



RUSSELL VALE COLLIERY UEP

Response to the PAC Second Merits Review

for

Wollongong Coal Ltd

December 2015

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ENVIRONMENTAL CONSULTANTS

RUSSELL VALE COLLIERY
UNDERGROUND EXPANSION PROJECT

RESPONSE TO THE PAC SECOND MERITS REVIEW

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For

Wollongong Coal Limited

1 INTRODUCTION

1.1 BACKGROUND

Wollongong Coal Limited (WCL) operates the Russell Vale Colliery located approximately 8 km north of Wollongong and 70 km south of Sydney. WCL is seeking Project Approval under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the Underground Expansion Project (UEP).

On 9 December 2014, the Minister for Planning made a request to the NSW Planning Assessment Commission (PAC) to undertake a review of the Russell Vale Colliery UEP and assess the merits of the Project as a whole. A public hearing was held in Wollongong on 3 February 2015.

The PAC published its report of the review of the Project (PAC Review Report) on 2 April 2015.

WCL and its technical specialists have considered each of the 15 recommendations in the PAC Review Report and responded to each in the documents:

- 'Russell Vale Colliery Underground Expansion Project Response to Planning Assessment Commission Review Report – Part 1' (Part 1) dated 23 July 2015; and
- 'Russell Vale Colliery Underground Expansion Project Response to Planning Assessment Commission Review Report – Part 2' (Part 2) dated 28 September 2015.

The Department of Planning & Environment (DP&E) issued the *'Addendum Report: Major Project Assessment Russell Vale Colliery Underground Expansion Project (MP 09_0013)*' (DP&E Addendum Report) in November 2015. Appendix L of the DP&E Addendum Report included a 'Draft Instrument of Approval' (draft Approval).

The Minister for Planning released Terms of Reference (ToR) for a second Merits Review of the Project on 23 October 2015. The ToR required the PAC to hold a public hearing. A public hearing was held in Wollongong on 8 December 2015.

1.2 DOCUMENT PURPOSE

This Document responds to issues raised verbally by the PAC at the site meeting on 8 December 2015, key issues raised by speakers at the public hearing on 8 December 2015 and to issues outlined in the PAC's correspondence to the Secretary of DP&E dated 11 December 2015. It also provides a response to the key residual issues raised by regulators in correspondence provided to Part 2.

This document has been prepared for the PAC to consider in finalising its Second Merits Review Report on the UEP.

Appendix A includes a summary of issues raised at the public hearing. This document has been prepared in reliance upon notes transcribed by WCL representatives at the public hearing. All reasonable efforts have been made to accurately represent the verbal submissions made by the Speakers at the Public Hearing.

Appendix B provides a detailed response by SCT Operations Pty Ltd (SCT) to WaterNSW queries on the angle of draw as referred to in the PAC's letter dated 11 December 2015.

2 RESPONSE TO PAC AND REGULATORY ISSUES

Following is a discussion on key issues raised as part of discussions with the PAC at the site meeting or in its correspondence to the Secretary requesting an extension of time dated 11 December 2015.

It also includes a response to issues raised by Office of Environment & Heritage (OEH), WaterNSW, Wollongong City Council (WCC) and Department of Primary industries (DPI) – Water in their October 2015 correspondence responding to Part 2.

In response to Part 2, the Environmental Protection Authority (EPA) and Division of Resources and Energy (DRE) indicated that they had no further comments or issues which required a response.

2.1 PLANNING ASSESSMENT COMMISSION

In its letter to the Secretary dated 11 December 2015, the PAC raised three issues it wishes to investigate further.

2.1.1 Public Meeting – IRAP Independence

The PAC and its some public speakers queried the independence of the Independent Risk Assessment Panel (IRAP). As such the PAC has commissioned Professor Galvin and Dr Mackie to review the "lengthy document provided" and may need to seek further clarification from the IRAP, Proponent or Government Agencies.

WCL supports this approach.

2.1.2 Draft Approval Conditions

The OEH has raised residual issues in its response to the notification of the public hearing which relate to the strengthening of conditions to protects swamps including measures as "…inserting definitions, inclusion of measurable triggers and performance standards …"

Performance measures are stipulated at Schedule 3, Condition 1 of the draft Approval for all relevant swamps. Note 1 stipulates that more detailed performance indicators will be outlined in management plans required under the approval. Definitions for all relevant performance measure terms including "negligible", "environmental consequences" and "subsidence impact" are included in the draft Approval 'Definitions' page.

WCL notes that these performance measures and definitions are comparable with other recently PAC approved projects (e.g. Springvale Colliery).

The draft Approval also requires WCL to prepare swamp-related management plans, variously required to be developed in consultation with OEH, WaterNSW, DPI-Water and DP&E as a part of the Extraction Plan process.

The Extraction Plan process (and its management plans) stipulated under Schedule 3, Condition 10 of the draft Approval provides a clear and consultative approach to the development of detailed performance indicators. It also allows for the integration of updated monitoring data, Independent Monitoring Panel (IMP) and incorporation of adaptive measures.

WCL believes that the Extraction Plan and associated management plans are the appropriate place for further definition of impact triggers and performance standards, as has been completed for previous projects. The Trigger Action Response Plan (TARP) within the upland swamp management plan provides quantitative definitions of greater than negligible impacts for key monitoring areas (including subsidence, shallow groundwater, discharge, species' composition, size of upland swamps and overall composition of upland swamps).

WCL also understands that OEH is finalising the 'Policy Framework for Biodiversity Offsets for Threatened Upland Swamps and Associated Threatened Species Impacted by Longwall Mining Subsidence' (Swamp Offset Policy), as previously recommended by the PAC. WCL has not had the opportunity to review this Policy, but understands that it will contain an expanded definition of negligible impacts, and set out triggers and performance standards for which offsets would be required. The Policy is also likely to establish an IMP to review management plans for upland swamps and provide advice on the suitability of triggers and performance standards for offsets (consistent with the draft Approval).

In light of this, WCL suggests that the definition of any impact triggers and performance standards prior to the finalisation of this Policy would not be preferable.

2.1.3 Angle of Draw

WaterNSW queried the angle of draw used in SCT's assessments.

DP&E provided angle of draw figures and calculations (dated October 2013) on 15 December 2015 prepared by WaterNSW.

On 17 December 2015, SCT conducted a review on of the WaterNSW information provided by DP&E which is provided in full in **Appendix B**. SCT concluded:

- The protection barrier and mining geometries presented in SCT reports are a true and accurate representation;
- Proposed mining does not extend into the 35° angle of draw protection barrier based on industry accepted methods for determining such protection barriers;
- The WaterNSW drawing shows a geometry that is significantly different to the mining geometry actually proposed in the UEP PPR, particularly in respect of Longwall 7 but also in several other panels; and
- The protection barrier calculation methodology presented in the spreadsheet is correctly presented, but this methodology has been misapplied by WaterNSW to incorrectly calculate protection barrier offsets.

2.2 OEH ISSUES

In its response to Part 2, OEH in its letter dated 21 October 2015 noted five dot points of "concerns". A response to each of these dot points is provided below.

2.2.1 Disagreement with Consequence Categories

OEH disagrees with the consequence categories from the risk matrix in table 10 of the Risk Assessment. Its representative states that fracturing of bedrock beneath the upland swamps cannot be remediated and as such, the consequence should be high or greater.

Biosis advises that there is emerging evidence to suggest that subsidence of upland swamps will not, in all circumstances, lead to long term, irreversible effects to upland swamps, particularly the loss of the community.

Although there are no suitable methods for remediation of bedrock fracturing (at present), such fracturing does not necessarily result in primary (i.e. impacts to hydrology) or secondary impacts (i.e. to ecological values). Data used to support these conclusions includes:

- Extensive mining has been undertaken beneath upland swamps on the Woronora plateau since the 1800s. Upland swamps within the study area have been subsided, some twice, through the extraction of the Bulli and Balgownie coals seams. This extensive mining has not resulted in any detectable gross changes in the extent of upland swamps indicating that mining does not directly lead to the loss of upland swamps;
- A recent visit by Biosis to Swamp 18, which was subsided during extraction of the Elouera longwalls in the early 2000s and consequently scoured following fire and heavy rain, shows that while a small area appears to have transitioned to woodland, areas immediately adjacent to the scour area support wet, healthy swamp communities. Surface moisture is evident, and these areas support communities reliant on intermittent to permanent waterlogging; and
- Analysis of interaction between root depth, groundwater and vegetation composition indicates some communities do not show significant interaction with groundwater and are likely to be less susceptible to impacts arising from fracturing (see Part 2 for further detail). This is consistent with recent reports from the IESC (Commonwealth of Australia 2014a p.38, 2014b p. 43) and is consistent with the hydrological model developed by Keith et al (2006).

Although it is true that fracturing may be irreversible, the occurrence of fracturing does not necessarily mean that there will be irreversible impacts to the ecological values of the swamp.

The conditions of the draft Approval, particularly the requirement for the provision of offsets should performance measures be exceed, puts in place appropriate controls to deal with any unpredicted consequences should they occur.

2.2.2 Area of Assumed Impact to Swamps

The area of assumed impact within swamps is a concern to OEH, particularly where impacts to a section of swamp has been predicted. Conclusions for swamp communities should factor in the likely error of models and include a worst-case scenario for the basis of consequences.

