

WALLARAH 2 COAL PROJECT
RESPONSE TO PLANNING ASSESSMENT COMMISSION REVIEW REPORT
for
Wyong Areas Coal Joint Venture

1 INTRODUCTION

The Minister for Planning and Infrastructure directed the Planning Assessment Commission (PAC) to undertake a review of the Wallarah 2 Coal Project (the Project) and to hold a public hearing. The public hearing was held at the Wyong Golf Club on 2 April 2014.

Following its review of the documentation for the Project and the public hearing, the PAC provided a letter to Kores on 14 April 2014 seeking additional information on a number of issues. The proponent provided a response to the PAC's letter on 2 May 2014 (the proponent's response).

The PAC finalised its review of the Project and published the *Wallerah 2 Coal Project Review Report* (PAC Report) on 12 June 2014. The PAC report recommended 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 allow the project to proceed" (p. 76)

The PAC report also identified some outstanding issues that needed to be resolved prior to determination by the consent authority. This report addresses the unresolved issues identified by the PAC.

2 RESPONSE TO PAC RECOMMENDATIONS

2.1 SUBSIDENCE

2.1.1 Subsidence Performance Criteria

The PAC states that:

“Given the uncertainty associated with the subsidence impact predictions, there needs to be a much ‘tighter’ specification of the performance criteria for some features and non-negotiable milestones at which assessment must demonstrate that the project is meeting the performance criteria” (p. 20)

In accordance with the conditions of development consent, the proponent will develop an Extraction Plan and / or Subsidence Management Plan prior to the commencement of secondary workings. The Plan will include specific performance criteria for natural and built features. The performance criteria will be based on model predictions and subsidence measurements for completed longwall panels. The Plan will include performance criteria for conventional and non-conventional subsidence effects.

The performance criteria in the Plan will be used to facilitate adaptive management. If there is a risk that the performance criteria will be exceeded, Trigger Action Response Plans (TARPs) will be implemented to reduce the risk of environmental harm.

All longwall panels will be made the subject of Extraction Plans and / or Subsidence Management Plans; however it is not necessary to develop separate Plans for each panel. Extraction Plans and / or Subsidence Management Plans will be developed to the satisfaction of the appropriate government authorities.

2.1.2 Far Field Horizontal Movements

The PAC expressed concern over the potential impacts of far-field horizontal movements on bridges along the M1 Motorway. The proponent will consult with RMS during the preparation of Extraction Plans. The proponent will provide the relevant subsidence predictions to RMS to inform a structural assessment of the bridges.

2.2 WATER

2.2.1 Impacts on Water Supply

The PAC has requested estimates of the potential impacts on the water supply scheme for each year of the Project. The groundwater impacts that have the potential to impact the water supply scheme are:

- Losses to the alluvium from leakage through the constrained zone to the zone of depressurisation;
- Temporarily increased alluvial groundwater storage as a result of subsidence; and
- Losses to the alluvium from near-surface cracking of bedrock and movement of water into fracture zones.

Table 1 presents estimates of the temporary and long-term impacts on the water supply scheme.

Minor leakage from the alluvium will occur until pore pressures recover to pre-mining levels. As such, this impact will extend beyond the period of mining. Due to the low permeability of the hardrock formations, the rate of leakage is predicted to be very low. Therefore, leakage from the alluvium is a long-term but very minor impact on the water supply scheme.

Losses due to cracking at the base of the alluvium are permanent but relatively minor “one-off” losses.

Increased storage in the alluvium occurs only when mining beneath the alluvium. During this period, an additional volume of surface runoff may be transferred into the alluvium. This additional water is returned to the stream as baseflow after subsidence is complete. Increased transfer of water into the alluvium is therefore considered to be a temporary impact on the water supply scheme (as acknowledged in PAC report).

