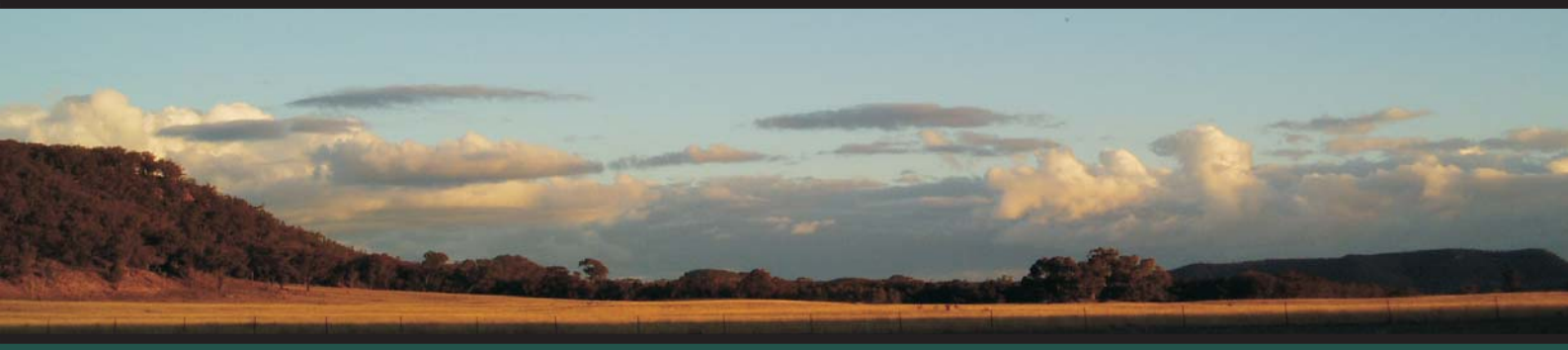
WILPINJONG COAL PROJECT



Responses to Submissions | ENVIRONMENTAL ASSESSMENT

EXCEL

ResourceStrategies

Wilpinjong Coal Pty Limited

No.	Issue	Response
1	Concerns were raised in regard to Landcare projects, including: • Disturbance of existing Landcare revegetation/regeneration areas. • Adequacy of the Enhancement and Conservation Area (ECAs) and regeneration areas in compensating for the disturbance of Landcare revegetation/regeneration areas. • Removal of Landcare groundwater monitoring bores. • Adequacy/accuracy of descriptions of Landcare projects in the area. • Recognition that Federal and State Government funding has been utilised in the Landcare projects. • Recognition of time and effort invested by community members in the establishment of Landcare projects.	The development of the Project would result in the disturbance of some areas of land that have previously been the subject of works undertaken by the Wilpinjong Landcare Group (Landcare). These works have included input from community volunteers. As stated in Section 1.5.1, Volume 1 of the Wilpinjong Coal Project Environmental Impact Statement (EIS): *"WCPL is a member of the Wilpinjong Landcare Group. WCPL would co-operate with Landcare in regard to land management initiatives within the Project area."* Co-operation with Landcare would comprise consulting with Landcare representatives in regard to the implementation of land management initiatives associated with the Project. This may extend to the funding of Landcare to participate in Project-related activities such as seed collection, tubestock germination and tree planting. As stated in Section 5, Volume 1 of the EIS, the Project includes significant land management initiatives, including: • *"the establishment of some 350 ha of woodland vegetation in areas proximal to the Project disturbance area in regeneration areas (Section 5.3);* • *the enhancement and conservation of some 295 ha of existing remnant vegetation within the* [Enhancement and Conservation Areas] *ECAs, including greater than 80 ha of the WBYBBRG* [White Box, Yellow Box, Blakely's Red Gum Woodland] *EEC* [Endangered Ecological Community] *(Section 5.4);* • *the establishment of some 185 ha of woodland vegetation in the ECAs, including some 50 ha of the WBYBBRG EEC (Section 5.4); and* • *improved connectivity of woodland vegetation between existing remnants (e.g. Goulburn River National Park and Munghorn Gap Nature Reserve) (Sections 5.2 to 5.4)."* As stated in Section 5.1.2.7, Volume 1 of the EIS, land management works within the ECAs would include activities such as: • *"appropriate fencing to prevent the uncontrolled entry of livestock and to encourage natural regeneration … ;* • *control measures to minimise the occurrence of weeds;* • *control measures to minimise the occurrence of animal pests;* • *limiting vehicular traffic; and* • *selective planting of native vegetation (e.g. along Wilpinjong and Cumbo Creeks)."*

No.	Issue	Response
1	(Continued)	It should be noted that some Landcare projects (i.e. tree plantings along Wilpinjong Creek) would be enhanced and extended by the proposed ECAs and regeneration areas described in Sections 5.3 and 5.4, Volume 1 of the EIS. The regeneration areas and ECAs include significant reaches of Wilpinjong and Cumbo Creeks (Volume 1, Section 5.3 of the EIS). The ECAs are situated on areas of WCPL-owned land which contain remnant vegetation and proximal grazing land. Conservation of the ECAs would be achieved through a rezoning application. As stated in Section 5.4, Volume 1 of the EIS: *"WCPL would:* • *conserve and manage the land in the ECAs in accordance with the FFMP;* • *apply to rezone the land in the ECAs for the purpose of protecting the land for conservation; and* • *exclude future open cut mining in the ECAs, unless, in the opinion of the Minister for Infrastructure and Planning, WCPL has demonstrated that there is a clear justification for this on social, economic and/or environmental grounds."* The *Greater Wollar Creek Catchment Dryland Salinity Groundwater Investigation* (DIPNR, 2003) to which the Wilpinjong Landcare Group contributed was used as an information source for the studies in the EIS. For example, the piezometer and bore locations were identified in the Groundwater Impact Assessment (Appendix B). Groundwater levels and quality in the Project area would be measured as part of the borefield monitoring programme as detailed in Section 5.1.3.7 (Volume 1) of the EIS. This would include the ongoing monitoring of selected/relevant Landcare bores on WCPL-owned land. Only two known Landcare bores (GW080406 and GW080411) as reported in DIPNR (2003) would be removed during the life of the Project. As WCPL is a member of the Wilpinjong Landcare Group, data obtained from those Landcare monitoring bores located on WCPL-owned land will be made available to the Wilpinjong Landcare Group. It is understood that State and Federal Government funding has contributed to the Landcare initiatives on WCPL-owned land. However, as stated in the EIS, the Wilpinjong coal resource has been identified by the NSW Government as a long-term source of coal for NSW electricity generators. The Project would contribute significant indirect and direct tax revenue to the Federal Government as well as taxes and royalties to the State of NSW.
2	Concern over the quantification and quality of mining resources/reserves and their use as the basis for the assessments presented in the EIS.	As required by the Department of Primary Industries - Mineral Resources (DPI-MR), a final geological report and resource/reserve statement, prepared in accordance with the *Australasian Code for Reporting Results, Mineral Resources and Ore Reserves* (The Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia, 2004), will be provided to DPI-MR prior to the granting of the mining lease.

No.	Issue	Response
2	(Continued)	Section 2.1, Volume 1 of the EIS, stated that: *"Exploration completed within EL 6169* [exploration licence] *(Figure 1-3) has delineated an in-situ coal resource in the order of 523 million tonnes (Mt), including an estimated total open cut ROM coal reserve of approximately 251 Mt. A 21 year mine plan has been prepared at a mining rate of up to 13 Mtpa of ROM coal that is expected to produce approximately 147 Mt of product coal for sale to domestic electricity generators and approximately 33 Mt of product coal to export. Open cut mining operations would require the excavation of some 330 million bank cubic metres (Mbcm) of waste rock."* Section 2.4, Volume 1 of the EIS, and supporting figures (drawings) describes the progression of the open cut operations and the locations from which the coal reserve would be progressively won. The environmental assessments presented in the EIS, including the Economic Assessment in Appendix I (Volume 5 of the EIS), are based on this data. To date, WCPL is not aware of any material changes to this data.
3	Concerns in regard to the extent and location of highwall mining activities and the potential impacts on escarpment areas and the Project ECAs.	As stated in Section 2.2, Volume 1 of the EIS, the Project would include selective highwall mining of the Ulan Seam within the Mining Lease Application (MLA 1) area. Any highwall mining would be constrained to remain within MLA 1 and the Development Application Area shown on Figure 1-3, Section 1.3 (Volume 1 of the EIS). The extent of any highwall mining activities would generally be limited to 200 m horizontally from the base (or toe) of the open cut highwall. As stated in Section 2.4.7 (Volume 1) of the EIS: "*As open cut operations reach pit limits, there may be opportunities to recover additional coal through highwall mining of selected plies of the Ulan Seam. The highwall mining operation would enable WCPL to recover coal which otherwise would be sterilised. Highwall mining beyond the pit limits would involve only partial extraction of the coal resource. Sufficient coal would remain in-situ between the mined panels so that no significant subsidence would occur to the land surface above those areas highwall mined*." The quality of coal produced from highwall mining would be expected to consistent with that produced from the open cut. The characteristics of the Project coal resource are described in Section 2.1, Volume 1 of the EIS. The quantity of coal extracted from highwall mining would ultimately be determined by mine design and the constraints described above. Based on the constraints presented above, highwall mining would not impact on the ECAs or escarpment areas located outside of MLA 1. Highwall mining would not be undertaken beneath Munghorn Gap Nature Reserve, the Goulburn River National Park or associated escarpment areas.

No.	Issue	Response
4	Mine safety management.	The Project will be conducted in accordance with the provisions of all relevant health and safety laws including the *Coal Mine Health and Safety Act 2002, Coal Mine Regulation Act 1982, Explosives Act* 2003, *Occupational Health and Safety Act* 2000 and the *Rail Safety Act* 2002. Further, the Project Mining Operation Plan will be prepared in accordance with the DPI-MR requirements and WCPL's legal obligations.
5	Ongoing community consultation during mining operations.	In regard to ongoing community consultation during mining operations, Section 5.1, Volume 1 of the EIS states: *"A formal community consultation programme commenced in February 2004 (Section 1.5.1) with the Minister for Mineral Resources appointing Ms Margaret MacDonald-Hill to chair a Project Community Consultative Committee (CCC) for the preparation and assessment phase of the Project EIS. The Project CCC comprises four community representatives, a representative from the MWRC, WCPL representatives and one representative from the DPI.* *A new CCC would be established for the construction and operation phase of the Project as an on-going channel for communication between the local community and WCPL. The new CCC would comprise a similar membership to the current CCC and would meet to discuss mine progress, rehabilitation activities, to review the general environmental performance of the Project and to discuss any issues raised by the community."*
6	Concern regarding the Project water supply borefield, including: • changes to predicted groundwater impacts if the locations of bores in the Project water supply borefield are modified; • consideration of the interaction between the open cut dewatering and the operation of the borefield; and • the impact of the borefield operation on perched aquifer systems in the Goulburn River National Park.	A groundwater investigation and modelling programme (Appendix B, Volume 2 of the EIS) was undertaken to investigate the nature and extent of local groundwater aquifers and the potential of these aquifers to supply Project water requirements. The extraction of groundwater from the Ulan Seam and Marrangaroo Sandstone was selected as groundwater investigations indicated that only these aquifers had suitable yield potential. The Ulan Seam and Marrangaroo Sandstone aquifer systems are described in Section 3.3.2, Volume 1 of the EIS and a conceptual hydrogeological cross-section is shown on Figure 3-5, Volume 1 of the EIS. The Project water supply borefield would be developed to the north and north-east of the Project open pits. The Project water supply borefield would comprise a network of up to 19 individual bores. Water extracted from the water supply bores would be reticulated to the CHPP water supply storage. The number of bores and operational management requirements of the borefield to meet the Project water supply make-up requirements would be determined during the detailed design of the Project water supply system.