The Risk Assessment assumed that impacts to swamps would be limited to the area within the 200 mm subsidence extent. The strains associated with lower subsidence (less than 200 mm) do not pose any risk of bedrock fracturing and do not exceed the criteria outlined by OEH (2012). The risk assessment took into consideration impacts not just to the swamp, but the total catchment area subsided (as well as catchment size), and was thus conservative in the assessment of potential impacts.

Data on the area and the catchment area subsided was used to inform the overall risk to each swamp. Using swamp CCUS1 as an example - 0.15 ha (3.14%) of the 4.81 ha swamp will be subsided, with less than 9% of the catchment subsided.

Based on numerous reviews of impacts to upland swamps from past mining, the risk assessment took the degree of subsidence into account when assessing the risk of deleterious impacts to the entire swamp.

This is supported by OEH's 'Draft Impact Assessment Criteria' (OEH 2012) which suggest that swamps meeting certain subsidence thresholds require further assessment. Swamps experiencing less than 200 mm of subsidence do not exceed these thresholds.

Should impacts to a greater extent of the swamps be detected during detailed monitoring, and performance measures exceeded, offsets will be provided in accordance with the relevant Conditions of Approval.

2.2.3 Evidence-based Statements

OEH notes that conclusions such as unlikely to result in significant impact (as for CCUS1 should be supported with evidence.

The conclusions within the risk assessment are supported by the documentation provided to the IRAP, and included assessment of factors (e.g. extent of subsidence, reliance of communities on groundwater interaction).

This evidence is outlined in the information on which the IRAP relied upon to determine that *"the risk assessment is . . . sufficiently detailed and at an appropriate level to evaluate the risks to the swamps, streams, groundwater and the waters of Cataract Reservoir."*

2.2.4 Reliance of Vegetation on Waterlogging MU42 Banksia Thicket

OEH notes that many risks for individual swamps rely on a statement that a swamp "does not support vegetation communities reliant on waterlogging" (including MU42) and is therefore less susceptible to decreased groundwater availability. OEH disagrees with this assumption.

Biosis advises that there is emerging evidence to indicate that some sections of upland swamps are reliant on groundwater in-flow, whilst others are more dependent on surface water inflows (Commonwealth of Australia 2014a, 2014b).

Evidentiary data for the reliance of certain communities on groundwater was presented to the IRAP, with an analysis of interaction between root depth, groundwater levels and vegetation composition used to inform the reliance of some vegetation communities on groundwater. This analysis showed that where groundwater levels show less surface or near surface expression, vegetation communities tend to be drier (see Part 2 for further detail).

The conclusion that some communities are less reliant on groundwater and more reliant on surface water in-flow from rainfall, and thus may be less vulnerable to changes from longwall mining, is supported by recent reports from the IESC (Commonwealth of Australia, 2014a p.38, 2014b p. 43) and is consistent with the hydrological model developed by Keith et al (2006).

2.2.5 Piezometer Installation

At present, there are some swamps for which there is no groundwater monitoring data. For these swamps, the reliance on perched groundwater systems was predicted based on comparisons to 'monitored' swamps with similar catchment area, soil type and vegetation composition.

WCL is currently seeking the necessary approvals for the installation of additional piezometers. A large number of piezometers will be installed upslope and downslope of swamps to monitor the movement of water.

2.3 WATERNSW ISSUES

In its letter dated 16 October 2015, WaterNSW outlined six "remaining comments" in response to Part 2. A response to each of these comments is provided below.

2.3.1 Explanation of Conceptual Water Balance

WaterNSW requested additional explanation of the conceptual water balance for Cataract Reservoir.

The conceptual water balance for Cataract Reservoir is shown in Part 2. The daily rainfall volume of 350 ML/day was calculated using a catchment area of 127 km^2 and average annual rainfall of 1,000 mm/year.

The average inflow to the reservoir is approximately 100 ML/day (*pers comm* Sydney Catchment Authority to SCT, 29/01/15). Therefore, the remaining 250 ML/day is assumed to be lost through evaporation, transpiration and infiltration.

Of the 100 ML/day entering the reservoir, approximately 38 ML/day is released as environmental flows, leaving 62 ML/day for water supply purposes (*pers comm* Sydney Catchment Authority to SCT, 29/01/15).

2.3.2 Surface Water and Groundwater Modelling –Surface Water losses

WaterNSW noted the different estimates of baseflow loss provided by the groundwater model and the surface water assessment.

The groundwater assessment and surface water assessment are concerned with different impact mechanisms. The groundwater assessment predicts the potential reductions in stream flow that result from depressurisation of the groundwater system. The surface water assessment is concerned with potential draining of surface flows to the groundwater system via subsidence induced cracking.

The Risk Assessment has determined that the potential reductions in stream flow due to groundwater depressurisation are negligible. Reductions in stream flow will occur primarily as a result of subsidence induced cracking. It is not possible to accurately quantify these losses as there is no established method for predicting the extent of cracking. The Integrated Risk Assessment has calculated the theoretical maximum loss by assuming that flows will be completely diverted from sub-catchments that are affected by subsidence. The actual impact is expected to be significantly less than this theoretical maximum. WCL will implement the necessary stream flow monitoring to quantify the impact of mining on stream flows.

2.3.3 Groundwater Model Predictions – Stream Baseflow

WaterNSW noted that the contribution of shallow aquifers to stream baseflow has not been quantified.

As explained in **Section 2.3.2**, Impacts to stream baseflow can occur via two mechanisms. The dominant mechanism is diversion of surface flows due to subsidence induced cracking. The quantum of losses due to this mechanism has been conservatively estimated by assuming complete diversion of surface flows from sub-catchments overlying and upstream of the longwall panels. The predicted losses due to cracking (up to 7.3 ML/day) represent the theoretical maximum impact. Any reductions in baseflow due to depressurisation of the shallow or perched aquifers will be well below the theoretical maximum impact.

2.3.4 Maximum Baseflow Reduction Predictions

WaterNSW noted that the maximum drawdown in Layer 1 of the groundwater model occurs in the timeframe of 50 to 100 years after mining. WaterNSW requested an estimation of the reduction in baseflow during this timeframe.

The groundwater modelling determined the main reduction in stream baseflow (0.041 ML/day) occurs concurrently with the longwall mining period, with the maximum reduction occurring during extraction of LW 6 due to the close proximity of LW 6 to Cataract Creek.

The groundwater model mass balance indicates that as LW 6 is extracted, Layer 1 incurs a loss of storage in the basement strata. As a result, Layer 1 is recharged by stream flow from Cataract Creek, thereby resulting in increased baseflow losses within Cataract Creek.

As mining progresses into subsequent panels, which are more distant from Cataract Creek, the Layer 1 storage in the vicinity of the creek recovers due to ongoing recharge from the creek, and the stream baseflow subsequently recovers to pre-mining levels.

The depressurisation in Layer 1 continues to radially expand out from the mining area after mining the Wongawilli Seam workings. However, the reduction in Cataract Creek baseflow does not continue to increase, as the Layer 1 depressurisation expands out, away from the creek, and the stream recharges Layer 1 in the vicinity of the creek, thereby inducing a recovery in the stream baseflow losses.

2.3.5 IRAP Ongoing Role

WaterNSW strongly supports the ongoing role of the IRAP as a conditional requirement.

Condition 12 under Schedule 3 of the draft Approval prescribes the establishment of an Independent Monitoring Panel (IMP).

2.3.6 Mine Closure and Contingency Plan

WaterNSW states DP&E should not consider recommending approval unless it is satisfied that the 'Mine Closure and Contingency Plan' contains feasible measures and wishes to comment on the draft plan.

WCL will continue to consult with WaterNSW in relation to the preparation of 'Mine Closure and Contingency Plans' which are required by the DSC.

2.4 WOLLONGONG CITY COUNCIL ISSUES

In its response to Part 2, OEH in its letter dated 14 October 2015 noted four areas where it wished to provide "written comments". A response to each is provided below.

2.4.1 Removal of LW 6

WCC suggested that LW 6 should be 'deleted' to avoid impacts to swamp CCUS4.

Impacts to swamp CCUS4 will be appropriately compensated for if the environmental consequences are greater than negligible.

Condition 4 under Schedule 3 of the draft Approval requires WCL to provide a $500,000 bond prior to further mining of LW 6. The bond will only be released if monitoring demonstrates that no greater than negligible environmental consequences have occurred.

If the environmental consequences are greater than negligible, WCL will provide offsets to the satisfaction of the Secretary of DP&E.

2.4.2 Construction of Acoustic Barrier

WCC supported the construction of an acoustic barrier to reduce noise impacts to receivers to the north of Bellambi Lane.

This issue is addressed in the draft Approval.

Condition 2b under Schedule 4 of the draft Approval requires WCL to undertake in situ noise monitoring to assess the need for a noise barrier. The monitoring results will be presented to affected residents and the EPA for a decision on whether further noise mitigation is necessary.

2.4.3 Bellambi Gully Flood Study

WCC supported the flood controls proposed in the Bellambi Gully Flood Study (Cardno, 2015) and recommended that a consent condition be added to this effect.

This issue is addressed in the draft Approval.

Condition 11 under Schedule 4 of the draft Approval requires the recommendations of the Bellambi Gully Flood Study to be implemented within 12 months of the date of the approval to the satisfaction of DP&E.