Table 1
Estimated Groundwater Impacts by Project Year

Project Year	Vertical leakage (ML)	Loss to crack storage (ML)	Shallow alluvial transfers (ML)
1 – Construction	0.00	0.00	0
2 – Construction	0.00	0.00	0
3 – Construction	0.00	0.00	0
4 – (Year 1 of Mining)	0.00	0.00	0
5	0.00	0.00	0
6	0.00	0.00	0
7	0.00	0.00	0
8	0.37	0.52	35
9	0.66	0.63	68
10	1.06	1.00	110
11	1.61	2.15	157
12	2.19	2.40	180
13	2.92	2.45	169
14	3.65	1.72	110
15	4.45	1.85	113
16	4.96	1.13	75
17	5.18	0.50	41
18	5.26	0.19	20
19	5.33	0.18	17
20	5.40	0.00	8
21	5.48	0.00	5
22	5.58	0.00	5
23	5.66	0.00	5
24	5.77	0.00	8
25	5.95	0.20	20
26	6.39	1.76	117
27	6.79	1.60	102
28	7.12	1.04	63

Streamflow is comprised of two components: baseflow and quickflow. Baseflow is the contribution to streamflow provided by aquifers, whereas quickflow is the contribution from rainfall runoff. Vertical leakage, additional crack storage and alluvial transfers resulting from the Project are predicted to have only a negligible effect on baseflows. However, these impacts result in temporary reductions in quickflow until equilibrium is reached after rainfall recharges the available pore space storage in the alluvium and until hydraulic gradients towards the local drainage channels are re-established.

The Buttonderry Site will capture surface runoff from within the Buttonderry Creek catchment. Buttonderry Creek drains to Porters Creek wetland, which is used to supplement the water supply scheme during drought periods. Since the size of the Buttonderry Site will remain constant throughout the Project life, the volume of runoff captured is dependent only on rainfall. The site will capture an estimated 30 ML/year of runoff under average rainfall conditions. Changes to catchment flows represents a long term but minor impact on the water supply scheme.

The EIS predicted a maximum impact of 270 ML/year on the Jilliby Jilliby Creek catchment. This is derived from the predicted transfer of water into the alluvium (180 ML) during the worst case year. The actual increase in storage is dependent on the porosity of the alluvial sediments. Due to the uncertainty in the in-situ porosity, a multiplying factor of 1.5 was conservatively applied to the predicted worst case impact (180 ML/year) to obtain a likely worst case impact (270 ML/year). The likely impact on the water supply scheme from all mechanisms (leakage, cracking, alluvial transfers and reduction in catchment flows) is predicted to be significantly less than this conservative (upper bound) estimate.

2.2.2 Compensatory Measures

The proponent commits to developing a compensatory mechanism to ensure that there is no net impact on the water supply scheme. This mechanism will be developed in consultation with the Central Coast Water Authority (CCWA) and NSW Office of Water.

The onsite water treatment plant will treat all mine water pumped from the underground workings and runoff from the stockpile area. The EIS proposes that surplus treated water will be discharged to Wallarah Creek, which is not part of the water supply scheme. It is feasible for the proponent to discharge surplus treated water back into the water supply catchment, thus replacing any water potentially taken from the water supply scheme.

NOW and the PAC also suggest that the proponent can compensate for its impacts on the water supply scheme by contributing funding to the costs of bringing forward the scheduled augmentation of the water supply scheme headworks. The proponent accepts this as an alternative to discharging treated water into the water supply catchment. However, if the option of returning water to the water supply catchment is adopted, there should be no need for the proponent to make any additional contribution to augmentation of the water supply scheme infrastructure.

2.2.3 Stream Morphology

The PAC has requested an assessment of the risk of impacts at the interface of subsided and unsubsidised stream sections during heavy rainfall events. A preliminary analysis has been undertaken to determine stream reaches where there is a risk of changes to stream morphology. These reaches and the corresponding proposed management approaches are displayed in **Figure 1**. The potential impacts on stream morphology and corresponding remediation measures are summarised in **Table 2**.

