Premier Baird has removed that legal right from every community fighting coal or gas in NSW. This is unacceptable to our community and many others. Confidential draft documents circulating through Planning Department suggest "second workings" of coal seams meaning further and greater subsidence over time, as if over 2m in areas isn't enough during the initial long wall mine phase.
714.	MPPA and CPI	SIG	Media reports suggest that the proponent KORES is withdrawing from overseas development due to massive debt ratios - future job prospects, development and environmental repair, compensation and rehabilitation have little hope of being realised. All Kores want, in our opinion, is the right to develop the mine then the next

No.	Stakeholder Name	ID	Issue
			purchaser will do the real damage. Can't the Government see this will become a stranded asset as the need for coal becomes less and less. As we understand it, South Korea is moving to hydro and nuclear and getting out of coal to supply energy as quickly as they are able.
715.	MPPA and CPI	SIG	Dust remains a real issue for health in the Blue Haven and Wyee precincts despite partial coverage of infrastructure. Pm10 emissions from the site are conservative and do not take into account the changing nature of intense wind and storm events in the recent years. BlueHaven and Wyee townships are now as close as 200 and 400 metres respectively from the new proposal bringing even greater problems for families in the area for both constant dust and noise 24 h/per day with a huge overhead structure on the main rail line and and loading hopper. There are many schools, pre-schools and establishments within 5 kms of the facility and they will suffer from emissions from the site. Emissions of less than Pm 5 particles, the real killers, are not even measured.
716.	MPPA and CPI	SIG	Noise exceedences are admitted to for "residences to the north of Bushells Ridge Road at Wyee" and general noise 24 h/per day for those living in Blue Haven and Wyee areas are issue of concern. This is not a reasonable burden for these people to constantly to suffer.
717.	MPPA and CPI	SIG	Proposals to have an air monitor installed at Wyee have been diverted to an out-of-influence area at Wyong Racecourse thereby distorting air quality readings for the region. Appendix C from the consultants (pages 2 and 3) says "Fugitive emissions can be expected during operation from loading stockpile to conveyor, wind erosion and maintenance of stockpiles and from upcast ventilation shafts" 5270 cubic metres per year of semi-solid salt waste for at least 14 years into underground storage and capacity and salty brine discharges into the Wallarah Creek system. The Office of Environment and Heritage have expressed concerns - the "ultimate fate of the supersaturated salt solution remains unclear". Can the NSW Government shed some light on the situation please?
718.	MPPA and CPI	SIG	The consultant's suggestion that "after more than 500 years, water levels in the workings (in the Jilliby Creek/Wyong creek catchment) are predicted to have recovered (and not be of concern)" is unacceptable, these both form part of the Wyong River catchment and hence feed in to the Coast's water supply.
719.	MPPA and CPI	SIG	The Mine Subsidence Board accepts only about a quarter of claims over the last ten years and will fight any great expense claimed by those who suffer subsidence. Also only the house itself is covered, while sheds, fences pools etc are exempt from claims.
720.	MPPA and CPI	SIG	Wallarah 2 have continually failed to consult with any of the people directly affected by the proposal. They have failed to hold any open public meeting explaining the project. Wallarah 2 have failed to bring to the public any concept drawing of the new conveyor system and loading facility near Blue Haven which is believed to be 9 storeys in height.
721.	MPPA	SIG	In conclusion, given our previous submission's concerns are not adequately addressed, this just adds to the mine's inability to provide safeguards or any comprehensive plans to deal with all of it's multitudinous serious environmental problems. There is no number of 'conditions' that can be placed on this mine that could conceivably allow it to proceed with any hope that there won't be devastating and long term environmental damage. This development application should be rescinded and the NSW Government should buy back or extinguish the licence.
722.	Full Circle Farm	SIG	Mine subsidence at property which will have a detrimental impact on farm, business and livelihood.
723.	Full Circle Farm	SIG	Dust, health, noise issues to Central Coast Community.
724.	Full Circle Farm	SIG	Impacts on Central Coast's water supply
725.	Bylong Valley Protection Alliance (BVPA)	SIG	Project uncertainty over future of project with KORES withdrawn from overseas development projects
726.	BVPA	SIG	Risk to the Wyong Water Catchment
727.	BVPA	SIG	Disregard of the wishes of the DLALC
728.	BVPA	SIG	Strength of objection by locally affected communities
729.	Kerry Mountain	SIG	Issues as per DLALC submission
730.	Australia Institute (TAI)	SIG	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. The Institute is wholly independent and not affiliated with any other organisation. As an Approved Research Institute, donations to its Research Fund are tax deductible for the donor.
731.	TAI	SIG	The economic assessment is flawed. It overstates the benefits of the project while understating its costs. While the economic assessment concludes the Wallarah 2 project would bring considerable net economic benefits, in fact the project is unlikely to be financially viable and would likely result in a net cost to the NSW community.
732.	TAI	SIG	The last economic assessment of the project was described by the Planning Assessment Commission as "not credible".

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733.	TAI	SIG	Part of the PAC's concerns over economic assessment of this project relate to the large differences between the different assessments of it, all by the same consultant, Gillespie Economics.
734.	TAI	SIG	Yet five years later, the same consultants, Gillespie Economics, evaluating the same mine, assuming the same production rate and an even higher coal price found:
735.	TAI	SIG	The huge differences in estimated net benefits are not adequately explained to readers. They relate largely to changes in scope. Gillespie Economics initially considered "the community" to include the South Korean government, while in the latest assessment has limited its scope to the community of NSW.
736.	TAI	SIG	The Wallarah 2 project is not the only project to have experienced difficulties with assessment by Gillespie Economics:
737.	TAI	SIG	There are many other examples of flawed analysis by this consultant. In fact it was Gillespie Economics' assessment of the earlier iterations of the Wallarah 2 project that sparked extensive reviews of NSW Government Guidelines on economic assessment. Given this background, it is surprising that the proponent persists with economic assessment by Gillespie Economics and that the Department of Planning and Environment accepts it.
738.	TAI	SIG	Gillespie Economics assume a coal price of just under \$100 per tonne, discussed further below. Assuming most of the project's coal is liable for a royalty rate of 7%, this adds \$7 to the per tonne cost of production, a total of \$55. To compare this to other coal mines in Australia and internationally, it needs to be converted to US dollars. At current exchange rates this is USD\$42 per tonne, or at Gillespie Economics' favoured exchange rate, USD \$39.6 per tonne. This would mean the Wallarah 2 project is one of the cheapest mines to operate in the world, and certainly cheaper than almost every mine in Queensland. This can be seen in a chart recently released by the Queensland Resource Council, based on analysis by Wood MacKenzie, analysts favoured by Gillespie Economics:
739.	TAI	SIG	Figure 1 shows that there are very few mines in the world that can produce at \$US40 per tonne. Unfortunately this chart does not show NSW mines, only Queensland mines in dark blue. Almost none of Queensland's coal mines can produce at the costs claimed by the proponents of Wallarah 2 and Gillespie Economics. Given that Wallarah is a relatively small, fairly deep underground mine, and it would involve mining in a sensitive area, it is not credible to suggest that it will be able to operate at an average cost among the cheapest in the world. It seems likely that its average costs would be well above world averages, which would likely make the project unviable at current, or at Gillespie Economics', coal prices. Gillespie Economics sensitivity analysis does not test the sensitivity of net production benefits to a change in operating costs.
740.	TAI	SIG	Gillespie Economics use a coal price of AUD\$100 per tonne, substantially above the current AUD price of \$88 per tonne, and far above the long term Treasury forecast of around \$80 per tonne
741.	TAI	SIG	Gillespie Economics claim that "forecasts" (p34-35) from the International Energy Agency (IEA) support their use of higher coal prices and that these include consideration of new climate policies. However, the IEA does not make "forecasts" at all,
742.	TAI	SIG	Gillespie Economics also fail to conduct sensitivity testing around the coal price on net production benefits, giving decision makers no understanding of the financial outlook for the project. This is inappropriate given the current uncertainty around coal markets and the viability of many coal projects. Decision makers should be aware that the project is unlikely to be financially viable currently or in the foreseeable future. If approved, it is unlikely to proceed as planned. In our opinion, the current approval is being pursued not because the project is profitable, but for corporate strategic reasons,
743.	TAI	SIG	The project lies under high voltage transmission lines, as noted in the EIS ... Gillespie Economics' assessment gives no understanding of how this issue could affect the viability of the project or its potential net benefit to the NSW community. Sensitivity analysis should be conducted to assess what volumes of coal might be affected, the timing of any sterilisation and how this affects the viability of the project. Potential costs to infrastructure owners, governments and power users should also be considered.
744.	TAI	SIG	The potential effects of the Wallarah 2 project on water resources have been hugely controversial. It is inappropriate for the economic assessment to include no detailed consideration of these impacts and to assume that all impacts will be offset by mitigation measures.
745.	TAI	SIG	A key part of controversy around the Wallarah 2 project has been its potential impacts on land owned by the Darkinjung Local Aboriginal Land Council and the various developments existing and planned for this area. The economic assessment includes no consideration of costs that might be imposed on the Darkinjung in either the cost benefit analysis or the local effects analysis. This may serve to heavily understate the costs of the project at a local level.
746.	TAI	SIG	The economic assessment claims that \$220 million in present value company tax will be paid by the proponents, over half the estimated benefit to Australia. There is no transparency around Gillespie Economics' calculation of this figure. Given the complexities involved in company tax payments, particularly with large companies with offshore entities, this is inappropriate and almost certainly serves to overestimate the benefits of the project. Mining companies have a huge array of ways to minimise company tax payments and this calculation should be shown in detail.
747.	TAI	SIG	What is not debatable is that social value of unemployment is heavily overstated in the assessment of the Wallarah 2 project. The assessment assumes \$186 million present value of this external benefit, some \$620,000 per job. It seems highly unlikely that the public would be willing to pay such a large sum for employment in a well

No.	Stakeholder Name	ID	Issue
			paid industry and one that tends to attract controversy around its environmental impacts.
748.	TAI	SIG	The “Supplementary Local Effects Analysis” is based on thoroughly discredited input output modelling. It has been heavily criticised by the PAC, including in relation to the Wallarah 2 project. The Land and Environment Court dismissed this modelling as “inadequate”. The Land and Environment Court's criticism was taken on board by another coal company, Yancoal.
749.	TAI	SIG	Gillespie Economics continue to defend input output modelling and they are entitled to their opinion. We note that they are contradicted not only by their consulting peers at ACIL Allen and by the bench of the Land and Environment Court, but also by recent Planning and Assessment Commission decisions, the ABS15, the Productivity Commission16 and many other economists.
750.	Form Letter 1	IND	The real fact that the proponent KORES is withdrawing from overseas development due to massive debt ratios, as recently expressed in the Korean press tells the community that the future job prospects, development and most importantly environmental repair, compensation and rehabilitation have little hope of being realised.
751.	Form Letter 1	IND	Page 85 of the ADA states that the royalties to the State over the proposed and improbable 28 years life of the mine is \$200 Million which equates to just over \$7 million per annum. With falling coal prices and Government concessional rebates this figure is inflated. Taking into account the costs of repair and rehabilitation, particularly in the Jilliby Vailley water catchment and Hue Hue subdivisions following subsidence, easily negates the benefits to the State and local authorities. By adding the long-term cost to public health and to greater airborne diseases in the population it begins to look like a costly enterprise for the public purse.
752.	Form Letter 1	IND	Pages 86 and 87 state job creation beginning with 79 through to direct and indirect job figures in year 2 of 1,111 jobs. This application states very clearly that this assessment is only looking at this Amendment and not the whole Project yet the job figures are obviously being included for the whole project such as a larger “intersectoral linkages” job quotation during construction of 1605 direct and indirect jobs. Because the original rail spur is not being built and will be replaced by a conveyor system (essentially being the main thrust of this Amendment) does not create an additional 1605 jobs for the whole Project as configured above. As in the original EIS the job prospects are not defined and again highly inflated and misleading.
753.	Form Letter 1	IND	Dust remains a real issue for health in the Blue Haven and Wyee precincts despite partial coverage of infrastructure. There is no attempt to cover coal wagons which will travel through the southern suburbs to Newcastle affecting all those communities of southern Lake Macquarie and Newcastle as has been demonstrated in the Hunter to Port line. There has been great concern about the mapping of coal dust and the lack of authorities to control those emissions. This project exacerbates the problem adding to that congestion toward the Newcastle terminal. The added times of daily rail crossing closures at Adamstown and Islington need to be disclosed to the Newcastle community.
754.	Form Letter 1	IND	Pm10 emissions from the site are conservative as usual and do not take into account the changing nature of intense wind and storm events in the recent years. BlueHaven and Wyee townships are now as close as 200 and 400 metres respectively from the new proposal bringing even greater problems for families in the area for both constant dust and noise 24 h/per day. There are many schools, pre-schools and establishments within 5 kms of the facility and they will suffer from emissions from the site.
755.	Form Letter 1	IND	Please refer back to the submission by Dr.Peter Lewis, Area Director of Public Health for North Sydney and the Central Coast wherein he outlines greater risks to children and health sufferers in this region should this project be approved.
756.	Form Letter 1	IND	Noise exceedences are admitted to for “residences to the north of Bushells Ridge Road at Wyee” and general noise 24 h/per day for those living in BlueHaven and Wyee areas are issue of concern.
757.	Form Letter 1	IND	Massive subsidence figures represented in the proponents EIS affect 245 homes and their infrastructure,86 of which are destined to suffer a metre or more drop right up to 2.3 metres and the valley floor suffering subsidence up to 1.8 metres fall right up to 2.6 metres near the Jilliby Conservation Area provokes “inevitable uncertainty concerning subsidence predictions” as a PAC principal finding. The regular flooding of the Jilliby Valley means that this proposal condemns the area to degradation and to long periods of separation from facilities and emergency services. The woeful performance of the Mine Subsidence Board in refusing the vast majority of claims Statewide for subsidence year in year out does not protect residents as is claimed in the application. “The project predicts risk of reduced availability of water for the Central Coast Water Supply” according to the PAC wherein they... ” recommended there should be no net impact on potential catchment yield” .The Central Coast water catchment supply in the Wyong valleys is at real risk of destruction due to massive subsidence and loss of potable water to the mine area below. This Amendment should be rejected and the whole project put aside due to many areas of risk.

No.	Stakeholder Name	ID	Issue
758.	Form Letter 2	IND	Dust remains a real issue for health in the Blue Haven and Wyee precincts despite partial coverage of infrastructure. Pm10 emissions from the site are conservative and do not take into account the changing nature of intense wind and storm events in the recent years. BlueHaven and Wyee townships are now as close as 200 and 400 metres respectively from the new proposal bringing even greater problems for families in the area for both constant dust and noise 24 h/per day with a huge overhead structure on the main rail line and and loading hopper. There are many schools, pre-schools and establishments within 5 kms of the facility and they will suffer from emissions from the site.
759.	Form Letter 2	IND	Proposals to have an air monitor installed at Wyee have been diverted to an out-of-influence area at Wyong Racecourse thereby distorting air quality readings for the region. Appendix C from the consultants (pages 2 and 3) says "Fugitive emissions can be expected during operation from loading stockpile to conveyor, wind erosion and maintenance of stockpiles and from upcast ventilation shafts"
760.	Form Letter 2	IND	5270 cubic metres per year of semi-solid salt waste for at least 14 years into underground storage and capacity and salty brine discharges into the Wallarah Creek system. OEH have expressed concerns - the "ultimate fate of the supersaturated salt solution remains unclear
761.	Form Letter 2	IND	The Mine Subsidence Board accepts only about a quarter of claims over the last ten years and will fight any great expense claimed by those who suffer subsidence. Also only the house itself is covered, while sheds,fences pools etc are exempt from claims.
762.	Form Letter 2	IND	Wallarah 2 have failed continually to consult with any of the people directly affected by the proposal. They have failed to hold any open public meeting explaining the project. They have failed to bring to the public any concept drawing of the new conveyor system and th loading facility near Blue Haven.
763.	Form Letter 2	IND	Only recently on the ABC was a program about how a coal mine was affecting neighbouring farmers
764.	Form Letter 3	IND	Poses a serious risk to Wyong's drinking water supply. It will undermine a major tributary and the void is modelled to soak up 2.5 million litres of water per day for at least 500 years - water diverted from creek and groundwater systems. For these reasons, the mine is opposed by the Central Coast Water Corporation.
765.	Form Letter 3	IND	Is opposed by Darkinjung traditional owners, who are disgusted with the arrogance the mine proponent has shown them. Rather than seek to make amends with the Darkinjung land council, the company has sought to cut them out of the process.
766.	Form Letter 3	IND	Is opposed by the directly affected communities of the Dooralong Valley, Blue Haven, and Wyee areas, whose health and livelihoods are threatened by the project. It is unfair and undemocratic to ask local residents to bear the impacts of a project that will provide no overall public benefit.
767.	Form Letter 3	IND	Is of highly dubious commercial viability. The ultimate owners of the project, the Korean Government, recently announced a strategic restructure for their resources companies, including Kores, away from thermal coal. In fact, the thermal coal industry is in the throes of terminal decline - many analysts expect the market will never recover, in the face of accelerating global climate change and the rapid development of renewable energy. The "economic assessment" put forward by the mine proponents is completely untrustworthy, and there is no reason to expect the mine would provide the long term financial benefits to NSW - in the form of jobs and royalties - that are promised.
768.	Form Letter 4	IND	Bushfire Despite being a proposal to undertake development on a bushfire prone land, the Amnded DA is silent on this issue. There is no assessmentof bushfire risks
769.	Form Letter 4	IND	It doesn't provide for asset protection zones around any of the development footprint.
770.	Form Letter 4	IND	The removal of a public road (Nikko Road) which assists in the management of bushfire risks. It proposes to replace the road with a 3m wide easement which is not connected to any traversable road. The 3m wide easement is not adequate for fire trucks particularly to that land on the eastern rail corridor south of the motorway link road.
771.	Form Letter 4	IND	There are significant residential areas in the vicinity. WSC took the responsible planning measure of identifying bushfire prone areas.
772.	Form Letter 4	IND	Noise and Dust The amended DA shows the daytime noise levels for Bushells Road Residential Sites as ranging between 40 – 50 dBA for both daytime and night-time levels. The Amended DA states that a Bushells Ridge Road residence (receptor) has predicted levels that exceed the PSNC by up to 4dBA.
773.	Form Letter 4	IND	Page iv of the Amended DA recognises that mitigation is required for single receptor (receptor 16) and the proponent will "consult with thee landowners and offer to apply appropriate acoustic treatments with the VLAMP for State Significant Mining, Petroleum and Extractive Industry Developments (NSW Government 2014). No similar consideration is made for any other properties, including those located at nearby Blue Haven.
774.	Form Letter 4	IND	The Amended DA offers no solution for the unsatisfactory noise levels that will be generated for people on adjoining land outside their homes or to the amenity of their land generally.
775.	Form Letter 5	IND	Absence of Water Control Measures The infrastructure to be placed on Nikko Rd is adjacent to Spring Creek. The Amended DA does not address the risk of pollution to Spring Creek arising from the washing of coal, grease or oil into Spring Creek.

No.	Stakeholder Name	ID	Issue
776.	Form Letter 5	IND	The Amended DA contains no detail on the location or design of water quality control devices presumably required within the Nikko Road, adjacent to the coal loading infrastructure, to ensure any stormwater or other run-off generated with the development (e.g. dust suppressant system) does not impact on nearby waterways.
777.	Form Letter 6	IND	As a resident on the Central Coast I object to the development of a coal mine under the water catchment area for the Central Coast. One of the biggest challenges for planning for the future of the Central Coast is having a secure, clean water supply. This mine threatens the water supply for the residents of not only the Wyong area but also Gosford area. The water collected in the valleys is pumped to Gosford, Woy Woy and hundreds of Thousands of people, their homes and businesses.
778.	Form Letter 6	IND	I object to the proposed development of a coal dump neighbouring Blue Haven and the dust, noise, health risks and environmental impacts this coal dump would have on our air quality and environment. I ask for the precautionary principal in relation to the potential health impacts of coal dust be adopted and this development rejected.
779.	Form Letter 6	IND	I object to the proposed rail link and the congestion it would create on the main train line between Sydney, Newcastle and Brisbane and beyond. This impact on NSW State infrastructure has not been planned and has implications for the entire northern rail passenger and freight lines.
780.	Form Letter 6	IND	I object to the mine subsidence which would be suffered by more than 245 residences, some homes would be subsided over 1.5 metres. The valley floor would suffer subsidence and impact on our catchment yield of water in the Jilliby Creek and Wyong Creek areas. It has been found there would be up to 2.6 metres subsidence near the Jilliby Conservation Area. This is the drinking water catchment for the Central Coast.
781.	Form Letter 6	IND	I object to the claims of jobs made by Kores when they have been exaggerated and this mine will not be a significant job generator for Central Coast residents.
782.	Form Letter 6	IND	I believe the security of our water is a core value and the NSW Government and Department of Planning are responsible to protect it at all cost. I call upon you to refuse this amended development application, no ifs no buts.
783.	Form Letter 7	IND	Premier Baird has removed our democratic rights to go directly to the Land and Environment Court and argue our case on Merit appeal. Baird has removed that legal right from every community fighting coal and gas in NSW.
784.	Gordon Lardner	IND	Raised concerns that the mine will be approximately 6 km from his home, and the proposed coal stockpile will be 600m from Blue Haven.
785.	Gordon Lardner of Hamlyn Terrace	IND	Concerned aquifers could be damaged.
786.	Simone Griffiths of Gorokan	IND	Threat to the water catchment from mining.
787.	Simone Griffiths of Gorokan	IND	The impacts of breathing in coal dust. Refers to global studies indicating that ingesting fine particles can lead to increased health risks by particles breathed into the lung them entering the blood stream
788.	Simone Griffiths of Gorokan	IND	Due to the fact the EPA says data on fine particle pollution levels is not yet available, opposes this project.
789.	Troy Carey of Blue Haven	IND	Risks to the water catchment and concerns over dust and noise to neighbouring suburbs.
790.	Bradley Cross of Blue Haven	IND	The Central Coast is expanding at such a rate, there's no room for a coal mine. Concerns regarding the coal loader and the Blue Haven community.
791.	Siobain Franks of Blue Haven	IND	Objects to the Project as a resident of Blue Haven.
792.	Warren Simmons of Yarramalong	IND	It is my understanding that members of this Government, including the corrupt Minister for Natural resources, Chris Hartcher, and The Corrupt Minister for Police, Mick Gallagher and others in this immediate area have been stood down and are under investigation by ICAC regarding corrupt activity relating to this and other proposals, yet these corrupt proposals continue to be entertained.
793.	Warren Simmons of Yarramalong	IND	Following an independent inquiry and two PAC hearings, as well as Court action regarding the obvious inability to access the land and extract the resource, they persist in wasting the time of the Dept of Planning and Courts, as well as the personal resources of the community. There is no obvious change to the subsidence, water, dust, noise and economic issues addressed previously, so the previous findings and restrictions/conditions would remain. Is this correct ?

No.	Stakeholder Name	ID	Issue
794.	Warren Simmons of Yarramalong	IND	This mine has been examined on so many levels and found not to be viable or economical. It is an insult to the intelligence of all involved that you persist in entertaining their applications, and now, particularly in light of the Korean Government stating that they are pulling out from off - shore resources like this, they leave no guarantee or even consideration that the figures being proposed are anything but an academic attempt to have the proposal passed so the project can be sold to another entity where that entity is not tied to, or supportive of the original proponents claims.
795.	Warren Simmons of Yarramalong	IND	It is also my understanding that the previous applications do not take into account the approved development application by the Darkinjung on the adjoining property that will place dwellings closer to the mining operation than that of Blue Haven and the surrounding suburbs, resulting in the dust and noise problem etc being increased.
796.	Mark Stone of NSW	IND	Concerned that a mine head will be put at the end of one of the waterways that flow into the Lake. He objects to the mine head being built on the eastern side of the railway and recommends that the money is paid to keep it on the western side of the railway, away from Blue Haven and Spring Creek.
797.	Mark Stone of NSW	IND	Concerns about the local waterway which flows into Tuggerah Lake.
798.	Mark Stone of NSW	IND	Concerns that the mine head is close to spring creek which is the breeding ground for millions of fish
799.	Mark Stone of NSW	IND	Believes the government should keep the mine head on the western side of the railway and pay the money for the use of the aboriginal land to protect this precious waterway.
800.	Mark Stone of NSW	IND	Against changes to the plans for the mine and believes the use of the aboriginal land should be paid for.
801.	Name withheld (of Newcastle)	IND	Subsidence is a major concern and more controls are needed to minimise the impact.
802.	Name withheld (of Newcastle)	IND	The proponent needs to commit to real controls. Once all is addressed the mine should go ahead.
803.	Name withheld (of Blue Haven)	IND	Concerns that the Project is too close to suburban homes and too close to the residents of Blue Haven.
804.	Nita Manley	IND	My farm location is unique to the proposed rail coal loading process in that it is the only residential property in the design that will be directly impacted by the proposal. I look forward to effective solutions to overcome some of my initial concerns as listed below. 555 Bushells Ridge Road Bushells Ridge NSW 2259.
805.	Nita Manley	IND	The main northern rail line which borders 250 metres of my property currently has both freight and passenger services passing at fairly constant speed and even individual noise generation 24 hours per day. This will change with the revised train loading proposal.
806.	Nita Manley	IND	The coal trains will be approximately 700 metres long and there will be rail cross over to a siding to load coal approximately 300 metres south, downhill from my boundary. This would mean that trains travelling south will be braking from main line speed along my boundary onto the siding.
807.	Nita Manley	IND	Trains being loaded, particularly at night to meet departure timetable constraints will be shunting at low speed creating additional noise travelling up the valley to my property.
808.	Nita Manley	IND	Loaded trains will be facing uphill and under full acceleration to shunt up through the crossover and past my property to gain optimum speed for the northern line.
809.	Nita Manley	IND	These three initial concerns I feel will all raise total noise exposure plus cause specific increases in random nuisance noise levels and random frequency of increased noise levels which will affect both my quality of life plus degrade the resale value of my property.
810.	Rodney Smith	IND	4 Crestwood Rd Jilliby The information provided indicates that subsidence under my property will be in the area of 0.5m to 0.75m on the maps but the EIS statements indicate only minor subsidence up to 150mm. How is this so?
811.	Rodney Smith	IND	Also the impacts of flooding on my property have not been fully quantified. While the 1% AEP flood level might not the change the occurrence of minor flooding affectation of my property will increase with subsidence. Minor floods will now start to affect my property. This has not been quantified by the applicant. This will affect the usage of my property where I run horses. Will I be compensated for the reduction in usage of my property.
812.	Rodney Smith	IND	Will the subsidence of my land (not my building) be reinstated back to original heights to ensure continued usage of my property as it is now?