2.4.4 Maintenance of Bellambi Lane

WCC noted that WCL has commenced negotiations regarding road maintenance contributions. WCC suggested that a consent condition be added to require WCL to conclude these negotiations.

This issue is addressed in the draft Approval.

Condition 14 under Schedule 2 of the draft Approval requires WCL to reach agreement with WCC within 6 months of the date of the approval in relation to contributions for the maintenance of Bellambi Lane. WCL advises it is currently progressing negotiations with WCC.

2.5 DPI – WATER ISSUES

In its response to Part 2, DPI-Water in its letter dated 16 October 2015 listed comments that WCL has reviewed and provides the following response.

2.5.1 Monitoring

DPI – Water notes the uncertainty in the predictions of stream flow losses and has highlighted the need for a comprehensive monitoring program to determine the magnitude of actual losses.

The predicted stream flow losses in the surface water assessment (WRM, 2015) represent the theoretical worst case. WCL will implement stream flow monitoring to determine the actual magnitude of the impact.

Condition 10 under Schedule 3 of the draft Approval requires the preparation of a Water Management Plan in consultation with DPI – Water and WaterNSW. The Water Management Plan will include a monitoring program to measure impacts on stream flow.

2.5.2 Licensing

DPI – Water notes the requirement for WCL to obtain Water Access Licences for the groundwater taken by the Project.

WCL acknowledges that Water Access Licences (WALs) are required to account for all groundwater taken by the Project. The groundwater assessment (GeoTerra / GES, 2015) predicts a maximum mine inflow rate of 1,212 ML/year. This total includes approximately 146 ML/year of inflow from upgradient workings in the decommissioned Cordeaux and Bulli Collieries. WCL will obtain appropriate WALs for the remaining 1,066 ML/year.

WCL currently holds WAL 36488 which authorises the taking of up to 365 ML/year. WCL is currently consulting with DPI – Water regarding the acquisition of additional licences.

2.5.3 Flood Controls

DPI – Water recommended further consideration of the water quality impacts of the recommended flood controls in the Bellambi Gully Flood Study (Cardno, 2015).

Condition 11 under Schedule 4 of the draft Approval requires the recommendations of the Bellambi Gully Flood Study to be implemented within 12 months of the date of the approval to the satisfaction of DP&E.

WCL currently proposes the construction of a 6 ML dry sediment basin within the stockpile area. Additional detailed design will be undertaken to confirm that this basin has sufficient capacity to support the flood mitigation strategy proposed by Cardno (2015).

3 RESPONSE TO PUBLIC HEARING ISSUES

Following is a discussion on key issues raised by presenters at the public hearing with a response to each. It does not provide a response to all issues, rather responds to comments which WCL considers are inaccurate or requires further clarification.

3.1 RISK ASSESSMENT AND IRAP

3.1.1 Independence of IRAP

Some speakers stated that the members of the IRAP were not independent and/or appropriately qualified.

Submissions: 7

Following consultation with other relevant agencies, DP&E advised that it was inappropriate for the IRAP to be constituted by representatives of government agencies. Instead, DP&E advised that the IRAP should be constituted by independent technical specialists.

In its letter dated 15 June 2015, DP&E approved the IRAP members proposed by WCL. The IRAP was constituted by leading experts in the fields of subsidence, rock mechanics, surface water, groundwater and ecology.

See further response to this issue at **Section 2.1.1**.

3.1.2 Risk Assessment

Presenters stated that there was no new information, errors or no improvement in information since February 2015.

Submissions: 4, 6, 10

The following significant work has been undertaken in response to the recommendations in the PAC Review Report (see Part 1 and Part 2):

- Integrated Risk Assessment;
- Re-running of the groundwater model using the latest monitoring data;
- Updating of the surface water assessment with the latest monitoring data;
- Detailed investigation of the risks associated with the Corrimal Fault and Dyke D8; and
- Revision of the Economic Assessment using the latest economic forecasts.

3.1.3 Regulatory Comments

Some speakers referred to comments from OEH and WaterNSW not being adequately addressed by DP&E or WCL; or that the comments supported the project not being approved.

Submissions: 3, 6, 8

Section 2 provides a detailed response to regulators' issues in response to Part 2 from October 2015. **Section 2** demonstrates that all have been addressed by WCL Statement of Commitments (SoC) or conditions of the draft Approval.

3.2 WATER RESOURCES

3.2.1 Cataract Reservoir Connectivity

Some presenters stated that connectivity to the reservoir had not conservatively been considered in the Integrated Risk Assessment in Part 2 and did not protect the special areas of the catchment. Various methods such as 'geochemical tracing' were suggested to 'prove' connectivity to Cataract Reservoir.

Submissions: 1, 7, 20, 22, 28, 29, 32, 37, 38, 43

The Risk Assessment included a comprehensive investigation into the geometry and characteristics of the Corrimal Fault (SCT, 2015). The Corrimal Fault has been intersected numerous times by workings in the Bulli and Balgownie seams. Observations made during these intersections have enabled SCT to predict the dimensions and alignment of the Corrimal Fault. A three-dimensional representation of the Corrimal Fault is shown in **Figure 1**.

Based on the most recent intersection of the Corrimal Fault during mining of LW 6, the Corrimal Fault is expected to taper out in the vicinity of LW 7. Therefore, the fault does not provide connectivity to Cataract Reservoir. Furthermore, the lack of elevated mine inflows during previous intersections of the fault indicates that the Corrimal Fault is not water bearing.

SCT's analysis of the Corrimal Fault was reviewed and supported by the IRAP.

3.2.2 Groundwater Model Accuracy

Various presenters purported specific errors in the groundwater model predictions and assumptions (e.g. that shear plane not included in model, bores GW1 and RV20 were not in a relevant position, height of drainage zone not determined).

Submissions: 1, 33

Part 2 included a revised groundwater model which responded to the comments made by Dr Colin Mackie (engaged by the PAC). The revised Groundwater Impact Assessment (Geoterra, 2015) was peer reviewed by Dr Noel Merrick and reviewed by the IRAP's Groundwater Specialist, Andrea Madden (PB).

Both WaterNSW and DPI – Water, the regulatory authorities responsible for water resources, did not require any amendments to the groundwater model.

As such, no amendments to the groundwater model are warranted.

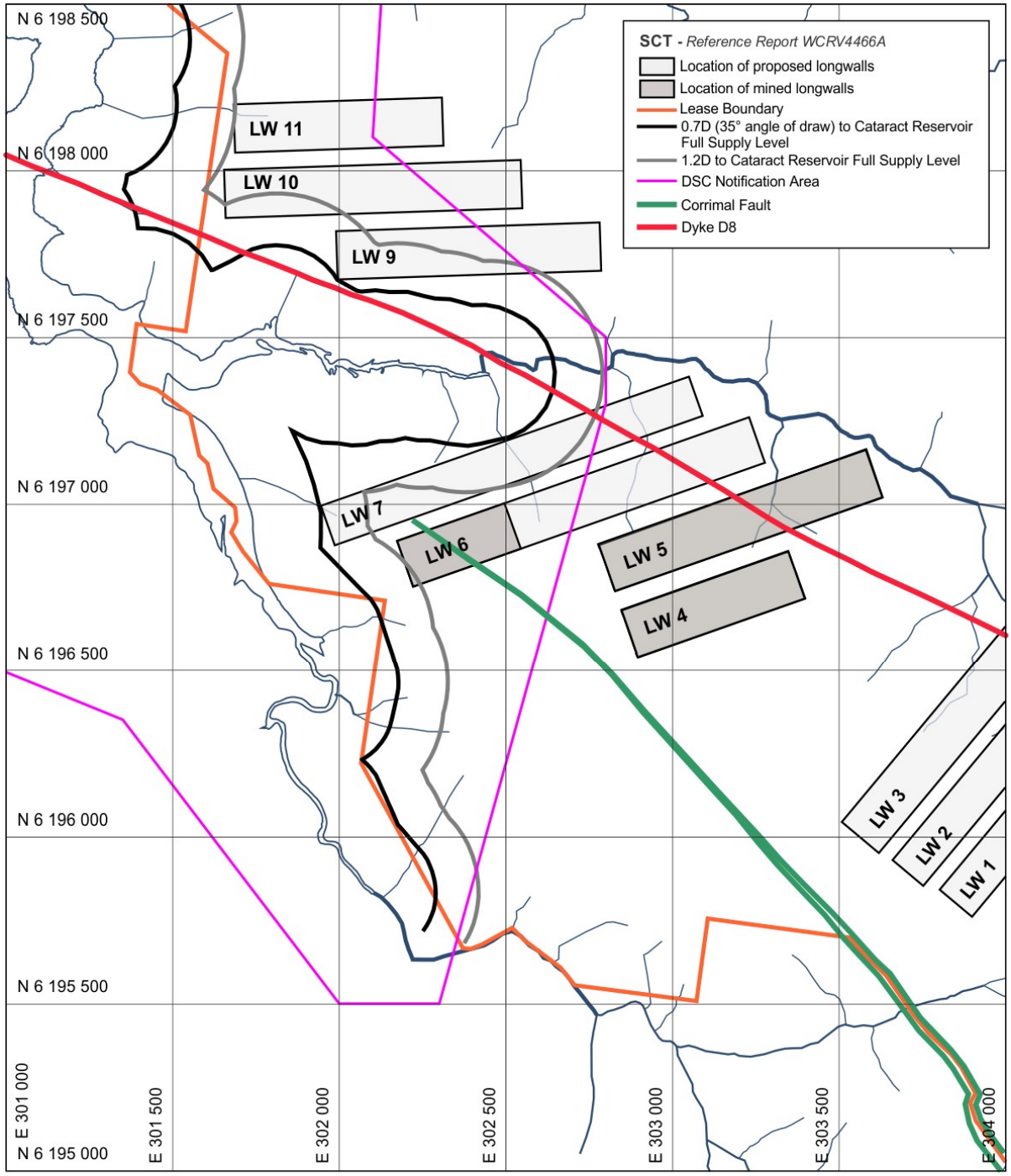

Figure 1: Plan of Russell Vale East Area showing location of Corrimal Fault and Dyke D8 relative to proposed longwall panels, the 35° angle of draw protection barrier for Cataract Reservoir and the DSC marginal zone defined by 1.2D from the full supply level.