No.	Issue	Response
6	(Continued)	The Project water supply borefield is described in Section 2.9.3, Volume 1 of the EIS as follows: *"A series of up to 19 production bores would be installed to the north of the open cut operations (Figure 2-3) as part of the Project water supply system. The production bores would operate at between approximately 1 litre per second (L/s) and 3 L/s to extract groundwater from the Ulan Seam and underlying Marrangaroo Sandstone using electric submersible pumps.*" As stated in Section 8.0 of Appendix B, Volume 2 of the EIS: *"Final bore locations would be determined following the completion of further detailed groundwater test work. As a result, the final installed bore locations may vary from those proposed on Drawing No 7."* Section 5.1.2.5, Volume 1 of the EIS states: *"A WSBP* [Water Supply Borefield Plan] *would be developed for the Project in consultation with relevant authorities and incorporated in the SWMP* [Site Water Management Plan]*. The WSBP would include:* • *details of borefield configuration and bore location;* • *management and monitoring programmes to be implemented during the operation of the borefield;* • *processes for validating measured groundwater drawdowns against those predicted to occur;* • *a schedule of on-going borefield performance reviews through the mine life; and* • *contingency measures to mitigate any adverse impacts on existing water supply bores, groundwater users or borefield users."* The environmental assessments presented in the EIS are based on the borefield configuration in Drawing No. 7 of Appendix B, Volume 2 of the EIS. At this stage no material change to this borefield arrangement is envisaged. Minor changes to the location of individual bores within the extent of the borefield shown on Figure 2-3, Volume 1 of the EIS, resulting from detailed design considerations, would not materially affect the conclusions drawn in the EIS. As stated in Section 12.3.1 of Appendix B, Volume 2 of the EIS: *"Dewatering of the open cut and simultaneous operation of the borefield would have an impact on some of the production bores, particularly those that are the shallowest and/or closest to the pit boundaries which would go dry during the mining period. Discontinuation of extraction from selected bores would extend the production life of the remaining bores.*

No.	Issue	Response
6	(Continued)	*Water balance modelling undertaken by Gilbert and Associates Pty Ltd (Appendix A of the EIS) indicates that at different stages of the Project there would be periods with a surplus of water. Pit dewatering from Year 14 of the Project would be sufficient to satisfy the total water supply requirement. Hence, there would be no need for the operation of the borefield from that time."* The groundwater model presented in Appendix B of the EIS is integrated in that it allows for the influence of the open cut development on the operation of the borefield and vice versa. As indicated above, the groundwater model assumed no extraction from the borefield beyond Year 14 of the Project. Further, as indicated in the extract below, extractions from individual bores were ceased once they were estimated to be dry due to: extractions from each bore; interaction between each bore; and/or interactions between the borefield and the open cut (Section 12.2 of Appendix B, Volume 2 of the EIS): *"The extraction bores in the borefield were simulated using MODFLOW well cells. Well cells allow water to be removed from the model domain at a pre-determined rate. The borefield extraction rate was applied based on advice from Gilbert and Associates Pty Ltd (Appendix A of the EIS) who conducted the water balance simulation for the Project.* *At the commencement of the predictive simulation, a total of 19 production bores extracting from the Ulan Seam and Marrangaroo Sandstone were simulated. All production bores were assumed to be screened in both aquifers (i.e. model Layers 4 and 5). Based on the pump tests reported in GeoTerra (2004) the extraction rates were assigned to range between 1.5 L/sec and at 2.5 L/sec.* *Nine of the production bores were removed at various times from the simulation when they were assumed to have been pumped dry."* In regard to the potential impacts of the borefield extractions on the perched groundwater aquifers in the Goulburn River National Park, based on the results of the groundwater modelling Section 13.1 of Appendix B, Volume 2 of the EIS states: *"Whilst the groundwater modelling prediction include reduced piezometric pressures in parts of the coal seam aquifer underlying the Goulburn River National Park sandstone plateau, it is expected that there would no discernible effect on the groundwater and surface water regimes in the overlying sandstone units (i.e. Narrabeen Group)."* It should be noted that perched aquifers, such as those in the sandstones of the Narrabeen Group, develop because there is a significant reduction in hydraulic connection between these aquifers and the aquifers below. This reduction, in a form of low permeability layer (or a number of layers) slows down the vertical movement of the groundwater from the upper to the lower aquifers to such an extent that a perched aquifer develops above the top of the low permeability layer. When the water level in the lower aquifer (that is top of the saturated zone) is below the base of the low permeability layer, as it is expected to be the case in the Goulburn River National Park area, changes in the groundwater pressures in the lower aquifer have essentially no impact on the upper perched aquifer.

No.	Issue	Response
6	(Continued)	As described in Section 5.1.3.7, Volume 1 of the EIS, the data collected by the borefield monitoring programme in the WSBP would provide: *"… input to borefield performance reviews and enable verification and refinement (where necessary) of the groundwater modelling results (Appendix B)."*
7	Concern regarding the need for temporary closure of the road and railway corridors for blasting.	Temporary road and rail closures for the purpose of allowing controlled mine blasts to occur within 500 m of road and rail infrastructure is accepted practice in the Hunter Valley. This practice assists in the winning of coal in a feasible and practicable manner and therefore minimises coal sterilisation. Section 4.12.1, Volume 1 of the EIS states: *"For periods when mine blasting is undertaken within 500 m of Ulan-Wollar Road or Wollar Road, temporary closure of these roads for short periods (i.e. less than 15 minutes) would be required while blasting is undertaken and to allow for post-blasting inspections. These temporary closures would be conducted in accordance with a Traffic Management Plan (TMP) (Section 4.12.2 and Section 5.1.2.9)."* Section 4.13, Volume 1 of the EIS also states: *"For blast events within 500 m of the Gulgong-Sandy Hollow railway, temporary closure of the railway for short periods (i.e. less than 15 minutes) would be required while blasting is undertaken and to allow for post-blasting inspections of the railway. These temporary closures would be conducted in consultation with the ARTC."* As stated in Section 4.5.6, Volume 1 of the EIS: *"Consideration of potential flyrock impacts would be incorporated into the blast design, particularly in regard to stemming length and bench spacing."* Methods to reduce the potential for flyrock impacts and details of temporary closures of Wollar Road, Ulan-Wollar Road and the Gulgong-Sandy Hollow railway when blasting is undertaken within 500 m of the road or railway would be included in the Blast Management Plan as stated in Section 5.1.2.12, Volume 1 of the EIS. As stated in Section 5.1.2.9, Volume 1 of the EIS, a Traffic Management Plan (TMP) will be prepared for the Project in consultation with the Roads and Traffic Authority (RTA) and Mid-Western Regional Council (MWRC). The TMP would be prepared in accordance with AS 1742.3-2002 *Manual of Uniform Traffic Control Devices – Traffic Control Devices for Works on Roads* and/or the manual for *Traffic Control at Work Sites* (RTA, 2003), and would include road closure management measures.

No.	Issue	Response
8	Concern regarding the geochemistry of coal, overburden and coal handling and preparation plant reject material and the potential for these materials to adversely impact water resources.	An assessment of the acid forming potential and salinity of the overburden and coal washery wastes (i.e. coarse rejects material and tailings) was undertaken by Environmental Geochemistry International Pty Ltd and is included in Appendix C, Volume 2 of the EIS. The geochemical test programme is described in detail in Section 2.1 of Appendix C of the EIS. The results indicated that overburden (i.e. mine waste rock material) at Wilpinjong is expected to be non-saline. As stated in Section 3.2 of Appendix C, Volume 2 of the EIS: *"An indication of the likely salinity of overburden was obtained from measurements of electrical conductivity (EC) of water extracts. Extracts were prepared by equilibrating samples in deionised water at a solid:water ratio of 1:2 w/w. The EC results are included in Table 1. An EC measurement is directly related to the amount of soluble salts present within a sample.* *The EC values ranged from 32 to 311 µS/cm and the average for the 50 samples was 119 µS/cm. These values are indicative of very low soluble salts contents. Based on these results, it is expected that overburden at Wilpinjong will be non-saline."* Environmental Geochemistry International Pty Ltd (EGi) considered that the likelihood of acid rock drainage generation from overburden is very low. As stated in Section 5.1 of Appendix C, Volume 2 of the EIS: *"Overall, the results indicate a very low likelihood of ARD generation from overburden at Wilpinjong as represented by the drill core samples included in the testing program. Based on the results of geochemical testing carried out by EGi it is expected that most overburden will be non-saline, non-acid forming, and have a circum-neutral pH."* Management practices for the overburden material are presented in Section 2.8.1, Volume 1 of the EIS. No special handling requirements for overburden are considered necessary. As stated in Section 5.2.7, Volume 1 of the EIS, WCPL would commission specific trials and studies over the life of the Project that may include geochemical and physical evaluation of mine waste rock characteristics. With regard to the acid forming potential of coarse rejects, Section 5.2 of Appendix C, Volume 2 of the EIS states: *"The results of this study suggest that coarse rejects will contain some sulphur and are likely to have some capacity for acid generation."* With regard to the salinity of coarse rejects, Section 4.2 of Appendix C, Volume 2 of the EIS states: *"The EC values for raw and product coal samples ranged from 102 and 112 µS/cm, which suggests very low soluble salts. The EC values for the five coarse rejects samples were higher at between 211 and 445 µS/cm, but these values are still indicative of low soluble salts. Based on these results, it is expected that raw coal, product coal, and coarse rejects at Wilpinjong will be non-saline."*

No.	Issue	Response
8	(Continued)	Management practices for the coarse reject material are presented in Section 2.8.2, Volume 1 of the EIS: *"To manage acid generation potential, coarse reject material would be dispersed throughout the overburden within the mine waste rock emplacements with the aim of producing a mix with a sulphur content that has an acid producing potential less than the acid neutralising capacity of the overburden. A blend ratio of at least 2:1 (overburden:coarse rejects) would be used (Appendix C). The total tonnage of coarse rejects produced over the life of the Project would be approximately one-seventh of the total mine waste rock produced therefore there would be scope to increase the blending ratio, if required.* *Where possible, coarse rejects would not be placed within 5 m of the final landform surface so there is sufficient coverage by non-acid forming overburden to provide a barrier to oxygen movement through the rehabilitated profile (Appendix C)."* With regard to the likely salinity and acid drainage potential of the tailings (i.e. fine reject material and slimes from the coal handling and preparation plant), Section 5.2 of Appendix C, Volume 2 of the EIS states: *"The results of this study suggest that most tailings will be at least moderately saline and have some capacity for acid generation. Since the tailings originate from the Ulan Seam and will be disposed of in-pit, it is expected that the groundwater flux through the tailings disposal areas in the long-term will be of a similar groundwater quality[3] to that which currently exists in the Ulan Seam, provided that the tailings management recommendations are implemented…"* **Note:** [3] EC values of 1,020 to 3,390 μS/cm have been reported for groundwater in the Ulan Seam. Reference: Australasian Groundwater and Environmental Consultants Pty Ltd (2005). Management practices for the tailings material are stated in Section 2.8.3, Volume 1 of the EIS: *"Where practicable, tailings disposal areas would be saturated during the operational phase by maintaining a water cover. Where this is not practicable (e.g. for reasons of settling density and/or water recycling), the surface area of the tailings without a water cover would be kept to a minimum and managed so as they are periodically covered by fresh tailings to maintain saturation levels.* *Once the tailings disposal areas are near-filled, they would be progressively capped with overburden material to a minimum depth of cover of 2 m prior to final profiling and rehabilitation.* *Final landforms would be designed with an allowance for the long-term settlement of tailings*."