No.	Stakeholder Name	ID	Issue
813.	Tricia Fortier of Lisarow	IND	The coal mine will cause health risks and contamination of drinking water.
814.	Name withheld of Gorokan	IND	Impact to the Central Coast water supply.
815.	Name withheld of Gorokan	IND	Comments that the Central Coast is being impacted by rapid housing development without sufficient public consultation and consideration of the environmental impact.
816.	Jordyn Mitchell of Budgewoi	IND	Main concern is for his health and the health of school friends.
817.	Jordyn Mitchell of Budgewoi	IND	Believes that 1 in 100 000 people will die as a direct result of the mine.
818.	Jordyn Mitchell of Budgewoi	IND	Concerned about the PM10 emissions and diesel fumes.
819.	Jordyn Mitchell of Budgewoi	IND	The application lists economic benefits and job figures for the whole project, not just the amendment
820.	Megan Benson of Bundeena	IND	Comments that the project was previously rejected by the Government.
821.	Megan Benson of Bundeena	IND	Notes that Gosford and Wyong Councils both hold grave concerns and oppose the Project
822.	Megan Benson of Bundeena	IND	Notes that the “revised” project removes the requirement for access consent from the Darkinjung Aboriginal Land Council.
823.	Name withheld of Jilliby NSW	IND	Family has a small property near Jilliby Conservation Area.
824.	Name withheld of Jilliby NSW	IND	Believes coal is an outdated energy source.
825.	Name withheld of Jilliby NSW	IND	Questions if NSW needs more coal mines and if the W2 mine will be viable? The project forecasts rely on high coal Prices and unrealistically low production costs.
826.	Name withheld of Jilliby NSW	IND	Concerned that recreation in the Jilliby Conservation area would become hazardous to recreational users. Comments on the compounded subsidence impacts of flooding and erosion, based on average of 1250mm of rainfall each year.
827.	Name withheld of Jilliby NSW	IND	Notes that the house is within a stand of red gums, over 100 years old and asks if they will withstand the subsidence movement. Highlights the beauty of the property, particularly billabong habitat. Concerned that the habitat will be drained and disappear.
828.	Name withheld of Jilliby NSW	IND	Raised many questions regarding subsidence – underground water tanks, wombat burrows, land on their property will be flood prone, when previously safe.
829.	Name withheld of Jilliby NSW	IND	There has been no consultation.
830.	Name withheld of Blue Haven	IND	Lived in Blue Haven over 10 years, concerns that the coal fill area will be 100m from spring creek which runs into Tuggerah Lake.
831.	Name withheld of Harrington NSW	IND	Notes that the area in question is the site of an up and coming grass based ethical farming practice run by Shannon and Kylie Kelly.
832.	Name withheld of Woogarra NSW	IND	A resident less than 4 kms away, concerned about coal dust particulates because they contain heavy metals which are toxic at low concentrations.
833.	Name withheld of Woogarra NSW	IND	Concerned that fine invisible dust less than 205 microns long lodge in lungs and are not naturally expelled so long term exposure increases risk of health problems.
834.	Guiseppe Amato of Blue Haven	IND	Concerned that the project will affect people with breathing problems like asthma.

No.	Stakeholder Name	ID	Issue
835.	Hugh Halcrow of Kincumber NSW	IND	Believes the EIS and assessment are both fundamentally flawed.
836.	Hugh Halcrow of Kincumber NSW	IND	Does not consider the amount of coal being dug up and burnt will have on climate change.
837.	Karma Wilson of Little Jilliby NSW	IND	Family is a frequent recreational user of the Jilliby Conservation Area for horse riding. Deeply concerned about the impacts from subsidence and struggle to understand how 2m of subsidence will impact the dramatic landscape that includes rocky ridgelines, creeks and rainforest gullies.
838.	Karma Wilson of Little Jilliby NSW	IND	Mining is destabilising and can cause cliff collapse and rock falls. Concerned that the predictions for subsidence could be underestimated. Believes the Jilliby Conservation Area could be destabilised and hazardous for decades.
839.	Karma Wilson of Little Jilliby NSW	IND	The submission quotes several extracts from NSW Government: Office of Environment & Heritage 'Alteration of habitat following subsidence due to longwall mining - key threatening process listing. NSW Scientific Committee - final determination.' http://www.environment.nsw.gov.au/determinations/LongwallMiningKtp.htm Including – Loss of native plants and animals may occur directly via iron toxicity, or indirectly via smothering. Long-term studies in the United States indicate that reductions in diversity and abundance of aquatic invertebrates occur in streams in the vicinity of longwall mining and these effects may still be evident 12 years after mining".
840.	Kevin Armstrong of unknown NSW	IND	A number of objections to the project already listed above and <ul style="list-style-type: none"> • Aquifers are likely to be fractured and water lost
841.	Kevin Armstrong of unknown NSW	IND	Kores failed in its EIS to identify by address which homes would be affected by subsidence. It is deceptive that the affected homes were only identified by a number, not by address - clearly to minimise local residents' awareness of their potential disadvantage.
842.	Kevin Armstrong of unknown NSW	IND	Regular flooding of the Jilliby Valley means that this proposal condemns the valleys area to long periods of separation from facilities and emergency services.
843.	Kevin Armstrong of unknown NSW	IND	Job creation predictions begin with 79 through to direct and indirect job figures in year 2 of 1,111 jobs. This application states very clearly that this assessment is only looking at this Amendment and not the whole Project yet the job figures are included for the whole project.
844.	Kevin Armstrong of unknown NSW	IND	It is significant that the air quality monitor for the northern Central Coast is located at Wyong Racecourse . kilometres south of the proposed mine and against the prevailing wind direction. One could suspect location of this installation was purposeful and that the exclusion of particle monitoring PM2.5 may have been deliberative. The Wyong air quality monitoring site is located on the northern apron of Wyong racecourse. It is situated within a residential/semi-rural area in the OEH's Central Coast region and was commissioned in December 2012.
845.	Kirk Newman of Blue Haven NSW	IND	Blue Haven landowner believes the project will negatively affect land value, health, the aesthetic qualities, flora and fauna and introduce instability to the surrounding residential lands.
846.	Robert Brooks of Doyalson North NSW	IND	3m of subsidence will have "catastrophic consequences" for potable water supply to the Central Coast.
847.	Robert Brooks of Doyalson North NSW	IND	Believes Kores is an arm of the South Korean Government. Questions who is really behind the proposal?
848.	Robert Brooks of Doyalson North NSW	IND	States the roads, land, underground services and the \$80M water pipeline from Mardi Dam will be severely affected by 3m subsidence.
849.	Name withheld of Watonobbi NSW	IND	Note the mine was not approved under previous assessment and the issues of concern at that time still have not been addressed.
850.	Name withheld of Watonobbi NSW	IND	Believes the questions have been ignored relating to long term health of the water supply, rural and urban communities as well as ecological impacts.
851.	C Des Champs of Watanobbi NSW	IND	The amended application poses more of a threat to human health than the previous application.
852.	C Des Champs of	IND	Medical data easily connects respiratory problems to coal dust.

No.	Stakeholder Name	ID	Issue
853.	Watanobbi NSW C Des Champs of Watanobbi NSW	IND	Discusses the serious drought experienced 10 years ago and that the Mangrove Dam could not adequately supply Central Coast Residents with drinking water. Water from Mardi Dam now supplies the Central Coast via a pipeline. Expresses concern that the location of the proposed longwall mine is directly under the aquifers of the water catchment of the Mardi Dam water supply.
854.	C Des Champs of Watanobbi NSW	IND	Believes the State Government's economic forecast for royalties does not add up.
855.	C Des Champs of Watanobbi NSW	IND	Believes we are in an era where renewables are becoming extremely competitive.
856.	C Des Champs of Watanobbi NSW	IND	Believes the State Government has an opportunity to protect the precious water on this dry continent. Lists the Liverpool and Northern Rivers regions as examples of where this has already happened. Believes it is possible to exclude the Central Coast from the burden of coal mining.
857.	Sidonie Gnauck of Budgewoi NSW	IND	Concerned runoff from the mine in Jiliby and Dooralong valleys will run directly into the natural water source that feeds the only water storage facility on the Central Coast.
858.	Sidonie Gnauck of Budgewoi NSW	IND	Understands the proposal down the track is to use the Lake as a dumping ground for the mine debris.
859.	Sidonie Gnauck of Budgewoi NSW	IND	Other countries such as France, China and the Pacific Islands recognise the damage caused by coal mining. Australia should follow their lead.
860.	Ray Rauschef of E Gosford NSW	IND	The key risks for the Project include water table interference, noise and dust impacts on urban areas such as Blue Haven and traffic movements generated, visual and traffic impacts from the whole project
861.	Rachel Craig of West Gosford NSW	IND	New coal mines should not be opened in Australia as a transition away from fossil fuels towards renewable energies will provide the best opportunity to prevent catastrophic climate change.
862.	Ron and Robyn Borg of Blue Haven NSW	IND	Concerned with coal dust, noise and health of not yet born children.
863.	Sandra Stone of Blue Haven NSW	IND	Impacts to Spring Creek. Lives on Spring Creek with young family. Describes spring creek as about 30m across, 4 ft to 7m deep. Local children and people swim in spring creek and catch and eat fish.
864.	Sandra Stone of Blue Haven NSW	IND	Commercial fisherman net spring creek every year sending their catch to the Sydney Fish markets.
865.	Sandra Stone of Blue Haven NSW	IND	The Korean Government is moving to nuclear and solar power generation.
866.	Name withheld of Blue Haven NSW	IND	The original application by Wyong Areas Joint Coal Venture in 2010 was rejected by the previous NSW Government in March 2011 on grounds of unsustainability (ESD principles) and the Government's application of the Precautionary Principle. Nothing in the new application changes that concept as essentially it is a reworking of the previous application.
867.	Name withheld of Blue Haven NSW	IND	The current NSW Government's "Aquifer Interference Policy" as intended should nullify the application at hand.
868.	Name withheld of Blue Haven NSW	IND	The Wyong Water Catchment was protected under a proclaimed NSW Statute in 1950 (Gazette No. 153 of the LGA 1919, 1950). Some 300,000 people in the Wyong and Gosford Local Government Area rely upon this major water catchment for their potable water. The recently completed Mardi-Mangrove pipeline also relies upon the sustainability of the water catchment district to transfer water from this system to the Mangrove Dam for water banking. In 1999 groundwater consultants, ERM Mitchell McCotter, found that transient pathways for water to travel downwards to the coal strata was evident and so bulk water would not be impeded on its downward path. Kores claim that there will be no effect upon the water supply due to impervious layers between the surface and the mine seam. Professor Phillip Pells, Senior Lecturer at

No.	Stakeholder Name	ID	Issue
			<p>the University of NSW, dismisses these claims. Kores do admit to a loss of water rated at 2m1 per day per square metre of the mine surface area. This extrapolates over the whole mine area to approximately 8 megalitres per day or 3000 megalitres each year once mining is complete. The professional uncertainties characterised within the Kores submission paint a very tentative picture for protection of the coast's natural potable water supply.</p> <p>The Peer Review by Professor Bruce Hepplewhite (page 258, Appendix H) questions many of the terms used and assumptions made during the geological modelling upon which subsidence and water loss are based.</p> <p>Some 46 panels are to be mined, including in the Hue Hue Subsidence Area where 150 houses (Appendix H Map on page 240) mostly of modern brick design exist on subdivided acres and will be subjected to subsidence up to one metre but may well suffer further subsidence due to the existence of Awaba Tuff strata below the mine on which the remaining pillars are supported.</p>
869.	Name withheld of Blue Haven NSW	IND	<p>Much discussion within the application refers to the uncertain nature and caution needed re the soft bedded Awaba Tuff leading to a scenario of adaptive management as mining begins to proceed. This type of experimental mining should only be carried out in an outback remote location and not under modern homes within the expanding outer suburbs of Wyong. The Department of Infrastructure and Planning should be alarmed by this and immediately inform the unsuspecting owners of the properties in the Hue Hue Subsidence District.</p> <p>A total of 245 houses (Appendix H, Page 130) will be impacted by subsidence from a conservative one metre to 1.6 metres throughout the mine area. A total of 755 Rural Building Structures will be impacted (Appendix H, leading up to 179) and 420 Farm Dams suffering subsidence to some degree (Appendix H, leading up to 187). As can be seen the projected damage inside the mining lease area would be catastrophic. The hinterland of the valleys are to be subsided 2.6 metres; Little Jilliby Creek at the southern end is predicted to fall 2 metres; the main artery into the Jilliby/Dooralong Valley, Jilliby Road is destined to be subsided 1.75 metres in places, remembering that these valleys flood on a regular basis leaving residents isolated from all directions.</p>
870.	Name withheld of Blue Haven NSW	IND	<p>Dust and noise from stockpiling and rail movements will impact on the established suburbs of Blue Haven, Wyee and all along the rail corridor from Morisset through Cardiff and southern suburbs to the port of Newcastle. The proponent fails to adequately address these ramifications. New burgeoning suburbs being created in northern Wyong shire will be impacted by the mining proposal. It is placed amid these developments and should not be considered based on known high rates of asthma and bronchitis as voiced by the medical profession for decades. Nineteen species of avian migratory waders in the area are protected under the Federal EPBC Act with binding agreements with China (CAMBA), Japan (JAMBA) and South Korea itself (ROKAMBA). The proposal directly affects these agreements. There are also flora species listed as threatened under the Act and local fauna species listed as endangered under the Act with the proposed mining area.</p>
871.	Name withheld of Blue Haven NSW	IND	<p>The Director-General's Requirements are extensive and in most areas Kores have failed to address these adequately.</p>
872.	Name withheld of Blue Haven NSW	IND	<p>Concerned that a carcinogenic hazard will be located as close as 1km from a peaceful expanding suburb stacked full of young families.</p>
873.	Name withheld of Blue Haven NSW	IND	<p>Believes that being in close proximity to the motorway, power station, concrete works and large electricity power lines is exposure to enough pollution. Locals are already exposed to pollution and noise without adding to this any further.</p>
874.	Name withheld of Blue Haven NSW	IND	<p>The Health Department says it's a bad development.</p>
875.	Helen McInnes of Terrigal NSW	IND	<p>Companies involved never undertake the necessary rehabilitation of this land.</p>
876.	Jenny Hughes of Pearl Beach	IND	<p>If the Project is approved would like to see several billion dollars given to the hospital for the extra cases of respiratory conditions that the hospital will need to treat.</p>
877.	Name withheld of Davistown NSW	IND	<p>The Central Coast is an important food source through fishing, oyster farming and market gardening.</p>
878.	David Slee of Blue Haven NSW	IND	<p>Believes the proposal does not give specifics regarding the height, nature and workings of the coal loader. Concerned that a very large structure will be visible from nearby residences and the suburb of Blue Haven, and that also spreads toxic coal dust particles further around the local and regional area. The extra visual and noise pollution from this loading structure could significantly affect local residents, but no details are contained upon which to assess this.</p>
879.	Emma McBride MP, Federal Member for Dobell	IND	<p>Raises concerns relating to the risk the project poses to the drinking water catchment.</p>

No.	Stakeholder Name	ID	Issue
880.	Emma McBride MP, Federal Member for Dobell	IND	Has reviewed the material provided by the IESC and has been advised the current application still poses impact on ground and surface water.
881.	Lisa Adorna of 24 Dakara Rd Wallarah NSW	IND	Believes property values will plummet as a result of the Project
882.	D Dale of Blue Haven NSW	IND	Believes the pollution is already bad and would get worse is the Project goes ahead.
883.	Hendrik Holtman of Blue Haven NSW	IND	Has severe lung disease and is worried about the coal dust
884.	Hendrik Holtman of Blue Haven NSW	IND	Raises concerns with light and noise aspects of the project and believes it is inappropriate to allow mining in the middle of suburbia
885.	J Wood of Blue Haven, NSW	IND	Lack of consultation, wasn't told of the plans for the mine "to be on our doorstep."
886.	J Wood of Blue Haven, NSW	IND	Believes Australia is not going to use much of the energy.
887.	Jason Gregory of Blue Haven NSW	IND	The creation of 1000 new jobs will place additional strain on an already stretched housing market.
888.	Brenna Sarkis of Blue Haven NSW	IND	Concerned for the health of family and friends and believes there is no way this cancer causing, particle (coal) dust can be made safe to live near
889.	Climate Future	SIG	Recent reports by Price Waterhouse Coopers, the International Energy Agency and the World Bank (among many others) indicate that we are taking insufficient action to reduce emissions. A report issued in May 2013 (Unburnable Carbon) indicates that to have an 80% chance of remaining below the 2 degree threshold agreed by countries at the Copenhagen 2009 UN conference, total fossil carbon burned by 2050 must be less than 900 Gt. Current recognized global assets of fossil carbon amount to more than 2,500 Gt.
890.	Climate Future	SIG	<p>Economic Impacts</p> <p>The economic impact of climate change has been estimated by many economists. A reasonable range of estimates is from \$20 to \$150 per tonne. The value depends on the discount rate and the actual effort to reduce emissions that is undertaken.</p> <p>The Wallarah 2 mine intends to mine 150.9 million tonnes of coal which results in emit 369 million tonnes of CO2-e green house gas emissions. This value does not appear to include transport outside Australia. All but 2.5% of the 369 MtCO2-e comes from burning the coal (equivalent to 100.64 MtC).</p> <p>Adopting a value of \$40 /t for social cost of carbon gives a total of:- \$4.03 billion Over 38 years this is \$100 million per year.</p> <p>If the social cost of carbon were to be in the upper range of assessments (\$150/tC) the total cost of this mine relating to climate change would be:- \$15.1 billion</p> <p>To put this into perspective:- this single mine, not large when considered in the context of coal mines in Australia, could cause climate change costs equivalent to the entire military budget of a mid-sized developed country (e.g., Israel's military budget is \$15 billion).</p> <p>The decision to allow this mine will unleash costs of billions of dollars onto future generations. This must be taken into consideration in the economic assessment of this mine.</p>
891.	Name withheld of Wyee NSW	IND	<p>Consultation</p> <p>Acquisition of Our Property 224 Bushells Ridge Road WYEE as stated by the Department of Planning Representative at a meeting held at Wyong Council Chambers hearing by the Department of Planning on the 28 October 2010 it was stated that the mining company would have to acquisition our property as we would have to move if</p>

No.	Stakeholder Name	ID	Issue
			this mine was developed because of the dust, noise and the close proximity of our house to the pit head as stated by Howard Reeves to me on that day.
892.	Name withheld of Wyee NSW	IND	Dust The stockpile is less than 400 metres from our residents and we use tank water that is collect from the roof of our house for all domestic water supply. It is well known spray water does not suppress coal dust as the water spray attaches to the dust particles and the dust particles still float in the air with the wind. There has been great concern about the mapping of coal dust and the lack of authorities to control those emissions. PM10 emissions from the stock pile of coal does not take into account the changing nature of intense winds and storm events. Wyee and Bluehaven townships are very close and will be affected by this dust, these areas have pre-schools established within these communities.
893.	Name withheld of Wyee NSW	IND	Noise Will be generated from machinery work on construction at the pit head and on going for 28 years the life of the mine from the machinery working on the stockpile 24 hours per day seven per week. The glare from the lights on the site pile of a night time will affect our sleep patterns which will affect our health as well as the traffic coming and going from this pit head continually. The noise from the link road can be clearly heard at our residents sirens, horns and exhausted brakes which is a great distance then this coal mine. Water Tanks The domestic water at this premises is collected from the roof of our home and the dust from the coal stack will make our water unusable for domestic purpose or any other purpose. Therefore will have to be replenished daily by the mine company, for our domestic use.
894.	Name withheld of Wyee NSW	IND	Traffic As we live on Bushells Ridge Road adjacent to the Tooheys Road intersection we will be affected from day one by traffic to this site. Construction traffic and workers, Bushells Ridge is a rural road with highly contaminated soil as a road base in front of our property laid down by Wyong Shire Council and the EPA ruled this soil had to be in captured in tar sealing on this section of road. Therefore any fractures in the tar from heavy traffic will have to be repaired immediately to stop further contamination to our residents.
895.	Name withheld of Wyee NSW	IND	Railway line The dust and noise along the rail corridor will impact on all residents along the rail corridor.
896.	Name withheld of Wyee NSW	IND	Lights and Glare The lights from night work at the pit head and the stockpile at night will impact on our sleep pattern seven days a week. No Impact study has been done on Bushell's Ridge Road for Fauna, in regard to Sugar Gliders, Echidna, Water Hens and Wombat, although we have a Conservation Order of protection on Sugar Gliders in the area of Lake Macquarie Local Government Area and this will affect the unique nocturnal animals the night work and glare from the lights.
897.	Name withheld of Wyee NSW	IND	Health Services Wyong Hospital could not cope with the emergency department attendees during the last large dust storm which affected this area this in turn affect young and aged. Therefore the dust from this mine will cause stress on the health system and Wyong Hospital in this area. The PM emission will affect people and cause lung problems from the emission from this mine and health report have shown that this is a direct issue that occurs with mines that are so close to residential areas.
898.	Name withheld of Wyee NSW	IND	Rehabilitation Who will pay for the rehabilitation of land impacted by this coal mine when productions ceases? Will this be left for the future generation of children and taxpayers subsidence to the land and ongoing destruction cause by long wall mining and the shaft and the aquifers of the valleys - Dooralong and Yarralong Valley.
899.	Name withheld of Wyee NSW	IND	Heritage I am fourth generation in this township and if this mine is approved by the Department of Planning I will lose my links to my community and heritage within this area.
900.	Name withheld of Wyee NSW	IND	We carry out a Red Angus stud on property and have done for years. This was never noted in the EIS and a replace property will be necessary.
901.	Name withheld of Wallarah NSW	IND	Impacts on tourism in the northern central coast
902.	Bob Mansfield of unknown NSW	IND	I have been a property owner for the last 30 years in Dunks Lane, Jilliby where I have 2 titles at 143 and 131 Dunks Lane and I have recently purchased 87 Dunks Lane as well. A total holding of approximately 131 acres. To say I object strongly to the current ADA on exhibition is an understatement. It puts my whole property at risk and my cattle operation also. Having built a new house on my property some 7 years ago, my builder estimated that the requirements of the Mine Subsidence Board at the time added between \$250,000 - \$300,000 additional construction cost to the build. I was disgusted by this requirement and now the whole property is being put at risk by the proposal being

No.	Stakeholder Name	ID	Issue
			considered. Furthermore, I don't think anyone has confidence in the performance of the Mine Subsidence Board who have a track record of refusing the vast majority of claims for subsidence.
903.	Ken Scales of Blue Haven NSW	IND	Increased health costs due to sickness caused by dust from the mine
904.	Ken Scales of Blue Haven NSW	IND	If Kores has to pay both the government and landowners for the coal, it will not be economic to operate the mine
905.	Ken Scales of Blue Haven NSW	IND	EIS Volume 1 Main report p13 – assesses the health risk resulting in death at 1 in 100000. This risk is now increased by moving the coal loader closer to houses schools and child minding centres.
906.	Ken Scales of Blue Haven NSW	IND	Health Impacts Transport and storage of Crystalline Silica Dust Particles generated by blasting. There is no risk management strategy to make informed decision as to what the real effects will be. EIS states there are no actual levels of crystalline silica or coal dust which can be guaranteed safe.
907.	Ken Scales of Blue Haven NSW	IND	Subsidence Section 6.2 states.. "in the event that any impacts occur, the MSB will rectify them". This strategy has not worked in the past e.g. Chain Valley Bay. It is the tax payer who gets the bill.
908.	Ken Scales of Blue Haven NSW	IND	Damage to Powerlines Concerned about mitigation strategy for the transmission towers relying solely on discussions with Trans grid. Believes the three towers at Jilliby Rd could be displaced by a single subsidence event and there is no remedial action proposed if this did happen.
909.	Ken Scales of Blue Haven NSW	IND	Flooding Refers to the 27 dwellings impacted by flooding that will increase due to subsidence. Believes there is no legal compulsion for a mining company to do anything, once the EIS is approved and there is no legal protection for these residents against these events.
910.	Ken Scales of Blue Haven NSW	IND	Flushing of Tuggerah Lake The EIS does not present a mitigating strategy to address the reduced water flow and consequently reduced flushing of Tuggerah Lake
911.	Ken Scales of Blue Haven NSW	IND	The effect of discharging pollutants and even increased acidity from residents washing coal dust from their properties or natural rainwater cleansing is not assessed in the EIS.
912.	Ken Scales of Blue Haven NSW	IND	Increased Water Charges A reduction in the water supply, caused by damage from this project, will cause a huge rise in cost of water over the long term
913.	Ken Scales of Blue Haven NSW	IND	Water Quality Compromise to the water quality going into Mardi Dam.
914.	Ken Scales of Blue Haven NSW	IND	Air Quality Dust deposition along the rail corridor
915.	Ken Scales of Blue Haven NSW	IND	The effect of passing traffic on the M1, which is close to the mine is not assessed in the EIS.
916.	Ken Scales of Blue Haven NSW	IND	The omission of maps from the last EIS, which contained virtually the same data on dust is an act of deceit.
917.	Ken Scales of Blue Haven NSW	IND	Financial Benefit and Employment The coal was acquired by the NSW Government in 1981 to provide cheap power for NSW, not South Korea.
918.	Ken Scales of Blue Haven NSW	IND	Transport Issues Expects new coal hoppers with ECP braking will be built and used for this Project.
919.	Ken Scales of Blue Haven NSW	IND	Believes that nothing can stop Kores from transporting the coal by road to Newcastle or Wollongong if they desire. Kores could also ship the coal by rail to Wollongong.
920.	Ken Scales of Blue Haven NSW	IND	Understand by reading the rail study that transporting the coal by rail is not feasible without major improvements to the existing rail infrastructure.
921.	Ken Scales of	IND	EIS does not address the social impacts of:

No.	Stakeholder Name	ID	Issue
	Blue Haven NSW		<ul style="list-style-type: none"> Property loss from subsidence Property loss from flooding Increased water charges and restrictions Negative effects on residents from health and dust
922.	Mark Moffet of unknown NSW	IND	The impact of coal dust on natural vegetation is excessive as it reduces photosynthesis and much of the coal dust on the underside of leaves etc cannot be blown/washed off.
923.	Mark Moffet of unknown NSW	IND	Historical Protection and Significance Concerns for impacts to: <ul style="list-style-type: none"> Lot 129 DP 755721 Boyds Lane Wyong Creek Wyong Community Hall Believes the impacts are too great to permit a coal mine
924.	Mark Moffet of unknown NSW	IND	Water Catchment Owns a property that borders Wyong Creek Catchment river. The maps indicate that the coal mine travels within 18m from the vertical line of Wyong Creek. Some 550m below the surface. The map contradicts any other maps circulated and distributed as marketing material.
925.	Sue Davies of Toukley NSW	IND	Believes the area is very important being a food bowl and it is not worth the risk to destroy the food and water supply.
926.	Name withheld of Chittaway Bay NSW	IND	Bushfires Mining will not cause fires, however it will gradually rod the ground of moisture.
927.	Name withheld of Chittaway Bay NSW	IND	330 kV Transmission Lines Concerned that Transgrid should reinforce the footings of the tension towers as a means to avoid coal sterilisation. The work required to replace those towers will have enormous negative impacts not assessed in the EIA.
928.	David Holland of Blue Haven NSW	IND	Potential for the Project to inhibit future growth of public transport infrastructure. Notes likely development at Bushell's Ridge and that future planning of a rail and bus interchange would be compromised
929.	David Holland of Blue Haven NSW	IND	Concern for residents who have installed solar panels. Available sunlight to these panels will be reduced by the fine coal dust depositing on them, unless they are cleaned regularly
930.	David Holland of Blue Haven NSW	IND	Concern for residents who have installed rainwater tanks and notes that rainwater storage units are compulsory for new homes.
931.	David Holland of Blue Haven NSW	IND	Prevailing winds carrying fine dust, depositing on washing, outdoor surfaces etc.
932.	David Holland of Blue Haven NSW	IND	Noise concerns with regards to locomotives shunting
933.	David Holland of Blue Haven NSW	IND	The EPBC Act 1999 Amendments Refers to a bill that has been recently passed to strengthen this Act to consider the water security related to mining activities.
934.	Janice Fowle of Jilliby NSW	IND	75 Sandra St Jilliby Concerns relating to land subsidence in her area
935.	Janice Fowle of Jilliby NSW	IND	Water supply is collected from the roof, concerned with dust impacts
936.	Janice Fowle of Jilliby NSW	IND	Concerned dust may also impact the efficiency of the solar panels and solar hot water system
937.	Nigel Tupper of Little Jilliby NSW	IND	Family owns small property near Jilliby Conservation area. Subsidence is expected at greater than 2m. The EIS identifies the family house as a shed. The submission raises many subsidence questions specific to the property and impacts to the nearby Jilliby Conservation Area which is enjoyed by the family for horse riding.

