

**Illawarra Coal**

Illawarra Coal Holdings Pty Ltd  
BHP Billiton Illawarra Coal Administration Centre  
Old Port Road Port Kembla  
New South Wales 2505 Australia  
PO Box 514 Unanderra  
New South Wales 2526 Australia  
Tel: +61 2 4255 3200 Fax: +61 2 4255 3201  
bhpbilliton.com

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Director-General  
Department of Planning

**Part 3A Application: 08\_0150 - Bulli Seam Operations Project**

Illawarra Coal Holdings Pty Ltd has carefully reviewed and considered the Planning Assessment Commission Report (July 2010) for the Bulli Seam Operations Project. The attached provides our response to the comments and recommendations within the Report relevant to the Appin Area 7, Appin Area 8, Appin West (Area 9), West Cliff Area 5 and Appin Area 3 Extended (western portion only).

We note that the PAC Report supports many aspects of the Bulli Seam Operations Environmental Assessment and recommends continued operations at both the Appin Mine and West Cliff Colliery. However, based on our review there are a number of conclusions and recommendations where there is significant disagreement. We will continue to undertake research and consult with stakeholders to provide greater certainty in these areas.

Regards



Colin Bloomfield

President

BHP Billiton Illawarra Coal

BULLI SEAM OPERATIONS  
RESPONSE TO BULLI SEAM OPERATIONS PAC REPORT  
SEPTEMBER 2010



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## 1. INTRODUCTION

Illawarra Coal Holdings Pty Ltd (ICHPL) has carefully reviewed and considered the Planning Assessment Commission (PAC) Report (July 2010) for the Bulli Seam Operations Project. The PAC Report supports many aspects of the *Bulli Seam Operations Environmental Assessment* (EA) and recommends continued operations at both the Appin Mine and West Cliff Colliery. However, based on our review there are a number of conclusions and recommendations where there is significant disagreement. ICHPL will continue to undertake additional research and consult with stakeholders to provide greater certainty in these areas.

ICHPL's response to the comments and recommendations within the PAC Report are provided below. The responses focus on aspects relevant to the Appin Area 7, Appin Area 8, Appin West (Area 9), West Cliff Area 5 and Appin Area 3 Extended domains. ICHPL propose to remove the North Cliff and Appin Area 2 domains and the majority of the Appin Area 3 domain from the current application.

It is ICHPL's view that the EA provides a transparent and credible assessment of the potential impacts of the Project and as outlined below contends that some conclusions in the PAC Report are unfounded.

Comments and recommendations relevant to the Appin Area 7, Appin Area 8, Appin West (Area 9), West Cliff Area 5 and Appin Area 3 Extended (western portion only) domains are reproduced in **bold** below. A response by ICHPL is then provided to each. Responses are provided to the following aspects:

- Aboriginal Heritage (Section 2)
- Road Transport (Section 3)
- Subsidence Impacts and Consequences (Section 4)
- Survey Effort (Section 5)
- Groundwater (Section 6)
- Surface Water (Section 7)
- Cliffs (Section 8)
- Steep Slopes (Section 9)
- Built Infrastructure (Section 10)
- Mine Surface Infrastructure (Section 11)

## 2. ABORIGINAL HERITAGE

The PAC Report (July 2010) states (page 244):

*...The EA then presents a tabulation of the archaeological significance for 632 sites identified in the project area, with the significance assessment reported to be based on Part 1 of the DECC Guidelines for Aboriginal Heritage Impact Assessment (DECC 2006). However, there is no information as to which stakeholders were involved in undertaking the assessment and the validity of the ranking outcomes therefore remains questionable.*

In addition, the PAC Report (July 2010) states (page 244):

*...A tabulation is presented of 8 sites deemed to be of particular cultural significance identified from these statements and comments. It is unclear from the EA whether it was ICHPL that deemed the sites such or whether this was a consensus outcome from the Aboriginal communities involved in the process.*

## ICHPL Response:

The archaeological significance assessment was undertaken by professional archaeologists as part of the Aboriginal Cultural Heritage Assessment, in accordance with the process outlined in Section 7.3 of Appendix G of the EA.

In regard to Aboriginal stakeholder involvement, as outlined in Section 7 of Appendix G of the EA, the Aboriginal Cultural Heritage Assessment includes assessment of Aboriginal community (or cultural) significance and archaeological significance. Section 7.2.1 of Appendix G of the EA (Cultural Significance) "presents a summary of statements or comments of cultural significance made by registered Aboriginal stakeholders during the Project field surveys both in regard to individual sites and in general". In addition, Section 2.2.1 of Appendix G of the EA "records cultural values identified in written responses to the draft report".

As described in Section 2.1.6 of Appendix G of the EA, a draft of the Aboriginal Cultural Heritage Assessment (including Section 7.3 [Archaeological Values]) was provided to registered Aboriginal stakeholders for comment. No comments were received in regard to the assessment of archaeological significance.

The Aboriginal Cultural Heritage Assessment (Appendix G of the EA) was peer reviewed by R.G. Gunn, who relevantly concluded (Attachment 3 of the EA):

*I therefore consider that the Bulli Seam Operations ACHA provides an adequate and reasonable assessment and consider the recommendations contained in the report to be appropriate and acceptable.*

The Department of Environment, Climate Change and Water (DECCW) (2 December 2009) provided the following comments regarding the Aboriginal Cultural Heritage Assessment (Appendix G of the EA):

*The assessment of archaeological significance of the sites has been carried out in accordance with the Australia International Council on Monuments and Sites (ICOMOS) Burra Charter guidelines, DECCW's ACH Standards & Guidelines Kit (National Parks & Wildlife Service, 1997, draft) and DoP's Draft Guidelines for ACH Impact Assessment and Community Consultation (2005) and is considered to be adequate, as is the community consultation...[emphasis added]*

Section 7.2.2 of the Aboriginal Cultural Heritage Assessment (Appendix G of the EA) outlines the process for determining sites that are considered to be of particular cultural significance:

*Table 6 lists the sites deemed to be of particular cultural significance identified through statements or comments made by registered Aboriginal stakeholders during the Project field surveys, and summarises the identified values that contribute to the sites' cultural significance. Table 6 lists sites which representatives indicated (either verbally in the field or in writing as part of comments provided regarding the draft version of this report) had particular cultural significance or importance. Section 7.2.1 above provides a summary of all specific comments made.*

As described in Section 7.2.2 of Appendix G of the EA, neither ICHPL nor Biosis were responsible for determining whether sites were of particular cultural significance. As described above, only one registered Aboriginal stakeholder needed to express that a site was of particular cultural significance for it to be recorded as such in the Aboriginal Cultural Heritage Assessment (Appendix G of the EA).

DECCW (2 December 2009) provided the following comment specifically regarding the assessment/determination of cultural significance in the Aboriginal Cultural Heritage Assessment (Appendix G of the EA):

*...The assessment of cultural significance has also been carried out in accordance with the above guidelines.*

Based on the above, it is ICHPL's view that stakeholder involvement and the assessment of particular cultural significance in the EA was appropriate and allowed for a valid Aboriginal heritage impact assessment.