No.	Issue	Response
9	Concerns were raised in regard to: • the coverage of Aboriginal heritage surveys; • potential impacts (including blast vibration) on Aboriginal heritage; • the management of salvaged items of Aboriginal heritage; • potential impacts on escarpment areas adjacent to the mine that contain Aboriginal heritage; and • impacts on Aboriginal heritage values due to ancillary works.	An Aboriginal cultural heritage survey and assessment was carried out across the Project disturbance area as well as sampling of the Enhancement and Conservation Areas (ECAs) and some areas of adjoining WCPL-owned land. Section F2.3.1 of Appendix F, Volume 3 of the EIS states: "*Aboriginal cultural heritage survey has been conducted across approximately 2,510 hectares (about 25 square kilometres) (refer Figure F2.1). Approximately 1,950 hectares of this coverage consists of the Project disturbance area (refer Section F1.1 above). The remaining 560 hectares of survey was conducted in adjacent lands. The surveys in adjacent lands consisted of sample survey areas selected with the aim of characterising the Aboriginal cultural heritage values within areas adjacent to the Project disturbance area, and/or other areas with potential for archaeological conservation management*." Section F4.3.1 of Appendix F, Volume 3 of the EIS states: "*No plateau or escarpments occur within the Project disturbance area*". As shown on Figure F2.1 of Appendix F, Volume 3 of the EIS, surveys undertaken in January 2005 included select escarpment areas to the south and north of the Project disturbance area. In addition to the above, as an outcome of consultation undertaken with the Aboriginal community during the preparation of the EIS, WCPL has committed to (Section 4.10.2, Volume 1 of the EIS): "*Conduct of further archaeological survey on slopes up to and including the escarpments within 500 m of the open cut mining area to identify any additional sites that are outside of the Project disturbance areas. The survey programme would be conducted progressively prior to the commencement of mining adjacent to these areas. WCPL has committed to complete this survey work within two years of the commencement of Project mining activities.*" The results of a blast impact assessment conducted for the Project are presented in Section 4.5.6, Volume 1 of the EIS. As part of the blast impact assessment a vibration assessment was undertaken for rock shelters that contain Aboriginal rock art. Section 4.5.6, Volume 1 of the EIS states: *"There are no regulatory criteria nominated in Australia for the assessment of damage to archaeological/geological structures from vibration. Research however has been undertaken by the US Army Corps of Engineers into the effects of large surface blasts on the dynamic stability of unlined tunnels of various diameters in sandstone and granite (Dowding, 1985). The results of the research indicated that intermittent rock fall or observable damage did not occur until vibration levels exceeded 460 mm/s.*

No.	Issue	Response
9	(Continued)	*The German Standard DIN 4150-3 Structural Vibration Part 3: Effects of Vibration on Structures (February 1999) includes guideline vibration velocity of 80 mm/s for evaluating the effects of "short-term" vibration on buried clay and concrete pipework. The application of this criterion to geological structures is considered conservative and introduces a 5-fold safety factor by comparison to the observable damage value of 460 mm/s (Appendix D)."* Section 4.5.6, Volume 1 of the EIS states: *"The maximum predicted vibration velocities for blasts in proximity to the Aboriginal rock art sites (sites 72, 152 and 153) are predicted to be below the 80 mm/s geological damage criterion. A monitoring programme would be implemented for these sites (Section 5.1.3.4)."* Section 5.1.3.4, Volume 1 of the EIS states: "*Vibrational peak particle velocity (mm/s) and air blast overpressure (dBL [Peak]) would be measured in accordance with AS 2187.2-1993 Explosives – Storage, Transport and Use – Use of Explosives. …* *In addition, the Aboriginal Cultural Heritage Assessment (Appendix F) recommended that ground vibration monitoring be undertaken at three of the identified Aboriginal rock art sites. Accordingly, ground vibration monitoring would be undertaken adjacent to Aboriginal rock art sites 72 (site V1), 153 (site V2) and 152 (site V3) (Figure 5-1) for any blast that is conducted within 1 km of the site."* Consideration of potential flyrock impacts would be incorporated into the blast design, particularly in regard to stemming length and bench spacing. Section 6.5 of Appendix D, Volume 2 of the EIS states: *"It is noted that the orientation and characteristics of these rock shelters are likely to minimise the potential for flyrock damage. All three sites are located in rock shelters with some overhang, that protects the art from above.* *The rock shelter at WCP72 is orientated to the east, facing away from potential blasting in Pit 2. The rock art associated with WCP152 and WCP153 would be partially screened by the open cut highwall, intervening vegetation and other natural rock structures that are located between the shelters and the open cut mining area in Pit 5.* *Given the location and nature of these rock art sites and surrounds, it is considered that the potential for flyrock damage occurring at these sites would be limited. Notwithstanding, for blasts within 500 m of these sites, appropriate stemming length and burden spacing would be incorporated into the blast design in order to reduce flyrock as far as practicable."*

No.	Issue	Response
9	(Continued)	The management and mitigation measures for Aboriginal heritage objects presented in the EIS were developed in consultation with the Mudgee Local Aboriginal Land Council (MLALC), Murong Gialinga Aboriginal and Torres Strait Islander Corporation (MGATSIC) and Warrabinga Native Title Claimants Aboriginal Corporation (WBNTCAC) during the Aboriginal cultural heritage survey and in subsequent heritage management workshops. Also, Section 4.10.2, Volume 1 of the EIS states: *"An ACHMP* [Aboriginal Cultural Heritage Management Plan] *would be developed in consultation with the Aboriginal community for management of Aboriginal cultural heritage at the Project and may be completed in stages as mine planning progresses. The ACHMP would be periodically updated over the Project life".* In regard to the management of salvaged items of Aboriginal heritage, notes from a Field Day and Workshop with the Mudgee LALC and Murong Gialinga ATSIC on 15 January 2005 state (Section F3.2.9 of Appendix F, Volume 3 of the EIS): *"Preference was given by the group members for the interim storage of recovered cultural material in a keeping place (such as a locked cabinet) and subsequent permanent management options to include re-placement onto the post-mining rehabilitated land surfaces, and the possible retention of a select number to serve as a display and education collection."* Similarly, at a Field Day and Workshop with the Warrabinga NTCAC on 14 January 2005, the establishment of a Keeping Place for salvaged items of Aboriginal heritage was discussed. Notes from this meeting state (Section F3.2.8 of Appendix F, Volume 3 of the EIS): • "*A keeping place should be established for the interim storage of recovered cultural material. A range of management outcomes exist for the permanent placement of recovered materials, including re-placement onto the post-mining rehabilitated land surface, and display of selected scarred trees*." Management measures would be described in the ACHMP and would include the following activities (Section 4.10.2, Volume 1 of the EIS): • *"Prior to disturbance, selected Aboriginal objects located within the Project disturbance area would be collected and relocated to a "Keeping Place" where the objects would be documented and stored.* • *Collected Aboriginal objects would be replaced onto completed landforms as part of the rehabilitation programme. This process may be undertaken progressively.* • *Salvage excavation, analysis and reporting would occur for selected sites/areas prior to disturbance. This programme would be developed and described in the ACHMP in consultation with the Aboriginal community.*

No.	Issue	Response
9	(Continued)	• *Selective salvage and further investigation would be undertaken into the age and origin of the scarred trees in the Project area and some examples would be re-placed onto rehabilitation areas."* Other potential impacts would be mitigated by the implementation of the following management measures stated in Section 4.10.2, Volume 1 of the EIS: • *"Pre-development baseline recording and blast vibration and dust monitoring at the rock shelters with rock art (Sites 72, 152, and 153) (Sections 5.1.3.2 and 5.1.3.4).* • *Regular monitoring of rock art sites that are located in relative proximity to the Project disturbance area (Section 5.1.2.10) and the implementation of further mitigation measures if the potential for adverse impacts is identified.* • *Conduct of further archaeological survey on slopes up to and including the escarpments within 500 m of the open cut mining area to identify any additional sites that are outside of the Project disturbance areas. The survey programme would be conducted progressively prior to the commencement of mining adjacent to these areas. WCPL has committed to complete this survey work within two years of the commencement of Project mining activities.* • *A programme of conservation management would also be implemented at selected sites in relative proximity to mining or infrastructure areas. This would include:* - *the installation of fencing with the aim of excluding livestock from rock art sites (72, 152 and 153);* - *the installation of an appropriate form of demarcation (e.g. temporary fencing or flagging) around sites which are located in close proximity to the Project disturbance area; and* - *the conduct of Aboriginal cultural awareness training as part of the induction of Project personnel which communicates the need for, and the various management strategies to be conducted for the management of Aboriginal cultural heritage."* In regard to ancillary Project works that may result in further ground disturbance, Section 4.10.1, Volume 1 of the EIS, states: "*As part of the Project detailed design phase, the final alignment of some of the ancillary infrastructure (e.g. road re-alignments, relocation of the 11 kV electricity transmission line, the on-site temporary construction camp and water supply bores and associated pump and pipeline system) would be determined. In addition, during the life of the Project, various works such as fencing and selective tree planting would be conducted in rehabilitation areas, regeneration areas and the ECAs as described in Sections 5.2.5, 5.3 and 5.4.*

No.	Issue	Response
9	(Continued)	*Prior to ancillary works occurring, pre-clearance Aboriginal heritage surveys would be conducted to identify Aboriginal objects located within the footprint of these works, and where practicable, Aboriginal objects would be avoided. Appropriate approvals would be sought under section 90 of the NPW Act for Aboriginal objects unable to be avoided by these Project components.*" As reported in Section F2.1 of Appendix F, Volume 3 of the EIS, written endorsement was received from the MLALC and the WNTCAC regarding the Wilpinjong Coal Project Aboriginal Heritage Assessment: • "*The Warrabinga NTCAC provided written feedback (Attachment F3) on the Aboriginal cultural heritage assessment and the report that had been issued for consultation. The letter expresses Warrabinga NTCAC's satisfaction with the consultation undertaken by WCPL, survey methodology and coverage, and the proposed Aboriginal cultural heritage management measures*." • "*The Mudgee LALC provided written feedback (Attachment F3) on the Aboriginal cultural heritage assessment and the report that had been issued for consultation. The letter expresses Mudgee LALC's satisfaction with the consultation undertaken by WCPL, survey methodology and that MLALC would like to work closely with WCPL in the development of an Aboriginal Cultural Heritage Management Plan*."
10	Concern regarding the impact of the Project on tourism and/or eco-tourism potential and the level of discussion of potential impacts on tourism in the Economic Assessment and EIS generally.	Tourism is a contributor to the regional economy. The description of the economy in Appendix I, Volume 5 of the EIS, is based on the Australian and New Zealand Standard Industrial Classification (ANZSIC) and the amalgamation of these into standard Input-Output Sectors (Section I3.2 of Appendix I, Volume 5 of the EIS) consistent with the National Accounts (Australian Bureau of Statistics, 2004[1]). Tourism is not a specific sector under these frameworks but spans a number of ANZSIC sectors to which tourists make expenditures. Tourism has therefore been assessed in the EIS. **Note:** [1] Australian Bureau of Statistics (ABS) (2004) *Australian National Accounts: Input Output Tables*. ABS Catalogue No. 5209.0.55.001. It should be noted that tourism takes place within the context of the other activities already taking place within the region, including coal mining (e.g. Ulan Coal Mine), agriculture and manufacturing sectors. These activities are not mutually exclusive with tourism. From a regional economy perspective, the broader the economic base of an economy the more resilient the economy is to external shocks to particular sectors that may occur from time to time (e.g. changes in the macroeconomic environment that may adversely affect domestic and international tourism).

No.	Issue	Response
10	(Continued)	The land the subject of the proposed mine comprises largely cleared privately owned pastoral land and hence it is not envisaged that the use of this land for mining will directly affect tourism. Any impact on tourism would be indirect and be associated with visual impacts from adjoining areas of interest to tourism. Visual impacts of the Project are assessed in Appendix N, Volume 5 of the EIS. The economic analysis, presented in Appendix I of the EIS, identified that visual intrusion can potentially impact visitors to surrounding areas. These unquantified, but likely minimal impacts, are compared in Appendix I, Volume 5 of the EIS to the estimated net production benefits of the Project (i.e. $1,454M) via the threshold approach. This figure represents the opportunity cost to society of not proceeding with the proposal. Interpreted another way, any environmental impacts from the proposal (including potential tourism impacts), after mitigation by WCPL, would need to be valued at greater than $1,454M to make the Project questionable from an economic efficiency perspective (Section I4 of Appendix I, Volume 5 of the EIS). The contribution of the mining sector to the regional economy is discussed in Section 3.13, Volume 1 of the EIS: *"Comparison with the state economy reveals that the agriculture, forestry and fishing sector, the mining sector and manufacturing sector are of greater relative importance to the regional economy. The coal mining sector is also the major sector responsible for exports from the region, followed by the manufacturing sectors of wine and spirits, meat and meat products and concrete (Appendix I). Imports are more evenly spread across sectors. The coal mining sector is the most productive sector of the economy (as measured through GRP* [gross regional product] *per employee) and has the highest average wage of all the economy sectors (ibid.)."* With regard to the potential impact of the loss of flora and fauna on tourism, as stated in Section I2.3.2 of Appendix I, Volume 5 of the EIS: *"Any impacts on flora and fauna species would likely affect the non use economic values (consumers' surplus) of individuals and could potentially be interpreted in an economic context via surveys to elicit the community's willingness to pay to avoid any potential impacts ie. the contingent valuation method or choice modelling.* *To some extent any impacts on flora and fauna species have been internalised by WCPL's proposed mitigation measures which include the progressive rehabilitation of the open cut area to a combination of native woodland and grazing areas and commitment to three large ECAs* [Enhancement and Conservation Areas] *adjoining the Project disturbance area for conservation of flora/fauna and Aboriginal heritage."* It should also be noted that the coal reserve to be mined by the Project is a State-owned resource with a majority of the product coal to be used for domestic power generation.