No.	Stakeholder Name	ID	Issue
938.	David Harris MP for Wyong	IND	Believes the Amendment has revealed larger health and environmental impacts...rail spur is within 300m of homes in Blue Haven.
939.	David Harris MP for Wyong	IND	Notes that the current regional development plan designates the northern part of the Central Coast for housing development and there is a major hospital within 5kms of the proposed conveyor.
940.	Greg Piper MP for Lake Macquarie	IND	Properties on Bushells Ridge Road and Hue Hue Road at Wyee are not assessed in the EIS.
941.	Alan and Judith Hayes, Dooralong NSW	IND	Durrenvalle Farm ...The PAC then prepared a Review Report, which made a number of recommendations and concluded as follows: "... the Commission considers that, if the recommendations, concerning improved strategies to avoid, mitigate or manage the predicted impacts of the project are adopted, then there is merit in allowing the project to proceed." None of the PAC's recommendations for improved strategies have been implemented.
942.	Alan and Judith Hayes, Dooralong NSW	IND	New data has shown the air quality across Australia has deteriorated to alarming levels, with the coal industry clearly the nation's worst polluter!
943.	Paul Robert Burton of Central Coast NSW	IND	The community should have been notified as the coal loader will be 220m and 400m from the nearest homes.
944.	Paul Robert Burton of Central Coast NSW	IND	Highly likely the modelled deaths per 100 000 have been underestimated
945.	Paul Robert Burton of Central Coast NSW	IND	The mining industry is incapable of monitoring its own activities.
946.	Laurie Eyes of Wyong Creek NSW	IND	Coal dust generated from rail wagons, coal stockpiles and rail facilities should be added to the significant pollution from the coal fires power stations and the cumulative impact assessed in the EIS should be
947.	Ursula Silva of Ourimbah NSW	IND	Questions whether there will be AQ monitoring within a 50 km radius of the mine
948.	Colin Pursehouse of Jilliby NSW	IND	40 Smiths Road Jilliby Property purchased in 2013, no consultation with the proponent on the application. Recently met with Peter Smith
949.	Colin Pursehouse of Jilliby NSW	IND	Public Exhibition and Process The original application was not on display, had to request it be bought out for review. Believes it is not appropriate to attempt to constrain submissions by only disclosing or exhibiting part of a proposal. Believes that the public exhibition was flawed and misleading.
950.	Colin Pursehouse of Jilliby NSW	IND	Subsidence The resultant changes in topography are extremely uncertain and there is no reassurance that the suitability of my land for raising cattle and other grazing activities will not be adversely impacted. Similarly, other agricultural activities in the locality (I am adjoining the Austurf Turf farm) are essential components of the intrinsic character of the valleys and any depletion or disruption to these activities will inevitably lead to loss of character, amenity and value.
951.	Colin Pursehouse of Jilliby NSW	IND	The lack of concern for impacts upon the occupiers and users of the Valleys is well illustrated by the Applicants assertions with regard to the turf farm adjoining my property. The proponent admits that impacts from subsidence may result in loss of turf production for three years but apparently regards this as acceptable.
952.	Colin Pursehouse of Jilliby NSW	IND	Submission of the Department of Primary Industry which makes the point there is no expert or empirical evidence to support the contention that the turf farm would return to productivity in 3 years.
953.	Colin Pursehouse	IND	Impacts on existing Water Courses and Sources

No.	Stakeholder Name	ID	Issue
	of Jilliby NSW		When, as in this case, an Applicant can seriously suggest that it is acceptable to await 500 years for the restoration of a natural physical system (groundwater pressure), surely alarm bells must be ringing loudly. I am not alone in my concerns and note several government departments and other public authorities (DPI, EPA, WSC, CCWCC, HRCMA) and various significant community and environmental groups who have expressed similar concern about the theoretical nature of the proponent's claims. I adopt the submissions of these bodies as part of my objection.
954.	Colin Pursehouse of Jilliby NSW	IND	Loss of existing water will not only seriously affect the water supply for the region but will have devastating impacts upon the carrying capacity of the valley grazing lands including my own property. Failure of the permanent creeks and watercourses and loss of seasonal waterbodies could render properties unusable for their present pastoral activities.
955.		IND	Electrical transmission Lines Destabilisation of high voltage transmission lines could lead to their failure and in addition to interruption to the national electricity grid, may result in dangerous conditions.
956.		IND	Adaptive Management PAC is apparently considering quarterly reporting of variation from predicted to actual subsidence...I would urge that reporting be on the basis of weekly assessment and reporting and should include public disclosure on the Reports to affected landowners and the public generally.
957.		IND	If approval is seriously contemplated, I urge that Consent be in terms similar to a Staged Development, that is, with approval limited to discrete stages and requiring further Consent for subsequent stages.
958.		IND	The performance standards should be those relating to impacts which, once experienced, can never be recovered; these are the Applicant's own assertions as to subsidence, etc, and impact upon waterways and the like.
959.		IND	Loss of Property Values The proposal will lead to a loss of value for properties identified as subject to subsidence and a reduction in their saleability. As a prospective purchaser of land in the locality and who considered numerous properties prior to purchasing our current one in 2013, I can attest that had I known of the proposal, I would certainly have expected a significant drop in the asking price of any property likely to be impacted by a mine.
960.		IND	Transport of Extracted Coal Australian Rail Track Corporation (ARTC) has advised that there are no available paths for the trains which the Applicant is relying upon to transport the mined coal to the wharves at Newcastle. Transport for New South Wales (TNSW) has also indicated there are significant issues concerning rail access and capacity including alternative routing when parts of the Main Northern Line are unavailable for any reason ... lack of rail capacity is a critical constraint to the proposal, especially if the cure for this deficiency is the construction of additional mainlines, passing loops or holding yards.
961.		IND	Amplification of rail beyond that directly associated with the loading facility does not form part of the Applicant's proposal. This being the case, the proponents have not factored into their economic projections, the significant cost of augmenting existing rail lines and other major and minor infrastructure necessary to meet their transport requirements.
962.		IND	The Department of Trade and Investment (DTI) has raised concerns about the viability of the proposal and in particular cites the need to sterilise significant areas of coal beneath the major electricity transmission lines.
963.		IND	The proponents dismiss the impact of their proposal upon the valley communities and individuals but I believe they understate the amount of distress and anxiety their development has already engendered and will continue to do if approved.
964.		IND	To read in the proponent's documentation and which has already been favourably received by PAC, that the value of agriculture in the valleys is of no consequence, is to see your property and any efforts at raising cattle or the like regarded as worthless. The valley properties are what they are, their production capacity is necessarily limited by size and other constraints, but the value in self- worth and well-being of producing from the land, no matter how small, is inestimable.
965.		IND	Treatment of Salt Waste There is also a proposal that under certain circumstances, the underground salt storage would be flooded, although it is not disclosed where the massive amounts of water necessary to achieve this will come from
966.	Kay Wilson of Holgate NSW	IND	Transporting coal on roads spreads coal dust into residential area
967.	Karen Nagle of Jilliby NSW	IND	40 Smiths Rd, Jilliby Wyong Coal has not performed detailed analysis and assessments of the principle water courses of Little Jilliby Creek and Jilliby Jilliby Creek let alone all the seasonal waterways and drainage channels. I submit that land subsidence and land tilt could lead to soil erosion or changes in the course of the streams and losses of billabongs,

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			drainage channels and other water courses. Additionally, if the mining causes significant fractures or fissures, the water could be lost altogether and the Central Coast's supply of drinking water could be seriously compromised.
968.	Peter Williams	IND	Senior Office of OEH officials' diverted plans to have an air monitor installed at Wyee and placed an out of influence area at Wyong Racecourse.
969.	Pells Consulting (161395)	SIG	the report is restricted to matters of groundwater in the PAC documents and in the RTS document
970.	Pells Consulting (161395)	SIG	Groundwater- Key Point in PAC report PAC rather chose to highlight matters where we considered the paramters used y the Proponent's modelling were skewed to benefit the proponent. Those matters were secondary to the key point that the proponent's own analysis did not support the Proponenet's claims. There appears to be no ratinal way forward in this regard.
971.	Pells Consulting (161395)	SIG	Proponent responses The proponent dismissed matters raised in Sections 4.1 to 4.3.
972.	Pells Consulting (161395)	SIG	Connectivity The question of not whether there is connectivity but how long it il take for the impacts to be noted and become significant.
973.	Pells Consulting (161395)	SIG	Groundwater Modelling Change in water movement from the alluvium from the present near-field horizontal flow to downward flow will, as a matter of physics, cause loss of base flow and loss of bore supplies, regardless of the magnitude of flow.
974.	Pells Consulting (161395)	SIG	No regard given to the matters raised in our submissions.
975.	Pells Consulting (161395)	SIG	In our opinion, the way results are expressd in regards to "drainage on an average 20m high column" is very misleading and represents incorrect understanding of groundwater flow systems
976.	Central Coast Council	REG	The former Wyong Shire Council and former Gosford City Council lodged a combined objection to the proposal during the initial exhibition period in June 2013. The previous submission objected to the proposal on the grounds detailed in Section 1 of this submission. These concerns are still considered to be relevant. Central Coast Council requests that the Planning and Assessment Commission (PAC) consider these objections as part of its assessment of the amended application.
977.	Central Coast Council	REG	1.1 Impact on groundwater The EIS underestimates the potential impact on groundwater. The conclusions reached in the EIS are primarily the result of the input parameters adopted for their numerical modelling. These input parameters are primarily driven by the unsuitable method by which the makeup of the rock and its defects have been sampled and are not consistent with available data or modelling within the EIS. Further, the modelling assumes recharge of the water system based on average climatic conditions. The EIS implies that water inflow to the mine, of up to 2.5ML/day would largely come from water stored in the ground. However, it avoids the fact that water stored in the ground comes from somewhere, and is currently in equilibrium with natural recharge. A valid way to consider this matter is encapsulated in the following quotation from Dr Rick Evans, principal hydrogeologist of Sinclair Knight Merz, viz: "There is no free lunch here. It's very simple - every litre of water you pump out of the ground reduces river flow by the same amount". Australian Financial Review, 24 May 2007
978.	Central Coast Council	REG	Other points to note are: <ul style="list-style-type: none"> • It is unclear precisely what portions of which rivers will be affected by leakage losses from the near surface alluvial lands into the deeper rock mass; • The time it will take for the impact of underground extraction to reflect in surface flows cannot be determined; and • The EIS states that the mine will not fully recover groundwater pressures for over 500 years.
979.	Central Coast Council	REG	These points, combined with the uncertainty on the input parameters to the groundwater modelling suggest there is a high probability that leakage losses from the alluvial lands will impact the surface water. Given the high likelihood or even near certainty that climate impacts would be sufficiently severe at some point implies that it may affect visible flows for long periods.

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980.	Central Coast Council	REG	On balance, the findings from the EIS are at the least a limited and probably unconservative view of potential impacts. This means that, at present, it is not known with an acceptable level of confidence what the likely impacts of the longwalls will be on groundwater resources, and on groundwater that feeds into the streams of the Dooralong and Yarramalong Valleys.
981.	Central Coast Council	REG	<p>1.2 Impact on surface water</p> <p>The EIS underestimates the impact on surface water. Loss of surface water from streams in either the Yarramalong and/or the Dooralong Valley will have a direct impact on the availability of water in the Wyong River downstream of the proposed mine which is used as part of the water supply to the Wyong and Gosford Local Government Areas. Further, loss of surface water will also affect businesses such as turf farming and supply of water to local bores.</p> <p>The assessment of loss of surface water is entirely dependent on the inputs to groundwater modelling and the impacts on groundwater flow by the mine. The EIS concludes that there will be very little impact on leakage from the near surface alluvial lands due to the very low permeability of the rock below the alluvial lands and, that what loss does occur will be readily compensated for by surface recharge.</p> <p>These statements are based on two assumptions. Firstly, that average climactic conditions prevail and secondly, a favourable view of the permeability of the rock below the alluvial lands. The latter point is discussed above under the topic of groundwater modelling, but suffice to say there is considered to be a high level of uncertainty and a lack of factual evidence to confirm the parameters used.</p> <p>With regard to the first point above, for the EIS to be relevant, it must also consider the variation in inputs to the surface water supply in extended dry periods. The review in the PSM report considers the flow in Jilliby Creek between 1972 and 2013 to illustrate the sensitivity of the stream flow to climate and to small variations in flow volumes, viz:</p> <ul style="list-style-type: none"> the median flow rate in the creek is about 4.5 ML/day; flows of less than 1ML/day occurred for 24% of the time; flows of less than 0.1 ML/day occurred for 10% of time. <p>The predicted water inflow to the mine of up to 2.5ML/day represents more than half of the average flow for Jilliby Creek and is greater than the flows recorded for 40% of the time since 1972.</p> <p>These flows are put into perspective when records of consecutive days, since 1972, where low flows are considered. The five longest periods of consecutive days when flow was less than 1 ML/day and 2 ML/day range from 112 up to 190 days. This shows that when dry periods occur, the flow in the creeks can be expected to be at a level that may be readily affected by leakage losses from the alluvial lands.</p> <p>Further, a review of the climate during this period reveals that while some periods of drought did occur such as the Millennium Drought, it does not include the experience of the more intense droughts of World War 2, and the time of Federation.</p>
982.	Central Coast Council	REG	<p>1.3 Flooding</p> <p>The results of the flood assessment appear reasonable given the limits of the prediction of subsidence and can be considered as "best practice".</p> <p>In terms of primary access points, the six (6) adversely affected locations can be raised after subsidence has occurred to mitigate the adverse effect. In some instances, the works may require new culvert works to facilitate passage of flood waters past the obstacles.</p> <p>Council is concerned regarding the longer term maintenance requirements of any mitigation measures.</p> <p>The discussion on potential flood mitigation measures remain at a feasibility level but are considered appropriate and to constitute "best practice" for this level of appraisal. Detailed assessment will be required if planning approval is given and this must ensure all the Director General's requirements (now known as Secretary's</p>

No.	Stakeholder Name	ID	Issue
			Environmental Assessment Requirements) are met.
983.	Central Coast Council	REG	<p><u>Impact of subsidence</u></p> <p>Subsidence is the prime and most readily notable impact of underground longwall mining. The extent and magnitude of subsidence has a controlling influence on potential damage to property and the extent and nature of flooding and movement of surface water.</p> <p>The prime result of mining are the expected number and severity of impacts across the 245 properties within the area affected by the predicted subsidence, viz:</p> <ul style="list-style-type: none"> • 83% of properties being unaffected; • 12% requiring very minor to minor repair; • 5% requiring substantial to extensive repair; and • <0.5% requiring a complete rebuild (i.e. about 1 property). <p>These impacts are based on predictions of subsidence comprising:</p> <ul style="list-style-type: none"> • Vertical subsidence up to 2.6m with less subsidence predicted in residential areas to the east and more subsidence within forested areas to the west. • Tilts up to 15mm/m concentrated above the edges of the panels and over forested areas. • Tensile strains up to 4mm/m concentrated near the edge of panels. About 99% of these strains are expected to be less than 2.5 mm/m. • Compressive strains up to 5.5 m/m concentrated about 50m inside the panel edges. • About 99% expected to be less than 3.3 mm/m. • Far field movements up to -60 mm horizontally at a distance of around 1km from mining diminishing to less than 25 mm at a distance of 2 km. <p>The subsidence prediction used for W2CP was developed using three key components:</p> <ol style="list-style-type: none"> 1. The predictive model developed using the empirical Incremental Profile Method (IPM) by the specialist subsidence consultant MSEC; 2. The method used to calibrate the empirical predictive model by the consultant Strata Control Technology (SCD); and 3. Chain pillar performance. <p>Firstly, the situation at the proposed W2CP is unique, as it will be undertaking deep mining of the Newcastle Coal Measures. The IPM had to draw experience from various mining operations in New South Wales to develop the proposed mining strategy.</p> <p>From a geological perspective, the IPM drew on empirical data from the shallow underground coal mining from the Newcastle Coal fields. From an operational perspective, the experience of deep mining in the Southern Coal Fields was utilised.</p> <p>As a result, the predictions of subsidence by MSEC, based on the empirical IPM approach were calibrated against computer based modelling by SCT and it is the result of this combination of empirical mining experience and computer modelling calibration that forms the prime aspect of the review herein.</p> <p>In summary PSM concludes that:</p> <ul style="list-style-type: none"> • Based on their discussions with W2CP, PSM understands that something like four (4) to five (5) panels would need to be extracted before a full model

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No.	Stakeholder Name	ID	Issue
			<p>calibration exercise could be undertaken to assess the validity of the subsidence prediction and modelling undertaken.</p> <ul style="list-style-type: none"> The reliability and accuracy of the SCT method is unknown as: <ul style="list-style-type: none"> There is a reliance on extrapolated inputs to which the method has been shown to be sensitive. The model is calibrated to site-specific data, and not to a small number of measurements from other sites. The sensitivity to most input parameters is not presented. Due to the empirical nature of the method the Incremental Profile Method (IPM) is only as reliable as the data to which it is calibrated, in this case the SCT model results. Therefore the reliability and accuracy of the IPM is in doubt. <p>This is to some extent recognised by Mine Subsidence Engineering Consultants (MSEC) who in the EIS state that a "thorough calibration...will only be achieved after subsidence monitoring data is obtained and analysed".</p> <p>PSM concluded that:</p> <ul style="list-style-type: none"> The use of one predictive model to calibrate another is generally unwise and not widely regarded as best practice. The IPM is stated as being conservative and likely to over predict impacts. The evidence for this conservatism and the expected magnitude with respect to W2CP are not provided. Indeed all indications are that the model development is centred around matching expected conditions and not exceeding or over-predicting them. There is a reliance on pillar compression after extraction resulting in a smoother subsidence profile. However, the basis for this assumption appears to conflict the Geological Report (Appendix G), where significant variation in both roof and floor conditions is expected across the site. The EIS acknowledges that pillar compression may not occur but does not quantify the impacts or changes in impact should this not occur. First longwall will prove that this pillar compression assumption is valid. No less than 3 longwalls (L1N to L3N) and more likely 4 to 5 longwalls are required before the pillar compression theory can be verified. <p>PSM accepts that these predicted impacts are in agreement with expectations based on measured subsidence impacts elsewhere, and the Newcastle and Southern Coalfields in particular.</p> <p>PSM is in general agreement that should the predicted level of subsidence occur, the type distribution and severity of impacts on houses, buildings and infrastructure is likely to be similar to that stated in the EIS.</p> <p>PSM does not agree that the prediction represents a conservative estimate of subsidence impacts as all the evidence presented in the EIS suggests the prediction represents the most likely impacts.</p> <p>PSM considers that the model, calibration and application of the prediction does not provide sufficient guidance as to the sensitivity and reliability of the method and may, therefore, fail the Director General's "reasonable level of confidence" test.</p> <p>In general PSM did not find any omissions or evidence to suggest that subsidence due to W2CP is likely to be significantly different to that predicted by the EIS. PSM's main concern is the lack of certainty around the predictive method and the likely variation in prediction based on observed variations that are already known and potentially those unknown.</p>

No.	Stakeholder Name	ID	Issue
984.	Central Coast Council	REG	<p>1.5 Risk assessment and adaptive management</p> <p>In terms of groundwater impacts, and to a lesser extent surface subsidence, the EIS presents an abridged assessment of the potential impacts and hazards posed by the W2CP.</p> <p>This situation arises as the EIS only considers risks that have been modelled by the specialist consultants and is thereby limited by the specialist assumptions and either lack of or limited sensitivity assessments. This is not considered appropriate at this stage of the assessment where transparency as to the full extent of potential impacts should be canvassed.</p> <p>Further, the consequence rankings limit the risk assessment process by requiring that severe, long term and/or potentially irreversible impacts are only at the high end of the assessment scale.</p> <p>In order to begin to allow the impacts of the project to be managed via adaptive management, the understanding of the impacts and risks must be robust and comprehensive, and quantitative in nature, not qualitative as set out in the EIS.</p> <p>The risk assessment should consider the level of risk associated with all aspects of the W2CP, and in particular those that:</p> <ul style="list-style-type: none"> • are associated with a high level of severity in terms of consequence; • have a high degree of uncertainty surrounding the assessment/modelling; • have consequences that either may not/cannot be able to be remediated, mitigated or managed once they are observed; or • represent a significant degree of community concern. <p>The results of a rigorous, quantitative risk assessment could then be considered with respect to acceptable levels of risk, and/or a cost/benefit assessment. The latter may result in high consequence impacts with a low risk and/or cost impact being disregarded in the final assessment of the project. However, as stated above, all risks need to be considered and presented so an informed judgement/decision can be made.</p> <p>In terms of the aspects of the project covered in the PSM report, it is recommended that the following issues be subject to a detailed risk assessment process which reflects:</p> <ol style="list-style-type: none"> 1. Ground Water Impacts - test the sensitivity of the baseflow water losses with respect to hydraulic conductivity, level of subsidence induced by mining and environmental factors such as drought. 2. Subsidence Impacts - test the magnitude and location of subsidence effects with respect to items such as variability of the roof conditions of the mine and strength of pillars. <p>If the impacts of the mine are to be managed via adaptive management then a risk assessment is essential in order for the process to be:</p> <ul style="list-style-type: none"> • correctly focused; and • establish realistic and measurable targets. <p>Following this, and possibly with the assistance of a cost/benefit assessment, for an adaptive management plan to be effective it must be based on targets for monitoring and assessment that are:</p> <ul style="list-style-type: none"> • specific; • measurable; and • agreed between all parties.

No.	Stakeholder Name	ID	Issue
			Further, the targets must be accompanied by agreed responses to ensure any management systems is appropriate and capable of implementation.
985.	Central Coast Council	REG	<p><u>1.6 Structure and approach of the EIS</u></p> <p>The EIS should fully consider and assess the different phases of the mine. The EIS does not adequately assess construction impacts, focusing primarily on operations. Impacts and issues associated with air quality, water quality and transport are likely to be significantly different during construction than during operation. The EIS does not adequately consider closure planning and no assessment of potential closure impacts has been undertaken. The EIS does not demonstrate that the Project would be closed in a manner that safeguards the environment and community assets.</p> <p>The Proponent's risk assessment and cost benefit analysis is based on the results of the EIS. The risks, benefits and costs associated with the Project need to be re-rated based on the knowledge gaps and uncertainties that remain and the findings of further recommended studies.</p> <p>An Environmental Management System has not been developed for the Project, nor is there a commitment to develop such a system.</p> <p>The project proponent has not committed to regular independent environmental audits throughout the project life cycle. However, the project proponent has committed to developing an Annual Review Report to systematically assess performance and identify areas for improvement.</p>
986.	Central Coast Council	REG	<p><u>Stakeholder engagement</u></p> <p>The Proponent has still failed to adequately engage with the community during the environmental assessment process and consequently limited consultation has been conducted. The EIS does not provide sufficient information on the concerns raised by the community during consultation.</p>
987.	Central Coast Council	REG	<p><u>1.8 Water quality</u></p> <p>The EIS does not assess impacts on surface water quality associated with the construction phase of the Project, nor does it provide management and mitigation measures for any potential impacts. There is no contingency for the Project if development does impact on water quality or hydrology. The mined materials and wall rock of the deposit have not been assessed in terms of their ability to leach acid and metalliferous drainage (AMD). This is a significant oversight as AMD / saline drainage can be one of the most long-lived environmental impacts from coal mining.</p> <p>The surface water monitoring program does not include a sampling point immediately downstream of the proposed Walarah Creek tributary discharge site.</p> <p>The EIS does not provide contingency for overflow of untreated mine water from the Mine Operations Dam (MOD) in the event that overflow may occur.</p> <p>The baseline assessment for groundwater quality appears to have included measurement of only pH and total dissolved solids (TDS), neglecting other key analytical parameters and therefore not providing a suitable baseline.</p> <p>The proposed measures for groundwater impacts are limited to repairing damaged bores from subsidence and replacing water supply if groundwater drawdown exceeds expectations. This is considered inadequate at these measures only deal with the effects of the proposed mine, not the mitigation of potential impacts. The applicant must provide specific mitigation measures to limit the potential impacts on water quality resulting from the proposal.</p>
988.	Central Coast Council	REG	<p><u>1.9 Air quality</u></p> <p>The methodology for air quality impact assessment does not appear to have been undertaken in a manner consistent with applicable legislation (DECC, 2005). Some modelling appears to include only Project emissions rather than Project emissions with baseline conditions. This provides a misleading assessment of likely dust levels that will be experienced by surrounding communities. Construction impacts and impacts associated with certain climatic conditions are not clearly outlined.</p> <p>Predicted Project-related emission concentrations from dispersion modelling assume Project implementation of best practices. These estimates are only relevant provided</p>

No.	Stakeholder Name	ID	Issue
			these controls are implemented. It is unclear whether the EIS commits the Project to these management and mitigation measures.
989.	Central Coast Council	REG	<p>1.10 Greenhouse gas</p> <p>Greenhouse gas emission mitigation strategies are very brief and do not demonstrate a sufficient level of commitment by the Proponent to reduce emissions. As such the Greenhouse Assessment does not adequately address the terms listed in the requirements issued by the Department of Planning and Infrastructure (including the supplementary requirements).</p>
990.	Central Coast Council	REG	<p>1.11 Noise and vibration</p> <p>It is unclear whether the control measures identified in the Noise and Vibration specialist study are Project commitments or recommended best practices. The results of noise modelling are only valid if the recommended attenuation measures are committed to and implemented.</p> <p>While noise modelling indicates that construction and operational noise will not be a major issue for the Project, modelling predicted that there may be some exceedances of Project Specific Noise Criteria (PSNC). Additional mitigation measures are not identified to prevent these exceedances.</p>
991.	Central Coast Council	REG	<p>1.12 Ecology</p> <p>In general, an adequate ecological baseline (terrestrial and aquatic) has been provided, however, it lacks detail in regard to threatened species population distribution and abundance estimates. Ecological surveys should have been conducted over a broader survey area to reflect impacts associated with all project components.</p> <p>Offsets required under the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) threatened species identified within the Project Boundary were not calculated using the new EPBC Act Policy Guidelines of 2012.</p>
992.	Central Coast Council	REG	<p>1.13 Traffic and transport</p> <p>A Rail Study has been conducted as part of the 2013 EIS to address the gaps in information regarding transport impacts identified in the 2010 EIS. This is a more comprehensive assessment of the transport route of the coal.</p> <p>It is noted that, although the findings of the report were acceptable, the most recent amendments have superseded the Rail Study undertaken in 2013. The management of rail transport will be managed by Sydney Trains and the Hunter Valley Coal Chain Coordinator, and is therefore outside of Council's control.</p>
993.	Central Coast Council	REG	<p>1.14 Visual amenity</p> <p>The visual assessment conducted as part of the 2013 EIS provided a reasonable site analysis and identification of key viewpoints, assessment of potential visual impacts and recommendations for mitigation measures to minimise impacts of the Project.</p>
994.	Central Coast Council	REG	<p>1.15 Archaeology and cultural heritage</p> <p>In general, a comprehensive survey and report of the Aboriginal cultural and historic heritage of the areas surveyed within the Project Boundary has been prepared apart from some areas with accessibility restrictions.</p>
995.	Central Coast Council	REG	<p>1.16 Community health and safety</p> <p>Uncertainties and knowledge gaps identified in this report including air and water quality impacts indicate that the assessment of community health and safety impacts and risks and their necessary management and mitigation measures are unlikely to be sufficiently comprehensive.</p>
996.	Central Coast Council	REG	<p>1.17 Impacts beyond Director General's Requirements</p> <p>Contingency plans for potential disasters, whether naturally occurring or human induced, have not been included in the EIS. This is an oversight and should be rectified</p>