Figure 1

Corrimal Fault & Dyke D8 (SCT, 2015)

3.2.3 Bellambi Gully Incident

Presenters noted the reportable incident from the existing operations which resulted in potential impacts to Bellambi Gully.

Submissions: 8, 11, 37, 44

On 7 December 2015, WCL identified and promptly reported an incident that had occurred at the Russell Vale site. A malfunction of the stockpile spray caused water carrying traces of coal to enter Bellambi Gully. The malfunctioning stockpile spray was repaired and mitigation measures (including water diversion) have been undertaken.

WCL promptly notified the EPA, which has attended the site to further investigate the incident, review the mitigation measures and collect data from Bellambi Gully. WCL has engaged specialist consultants to undertake a Rapid Ecological Assessment to identify impacts.

WCL has submitted two reports on the event to the EPA and will continue to work closely with the agency and its environmental consultants to resolve this issue.

3.2.4 Mining in Drinking Water Catchment

Some speakers stated that no other country in the world allows mining in its drinking water catchments.

Submissions: 22, 28, 29, 32, 37, 38, 43

Some speakers at the public meeting referred to the report of the Chief Scientist titled "*Measuring the cumulative impacts of all activities which impact ground and surface water in the Sydney Water Catchment*" (2014). The Chief Scientist's report states:

> *"It was noted that there are no international examples of longwall mining operating in publicly owned drinking water catchments but there are examples of it occurring under streams and aquifers connected to privately owned wells in the Appalachians of the U.S.A".*

However, this statement should not be interpreted as an argument against mining beneath drinking water catchments. In fact, the Chief Scientist concludes that:

> *"The current cautionary approach by the Dams Safety Committee and other government agencies seems to be preventing development that could cause obvious disastrous cumulative impacts, and therefore there is no reason to stop longwall mining immediately".*

The DSC has advised that it does not object to mining within the Cataract Dam Notification Area, although there may be a requirement to truncate LW 7 if the Corrimal Fault is encountered.

3.2.5 Discrepancy Between Groundwater and Surface Water Models

A speaker stated there was a discrepancy between the predictions of the groundwater and surface water models in relation to impacts to baseflow.

Submissions: 1, 28

This issue has been addressed in **Section 2.3.2**.

3.3 AMENITY ISSUES

3.3.1 Air Quality and Health

Presenters mentioned concerns in relation to human health from the UEP, particularly in relation to PM_{10} and $PM_{2.5}$ emissions from stockpiles and active areas.

Submissions: 5, 11, 19, 24, 37, 41

$PM_{2.5}$ and PM_{10} were modelled for the UEP.

The PM_{10} annual average limit of 30 ug/m^3 is a regulatory limit and is based on human health criteria.

No criterion for $PM_{2.5}$ is stipulated in NSW, however the NEPM annual average criterion of 8 ug/m^3 is used to assess predicted impacts against.

For both PM_{10} and $PM_{2.5}$, predictions from the UEP are within the relevant criterion.

3.3.2 Coal Transport

Some submissions were concerned that WCL should contribute towards the maintenance of Bellambi Lane. Some also stated that haul trucks should be mitigated for noise.

Submissions: 11, 30, 45

This issue is addressed in **Section 2.4.4**.

3.3.3 Near Neighbour Noise

A presenter who is a long-term resident of Bellambi Lane stated he has to date, experienced significant noise and dust impacts and is concerned in relation to the increase in trucking of coal to PKCT.

Submissions: 26

Wilkinson Murray (2014) modelled predicted noise from the additional truck movements form the UEP to PKCT.

The modelling undertaken in considering the above methodology has found that the increase in traffic noise levels are less than 2 dB (i.e. 1.7 dBA). On this basis, it is considered that the impact associated with increasing the haulage from 1 Million tonnes per annum (Mtpa) to 3 Mtpa is considered to be a minor impact that would be barely perceptible.

Additionally, traffic noise impacts are also being managed as follows:

- Haulage is restricted such that no movements are to occur during the night time period; and
- The haulage contractor to Russell Vale is committed to replacing its fleet with larger trucks and trailers that comply with Euro 5 specifications. These trucks are quieter and can haul more coal reducing the amount of trips needed to and from Russell Vale.

3.4 ABORIGINAL HERITAGE

A speaker stated that the Aboriginal community has not given its consent to the project.

Submission: 14, 50

Consultation with the Aboriginal community commenced in 2008. Accordingly, stakeholder consultation was appropriately undertaken in accordance with the *Interim Community Consultation Requirements Guideline* (DEC, 2004). The following stakeholders were consulted with responses included in the EA:

- Northern Illawarra Aboriginal Collective;
- Kulila Site Consultants;
- Peter Falk Consultancy;
- Illawarra Local Aboriginal Land Council; and
- Wodi Elders Corporation.

3.5 ECOLOGY

3.5.1 Insufficient Baseline Swamp Data

A presenter stated that no baseline data existed to determine swamp impacts. Speakers stated that impacts to threatened species had not been quantified or were unacceptable.

Submissions: 8, 10, 25

Biosis advises that WCL has undertaken extensive work since 2011 to develop the most comprehensive monitoring program for upland swamps undertaken for the Southern Coalfield. This monitoring program has included the installation of over 25 shallow groundwater piezometers, detailed subsidence monitoring within and around upland swamps, monitoring of outflow from upland swamps and associated waterways using flow monitoring stations, Light Detection and Ranging (LiDAR) mapping to document changes in size and extent of upland swamps and detailed ecological monitoring to document changes in species composition and distribution. This monitoring program, which as been peer reviewed and assessed and approved by State and Commonwealth regulators, has resulted in comprehensive baseline dataset for upland swamps.

As a part of the environmental assessment of the UEP, WCL has undertaken detailed and extensive surveys for threatened species and assessment of the potential impacts to threatened species. Biosis notes that these surveys and assessments have focused on documenting the impacts to species associated with natural features at risk of impact, namely rocky environments (cliffs and rocky outcrops), streams and creeks and upland swamps.

Comprehensive detailed and targeted surveys have been undertaken of all significant natural features within the UEP area, with the survey effort exceeding State and Commonwealth survey guidelines. These surveys did not identify any significant habitat for threatened species, other than habitat for the Giant Dragonfly, and therefore concluded that the potential for impacts to the majority of threatened species was low.

To date, regulators have not raised the adequacy of survey or the degree of impact to threatened species as a key issue.

3.5.2 Offsets Not Suitable to Mitigate Impacts

Various speakers stated that offsets were not a suitable way to mitigate impacts to flora and fauna, particularly swamps (especially where monetary contributions could be held in a fund). They also stated that there is significant uncertainty in relation the impacts on upland swamps.

Submissions: 5, 8, 10, 27, 28, 43

Biosis advises that the use of offsets to compensate for impacts to biodiversity through long-term conservation outcomes forms a core principle of Government policy across Australia and globally. To specifically address offset for impacts to upland swamps, OEH is finalising the Swamp Offset Policy. This Policy will outline impact thresholds for which offsets are required, monitoring required to adequately assess impacts and mechanism to address any uncertainty in impact predictions.

OEH is yet to open the Biodiversity Offsets Fund. When available, the fund will allow proponents to satisfy their offset requirement through a monetary contribution to the fund. It should be noted that the intent of the fund is to purchase like-for-like offsets on behalf of proponents. The advantage of the fund will be that it will allow more strategic approaches to the purchasing of offsets. Such an approach will be beneficial to communities such as upland swamps with discreet distributions.

3.6 CLIMATE CHANGE & GREENHOUSE GAS

Presenters stated that the project should not be approved due to its impacts on climate change.

A presenter asserted that the greenhouse gas calculations in the PPR were inaccurate. One presenter stated that methane has 40-70 times more 'heat trapping capacity than CO2'.

Speakers stated that a transition to non-mining related jobs was essential for the region.

Submissions: 18, 22, 27, 34, 46

A greenhouse gas assessment was undertaken as part of the PPR (Gujarat NRE Coking Coal, 2013) for the UEP. The direct greenhouse gas emissions (Scope 1 & 2) for the peak year have been estimated at 200,849 tonnes of CO_2-e per annum. These direct emissions represent 0.1% and 0.03% of annual scope 1 and 2 emissions for NSW and Australia respectively.