No.	Issue	Response
10	(Continued)	WCPL has a keen interest in working in a constructive and open manner with other businesses in the region, including tourism operators.
11	Concerns were raised in regard to: • the adequacy and presentation of background meteorological, air and noise data; and • the reliance of predictive noise and air quality modelling on this data.	***General Meteorological Data*** A summary of baseline meteorological data obtained for the EIS studies is presented in Section 3.1.2, Volume 1 of the EIS. This includes data obtained from climate monitoring stations at Gulgong Post Office and Mudgee and rainfall data obtained from two stations in Wollar. The period of record from these stations ranges from 42 years to 134 years. Section 3.1.2, Volume 1 of the EIS summarises the data obtained from these stations, including relative humidity, temperature, rainfall and evapotranspiration. Section 3.1.2, Volume 1 of the EIS states: "*In addition to the Bureau of Meteorology stations, a meteorological station which continuously records wind speed and direction, temperature, relative humidity, net solar radiation, rainfall, and sigma theta (the rate of change of wind direction) was installed at the Project site in May 2004 (Figure 3-1).*" In regard to wind speed and direction, Section 3.1.2, Volume 1 of the EIS, states: "*Figure 3-2 provides wind roses for the Wilpinjong area (Appendix E) that have been compiled from nine months of data from the meteorological station and three months of data produced by a CSIRO model (The Air Pollution Model [TAPM]). The wind roses indicate that relatively strong winds from the west are dominant during winter and while they are also common during spring, spring exhibits an almost equal distribution of easterly and westerly winds. The wind roses also indicate that winds from the east and east south-east are more common during summer and autumn, respectively. Comparison of measured on-site wind data with TAPM indicates seasonal wind direction compares favourably, with measured on-site wind speeds generally lower than the wind speeds generated by TAPM.*" It should be noted that data continues to be downloaded at the on-site meteorological station. Holmes Air Sciences have compared data obtained on-site since the development of the EIS with the relevant TAPM data. Similar to the comparison made in the EIS (see above), this comparison indicated that the wind direction compares favourably between the two data sets, with measured on-site wind speeds generally lower than the wind speeds generated by TAPM. ***Background Noise Data and the Noise Assessment*** An operational noise impact assessment for the Project was conducted by Richard Heggie Associates and is presented in Appendix D, Volume 2 of the EIS.

No.	Issue	Response
11	(Continued)	A summary of the project background noise monitoring is provided in Section 3.1 of Appendix D, Volume 2 of the EIS which states: "*Background noise surveys to characterise and quantify the acoustical environment in the area surrounding the Project were conducted in two programmes between 5 August and 4 September 2004. Nine unattended noise loggers were positioned at selected representative dwellings commencing Thursday 5 and Thursday 19 August 2004, for the first and second campaigns respectively*. *In order to supplement the unattended logger measurements and to assist in identifying the character and duration of background noise sources, operator-attended daytime, evening and night-time surveys were also conducted at all nine logging locations. The measurement methodology and analysis procedures are described in* ***Appendix C2****. The operator-attended measurement results are summarised in* ***Table 6***." Section 3.1 of Appendix D, Volume 2 of the EIS then presents a comprehensive summary of the measured background data, including: • Table 6 – Operator-Attended Background Noise Environment August 2004 (dBA re 20 μPA); • Table 7 – Unattended Background Noise Environment August 2004 (dBA re 20 μPA); and • Table 8 – Noise Environment for Project Assessment Purposes (dBA re 20 μPA). The data provided in Table 8 of Appendix D, Volume 2 of the EIS was then used for assessment purposes. This data set is considered to be adequate for the purpose of the noise assessment. Background noise levels and weather condition detailed results contained in Appendices C2 and C3 to C11, Volume 2 of the EIS are available upon request. These appendices predominantly comprise raw data and graphs. As discussed above, Section 3.1 of Appendix D, Volume 2 of the EIS, presents the analysis of this data. Appendices C2 and C3 to C11 were requested by one community member and were promptly provided to this person. Since publication of the EIS, meteorological monitoring at the site has continued. This data confirms that winds generally from an easterly direction are a feature of the site. This data also indicates that dwellings within the Noise Management and Affectation zones presented in Table 46 in Appendix D, Volume 2 of the EIS remain unchanged. ***Windrose Data and the Air Quality Assessment*** An air quality impact assessment for the Project was conducted by Holmes Air Sciences and is presented in Appendix E, Volume 2 of the EIS.

No.	Issue	Response
11	(Continued)	Section 4 of Appendix E, Volume 2 of the EIS describes the dispersion meteorology, local climatic conditions and existing dust levels utilised for the air quality assessment and the data set upon which the conditions are based. Data obtained from the on-site meteorological station was supplemented by data obtained from CSIRO's 'The Air Pollution Model' (TAPM) to generate the windrose diagrams. These data were used to describe the prevailing wind conditions in the Project area (Section 4.1 of Appendix E, Volume 2 of the EIS): "*A meteorological station was installed on the Project site in May 2004. The location of the meteorological monitoring station and other monitoring sites are shown in* ***Figure 4****. Data collected from the meteorological station include 10-minute records of temperature, wind speed, wind direction and sigma-theta. The data have been processed into a form suitable for use in the ISCST3 dispersion model. At the time of writing, one full year of data had not been collected with the meteorological data file containing 6,456 hours of data (74% of one year). Data are continuing to be collected from this site.* *Meteorological data has also been generated for the Project by CSIRO's model (The Air Pollution Model, TAPM). TAPM is a prognostic model which has the ability to generate meteorological data for any location in Australia (from 1997 onwards) based on synoptic information determined from the six hourly Limited Area Prediction System (LAPS) (****Puri et al., 1997****). The model is discussed further in the accompanying user manual (see* ***Hurley, 2002****).* *The on-site data and TAPM generated data have been prepared into meteorological data files suitable for use in dispersion modelling. Windroses generated from these two datasets are presented in* ***Figures 5*** *and* ***6****. It can be seen from* ***Figure 5*** *that the winds measured at the site are well defined and are predominantly from either the east or west. In summer the most common winds are from the east while in winter this pattern is reversed, with westerly winds dominant. Spring exhibits an almost equal distribution of easterly and westerly winds.*" The data set described above is considered to be adequate for the purpose of the air quality assessment. As described in Sections 5.1.3.1, 5.1.3.2 and 5.1.3.3, Volume 1 of the EIS, a comprehensive programme of meteorological, air quality and noise monitoring is proposed during the life of the Project. This monitoring would be utilised to validate air and noise emission predictions made in the EIS. If approved, it is expected that the Project would be provided with project approval conditions and an Environment Protection Licence that requires WCPL to undertake site activities in a manner that results in compliance with the noise and air quality emission predictions presented in the EIS. Consequently, if the modelling presented in the EIS (and data it is based on) is found to be incorrect (i.e. emissions are higher than expected), then WCPL would be required to modify its operations until the predicted emissions at the receptor are achieved.

No.	Issue	Response
12	Requests for information relating to contractual arrangements between Macquarie Generation (MG) and WCPL, in particular, the quantity of coal contracted to MG over different periods of the Project life.	WCPL is a wholly owned subsidiary of Excel Coal Limited. As stated on Excel Coal Limited's website (http://www.excelcoal.com.au/operations/wilpinjong/index.htm): • *"In December 2003, the NSW Minister for Mineral Resources announced that Excel was the successful tenderer for the development of the Wilpinjong Project in the Western Coalfields of NSW.* • *Excel subsequently signed a 19 year coal supply agreement with Macquarie Generation for the supply of between 3.0 and 7.0 million tonnes of coal per annum and has been awarded an exploration licence (EL6169) over the Wilpinjong coal resource.* *Excel has entered into a contract with Macquarie Generation to supply coal to its Bayswater and Liddell power stations for a period of 19 years commencing in 2007. The contract provides for the supply of a specific quantity of energy equivalent to approximately 3 million tonnes of coal in the first year, 4 million tonnes in the second year and 5 million tonnes per annum for years three, four and five. For the remaining fourteen years of the contract, Excel will supply Macquarie Generation with between 3 and 7 million tonnes of coal per annum."* The WCPL agreement with Macquarie Generation contains confidentiality provisions and the agreement is commercial in confidence between those two parties.
13	Concerns were raised in regard to non-Aboriginal heritage, particularly: • The level of research effort expended and the level of detail of reporting of lesser significance sites identified during the survey. • A suggestion that archival recording should be undertaken for all heritage sites identified, rather than just moderate and high local significance sites. • Queries about the management and staging of demolition of buildings in the mine and contained infrastructure area. • Suggestions that buildings in the mine and contained infrastructure area should be relocated, or mothballed and replaced onto the rehabilitated landform and that a local history study could be completed as a mitigation measure.	The assessment was undertaken in general accordance with the NSW Heritage Manual (NSW Heritage Office and Department of Urban Affairs and Planning, 1996). The survey and research effort undertaken in the Non-Aboriginal Heritage Assessment is appropriate for the EIS level of assessment. No sites of Regional or State heritage significance were identified in the survey. As stated in Section G2.1 of Appendix G, Volume 3 of the EIS: *"No place within the Project area is entered in any of the following heritage registers:* • *Local Environment Plan (LEP).* • *NSW State Heritage Register.* • *Register of the National Estate (Commonwealth).* • *National Heritage List (Commonwealth).* • *National Trust of Australia (NSW) Classified List."* The report describes places assessed as having heritage significance at or above moderate local significance level. Records of places of lesser heritage significance (i.e. low local significance or below low local significance) were retained as field records.

No.	Issue	Response
13	(Continued)	Archival recording was conducted for all identified sites of moderate to high local significance. Archival recording for sites of low and below local significance was not considered necessary for the EIS assessment due to the low level of significance. WCPL will work with the Mid Western Regional Council to determine if the archival recording of these sites is warranted on public interest grounds. With respect to demolition of buildings, Section G5.3 of Appendix G, Volume 3 of the EIS states: "*… In general, buildings should only be demolished if their destruction for mining or infrastructure construction is required. … Re-use of stone and slabs in the conservation of other places by local landholders or the Mudgee Historical Society should be considered for materials from Hillside and Warrawong, should they be demolished.*" With respect to any perceived ambiguity as to which buildings of local heritage significance would be demolished, Section 4.11.1, Volume 1 of the EIS states: *"Four buildings of local significance were identified within the open cut mine and contained infrastructure area. These sites include (Figure 3-10):* • *Site 2 "Hillside" – located in the north-eastern corner of Pit 4;* • *Site 4 "Warrawong" – located near Bens Creek in the southern part of Pit 2;* • *Site 5 Atcheson's Cottage – located near Bungulla Road in Pit 5; and* • *Site 6 Loys Cottage – located near the western boundary of Pit 5.* *Of the four sites, only Warrawong (Site 4) remains in fair to good condition, with the other three sites being in poor or ruined condition (Appendix G). These sites would be demolished when mining through these locations."* In addition, Section 4.11.2, Volume 1 of the EIS states: "*… When "Warrawong" and "Hillside" need to be demolished for mining, materials such as stone and wooden slabs would be offered to local landowners or the Mudgee Historical Society for conservation or re-use.*" Buildings in the mine path would generally be left in-situ, until such time as demolition is required to allow mining to progress. Two buildings (*Cumbo Creek* and *Keylah*) were the subject of pre-existing Council approvals for their demolition and the management of these buildings was not revisited in the EIS. However, these buildings were recorded to archival standard prior to demolition. Relocation or mothballing of other buildings for replacement onto rehabilitated landforms would not be economically justified given the low level of heritage significance and current state of the buildings in question. As part of WCPL's commitment to assist with community heritage conservation, if local people are interested in commissioning a local history study relating to the Project area, WCPL would consider providing assistance, based on the merits of the proposal.