No.	Stakeholder Name	ID	Issue
			<p>prior to the further assessment and determination of the application.</p> <p>The Buttonderry Waste Management Facility is mentioned in the EIS in respect to visual amenity, however, the potential environmental risks (gas and leachate leakage) associated with the proximity of this facility to the project are not discussed.</p>
997.	Central Coast Council	REG	<p><u>1.18 Management and monitoring</u></p> <p>The EIS is not accompanied by management and monitoring plans. It is understood that these have not yet been prepared. Good industry international practice and / or best practice requires an Environmental Management and Monitoring Plan to be prepared as part of the EIS process. Ideally this should be accompanied by a budget indicating that the Project is sufficiently resourced to undertake this work. It is not possible to fully assess the impacts of the Project without an adequately articulated management and monitoring plan.</p> <p>Notwithstanding the above it is understood that the latest guidelines provide for Management Plans to be prepared much later in the process.</p> <p>In recent years a trend has developed for adopting 'Adaptive Management' to deal with uncertainties in respect to future impacts on groundwater and surface water systems from mining operations. This developed to the point that adaptive management involved changing the targets that were established in environmental impact statements in response to what actually occurred in the field. This was done in conjunction with the establishment of groundwater monitoring systems and the visual and flow monitoring in creeks and rivers.</p> <p>The unacceptability of this approach was determined by the Land and Environment Court in a recent case (2013) in regard to the proposed expansion of Berrima Colliery. The judges found as follows with respect to Adaptive Management:</p> <p>Adaptive management regime</p> <p>The intention of the Water Management Plan is to provide an adaptive management regime, under which management actions would be modified in response to the results of the monitoring program. Preston CJ held that,</p> <p>"in adaptive management, the goal to be achieved is set, so there is no uncertainty as to the outcome and conditions requiring adaptive management do not lack certainty, but rather they establish a regime which would permit changes, within defined parameters, to the way the outcome is achieved."</p> <p>It follows that it is necessary for there to be precise limits imposed on the cumulative operations of the colliery.</p> <p>The judges went on to quote Judge Preston in a previous case in relation to the need for implementation of the precautionary principle when there is uncertainty in respect to future environmental impacts. They stated:</p> <p>Preston CJ held in Telstra at [150], the following, in regard to the precautionary principle and the shifting of the evidentiary burden of proof:</p> <p>'If each of the two conditions precedent or thresholds are satisfied - that is, there is a threat of serious or irreversible environmental damage and there is the requisite degree of scientific uncertainty- the precautionary principle will be activated. At this point, there is a shifting of an evidentiary burden of proof. A decision-maker must assume that the threat of serious or irreversible environmental damage is no longer uncertain but is a reality. The burden of showing that this threat does not in fact exist or is negligible effectively reverts to the proponent of the economic or other development plan, programme or project.'</p> <p>We are satisfied that the precautionary principle is activated as the risk of significant environmental harm currently remains uncertain.</p>

No.	Stakeholder Name	ID	Issue
			<p>The judges determined that the proposed expansion of Berrima Colliery should not proceed on the basis of Adaptive Management as was proposed by the colliery owners.</p> <p>Council considers that the legal findings summarised above should be taken into account in respect to the proposed W2CP, because future impacts on groundwater and surface waters are likely to be substantial to both town water supplies in drought periods, and to agriculture and flora & fauna under even average climatic conditions. Furthermore, there are substantial uncertainties in respect to a number of these impacts, making it possible, and even probable that the impacts will be greater than assessed by the EIS.</p>
998.	Central Coast Council	REG	<p><u>2. Issues identified with the amended proposal</u></p> <p>The amendments primarily relate to the replacement of the originally proposed rail loop, within the Tooheys Road facility, by a conveyor system and coal load out facility along a new rail spur to be located along the Main Northern Rail Line (MNRL).</p> <p>The amendments also include the realignment of the proposed sewer connection to the Charmhaven Sewerage Treatment Plant (CSTP).</p> <p>Central Coast Council has reviewed the amended information. The issues identified are as follow:</p>
999.	Central Coast Council	REG	<p><u>2.1 Insufficient information provided</u></p> <p>The amended information prepared by the proponent does not provide sufficient information to undertake a comprehensive impact assessment.</p> <p>The omissions and limitations include:</p>
1000.	Central Coast Council	REG	<p><u>Strategic Planning Proposals</u></p> <p>A planning proposal (RZ/14/2014) was lodged over the adjacent land to the north of the proposed rail spur.</p> <p>The planning proposal includes low-density residential allotments, rural residential land and 1.4ha of commercial development. Conditional Gateway approval was granted in May 2016 by the Department of Planning and Environment (DoPE). The proposal includes land adjacent to the MNRL, with the southern extent of the residential land located approximately 240m north of the proposed rail spur.</p> <p>The amended assessment prepared by Hansen Bailey omitted the planning proposal and does not comment on the potential impacts posed by the proposed new coal delivery system.</p>
1001.	Central Coast Council	REG	<p><u>Detailed Design Drawings</u></p> <p>The detailed design drawings do not provide an accurate representation of the proposed coal delivery system. This extends to the following:</p> <ul style="list-style-type: none"> No details are provided on the elevated road crossings over Tooheys Road, the alignment along Tooheys Road / Doyalson Link Road or the connection with the coal load out facility. The omission of detailed designs of the structures identified above does not allow for a comprehensive assessment.
1002.	Central Coast Council	REG	<p><u>2.2 Flooding</u></p> <p>The proposed rail spur will require the construction of two (2) new crossings over the Spring Creek tributaries located at existing rail bridges.</p> <p>The new structures will be located within the tributaries and will be affected by the 1% AEP flood levels.</p>

No.	Stakeholder Name	ID	Issue
			<p>The flood modelling undertaken by G Herman & Associates indicated that the new structures would result in afflux of 0.01m at Bridge 1 and 0.03m at Bridge 2. Velocities during these large storm events will increase flows by a maximum of 0.04m/s around the new bridges.</p> <p>As the proponent has provided no specific details on the bridge designs, it is difficult to gauge the robustness of the flood modelling. Based on the modelling provided, it would appear that the proposal will not significantly affect the flood patterns in the area, but this cannot be determined with certainty.</p> <p>It is understood that the final design of any structures is to be discussed with the NSW Office of Water (NOW) to ensure limited impact on the riparian corridor.</p>
1003.	Central Coast Council	REG	<p><u>2.3 Noise Impacts</u></p> <p>The proponent provided acoustic modelling showing the changes in the acoustic environment. The modelling included the construction of a 4.5m high noise barrier along the southern section of the new rail spur. The barrier will extend approximately 50m north from the Doyalson Link Road.</p> <p>The modelling indicated that the new coal delivery plant would have a negligible impact on the residential development in Blue Haven and Wyee South.</p> <p>However, ongoing noise monitoring must be undertaken to verify the modelling during the operational stage of the development. The proponent must address and rectify any noise emissions found to be above those specified in the acoustic modelling.</p>
1004.	Central Coast Council	REG	<p>Noise levels at the dwellings along Thompson Vale Road and Bushells Ridge Road will increase by up to 4dB. The report states that this level of impact can be described as a 'Moderate' degree of affectation, under the Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Development (VLAMP). The recommendation includes the installation of 'reasonable and feasible noise mitigation measures such as double glazing, insulation and/or air conditioning will be made available to affected landowners, upon request.'</p> <p>The proposed changes in the ambient acoustic environment will result in significant impacts on these residences. The coal delivery system must be redesigned or additional mitigation measures developed to ensure these impacts are eliminated.</p>
1005.	Central Coast Council	REG	<p>No modelling of the impacts on the future residential and commercial development to the north of the proposed rail spur was undertaken. The noise assessment therefore does not specifically address the potential impacts on the areas mentioned above.</p> <p>The proponent must consider amendments to the current design to reduce the potential acoustic impacts. The amended assessment and modelling showing the potential impacts on the land to the north of the coal load out facility must also be provided.</p>
1006.	Central Coast Council	REG	<p><u>2.4 Air Quality</u></p> <p>Updated PM2.5 and PM10 modelling was provided as part of the amended proposal. The modelling indicated that air quality would not significantly change from that expected under the original proposal.</p> <p>The modelling does not however include impacts on the future residential and commercial development on the land included in RZ/14/2014 and on the Council Land Holdings. Additional modelling must be provided to identify the potential air quality impacts on the land to the north. Where necessary, appropriate mitigation measures must be provided.</p>
1007.	Central Coast Council	REG	<p>The consent authority must ensure that specific air quality monitoring is undertaken as part of the ongoing operation of the proposed mine. This must include permanent dust deposition gauges to be located at the:</p> <ul style="list-style-type: none"> southern extent of the future residential development included in RZ/14/2014; western extent of the Council Land Holdings;

No.	Stakeholder Name	ID	Issue
			<ul style="list-style-type: none"> western extent of the existing residential development in Blue Haven; existing gauges D3 and D4 (as shown on Figure 2.1 of the Air Quality; and Greenhouse Gas Assessment prepared by Pacific Environment Limited). <p>Any emissions exceeding the relevant guidelines must be addressed and appropriate mitigation measures put in place to negate any health impacts resulting from the exceedances.</p>
1008.	Central Coast Council	REG	<p><u>2.5 Ecology</u></p> <p>Council's Ecologist has reviewed the Ecological Impact Assessment – Addendum prepared by Cumberland Ecology (June 2016) and notes that the amendments result in an overall reduction of impacts on biodiversity values compared to the original proposal.</p> <p>The report identifies potential habitat in the study area for the species listed below, however, surveys were not undertaken during their optimal survey period (in accordance with Council's Flora and Fauna Survey Guidelines (2014)):</p> <ul style="list-style-type: none"> Caladenia tessellata (Sep – Oct); Corunastylis sp. 'Charmhaven' (Feb – Mar). The earliest that known populations of the species have been detected is 29 January, with the majority detected in February and March (Payne, 2014); Corunastylis insignis (Sep – Oct); Tetratheca juncea (Sep – Oct); and Thelymitra adorata (Sep – Oct). <p>The significance of impacts to these species cannot be fully assessed until surveys are undertaken in accordance with Council's survey guidelines. Prior to the consideration of the application, it is requested that surveys are undertaken for the species during the periods listed above and the appropriate survey time should be further refined by confirming with Council when known reference populations are flowering.</p> <p>The results of targeted flora surveys should be used in updated Assessments of Significance for the species.</p>
1009.	Central Coast Council	REG	<p><u>2.6 Visual Impacts</u></p> <p>The applicant provided an addendum to the Visual Impact Assessment (VIA) to address the proposed amendments. This included the assessment of six (6) new viewsheds along the conveyor alignment and Nikko Road reserve. The assessment concluded that a 'Moderate' impact would result from the new coal delivery system and will therefore not significantly affect the surrounding development.</p> <p>The VIA did not include any photomontages showing the view from the surrounding properties towards the 27.5m high coal load out facility. It is therefore difficult to understand the level of impact.</p> <p>The proponent must provide an amended VIA to include:</p> <ul style="list-style-type: none"> an assessment of the visual impacts on the land to the north of the proposed coal load out facility. ; the Council Land Holdings; and photomontages of all the viewsheds included in the amended VIA.
1010.	Central Coast Council	REG	<p><u>2.7 Service Connections</u></p> <p>The proponent amended the proposed sewer connection that connects the Tooheys Road site to the CSTP.</p> <p>The infrastructure is to be located along a similar alignment as the proposed conveyor system. At the Doyalson Link Road rail crossing, the sewer will follow the Nikko</p>

No.	Stakeholder Name	ID	Issue
			<p>Road reserve to the CSTP in the south.</p> <p>Should the proposal be granted approval, the proponent must liaise with Council to ensure the sewer alignment is acceptable. Potential servicing synergies with the future industrial development to the south of the Link Road may also be available in the future.</p> <p>Furthermore, the following conditions relating to Council's water and sewer services should be imposed, in the event of any approval:</p> <ul style="list-style-type: none"> • no disposal of brine or mine water to the sewer; • connection of potable water to Buttonderry and Tooheys Road sites; • sewage connection to Buttonderry and Tooheys Road sites; and • connections to be in accordance with Council's requirements.
1011.	Central Coast Council	REG	<p><u>2.8 Construction Management</u></p> <p>The amended submission provides limited details on the management of the construction of the coal delivery system. In the event of approval, a Construction Environmental Management Plan (CEMP) must be prepared to provide details on the access arrangements, traffic management procedures, depot locations and construction activities during the construction phase of the development.</p>
1012.	Central Coast Council	REG	<p><u>CONCLUSION</u></p> <p>The initial submission prepared by the former Wyong Shire Council and Gosford City Council, objected to the proposal on a number of grounds. These have been outlined above.</p> <p>These concerns are still considered to be relevant and the Central Coast Council considers that the PAC should include these as part of its assessment of the amended proposal. In the event, however, that it is intended to progress the application, the matters set out in the table attached to the original submission need to be addressed.</p> <p>It is considered that the information provided to inform the proposed amendments are not sufficient to undertake a comprehensive assessment of the potential impacts.</p> <p>Prior to further consideration and determining of the application, the following matters need to be addressed:</p> <ul style="list-style-type: none"> • Detailed designs of the structures above must be prepared for review prior to further assessment of the application. This includes detailed bridge designs that reflect the pier configuration of the existing bridges. • An updated noise impact assessment, air quality assessment and visual impact assessment must be prepared to assess the potential impacts from the proposed amendments on the future urban design included in RZ/14/2014 and the Council Land Holdings. • Permanent dust deposition gauges must be installed and monitored at: <ul style="list-style-type: none"> • southern extent of the future residential development included in RZ/14/2014; • western extent of the Council Land Holdings; • western extent of the existing residential development in Blue Haven; • existing gauges D3 and D4 (as shown on Figure 2.1 of the Air Quality; and • Greenhouse Gas Assessment prepared by Pacific Environment Limited). • Seasonal flora and fauna surveys must be undertaken in accordance with Council's survey guidelines for the species listed in the submission above. The results of targeted flora surveys should be used in updated Assessments of Significance for the species. • An amended Visual Impact Assessment must be prepared and include detailed photomontages of the vistas surrounding the proposed 27.5m

No.	Stakeholder Name	ID	Issue
			<p>high coal load out facility.</p> <ul style="list-style-type: none"> Further, the following conditions relating to Council's water and sewer services must be imposed: <ul style="list-style-type: none"> no disposal of brine or mine water to the sewer, connection of potable water to Buttonderry and Tooheys Road sites, sewage connection to Buttonderry and Tooheys Road sites, and connections to be in accordance with Council's requirements. A CEMP must be prepared and include details on the access arrangements, traffic management procedures, depot locations and construction activities. <p>The information submitted as part of the amended proposal does not provide sufficient detail to undertake a comprehensive assessment of the potential impacts resulting from the new coal delivery system. Accordingly, Central Coast Council remains opposed to the proposal.</p>
1013.	DRE	REG	Under the Conditions of the Mining Lease (ML), the Division's requires a title holder to adopt a risk-based approach to achieving the required rehabilitation outcomes. The applicability of the controls to achieve effective and sustainable rehabilitation is to be determined based on the site specific risk assessments conducted by the title holder. This risk assessment should be used to not only establish a basis for managing risk when planning an activity, but it should also be used and updated (as required) to continuously evaluate risk and the effectiveness of controls used to prevent or minimise impacts. A title holder may also be directed by the Division to implement further measures, where it is considered that a risk assessment and associated controls are unlikely to result in effective rehabilitation outcomes.
1014.	DRE	REG	The effects of subsidence have not been considered in this assessment. DPE should refer to the Departments Resource Regulator for separate advice.
1015.	DRE	REG	As coal is a prescribed mineral under the Mining Act 1992, the proponent is required to hold the appropriate mining titles from the Division in order to mine this mineral. The Division notes the proposed mining activities are within the existing Authorisations 405 and EL 4911 held by the proponent and MLA 342, 343, 346, 350, 462 and 522 submitted by the proponent.
1016.	DRE	REG	The Division recommends that sustainable rehabilitation outcomes can be achieved as a result of the project.
1017.	DRE	REG	The recommended draft conditions of approval have been reviewed by consistency and standardization with other project assessments and the draft Development Consent Conditions for SSD4974 (as originally proposed in 2013).
1018.	DRE	REG	Pending granting of the Development Consent, the Division recommends that the following conditions be incorporated.
1019.	DRE	REG	Rehabilitation Objectives and Commitments Rehabilitation must be substantially consistent with the Rehabilitation Objectives as described in the EIS and the Statement of Commitments outlined below. (See table in submission)
1020.	DRE	REG	Progressive Rehabilitation The Proponent shall carry out all surface disturbing activities in a manner that, as far is reasonable practicable, minimizes potential for dust emissions and shall carry out rehabilitation of disturbed areas progressively, as soon as reasonably practicable.
1021.	DRE	REG	Rehabilitation Plan The Proponent must prepare and implement a Rehabilitation Plan. The Rehabilitation Plan must: <ul style="list-style-type: none"> Be prepared in accordance with Division guidelines and in consultation with the Division, Office of Environment and Heritage, Environmental Protection Authority, Department of Primary Industry – Water, Wyong Council and the Community Consultation Committee; Be approved by the division prior to carrying out any surface disturbing activities of the development, unless otherwise agreed by the Secretary, DPE. Incorporate and be consistent with the rehabilitation objectives in the EA, the statement of commitments and the above table. Integrate and build on, to the maximum extent practicable, the other management plans required under this approval. Address all aspects on mien closure and rehabilitation, including post mining land use domains, rehabilitation objectives, completion criteria and rehabilitation monitoring and management.
1022.	ARTC	REG	Following your request in March 2016 for ARTC to model the capacity availability for the Wallarah 2 Coal Project volumes on the ARTC Hunter Valley Network I can confirm that there is sufficient capacity on the ARTC Hunter Valley Network to accommodate the indicated volumes without the requirement for additional infrastructure to

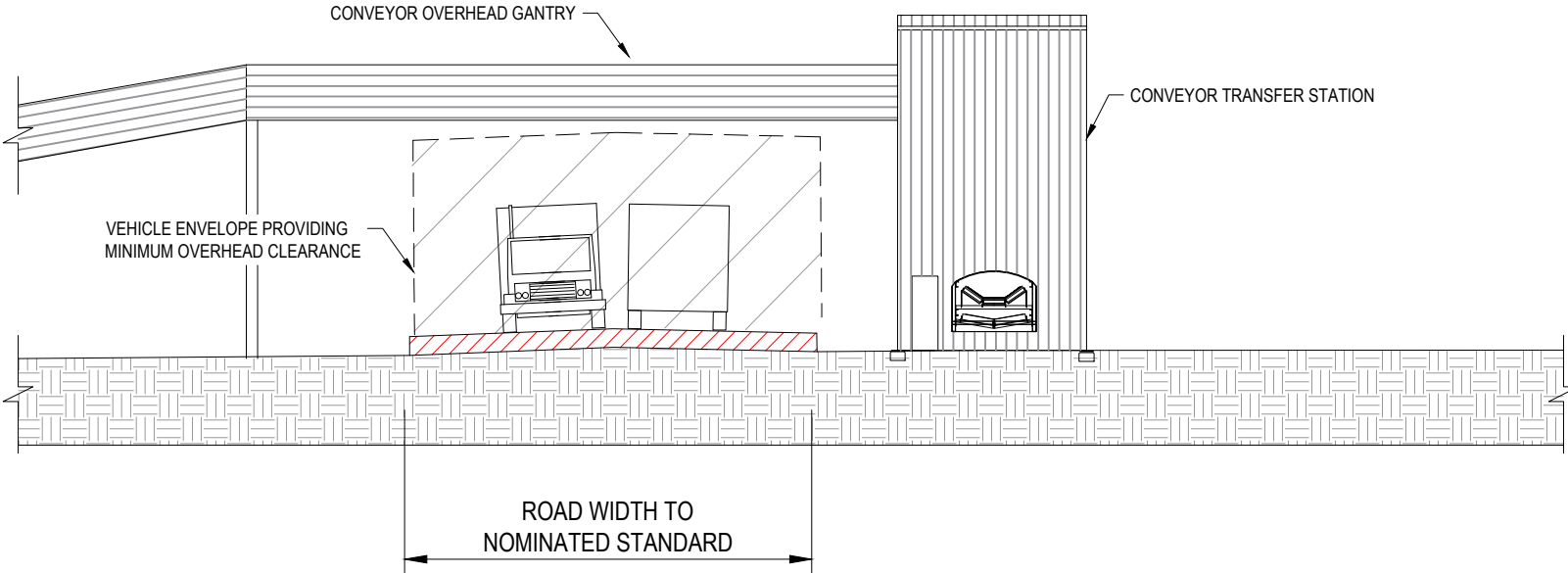
No.	Stakeholder Name	ID	Issue
			be developed.
1023.	ARTC	REG	I would like take the opportunity to reiterate that as per our discussion in May 2016, that although there is sufficient capacity within the Hunter Valley Network to accommodate the Wallarah 2 Coal volumes, the operational complexities between integrating the dynamic ARTC Hunter Valley coal chain (HVCC) with the adjoining Transport for NSW (Railcorp) network's timetable will create significant challenges for successful delivery of the proposed the Wallarah 2 Coal Project volumes across the two rail networks.
1024.	ARTC	REG	Due to the dynamic nature of the demand profile of the HVCC, the risks will change from day to day and will require close coordination between Wallarah 2, Railcorp, ARTC and your rail haulage provider to manage any issues that present.
1025.	DP&E	REG	Rail and road network a. The EIS accompanying the amended development application proposes changes to the originally proposed train cycles for the project. It is unclear to the Department whether the modelling used to determine that there is 'sufficient network capacity' without the need for additional infrastructure included any increase in existing passenger and non-coal freight train as would be expected over the life of the project.
1026.	DP&E	REG	Rail and road network b. Whilst noting that some information has been provided on alternate access to land parcels in the event of closure of Nikko Road, the Department has reviewed numerous submissions which contend that access via other routes is not possible, practical or convenient. The Department requests further detailed information on all alternate access routes (including their standard and quality, and any potential limitations), design of the proposed shared road corridor and how access for emergency and telecommunications services would be managed and maintained for both the shared road corridor and for other land parcels.
1027.	DP&E	REG	Air quality a. Check for inaccuracies as per EPA's comments.
1028.	DP&E	REG	Air quality b. The air quality management and mitigation measures should provide clear commitments, and avoid ambiguous or hypothetical language. For example, words such as 'would', 'should', 'where possible' or 'where necessary' are to be avoided or clearly defined.
1029.	DP&E		Noise a. The Department shares a number of concerns raised by the EPA in regards to noise. In particular, the Department expects the RTS to address issues relating to classification of amenity categories for potentially affected receivers. The noise assessment should be revised based on the EPA's recommendations, or else a strong justification provided as to why each receiver has been assigned the proposed amenity category.
1030.	DP&E		Noise b. Based on revisions consequent to point a., further consideration of the NSW Government Voluntary Land Acquisition and Mitigation Policy should be provided.
1031.	DP&E		Noise c. The Department is concerned about the potential construction noise impacts to receivers in the vicinity of the rail corridor. Further and/or additional management and mitigation measures should be provided once the EPA's comments have been addressed.
1032.	DP&E		Noise d. The noise management and mitigation measures should provide clear commitments, and avoid ambiguous or hypothetical language. For example, words such as 'would', 'should', 'where possible' or 'where necessary' are to be avoided or clearly defined.
1033.	DP&E		Visual a. Photomontages of all the viewsheds included in the amended visual impact assessment should be provided, as well as from the potential viewsheds discussed in Section 5 below.
1034.	DP&E		Impacts on other land users a. The EIS does not provide adequate consideration of the potential impacts of the amended development on potential future adjacent land uses. For example, land to the north of the proposed rail spur (240 metres) has recently been granted conditional Gateway approval for low-density residential allotments, rural residential land and a small amount of commercial development. The Department notes that 'sensitive receivers' do not currently exist on this land, nor is there any immediate likelihood of this; however the potential impacts on privately-owned land (vacant or otherwise) should be considered.
1035.	DP&E		Impacts on other land users b. The Darkinjung Local Aboriginal Land Council (Darkinjung LALC) has raised a number of concerns regarding the potential impacts the proposed amendment would have on its future ability to develop its land, should the project be approved. The Department acknowledges the Darkinjung LALC as a significant landholder of land

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			surrounding the proposed amendment area. The Department considers that the interests of the Darkinjung LALC in regards to its land surrounding the amendment proposal have not been adequately considered in the EIS. Further detailed information regarding proximity of these land parcels to the proposed coal infrastructure, and potential noise, air quality and visual impacts should be provided. As discussed in Section 4, photomontages of the proposed coal infrastructure as potentially viewed from these parcels of land should be provided.								
1036.	DP&E		Agency and public submissions DPE requests the RTS consider and respond to all agency and public submissions received, including advice presented and recommendations made therein.								
1037.	DPI – Resources and Energy		I refer to your email of 20 July 2016 requesting comments from the Division of Resources & Energy (the Division) to an amended development application and revised Environmental Impact Statement (EIS) for the Wallarah 2 Project (the Project) proposed by Wyong Areas Joint Venture (the Proponent). The purpose of the review is to determine whether the applicant has provided sufficient information in the Environmental Assessment (EA) to assess the potential impacts of the modifications. Specifically, the Division's assessment has been undertaken to determine whether economic, social and environmental outcomes can be sustain ably achieved as a result of the project and that any identified risks or opportunities can be effectively regulated through the conditions of mining titles issued under the <i>Mining Act 1992</i> . It should be noted that this review does not represent the Division's endorsement of the proposed rehabilitation methodologies as presented in the EIS.								
1038.	DPI – Resources and Energy		Under the conditions of a Mining Lease (ML), the Division's requires a title holder to adopt a risk-based approach to achieving the required rehabilitation outcomes. The applicability of the controls to achieve effective and sustainable rehabilitation is to be determined based on the site specific risk assessments conducted by a title holder. This risk assessment should be used to not only establish a basis for managing risk when planning an activity, but it should also be used and updated (as required) to continuously evaluate risk and the effectiveness of controls used to prevent or minimise impacts. A title holder may also be directed by the Division to implement further measures, where it is considered that a risk assessment and associated controls are unlikely to result in effective rehabilitation outcomes.								
1039.	DPI – Resources and Energy		The Division has reviewed the <i>Walarah 2 Coal Project Amendment to Development for Wyong Areas Coal Joint Venture July 2016</i> (Application SSD-4974) and advises the following: The effects of subsidence have not been considered in this assessment. Department of Planning and Environment (DPE) should refer to the Department's Resource Regulator for separate advice.								
1040.	DPI – Resources and Energy		As coal is a prescribed mineral under the Mining Act 1992, the proponent is required to hold appropriate mining titles from the Division in order to mine this mineral.								
1041.	DPI – Resources and Energy		The Division notes the proposed mining activities are within existing Authorisation 405 and EL 4911 held by the Proponent and MLA 342, 343, 346, 350, 462 and 522 submitted by the Proponent.								
1042.	DPI – Resources and Energy		The Division recommends that sustainable rehabilitation outcomes can be achieved as a result of the project.								
1043.	DPI – Resources and Energy		The recommended draft conditions of approval have been reviewed for consistency and standardisation with other project assessments and the draft Development Consent Conditions for SSD4974 (as originally proposed in 2013).								
1044.	DPI – Resources and Energy		<table><tr><td colspan="2">Pending grant of the Development Consent, the Division recommends that the following conditions be incorporated: Rehabilitation must be substantially consistent with the Rehabilitation Objectives as described in the EIS and the Statement of Commitments outlined below.</td></tr><tr><td>Rehabilitation Feature</td><td>Objective</td></tr><tr><td>Mine site (as a whole of the disturbed land and water)</td><td>Safe, stable and non-polluting, fit for the purpose of the intended post-mining land use(s). Final landforms designed to incorporate natural micro- relief and natural drainage lines, which, where reasonable and feasible, further avoid straight run drainage drop structures, to integrate with surrounding landforms.</td></tr><tr><td>Surface Infrastructure</td><td>To be decommissioned and removed. Sites to be made safe, and hydraulically and geotechnically stable. Site to be revegetated with suitable local native plant species, and a landform consistent with the surrounding environment.</td></tr></table>	Pending grant of the Development Consent, the Division recommends that the following conditions be incorporated: Rehabilitation must be substantially consistent with the Rehabilitation Objectives as described in the EIS and the Statement of Commitments outlined below.		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). Final landforms designed to incorporate natural micro- relief and natural drainage lines, which, where reasonable and feasible, further avoid straight run drainage drop structures, to integrate with surrounding landforms.	Surface Infrastructure	To be decommissioned and removed. Sites to be made safe, and hydraulically and geotechnically stable. Site to be revegetated with suitable local native plant species, and a landform consistent with the surrounding environment.
Pending grant of the Development Consent, the Division recommends that the following conditions be incorporated: Rehabilitation must be substantially consistent with the Rehabilitation Objectives as described in the EIS and the Statement of Commitments outlined below.											
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). Final landforms designed to incorporate natural micro- relief and natural drainage lines, which, where reasonable and feasible, further avoid straight run drainage drop structures, to integrate with surrounding landforms.										
Surface Infrastructure	To be decommissioned and removed. Sites to be made safe, and hydraulically and geotechnically stable. Site to be revegetated with suitable local native plant species, and a landform consistent with the surrounding environment.										