Detailed risk assessments for streams will be included in Extraction and / or Subsidence Management Plans. This will involve identification of risks and management strategies for specific locations along streams. Risks to stream morphology will be assessed based on revised subsidence predictions. Since the first five longwall panels are not located beneath Jilliby Jilliby Creek, there is an opportunity to validate subsidence predictions using monitoring data prior to mining beneath the creek.

Given that the existing alluvial stream system is dynamic, baseline and ongoing monitoring is a key element of identifying subsidence related impacts. Examples of naturally occurring changes to stream morphology are shown in **Plate 1** and **Plate 2**. The monitoring program will include measurements and inspections of ground levels, vegetation, ecology, water quality and groundwater.

Proactive soft intervention, such as improvement of bank vegetation, may be undertaken where areas of potential elevated subsidence impact coincide with existing geomorphic instability. An example of soft intervention is shown in **Plate 3**. WACJV will consult with owners of land where potential impacts to streams may occur. These issues will be addressed in the Property Subsidence Management Plans for these properties.

Table 2
Potential Impacts and Stream Morphology and Management Measures

Potential Impact	Comment	Potential Management Measures
Avulsion due to temporary lowering of relative floodplain levels	Historical avulsions have played a significant role in the evolution of the existing system. Incremental subsidence effects could locally enhance or counteract natural processes.	Temporary earth bund across low point in bank (outside of riparian vegetation) to limit flow breakout. Potential bank scour to overflow path replaced to natural level and revegetated.
Meander cutoff through bank collapse	Shortcutting of meander bends occurs in the existing system. Detailed monitoring will provide the basis for determining the contribution of subsidence to future cutoffs.	Assess whether cutoff is natural or due to differential settlement. Repair or replace bank profile and vegetation.
Headward erosion caused by local increase in bed gradient	Analysis of gradient impacts on stream hydraulics indicates a low risk of headcutting.	Increased roughness and bed protection through placement of large woody debris. Existing large woody debris realigned to eliminate or protect headcut.
Increased undercutting of bank on outside bend	Vegetation plays a key role in stabilising channel banks.	Monitor and replace bank profile and vegetation if significant erosion occurs.