No.	Issue	Response
14	Requirement to: • obtain a mining lease; • comply with mining lease conditions with respect to lodging a Mining Operations Plan (MOP) and Annual Environmental Management Report (AEMR); and • resolve native title issues.	As stated in Section 1.2.3, Volume 1 of the EIS, a mining lease application (MLA 1) was lodged in February 2005 over an approximate 2,800 hectare portion of Exploration Licence (EL) 6169. The location of MLA 1 is shown on Figure 1-3, Volume 1 of the EIS. Section 5.1.1, Volume 1 of the EIS, states: "*The Mining, Rehabilitation and Environmental Management Process (MREMP) (DMR, 2002b) is a DPI-MR initiative and incorporates the Mining Operations Plan (MOP) and the AEMR* [Annual Environmental Management Report] *as primary regulatory reporting documents… The structure and content of the Project MOP and AEMR would be developed in accordance with MREMP guidelines (DMR, 2002b) and through consultation with various regulatory and advisory agencies including the DPI* [Department of Primary Industries]*, DEC* [Department of Environment and Conservation]*, DIPNR* [Department of Infrastructure, Planning and Natural Resources]*, and MWRC* [Mid-Western Regional Council]*."* The proposed content of the Project MOP and AEMR is provided in Sections 5.1.1.1 and 5.1.1.2, Volume 1 of the EIS, respectively. WCPL is currently involved in native title negotiations with the relevant registered claimants.
15	Concern that the Project should be referred to the Commonwealth Minister for Environment and Heritage under the *Environmental Protection and Biodiversity Conservation Act, 1999* (EPBC Act).	Section 1.5.3, Volume 1 of the EIS, stated that: "*The Project will be referred to the Commonwealth Minister for Environment and Heritage for an assessment of whether or not it includes a controlled action under the EPBC Act*." WCPL formally referred the Project to the Commonwealth Minister for Environment and Heritage under the EPBC Act in September 2005.
16	Concern regarding the visual impact of the Project including: • visual impacts from local roads; • night-lighting effects on nearby residences and on wildlife; • cumulative night-lighting effects; and • adequacy of light impact assessment.	Visual impacts that are expected to arise as a result of Project activities were assessed by EDAW Gillespies Australia (EDAW) and are described in Appendix N, Volume 5 of the EIS. The visual settings (e.g. local, sub-regional and regional) were based on distance from the development as described in Attachment NA of Appendix N, Volume 5 of the EIS. For the purposes of the visual impact assessment, landuses in the vicinity of the Project were characterised in terms of low, moderate or high visual sensitivity. For example, Ulan-Wollar Road was characterised as low visual sensitivity whilst Wollar Road was characterised as low to moderate visual sensitivity. As stated in Section 4.2.3, Volume 1 of the EIS: "*Views of the Project from Ulan-Wollar Road and Wollar Road within the sub-regional setting (1 to 5 km) would generally be obscured from view and would comprise to a small proportion of the overall viewscape due to the relative flatness of the valley floor. There would be a negligible visual impact within the sub-regional setting (Table 4-2). …*

No.	Issue	Response
16	(Continued)	*Within the local setting, views of the Project from Ulan-Wollar Road would include the safety bunds constructed along selected boundary areas of each open pit with distant views of open cut mining operations also available from some elevated areas (Appendix N). As described above, the safety bunds would be revegetated and this would reduce the level of visual impact over time.* *Given the low sensitivity coupled with the moderate level of visual modification (with the safety bunds as the most visually prominent component of the Project), a low level of visual impact would result (Table 4-2). …* *Within the local setting, views of the Project from Wollar Road would be limited by intervening topography and further restricted by vegetation between the road and the Project area (Appendix N). The existing vegetation along the south-eastern boundary of Pit 3 near Wollar Road would be retained as a screen. The level of visual modification from viewpoints along Wollar Road would therefore be low (ibid.).* *The low level of visual modification coupled with the low to moderate level of visual sensitivity, would result in a low visual impact on users of Wollar Road within the local setting (Appendix N)….*" A visual impact assessment summary is provided in Table 4-2, Volume 1 of the EIS. The measures used to mitigate these potential impacts are discussed in Section 4.2.4, Volume 1 of the EIS and include: "*The mining method described in Section 2.4 involves progressive backfilling of mined-out voids behind the advancing open cut. Final landform shaping is to approximate existing topographic forms. Regular slopes and sharp transition angles would be varied and rounded to provide a more natural appearance.* *The revegetation programme would be progressive, commencing soon after the completion of landform shaping. Visual impacts associated with unvegetated mine landforms would progressively reduce once the vegetative cover begins to establish. Revegetation in woodland areas would utilise native tree/shrub species, as well as grasses, characteristic of the area for consistency of colour and visual texture.* *Other measures that would be employed to mitigate visual impacts include:* • *design and construction of Project infrastructure in a manner that minimises visual contrasts (e.g. suitably coloured cladding for buildings); and* • *early establishment of vegetation on safety bunds.* *In addition, it is proposed to establish vegetation screening at the "Wilpin Farm" residence early during the Project life."*

No.	Issue	Response
16	(Continued)	Section 4.2.3, Volume 1 of the EIS describes the potential impacts of night-lighting activities in the Project area as follows: "*Direct views of night-lighting sources from Ulan-Wollar Road would generally be screened behind the safety bunds placed along sections of the northern boundary of the open pits. Direct views from Wollar Road would be screened by the ridgeline to the south of the Project area and intervening vegetation. However, lighting on taller infrastructure such as the CHPP, coal handling and train loading infrastructure may be visible at these locations and from the "Wilpin Farm" residence.* *Potential night-lighting impacts on the local and sub-regional settings would generally be restricted to the production of a glow above operational areas that contrast with the night sky. This effect would decrease with distance, however, the glow would be visible at nearby residences and along the local road network. Some further light spill may occur on nights when there is a low cloud base and reflection off the cloud base occurs.*" Section HB4.1 of Appendix HB, Volume 4 of the EIS discusses the potential impacts of night-lighting on wildlife: "*Little information is available on the potential impacts of lighting on wildlife. Potential impacts of lighting associated with the Project on fauna however are likely to relate to alteration of forage zones, primarily for insectivorous bird and bat species.*" With regard to potential cumulative night-lighting impacts, Section N4.5 of Appendix N, Volume 5 of the EIS states: "*As the Ulan Coal Mines (including Ulan Stage 2) is located approximately 11 km north-west of the Project, these activities would not contribute to potential visual impacts within the local or sub-regional setting of the Project area.* *As discussed above in Section N4.4, night-lighting at the Ulan Coal Mines has modified the levels of lighting in the regional setting. Potential cumulative night-lighting impacts would result in a light glow above the operational areas of the Project and Ulan Coal Mines (including Ulan Stage 2) within their respective visual settings.*" Section 4.2.4, Volume 1 of the EIS states the mitigation measures to be implemented to minimise the potential impacts of night-lighting: "*Night-lighting would be restricted to the minimum required for operational and safety requirements and would be directed away from roads and sensitive viewpoints. Lighting above topographic screens would be directed downwards and light shields would be used to limit the spill of lighting where practicable.*"

No.	Issue	Response
17	Concern regarding land use management issues particularly the potential for increases in dryland salinity.	In regard to land use management, a Land Management Plan (LMP) and Erosion and Sediment Control Plan (ESCP) would be developed for the Project (Sections 5.1.2.1 and 5.1.2.2, Volume 1 of the EIS). The LMP would describe measures to manage WCPL-owned land in a manner consistent with the Environmental Protection Plan objectives stated in Section 5, Volume 1 of the EIS. In addition, the LMP would address grazing management, access controls and any potential land degradation impacts. The ESCP would present measures which aim to control soil erosion and sediment generation proximal to the source and thereby minimise the potential for Project activities to adversely affect downstream water quality (including salinity management). Further, as stated in Section 5.2.4, Volume 1 of the EIS: *"Details of soil management strategies and practices including the methodology and timing of implementation would be included in the MOP* [Mining Operations Plan] *(Section 5.1.1.1) and would address the components listed in Table 5-4."* Table 5-4 in Section 5.2, Volume 1 of the EIS lists the soil removal, handling and replacement considerations to be included in the MOP. These considerations include selective stockpiling of soil according to soil type and salinity and the implementation of measures to ensure long-term viability of soil resources and manage soil salinity. The revegetation programme for the Project rehabilitation areas provides for a combination of woodland areas and mixed woodland/pasture areas, as described in Section 5.2.5, Volume 1 of the EIS: *"The revegetation programme for Project rehabilitation areas would establish some 850 ha of woodland vegetation over the long-term, and in association with the establishment of woodland vegetation in the regeneration areas (Section 5.3) and ECAs* [Enhancement and Conservation Areas] *(Section 5.4), would contribute to an overall net increase in woodland vegetation of some 1,095 ha."* Several research projects have been completed under the NSW Salinity Strategy. As stated on the Salinity Solutions NSW website (http://dipnr.nsw.gov.au/salinity/science/science_knowledge.htm): *"The use of deep-rooted perennial vegetation (trees and pastures) can increase water use within the landscape, helping to control the spread of dryland salinity."* The locations of the Project rehabilitation areas, regeneration areas and ECAs are shown conceptually in Section 5, Volume 1 of the EIS. These locations include significant areas of low lying land along Wilpinjong and Cumbo Creeks. The design of the revegetation works within the rehabilitation and regeneration areas, including consideration of salinity management potential, would be further reviewed through the MOP (Section 5.1.1.1, Volume 1 of the EIS) and Flora and Fauna Management Plan (Section 5.1.2.7, Volume 1 of the EIS) approval processes, respectively.

No.	Issue	Response
17	(Continued)	Concerns associated with salinity of water in the final voids and potential salinity impacts on downstream surface water resources are described in Issue No. 56.
18	Concerns were raised in regard to: • The level of detail in, and adequacy of, the assessment of impacts on threatened species. • The potential impacts, including clearing, on remnant vegetation and reduction in biodiversity. • Adequacy of the Enhancement and Conservation Areas and regeneration areas and their long-term performance. • The potential impacts, including clearing, on the WBYBBRG Endangered Ecological Community. • The timing of the flora and fauna surveys. • Cumulative impacts of the Project. • Restriction of movement for fauna. • The potential impacts on threatened fauna species, including the Squirrel Glider. • The potential increase of fauna mortality via vehicular strike. • The potential impact of weeds and animal pests. • The potential impact of noise and blasting upon fauna. • The potential impact of night-lighting upon fauna. • Habitat resources and seed collection.	***Threatened Species Impact Assessment*** Appendix HE, Volume 4 of the EIS assesses the Project for significant effects on threatened species, populations, ecological communities, and their habitats in accordance with Section 5A of the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act). The potential impacts of the Project which are considered include direct (eg. habitat removal) and indirect effects (e.g. increases in feral animals). A list of threatened species, populations and endangered ecological communities which are known or considered possible occurrences in the Project area and surrounds which are assessed by the Eight Part Tests of Significance is presented in Table HE-1 of Appendix HE, Volume 4 of the EIS. The Eight Part Test of Significance for the Project was undertaken for fifteen threatened flora species (Section HE3.1 of Appendix HE), thirty-six threatened fauna species (Section HE3.2 of Appendix HE) and one endangered ecological community (Section HE3.3 of Appendix HE). As stated in Section HE2.1 of Appendix HE, Volume 4 of the EIS: "*The assessment is made in accordance with National Parks and Wildlife Service (NPWS) (1996) Information Circular No. 2: Threatened Species Assessment under the EP&A Act: The '8 Part Test of Significance'*." Parts (a) and (c) of each Eight Part Test of Significance include a description of the important life cycle components and habitat requirements of the threatened species (e.g. Diamond Firetail, Hooded Robin, Black-chinned Honeyeater and Brown Treecreeper). Important life cycle components described for plants include seed banks, recruitment (germination and establishment of plants) and reproduction (including pollination and fecundity). For animals important life cycle components described include breeding, mortality, dormancy, roosting, feeding, migration and dispersal. Part (c) of the Eight Part Test of Significance addresses whether a significant area of known habitat is to be removed or modified from within the region as a result of the development. WCPL has withdrawn its development application lodged under Part 4 of the *Environmental Planning and Assessment Act* 1979 (EP&A Act), and lodged an application for "Project Approval" for the same Project under Part 3A of the EP&A Act. Eight Part Tests of Significance are not required under Part 3A of the EP&A Act, but this does not alleviate the requirement to adequately assess potential impacts on threatened species. The level of detail and assessment which is required to conduct the Eight Part Tests of Significance is considered appropriate for an EIS assessment given that such tests were mandated under Section 5A of the EP&A Act and have been accepted practice in the assessment of impact on threatened species.