No.	Stakeholder Name	ID	Issue
			Rehabilitation materials
			Materials (including topsoils, substrates and seeds of the disturbed areas) are recovered, appropriately managed and used effectively as resources in the rehabilitation.
			All watercourses subject to subsidence impacts
			Hydraulically and geomorphologically stable, with riparian vegetation that is the same or better than prior to mining
			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.
			Steep slopes and rock face features subject to subsidence impacts
1045.	DPI – Resources and Energy		No additional risk to public safety compared to prior to mining.
			Built features damaged by mining operations
			Repair to pre-mining condition or as nearly practicable unless the owner agrees otherwise, or the damage is fully restored, repaired or compensated for under the <i>Mine Subsidence Compensation Act 1961</i> .
			Community
			Ensure public safety with regard to the effects of mining activity
			Rehabilitation of Native flora and fauna habitat
			Size, locations and species of native tree lots and corridors are established to sustain biodiversity habitats. Species are selected that re-establish and complement 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.)
1045.	DPI – Resources and Energy		The Proponent shall carry out all surface disturbing activities in a manner that, as far as reasonably practicable, minimises potential for dust emissions and shall carry out rehabilitation of disturbed areas progressively, as soon as reasonably practicable.
1046.	DPI – Resources and Energy		The Proponent must prepare and implement a Rehabilitation Plan. The Rehabilitation Plan must: • be prepared in accordance with Division guidelines and in consultation with the Division, Office of Environment & Heritage, Environmental Protection Authority, Department of Primary Industry - Water, Wyong Council and the Community Consultation Committee
1047.	DPI – Resources and Energy		be approved by the Division prior to carrying out any surface disturbing activities of the development, unless otherwise agreed by the Secretary, DPE.
1048.	DPI – Resources and Energy		incorporate and be consistent with the rehabilitation objectives in the EA, the statement of commitments and the above table.
1049.	DPI – Resources and Energy		integrate and build on, to the maximum extent practicable, the other management plans required under this approval
1050.	DPI – Resources and Energy		address all aspects of mine closure and rehabilitation, including post mining land use domains, rehabilitation objectives, completion criteria and rehabilitation monitoring and management.
1051.	Transgrid		Correspondence provided by WACJV refers to 2013 email correspondence / submission
1052.	DLALC		As outlined in our earlier submission, the amended DA will have significant adverse impacts on Darkinjung's interests in the immediate locality. Darkinjung maintains the objections set out in its earlier submission and maintains that the amended DA should be refused for the reasons set out in that submission. We note that since the earlier submission Darkinjung still has not received basic documentation such as a copy of Road Closure Application W562973. This and the inadequacy of the other information in the Amended DA has prevented Darkinjung and other members of the public to properly comment on the proposal. The public notification and consultation process has been fundamentally flawed in this regard.
1053.	DLALC		As noted at paras [103]-[114] of our earlier submission, the Director-Generals requirements, and the supplementary Director-General's requirements required consultation with affected land owners, and that did not occur. As a result options which might otherwise been considered and developed prior to lodging the amended DA have not been investigated. The failure of Walarah 2 to effectively consult with Darkinjung has prevented the opportunity to explore all options - not only to the benefit of both parties, but also the broader community. Specifically the amended proposal;

No.	Stakeholder Name	ID	Issue
1054.	DLALC		Has not given any consideration for potential impacts upon major residential rezoning proposals, lodged with Wyong Shire Council in 2014, to which a Gateway Determination was issued by the Department in May 2016;
1055.	DLALC		Will, as a result of the closure of the Nikko Road reserve, deny access to other Darkinjung land interests in the immediate area;
1056.	DLALC		Has not considered the potential future strategic need of the Nikko Road corridor, to link a growing Wyee to the growing Warnervale area.
1057.	DLALC		Since our letter of 31 of August, we have exchanged a number of communications with Wallarah 2, in an effort to find acceptable solutions to all parties. A further alternative scenario has been presented to Wallarah 2, which they have indicated a willingness to also investigate, but to date, no agreement/solution has been reached. Darkinjung maintains that to expedite a determination without full and proper consideration of not only Darkinjung's interests, but also viable alternatives, is tantamount to failure in the application of Government policy.
1058.	RMS		Roads and Maritime understands the application involves modifications to the existing approval for the Wallarah 2 Coal Project including a new connection to rail infrastructure through a rail spur and conveyor system and construction of a sewer connection. No change is proposed to the road network however the proposed rail spur and conveyor system are to run east, parallel to the Motorway Link Road to the Main Northern Rail Line and the sewer connection is to be constructed underneath the Motorway Link Road following the rail line to the south. It is unclear from the plans provided whether the new conveyor infrastructure is to be provided within the road reserve.
1059.	RMS		Roads and Maritime has no proposal that requires any part of the property.
1060.	RMS		The property has common boundaries with the Pacific Motorway M1 (former F3 Freeway), which is declared Freeway, and Doyalson Motorway Link (MR675), which is declared Controlled Access Road. Direct access across these common boundaries is restricted.
1061.	RMS		The applicant shall undertake a risk assessment consistent with the requirements of the RMS Draft "Technical Guide to Mine Risk Assessment IAM-AM-TP1-160-G01 - Version 1 draft with cover page February 2015" for works within the road corridor.
1062.	RMS		As previously advised by the Roads and Maritime M1 Pacific Motorway Replacement and Widening: Tuggerah to Doyalson Project team, bridges in the vicinity of the proposed "drift tunnel" have been designed to cater for lateral ground strains of +/-2mm/m due to adjacent mining activities. The Wallarah 2 Coal Project have previously committed to zero ground settlement from the proposed drift tunnel and, accordingly the bridges have been designed to allow for 0mm vertical, 0mm horizontal and 0 rads rotational displacements.
1063.	RMS		The applicant shall undertake background vibration monitoring and ensure that vibration at the bridge supports for the existing Doyalson Link Rd M1 overbridge resulting from the excavation and reinstatement of the proposed drift tunnel shall not exceed that expected under normal operational service.
1064.	RMS		The applicant shall design and construct the proposed drift tunnel so as to avoid direct or consequential interaction with existing bridge piles or any effect on the bridge structures. Regarding piles for the Doyalson Link Rd M1 overbridges, Roads and Maritime advises: <ul style="list-style-type: none"> • Piles for the existing Doyalson Link Rd M1 overbridge are believed to be founded at approximately R.L 28.00m or below with some uncertainty. • Piles for the proposed Doyalson Link Rd M1 overbridge duplication are designed to be founded at approximately RL 20.70m +/-5m.
1065.	RMS		Prior to the issue of any construction certificate the applicant shall consult with Roads and Maritime Asset Network Management to arrange and enter into a deed with regards to any works within the classified road corridor. <i>Comment: The deed should stipulate terms and conditions in relation to the construction, operations/maintenance and disposal of all works within the classified road corridor.</i>
1066.	Communication Partners Inc		Form letter issues F1, F2

APPENDIX C
Additional Design Drawings

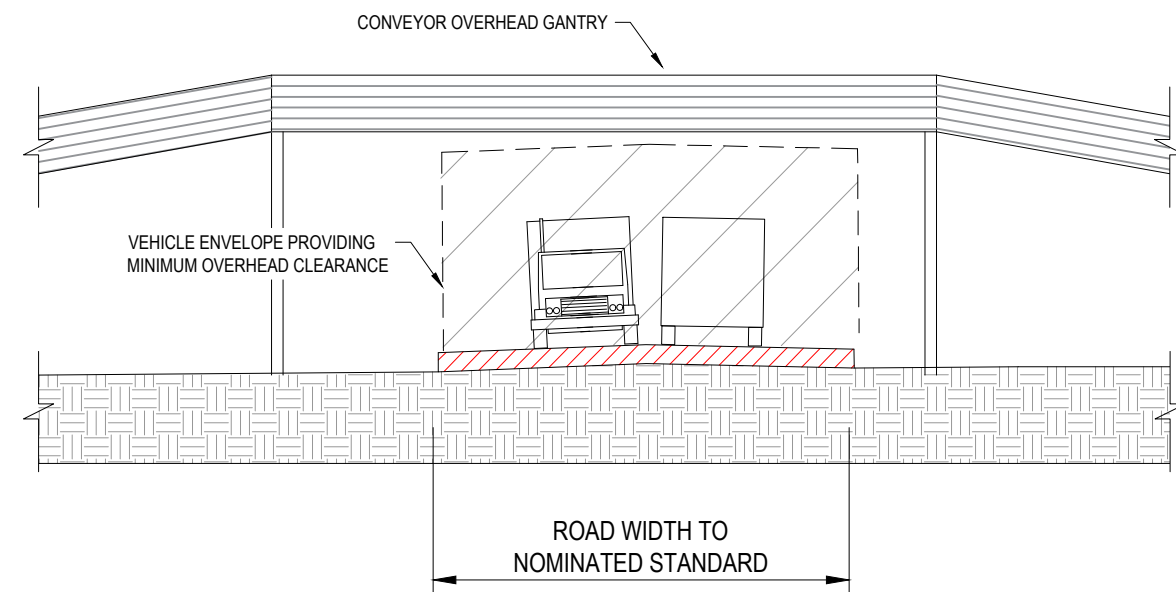


ELEVATION
TOOHEYS ROAD
SCALE 1:200

- NOTES:
- 1. MINIMUM VEHICULAR CLEARANCE TO BE IN ACCORDANCE WITH RMS STANDARDS.
 - 2. OVERHEAD GANTRY TRESTLES TO BE OUTSIDE CLEAR ZONE. OTHERWISE SAFETY BARRIERS TO BE INSTALLED IN ACCORDANCE WITH RMS STANDARDS.
 - 3. CONVEYOR GANTRY WILL HAVE SOLID FLOOR WITH DRAINING TO THE MAIN SITE DRAINAGE SYSTEM

CONCEPT ONLY

									 <p>GHD Tower, Level 3 24 Honeysuckle Drive, Newcastle NSW 2300 Australia PO Box 5403 Hunter Rgn Mail Cent. NSW 2310 T 61 2 4979 9999 F 61 2 4979 9988 E ntmail@ghd.com W www.ghd.com</p>	DO NOT SCALE		Drawn J.JENNINGS	Designer P.YOUMAN	Client	WYONG COAL WALLARAH 2	
D	RE-ISSUED FOR COMMENT			I.M.S.			21.10.16			Drafting Check	Design Check	Project	WALLARAH 2			
C	CLIENT COMMENTS INCORPORATED			J.J			26.08.16			Approved (Project Director) Date		Title	GANTRY OVER TOOHEYS ROAD PLAN AND ELEVATION			
B	CLIENT COMMENTS INCORPORATED			J.J			24.08.16									
A	ISSUED FOR COMMENT			JJ			22.08.16									
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing			Drawn	Job Manager	Project Director	Date		Scale AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	Original Size	Drawing No: 22-17704-C306	Rev: D		

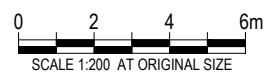


ELEVATION
BORAL ROAD
SCALE 1:200

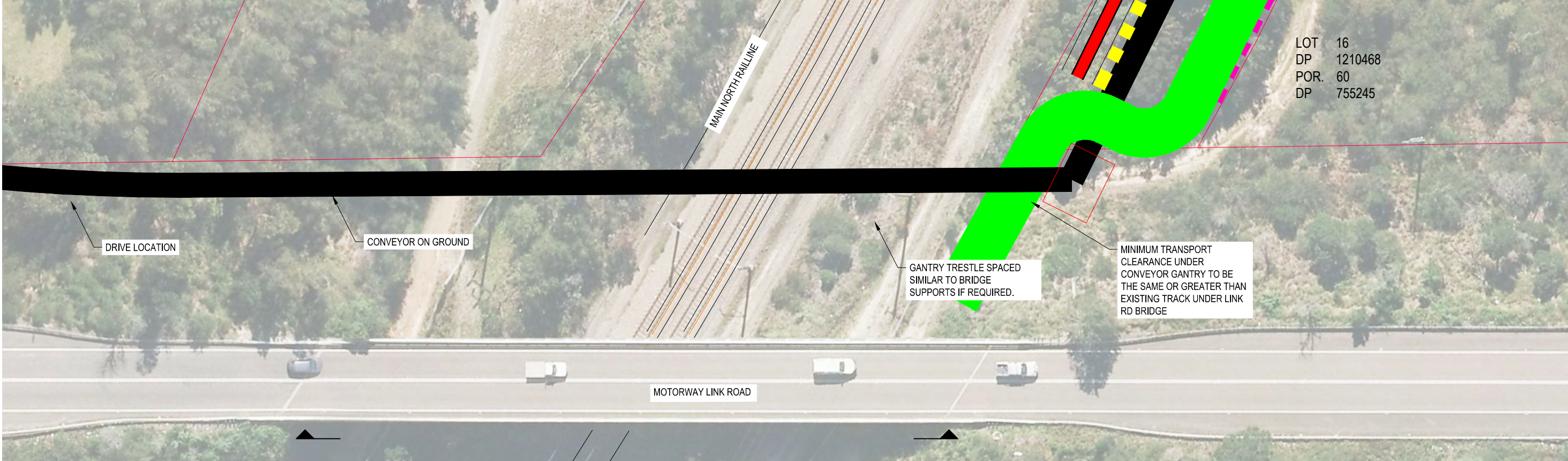
NOTES:

1. MINIMUM VEHICULAR CLEARANCE TO BE IN ACCORDANCE WITH RMS STANDARDS.
2. OVERHEAD GANTRY TRESTLES TO BE OUTSIDE CLEAR ZONE. OTHERWISE SAFETY BARRIERS TO BE INSTALLED IN ACCORDANCE WITH RMS STANDARDS.
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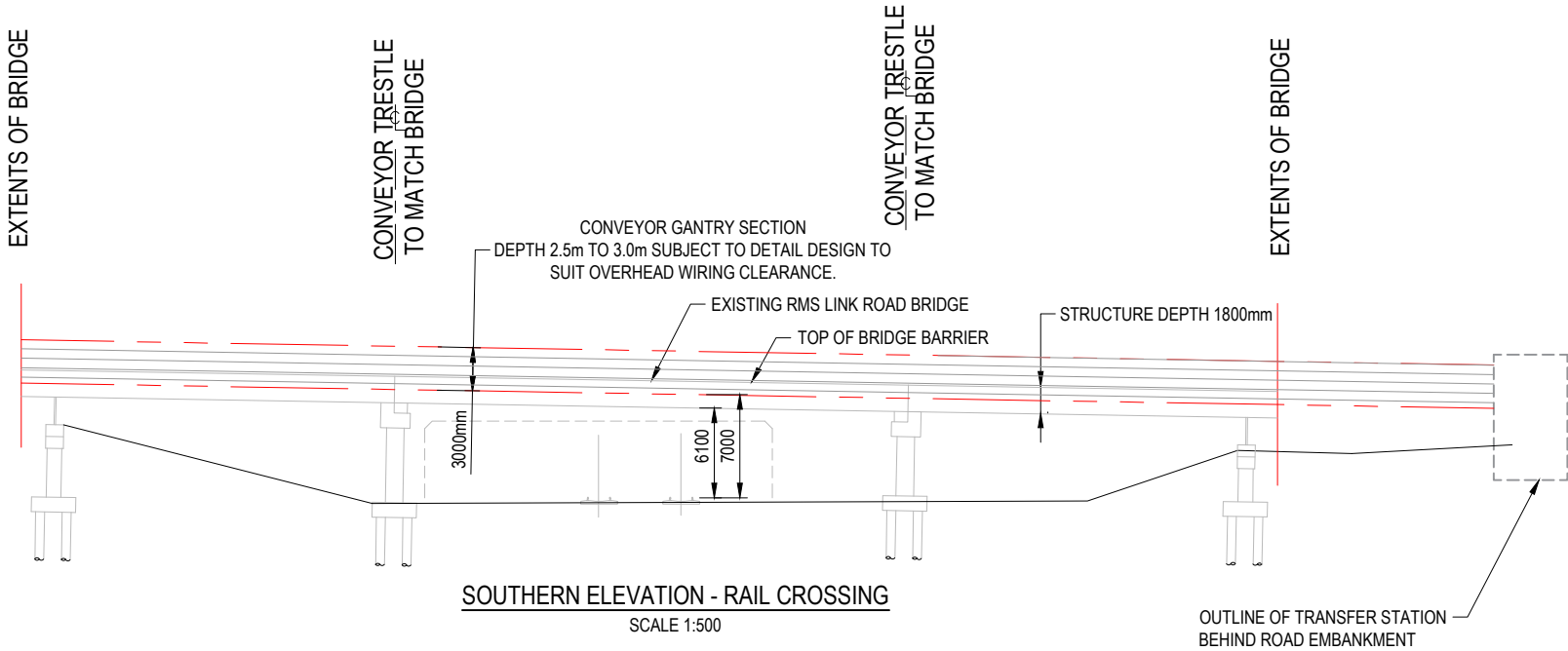
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A	ISSUED FOR COMMENT	JJ			28.08.16
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director
					Date



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	Approved (Project Director) Date		Title			
Scale AS SHOWN	This Drawing must not be used for Construction unless signed as Approved		Original Size	A3	Drawing No: 22-17704-C310	Rev: B



PLAN - RAIL CROSSING
SCALE 1:500



LEGEND	
	EXISTING RAIL TRACK
	RAIL SPUR
	CONVEYOR
	ACCESS ROAD EASEMENT
	DARKINJUNG LAND

IN PROGRESS

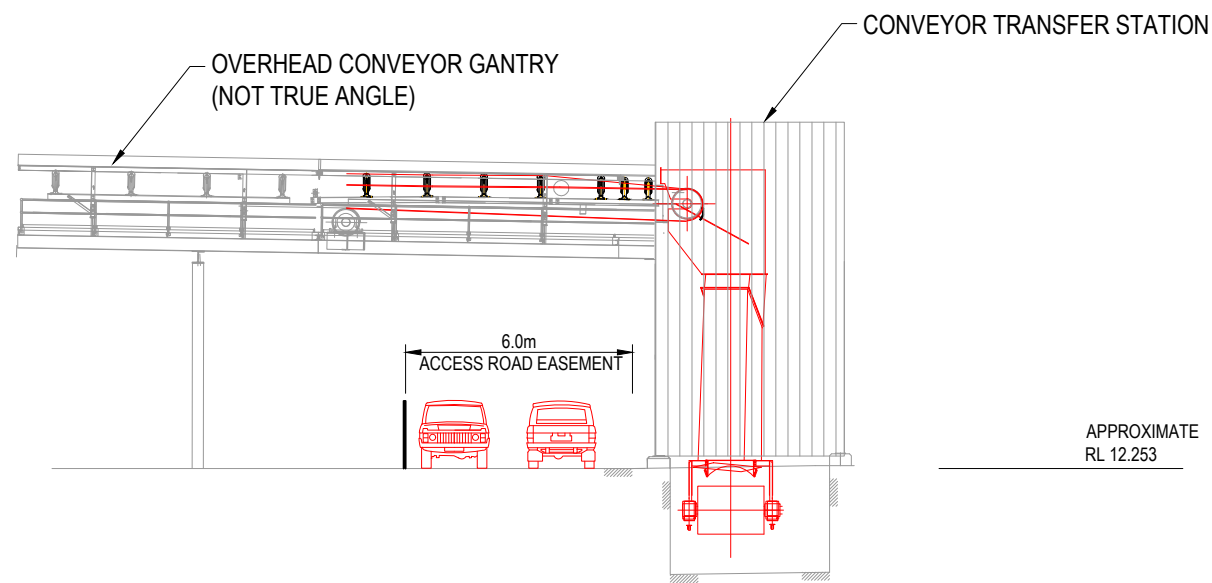
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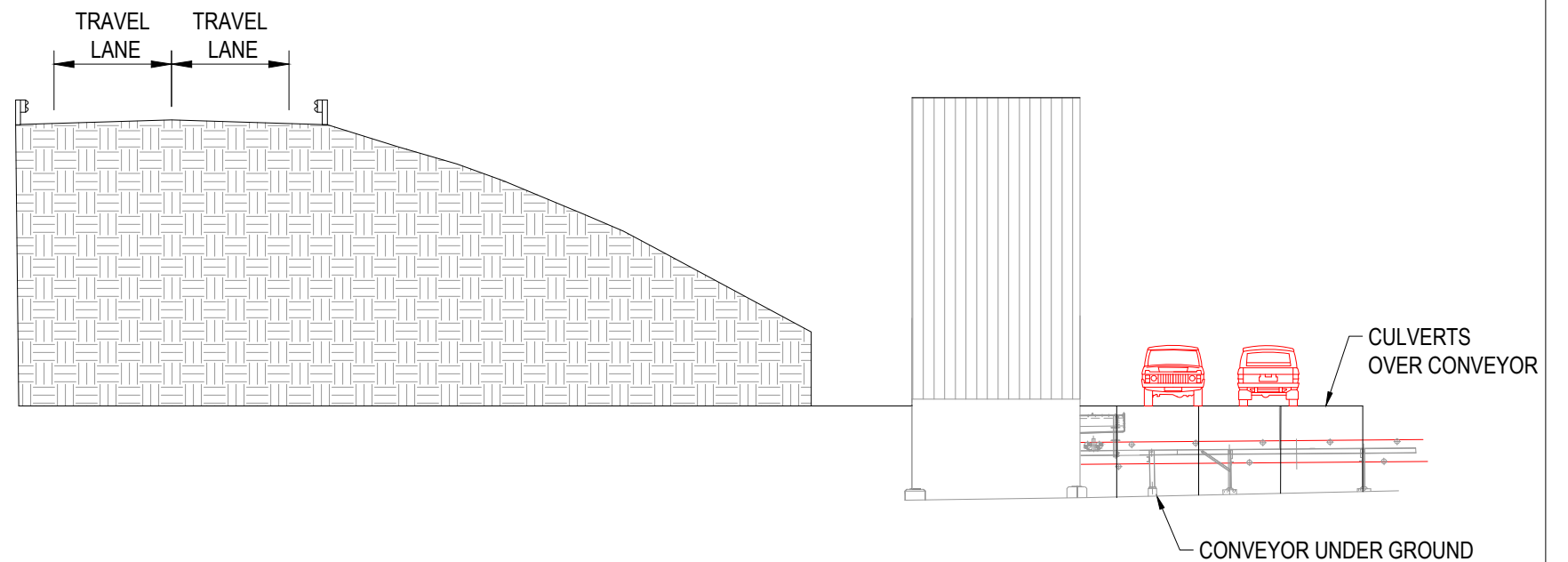
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	Drafting Check	Design Check
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Client	WYONG COAL WALLARAH 2		
Project	OVERLAND CONVEYOR - 6m ACCESS ROAD OPTION		
Title	RAIL CORRIDOR CONVEYOR CROSSING		
Original Size	A3	Drawing No: 22-17704-C324	Rev: A



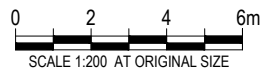
SOUTH ELEVATION
SCALE 1:200



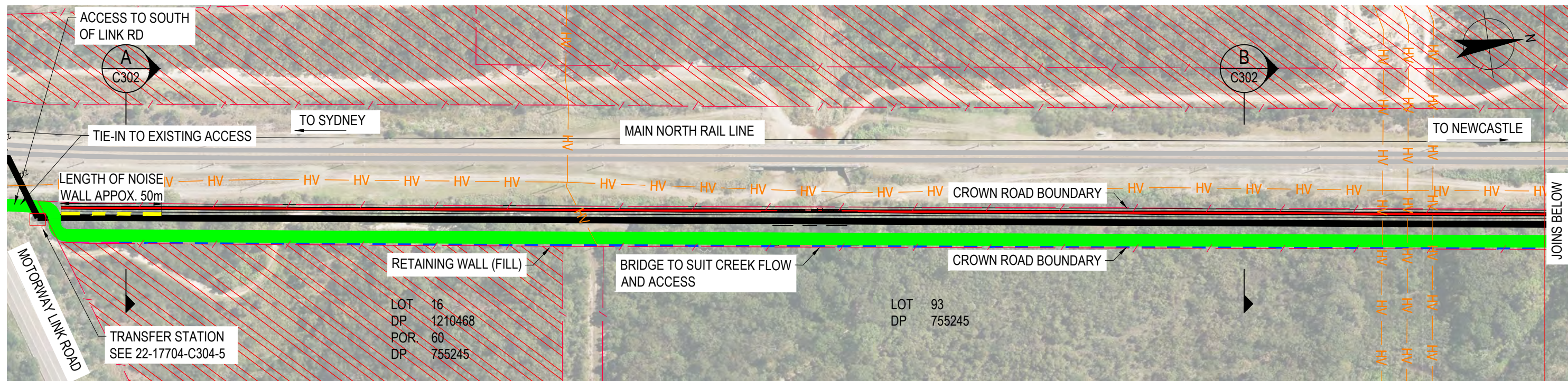
EAST ELEVATION
SCALE 1:200

CONCEPT ONLY

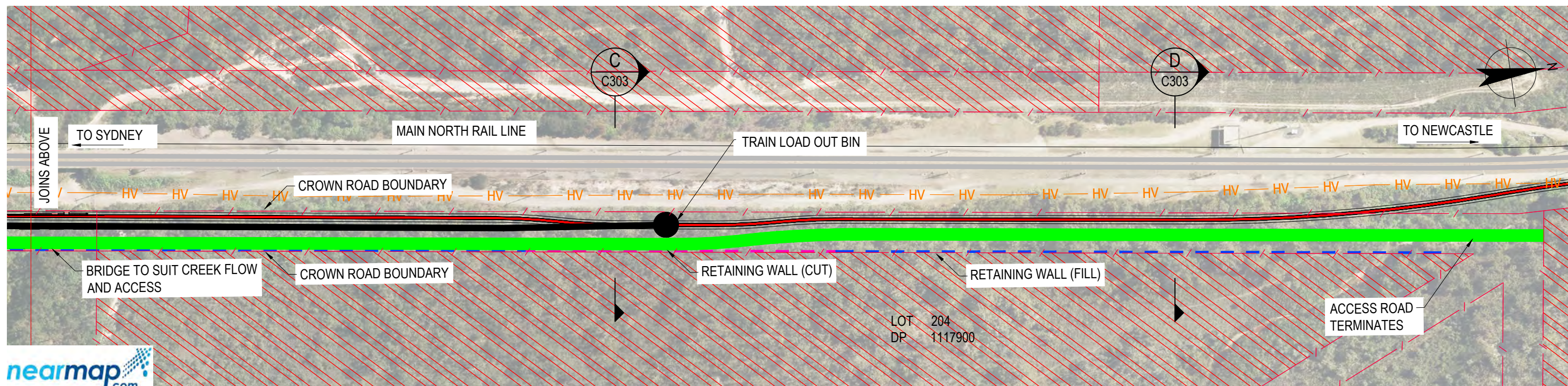
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	Approved (Project Director) Date		Title	TRANSFER STANTION 6m ACCESS ROAD OPTION ELEVATIONS			
	Scale AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	Original Size A3	Drawing No: 22-17704-C326		Rev: B	



PLAN
N.T.S



PLAN
N.T.S

LEGEND

	EXISTING RAIL TRACK
	RAIL SPUR
	CONVEYOR
	ACCESS ROAD EASEMENT
	EXISTING OVERHEAD POWERLINES

	RETAINING WALL (FILL)*
	RETAINING WALL (CUT)*
	NOISE BARRIER
	DARKINJUNG LAND

NOTES

1. * INDICATES INCORPORATING SURFACE DRAINAGE CONTROL

IN PROGRESS

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A	ISSUED FOR COMMENT		J.J			28.10.16