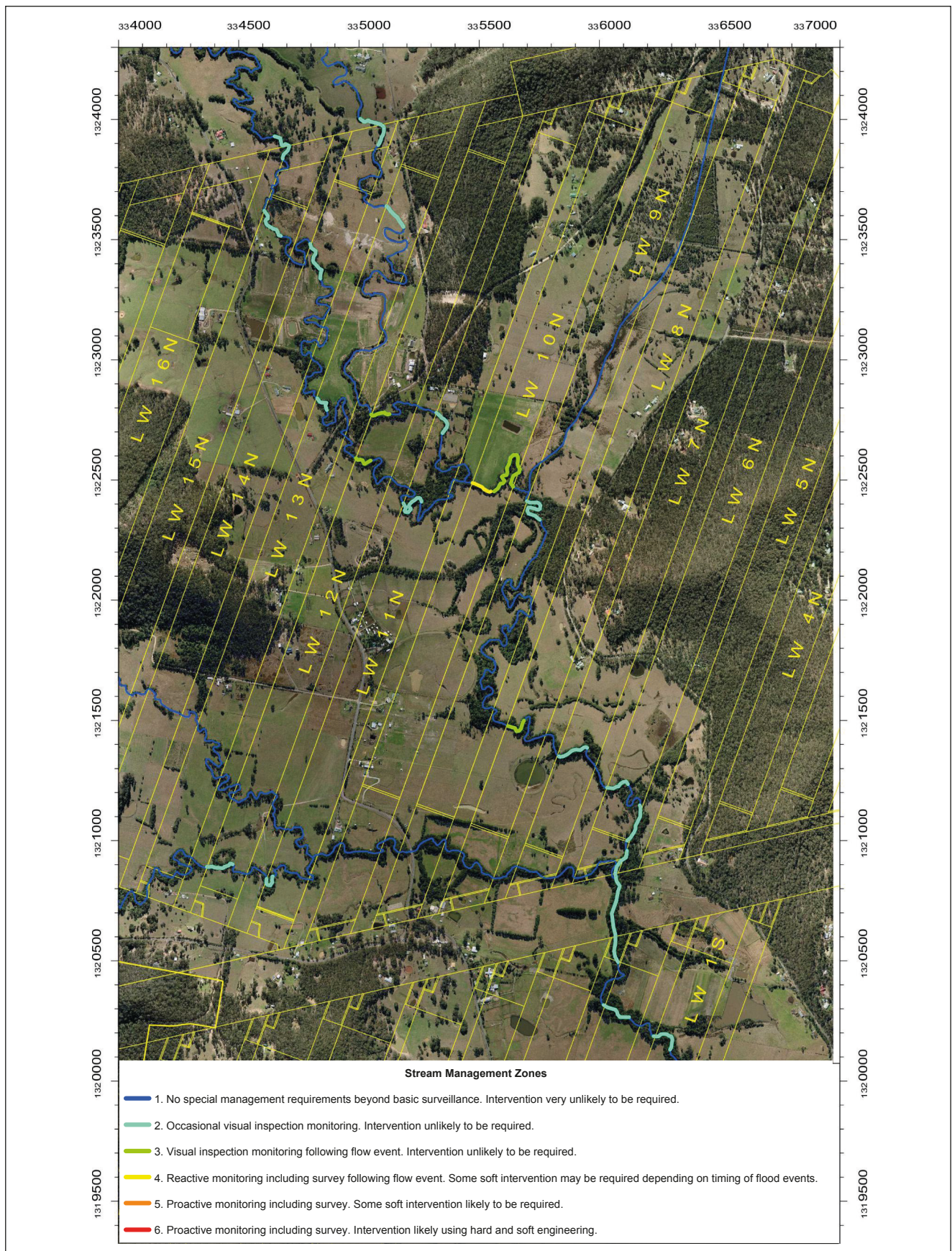


Plate 1
Natural Avulsions and Meander Cutoffs



Examples of historical
stream alignments
abandoned through
natural avulsions and
meander cutoffs

Plate 2
Natural Bank Erosion and Undercutting



Plate 3 Example of Soft Remediation Measures



Strategic placement of large woody debris can be used to mimic existing system

The PAC has suggested the following performance measures for Jilliby Jilliby Creek:

- No more than minor consequences in any part of the stream at any time; and
- Post-subsidence, stream sections be returned to condition equivalent or better than their pre-subsided condition.

The proponent agrees with these performance measures as they ensure that there are no significant long-term impacts, without requiring the proponent to address any changes that are within the natural variability of the creek.

2.2.4 Water Quality

The PAC recommends water quality sampling points upstream and downstream of each longwall panel to monitor the impacts of mining on water quality. The proponent has committed to establishing a water quality monitoring network. However, it is not possible to conclusively distinguish between natural variability in water quality and changes due to mining. For suspended sediment in particular, background concentrations are highly variable and are affected by processes at both local scale (such as bank slumping) and catchment scale (such as runoff from agricultural land).

WACJV agrees to develop a water monitoring program in consultation with NOW, CCWA and the Environment Protection Authority (EPA).

2.2.5 Water Treatment Plant

Mine water generated by the Project will be treated at the onsite water treatment plant. The water treatment plant is planned to utilise a number of treatment methods including dissolved air flotation, filtration, ion exchange and reverse osmosis. Conceptual design has been undertaken for the water treatment plant and has demonstrated that the plant is capable of producing water that is comparable in quality to the background water quality in Wallarah Creek.

Detailed design of the water treatment plant will ensure that treated water complies with the water quality criteria specified by the EPA.

2.2.6 Flooding

The PAC recommends that the proponent develop an Emergency Evacuation Management Plan that outlines evacuation measures in the event of a flood. WACJV is not the appropriate body for emergency evacuation planning. However, WACJV agrees to assist Wyong Shire Council (WSC), the State Emergency Service (SES) and other appropriate authorities in the review and potential revision of emergency evacuation plans, as may be required throughout the life of the Project. WACJV can assist in this process by providing its pre-mining modelled predictions for post-subsidence flooding conditions, as well as any refined predictions using the results of its validated subsidence model (based on actual monitoring following mining), including the identification of any areas at greater risk.