No.	Issue	Response
18	(Continued)	As stated in Section HE3.4 of Appendix HE, Volume 4 of the EIS, the Eight Part Test of Significance determined that: • "*No local populations of threatened species would be placed at risk of extinction.* • *In relation to the regional distribution of habitat of a threatened species, it is considered that a significant area of known habitat would not be modified or removed by the Project.* • *An area of known habitat is unlikely to become isolated from currently interconnecting or proximate areas of habitat for each threatened species or ecological community*." With regard to the Regent Honeyeater, as stated in Section HE3.2.19 of Appendix HE, Volume 4 of the EIS: "*Less than 290 ha of remnant vegetation containing either known or potential habitat for the Regent Honeyeater (including approximately 50 ha of White Box, Yellow Box, Blakely's Red Gum Woodland Endangered Ecological Community) will be cleared or modified for the Project (mature vegetation in intact remnants). In relation to the regional distribution of known or potential habitat for this species, it is considered that the area to be removed or modified for the Project area does not constitute a significant area given the small scale of the habitat removal/modification required for the Project and the greater quantity and quality of such habitat in the bioregion*." As stated in Section 4.7.1, Volume 1 of the EIS: *"Based on the information presented in the Eight Part Tests, it was determined that the Project is unlikely to significantly affect any threatened flora species."* Further, as stated in Section 4.8.1, Volume 1 of the EIS: *"Based on the information presented in the Eight Part Tests, it was determined that the Project is unlikely to significantly affect threatened fauna species."* ***Remnant Vegetation - Potential Impacts and Mitigation Measures*** Section 4.7.1, Volume 1 of the EIS describes the potential impacts of the Project disturbance area including clearing of approximately 290 ha of remnant vegetation. Flora management strategies have been developed to mitigate the potential impacts (including short-term and long-term impacts as well as cumulative impacts) of the Project on flora. Flora mitigation measures are described in Section 4.7.2, Volume 1 of the EIS and include the rehabilitation of some 1,070 ha and regeneration of some 350 ha of land:

No.	Issue	Response
18	(Continued)	• "*Rehabilitation areas - rehabilitation and revegetation of areas disturbed by the Project would be undertaken progressively as mining proceeds, with coal removal and the formation of final (mine waste rock emplacements) landforms behind the advancing face of the open cut. Rehabilitation and revegetation of infrastructure areas would also be undertaken progressively as infrastructure is decommissioned. The revegetation programme for Project rehabilitation areas provides for a combination of woodland and pasture outcomes. Some 850 ha of the Project final landform would be revegetated with woodland vegetation and some 1,070 ha would be revegetated to mixed woodland/pasture. The revegetation programme would aim to establish floristic diversity within the woodland areas.* • *Regeneration areas - regeneration areas would be established on areas of WCPL owned land situated proximal to Project disturbance/rehabilitation areas. The regeneration areas contain predominantly cleared agricultural land in which woodland vegetation (some 350 ha) would be established through natural regeneration/selective planting.*" The rehabilitation/regeneration measures described above, plus the 185 ha of woodland that would be established in the Enhancement and Conservation Areas (ECAs) discussed below, would result in an overall net increase in woodland vegetation of some 1,095 ha, as stated in Section 4.7.1, Volume 1 of the EIS, and shown in Table 5-1 of Section 5, Volume 1 of the EIS. Section 5.4, Volume 1 of the EIS states: "*'Conservation' of the ECAs would be achieved through a rezoning application. WCPL would:* • *conserve and manage the land in the ECAs in accordance with the FFMP;* • *apply to rezone the land in the ECAs for the purpose of protecting the land for conservation; and* • *exclude future open cut mining in the ECAs, unless, in the opinion of the Minister for Infrastructure and Planning, WCPL has demonstrated that there is a clear justification for this on social, economic and/or environmental grounds.*" In addition, as stated in Section 4.7.2, Volume 1 of the EIS, a flora monitoring programme would be developed for the rehabilitation areas, regeneration areas and the ECAs to monitor the effectiveness of the revegetation or enhancement initiatives. The monitoring programme would be outlined in a Flora and Fauna Management Plan (FFMP). The FFMP would be prepared to facilitate integration of flora and fauna management measures with Project construction and operation, as described in Section 5.1.2.7, Volume 1 of the EIS. Table 5-6 of Section 5, Volume 1 of the EIS proposes key completion criteria that would be utilised to evidence achievement of the Environmental Protection Plan (EPP) objectives including those relating to rehabilitation areas, regeneration areas and the ECAs.

No.	Issue	Response
18	(Continued)	Section 1.7.10, Volume 1 of the EIS discusses the clearing of remnant vegetation within Pit 3, discusses the alternative mining methods for Pit 3 and provides an assessment of the consequences of restricting the mining operations in Pit 3. The flora and fauna values of the remnant in Pit 3 are described in Sections 3.6 and 3.7, Volume 1 of the EIS, and Appendices HA to HE, Volume 4 of the EIS. The rehabilitation areas, regeneration areas and the ECAs presented above would provide significant habitat resources and refuge for native fauna including threatened species and common species such as kangaroos, wombats and emus. To strike a balance between the effects of mining and the value of the resource, these lands, and the fauna that utilises them, would be managed in accordance with the proposed Land Management Plan (Section 5.1.2.1, Volume 1 of the EIS) and FFMP (Section 5.1.2.7, Volume 1 of the EIS). ***Potential Impacts on the WBYBBRG Endangered Ecological Community*** As detailed in Section HE3.3.1 of Appendix HE, Volume 4 of the EIS, of the approximately 180 ha of the White Box, Yellow Box, Blakely's Red Gum Woodland Endangered Ecological Community and the Grassy White Box Woodlands Endangered Ecological Community (WBYBBRG EEC) mapped by FloraSearch in the Project area and surrounds, approximately 50 ha occurs in the proposed disturbance area and will be cleared or modified by the Project. Table HA-5 of Appendix HA, Volume 4 of the EIS describes the condition of WBYBBRG EEC in various locations within the study area. Section 4.7.2, Volume 1 of the EIS describes a number of measures which have been developed to mitigate potential impacts on flora, including the WBYBBRG EEC. As stated in Section 4.7.2, Volume 1 of the EIS: "*Some 295 ha of remnant vegetation would be conserved and enhanced by the ECAs, including more than 80 ha of the WBYBBRG EEC. Further, some 185 ha of woodland vegetation would be established in the ECAs through natural regeneration/selective planting, including some 50 ha of the WBYBBRG EEC.*" Section HE3.3.1 of Appendix HE, Volume 4 of the EIS describes further measures which have been developed for the Project to minimise potential impacts on the WBYBBRG EEC within the Project area including*:* • "*Enhancement and conservation of remnants – to enhance and conserve approximately 480 ha of remnant woodland habitat and adjacent farmland in the Wilpinjong Enhancement and Conservation Areas (ECAs). Management measures would include:* – *1:1 long-term re-establishment plus greater than 1:1 conservation of the WBYBBRG community, ie. greater than 80 ha of the endangered community is conserved in the ECAs, and an additional 50 ha will be re-established in the long-term.*

No.	Issue	Response
18	(Continued)	– *Appropriate exclusion fencing where required to reduce grazing by stock and encourage natural regeneration. This is expected to benefit the WBYBBRG EEC because grazing by stock prevents regeneration of native Eucalypt woodland.* • *Weed and Pest Management – to control the potential adverse impacts of weeds and feral animals on surrounding habitat. Measures will include active weed and feral animal control. Grazing by feral animals (eg. rabbits) prevents regeneration of shrubs and Eucalypts.*" Further, progressive rehabilitation will result in the establishment of significant areas of woodland which will include areas containing species characteristic of the WBYBBRG community [eg. White Box (*Eucalyptus albens*), Yellow Box (*E. melliodora*) and Blakely's Red Gum (*E. blakelyi*)]. In accordance with the provisions of Section 5A of the EP&A Act, an Eight Part Test of Significance was prepared for the WBYBBRG EEC and presented in Appendix HE, Volume 4 of the EIS. As stated in Section 4.7.1, Volume 1 of the EIS: "*Based on the information presented in the Eight Part Test, it was determined that the Project is unlikely to significantly affect the WBYBBRG EEC*." Further, as stated in Section HE3.3.1 of Appendix HE, Volume 4 of the EIS, the Eight Part Test of Significance found that: "*In relation to the regional distribution of known or potential habitat for this EEC, it is considered that the area to be removed or modified for the Project area does not constitute a significant area given:* • *the localised nature of the Project area disturbance;* • *occurrence of proximal known and potential habitat to the Project area. The WBYBBRG EEC has previously been identified within Goulburn River National Park (Hill, 2000; NSW Scientific Committee, 2004e); and* • *the progressive nature of Project disturbance and early rehabilitation with species characteristic of the WBYBBRG community in some areas [eg. White Box (Eucalyptus albens), Yellow Box (E. melliodora) and Blakely's Red Gum (E. blakelyi)].*" ***Survey Timing*** With regard to flora surveys, as stated in Section HA2 of Appendix HA, Volume 4 of the EIS:

No.	Issue	Response
18	(Continued)	"*The vegetation survey was carried out over four field visits totalling 18 days in autumn (March 16-19), winter (late May to early June) and spring (October 25-29, November 22-24) 2004. The survey aimed to inspect all remnants of native vegetation within the study area to identify and sample all communities present. All habitat types were surveyed to maximise the chances of finding populations of any threatened species that may occur. Coverage of the area was facilitated by recent aerial photography showing remnant vegetation. The surveys were conducted by four wheel drive vehicle. Some areas inaccessible by vehicle were traversed on foot.*" With regard to fauna surveys, as stated in Section HB2.1 of Appendix HB, Volume 4 of the EIS: "*The surveys were undertaken during two seasons in 2004. An autumn survey was undertaken over two periods. The first period was from the 19 to the 28 April, 2004, and the second period was from the 15 to the 27 May, 2004 (total of 23 survey days). A spring survey was undertaken from the 21 to the 29 November 2004 (total of nine days).* *The weather for the survey periods was typical of the respective seasons.*" The techniques used during the surveys generally follow the draft survey guidelines produced by the NSW National Parks and Wildlife Service (NPWS) and SMEC Australia (2003). The above survey events were considered adequate for the purpose of the assessment presented in the EIS. It should be noted that the Eight Part Tests of Significance for the Project assessed threatened species, populations and endangered ecological communities which are known or considered possible occurrences in the Project area and surrounds. That is, they were assessed regardless of whether or not they were identified during the flora and fauna surveys described above. ***Potential Cumulative Impacts on Flora*** Section 4.7.2, Volume 1 of the EIS describes the cumulative impacts on flora. Cumulative impacts of the Project on flora predominantly relate to impacts on diversity and abundance associated with habitat disturbance and alteration. The assessment of cumulative impacts has taken into account the characteristics of the existing vegetation, existing landuses, the extent and type of vegetation disturbance associated with the Project and the Project ameliorative measures. As stated in Section 4.7.1, Volume 1 of the EIS: "*A range of mitigation and ameliorative measures have been incorporated into the Project to minimise the potential impacts of the Project, including regional cumulative impacts on flora. The Project EPP* [Environmental Protection Plan] *(Section 5) provides for environmental management of the Project area and surrounds, the rehabilitation of the Project disturbance areas (i.e. rehabilitation areas), the establishment of woodland vegetation (i.e. regeneration areas) and the enhancement and conservation of remnant vegetation (i.e. ECAs). These initiatives would result in an overall net increase in woodland vegetation of some 1,095 ha.*"