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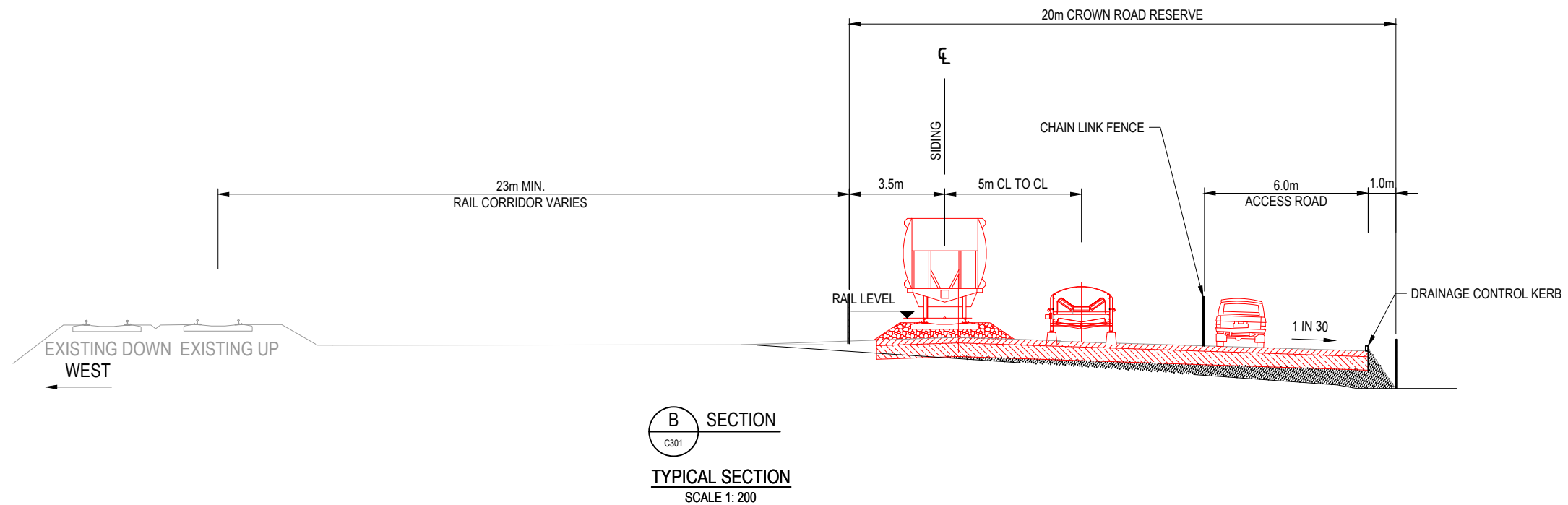
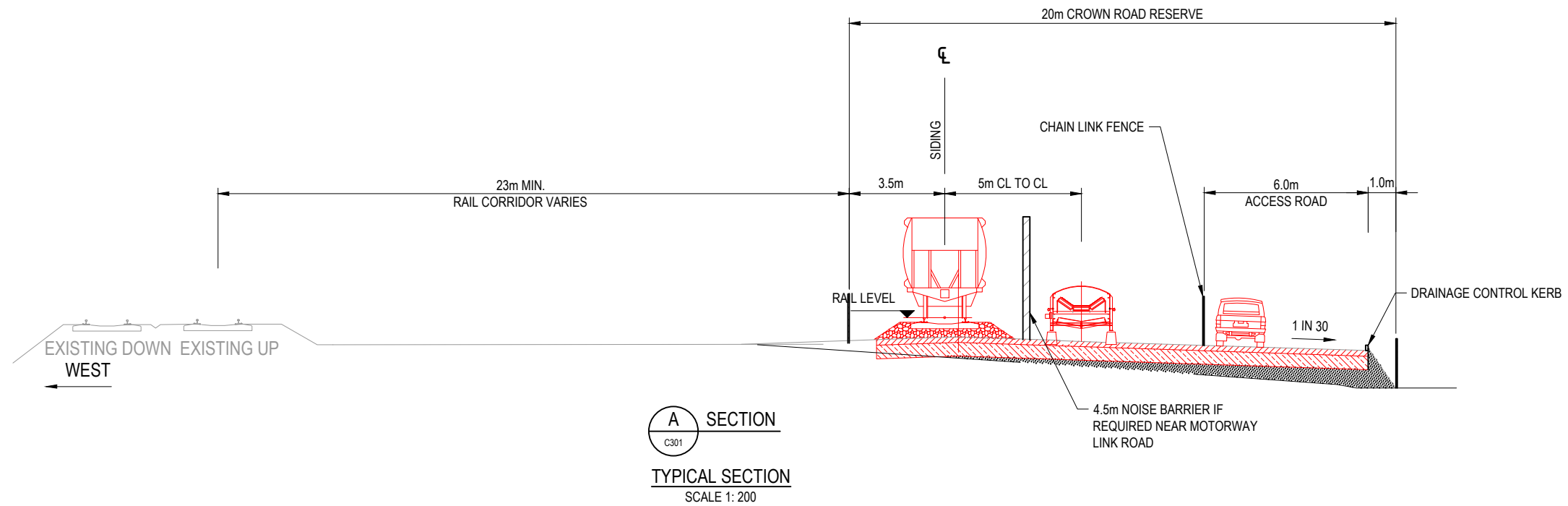
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Drafting Check		Design Check	
Approved (Project Director)		Date	
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Project **RAIL SPUR - 6m ACCESS ROAD OPTION**
Title **SCHEMATIC PLAN VIEW**

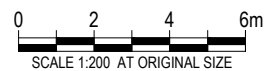
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Rev: A

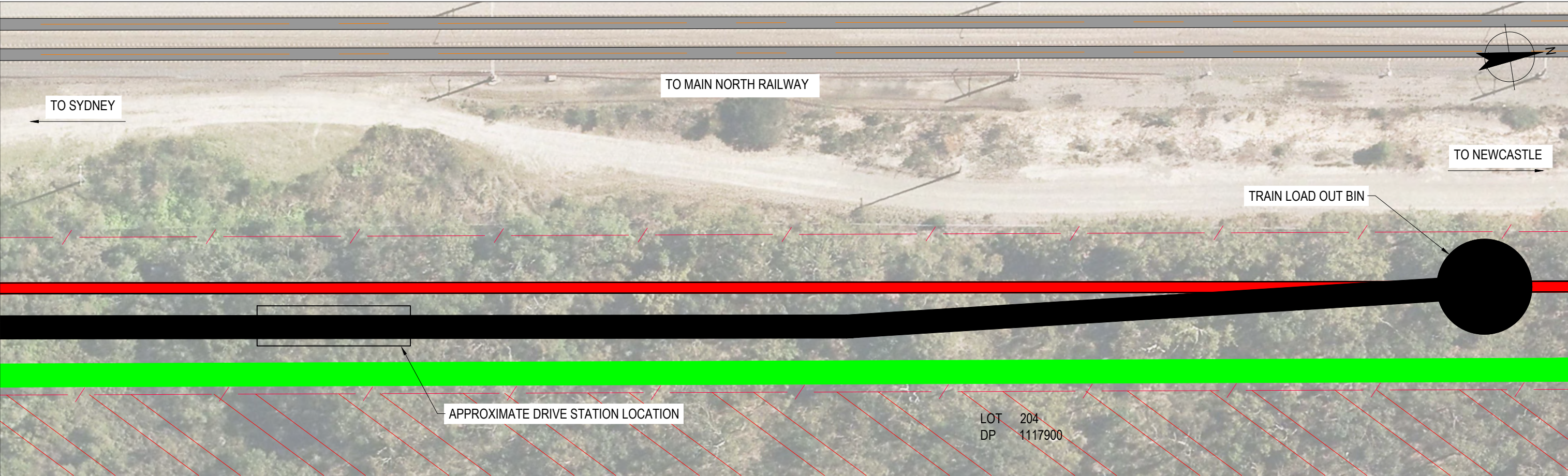


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					Date



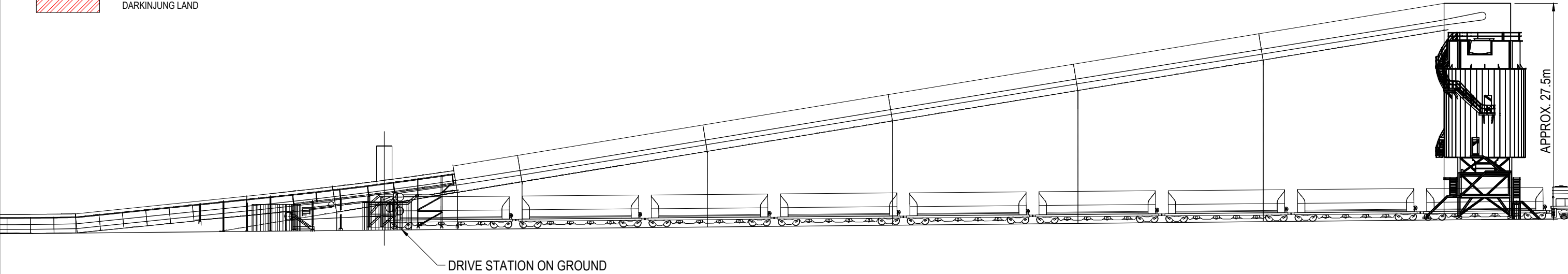
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		Approved (Project Director) Date		Title RAIL SPUR - 6m ACCESS ROAD OPTION
Scale AS SHOWN	This Drawing must not be used for Construction unless signed as Approved			Original Size A3
Drawing No: 22-17704-C322				Rev: A



- LEGEND**
- EXISTING TRACK
 - RAIL SPUR
 - CONVEYOR
 - ACCESS ROAD EASEMENT
 - DARKINJUNG LAND

PLAN

SCALE 1:1000



ELEVATION

SCALE 1:1000

CONCEPT ONLY

C	CLIENT COMMENTS INCORPORATED	J.J			26.08.16	
B	CLIENT COMMENTS INCORPORATED	J.J			24.08.16	
A	ISSUED FOR COMMENT	J.J			22.08.16	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date

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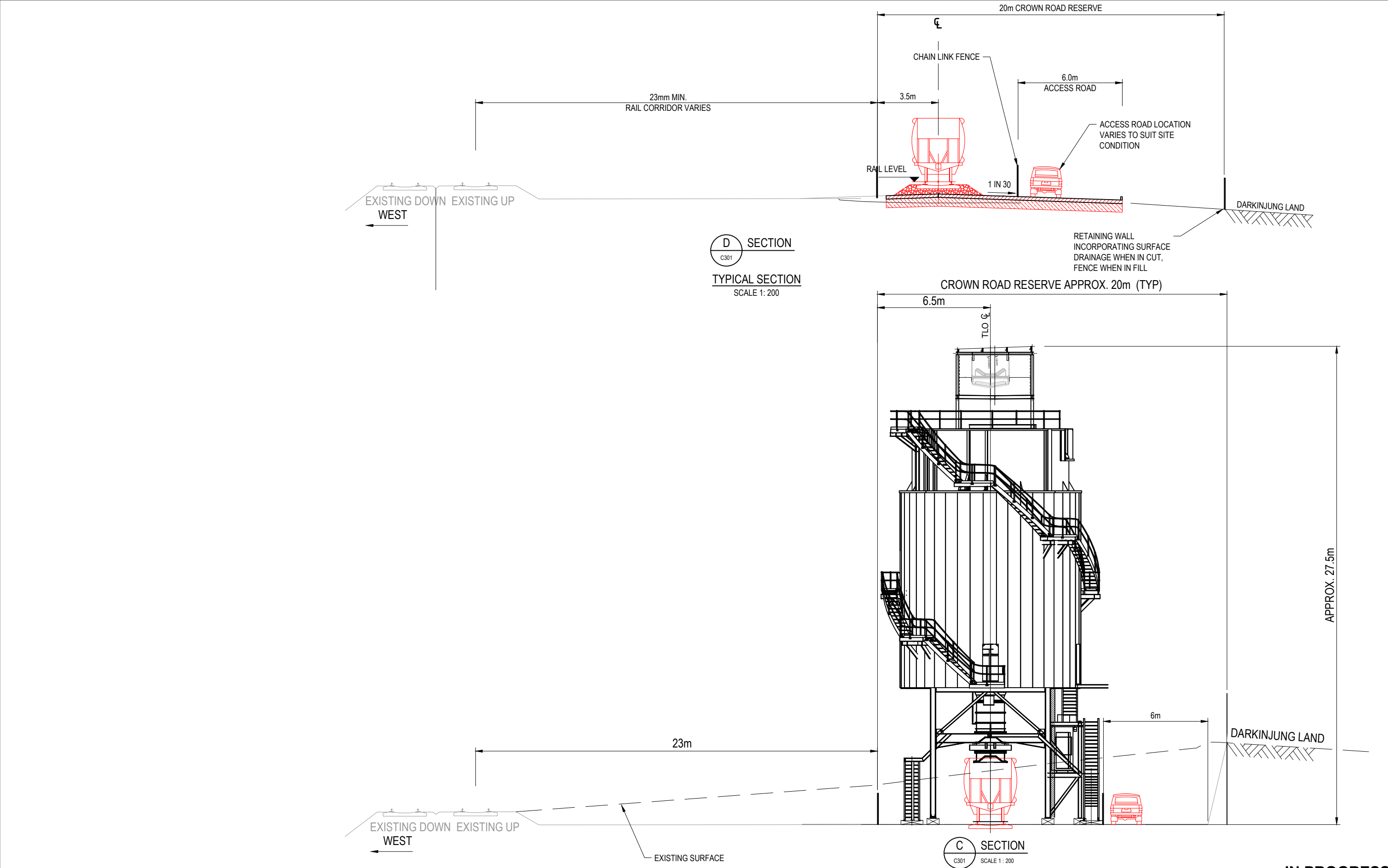




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Client	WYONG COAL WALLARAH 2		
Project	BIN AND CONVEYOR		
Title	PLAN AND ELEVATION		
Original Size	A3	Drawing No: 22-17704-C307	Rev: C



A	ISSUED FOR COMMENT			J.J	28.10.16
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing			Date
	Drawn	Job Manager	Project Director		



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	Approved (Project Director)			Title	RAIL SPUR - 6m ACCESS ROAD OPTION SECTIONS		
	Date			Original Size			
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APPENDIX D

KA Review of 'Pells Consulting (2016)' Report and 'Pells Sullivan Meynink (2013)' Related Issues



KALF AND ASSOCIATES Pty Ltd

Hydrogeological, Numerical Modelling Specialists

A.B.N.: 67 079 152 462

Phone: 02 99187478

Email: frkalf@gmail.com

**KA Review of 'Pells Consulting (2016)' Report
and 'Pells Sullivan Meynink (2013)' related issues**

**Dr F. Kalf
B.Sc. M.App.Sc PhD
30 October 2016**

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Background and Previous Reports

On the 5 September 2016, Pells Consulting (PC) produced a report (PC 2016) in response to a request and brief from the Environmental Defenders Office (EDO) on the 23 August 2016. The EDO requested that PC report on the documents that have been produced since the original EIS for the Wallarah 2 Coal Project with regard to the amended potential groundwater and surface water impacts and adequacy of both the Proponent's responses to submissions and the Planning Assessment Commission's (PAC) principal findings and recommendations.

Dr Pells, the author of the PC report states in that document that he was not able in the time available to make such an assessment but instead makes reference to the PAC report and 'Response to Submissions' document dated September 2013¹. Also relevant is the report by Pells Sullivan Meynink (2013) for Wyong Shire Council referred to hereafter as the PSM (2013) report that contains details of the issues alluded to in the PC report.

However there is also a previous PSM (2010) report that contains a number of issues that appear again in the more recent PSM (2013) report. The PSM (2010) report was reviewed by Dr Kalf of Kalf and Associates Pty Ltd (Kalf 2010). An Appendix herein contains the complete Kalf (2010) review of the PSM (2010) report and also the Kalf (2010) Conclusions and Considerations section but not the Kalf (2010) review in that document of the DECCW and NOW documents and associated Appendices A (Related to Judge Reynold's Inquiry), B (Longwall mining under the Cataract Reservoir) and C (Longwall mining at the Wyee State Mine Central Coast NSW).

The Pells Consulting Report

The PC (2016) report letter as well as an introduction includes the following relevant sections and sub-sections:

2.0 Overall Statement

3.0 Groundwater – Key Point in PAC report

4.0 Proponents Responses

4.1 General

4.2 Importance of considering drought flow conditions

4.3 Where does the mine inflow come from?

5.0 Connectivity

6.0 Groundwater Modelling

7.0 Subsidence Impacts

This KA report examines the statements within each of the sections and sub-sections as listed above and provides comment, and in addition where relevant, comments requested by KA and received from Dr. C. Mackie of Mackie Environmental Research (MER), the author of the Wallarah modelling reports on specific issues.

¹ See the last two paragraphs in this report above the 'References' section that deals with the contents of that report.

PC 2.0 Overall Statement

The PC (2016) report claims that there is not one submission by any contributor regarding groundwater and surface water that is critical about the findings in the original EIS. Dr Pells concludes that this means that *“only the Proponent understands the truth, and that truth is that the proposed mine will have no impact of any significance on the useful groundwater system, on stream baseflows, and on surface water resources”*². In assessing the current evidence KA is of the opinion that the statement is made because it does not agree with the Dr Pells’ adverse assessments of mining impacts based on his interpretation of the data, modelling results, and his conceptual ideas about groundwater and surface water and sub-surface mining interaction, and not necessarily what the modelling results and evidence actually show or the actual conditions that would exist in the mining zone. For example the statement made by Dr Pells that the proposed mine will have *“no impact”* is incorrect, as there will be some leakage from alluvium estimated to be up to 73 ML/annum but replaced by rainfall recharge. In addition the MER modelling report has indicated the possibility of subsidence effects requiring some bores that currently lie within the mining footprint to be replaced.

Dr Pells continues with *“in my opinion this adversarial approach makes objective scientific examination and discussion impossible”*, yet he proceeds to do so in the subsequent sections of the PC report.

PC 3.0 Groundwater – Key Point in PAC Report

Dr Pells refers to a Section 4 in PC (2013) and states that *“we simply expressed the plots presented in the EIS in a readily understood manner and showed that the work done by the proponent demonstrated far greater impacts on the groundwater systems than were admitted in the words of the EIS”*. The following references to figures and sections are from the more extensive PSM (2013) report but also includes references to the same figures but different sections in the PC (2013) report:

- Figure A1 (Section 8.2.4) indicating the residual mass curve periods of lower rainfall (referred to in the PC report section 4.2 regarding drought conditions). Figure A1 (Section 3) in PC (2013).
- Figure 17 (Section 8.3.1) indicating the computed mine inflows (referred to in the PC report section 4.3 regarding the source of inflow water). Figure 6 (Section 4.2) in PC (2013).
- Figures 18 and 19 (Section 8.3.2) showing the pre-mine and post mine drawdown in section in three hypothetical open ended bores (referred to in the PC report section 5.0 regarding connectivity of depressurisation at depth below the ground surface). Figures 7 and 8 (Section 4.3) in PC (2013).

² Despite this conclusion the PC report nevertheless states in section 4.3 *“The proponent’s response also contains a truth”* when indicating leakage from alluvium.

- Figure 20 (Section 8.4.2.2) Model vertical permeability³ of the constrained zone compared to fracture model vertical permeability (referred to in the PC report Section 6.0 Groundwater Modelling regarding the “skewed”, that is, the apparent displaced lower permeability applied in the MER modelling compared to the SCT modelled fracture vertical permeability. Figure 9 (Section 5.2.1) of PC (2013).
- Figure 21 (Section 8.4.2.2) MER random distribution of synthetically generated (i.e. stochastic) vertical permeability in the constrained zone (referred to only in the PSM 2013 report).

These items are discussed in the PC (2016) report sections in turn below as follows.

PC 4.0 Proponents Responses

PC 4.2 Importance of considering drought flow conditions

PC (2016) and PSM (2013) contend that extreme drought conditions should have been addressed in the MER modelling report. Despite WW2 and federation droughts being more severe according to PC (2016), the Millennium drought remains one the most severe over that last 67 years since the 1940's and therefore is not an unsuitable period of unusual rainfall deficits in the region for assessment of drier conditions. The lower rainfall deficits commencing in 1990 occurred over a longer time period than the one commencing in 2000 but the 90's event had a much longer period of rainfall excess prior to its commencement making it less severe than the millennium drought (Figure 16 PSM 2013). The 90's rainfall deficits also setup the drier conditions for the 2000's drought.

PC 4.3 Where does the mine flow come from?

In this section the PC (2016) report is critical of the EIS groundwater/surface water interaction of the MER modelling assessment. Dr Pells (PC 2016) does not agree that the predicted 2.5 ML/day (i.e. the maximum inflow rate – Figure 17, PSM 2013), which the modelling predicts is derived predominately from groundwater storage in the sub-surface rock strata, would “*never impact on the upper portion of the groundwater system*” and therefore not affect the baseflows, vegetation and groundwater supplies. He contends that this was demonstrated in their submission by “*looking carefully at what the proponents own modelling showed*”.

It is not clear what “*looking carefully*” means in the PC report. However, the PSM (2013) elaborates on this issue in Section 8.3. The PSM report (Section 8.3.1 paragraph 2 page 31) contends that the mine groundwater inflow “*comes from somewhere and is equilibrium with natural recharge*”. However, this simplistic conceptual model misses an important mitigating factor. Equilibrium is not established instantaneously under mining conditions where constrained zones exist but takes considerable time buffered by low formation vertical permeability. Hence an inflow rate of several ML/day is not transmitted at the surface instantaneously or even over a short time period. The inflow rate would need to be determined by dividing that total volume extracted over the mining period by a very long period of time (hundreds of years). Clearly under those conditions the inflow rate from any surface source would be considerably reduced. The MER modelling considers that direct recharge to alluvium and consequent leakage would be 7.3 ML/annum. But with a MER

³ In this report the word ‘permeability’ is the same as ‘hydraulic conductivity’, sometimes abbreviated herein and in other reports as ‘conductivity’.

conservative 10 fold uniform increase applied in vertical permeability in the constrained zone then alluvium leakage would be up to 73 ML/annum but with that alluvial leakage replaced by rainfall recharge at the ground surface.

Dr Mackie has responded to this issue at KA's request as follows:

"The impact of mining on baseflows associated with the main drainage channels has been assessed by examining the water budgets for the groundwater flow model boundary conditions used to represent the channels and alluvium recharge. This is the established mechanism for assessing baseflow impacts. Model output indicates negligible change to these baseflows even though leakage losses are occurring from the alluvium to deeper strata. However some localised change to flows within the alluvium can be expected in the vicinity of the migrating subsidence wave as ground movements occur and a mined panel is displaced downwards relative to the adjacent unmined area. This displacement and the changes in the localised flows cannot be simulated in the regional flow model. Alternate simplified modelling was therefore undertaken and was reported in Appendix F of the EIS."

Acceptance of extensive depressurisation of coal seam(s) and the rock formation immediately above a mine footprint is not uncommon. There have been numerous approved coal mining projects in NSW where depressurisation occurs at depth but where there are minimal effects in overlying rock and/or alluvium. Where there is a drawdown effect in sub-surface structures the current Aquifer Interference Policy (AIP) stipulates that minimum harm is deemed to occur in a bore or well where drawdown is less than 2m.

Depressurisation can extend up to kilometres in the subsurface coal seams, as is evident in the Wallarah case at full development at depth (MER 2013 Figure 9) and while not creating dewatering at that depth, it can yield substantial quantities of groundwater from storage to the mining voids. Therefore the notion in the PC report that the mine inflow must be directly sourced from downward leakage in the short term is invalid and all geological evidence and modelling indicate it would not be the case at Wallarah.

To support the PC view of absolute instantaneous or somewhat delayed concept of extracted groundwater influence at the surface, the PC report provides an alleged quote from a hydrogeologist Dr R. Evans in the Australian Financial Review on the 24 May 2007⁴.

'There is no free lunch here. It's very simple – every litre of water pumped out of the ground reduces river flow by the same amount'

As it stands as an isolated statement, and as general rule, KA considers it invalid. Dr Evans was contacted recently on the 22 September 2016 at his office in Melbourne by phone. He reacted by indicating he had no recollection of making the statement and that on the contrary it was misleading, incomplete and out of context. Dr Evans recalled only that it was probably the result of the journalist interpretation after a discussion between himself and the journalist. Dr Evans stated that the context of the discussion was related to pumping bores in alluvium and their distance from a river or stream specifically in the Murry-Darling Basin region. He stated the main processes that occur under pumping conditions in this situation are; water is removed from alluvial storage; a reduction in evapotranspiration loss is captured and a component of water leakage from the river/stream. In addition there would also be direct recharge by rainfall infiltration that would join the watertable and hence groundwater storage.

⁴ This quote also appears in the Wyong Council report (2013, page 4 paragraph 1).

For a bore/well placed at the stream bank the majority of water would be derived from the stream. But as the bore/well location is placed at increasing distance from the stream a decreasing volume of direct stream leakage would be available for the bore/well with the other components of evapotranspiration reduction capture and direct rainfall recharge making up the remaining deficit.

Clearly the misquotation generated by a journalist rather than by a well-respected hydrogeologist that is supposedly valid for all situations can be dismissed as overly simplistic and incorrect. The PC report conceptual model misunderstands the groundwater system behaviour in a hard rock environment of low permeability under deep mining conditions.

PC 5.0 Connectivity

The PC report contends that connectivity *“is simply the question of the impact of complete depressurisation of the strata at coal seam level on the groundwater pressure regime near the ground surface”* and that *“it [connectivity] actually has nothing to do with quantity of flow”*. This is a rather curious statement and seems to follow the PC concept of absolute, relatively rapid mine impact interaction. The hypothesis suggested is that depressurisation propagates to the ground surface quickly or alternatively, it does not and only if *“there were a perfectly impermeable barrier between the mine and the surface”*. Yet in reality the depressurisation propagation is in a dominant horizontal direction. In the vertical direction it is controlled and impeded by the degree of vertical permeability and less so by storativity of the rock strata. The degree of vertical permeability and storativity therefore affects the rate of vertical flow created towards that depressurisation. The PC statement is curious because in Section 6.0 of the PC report the notion that connectivity *“has nothing to do with quantity of flow”* is seemingly contradicted when it states shortly after with *“However, the magnitude of flow is also important to the overall water balance and in this regard the issue around which debate rages are the permeability values adopted in the theoretical modelling by the proponent.”*

An issue related to the connectivity concept is given in Section 8.3.2 of the PSM report titled ‘Groundwater Impacts’ where Figures 18 and 19 (reproduced below) are used by PSM (2013) in their report to indicate in their view how the mining in the sub-surface (Figure 19) would affect hypothetical open ended bore water levels (actually piezometers as depicted in the figures by PSM rather than bores) compared to pre-mine conditions (Figure 18⁵). Figure 19 depicts the modelled pressure head section at Wallarah at full mine development and includes a MER modelled conservative assumption of complete drainage of the rock strata overlying the coal seam up to the constrained zone⁶ in Figure 19. PSM (2013) use this EIS MER model section of pressure heads to draw in the interpreted equipotentials (i.e. total head equal to pressure head plus elevation) to determine the water level in three hypothetical bores of different depth that are open at the bottom of each hole.

Of course in actual production pumping bores ‘screens’ or open slotted intervals if they were constructed to such depths as opposed to bottom entry bores would be used at various elevation levels within a bore depending on the depths of water bearing zones encountered in the profile. Hence drawdowns would resolve to an average of these heads that would

⁵ It is noted that while the Figure 18 title is for the pre-mining case the notation on that figure incorrectly states ‘after mining’ in the red notation regarding equipotentials, apparently mistakenly copied from Figure 19.

⁶ See MER (2013) Section E8 point 3 : “A simplified and conservative approach has therefore been adopted that assumes connected and relatively free draining cracking over full panel width to maximum height [in the MER model section in Fig 19]. As a result simulated depressurisation of overburden strata especially beneath the alluvium is more widespread than may ultimately be observed under field conditions”.

therefore be much less than for the hypothetical case of bore bottom water entry as shown in Figure 19.