Therefore, the contribution of the Project to global greenhouse gas emissions would be insignificant.

3.7 ECONOMICS

Some presenters mentioned various economic-related issues which included: error in calculation of $23M in royalties, non-payment of carbon tax, subsidies to the coal industries outweighing royalties, and the way in which 'impacts' are considered in the economic model. Some speakers suggested ways to amend standard 'cost benefit analysis' (e.g. how offsets are considered).

Submissions: 36, 38

The PAC recommended that a revised economic assessment be undertaken to "reflect the current economic climate". A revised Economic Assessment, based on the latest economic forecasts, was undertaken by Gillespie Economics (included in Part 1). The Economic Assessment was subject to an independent peer review by CIE, which was commissioned by DP&E (as per the PAC's recommendation).

The revised Economic Assessment found that the UEP would generate at least $23M in royalties, as well as company tax and non-market employment benefits.

At the regional level, the Project is prediction to have impacts of up to:

- $114 M in annual direct and indirect output;
- $96 M in annual direct and indirect household income; and
- 1,498 in annual direct and indirect employment.

3.8 OTHER ISSUES

3.8.1 Project Need Justification

A speaker stated that a justification of the need for the Project has not been provided in any document. Further, presenters stated that the 3 Mtpa limit requested has not been justified.

Submissions: 4

Section 1.6 of the 'NRE No 1 Colliery Project Application 09_0013 Environmental Assessment' (ERM, 2013) (EA) provides a detailed justification for the project "… to ensure the continuation and operation of the Colliery … as well as improve the operational efficiency of the Colliery."

The majority of saleable product from the UEP is metallurgical coal, which is a vital ingredient for the production of steel (World Coal Association, 2015). According to the Commonwealth Office of the Chief Economist (OCE) world steel consumption is projected to grow by around 1.6 per cent a year to 1.74 billion tonnes in 2020, underpinned by ongoing urbanisation and an expanding manufacturing base in many developing countries, particularly China and India.

Developing economies have been the growth engine of world steel consumption over the past decade and they are expected remain a key driver throughout and beyond the life of the Project (OCE, September 2015).

WCL seeks approval to produce up to 3 Mtpa of ROM coal. Although the coal resource is not sufficient to sustain this maximum production rate for the duration of the Project, it is possible that this production rate will be achieved in a particular year.

Hatch (2015) has confirmed that the surface infrastructure at the Russell Vale Site has the capacity to produce 3 Mtpa of ROM coal.

3.8.2 Existing Surface Facilities

A speaker alleged that WCL has over 120,000 t of stockpiles on site and only 80,000 t is approved at site at present. It was also claimed that over 200,000 t of waste is emplaced under the WCC approval, and is inconsistent with that approval. It was stated that the UEP proposes a 360,000 t capacity stockpile which will be 33 m in height.

Submissions: 3, 20, 39

Russell Vale Colliery has an approved ROM Stockpile of 80,000 tonnes and a high ash stockpile that is delineated by footprint not tonnage.

WCL advises there is up to 200,000 tonnes of material on the emplacement tipping face which is not a stockpile, rather an emplacement area. There is no timeframe restriction in WCL planning approvals in relation to the emplacement area.

3.8.3 Financial Viability of WCL

It was stated by some speakers that WCL has significant financial issues and has not fulfilled its financial or planning approval responsibilities, and payments of royalties and as such, the UEP should not be granted.

Submissions: 13, 20, 37

WCL was formerly known as Gujarat NRE Minerals Limited and in 2013, there was a change in the company's principal shareholder and an ensuing change in management.

WCL advises that with the full support of the principal shareholder, it will meet all requirements in the future.

3.8.4 Project Reserves

A presenter stated that WCL claimed reserves of 122.8 Mt at its investor presentation which the presenter stated was misrepresentative.

Submissions: 5

The UEP seeks approval to extract 4.7 Mtpa. Beyond this, WCL holds various mining leases with additional identified resources, to which the investor presentations refers.

3.8.5 Failure to Declare Political Donations

A presenter stated the WCL has not stated its political donations in relation to the project.

Submissions: 20

WCL has disclosed political donations in August 2011 and confirmed again in February 2015. Both are available on the DP&E website.

3.8.6 Fit & Proper Person

A presenter stated that WCL was not a 'fit and proper' person under Section 380A of the Mining Act 1992.

Submissions: 3

WCL advises that this query is outside the scope of the PAC's TORs. A project approval runs with the land and is not personal and therefore these submissions are irrelevant.

Section 380A of the *Mining Act 1992* is administered by the NSW Minister for Industry, Resources and Energy. Whether WCL is a 'fit and proper person' within the meaning of section 380A is not a lawful consideration under Part 3A of the EP&A Act.

3.8.7 Alleged Corruption

A presenter made various, unsubstantiated statements in relation to alleged corruption and criminal mis-conduct in relation to Jindal Steel's overseas operations.

Submissions: 3

WCL notes that these submissions are rejected and are outside the scope of the PAC's TORs.

3.9 SUBMISSIONS IN SUPPORT

3.9.1 Socio-economic Benefits

Presentations in support cited the recommencement of operations at the mine would lead to up to 300 direct jobs, $23 M in royalties, and the flow-on benefits from this and benefits to the community from WCL's contributions.

Submissions noted the necessity of coking coal for the production of iron and steel with no other alternative at present. It was also noted that this demand from India in particular is likely to increase.

Further, these submissions noted a need for new jobs that the UEP will generate considering the unemployment rate (compared to the rest of NSW), along with the many redundancies in the mining and related-industry sectors in recent times.

Submissions: 9, 15, 16, 17, 21, 42, 48, 49

WCL agrees with these submissions.

The UEP will ensure continuity of employment for the existing workforce. This is significant given that the Wollongong Local Government Area has a high unemployment rate (7.0%) relative to the state average of 5.9% (2011 census).

4 CONCLUSION

WCL trusts that the PAC will duly consider the information provided within this document during the preparation of its Second Review Report.

Should you have any queries in relation to this document or have any further questions regarding the UEP, please contact Dianne Munro on 02 6575 2000.

* * *

For
HANSEN BAILEY

Andrew Wu
Environmental Engineer

Dianne Munro
Principal

5 REFERENCES

- Commonwealth of Australia (2014a). Temperate Highland Peat Swamps on Sandstone: ecological characteristics, sensitivities to change, and monitoring and reporting techniques. Prepared by Jacobs SKM for the Department of the Environment, Commonwealth of Australia.
- Commonwealth of Australia (2014b). Temperate Highland Peat Swamps on Sandstone: evaluation of mitigation and remediation techniques. Prepared by the Water Research Laboratory, University of New South Wales, for the Department of the Environment, Commonwealth of Australia.
- Keith D.A., Rodoreda S., Holman L. and Lemmon J. (2006). Monitoring change in upland swamps in Sydney's water catchments: the roles of fire and rain. Department of Environment and Conservation, Sydney.
- OCE, September 2015, Commonwealth Office of the Chief Economist (OCE) Resources and Energy Quarterly – September Quarter 2015.
- World Coal Association, 2015 https://www.worldcoal.org/coal/uses-coal/how-steel-produced.

APPENDIX A

Summary of Key Issues from Public Hearing

Ref	Stakeholder	Issue
P1	Dr Peter Turner (National Parks Association for NSW)	• No determination of height of the drainage zone above multi-seam extraction – significant flaw in groundwater model. • Groundwater model not calibrated to stream flow or mine inflow. • Shear plane at 70-110 mbgl. • Insufficient information to reliably assess the risk consequences of drainage zone intersecting a water bearing hear plane. • Bores GW-1 and RV20 are not in a location that allows a determination of intersection of drainage zone in multi seam extraction. • Lack of information regarding impacts of historical mining. • Insufficient groundwater model – hard to have confidence in 2.8 mega litres a day and stream flow loss.
P2	Amanda Walsh	• Not in Attendance
P3	Nic Clyde (Lock the Gate)	• Minister cancelled a PEL which overlaps with Russell Vale. • Economics – cost / benefit analysis. Royalties are less than $23 M and probably more like $18 M. • Subsidies to the coal industry amount to $5.22 per tonne of coal exported. • If subsidies are considered, the cost of the project is $25,022,000, compared to a benefit of $18-23 M. • The cost of greenhouse gas emissions in the BCA does not include Scope 3 emissions. • Fit and proper person – EDO has said that this is relevant to the planning process? EDO has written to Rob Stokes at planning. • There are six grounds that it is not fit and proper. • Mentions unpaid royalties ($3.6 M) and unpaid bond to Wollongong council ($400,000). • WCL lacks the technical expertise to undertake mining. • Jindal Steel facing criminal conduct issues. New York Times article. Ramesh Aggarwal shot by company and is coming to Australia – has not been proven in court of law. • Naveen Jindal has been charged with criminal misconduct. • National Green Tribunal. • Ex High Court registrar and special judge said that the company manipulated the government. • European Coalition for Corporate Justice comments. • WaterNSW raised two issues: 1) geochemical tracers should be used to determine connectivity with the reservoir; and 2) not enough information re swamp water balances.
P4	Deidre Stuart	• Applied scientist. • WCL has not complied with conditions of past approvals (namely, the WCC for the emplacement area) • No justification of the need for the Project in any document. • No new information has been provided since February (PAC Review 1).
P5	Ann Brown (National Parks Association Illawarra)	• Escarpment close to LWs 1-3. • Lacks a figure that shows swamps, topographic contours and longwall panels • Chief scientist said that LW mining impacts would impact swamps worse than coal seam gas extraction. • Impacts to swamps cannot be remediated or offset. • There is no baseline for determining swamp impacts. • IESC said that swamps should not be mined beneath. • Expect integrity from company –can they trust the company? Mining Act – not responsibility of the PAC to consider the company. • Questioned the company's ability to undertake rehabilitation – notes $8 M dollar bond with DRE. • At its investor presentation, WCL claimed reserves of 122.8 Mt – misrepresents the situation – the reserves may be there but have no right to advertise them. WCL represents these reserves as high quality coking coal, when in fact only 52% is coking coal. • Amendment to mining SEPP. cl 12AA.