**The PAC Report (July 2010) states (page 249):**

*The impact risk assessment presented in Appendix Q only addresses one half of the risk assessment equation, namely the assessment of the likelihood of an impact occurring. It does not address the consequences of the event.*

**ICHPL Response:**

Section Q6.6.2 of Appendix Q of the EA describes the previously recorded consequences to Aboriginal heritage sites from underground mines in the Southern Coalfield:

*To date 152 Aboriginal heritage sites in the Southern Coalfield subject to mining-induced subsidence effects have been subject to monitoring (Kayandel Archaeological Services, 2008; Sefton, 2000; and records held by Biosis Research). Of the 152 Aboriginal heritage sites that have been monitored, 11 (7% of monitored sites) had recorded consequences at the same time as being subject to mining induced subsidence and as such the consequences are attributed to mining. One of these 11 Aboriginal heritage sites has exhibited an impact to the archaeological features present, being the fracturing of an art panel (Appendix G of the EA).*

*Table Q-2 summarises the 11 Aboriginal heritage sites considered to have been subject to impacts from mining induced subsidence. Available photos of the recorded consequences are provided in Attachment QC.*

Table Q-2, mentioned in the above quote, includes a description of the recorded consequences (including photos) to Aboriginal heritage sites attributed to mining in the Southern Coalfield.

Section Q6.6.2 of Appendix Q of the EA describes the consequences that are likely to be observed at Aboriginal heritage sites within the Project area:

*The highest category generally achieved by the risk of impact assessment is "moderate". This recognises the results of previous monitoring that indicate consequences to sites are rare (occurring in approximately 7% of monitored cases which have generally focused on sites with higher risk of impact) and that when consequences have been recorded they have been relatively minor (rarely impacting art surfaces for example). [emphasis added]*

Section Q6.6.2 of Appendix Q of the EA provides a discussion of the likelihood of *impact* and *significant impact* consistent with the framework and assessment process outlined in the Metropolitan Coal Project PAC Report (PAC, 2009):

*...Based on the above, Attachment QA details the risk of impact from subsidence to sites of high or moderate archaeological significance or sites of particular cultural significance. Attachment QA indicates that of the 76 sites of moderate or high archaeological significance or sites of particular cultural significance, 26 (34%) sites were assessed as having a Negligible risk, 31 (41%) sites a Very Low risk, 12 (16%) sites a Low risk and 7 (9%) sites a Moderate risk. No sites were assessed as having a High risk. This is consistent with previous observations within the Southern Coalfield during monitoring programmes (Appendix G of the EA). Although considered highly unlikely, the complete collapse of a shelter of high archaeological significance or particular cultural significance could be considered as a significant impact. The evidence at hand suggests that Project related subsidence does not pose a significant risk of impact to Aboriginal heritage sites within the study area. [emphasis added]*

Further to the above, DECCW (2 December 2009) provided the following comments regarding the Aboriginal Heritage Site Risk Assessment (Appendix Q of the EA):

*The discussion of subsidence impacts in relation to sites in the escarpment are based on an assessment of the likelihood of subsidence to occur within the Bulli Seam and an evaluation of monitoring data from archaeological sites in other mining areas in the Illawarra. This information has been collected over a number of years. These criteria have been applied to all of the [Aboriginal cultural heritage] sites that are in the escarpment. DECCW considers that this adequately assesses the potential risk of impact from subsidence and notes that the depth of mining at Bulli Seam will also be a factor in the reduction of potential impact from subsidence...[emphasis added]*

Based on the above, it is ICHPL's view that the impact assessment presented in Appendix Q addresses both risk and consequence and provides an appropriate and valid Aboriginal heritage impact assessment.

The PAC Report (July 2010) states (pages 248-249):

*...Immediately after the methodology is presented, Appendix G goes on to discuss 'risk of impact' and to tabulate this parameter for all sites of 'moderate' or 'high' archaeological significance<sup>439</sup>...*

*Although Table 9 of Appendix Q [sic] is labeled [sic] and described as a risk impact assessment for sites of archaeological significance and particular cultural significance, it only rates the sites in terms of their archaeological significance. Hence, the risk assessment needs to be repeated for cultural heritage sites of particular significance.*

<sup>439</sup> Site 52-2-0496 either does not belong in this tabulation or has been assigned an incorrect level of archaeological significance.

#### ICHPL Response:

Table 9 of Appendix G (and Attachment QA of Appendix Q) of the EA provides a risk impact assessment from potential subsidence effects for all sites of 'high' and 'moderate' archaeological significance and particular cultural significance (as listed in Table 6 of Appendix G of the EA).

All of the sites of particular cultural significance were assessed as sites of 'high' or 'moderate' archaeological significance, with the exception of site 52-2-0496 which was assessed as a site of 'low' archaeological significance. All of these sites (with the potential to be impacted by subsidence) were included in Table 9 of Appendix G of the EA.

Therefore, no further risk assessment needs to be conducted for sites of particular cultural significance as these were already included in the risk impact assessment presented in the Aboriginal Cultural Heritage Assessment (Table 9 of Appendix G of the EA).

The PAC Report (July 2010) states (pages 253-254):

*The Panel concludes that:*

...

5. *Aboriginal heritage sites in the vicinity of the Coal Wash Emplacement should have been included in the risk assessment.*
6. *Impacts on Aboriginal heritage associated with the Stage 4 Coal Wash Emplacement have not been adequately assessed in the EA.*

*The Panel recommends that*

...

4. *The Stage 4 Coal Wash Emplacement should not proceed until such time as the continued protection of significant sites that were specifically protected as part of the Stage 3 Coal Wash Emplacement approval process is resolved to the satisfaction of the Director General of Planning after:*
  - i. *completion of an adequate Aboriginal Heritage assessment;*
  - ii. *consultation with Department of Climate Change and Water (DECCW);*
  - iii. *consultation with relevant Aboriginal communities.*

#### ICHPL Response:

The Aboriginal Heritage Site Risk Assessment (Appendix Q of the EA) was conducted in accordance with the framework and assessment approach outlined in the Metropolitan Coal Project PAC Report (PAC, 2009), viz. (page 41):

*The Panel has given careful consideration to the possible use of the RMZ concept in its review of the current proposal and recommends that it be incorporated into a broader risk framework that includes:*

- *Identifying natural features likely to be at risk of negative environmental consequences from subsidence impacts;*
- *... [emphasis added]*

The Aboriginal Cultural Heritage Assessment (Appendix G of the EA) includes an adequate assessment of the potential impacts on Aboriginal heritage in the vicinity of Stage 4 of the West Cliff Coal Wash Emplacement. It would be inconsistent with the Metropolitan Coal Project PAC Report (PAC, 2009) to include non-subsidence related impacts in a risk assessment that is designed to assess potential risks associated with subsidence.

In regard to the adequacy of the Aboriginal Cultural Heritage Assessment (Appendix G of the EA), it is noted that the PAC Report (July 2010) states (page 251):

*The Panel notes that three of the four sites for which DECCW has recommended impacts be avoided, are classified in the EA as 'likely' to be buried. The EA provides no indication of likelihood associated with the term 'likely'. However, the Panel interprets the words has the potential to impact sites to imply that there are measures available to avoid impact if need be. If this is not the case and burial is inevitable, then given the other already noted in this section, the Panel seriously doubts the transparency of the EA.*

Section 8.3.2 of Appendix G of the EA states:

*The proposed Stage 4 Coal Wash Emplacement Area has the potential to impact sites either through burial of the sites under the Coal Wash Emplacement, through direct impact by associated works supporting the Stage 4 Coal Wash Emplacement area (such as channel diversion drains, settling dams and haul roads) or through secondary impacts (such as dust settling on the art panels). [emphasis added]*

The word 'potential' is used in the above context as the Project has not yet been approved, and therefore only has the potential to impact sites as its approval is not a certainty. Impacts are typically described in nearly all contemporary EAs as "potential impacts" for this very reason.