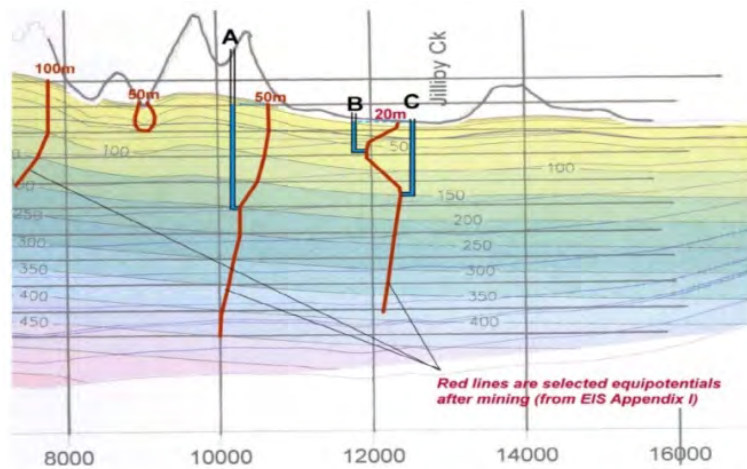


Figure 18: Pre-mining groundwater regime from Figure E17 of Appendix H of the EIS

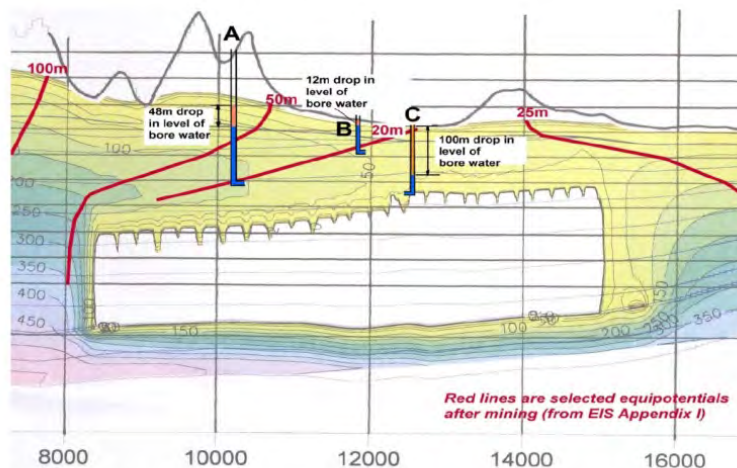


Figure 19: Prediction in the EIS of the groundwater regime at completion of mining

However, attention is drawn to the top of the saturated zone in both figures, that is, the watertable profile (top of the yellow shaded section) where it is clear that the position of the watertable is essentially the same in Figures 18 and 19. Consequently, this indicates that there is essentially no watertable drawdown created in the simulated modelled sections due to the sub-surface mining despite the implication by PSM and PC reports. That is, the pre-mine and end of mining watertable, is essentially unaffected by the deeper mining and the consequent modelled dewatering of the rock formation above the mined out seam in the section. Hence although the PSM report maintains that it has indirectly demonstrated mining influence at the surface by referring to these model section results, it is clear that Figures 18 and 19 on the contrary show no such drawdown influence. The depths adopted for the hypothetical bores/piezometers of course are imaginary and hypothetical and bear no relation to the depths of existing bores that currently lie within the mine footprint. In addition it is very unlikely that any bores constructed in this area, should they attempt to do so in the future, assuming no mining, would be drilled to the depths indicated, simply because of the limited groundwater potential and poor quality groundwater at these depths (see also Appendix herein Kalf (2010) review of PSM (2010) report item 6 paragraph 3 comment by

investigator Cook.)

Dr Mackie provided further comment on this issue as follows:

1. The head distributions prepared by PSM and shown in red are reasonable interpretations that demonstrate significant head losses in hypothetical boreholes located within the mine panel footprint. Bores A, B and C appear to be approximately 270m, 70m and 140m deep respectively, with inlets indicated at the base of each of the boreholes. At these depths and with this design, head losses for these hypothetical boreholes would indeed be substantial;

2. NOW registered boreholes that are situated within the mine panel footprint were summarised in Table 5 of the MER report. A review of this information indicates 12 boreholes within the footprint of which 4 appear not to be licenced and may never have been completed as pumping bores (probably due to poor yield or poor water quality). Reported depths of the bores have been checked against the layers included in the groundwater model to assess the potential water table impacts. All are situated within layer 1 of the groundwater model. This layer exhibits negligible pore pressure losses induced by upwards migration of the phreatic surface [watertable] from the WGN coal seam. However these same bores are highly likely to suffer mechanical damage as well as a temporary reduction in respective water levels (less than 2 metres) resulting from subsidence movements. Provision will need to be made by Wallarah to repair or replace these facilities.

Hence Dr Mackie has confirmed that existing bores that overlie the proposed footprint lie within the top layer of the numerical model and as discussed herein and verified in Figures 18 and 19 would not be affected by mine depressurisation contrary to the hypothetical conceptual ideas in PC (2016) and PSM (2013). Subsidence will however create some drawdown in these bores but it would not be substantial. The issue of likely damage to these bores has already been acknowledged and assessed by the PAC (2014, Section 3.2.4, paragraph 2).

“There is a possibility that subsidence could cause damage to these structures [bores and wells] and they would then need to be repaired or re-drilled at the Proponent’s expense.” “....there are ‘standard’ conditions in the draft recommended conditions of consent to cover impacts on both the water supply and integrity of privately owned bores and wells. The only additions that the Commission recommends are a requirement to do a pre-mining test of private bores within the zone of potential impact and a requirement that the proponent bear the costs of independent assessment of any loss and the burden of proof that any loss is not due to the effect of mining.” KA is in agreement with this PAC judgement and recommendations.

PC 6.0 Groundwater Modelling

In this section PC (2013) report states that “*Change in water movement in the alluvium from the present near-horizontal flow to downward flow will, as a matter of physics cause loss of baseflows and loss of bore supplies, regardless of the magnitude of flow.*” This issue has already been covered by the KA comments in sections ‘PC 2.0 Overall Statement’, PC 4.3 ‘Where does the mine water come from?’ and ‘PC 5.0 Connectivity’ above.

The PC report goes on to criticize the adoption of “*incorrect permeability data skewed to suit the Proponent*” in the Wallarah 2 numerical model. No further explanation is provided in PC report regarding this issue. However, the discussion in the PSM (2013) report Section 8.4.2.2 including Figure 20 is relevant. In this figure the PSM (2013) report makes a comparison between what they notate as the “*Range of vertical permeabilities used in 3D*

groundwater model” which they contend “are substantially on the low side of any realistic range of possibilities which have been identified in the EIS” and vertical fracture permeabilities generated by the SCT FLAC2D numerical fracture model also shown in the PSM (2013) Figure 20⁷.

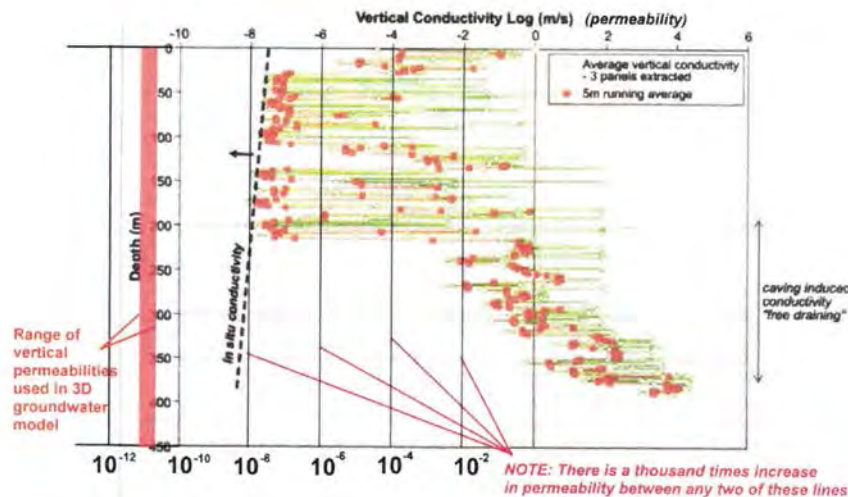


Figure 20 Vertical Permeability values from Appendix F of the EIS versus values used in groundwater impact assessment in Appendix G (After Figure 2.35 Valley Case)

The first point is that the FLAC2D permeabilities are fracture generated model values as opposed to bulk rock vertical permeability and are not measured. Secondly, Figure 20 used for the permeability comparison depicts depth from the ground surface to the assumed coal seam. The FLAC2D fracture permeabilities show firstly the presence a much higher fractured zone permeability zone at depth above the simulated goaf (those permeability values displaced to the right) and a zone higher in the profile (above about 200 m depth) representing the constrained zone of much lower permeability with the majority of values which lie along, or very close to a dotted line notated as “*insitu [vertical] conductivity*”. The “*insitu conductivity*” line is understood to have been estimated by the FLAC2D users and the small arrow pointing to left indicates a probable much lower value position of those insitu values. The red strip in Figure 20 drawn in by PSM, that is purported to represent the MER model permeability range, is therefore misleading since it is not related to total depth. On the contrary this permeability range only applies in upper constrained zone above a depth of about 200m from the ground surface.

The PSM (2013) report states the assumptions regarding permeability in the MER 3D model are contradicted by calculations in the SCT/MSEC (Strata Control Technology and Mine Subsidence Engineering Consultants 2010) report. That is, PSM contend that there is some disruption of the strata throughout the 350m profile above the level of extraction. It overlooks that the SCT FLAC2D model predicts a dramatic reduction in vertical permeability above a depth of about 200m in their Figure 20 profile signifying the commencement of constrained zone conditions. The majority of this permeability change is primarily in the horizontal direction as is evident in the modelled fracture profile (reproduced in Figure 11 of PSM (2013) report below). The change in permeability is also evident in Figure 1b from MER

⁷ The ‘NOTE:’ comment below Figure 20 that “There is a thousand times increase in permeability between any two lines” is incorrect. The graph x-axis depicts a factor of 100 not 1000 between lines.

(2010) below showing FLAC2D generated fracture zone horizontal and vertical displacements (fracture permeability) above a depth of 200m from the ground surface.

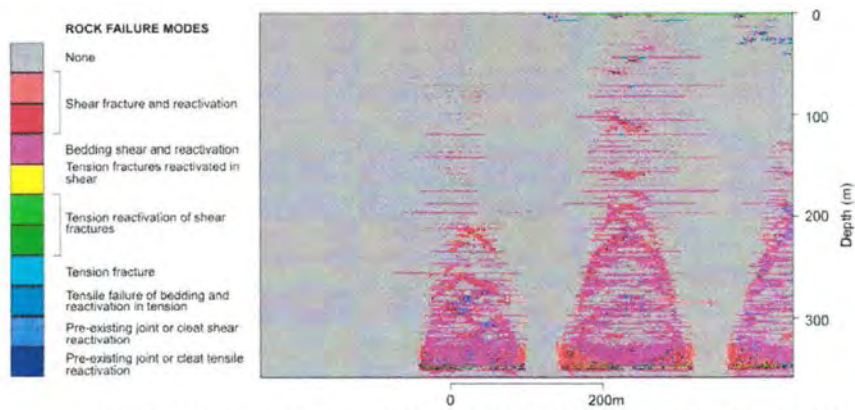


Figure 11: Modelled Rock Fracture Development for the Hue Hue Case (3m extraction)

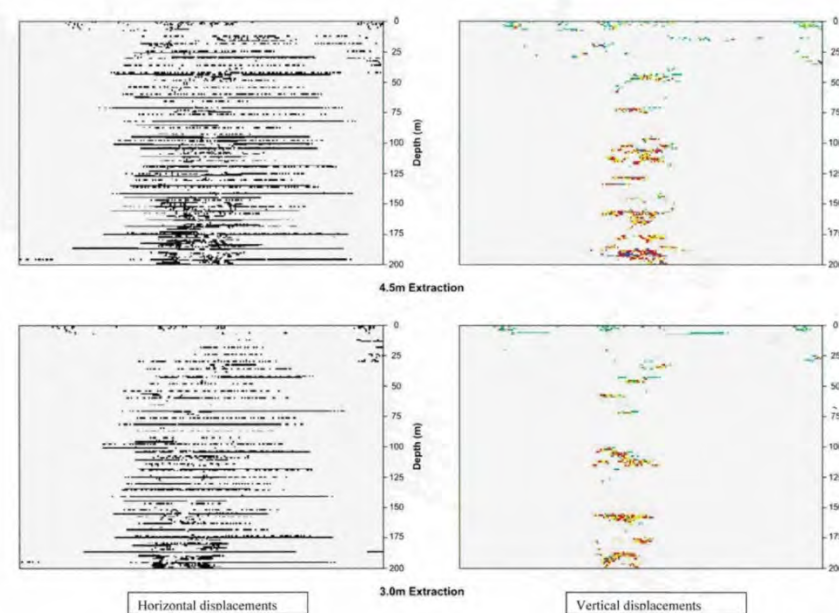


Figure 1b

Figure 1b reveals a PSM (2013) report misunderstanding about their “*disruption*” comment that in the constrained zone while there is a significant increase in the horizontal permeability there is much less change, if any, in the vertical permeability.

KA requested Dr Mackie comment on this issue and he has responded as follows:

“Numerical modelling to predict the geomechanical impacts on rock strata was undertaken by SCT. Findings from those studies demonstrated that caving related fracturing could be expected to extend approximately 200m above the WGN seam. Above this height the disturbance to the strata would be limited to bedding shear and localised non continuous fracturing. This implies that connected subsidence induced fracturing (and enhanced vertical drainage) above goaf becomes progressively less connected at increasing height above seam and is predicted to be unconnected at 200m. Above 200m the vertical permeability was predicted by SCT to be unchanged from the undisturbed regime.”

With regard to [PSM (2013)] Figure 20, it is my understanding that the undisturbed permeability of strata above 200m is reflected in the concentration of data points at about $1E-08$ m/s ($8.6E-04$ m/day) down to about 200m depth. The dashed line and the arrow pointing to the left indicate that the insitu conductivity (permeability) could be anywhere to the left which includes the values employed in the groundwater model. The somewhat randomly higher values to the right of the dashed line may be associated with localised changes in lithology or localised presence of discrete and unconnected fractures. The reasoning behind the nomination of these values and the presentation of a 'running average' is best addressed by SCT.

There is also an important distinction between the two data sets. Very small cells are employed in the SCT model (1m x 1m in a 2 dimensional plane) while much larger cells (50m x 50m x 50m) are employed in the 3 dimensional groundwater model. It is inappropriate to associate the two models in the manner adopted by PSM on Figure 20".

One of the fundamental flow principles of stratified media in hydrogeology and in other earth sciences is that where there is vertical groundwater flow such flow will always be controlled by the lowest layer of vertical permeability (Bouwer 1978). What is clear from Figure 20 and the FLAC2D simulation is that the vertical flow rate would be substantially impeded by those layers that lie between and are associated with the 'Insitu conductivity' fractures and not controlled by those somewhat larger permeability values depicted in the FLAC2D simulation.

In order to reduce uncertainty of permeability values used in the EIS, MER (2013) conducted in addition a "stochastic" sensitivity analysis to simulate irregular permeability distribution within the profile for a wide range of vertical permeability. In this approach the permeability distribution in three dimensions was randomised to determine, not the fracture permeability but the equivalent, and effective bulk rock vertical permeability, that is, the effective vertical permeability controlling the vertical groundwater flows in the constrained zone. This is an acceptable advanced approach in groundwater modelling practice conducted by MER. The result of this stochastic modelling was that the effective vertical permeability so obtained was close to the values adopted in the MER EIS regional numerical flow model.

It is clear from the PSM report and comments on this approach that PSM misunderstood the objective, process and significance of the MER analysis and results. Consequently PSM (2013) produced an incorrect description of this issue. The PSM (2013) description assumed that numerous realizations of uniform individual increasing higher permeabilities were simulated. This is incorrect and they failed to recognise that higher and lower permeabilities are all simultaneously contained within each simulation but randomly distributed as permeability zones that would be in reality yield equivalent bulk permeability within the constrained zone.

Dr Mackie has responded to this issue as follows:

"Stochastic simulations where randomised permeabilities are generated to represent certain strata, included model W4 and a number of column models that addressed the 'constrained zone'. It is the constrained zone models that are most relevant since these models consider the intervening zone between the alluvial lands and the deeper zone of enhanced vertical drainage below about 200m depth. These constrained zone models were summarised in an Issue Paper provided as part of the response to EIS submissions. In that paper stochastic simulations were conducted on a 1ha (surface area) column comprised of 24 layers of model cells with dimensions of 5m x 5m x 5m in an attempt to replicate tortuous flow using equivalent porous media. Results demonstrated that if 50% of

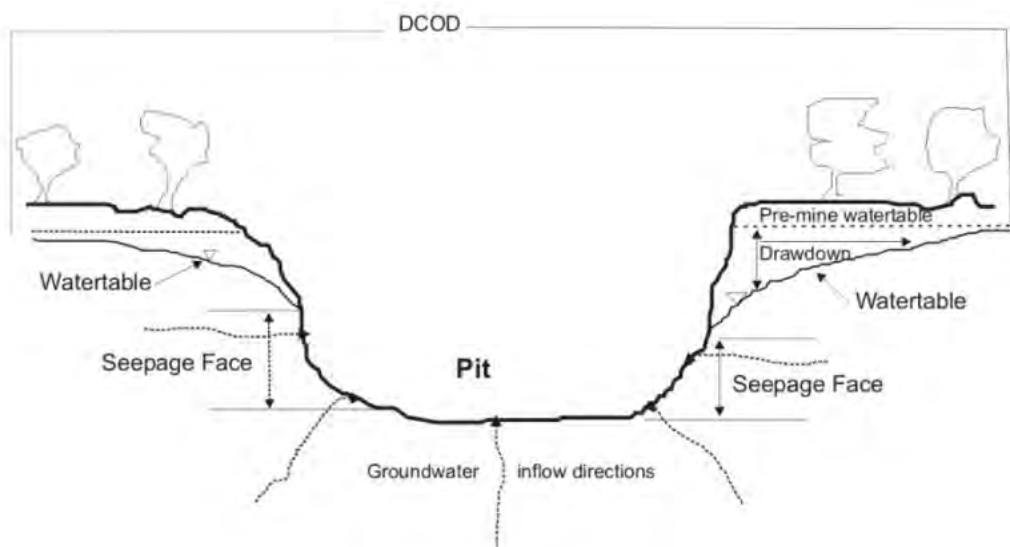
the cells in any single layer contained a vertical fracture, the derived average saturated vertical permeability would be similar to the values adopted in the regional flow model."

The statement in the MER (2014 Section E7) report is also relevant:

"Basically the horizontal conductivity is relatively insensitive when compared to the vertical conductivity in controlling vertical leakage through the constrained zone. Similarly, by introducing randomness to vertical conductivities it is possible to increase the mean value without affecting the bulk conductivity of the column."

The PSM (2013) indicates that the flow of groundwater through rock masses is normally dominated by fracture flow and not by the rock matrix. The PSM report quotes various sub-surface structures where fractures can induce groundwater inflow. While it is true that fractures in the sub-surface can provide sub-surface flow into bores and wells it is also true that these water bearing fractures tend to occur irregularly in any vertical borehole as any hydrogeologist or drilling contractor will attest. But additional evidence is available in large open pit mining environments. In those cases there are many examples, in KA experience, where visible fracture traces exist but are irregular and often sparsely distributed and are either not continuous or do not have the same intensity and frequency in the vertical or semi-vertical direction.

Rock matrix seepage is nevertheless also present and important but in most cases not visible due to evaporation at moderate to high temperatures in open pits. An excellent example of this seepage was recently photographed during a court case regarding a sandstone pit. This photo was taken during early cold morning conditions under sun reflection (Figure below). It shows the distinct matrix seepage face in that pit high wall with no distinct fracture inflow along that face visible during the inspection. The matrix seepage "disappeared" later in the day due to evaporation. (Note: DCOD - Drawdown Cone of Depression in 3D)





Hence significant open fractures are not necessarily connected throughout the geological profile with the same frequency and intensity. There will always be localised zones of fracture openness that predominate in the horizontal direction with consequent localised storage of groundwater of interspersed water bearing strata. It cannot be concluded that there are well defined continuous pathways available for downward vertical groundwater flow in an extensive deep mining profile because horizontal fractures at depth and vertical/ semi-vertical fractures are evident at shallow depths.

Dr Mackie has also indicated in his report (MER 2014 Section E8):

“Adopted model conductivities for hard rock strata are very low and reflect core and packer testing results with the assumption that conductivities are matrix dominated rather than fracture dominated. This is consistent with observations of drill core where fractures zones are observed to be infrequent. While such zones (where identified) are considered to be locally transmissive, they are expected to be poorly connected and to offer limited storage.”

The corollary is that the PC (2016) report notion that there would be a strong direct connection between the mine and the ground surface is not supported. The constrained zone is one where vertical permeability is low and close or equal to the permeability of undisturbed strata. Consequently vertical flow rate is restricted in this zone including depressurisation propagation that would be impeded in reaching the ground surface under mining conditions. (See also Appendix comments herein concerning this issue and shallow fracturing that is essentially unconnected to sub-surface mining zones)

PC (2016) has noted that regarding constrained zone *“This assumption that there will be a Constrained Zone of unaffected permeability more than 220m above the level of extraction is not supported by experience within the Southern Coalfields and at Ulan”*. There is no evidence provided in the PSM (2013) that such a zone does not exist in the Southern Coalfields. On the contrary where there is a substantial depth of rock overlying coal seam extraction a constrained zone is very likely to develop as it has in the Southern Coalfields validated by limited depressurisation influence in piezometers placed higher in the profile at monitored mine sites. As noted previously, Figure 20 used by PSM (2010) illustrating the FLAC2D fracture simulation clearly indicates the predicted presence of a constrained zone above 200m depth from the ground surface at Wallarah. It is possible that there is confusion in the PSM statement regarding the evidence of shallow cracking near surface at the Southern Coalfields that is not related to deeper connection. Also the reference to Ulan has been shown to be invalid because of the significant different geological profile at this site. The issue was covered in the Kalf (2010) review of the PSM (2010) report (see attached

Appendix at point 2 in the Kalf (2010) review) a copy which is provided below:

*"The report goes on page 19 to compare the Ulan mining site with the Wallarah proposed site indicating that the field results and assumed model results at these two sites: **"are so diametrically opposed to those of Wallarah 2 that they warrant quoting in this review."** There does appear to be elements of the dramatic and scare value here in my opinion given that the geological environment of the two sites influenced by mining is not quite comparable. In this context the emphasis on the Ulan site loses some of its puff when the report notes: **"Even if the Ulan situation is not a complete [sic->complete] analogy for Wallarah....."**, followed by: **".. it would seem reasonable that Mackie should seek to integrate the findings from Ulan into the Wallarah 2 studies.** It seems to me that if the **"Ulan situation is not a complete analogy for Wallarah"**, as admitted in the PSM review, then there would be no valid reason to **"integrate"** the Ulan findings into the Wallarah analysis."*

The PC (2016) report on page 4 further on produces an extended quote from the MER EIS modelling report (MER 2013) related to model leakage estimates from the alluvium at Wallarah. The first disagreement is concerned with the adoption of the MER permeability values that has already been discussed in 'PC 6.0 Groundwater Modelling' paragraphs 2 to 9 above. The second disagreement concerns the quote in the MER report of drainage of an average 20m high column. Dr Pells states that this *"is very misleading and represents incorrect understanding of groundwater flow systems"* but does not elaborate the reasons for this statement or provide a detailed explanation why it represents *"incorrect understanding"*. Perhaps Dr Pells simply disagrees with the final conservative leakage result of up to 73 ML/annum⁸ of leakage because it disagrees with his incorrect direct leakage conceptual model.

KA considers the MER explanation of leakage as an accepted and direct way of illustrating the likely magnitude of leakage from alluvium mitigated by direct rainfall recharge.

Dr Mackie has also responded as follows:

"The estimated vertical leakage rate from the alluvium to underlying strata has been assessed to be about 2ml/day per square metre to the completion of mining. This leakage is estimated to occur over an area of the order of 9.3 square kilometres within the mine footprint. Hence the vertical leakage losses are calculated to total about 0.02ML/day or about 7.3ML/annum. In order to assess the impact of this leakage during drought conditions, I simplified the assessment to consideration of a vertical column of alluvium nominally 20m high with a surface area of 1m x 1m and a 20% drainable porosity as used in the groundwater flow model. Assuming no rainfall recharge to the top of the column and discounting any other losses associated with non-mining flows (e.g. horizontal flows to creeks and channels), the rate of fall of the water table within this column would be 0.01mm/day or 3.65mm/annum. If a drought period of say 5 years with zero rainfall recharge is considered, then the fall in the water table would be about 18.2mm over the 5 years term. This loss would apply regardless of the height of the alluvial column. Of course it is improbable that no rainfall recharge would occur over a period of 5 years. Indeed, water table observations in shallow monitoring bores located in the alluvium indicate rapid recharge even for relatively small rainfall events (see Appendix C of the EIS)."

⁸ 73 ML/annum is based on an estimate of model estimate of 7.3 ML/annum multiplied conservatively by a uniform 10 fold increase by MER of the vertical permeability in the constrained zone.

Summary of the KA Review - Pells Consulting (2016) report and related PSM (2013) issues

1. While the World War 2 and Federation drought periods at the turn of the Century were severe, the Millennium drought is one of the most severe over the last 67 years and therefore remains a period of unusual rainfall deficit in the region and therefore suitable for assessment of drier conditions.
2. The computed mine inflow is derived almost exclusively from deep storage depressurisation over a wide area in the subsurface. The computed rates of inflow during mining are therefore not derived instantaneously or within a short period by direct leakage of stream flow, baseflow or alluvium. Recovery of water levels in the sub-surface post mining would require a very long time period and therefore flow to the deeper groundwater will occur at low rates over this period of time from direct rainfall recharge. The PC (2016) report conceptual model misunderstands the groundwater system behaviour in a hard rock environment of low permeability under deep mining conditions.
3. The notion by Pells Consulting that there would be a strong direct connection of depressurisation to the ground surface due to mining at Wallarah is not supported. Given the particular geological conditions all analyses and evidence indicate that there would be a constrained zone in the geological profile that would in turn impede depressurisation propagation to the ground surface and hence downward flow from water sources at ground surface.
4. The quotation in the PSM (2013) report: *'There is no free lunch here. It's very simple – every litre of water pumped out of the ground reduces river flow by the same amount'* has been shown to be overly simplistic, out of context and flawed and not an accurate quotation from a well-respected hydrogeologist or applicable at Wallarah.
5. The PSM (2013) report use of the EIS MER model pressure head section to demonstrate hypothetical bores having excessive drawdown and by implication that there is therefore active interaction with the shallow watertable near surface is misleading and invalid. The model shows no drawdown of the shallow watertable, and existing bores lie at much shallower depths than depicted by the PSM hypothetical bores. Some damage may ensue to existing bores due to subsidence that has been acknowledged and covered in the PAC assessment.
6. Comparison made between Wallarah model permeability and SCT model generated fracture zone in the proposed Wallarah mining profile indicates that the apparent differences do not indicate that the Wallarah model permeability set adopted for the constrained zone above a depth of about 200m is invalid. The model parameters are not "skewed", that is displaced to lower permeability values, as the Pells Consulting report alleges if there is an understanding about the basis of each model assessment and the likelihood of the probable position of the SCT 'insitu [vertical] conductivity' very likely extending into the vertical permeability region adopted in the MER model.

7. Rock matrix seepage can form an important source of inflow in sub-surface mines although often removed by ventilation. There will always likely to be localised zones of fracture openness that predominate in the horizontal direction with consequent localised storage of groundwater of interspersed water bearing strata in a mining rock profile. However, it cannot be concluded that there are well defined continuous pathways available for downward vertical groundwater flow in an extensive deep mining profile.
8. There is no evidence provided in the PSM (2013) that a constrained zone does not exist in the Southern Coalfields. On the contrary where there is a substantial depth of rock overlying coal seam extraction a constrained zone is most likely to develop as it has in the Southern Coalfields, validated by limited depressurisation influence in piezometers placed higher in the profile at monitored mine sites. In addition PSM (2010) illustration of the SCT FLAC2D fracture simulation clearly indicates the predicted presence of a constrained zone above a depth of about 200m at Wallarah.
9. Reference to the mining at Ulan in the PC (2016) report has been shown to be invalid because of the significant different geological profile at this site.
10. The synthetic 'stochastic' simulation in the MER (2013) report to determine the effective bulk vertical permeability has not been understood by the PSM (2013) report. PSM (2013) assumes that a number of realizations of different and increasing uniform permeability have been generated rather than a random combination of higher and lower permeability in a profile conducted in a number of separate simulations. The MER stochastic model analysis is valid and indicates a bulk effective vertical permeability that is very similar to the vertical permeabilities used by MER in the earlier EIS modelling work.
11. Calculations conducted by MER to determine the leakage from alluvium are considered to be relevant and suitable. These calculations indicate up to 73 ML/annum downward flow allowing for a conservative ten-fold increase in vertical permeability in the constrained zone with such flow replaced by rainfall recharge at the ground surface.