Ref	Stakeholder	Issue
		• $20-23M dollars in royalties. • Company did not pay carbon tax until taken over by Jindal. • EPA announcement – Bellambi Gully pollution incident. • Two new coal stockpiles proposed – PM2.5 becomes a health issue. • Dutch citizens have a legal right to be protected from climate change.
P6	Robert Garnsey	• Friends and family shocked that LW mining is proposed under water catchment. • Refers to WaterNSW concerns. IESC fact sheet on LW mining. • No improvement in information since the IESC's advice in February 2015.
P7	Carolyn Graham (Rivers SOS)	• Protection of special areas of the catchment. • PAC had appointed a person working at Peabody. PAC always packs panels with mining consultants. • Andrew Stoeckel – previous director of ABARE which was criticised by ombudsman for not having declared the source of its funding which compromised the credibility of the work. • IRAP – PAC recommended people to be appointed to IRAP, Planning appointed different people. Chair is Chair of mining at UNSW – the school is member of Mineral Council. • Arthur Waddington – director of MSEC and been working for mining industry for decades. • Andrea Madden – Parsons Brinkerhoff consultant – works for mining companies. • Steve Perrens – Advisian – which is an international mining consultant. • David Robertson from Cumberland – work has been criticised in the past. • DP&E letter recommending approval – says that mine subject to best practice. No such thing as best practice for multi-seam mining. • Jindal's economic conditions.
P8	Daisy Barham (Nature Conservation Council of NSW)	• Represent 150 community based environmental groups. • OEH disagreed with the Risk Assessment's conclusions regarding swamps. • Changes to groundwater availability will have impacts on vegetation. • Changes to pH and dissolved oxygen levels will affect aquatic organisms. • WCC commented that LW 6 should be truncated. • Rain water into Sydney's catchment will reduce by 25% due to climate change. The Project will further reduce water availability. • Impacts on threatened species under the TSC Act – giant burrowing frog, masked owl, broad-headed snake, spotted tailed quoll etc. • Requests that the PAC do not approve offsets for biodiversity. A bond is not sufficient protection for biodiversity. • Non-compliance with conditions of previous approvals – reason has been lack of human and financial capacity.
P9	Debra Murphy (Illawarra Business Chamber)	• Mining is a significant contributor to gross value added in the region • Mining generates 5 indirect jobs for each direct job
P10	Emma Rooksby	• Works in risk assessment / management. • Sees substantial uncertainty re the impacts on upland swamps. • Triple seam mining techniques are risky and unproven. • Agencies comments have not been fully addressed and still outstanding, • Mentions that in Paris conference looking at reducing 'climate change' target from 2 degrees to 1.5 degrees change.
P11	Holly Creenaune (Land	• Represent 100 community groups.

Ref	Stakeholder	Issue
	Water Future)	• IRAP found 29 medium level risks. • Increase in truck movements – that the amended conditions re mitigations measures for noise and dust 'reasonable and feasible' are insufficient. • There are no noise and air quality standards that relate to human health. • Mine Subsidence Board (operation tunic) allegations re kickbacks from building contractors. • Mentions the Bellambi Gully pollution incident. • Need a transition from coal to other areas – Hunter used as an example. • Approval of the Project does not guarantee security of jobs
P12	John Wilson	• Seeks a prohibitative injunction. • Need to lodge a statement of claim. • The court is the government. • Proceedings against the Project would be before a jury.

P13	Tim Buckley (Institute of Energy, Economics and Financial Analysis)	• Director of energy finance at IEEFA.
		• Previously at Citigroup.
		• Questions the financial capacity of the proponent to safely undertake the UEP.
		• WCL has no capacity to fund the project.
		• Net debt of $694M, compared to book value of $96M.
		• $400M in losses over the past 30 months.
		• CEO, CFO and other staff have all left at WCL – therefore not only financial but management capacity of the company is in question.
		• Three financial issues:
		  • global coal sector in structural decline – refers to China – Imports down 40%, coal price down 70%
		  • coal sector is wealth hazard – Peabody energy used as example, Rio Tinto, Glencore, WCL share price down almost 100%. Jindal shares down 85% - net debt US$6.3 billion.
		  • Financial distress compounds dire operating outlook. Jindal cannot even meet interest expenses.
		• Qld Dept of natural resources have published something re mining and financial distress.
		• Consensus pricing predicts no improvement in coal prices.

P14	Rod Plant	• Aboriginal representative. • The Aboriginal community has not given consent to the Project. • WCL cannot meets its obligations to its employees.
P15	James Keene (Australia India Business Council)	• CEO of Australia India Business Council. • Coking coal vital for production of iron and steel. • Indian demand for steel will increase
P16	Taylor Benny	• WCL environmental team member
P17	Ana Gracanin	• WCL environmental team member
P18	Tom Hunt (Wollongong Climate Action Network)	• Climate change results in greater severity of natural disasters • Intergovernmental panel on Climate Change report mentioned. • CO2 emissions have been miscalculated in the PPR
P19	Suzanne Fawaz	• Resident living two streets back from Bellambi Lane.

Ref	Stakeholder	Issue
		• Dust and noise pollution – has fine black coal dust in house. • Suffers from respiratory problems. • Increased truck movements give rise to increased noise and road safety risks.
P20	Cr Jill Merrin	• Greens Councillor. • WCL has failed to declare political donations • WCL has not paid its royalties • The Project breaches 'catchment' legislation • Illawarra Regional Plan (DoP document) lack of consideration of climate change. • Mentioned stockpile pollution incident.
P21	Dr Dale Cooper	• Coordinated IRAP.
P22	Adrian Ingleby	• Lives in Otford, 32 kms from Wollongong in Royal National Park. • Methane has between 40 and 70 times more heat trapping capacity than CO_2. • No other country allows mining beneath its drinking water catchments
P23	Isabel McIntosh (Protect Sydney's Water Alliance)	• Not in attendance.
P24	Margaret Armstrong	• Resident of Corrimal • Longwall mining is increasing in size. Mechanisation of mining is responsible for job losses. • Methane emissions result in observed bubbling in the Cataract and Nepean Rivers
P25	Martin Denny	• Not all terrestrial fauna species have been considered. • Impact assessment is inadequate because not all required survey methods have been utilised. • OEH guidelines and Commonwealth Dept of Environment. • Implications of Part 3A of *Environmental Planning & Assessment Act* – DG assessment requirements. • Part of the requirements relates to biodiversity – potential impacts on terrestrial, ecological communities and their habitats – draft guideline for threatened species assessment guidelines (part 3A) and threatened biodiversity survey and assessment guidelines. • guidelines not mandatory – have been prepared for use. • SEWPAC – now Federal Dept of Environment.
P26	Desmond Jacobs	• Resident of Bellambi Lane for 29 years. • 15-20 trucks in per hour and between 15 and 17 existing per hour. • Experience significant noise and dust impacts. • The noise and dust impacts will be magnified three-fold due to the increase in coal production
P27	Murray Scott (National Parks Association Southern Sydney)	• Offsetting is ineffective because there is never an exact match for ecological conditions. • Greenhouse gas emissions was not considered in the PAC review report. • 2015 price forecast – coking coal predicted to drop 10%. • Piecemeal approvals process. • Any approval is conditional on funding for rehabilitation • No offsets be accepted for surface damage prevention • Future proposals for Russell Vale West should be explicitly refused.
P28	Shirley Gladding	• Resident of Woonona. • Risk of damage to water catchment.