As stated in Section 9.4 of Appendix G of the EA:

*It would not be practical to avoid all sites associated with the Stage 4 Coal Wash Emplacement area. Impacts associated with the emplacement area include burial under the coal wash emplacement and disturbance from supporting coal wash emplacement developments (haul roads, channel diversions, settling dam works); and potential dust impacts.*

*For sites located within the boundaries of the proposed Stage 4 Coal Wash Emplacement area, the proposed management approach is to conduct detailed recording and where appropriate archaeological salvage of a sample of occupation deposit. This strategy is consistent with that successfully employed for the Stage 3 Coal Wash Emplacement area.*

The Aboriginal Cultural Heritage Assessment (Appendix G of the EA) was peer reviewed by R.G. Gunn, who relevantly concluded (Attachment 3 of the EA):

*I therefore consider that the Bulli Seam Operations ACHA provides an adequate and reasonable assessment and consider the recommendations contained in the report to be appropriate and acceptable.*

In regard to the PAC Report statement relating to consultation, the Aboriginal community and DECCW have been comprehensively consulted. This has been recognised by DECCW (refer to earlier response and DECCW's submission to DoP) and by the Aboriginal community (refer submissions to the DoP).

Notwithstanding the above, consultation would continue to be conducted with DECCW and the Aboriginal community in regard to management and mitigation measures for Stage 4 of the West Cliff Coal Wash Emplacement. As described in Section 5.10.3 of the EA:

*An Aboriginal Heritage Plan (AHP) would be developed for the Project in consultation with the Aboriginal community and the DECC. The AHP would be active throughout the life of the Project and would incorporate the outcomes of monitoring, survey and fieldwork, analysis and consultation. The AHP would include a protocol for the involvement of the Aboriginal community over the life of the Project with participation of Aboriginal community representatives in cultural heritage monitoring, management and mitigation works. The AHP would detail the statutory requirements to be met throughout the life of the Project regarding the management of Aboriginal heritage and include the mitigation measures described in the sub-sections below.*

Based on the above, it is ICHPL's view that the potential impacts on Aboriginal heritage associated with the Stage 4 Coal Wash Emplacement have been transparently assessed and provides an appropriate and valid Aboriginal heritage impact assessment.

### **3. ROAD TRANSPORT**

The PAC Report (July 2010) states (page 355):

*The Panel recommends that any approval for the project contain a requirement that the issues below are resolved to the satisfaction of the Director-General of Planning prior to any increase in coal production being permitted.*

- i. The Proponent clarify if the number of additional traffic movements generated by the proposal require recalculation to accommodate weekend operations of the proposal;*
- ii. The Proponent provide the Department with the figures regarding the percentages of heavy and light vehicles (included [sic] loaded and unloaded) attributed to the proposal at key locations on haulage routes and at key intersections;*
- iii. The RTA verify the Proponent's SIDRA analysis;*
- iv. The RTA undertake a thorough assessment of the proposal including its cumulative impact and any supplementary information provided by the Proponent;*
- v. The RTA review the impact of undertaking peak hour turning surveys on Easter Thursday.*

#### **ICHPL Response:**

As described in Section 2.9.1 of the Road Transport Assessment (Appendix K of the EA), coal haulage on weekends is lower than that on weekdays (80% on weekdays and 20% on weekends).

Therefore the potential impact of the Project on the road network is at its maximum on weekdays (which coincides with maximum traffic from other sources). A separate assessment of lesser Project traffic generation on weekends is not warranted.

ICHPL provided the technical authority (the RTA) with additional information regarding intersection (SIDRA) modelling in March 2010 and further clarification on the breakdown of heavy and light vehicle generation at particular intersections in August 2010. This correspondence can be provided to the DoP on request.

The NSW Roads and Traffic Authority (RTA) has provided a letter to the DoP on 31 August 2010 which states:

*Reference is made to a letter received by the Roads and Traffic Authority (RTA) on 11 August 2010 from Gary Brassington of BHP Billiton containing additional information regarding the subject major project application forwarded to the RTA for consideration.*

*The RTA has reviewed the submitted information and will not object to the major project application subject to the following issues being addressed prior to determination: ...*

All of the remaining issues identified by the RTA relate to intersection upgrades. The RTA raised no objections in their advice to the DoP regarding:

- weekend Project vehicle movements;
- Traffix Pty Limited's SIDRA analysis conducted for the Project (provided by ICHPL to the RTA in March 2010); or
- conducting peak hour turning count surveys on Thursday 9 April 2009 (which was not a public holiday nor within a school holiday period).

ICHPL will continue to consult with the NSW Department of Planning (DoP) and RTA in regard to resolving the outstanding issues identified.

**The PAC Report (July 2010) states (page 353):**

*The Proponent's 'Response to Agency Submissions' was provided after exhibition of the proposal which raises questions as to the public's ability to understand the traffic impacts of the proposal during the exhibition period.*

**In addition, the PAC Report (July 2010) states (page 353):**

*...Whilst these figures indicate that the background growth in vehicle movements will in general have a greater impact on the road network than the proposal, no detail regarding the percentage of overall traffic movements attributed solely to heavy vehicles associated with the proposal has been provided. The Panel is of the view that given the impact of heavy vehicles on road capacity, particularly those that are loaded, a proper assessment of this issue cannot be made without this information.*

#### **ICHPL Response:**

The Road Transport Assessment included consideration and assessment of the additional heavy vehicles generated by the increase in coal haulage (Section 4.1.1 of Appendix K of the EA). These increases in heavy vehicle movements were assessed in terms of the potential cumulative impacts with existing traffic movements and background growth.

The calculation of Degree of Saturation (DOS) and Level of Service (LOS) using the SIDRA computer program and the assessment of potential traffic impacts includes consideration of vehicle class (i.e. recognises the larger size and likely waiting time of heavy vehicles at intersections).

The impact of the Project on road and intersection performance was assessed and clearly described in the EA.

As a component of ICHPL's response to the RTA submission, a more detailed breakdown of the Project's vehicle movements by vehicle type was provided. This information did not change the assessment of impacts on road and intersection performance. ICHPL's responses to submissions on the EA were provided to the PAC in April 2010 and were made publicly available in May 2010 (via the DoP and PAC websites). Again, ICHPL must stress that all of the relevant assessment information in terms of potential cumulative impacts was presented in the EA and is publicly available. The fact that ICHPL then provided a more detailed breakdown at the request of the technical authority (the RTA) does not invalidate the EA in any way.

**The PAC Report (July 2010) states (page 354):**

*As indicated in the Proponent's Report when compared with the estimated percentage of project movements per weekday, the proposal results in minimal additional vehicle traffic in accident areas, however again the Panel is unable to ascertain the percentage increase in heavy vehicles in these areas attributed to the proposal and as such the potential road safety impacts of the proposal are unable to be appreciated or accurately assessed.*

**ICHPL Response:**

As described in the above response, as a component of ICHPL's response to the RTA submission, a more detailed breakdown of the Project's vehicle movements by vehicle type was provided. This information did not change the assessment of impacts on road and intersection performance. ICHPL's responses to submissions on the EA were provided to the PAC in April 2010.

As discussed above, the RTA indicated (August 2010) that it will not object to the major project and continues to work with ICHPL in regard to intersection upgrade requirements.