After the completion of this report Dr Kalf was advised by Hansen Bailey about the reference of the additional report by 'Pells Consulting' dated 10 June 2013. This is the document referred to herein as '*Response to Submissions*' document dated September 2013' under the first heading herein '*Background and Previous Reports*'. This Pells (2013) report to the PAC has been examined and it is essentially a summary of the PSM (2010) report related issues referenced herein that covers the majority but not all of the material in the PSM (2010) report and reported herein. Consequently no changes are considered necessary to the contents of the KA review presented herein or to the '*Summary of the KA Review*' statements given above.

The only additional issue that requires clarification is the Jilliby Jilliby Creek flow loss quoted as 0.74 ML/day last paragraph above Section 4.3 in the Pells (2013) report. Dr Pells states this daily rate is based on page 86 of the EIS Appendix I MER report that the

streamflow loss would be 270 ML/annum (Section 7 Water Sharing Plans paragraph 3).. Dr Pells appears also to assume that this loss is continuous for the entire period of mining. However, MER in Section 7 states that this loss is due to panel induced subsidence that “in alluvial lands may induce temporary leakage from surface drainage systems ...as the watertable equilibrates”. That is, it is a temporary loss effect over the limited period of individual panel extraction during which time the outflow from the Creek will fill the depressed alluvial storage directly above the extracted panel. In addition, the rate quoted by MER is a conservative estimate rather than what is likely to occur. It is relevant that Table E4 later in the MER report indicates negligible long term leakage vertically downward from Jilliby Jilliby Creek. From Section E7.1 MER states “ *While pressure losses are noted in deeper hard rock strata negligible losses are evident in the shallow watertable alluvial groundwater system and connected system*” [i.e. streams].

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APPENDIX
Kalf (2010) review - PSM (2010) report
including Conclusion and Considerations

The Pells Sullivan Meynink Review

Wyong Shire Council commissioned this report as part of the Earth Systems review and it deals with the geotechnical, hydrogeological and hydrological impact of the proposed mining.

Dr P. Pells reviewed the groundwater aspects and in particular the EA Mackie modelling description and results. Dr Pells' review (Pells 2010) is referred to hereafter as the PSM review.

1. On page 21 the PSM review makes the following statement: ***"Mackie have used the computer program, modflow, which is widely used for this kind of work that is not a true three-dimensional model. It attempts to take three-dimensional factors into account through a "smearing" process in vertical, one-dimensional columns. However, if the input parameters are appropriate it is considered that modflow is a reasonable model to use to provide guidelines as to likely impacts on the groundwater regime. However, many of these impacts could be calculated using simple, one-dimensional hand calculations, and to some extent the apparent sophistication of modflow can deflect the reader from a proper appreciation of the limitations of such computer modelling."***

This paragraph seems to reveal a degree of misunderstanding about the theoretical basis of the Modflow-Surfact computer code used and its applications to groundwater flow problems. Modflow and in particular Modflow-Surfact, a more advanced variably saturated computer code variant, is a three-dimensional layered model that can model to any 3D resolution required depending on data availability, computer memory and resources.

The word ***"smearing"*** is also inappropriate. All numerical models whether finite difference or finite element⁹ involve some form of averaging of rock properties at the finite difference cell or element scale. The important point is that such a model applied to stratified layers that occur in association with coal seams, should be representative of the higher permeability zones of the strata layers in the horizontal direction and the lower permeability zones in the vertical direction. In the vertical direction, the lower or lowest permeability of a particular layer or layers in a stratified sequence in disturbed strata due to mining ultimately determines the groundwater flow rate in that direction. Flow patterns that are initially vertical and become horizontal or vice versa over a given time period cannot, in any way, be accounted for using the "one-dimensional hand calculations" suggested in the PSM review.

The notion therefore that one could determine, for example the three-dimensional regional drawdown distribution in a multi-layered variable strata thickness sequence of variable horizontal and vertical permeability and saturated-unsaturated conditions under a variety of boundary conditions using a one-dimensional column manual approach, is invalid.

⁹ Two different methods that subdivide the strata of porous medium into cells or so called elements to solve a set of simultaneous equations of groundwater flow applied to each cell or element.

Determining the vertical leakage using such a one-dimensional column, as apparently used in the PSM review, using packer permeability results would also be wrong because it takes no account that the vertical permeability can be several orders of magnitude less than the horizontal values particularly for disturbed strata as discussed in detail in Appendix A.

2. The report goes on page 19 to compare the Ulan mining site with the Wallarah proposed site indicating that the field results and assumed model results at these two sites: **"are so diametrically opposed to those of Wallarah 2 that they warrant quoting in this review."** There does appear to be elements of the dramatic and scare value here in my opinion given that the geological environment of the two sites influenced by mining are not quite comparable. In this context the emphasis on the Ulan site loses some of its puff when the report notes: **"Even if the Ulan situation is not a compete [sic->complete] analogy for Wallarah....."**, followed by: **".. it would seem reasonable that Mackie should seek to integrate the findings from Ulan into the Wallarah 2 studies."** It seems to me that if the **"Ulan situation is not a complete analogy for Wallarah"**, as admitted in the PSM review, then there would be no valid reason to **"integrate"** the Ulan findings into the Wallarah analysis.

It is better to compare the Wallarah site with some of those coal mine sites in the Southern Coalfield of NSW as has been done in this report. Such a comparison together with many other studies indicates the presence of a retarding zone to vertical flow (i.e. an aquitard zone) between the surface and the coal seam. This is validated by the limited inflows into mines in the Southern Coal Field overlain by a large water storage (e.g. Cataract Reservoir - see Appendix B, Longwall mining under Cataract Reservoir). However, the PSM review fails to provide evidence for the Southern Coalfield only giving a reference Pells-1993 for further details. This document is not listed in Pell's report reference list.

3. On page 19 the PSM review notes that: **"the permeability values for most of the strata above the extracted longwalls, and within the confined [sic -> Constrained] zone, are equal to the substance permeabilities of a rock; therefore Mackie have adopted permeability that is between 10 times and 100 times lower than those measured in the Cooranbong study and in the Wyong groundwater study."** The term **"substance permeabilities"** is taken to mean the natural insitu, that is, the pre-mine horizontal permeability of the strata. Examining the Mackie adopted model horizontal permeability values indicates that they are in the range 1.8×10^{-5} m/day to 3.4×10^{-5} m/day while the Cooranbong measured values are in the range (Forster 1997) 2.6×10^{-4} m/day in shallower (56 to 62m) Patonga Claystone with remaining deeper strata profile in the range 4.8×10^{-5} m/day to 1.7×10^{-6} m/day. That is apart from the shallow Patonga Claystone permeability value the remaining deeper Narrabeen Group strata at Cooranbong have permeabilities that are about the same or 10 times less than the values adopted by Mackie for the model pre-mine horizontal permeability.

4. Later in the PSM review on page 23 it is not so clear from that report, that the **"substance permeabilities"** (that were interpreted herein as horizontal *K* values) would be distinctly different from the vertical permeability values of the strata when it is stated that: **"the vertical permeability values adopted by the Mackie report for Wallarah 2 model are between 100 to 1000 times lower than values suggested by field testing"**. Apart from the fact that packer tests do not measure vertical permeability, the comment indicates that the PSM review makes no particular distinction between the horizontal permeability *Kh* values, that are those essentially measured using packer tests in the field, and vertical permeability *Kv* of the strata particularly after mining disturbance. As discussed in Appendix A the vertical permeability values are of distinctly different magnitudes because packer tests tend to measure the most permeable parts of the strata in a horizontal direction while vertical groundwater flow is controlled by the layer of lowest permeability in the strata profile.

For example at the Kemira colliery test bores, the vertical permeability in the disturbed strata is calculated to have a harmonic average value of 5×10^{-7} m/day for a permeability ratio *Kh/Kv* of 1000 or 5×10^{-6} m/day if such a ratio is 100. (Table A1. Appendix A). The higher value is of the same order of magnitude used in the Mackie modelling report. Thus given a substantial cover of interbedded sandstones, shales, siltstones and claystone the constrained zone severely retards water leakage from the surface towards the mine. The New South Wales Office of Water (NOW) agree with the conclusion about such retarding qualities in their review of the Mackie model report (page 2) : **"the risk of subsidence-induced inter-connectivity between alluvial groundwater systems and the mine workings may be regarded as minimal"**.

The analysis in Appendix A from the two Kemiri bores in the Southern Coalfield indicates that the horizontal permeability of the Narrabeen strata are however affected to varying degrees by mining throughout the profile with horizontal permeability in the constrained zone increasing by up to 2 orders of magnitude (100 times) but as indicated with little change if any in the effective vertical permeability.

5. The PSM review on page 18 notes that the Mackie report has **"ignored the information given in respect to the natural permeability of the strata above the coal seam and has ignored similar data from the report by Coffeys Partners International (1998) for the Wyong Groundwater Study"**. I have examined the Coffey report in detail and tabulated the packer tests derived (horizontal) permeability values. The arithmetic average for these set of results excluding those for the coal seam is 4.8×10^{-4} m/day. However, the majority of the values have a magnitude of 10^{-5} m/day and therefore not surprising the set of values yields a median permeability value of 10^{-5} m/day¹⁰. The reason for the occurrence of many values of 10^{-5} m/day is because the tests in the Coffey report could not apparently resolve permeability values less than about 4.3×10^{-4}

¹⁰ The arithmetic average in this case is incorrectly weighted toward the few larger values in the set. The median gives a better measure of the most common values.

m/day. The report notes that: "**For determining the mean K values in m/day cited.. a nominal value of 10^{-5} m/day was ascribed to those values having a K [permeability] of < [less than] 4.32×10^{-4} m/day.**"

Clearly the horizontal permeability magnitude is similar to the Kemira bore K7 pre-mine horizontal permeability test values (Arithmetic average = 7×10^{-5} m/day; Median = 4.3×10^{-5} m/day) and those in the Cooranbong investigation (Arithmetic Average = 8.5×10^{-5} m/day, Median = 7.7×10^{-5} m/day). Since the strata permeability is anisotropic the vertical permeability is likely to be 100 to 1000 smaller than the horizontal for disturbed strata for the reasons outlined in detail in Appendix A. For disturbed strata due to mining it could be expected that the harmonic average vertical permeability would lie in the range adopted by the Mackie model.

6. On page 22 the PSM review notes that "**The Mackie assumption as to the absence of fractures within the bulk of the Narrabeen sequence is also in contradiction to findings of a paper by Cook (2009).**" It is agreed that there is high fracture and porosity in certain areas in the upper Terrigal formation, many kilometres south of the mining site where this formation is a much thicker, but not in "**the bulk**" of the Narrabeen strata sequence as suggested particularly within the mining lease. This can be seen from the range of bores depths that have had some limited success and failure. Most of these bores yield only small supplies of variable quality water sourced from irregularly distributed fractures in predominately lower lying topographic sites at depths less than 50m. For example the NOW registered bore details listed by Mackie (2010) have a median depth of about 30m and a median bore yield of about 0.8 L/sec. Some bores have failed to produce a useful supply. There is only one deep bore recorded of 131m that yields only 0.2 L/sec.

The PSM review indicates that Cook (2009) has reported an "**aggregate**" yield of 15 L/sec¹¹ from bores constructed as part of the Gosford/Wyong emergency water supply. This yield is obtained from borefields in the uppermost Terrigal Formation in the strata sequence. The closest bores (Bangalow and Ourimbah creek borefields) are located some 11 kilometres south in a straight line from the southern boundary of the Wallarah 2 lease area.

More importantly, is that the Terrigal formation does not underlie the eastern part of the proposed mine site area and nor does it underlie the major creeks across the mining lease such as Jilliby Jilliby (Dooralong Valley) and lower part of Little Jilliby Creek (Figure 1 below on page 20). The uppermost formation underlying most of the coal lease and the creeks is the Patonga Claystone formation, the strata that Cook refers to as "**unprospective**". Later in the same paper Cook states: "**The underlying Patonga Claystone**

¹¹ It is to be noted that the horizontal permeability of the Terrigal formation at these localised fracture bore sites zones is in the range 0.9 to 35 m/day, some many thousands of times greater than the bulk of the Narrabeen strata that underlie the mine site.

was assessed to have low potential for the discovery of useful flows of groundwater for the purpose. In addition, the quality of groundwater is generally poor with common high salinity levels. That is, the Patonga formation is of low permeability, and has very limited groundwater potential for the same reasons that the intervening strata down to the coal seam have virtually no groundwater potential as well as having a high groundwater salt content. The Terrigal formation comprising mainly sandstone only occurs along the elevated terrain in the western part of the mining lease with a groundwater potential that would be far less favourable.

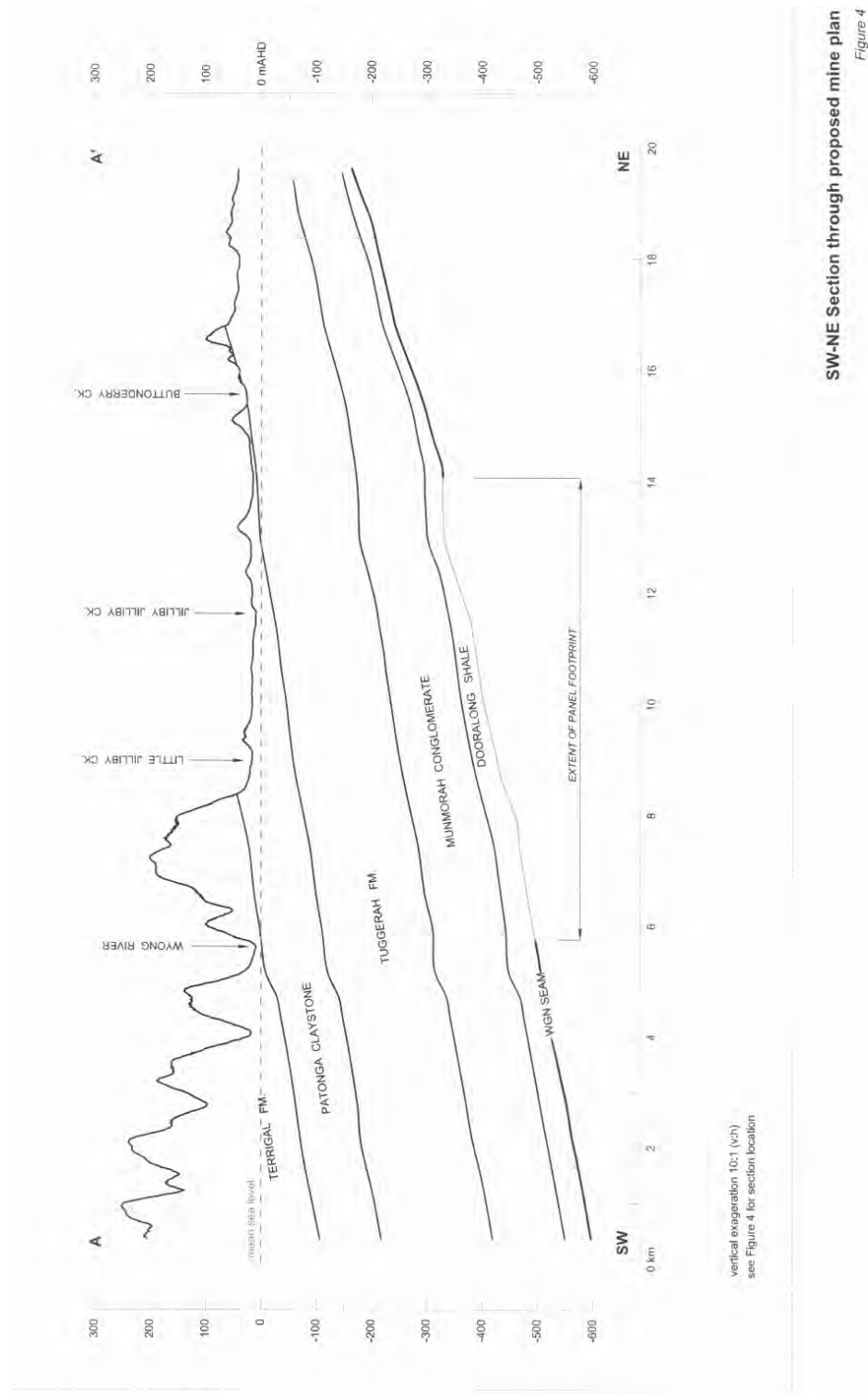


Figure 1 The “unprospective” Patonga Claystone formation underlying the majority of the mine site area and the major creeks (Taken from Mackie 2009 Figure 4)

Figure E4 verifies this in the EA Mackie report showing interpreted horizontal permeability profile for bore B250W300 that penetrates this formation at an elevated site. The profile shows no major difference between the Terrigal Formation horizontal permeability and the underlying Patonga formation. Any water bearing strata in the Terrigal formation would tend to

be perched and hydraulically isolated from mine influence at a height of more than 500m above the seam (Figure 1). Therefore it would not be affected by panel extraction. These are the findings in a similar strata profile in the Southern Coalfield of NSW (Merrick 2009) where elevated groundwater circulation systems in the Hawkesbury Sandstone are perched water-bearing strata unaffected by mining.

Hence the reference to the Gosford/Wyong water supply site by the PSM review and the implication that the apparently localised highly fractured nature of that rock formation at these distant bore site locations would apply over the mine site is quite misleading.

7. The PSM review (page 21) also refers to a study done by Coffey and Partners in 1980 by MacGregor who inspected **"by helicopter, boat and by foot"** exposures of rock along cliff lines in the South Coast to assess the fracture and joint frequency and distribution of the Narrabeen strata. While of interest, to suggest that these de-stressed and weathered rock exposures would reflect the actual geological structures that would occur deep within the bulk of the rock mass away from the exposed cliff faces is invalid.
8. On page 24 the PSM review states: **" Both the Mackie reports and the MSEC report seeks to dismiss the substantial evidence from the Southern and Western coalfields to the effect that the zone of near surface cracking is created within the rock strata that is substantially deeper than 10 to 20 m and has had major impacts on certain streams and rivers such as the Cataract river and the Waratah Rivulet. Evidence of cracking being deeper than 10 to 20 m included the emission of substantial quantities of methane into the bed of the Cataract River. This certainly came from depths greater than 20 m."**

Vertical cracking near the surface can occur but these fractures are due to surface subsidence tensile forces that are known and acknowledged to occur at relatively shallow depths, but not at all mining sites. Holla and Barclay (2000) indicate that at the Cataract River the gorge floor cracked at several locations but that surface cracking already existed prior to mining due to pre-existing regional stress field created during the formation of the gorge (or at least were in a stressed state for this to readily occur). The cracks were shown to be unconnected to the mine with an estimate that surface cracking **"might extend approximately 10m to 20m below the surface. There was surface water leakage to the shallow water table under the river and this leakage could be controlled by the [vertical] permeability of the Hawkesbury Sandstone. Monitoring of piezometers installed in the river indicated that the regional water table had not moved as a result of mining. Box notch weir was installed to monitor flow along the river due to a controlled release of 5 ML per day over the Broughtons Pass Weir. The study indicated that there were surface water losses attributable to the mining and natural causes amounting to 1.5 ML per day. These water losses, however, contributed to subsurface flow within the shallow groundwater system, which was connected to the Nepean River flow. There were no total losses to the river flow system, as all the water eventually flowed into the Nepean River."** (Holla and

Barclay 2000 pages 95-96).

Methane outflow at the ground surface is not necessarily immediately sourced directly from the coal seam but may be present in the upper layers of the Narrabeen strata as verified by Cook (2009) who found methane and carbon dioxide de-gassing present in the uppermost Terrigal formation during water supply pumping tests. Gas mobility is also much greater than water having a much greater hydraulic conductivity in the same strata than water due to differences in density and viscosity.

Finally, the fracture simulations conducted by SCT/MSEC (2010) (See Appendix A, Figure A2) show that shallow vertical fractures with slightly higher vertical permeability only occur sporadically in the Hue Hue area W2CP profile within 10m to 15m from the surface.

Conclusions and Considerations

- The Mackie report overall is quite detailed and presented and documented in a very professional manner in my opinion. The report covers both the calibrated groundwater steady-state using admittedly limited monitoring water levels; however, the use of a large database of core and packer test permeability and well known hydrogeological principle of undisturbed water levels in a hard rock environment have produced a very plausible modeled regional pre-mine water levels.
- The conceptual model used by Mackie Environmental Research for simulating longwall mining uses the acknowledged structural behavior of sedimentary strata overlying longwall coal seam extraction. This includes a caving zone overlain by a major fracture zone; a constrained zone of low vertical permeability above that and finally a surface zone. Updates to the computer model (Mackie 2010) include scaled higher horizontal permeability due to mining in the constrained zone to near surface levels in lower lying areas above the mine footprint. The model also simulates the impact on streams and rivers and determines leakage in a suitable manner in my opinion including sensitivity of permeability between the creek lines and the underlying alluvium.
- Bore permeability testing carried out during the Commission of Inquiry into mining under stored water in the Southern Coalfield of NSW indicates that the permeability in the strata profile, similar to strata at Wallarah 2, is highly anisotropic once the profile is disturbed by longwall mining. This anisotropy is due to the predominate horizontal fracturing, bedding shear and delamination (strata separation) at depth during mining, within the constrained zone. This causes in turn a much higher horizontal permeability in this zone with a retained lower effective vertical permeability, due to the resistance to vertical flow of the intervening

layers between these structures. A geotechnical fracture model prepared for the Wallarah 2 project validates this aspect. There is also evidence of essentially limited inflow to sub-surface mines in the Southern Coalfield and mines in the Central Coast of NSW and elsewhere. The updated Mackie model has incorporated these disturbed horizontal permeability distributions.

- The New South Wales Office of Water are in agreement with the conclusion that there would be virtually no inflow to the Wallarah 2 mine from the surface: *"the risk of subsidence-induced inter-connectivity between alluvial groundwater systems and the mine workings may be regarded as minimal"*. And later in the same document *"the knowledge to date on the extent of goaf¹² fracturing is such that NOW concurs that direct connective cracking between the mine working goaf and that of tension cracking on the land surface is a low likelihood given the depth of mining proposed."*
- While there is currently limited monitoring, due to a number of reasons, there will be sufficient time to install additional monitoring piezometers, provided access is approved, given that it will be some 3 years during construction of the mine decline and site facilities before actual longwall mining commences. The reported notion that the mine should not go ahead because of limited data and monitoring is not considered to be a valid reason for withholding approval to proceed.
- Dr Pells' review (PSM review) appears to misunderstand the basis and features of the Modflow-Surfact model used in Dr Mackie's analysis. The model is a three-dimensional layered model, does not "smear" the strata model parameters and can if required model to any vertical resolution required including variable saturation.
- The PSM review makes reference to the Ulan mine indicating that the results should be integrated into the modelling of the Wallarah 2 coal project. However, given that the PSM review then admits *"Ulan situation is not a complete analogy for Wallarah"*, there clearly would be no valid reason to include such findings into the Wallarah analysis.
- The PSM review makes no distinction between the horizontal and vertical permeability of the Narrabeen strata either in a pre-mine or post-mine state. The report therefore fails to acknowledge or understand that the strata is not isotropic but anisotropic and therefore that fracturing during mining is essentially horizontal with leakage from the surface severely restricted because of the effective low vertical permeability controlling such vertical flow. Therefore the PSM review is wrong to assert that the *"vertical permeability values adopted by Mackie for the Wallarah 2 model are between 100 to 1000 times lower than the values suggested by field testing"*. Apart from the fact that field testing does not determine vertical permeability, the values adopted for vertical permeability in Mackie report

¹² Goaf - the opening created due to rock collapse immediately above the mined out coal seam.

are actually of a similar magnitude or likely to be even higher than interpreted from the field tests if there is an understanding about the anisotropic permeability of the Narrabeen Group of interbedded strata under deformation. This is supported by other studies referred to in the PSM review.

- The PSM review makes reference to studies and drilling and testing for the Gosford/Wyong emergency water supply indicating highly permeable zones in the Terrigal Formation implying this is also likely the case at the Wallarah 2 site. The statements are misleading given that most of the site area and main creek channels at Wallarah 2 are underlain by the Patonga Claystone and deeper rock strata that have low permeability and very limited to virtually no groundwater potential with a high salt water content. The investigator of the Gosford/Wyong water supply has noted that the Patonga Claystone formation is *"unprospective"*.
- The New South Wales Office of Water (NOW) review indicates that the main concern is the perceived interruption or influence of shallow mine subsidence cracking on the baseflow in creeks. NOW contend that the alluvial groundwater hydraulically *"supports"* and *"buffers"* low surface flow in these creeks (even though they are likely to be brackish) and that the Mackie model is not *"robust"* enough to make predictions about the effects of these perceived changes. I do not agree with the NOW review that the Mackie Modflow-Surfact model is not *"robust"* enough, that is, is not capable of determining the impact, if any, on the shallow alluvial groundwater system.

The experience by Forster (1995) indicates: *" testing carried out during the [Wyee State Coal mine] study did not detect any surface effects due to mining. Because the overburden is topped by a layer of weathered rock and soil to a depth of 10 to 15 m in this area, the induced surface strains would have been absorbed by this material without any noticeable effects. If a layer of soil and/or weathered rock covers the ground surface then strain effects will often not be evident in this zone. This assumption is supported by the observation at Cooranbong, where the surface shows little sign of disruption despite having been subjected to tensile strains probably in excess of 8 mm/metre."*

Also Reid in 1995 referenced in Holla and Barclay (2000) notes with regard to possible fracturing at the base of the Cataract Reservoir with Longwall mining beneath it : *"The results of [measured] in situ strains have been interpreted to mean that the mining has resulted in small deformations at the floor of the reservoir and this has increased confidence in the ability of the strata to remain relatively impermeable."*

- With regard to the likely variation in water level in the alluvium due to subsidence, the Mackie report indicates that the temporary drop in water level in the alluvium would be similar to the magnitude of subsidence (up to 1.3m). It has to be kept in mind that this drop would be well within the range of the water table elevation variation due to seasonal rainfall variability and

much less than watertable decline that would be created during extended drought periods

- The review related to groundwater conducted by DECCW and the impacts they say might be created by the Wallarrah 2 coal mine are of interest, but are too general and unspecific to enable a satisfactory comparison to be made with those that are likely to occur at Wallarrah 2 mine site. Many of the issues raised have already been addressed in the EA Mackie and update reports and field experience at other mine sites as set out in this report.
- My critical review of the modelling and observations contained in the EA report; Mackie "update report" and my study of earlier and more recent computer model results, including field evidence and groundwater impacts caused by coal mine subsidence elsewhere, result in me agreeing with Dr Mackie about the predicted minimal impacts on groundwater due to mining at the W2CP. That is, the likely impacts on shallow groundwater and surface water environments are considered to be low and highly unlikely to affect the water resources of the alluvial lands situated within the Dooralong and Yarramalong valleys.
- I concur with the monitoring and verification program as set out in the Mackie report. (See Appendix D) but would also include the following:

Two pre-mining monitoring bores to be centered and separated above each of the initial 125m and 150m wide panels. These bores should be cored and logged (including fracture frequency) in the normal manner and packer tested from the near surface to full depth. Following seam panel extraction these bores may be damaged at depth and therefore replacement bores should be constructed in the near vicinity to the original bore sites and packer tests repeated from the surface down to the caving zone. The bores should be cored and logged (including fracture frequency) and then packer tested to determine the increase in horizontal permeability. The new bores should also be completed with multi-depth piezometers to assess strata vertical connectivity.

This process should be repeated with at least one monitoring bore and replacement bore centered within the panel immediately adjacent to the Jilliby Jilliby creek alluvium before mining extends beneath the creek alluvial flats.

Discussion with Dr Mackie indicates the above suggested drilling and testing programme will most likely include additional bores for assessment during the earlier stages of mining. Dr Mackie also indicated that it may be useful to optimise the location of other additional bores with any proposals put forward by SCT in the future.

With regard to possible remediation, farm dams should also be included in the assessment.