No.	Issue	Response
18	(Continued)	The mitigation measures developed for flora are detailed in Section 4.7.2, Volume 1 of the EIS. These mitigation measures minimise the potential impacts of the Project on flora. The EPP initiatives would result in an overall net increase in woodland vegetation. ***Potential Cumulative Impacts on Fauna*** Similarly to the assessment for flora, the EIS has assessed the cumulative impacts on fauna by taking into consideration the terrestrial fauna species recorded in the vicinity of the Project, existing landuses, the extent and type of habitat disturbance associated with the Project and the proposed ameliorative measures. Potential impacts of the Project upon fauna are listed in Section 4.8.1, Volume 1 of the EIS: *"… Notwithstanding, the Project area and surrounds provides (to varying degrees) opportunities for foraging, breeding, nesting, predator avoidance and movement between areas, thus promoting genetic diversity and facilitating dispersal/migration. These opportunities could potentially be reduced as a result of habitat disturbance associated with the Project."* A range of mitigation and ameliorative measures have been incorporated into the Project to minimise the potential impacts of the Project, including regional cumulative impacts on terrestrial fauna. The mitigation measures developed for terrestrial fauna are described in Section 4.8.2, Volume 1 of the EIS, and include the establishment of woodland vegetation, the creation of the ECAs, salvage of habitat features, and the strengthening of linkages between remnant vegetation. As described in Section 4.8.2, Volume 1 of the EIS, fauna management strategies would be detailed in the FFMP to be prepared for the Project prior to construction. The proposed content of the FFMP is described in Section 5.1.2.7, Volume 1 of the EIS and would include: "*… a Vegetation Clearance Protocol (VCP) and a Threatened Species Management Protocol (TSMP), would describe management of the regeneration areas and the ECAs, and would include monitoring to assess the performance of the rehabilitation areas, regeneration areas and the ECAs*…" The monitoring programme to be detailed in the FFMP may include fauna surveys in areas used for relocation of native fauna in the VCP process. This requirement would be determined in consultation with the relevant authorities.

No.	Issue	Response
18	(Continued)	***Fauna Movement/Corridors*** The Project EPP would aim to provide links for wildlife to move between existing remnant vegetation and rehabilitation/regeneration areas, as stated in Section 4.8.2, Volume 1 of the EIS: • *"A key objective of the Project EPP is to increase the continuity of woodland vegetation, thereby maximising opportunities for the creation of wildlife corridors. This would be achieved by establishing links between the rehabilitation areas, regeneration areas and existing remnant vegetation in Munghorn Gap Nature Reserve, Goulburn River National Park and the ECAs.* • *Conservation and enhancement of the ECAs would strengthen the linkages between the woodland rehabilitation areas, regeneration areas, Goulburn River National Park and Munghorn Gap Nature Reserve, as well as assist in the faunal recolonisation of Project rehabilitation areas and regeneration areas."* As described in Section 2.4.4, Volume 1 of the EIS, vegetation clearing would be undertaken progressively over the life of the Project. Further, as stated in Section 5.2.5, Volume 1 of the EIS: *"Revegetation of Project disturbance areas would be conducted progressively as mining proceeds…. Rehabilitation and revegetation of infrastructure areas would also be undertaken progressively as infrastructure is decommissioned."* As indicated on Figure 5-3 of Section 5, Volume 1 of the EIS, the proposed corridors linking Goulburn River National Park, Munghorn Gap Nature Reserve, Crown Land, the ECAs and rehabilitated Project landforms are generally greater than 0.5 km in width. As part of the Mining, Rehabilitation and Environmental Management Process, a final Mine Closure Plan (MCP) would be developed in consultation with relevant authorities and the Project Community Consultative Committee (as stated in Section 5.1.1, Volume 1 of the EIS) and would detail final rehabilitation works. ***Potential Impacts on Threatened Fauna Species*** As stated in Section 4.8.1, Volume 1 of the EIS: "*Seventeen threatened fauna species were recorded in the vicinity of the Project, including 10 birds and seven mammals (Table 3-15). In accordance with the provisions of Section 5A of the EP&A Act, Eight Part Tests of Significance were completed (Appendix HE) for 36 threatened fauna species considered to possibly occur within the Project area or surrounds. Based on the information presented in the Eight Part Tests, it was determined that the Project is unlikely to significantly affect threatened fauna species*."

No.	Issue	Response
18	(Continued)	WCPL has withdrawn its development application lodged under Part 4 of the *Environmental Planning and Assessment Act* 1979 (EP&A Act), and lodged an application for "Project Approval" for the same Project under Part 3A of the EP&A Act. Eight Part Tests of Significance are not required under Part 3A of the EP&A Act, but this does not alleviate the requirement to adequately assess potential impacts on threatened species. The level of detail and assessment which is required to conduct the Eight Part Tests of Significance is considered appropriate for an EIS assessment given that such tests were mandated under Section 5A of the EP&A Act and have been accepted practice in the assessment of impact on threatened fauna species. As stated in Section 4.8.2, Volume 1 of the EIS, initiatives have been developed to mitigate the potential impacts (including cumulative impacts) of the Project on terrestrial fauna. Specifically for threatened species, as stated in Section 5.1.2.7, Volume 1 of the EIS: "*A TSMP* [Threatened Species Management Protocol] *would be developed to facilitate implementation of threatened species management strategies to minimise potential impacts on threatened flora and fauna species. Key components of the TSMP would include site observations/surveys, threatened species management strategies and reporting*." Section HE3.2.25 of Appendix HE, Volume 4 of the EIS describes a number of measures that have been developed for the Project to minimise potential impacts on the squirrel glider within the Project area and adjacent park and reserve areas including: • *"Pre-clearance Surveys – to identify and survey potential nesting/breeding habitat for the Squirrel Glider. The surveys would include the capture and release of any Squirrel Gliders into alternative suitable habitat located outside of the proposed disturbance areas.* • *Weed and Pest Management – to control the potential adverse impacts of weeds and feral animals within the Project area and on surrounding habitat, including Protected areas. Measures will include active weed and feral animal control.* • *Enhancement and Conservation of Remnants – to enhance and conserve woodland habitat resources through the Wilpinjong Enhancement and Conservation Areas (ECAs). Management measures would include the fencing of ECAs to exclude stock.* • *Progressive Rehabilitation – to result in the establishment of wildlife corridors for the Squirrel Glider. This would include rehabilitation of the riparian vegetation of Wilpinjong Creek and the Cumbo Creek diversion. The species of vegetation used to rehabilitate the area will include suitable habitat species for the Squirrel Glider including Eucalyptus crebra (Narrow-leaved Ironbark) and E. moluccana (Coast Grey Box) which are both known to exist in the study area. This will benefit the Squirrel Glider in the long-term*." Further detail of these measures would be provided in the integrated environmental management plans as discussed in Section 5, Volume 1 of the EIS.

No.	Issue	Response
18	(Continued)	***Potential Increase of Fauna Mortality Via Vehicular Strike*** Section 4.8.2, Volume 1 of the EIS presents measures to reduce the potential for vehicle strike on native fauna: • *"Speed limits would be imposed on roads and tracks on WCPL-owned land to reduce the potential for vehicle strike on native fauna. Prior to the commencement of construction, WCPL would consult with the RTA, MWRC and the DEC regarding the installation of native fauna warning signs on Wollar Road through the Munghorn Gap Nature Reserve.* • *An environmental education programme would be included in the employee and contractor inductions relevant to native fauna and would include an awareness of the potential to encounter native animals whilst commuting to and from the Project site and relevant actions to be taken in the event of an incident involving native fauna."* ***Weed/Animal Pest Management*** Section 4.8.2, Volume 1 of the EIS describes the measures to mitigate the impact of colonisation of non-endemic species in the Project area: *"A clean, rubbish-free environment would be mandated to discourage scavenging and reduce the potential for colonisation of these areas by non-endemic fauna (e.g. introduced rodents, birds). An animal pest control programme would be implemented in accordance with the control strategies detailed in the WAPCP* [Weed and Animal Pest Control Plan] *to be prepared for the Project prior to construction (Section 5.1.2.8).*" The WAPCP would be developed for the Project for WCPL-owned land and would include management strategies to control the potential adverse impacts of weeds and animal pests, as described in Section 5.1.2.8, Volume 1 of the EIS. Weeds would be controlled through mechanical removal and/or the application of approved herbicides. Animal pest control would be undertaken by a licensed contractor. ***Potential Impact of Noise and Blasting on Fauna*** Section 4.8.1, Volume 1 of the EIS acknowledges the impact of noise upon fauna in the Project area: *"Numerous studies have been undertaken on the effects of noise on wildlife (e.g. Algers et al., 1978 in Richard Heggie Associates, 1997; Allaire, 1978; Ames, 1978; Busnel, 1978; Lynch and Speake, 1978; Shaw, 1978; Streeter et al., 1979; Poole, 1982 in Richard Heggie Associates, 1997).* *In essence, the studies indicate that many species are well adapted to human activities and noise. Notwithstanding, the Project would increase the existing level of noise, which has the potential to disrupt the routine activities of vertebrate fauna."* As stated in Section 5.13, Volume 1 of the EIS, an environmental monitoring programme would be developed for the Project and would include noise and blast monitoring.

No.	Issue	Response
18	(Continued)	It should be noted that the Project noise and vibration assessment has been based on acceptable levels for humans in accordance with the Department of Environment and Conservation's (DEC) requirements. Therefore, the Project operations would be constrained to these strict emission limits. ***Potential Impact of Night-lighting on Fauna*** Section 4.2.3, Volume 1 of the EIS describes the potential impacts of night-lighting activities in the Project area as follows: "*Direct views of night-lighting sources from Ulan-Wollar Road would generally be screened behind the safety bunds placed along sections of the northern boundary of the open pits. Direct views from Wollar Road would be screened by the ridgeline to the south of the Project area and intervening vegetation. However, lighting on taller infrastructure such as the CHPP, coal handling and train loading infrastructure may be visible at these locations and from the "Wilpin Farm" residence.* *Potential night-lighting impacts on the local and sub-regional settings would generally be restricted to the production of a glow above operational areas that contrast with the night sky. This effect would decrease with distance, however, the glow would be visible at nearby residences and along the local road network. Some further light spill may occur on nights when there is a low cloud base and reflection off the cloud base occurs.*" With regard to potential cumulative night-lighting impacts, Section N4.5 of Appendix N, Volume 5 of the EIS states: "*As the Ulan Coal Mines (including Ulan Stage 2) is located approximately 11 km north-west of the Project, these activities would not contribute to potential visual impacts within the local or sub-regional setting of the Project area.* *As discussed above in Section N4.4, night-lighting at the Ulan Coal Mines has modified the levels of lighting in the regional setting. Potential cumulative night-lighting impacts would result in a light glow above the operational areas of the Project and Ulan Coal Mines (including Ulan Stage 2) within their respective visual settings.*" Section HB4.1 of Appendix HB, Volume 4 of the EIS discusses the potential impacts of night-lighting on wildlife: "*Little information is available on the potential impacts of lighting on wildlife. Potential impacts of lighting associated with the Project on fauna however are likely to relate to alteration of forage zones, primarily for insectivorous bird and bat species.*"