#### **4. SUBSIDENCE IMPACTS AND CONSEQUENCES**

**The PAC Report (July 2010) states (page 11):**

*The Panel is unaware of any other EA related to underground coal mining that has not addressed the design and layout of development roadways in order to permit an assessment of the likelihood that they will indeed result in a non-subsiding outcome.*

**In addition, the PAC Report (July 2010) states (page 396):**

*That the design of all main development roadways within the Study Area should be approved through the Extraction Plan process prior to commencement of such development.*

**ICHPL Response:**

As described in Section 2.5.3 of the EA:

*Each longwall would be formed by developing gate roads (the tail gate and main gate roads). To construct the gate roads, two roadways (headings) would be driven parallel to each other using continuous miners (Figure 2-14). The two headings that form the gate roads would be connected by driving a 'cut-through' from one heading to another at regular intervals (e.g. at 130 m spacings). This*

*leaves a series of pillars of coal along the length of the gate road which support the overlying strata (Figure 2-14).*

The EA provided the same information in regard to the design of development roadways as the *Metropolitan Coal Project Environmental Assessment*.

ICHPL does not agree that first workings (which are non-subsiding) should be the subject of assessment through an Extraction Plan. Such an approach is not consistent with the Project Approval for the Metropolitan Coal Project, which included the following condition:

**FIRST WORKINGS**

5. *The Proponent shall not carry out first workings in the mining area that are not consistent with the approved mine plan without written approval of the Director-General.*

ICHPL would accept a similar condition.

**5. SURVEY EFFORT**

The PAC Report includes a number of conclusions in relation to survey effort for the aquatic and terrestrial ecology assessment conducted as part of the EA. The Panel concludes that the information provided is not adequate for the purpose of a comprehensive risk assessment for species that are listed as endangered.

As described below the EA utilised all relevant reported data, including the extensive data sets prepared by government agencies and extensive monitoring data accumulated by ICHPL operations.

In addition, the species evaluations for the EA assessed potential impacts on all potential habitat as opposed to only known records for species listed as endangered. In this way, the impact assessment is considered to be conservative.

As described in the EA, Biodiversity Management Plans would form a component of the Extraction Plan process where additional surveys would be conducted if required.

**The PAC Report (July 2010) states (page 199):**

*DECCW makes the point that the survey effort for this species [Macquarie Perch] was inadequate and so simply not possible to know whether there are other populations in the BSO study area and, if so, what the potential impacts of the Project would be on these populations.<sup>332</sup> The Panel agrees that the information provided is not adequate for the purposes of a comprehensive risk assessment on a species that is listed as endangered under both NSW and Commonwealth statutes.*

<sup>332</sup> DECCW (2009b), p.29

**In addition, the PAC Report (July 2010) states (page 199):**

*This species [Sydney Hawk Dragonfly] is listed as endangered under the FM Act and is only known from four locations. Whilst it was not found in the current survey, the known locations are proximate to the Project Area and it may exist in areas of suitable habitat within the Project Area. The survey effort was insufficient to settle the question.*

**In addition, the PAC Report (July 2010) states (page 200):**

*Overall, the Panel considers that the survey intensity is inadequate for this species [Adams Emerald Dragonfly] and that it is not possible to rule out its occurrence in the Project Area. The*

*Panel takes the view that the impact assessment in the EA is not credible in relation to this species and, because of the species' particular habitat requirements and lifestyle characteristics, it would be highly vulnerable to mining-induced subsidence impacts on streams.*

In addition, the PAC Report (July 2010) states (page 201):

*The EA states that the species [Giant Dragonfly] was not found in the surveys for this study, but it is equally clear that there were no attempts to target it in either the terrestrial fauna surveys or the aquatic ecology surveys. The species is not included in the list in Appendix F of the EA of threatened species possibly occurring within the Project Area<sup>341</sup>, although this omission is strongly criticised by DECCW, who assert that the species is likely to occur in areas of suitable habitat within the Project Area.<sup>342</sup>*

...

*The Panel concludes:*

...

- *The lack of information on occurrence in the Study Area rests squarely with the proponent, since surveys that might have located it were not conducted. If there are localised populations and that location is subject to subsidence-induced impact then the consequences for the localised population could be disastrous.*

<sup>341</sup> EA, Appendix F, Table 1, pp.8-9

<sup>342</sup> DECCW, Response to PAC Questions, Part 1, 05/02/10, Item 9. (See also Y.3.3 above)

In addition, the PAC Report (July 2010) states (page 212):

*The Panel's findings and recommendations in relation to flora<sup>350</sup> are:*

...

2. *The survey work for threatened species is inadequate to support an assessment of risk from potential subsidence-related impacts of mining in the BSO Project Area based on nominal longwall panel widths of 310 m and the Base Case mine layout. There is no site-specific information on the two-thirds of the threatened species known from the area that were not found in the BSO surveys.*
3. *The possibility of increased longwall panel width has not been factored into the assessment of possible subsidence-related impacts on habitats or particular species or associations, particularly threatened species and EECs.*
4. *Where the depth of cover is 400 m or less or where valley closure predictions exceed 200 mm<sup>359</sup> comprehensive flora surveys should be conducted to specifications provided by DECCW with a view to identifying EECs or threatened species and, where these are found, assessing population viability and risk from subsidence-related impacts of mining. If significant EECs and/or threatened species are found, measures to protect those EECs and/or threatened species should be developed prior to any mining commencing.*

<sup>350</sup> As discussed in this Chapter. Most of the issues with flora related to swamps and the proposed Stage IV Coal Washery Emplacement are dealt with elsewhere.

<sup>359</sup> This is based on 310m longwalls. If that increases these estimates need to be revised.

In addition, the PAC Report (July 2010) states (pages 219-220):

*The Panel's findings and recommendations in relation to fauna<sup>370</sup> are:*

1. *The survey intensity is inadequate for the purposes of assessment of risk to fauna in the Project Area generally ...*

...

*In relation to management plans, the full suite of avoidance, mitigation and management approaches should be considered and, if adaptive management is an option, it should meet the test laid out in Stoneco.<sup>378</sup>*

...

2. *For the western domains (Area 7, Area 8 and Area 9 and West Cliff Area 5) further targeted surveys for threatened species should be undertaken based on advice from DECCW. These surveys are designed to locate threatened species and provide significant information to allow assessment of any actions required to protect significant populations of threatened species from the potential impacts of the mining proposal.*

<sup>378</sup> As discussed in this Chapter. The issues with fauna related to swamps are dealt with in Chapter 6 and the proposed Stage IV Coal Washery Emplacement are dealt with in Chapter 13.

<sup>380</sup> Newcastle and Hunter Valley Speleological Society Inc v. Upper Hunter Shire Council and Stoneco Pty Limited [2010] NSW LEC 48

#### ICHPL Response:

As outlined in Section 3 of Appendix D (Aquatic Ecology Assessment) of the EA, a significant number of aquatic surveys, monitoring reports and assessments have been undertaken across the Project area and surrounds over the past 20 years by the I&I NSW-Fisheries, the DECCW and on behalf of ICHPL. Section 3 of Appendix D of the EA provides a summary of the findings of 39 such studies relevant to the Project area.

The results of these 39 investigations were reviewed as part of the Aquatic Ecology Assessment (Appendix D of the EA), including consideration of records and known distribution of threatened species such as the Macquarie Perch, the Sydney Hawk Dragonfly, the Adams Emerald Dragonfly and the Giant Dragonfly. As stated in Section 4 of Appendix D of the EA, the aquatic ecology sampling program was designed in consideration of the findings of these studies and aimed to be in addition to the existing substantial data set, not replace it.

Several of these previous studies have included a specific aim of determining the presence of the Macquarie Perch, including a recent study undertaken by I&I NSW-Fisheries and DECCW (DPI, 2008) focused on the Dharawal State Conservation Area. No individuals of the Macquarie Perch were identified by the I&I NSW-Fisheries and DECCW study (DPI, 2008).