Ref	Stakeholder	Issue
		• Discrepancy between the predictions of the groundwater and surface water models. • Mentions repeal of section 12AA – environment should come to forefront in evaluations. • Offsets do not compensate for damage that has occurred. • Mining only employs 2.6% of Illawarra workforce.
P29	Dr Keith Tognetti	• Faults may provide connectivity from the mine workings to the reservoir • WCL should be liable for overflows from the escarpment (if these occur)
P30	Irene Tognetti (Wollongong Transport Coalition)	• Concerned re extra coal trucks on Bellambi Lane. • WCL should be required to contribute to maintenance of Bellambi Lane. • WCL should be required to seal and line mark the car park. • 1979 conditions of mine included coal haulage being capped at 2 Mtpa to be facilitated by a conveyor. WCL should justify why a conveyor to the rail line should not be constructed. • Suggests that trucking of coal should be capped at 1 Mtpa. Any surplus should be transported by rail. • Suggests that trucking should cease at 6pm. • Suggests 50c per tonne levy on truck haulage. • Project should utilise the Malden-Dombarton rail line. • Noise attenuation should be implemented on road trucks.
P31	Derek Finter	• No attendance.
P32	Miguel Heatwole (Ecopella)	• Opposition to mining in drinking water catchments • Methane emissions • Song.
P33	Dallas de Brabamder	• WRM's predicted stream flow loss of 7.3 ML/day equates to water for 25,000 people. • Discrepancy between the predictions of the groundwater and surface water models. • Project should be judged according to the worst case scenario. • Cumulative impacts on Sydney water catchment.
P34	Michael Rynn (Parramatta Climate Action Group)	• Concerns re climate change. • s 34B of EP&A Act.
P35	Adam Waddell	• Not in attendance.
P36	Neil Perry	• Asked to prepare expert brief for EDO. • Economist from University of Western Sydney. • Analysed the economic assessment by Gillespie Economics. • Non-market employment benefits are not required to be considered under any benefit-cost analysis guidelines. • Completed theoretical assessment of offsets – never been formal treatment of offset in benefit-cost analysis. Considers that a cost should be imposed for impacts that have been offset. • Social value not the same as cost of offset. • Social costs have not been determined.
P37	Kaye Osborn (Illawarra	• Opposed to mining in Special Areas. • Jindal Steel intends to divest all overseas assets including WCL.

Ref	Stakeholder	Issue
	Residents for Responsible Mining)	• WCL does not have the financial capacity to undertake remediation. • Mentioned the pollution incident in Bellambi Gully. This incident would not have occurred if the Bellambi Gully realignment had been completed. • Need justification for a production rate of 3 Mtpa when the total resource is 4.7 Mt. • Claimed that WCL has not met the conditions of the WCC approval for the emplacement area. • The emplacement area presents risks of excessive dust, spontaneous combustion and instability. • Challenged the re-commissioning of the Bulli Conveyor
P38	Susan Benham	• Resident. • Project will trigger respiratory diseases. • High risk to swamp CCUS4. • Impacts to swamps will result in impacts to drinking water catchment. • Pg 18 of Addendum Report says no air quality impacts. • Economic Assessment has not accounted for air, noise or traffic impacts.
P39	Gavin Workman	• Claimed that WCL currently has a 120,000 tonne stockpile, whereas the existing approval only allows for 80,000 tonnes. • Claimed that WCL has dumped 200,000 tonnes of waste in the WCC approved emplacement area. • The Project proposes stockpiles with a total capacity of 360,000 t. These stockpiles will be 33 m high and will therefore result in dust impacts. • The stockpile at Wongawilli Colliery was limited to a height of 12 m. • The Annual Report for WCL forecasts an increase in production to 6.4 Mt and construction of a washery.
P40	Michael Streatfield	• No attendance.
P41	Dr Melissa Haswell (Doctors for the Environment Australia)	• Concerns re human health. • Integrated Risk Assessment did not consider impacts to human health. • Particulate matter is a major health risk. • Residents should be warned about high risk days (i.e. adverse meteorological conditions) so that they know when to stay indoors • WaterNSW principles for managing mining and coal seam gas. • Wollongong now classified as under extreme water stress (Water Resources Institute). • Tipping points and cumulative impacts – NSW Chief Scientist and Engineer.
P42	Bruce Rowles	• Principal of Aspect South Coast School. • WCL has provided support to the school and its programs. • Supports the expansion.
P43	Peggy Fisher	• Resident. • Faults may provide hydraulic connectivity with Cataract Reservoir • Swamps cannot be remediated. • Triple seam mining results in a greater risk of drying of swamps.
P44	Catherine Blakey	• Mentioned the pollution incident in Bellambi Gully • Swamps are essential for managing nutrient loads. • Triple seam mining may result in the 'tipping point' for swamps being exceeded. • Russell Vale Colliery generates 779 tonnes of particulate matter compared to 80 tonnes from Dendrobium Mine
P45	A/Prof. Phillip Laird	• If the expansion goes ahead, the additional coal production should be transported by rail.

Ref	Stakeholder	Issue
		• Proponent should be responsible for road maintenance costs. • Hidden subsidies for road transportation. • Department favourable of proponent.
P46	Elizabeth Cameron (Oakley Flora & Fauna Conservation Society Inc)	• Climate change • Project will impact on water security • WCL needs to demonstrate its financial ability to pay for environmental safeguards
P47	Sharyn Cullis	• Not in attendance.
P48	Dominic Tier	• WCL employee • The Project provides essential jobs and materials for industry
P49	Rhys Brett (Wollongong Coal)	• Proponent. • WCL has a long-term outlook for development of its coal resources. • Comprehensive risk assessment has been undertaken and supported by the IRAP. • Economic benefits of the Project.
P50	Garry Payne	• The Aboriginal community has not given consent for the proposal • The Aboriginal community has not been consulted regarding the significance of sites • Scarred trees and a women's site are present at Russell Vale West

APPENDIX B

Clarification of Protection Barrier to Cataract Reservoir

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17 December 2015

David Clarkson
Group Environment Manager
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Dear Dave

CLARIFICATION OF PROTECTION BARRIER TO CATARACT RESERVOIR

Wollongong Coal is proposing to longwall mine coal in the Russell Vale East area of Russell Vale Colliery about 9 km north-north-west of Wollongong as part of the Underground Expansion Project – Preferred Project Report (UEP-PPR). The surface area above the proposed UEP-PPR longwall panels is located within the Metropolitan Special Area administered by Water NSW. Water NSW has presented a spreadsheet and drawing to the Planning Assessment Commission (PAC) for the project suggesting that Longwall 7 extends into the 35° angle of draw protection barrier for Cataract Reservoir. Wollongong Coal commissioned SCT to review the basis for the barrier geometry and the Water NSW submission as detailed in an email from Jessie Evans, NSW Department of Planning and Environment on 15 December 2015 entitled "Russell Vale Colliery - Clarification of Draw Zones". This letter report presents the outcomes of our review.

Our review indicates that:

1. The protection barrier and mining geometries presented in SCT reports are a true and accurate representation of these geometries.

2. Proposed mining does not extend into the 35° angle of draw protection barrier determined using industry accepted methods for determining such protection barriers.

3. The Water NSW drawing shows a geometry that is significantly different to the mining geometry actually proposed in the UEP-PPR, particularly in respect of Longwall 7 but also in several other panels.

4. The protection barrier calculation methodology presented in the spreadsheet (Holla 1993) is correctly presented, but this methodology has been misapplied by Water NSW to incorrectly calculate protection barrier offsets.

Figure 1 shows the proposed UEP-PPR mine plan, full supply level (FSL), and mine workings, overlain on top of the drawing Trim Ref: D2013 created for the then SCA by John Bickmore and dated 22 November 2013 (referred to here as Drawing D2013).

It is noted that the version of Drawing D2013 attached to the Jessie Evans email was significantly distorted. The drawing had to be reduced in width by 15% relative to its height and rotated by -1.25° in order to provide a reasonable match with the actual plan of the proposed mining in MGA coordinates. The misalignment of the edge of the Drawing D2013 with the MGA grid provides an indication of the extent of the adjustment that was required. The plans used as the basis for figures in SCT reports were prepared for the UEP-PPR by the registered mine surveyors for Wollongong Coal. These plans form the basis of the figures presented in SCT Report NRE14123 dated 24 September 2013 (and a subsequent update WCRV4263 dated 18 June 2014), The correlation between the actual DSC notification area in MGA coordinates and the notification area as depicted in Drawing D2013 provides an indication of the accuracy of the final match that was able to be achieved.

Drawing D2013 misrepresents the proposed geometry, particularly in respect to the length, width, and position of Longwall 7, but also the length and extent of most of the other panels as well. It appears that the geometry of Longwall 7 was not updated in Drawing D2013 from the original UEP. Other panels were updated to partially reflect the revised UEP-PPR geometry but not Longwall 7. For the UEP-PPR, Longwall 7 was reduced in length and width and offset to the south so as to remain outside the 35° angle of draw barrier protecting Cataract Reservoir, including the portion of the reservoir that extends up Cataract Creek.

The full supply level (FSL) for Cataract Reservoir is inaccurately presented in Drawing D2013. The FSL presented in the drawing appears to be based on a 1:25,000 topographic series map. The FSL presented in SCT reports is based on plans produced during the 1960's and 1970's by the then Metropolitan Water Sewerage and Drainage Board (MWS&DB) from aerial photographs that together with local mine site ground surveys have become the customary basis for locating the FSL for depiction on statutory mine plans and record tracings of colliery workings in the Southern Coalfield.