2.3 NOISE

2.3.1 Operational Noise

The PAC has requested further details on the degree of exceedance of the project specific noise criteria (PSNC) for receivers 57 & 58.

Based on the results of ambient background noise measurements, the PSNC for the residences on properties 57 and 58 were determined to be 52 dBA and 48 dBA respectively. PSNC are presented in Table 8 of the Noise and Vibration Impact Assessment (Atkins Acoustics, 2013). Acquisition of private property is generally required if the PSNC is exceeded by greater than 5 dBA. No exceedances of the PSNC are predicted to occur at the residences on these properties. The PSNC is predicted to be exceeded at some locations on properties 57 and 58, however there are no areas where the PSNC is predicted to be exceeded by more than 5 dBA. Therefore, the Project does not trigger the requirement to acquire any properties.

2.3.2 Rail Noise

The PAC recommends monitoring of wheel squeal noise generated by trains on the rail loop. Transport for NSW has confirmed that 200 m is the minimum radius required to reduce wheel squeal noise.

The rail loop consists of four bends with radii of 500 m, 500 m, 200 m and 800 m. Therefore, the design of the rail loop complies with the minimum radii recommended by Transport for NSW.

WACJV will implement a noise monitoring program including monitoring of potential wheel squeal (if required by the conditions of development consent).

2.4 AIR QUALITY AND GREENHOUSE GAS

The PAC has recommended that timeframes be imposed for the implementation of flaring and beneficial use of captured methane.

WACJV commits to enclosed flaring of captured methane upon commencement of underground mining and the establishment of the proposed gas pre-drainage system. Within 3 years of commencing longwall mining, WACJV will undertake a study into the feasibility of options for beneficial use of captured methane. If beneficial use of methane is determined to be viable, a plan for the implementation of such a system will be developed to the satisfaction of DP&E.

2.5 ECONOMICS

The PAC remarked that there is a discrepancy between the estimated economic benefits stated in the EIS and the estimate for the previous project application (07_0160). The PAC refers to the net benefit of \$1,519M stated in the Economic Impact Assessment for the previous application (Gillespie Economics, 2008) and contrasts this with the value of \$346M stated in the Economic Impact Assessment for the Project (Gillespie Economics, 2013).

This is not a “like for like” comparison. Firstly, the Project targets a smaller coal reserve than the previous project application. Secondly, different metrics have been used to compare the two proposal developments. The net benefit of \$1,518M referred to for the previous application represents the total global net benefit and includes non-market employment benefits. In contrast, the net benefit of \$346M referred to for the Project represents the total net benefit to Australia only and does not include non-market employment benefits.

A comparison of the two proposed developments on a common basis (i.e. the net benefit to Australia using a 7% discount rate and excluded non-market employment benefits) shows that the previous project application was estimated to provide a net benefit of \$487M (present value) and the Project is estimated to provide a net benefit of \$353M (present value). The residual difference is mainly due to the smaller coal reserve targeted by the Project.

The PAC remarked that there is no justification for the stated capital investment value of \$805M. Information regarding capital expenditure is commercially sensitive. However, this value was conservatively calculated using industry standard costing procedures.

* * *

for
HANSEN BAILEY



Andrew Wu
Environmental Engineer



James Bailey
Director

3 REFERENCES

- Atkins Acoustics (2013) *Wallarah 2 Coal Project Noise and Vibration Impact Assessment*
- Gillespie Economics (2008) *Wallarah 2 Coal Project Economic Impact Assessment*
- Gillespie Economics (2013) *Wallarah 2 Coal Project Economic Impact Assessment*
- Planning Assessment Commission (2014) *Wallarah 2 Coal Project Review Report*