In addition, the species evaluation for the Macquarie Perch provided in Appendix D of the EA assessed potential impacts on all potential habitat for this species as opposed to only streams with known contemporary records. In this way, the impact assessment is considered to be conservative.

It is noted that the I&I NSW-Fisheries Division (15 December 2009) stated the following:

*Consequently I&I NSW would expect a condition of approval for the following:*

*Continued monitoring of fish populations in Punchbowl, O'Hares Creek and the Georges River to determine the extent of the Macquarie Perch population and monitoring of the generation of iron floc and the potential for impacts on the breeding habitats of the Macquarie Perch population.*

ICHPL agrees with the above I&I NSW recommendation.

Notwithstanding the above, ICHPL has committed to minor fracturing only of controlling rockbars, with negligible diversion of water from associated pools within the Georges River. As a result of the changes to the Project described earlier, the Project would not result in any subsidence impacts to the

Cataract River or O'Hares Creek. This substantially mitigates potential impacts to the Macquarie Perch through avoiding impacts on key habitat.

As stated in Section 6.7 of Appendix D of the EA:

*The Sydney hawk dragonfly (Austrocordulia refracta) was first collected in 1968 from the Woronora River (downstream of the Woronora Dam, near Engadine) and subsequently at Kangaroo Creek (near Audley) (Theischinger, 1973), and later from the Nepean River (near Maldon Bridge) (Theischinger, 1997; Hawking and Theischinger, 1999)...*

*Despite widespread and consistent efforts, the Sydney hawk dragonfly has not been recorded in locations other than those detailed above (DPI-Fisheries, 2004). Moreover, intensive surveys in recent years have failed to detect the presence of any life stages of the Sydney hawk dragonfly along the Kangaroo Creek or in the Woronora River after the removal of the weir at Heathcote (Hawking and Theischinger, 2004). The species has not been located in the Project area.*

The Sydney Hawk Dragonfly has not been recorded in the Project area as part of previous surveys (Section 3 of Appendix D of the EA) or surveys conducted for the Aquatic Ecology Assessment (Appendix D of the EA).

Nonetheless, as it is not scientifically robust to rule out the potential occurrence of this species in the Project area, the species evaluation for the Sydney Hawk Dragonfly included in Section 6.7 of the Aquatic Ecology Assessment (Appendix D of the EA) conservatively assumed the presence of this species within the Project area.

As stated in Section 6.7 of Appendix D of the EA:

*The Adams emerald dragonfly is known only from four localities, all in the greater Sydney region: Somersby Falls and Floods Creek in Brisbane Waters National Park near Gosford; Tunks Creek and Berowra Creek near Berowra and Hornsby; Bedford Creek in the Lower Blue Mountains; and Hungry Way Creek in Wollemi National Park (DPI-Fisheries, 2002). There are no records for the Adams emerald dragonfly south of Sydney despite widespread and consistent efforts to collect individuals since the 1960s (DPI-Fisheries, undated).*

*The Project area is located to the south of the known distribution of the Adams emerald dragonfly and, if discovered in the Project area, would represent a distributional limit for this species.*

The Adams Emerald Dragonfly has not been recorded in the Project area as part of previous surveys considered in the EA (Section 3 of Appendix D of the EA) or surveys conducted for the Aquatic Ecology Assessment (Appendix D of the EA).

Nonetheless, as it is not scientifically robust to rule out the potential occurrence of this species in the Project area, the species evaluation for the Adams Emerald Dragonfly included in Section 6.7 of the Aquatic Ecology Assessment (Appendix D of the EA) conservatively assumed the presence of this species within the Project area.

Consideration and assessment of the Giant Dragonfly was included in the Aquatic Ecology Assessment (Appendix D of the EA). It was therefore not appropriate to include the Giant Dragonfly in Table 1 (Threatened Fauna Species Considered Possible Occurrences within the Study Area or Immediate Surrounds) of the Terrestrial Fauna Assessment (Appendix F of the EA).

The Giant Dragonfly has not been recorded in the Project area as part of previous surveys considered in the EA (Section 3 of Appendix D of the EA) or surveys conducted for the Aquatic Ecology Assessment (Appendix D of the EA).

Nonetheless, the species evaluations for the Giant Dragonfly included in Section 6.7 of the Aquatic Ecology Assessment (Appendix D of the EA) conservatively assumed the presence of this species within the Project area.

Furthermore, as described in Section 6.7 of Appendix D of the EA:

*The Giant Dragonfly inhabits both coastal and upland permanent wetlands (NSW Scientific Committee, 2004).*

Given the proposed changes to the current application discussed above, the suitable habitat described above for the Giant Dragonfly would no longer be within the Project area.

As described in Section 2 of Appendix E of the EA:

*The vegetation of the study area and immediate surrounds is well known. Multiple detailed studies have been published in the last 20 years. Keith (1994) mapped and described the vegetation communities of the O'Hares Creek catchment on the Woronora Plateau. This followed an earlier paper focused on the diversity, floristics and soil relationships of upland swamp communities in the same area (Keith and Myerscough, 1993). French et al. (2000) described and mapped the vegetation of the Holsworthy Military Area which occupies the north western parts of the Woronora Plateau and adjoining areas of the Cumberland Plain. The southern parts of the Holsworthy Military Area coincide with the northern end of the North Cliff domain of the current study area. Subsequently, the SCA and the NSW National Parks and Wildlife Service (NPWS) surveyed and mapped the flora communities of the Woronora, O'Hares and Metropolitan Special Areas that comprise the bulk of the Woronora Plateau (NPWS, 2003). The plant communities of the western parts of the study area have been classified and mapped as part of broader vegetation mapping of the Cumberland Plain (Tozer, 2003). The vegetation of the whole study area was reclassified and mapped by the NSW Department of Natural Resources and DECC as part of the NSW Native Vegetation Mapping Program for south-eastern NSW (Region 4) (Tozer et al., 2006). The latter program incorporated the data generated by many previous studies, including much unpublished data held by the Sydney Royal Botanic Gardens (SRBG) and the NPWS.*

*In addition there have been many smaller, localised flora studies near the study area associated with environmental assessments or monitoring for mining (Biosis Research [Biosis], 2002a, 2002b, 2003, 2005a, 2005b, 2006a, 2006b, 2007a, 2007b, 2007c, 2008, 2009) and residential developments (e.g. Conacher Travers, 2000; HWR Pty. Ltd. 2002, 2006).*

As stated in Section 2.4 of Appendix E of the EA:

*A large number of sources were examined to determine what threatened flora species, populations and communities are known to occur, or may potentially occur, in the study area. These sources included State and Commonwealth government websites and publications, scientific papers and previous flora survey reports.*

As described in Section 1.3 of Appendix F of the EA:

*A number of fauna surveys have been carried out in recent years in the wider region and general locality of the Project and were reviewed as part of this survey and assessment.*

*Numerous fauna surveys have been undertaken on behalf of ICHPL to identify fauna species present within previous and current underground mining areas. These surveys have been undertaken between 2000 and 2008...*

*In addition, several regional fauna surveys have been undertaken by the NSW Department of Environment and Climate Change (DECC) and NSW National Parks and Wildlife Service (NPWS) between 1997 and 2004...*

As described in Section 1.4.7 of Appendix F of the EA:

*A number of database sources were used to identify threatened species which may occur in the study area, including:*

- ♦ *the DECC Atlas of NSW Wildlife for the search area covering the Wollongong 1:100,000 map sheet (DECC, 2009a);*

- DECC's list of threatened species found within the Sydney Cataract and Cumberland Catchment Management Authority (CMA) subregions (DECC, 2009b; 2009c);
- an EPBC Act Protected Matters Search using a search area of approximately 40 km x 50 km covering the study area (DEWHA, 2009a);
- Birds Australia (2008) database records using a search area of approximately 40 km x 50 km covering the study area;
- Australian Museum (2009) database records using a search area of approximately 40 km x 50 km covering the study area;
- Bionet database (2009); and
- previous fauna surveys as described in Section 1.3.