It is helpful to understand the basis for the FSL in the project area. In 2009, during mine planning for the original UEP, mine surveyors recognised and highlighted to the Dams Safety Committee (DSC) in December 2009 that the delineation of the FSL for Cataract Reservoir on some electronic databases was inconsistent with the FSL shown on MSW&DB plans 8257E and 8255E and a colliery survey conducted in July 1926. While the FSL shown on the MSW&DB plans was routinely used as the basis to successfully control the type and extent of mining in the vicinity of the reservoir, these outlines were not available with sufficient accuracy in electronic databases held by Water NSW and Land and Property Information NSW to be in compliance with the

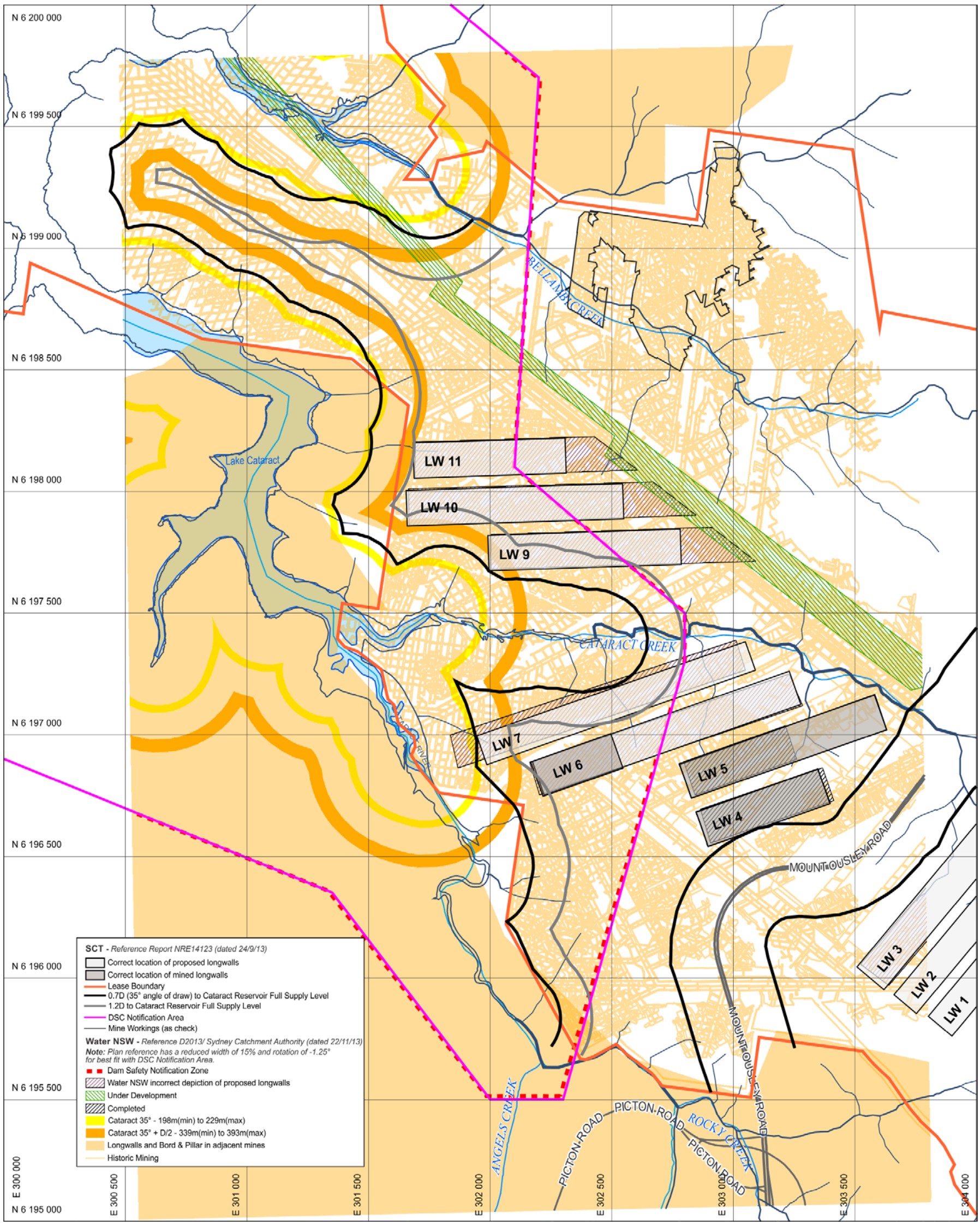


Figure 1: Plan showing Water NSW Drawing D2013 overlain with the proposed mine plan, full supply level of Cataract Reservoir as determined to contemporary mine survey standards, and the 35° angle of draw protection barrier calculated using the industry standard approach (Holla et al 1993).

legislated standards and practices to the satisfaction of the registered mine surveyors at Wollongong Coal.

A program of Airborne Laser Scanning (LiDAR) was then undertaken. The resolution of this data is approximately ±0.5 m on a ground point spacing of 4 m. To refine the FSL to the legislated standards, additional work was undertaken in 2010 to reprocess the original LiDAR data with additional ground control survey points around the perimeter of reservoir to increase accuracy for the FSL to about ±0.05 m vertically. The resulting reprocessed LiDAR data gave an FSL that was within ±10 m of the MSW&DB plans. To be consistent with previous plans that had been certified as accurate, a hybrid FSL was produced by combining and correlating the MWS&DB plans with local ground surveys, record tracings, and in areas where this information was absent, the 2010 reprocessed LiDAR data. The reliability of this hybrid FSL was confirmed in April 2012 for Cataract River, Cataract Creek, and Bellambi Creek when Cataract Dam was at full supply by review of satellite imagery. This hybrid model was forwarded to the DSC and the DSC subsequently adjusted the Cataract Notification Area via a government gazette in March 2013.

On the basis of the work that has been done, the FSL as presented in SCT reports is considered to be accurate enough for practical purposes and consistent with legislated survey standards.

The 35° angle of draw protection barrier provided to the FSL of Cataract Reservoir has been calculated using the approach presented by Holla et al (1993) and reproduced in the spreadsheet attached to the Jessie Evans email (reproduced here in Figure 2). This approach is industry standard for protecting features such as Cataract Reservoir.

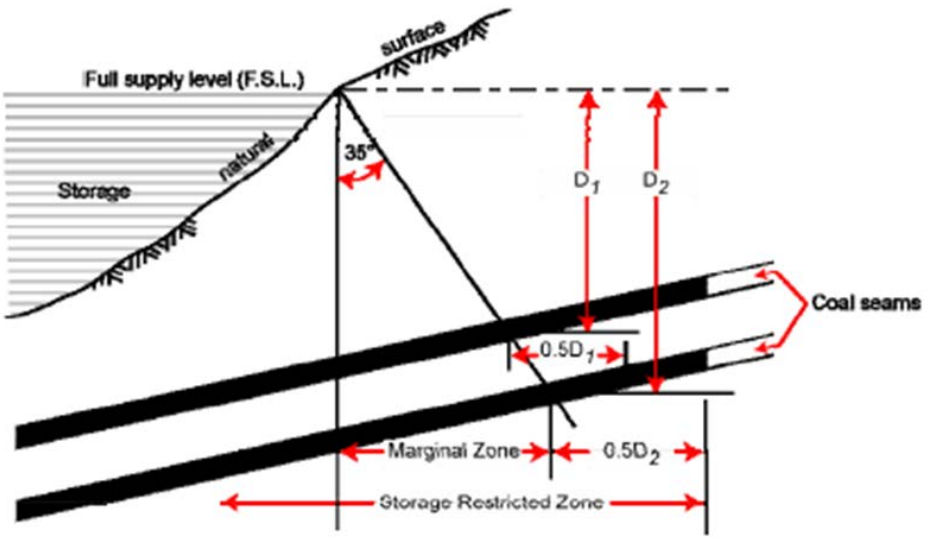


Figure 2: Industry standard approach for calculating protection barriers (Holla et al 1993).

The overburden depth to the Wongawilli Seam used for calculating the protection barrier is based on a three dimensional model of seam elevation developed from surveyed data from the Bulli Seam mine workings and measured separation between the Bulli Seam and the Wongawilli Seam. This model is considered to be sufficiently accurate for practical purposes.

At the closest point to the western end of Longwall 7, the depth of overburden at the FSL is 297 m. Using the Holla et al (1993) approach, the offset to the FSL is calculated to be 0.7 times 297 m of 208 m and this is the offset that has been applied to limit the length of Longwall 7.

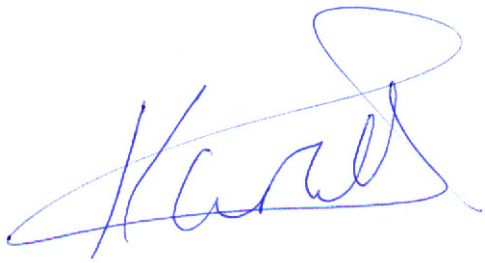
At the closest point to the side of Longwall 7 (adjacent to Cataract Creek), the depth of overburden at the FSL is nominally 290 m giving an offset to the FSL in Cataract Creek of 203 m. This offset has been applied to limit the width of Longwall 7 in the UEP-PPR design.

The Water NSW calculations presented in the spreadsheet attached to the Jessie Evans email use a mix of overburden depths that are not representative of the depth of mining at the FSL. When the correct depths are used, the calculated barrier sizes are consistent with those presented in the SCT reports and used as the basis to offset panels from Cataract Reservoir.

It is noted that the 35° angle of draw protection barrier presented in the SCT reports is consistently more conservative than the equivalent barrier presented in Drawing D2013. This conservatism is particularly evident in the vicinity of Longwalls 7 and 9, both of which are constrained in length in the UEP-PPR plan by the protection barrier. Longwall 7 has also been narrowed and offset so as to remain outside the barrier. Both panels would be much less constrained using the barrier presented in Drawing D2013

If you have any queries, or require further clarification of any of these issues, please don't hesitate to contact me.

Yours sincerely



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