Extensive data sets for aquatic and terrestrial ecology exist for the Project area. These datasets include vegetation and fauna surveys and mapping prepared by government agencies and other detailed flora and fauna studies by recognised experts, all of which are referenced and described in the EA as relevant background information that informed the Project flora and fauna surveys.

Based on the above, ICHPL considers the EA provides a credible assessment of aquatic and terrestrial ecology for the Project.

As stated in Section 7.6.2 of the EA:

*As a component of the Extraction Plan process (Section 7.3.1), longwall geometry would be reviewed and the width of longwalls and pillars would be determined to achieve the environmental outcomes described in this EA and authorised by the Project Approval while maximising economic return on investment.*

As a component of the Extraction Plan process, longwall panel widths could not be increased without demonstrating that the impacts on flora would be generally consistent with those described in the EA.

Notwithstanding the above, as stated in Section 5.8.3 of the EA:

*...A Biodiversity Management Plan would be developed and would include measures to minimise impacts on terrestrial flora, including the flora management measures described below. The Biodiversity Management Plan would be developed in consultation with the DECC and the SCA, and to the satisfaction of the DoP.*

As described in Section 7.3.1 of the EA, the Biodiversity Management Plan would form a component of the Extraction Plan process. Additional surveys may be conducted during the preparation of the Biodiversity Management Plan if required.

**The PAC Report (July 2010) states (page 401):**

**23. That if the Panel's recommendations in relation to providing adequate protection for streams and swamps are not adopted then an adequate survey for threatened species that may occur in the Study Area or surrounds be conducted to standards agreed between DECCW and DII (Fisheries) before any mining is permitted under streams or swamps in the Study Area.**

**ICHPL Response:**

It is noted that a number of the recommendations in the PAC Report (July 2010) in relation to providing protection for streams and swamps are no longer relevant due to the proposed changes to the Project application as discussed above.

Notwithstanding the above, as described in Section 5.7.3 of the EA:

*The aquatic ecology components of the Biodiversity Management Plan would be developed in consultation with the NSW Fisheries and other relevant authorities and to the satisfaction of the DoP.*

...

*Consistent with the recommendations of the SCPR (DoP, 2008), the aquatic ecology monitoring programme would be designed to:*

- (i) monitor subsidence-induced impacts on aquatic ecology; and*
- (ii) monitor the response of aquatic ecosystems to the implementation of stream remediation and management works.*

*The aquatic ecology monitoring programme would be described in detail in the Biodiversity Management Plan and would:*

- include monitoring at an appropriate frequency and scale for a period prior to, during, and following the completion of mining;*
- include monitoring at an appropriate frequency and scale prior to, during, and following the implementation of stream remediation and management activities;*
- take into account the seasonality and inter-annual variability of the systems under study;*
- target the collection of a minimum of two years pre-mining data, where practicable;*
- ...*
- be peer reviewed by an appropriately qualified specialist.*

## **6. GROUNDWATER**

The PAC Report (July 2010) states (page 77):

*In view of the numerous abnormalities identified in (EA) modelling outcomes, and the marked changes in outcomes reported for the revised groundwater model, the Panel also recommends a comprehensive independent audit of the revised groundwater model be undertaken.*

### **ICHPL Response:**

The revised groundwater model results were provided to the PAC Panel for their review following a specific request. In addition, the revised groundwater model was peer reviewed by Dr Frans Kalf (letter dated 2 June 2010), who relevantly stated:

*This letter report is to confirm that I have now examined the reported revised modelling and updated report Revision A dated 21 May 2010 by Heritage Computing, that was prepared in response to the NSW Planning Assessment Commission (PAC), in support of the Environmental Impact Statement for the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 assessment.*

...

*Based on the evidence presented and the modelling conducted I concur with the report conclusions and management and mitigation measures presented. The updated results do not differ appreciably from the conclusions presented previously.*

Based on the above, ICHPL considers an additional independent peer review is not warranted.

## 7. SURFACE WATER

The PAC Report (July 2010) states (page 142):

*As a result, description of project-related risks to stream values in the EA is narrow, focused almost entirely on catchment yield, maintenance of in-stream pools and protection of water quality. This narrow focus represents a limited appreciation of the risks to the values of rivers and streams from mining in the Study Area, particularly in the sandstone gorge areas to the east and south, and renders incomplete any judgement of acceptability that relies only on this assessment.*

### ICHPL Response:

The Stream Risk Assessment (Appendix P of the EA) was conducted in accordance with the risk assessment framework and assessment approach outlined in the Metropolitan Coal Project PAC Report (PAC, 2009). As stated in the Metropolitan Coal Project PAC Report (PAC, 2009) (page 55):

*...the Panel is faced with identifying a set of values that might attach to a stream meeting the SCI threshold and that would assist in determining the nature and level of any protection that might be recommended. The list of values below is drawn from the EA, government agency submissions, public submissions and the SCI Report. It does not purport to cover all possible values, but it is the Panel's view that the main ones are included:*

- Importance to catchment yield
- Significance to water supply
- Scale of the watercourse
- Permanence of flow
- Water quality
- Ecological importance
- Environmental quality (pristine, modified, severely modified)
- Visual amenity (eg cascades runs, pools etc)
- Community value (value the community attributes to protection)
- Regional significance

All of these stream values were discussed in the Stream Risk Assessment (Appendix P of the EA). In addition to the above, impacts on these stream values were discussed in the following parts of the EA:

- importance to catchment yield (Appendix C of the EA);
- significance to water supply (Appendix C of the EA);
- scale of the watercourse (Appendix C of the EA);
- permanence of flow (Appendix C of the EA);
- water quality (Appendix C of the EA);
- ecological importance (Appendices D and E of the EA);
- environmental quality (Appendices C, D and E of the EA);
- visual amenity (Section 5 of the EA);
- community value (Appendix L of the EA); and
- regional significance (Appendix C of the EA).

Based on the above, it is ICHPL's view that the description of project-related risks to stream values in the EA is comprehensive.

The PAC Report (July 2010) states (page 170):

*Despite extensive material addressing stream related consequences and risks in (at least) Appendices A, C, D and P of the EA, the Panel was unable to find convincing links from subsidence impacts and their hydrologic consequences to an assessment of the risks of changes to the ecological values of stream biotopes associated with the range of stream morphologies that will be impacted throughout the Study Area.*

**ICHPL Response:**

The Stream Risk Assessment (Appendix P of the EA) was conducted in accordance with the risk assessment framework and assessment approach outlined in the Metropolitan Coal Project PAC Report (PAC, 2009).

The Surface Water Assessment (Appendix C of the EA) provides a description of the potential hydrologic impacts of subsidence on a stream by stream basis, rather than using a broader stream biotope approach. In regard to this assessment, the PAC Report (July 2010) states (page 179):

*The EA describes the consequences of subsidence for individual streams through the Study Area<sup>302</sup>. The Panel generally concurs with this description of consequences.*

<sup>302</sup> EA, Appendix C, Section 6.

The Aquatic Ecology Assessment (Appendix D of the EA) and Terrestrial Flora Assessment (Appendix E of the EA) include assessments of the potential impacts on the ecological values of streams and their biota based on (and with substantial referencing back to) the hydrologic impact assessment of individual streams in the Surface Water Assessment (Appendix C of the EA).

The PAC Report (July 2010) states (page 172):

*In the BSO Study Area, the Panel has less confidence about predicted groundwater flow mechanisms because of the larger and more diverse area involved, the lack of data to support modelling and the increased longwall panel width. The Panel is therefore of the view that the issue of possible loss of catchment yield is not resolved, and warrants further investigation.*

**ICHPL Response:**

Contrary to the above, the PAC Report (July 2010) states (page 76):

*Calculations based on catchment area indicate that all baseflow losses are likely to be small and inconsequential. The Panel concurs with these findings.*

Given that the PAC Panel concurs with the findings that potential impacts on all baseflow is likely to be small and inconsequential, ICHPL questions the statement that "the issue of possible loss of catchment yield is not resolved".

The PAC Report (July 2010) states (page 195):

*The Panel recommends that all streams afforded special significance status plus Lizard and Cascade Creeks and the Georges River in West Cliff Area 5 be protected by requiring, as part of any approval, a performance criterion of negligible subsidence-related impact...*

## ICHPL Response:

In relation to 'special significance' the Metropolitan PAC Report provides the following (page 42):

*'Special Significance Status' is based on an assessment of a natural feature that determines the feature to be so special that it warrants a level of consideration (and possibly protection) well beyond that accorded to others of its kind. It may be based on a rigorous assessment of scientific importance, archaeological and cultural importance, uniqueness, meeting a statutory threshold or some other identifiable value or combination of values.*

The PAC Report (July 2010) states (page 153):

*If a natural feature achieves 'special significance' status then its value is elevated to the point where it automatically receives special consideration for protection that would ensure negligible change in its values from the impacts of mining.*

The PAC Report (July 2010) outlines detailed consideration of a number of factors, including naturalness, landuse, connectivity within swamp complexes, threatened species and ecological communities and stakeholder comments. Based on this assessment the PAC Report identifies 18 of the 53 stream reaches (i.e. 34%) as being of 'special significance'.

The PAC Report (July 2010) provides no justification to warrant the inclusion of additional streams (i.e. Lizard Creek, Cascade Creek and Georges River) for the requirement of negligible impact. The inclusion of these streams is contrary to the risk assessment approach outlined in both the Metropolitan PAC Report (PAC, 2009) and the PAC Report (July 2010) for this Project.

In addition, it is noted that the Georges River (in West Cliff Area 5) is not included in the list of streams considered for 'special significance' status (Table 15 of the PAC Report [July 2010]), however is included in the list of streams for which the negligible subsidence criterion is proposed.

The PAC Report (July 2010) states (page 198):

*Decrease in water quality as a consequence of subsidence is also mentioned as a risk to aquatic systems, although the water quality changes are described as 'localised and transient'.<sup>322</sup> This does not accord with the Panel's observations of subsidence-induced water quality changes which can extend a substantial distance downstream of the impacted area and be persistent for a long period (e.g. iron staining and turbidity)...*

<sup>322</sup> EA, Appendix D, pp.131

## ICHPL Response:

As noted in Table 5-2 of the EA, localised impacts on stream water quality are qualified as:

*Estimated to include the extent of subsidence effects plus in the order of 600 m downstream (after HCPL, 2008).*

## 8. CLIFFS

The PAC Report (July 2010) states (page 230):

*The Panel concludes that the EA presents an inadequate discussion of potential impacts of the Base Case layout on cliffs located above goaves, these being confined to Area 3 and Area 8<sup>409</sup>. It is of the view that the total length of cliff line that could be impacted by cliff instability for the Base Case layout may be considerably greater than 3 to 5% and that such impacts will include cliff falls, as opposed to rock falls. Furthermore, the consequences of these impacts may be higher than conveyed by the figure of 3 to 5%, or any such figure that is based on overall length*

*of cliff line, especially if cliff instability is concentrated in particular segments, such as bends in a valley. Any increase in longwall panel width is likely to result in a significant increase in the level of impact that, on the basis of information presented in the EA, is indeterminate at this point in time.*

<sup>499</sup> *There may be some minor exceptions, with one cliff being shown over longwall workings on Dahlia Creek for example, EA, Appendix A, Drawing No: MSEC404-210.*

#### ICHPL Response:

As stated in Section 5.2.4 of the EA:

*...Based on the history of mining at Tower and Tahmoor Collieries, there is a moderate to likely probability that rock falls and cliff instabilities would occur somewhere along cliff lines which are directly mined beneath, including those along Wallandoola Creek and Cascade Creek. Any rock falls or cliff instabilities, resulting from the extraction of the longwalls, are expected to represent in the order of 3 to 5% of the total linear length of cliff lines that are directly mined beneath (Appendix A).*

*It is extremely difficult to accurately predict which cliff line would experience an impact. It is considered, however, that cliff lines at greater risk of impact are those with large overhangs and concave lengths located along sections of streams.*

This conclusion is consistent with *Impacts of Underground Coal Mining on Natural Features in the Southern Coalfield Strategic Review* (DoP, 2008) (page 2):

*The Panel also observed subsidence impacts on cliff lines, principally rock falls associated with river gorges or other cliffs. Most such rock falls appeared to be minor, in so far as they seem to affect a relatively small proportion of cliffs close to longwall operations.*

The flexibility with regard to mine geometry and layout that ICHPL is seeking as part of the Project is both sensible and a realistic approach for a 30 year project assessed under Part 3A. The EA makes it clear that any changes to the current mine plan would need to demonstrate (through the Extraction Plan process) compliance with the environmental outcomes described in the EA. As stated in Section 7.6.2 of the EA:

*As a component of the Extraction Plan process (Section 7.3.1), longwall geometry would be reviewed and the width of longwalls and pillars would be determined to achieve the environmental outcomes described in this EA and authorised by the Project Approval while maximising economic return on investment.*

...

*In addition to the above, in the event that the environmental impacts associated with mine subsidence exceed that authorised by the Project Approval, in addition to remediating the impacts, adaptive management measures would be applied to bring the impacts back within the EA predictions. Such adaptive management measures would include reducing longwall width, increasing pillar widths or shortening a longwall to reduce subsidence effects at the surface.*

Based on the above, it is ICHPL's view that the EA presents an adequate discussion of potential impacts on cliffs located above goaves. As a component of the Extraction Plan process, longwall panel widths could not be increased without demonstrating that the impacts on cliffs would be generally consistent with those described in the EA.

**The PAC Report (July 2010) states (page 236):**

*The Panel concludes that:*

...

- 10. The Major Cliff Line Risk Assessment (Appendix R) contains a range of useful information for undertaking a risk assessment. Nevertheless, Appendix R does not constitute an adequate risk assessment of mine subsidence implications for cliff in the Study Area.**

**ICHPL Response:**

The Major Cliff Line Risk Assessment (Appendix R of the EA) was prepared consistent with the steps described in Section 6.2 of the Metropolitan PAC Report (PAC, 2009). ICHPL considers the information contained in Appendix R of the EA adequate for environmental assessment purposes for a Part 3A EA. In addition, Section R7 of Appendix R of the EA describes that a Risk Management Plan would be prepared for each cliff line proposed to be directly mined beneath. As described in Section R7 of Appendix R of the EA, the Risk Management Plans would identify:

- (i) the options for managing the risk based on one or a combination of avoidance, mitigation, remediation or tolerance and taking account of any assessment of special significance of the feature;
- (ii) where relevant, the potential costs of those options;
- (iii) a preferred option;
- (iv) where relevant, a monitoring regime that will detect impact, measure actual impact against predicted impact and measure the effectiveness of the management strategies adopted;
- (v) contingency plans for dealing with the situation where actual impact exceeds predicted impact; and
- (vi) auditing of the implementation and effectiveness of the risk management plan.

**The PAC Report (July 2010) states (page 227):**

*The EA reports that the longwalls will mine directly beneath some cliffs along Wallandoola Creek and Cascade Creek in Area 3, Figure 38. It fails to identify and analyse a further 10 cliffs in the upper reaches and 2 in the lower reaches of Allens Creek in Area 8 that are also proposed to be directly undermined.*

**ICHPL Response:**

Cliffs located along Allens Creek are identified and shown as being located above goaf on Drawing MSEC404-211 (Cliffs & Steep Slopes in Appin Areas 8 and 9) in Appendix A of the EA. In addition, specific detail on all identified major cliff lines within the Project area (including those along Allens Creek) is presented and analysed in the Major Cliff Line Risk Assessment (Appendix R of the EA). Appendix R of the EA also includes figures presenting Risk Management Zones for all identified major cliff lines within the Project area (including those along Allens Creek).

The conclusions presented in Appendices A and R of the EA in regard to cliffs located above goaf is based on various case studies of previous longwall mining both beneath and in the vicinity of cliffs, as follows:

*Any impacts on cliff lines, resulting from the extraction of the longwalls, are expected to represent in the order of 3 to 5% of the total length of cliff lines that are directly mined beneath. It is extremely difficult to accurately predict which cliff line would experience an impact. It is considered, however, that cliff lines at greater risk of impact are those with large overhangs and concave sections of cliff lines along associated streams.*

This conclusion is relevant and valid for the cliffs identified in the EA along Allens Creek which are proposed to be directly undermined. In addition, the Risk Management Plan described in Section R7 of Appendix R of the EA and outlined in the above response would be applied to each cliff line that is proposed to be directly mined beneath (including those along Allens Creek).

## 9. STEEP SLOPES

The PAC Report (July 2010) states (page 239):

*The Panel concludes that:*

...

2. *The assessment of stability of slopes on the sides of ridges has not been founded on geotechnical engineering principles and is inadequate.*

*The Panel recommends that:*

1. *That Performance Criteria in any Project Approval should include a requirement that, where any slopes are present that might be impacted by a proposed mining layout: all infrastructure not owned by the leaseholder remains in a safe, serviceable and repairable condition unless otherwise agreed by the infrastructure owner; no significant environmental harm is caused and risks to public safety are not increased.*
2. *Where any slopes are present that might be impacted by a proposed mining layout, no Extraction Plan should be approved until:*
  - i. *any risks associated with increased stability have been assessed to the satisfaction of the Director-General of the Department of Planning by a geotechnical engineer who is a recognised specialist in land slippage and utilising methodologies consistent with the Australian Standards, and*
  - ii. *where such risks are present that the proposed avoidance, mitigation or management measures are capable of ensuring the Performance Criteria in the Approval are met.*

### ICHPL Response:

As described in Section 5.4.4 of the EA:

*Mine subsidence would be unlikely to result in large-scale slope slippage, as experience indicates that the probability of mining induced large-scale slippages is extremely low due to the significant depth of cover (Appendix A). Localised natural slope slippage has been observed along the Razorback Range and it is therefore possible that further localised slope failures along the Razorback Range may occur during mining (Appendix A). While the risk of large-scale slope slippage is low (Appendix A), management measures for structures and roads that are located in the vicinity of steep slopes are described in Section 5.4.5.*

Notwithstanding the above and with specific regard to geotechnical engineering principles, Section 5.4.5 of the EA states:

*ICHPL would undertake a study into the potential subsidence related impacts on the steep slopes of Razorback Range (incorporating Donalds Ridge), focussing on steep slopes near roads and structures. The study would seek input from structural and geotechnical engineers and subsidence engineers, and would be conducted in consultation with WSC and private landholders. The results of this assessment would be incorporated into management and mitigation measures (if required) as a component of future Extraction Plans to maintain the roads and structures in a safe and serviceable manner throughout the mining period.*

*This study would include aspects such as:*

- Identification of structures, dams and roads that lie in close proximity to steep slopes.
- Site investigation and landslide risk assessment of structures near steep slopes by a qualified geotechnical engineer.
- Site investigation and structural assessment of structures where recommended by the geotechnical engineer. This would include recommendations to mitigate against potential impacts.
- Installation of a monitoring programme, which would include, but not necessarily be limited to, ground surveys and visual inspections.
- Development of remediation measures to prevent the formation of soil erosion channels. Erosion protection measures may also include planting of additional vegetation in order to stabilise slopes in the longer term.

Menangle Road and Remembrance Drive cross the Razorback Range. ICHPL would develop management strategies, in consultation with WSC, to manage the risks of down slope movement of surface soils and rock falls in the vicinity of these roads.

Based on the above, it is ICHPL's view that the assessment provided in the EA is both adequate and robust for the purpose of a Part 3A EA.

## 10. BUILT INFRASTRUCTURE

The PAC Report (July 2010) states (page 313):

*The Panel concludes that:*

...

- *The commitment by ICHPL that all houses within the Study Area are expected to remain safe, serviceable and repairable, is unrealistic in light of experience to date. A small number of structures are likely to be damaged to the extent that they will need to be demolished and reconstructed.*

### ICHPL Response:

As stated in Section 5.4.4 of the EA:

*All houses within the study area are expected to remain safe, serviceable and repairable throughout the mining period, provided that they are in sound structural condition prior to mining (Appendix A).*  
[emphasis added]

Section 5.4.5 of the EA describes the proposed management and mitigation measures for houses within the Project area:

*When mining occurs and in the event of mine subsidence damage, claims are lodged with the MSB for mine subsidence damage to houses and effects (Section 7.3.1). If a claim is accepted, the MSB may offer the owner the option of having repairs carried out by the MSB's contractors or of having the MSB provide a financial settlement. The usual practice is for the MSB to arrange, supervise and pay for the repairs (MSB, 2007). The safety and serviceability of all houses would be maintained throughout the mining period.*

ICHPL notes that from experience in the Southern Coalfields, in the majority of cases where houses are demolished and rebuilt, it is done so not because they are unsafe or unserviceable, but rather because it is more cost effective than repair.

## 11. MINE SURFACE INFRASTRUCTURE

The PAC Report (July 2010) states (page 339):

*In view of the lack of information available, the Panel recommends:*

1. *That the government consider the implications of including surface goaf gas drainage facilities in an approval where there has been no opportunity for the public to comment on the details of any proposals and there are potential impacts of construction and operation of the facilities on both public and private land.*

### ICHPL Response:

As described in Section 2.5.5 of the EA, as a component of the Surface Goaf Gas Drainage Management Plan process ICHPL has committed to obtain suitable landholder agreements or easements over land for gas drainage sites, surface infrastructure and associated vehicular access (where required).

The Surface Goaf Gas Drainage Management Plan would also include targeted noise and air quality assessments, targeted visual impact assessment, a Vegetation Management Protocol, design of erosion and sediment control and site water management measures, site-specific Aboriginal and non-Aboriginal heritage inspections and progressive rehabilitation. The Surface Goaf Gas Drainage Management Plan would be prepared to the satisfaction of the DoP.