No.	Issue	Response
18	(Continued)	Section 4.2.4, Volume 1 of the EIS states the mitigation measures to be implemented to minimise the potential impacts: "*Night-lighting would be restricted to the minimum required for operational and safety requirements and would be directed away from roads and sensitive viewpoints. Lighting above topographic screens would be directed downwards and light shields would be used to limit the spill of lighting where practicable.*" The above mitigation measures are considered adequate for the purpose of managing the potential impact of night-lighting on fauna. ***Salvage of Habitat Features and Collection of Seed*** Tree hollow salvaging and collection of seed is discussed in Section 5.1.2.7, Volume 1 of the EIS and would be part of the Vegetation Clearance Protocol under the FFMP as follows: *"Specific vegetation clearance procedures would be developed and would include:* *...* • *salvage of habitat features (e.g. hollows) and collection of seed for use in the rehabilitation areas, regeneration areas and/or in the ECAs; and...*" That is, suitable habitat features such as hollows and logs would be salvaged, where practicable, and used in the rehabilitation areas, regeneration areas and/or in the ECAs, to aid the colonisation of those areas by endemic native fauna.
19	Concern regarding the timing and completion of Environmental Management Plans and detail on Monitoring Programmes, including: • Mining Operations Plan. • Annual Environmental Management Report. • Site Water Management Plan. • Water Supply Borefield Plan. • Cumbo Creek Relocation Plan. • Spontaneous Combustion Management Plan. • Flora and Fauna Management Plan. • Mine Closure Plan. • Final Void Management Plan	An overview of the environmental management plans and monitoring programmes that would be implemented for the Project is presented in Section 5.1, Volume 1 of the EIS. As stated: *"The management and monitoring programmes should be viewed as provisional pending further input from relevant authorities during the assessment phase of the EIS."* Specific requirements to be addressed in the plans and programmes which result from the assessment phase of the approval process would be included in any project approval conditions. Consistent with other contemporary major projects in NSW, these conditions would prescribe timing requirements for the development of these plans/programmes (e.g. prior to the commencement of construction) and would also be required to be developed to the satisfaction of the Director-General and/or in consultation with relevant government agencies. As stated in Section 5.1.2, Volume 1 of the EIS: *"Management plans would be progressively prepared, prior to and/or during the development of the Project, so they can be implemented prior to a relevant action taking place."* A list of the proposed management plans is presented in Table 5-2, Volume 1 of the EIS:

<table>
<tr><th>No.</th><th>Issue</th><th>Response</th></tr>
<tr><td>19</td><td>(Continued)</td><td>
<table>
<tr><th>Management Plan</th><th>Section</th></tr>
<tr><td>Land Management Plan</td><td>5.1.2.1</td></tr>
<tr><td>Erosion and Sediment Control Plan</td><td>5.1.2.2</td></tr>
<tr><td>Bushfire Management Plan</td><td>5.1.2.3</td></tr>
<tr><td>Site Water Management Plan</td><td>5.1.2.4</td></tr>
<tr><td>Water Supply Borefield Plan</td><td>5.1.2.5</td></tr>
<tr><td>Cumbo Creek Relocation Plan</td><td>5.1.2.6</td></tr>
<tr><td>Flora and Fauna Management Plan</td><td>5.1.2.7</td></tr>
<tr><td>Weed and Animal Pest Control Plan</td><td>5.1.2.8</td></tr>
<tr><td>Traffic Management Plan</td><td>5.1.2.9</td></tr>
<tr><td>Aboriginal Cultural Heritage Management Plan</td><td>5.1.2.10</td></tr>
<tr><td>Spontaneous Combustion Management Plan</td><td>5.1.2.11</td></tr>
<tr><td>Blast Management Plan</td><td>5.1.2.12</td></tr>
<tr><td>Mine Closure Plan</td><td>5.5.1</td></tr>
<tr><td>Final Void Management Plan</td><td>5.5.1</td></tr>
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As stated in Section 5.1, Volume 1 of the EIS:
“Environmental Management Responsibilities
Environmental management would be the responsibility of all Project employees, with co-ordination provided by an environmental team. The environmental team would be lead by an Environmental Manager, who would report directly to the General Manager.”
Section 5.1.1, Volume 1 of the EIS states:
“The Mining, Rehabilitation and Environmental Management Process (MREMP) (DMR, 2002b) is a DPI-MR initiative and incorporates the Mining Operations Plan (MOP) and the AEMR as primary regulatory reporting documents…The structure and content of the Project MOP and AEMR would be developed in accordance with MREMP guidelines (DMR, 2002b) and through consultation with various regulatory and advisory agencies including the DPI, DEC, DIPNR, and MWRC.”
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No.	Issue	Response
19	(Continued)	Further details on the Project MOP and AEMR are provided in Sections 5.1.1.1 and 5.1.1.2, Volume 1 of the EIS, respectively. As stated in Section 5.1.1.3, Volume 1 of the EIS, an Environmental Management Strategy (EMS) would be prepared for the Project and would describe: • *"operational procedures and environmental management plans to manage the environmental effects of the Project;* • *assignment of responsibilities;* • *verification and audit processes;* • *environmental monitoring programmes;* • *schedules for the development and implementation of environmental management plans and monitoring programmes;* • *training programmes;* • *community consultation processes;* • *complaint handling mechanisms including site contacts;* • *strategies to use monitoring information to improve performance;* • *strategies to achieve acceptable environmental impacts (including remedial response strategies); and* • *measures to avoid and minimise the generation of wastes and promote waste re-use and recycling."* ***Water Management and Monitoring*** As stated in Section 5.1.2.4, Volume 1 of the EIS: "*A Site Water Management Plan (SWMP) would be developed for the Project in consultation with relevant authorities...The SWMP would be reviewed and revised as required in consultation with relevant authorities and would be periodically updated over the mine life.*" Section 5.1.2.4, Volume 1 of the EIS also includes a description of what would be included in the SWMP: *"The SWMP would describe the Project site water management system, including:* • *the predicted site water balance as well as details of the Project water supply system (e.g. water supply storage, pump and pipeline capacities and a Water Supply Borefield Plan [WSBP] – Section 5.1.2.5);*

No.	Issue	Response
19	(Continued)	• *procedures that would be implemented to:* – *ameliorate potential surface water impacts; and* – *establish priority water use (Section 2.9.2);* • *details of surface water management structures including the design of the Cumbo Creek relocation (Cumbo Creek Relocation Plan [CCRP] – Section 5.1.2.6);* • *location and design specifications for all clean water diversions, including channel design and stabilisation, sediment retention storages and other structures;* • *details of internal drainage of the mine water circuit, including any bunding, drainage channels, dewatering pits, advance dewatering bores and storages;* • *measures to manage waters that accumulate in mine workings, including the isolation and return of potential direct groundwater inflows from Wilpinjong Creek or Cumbo Creek alluvium (Section 2.4.8);* • *surface water and groundwater monitoring programmes (Sections 5.1.3.6 and 5.1.3.7);* • *investigation triggers and contingency/ remediation plans for managing adverse impacts of the Project on surface water and groundwater including existing users; and* • *details of strategies for the decommissioning of water management structures.* *The SWMP would be reviewed and revised as required in consultation with relevant authorities and would be periodically updated over the mine life*." As stated in Section 5.1.3.6, Volume 1 of the EIS: *"Surface water flow rate (via water level) would be monitored continuously at installed gauging stations on Wilpinjong and Cumbo Creeks (Figure 5-1). …* *The site water balance would be reviewed annually to optimise performance and validate predictions. These reviews would be linked to borefield performance reviews. The reviews would also facilitate the preparation of contingency/remediation plans for managing adverse impacts of the Project on surface water, where necessary (Section 5.1.2.4)."* Sections 5.1.3.6 and 5.1.3.7, Volume 1 of the EIS describes the parameters to be analysed in the surface water and groundwater monitoring programmes, respectively. As stated in Section 5.1.2.5, Volume 1 of the EIS: "*A WSBP* [Water Supply Borefield Plan] *would be developed for the Project in consultation with relevant authorities and incorporated in the SWMP*."

No.	Issue	Response
19	(Continued)	Section 5.1.2.5, Volume 1 of the EIS also includes a description of what would be included in the WSBP. As stated in Section 5.1.3.7, Volume 1 of the EIS: *"The borefield monitoring programme would be developed and detailed in the WSBP (Section 5.1.2.5). Data collected by the programme would provide input to borefield performance reviews and enable verification and refinement (where necessary) of the groundwater modelling results (Appendix B)."* As stated in Section 5.1.2.6, Volume 1 of the EIS: "*A CCRP* [Cumbo Creek Relocation Plan] *would be developed for the Project in consultation with relevant authorities and incorporated in the SWMP.*" Section 5.1.2.6, Volume 1 of the EIS also includes a description of what would be included in the CCRP. ***Spontaneous Combustion*** As stated in Section 5.1.2.11, Volume 1 of the EIS: *"A Spontaneous Combustion Management Plan would be developed for the Project in consultation with the DPI-MR and would include:* • *coal stockpile and emplacement management measures;* • *monitoring potential causes of spontaneous combustion events; and* • *actions that can be implemented in the event of spontaneous combustion."* ***Air, Noise and Blast Monitoring Programmes*** As stated in Section 5.1.3.2, Volume 1 of the EIS: "*The Project air quality monitoring programme would monitor dust deposition and concentrations of the PM_{10} proportion of suspended particulates utilising a network of dust deposition gauges and three high volume samplers (measuring PM_{10}). The monitoring programme would incorporate mechanisms for responding to dust-related complaints.*" As stated in Section 5.1.3.3, Volume 1 of the EIS: "*Noise monitoring would be conducted in accordance with AS 1055-1997 Acoustics – Description and Measurement of Environmental Noise and the NSW INP (EPA, 2000).* *The monitoring programme would incorporate mechanisms for responding to noise-related complaints. The results of the noise monitoring programme would be used to optimise noise emission controls, validate EIS predictions and would be reported in the AEMR.*"

No.	Issue	Response
19	(Continued)	As stated in Section 5.1.3.4, Volume 1 of the EIS: "*Vibrational peak particle velocity (mm/s) and air blast overpressure (dBL [Peak]) would be measured in accordance with AS 2187.2-1993 Explosives – Storage, Transport and Use – Use of Explosives. The monitoring programme would incorporate mechanisms for responding to blast-related complaints*." ***Flora and Fauna Management Plan*** Section 5.1.2.7, Volume 1 of the EIS states: *"A Flora and Fauna Management Plan (FFMP) would be prepared to facilitate integration of flora and fauna management measures with Project construction and operation.* *The FFMP would contain a number of management strategies to minimise the potential impacts of the Project on protected and threatened flora, fauna and their habitats. The FFMP would include a Vegetation Clearance Protocol (VCP) and a Threatened Species Management Protocol (TSMP), would describe management of the regeneration areas and the ECAs, and would include monitoring to assess the performance of the rehabilitation areas, regeneration areas and the ECAs, as discussed further below."* Further, Section 5.1.3.8, Volume 1 of the EIS states: *"An aquatic monitoring programme would be developed to monitor the aquatic macroinvertebrate assemblages, in-situ water quality, characteristics and health of Wilpinjong and Cumbo Creeks."* ***Mine Closure Plan*** The details of the Mine Closure Plan (MCP) (which includes the Final Void Management Plan [FVMP]) are presented in Section 5.5.1, Volume 1 of the EIS and are to be developed in consultation with relevant authorities. Prior to the completion of mining operations, a MCP would be developed in consultation with relevant authorities and the Project Community Consultative Committee. The MCP would document the final mine closure process, final rehabilitation works and post-closure maintenance and monitoring requirements appropriate to established completion criteria. As stated in Section 5.5.1, Volume 1 of the EIS: "*The MCP would address long-term landuse for the site and would take into consideration:* • *management of the ECAs in accordance with relevant commitments;* • *experience and data obtained from progressive rehabilitation and revegetation activities;* • *results of monitoring programmes;* • *relevant regional planning strategies;*

No.	Issue	Response
19	(Continued)	• *integration with surrounding landuses (e.g. Munghorn Gap Nature Reserve and Goulburn River National Park); and* • *performance against relevant completion criteria.* *A FVMP would form a component of the MCP. Issues addressed by the FVMP would include:* • *assessment of the hydrological behaviour of the final voids (e.g. long-term water quality and water balance);* • *groundwater and surface water management (e.g. final landforming works to minimise surface water inflows to the voids);* • *long-term geotechnical stability of the voids (e.g. profiling requirements);* • *public safety;* • *access requirements; and* • *water quality monitoring requirements*." The above system of management and monitoring programmes is considered adequate for a development of this nature. However, it is envisaged that further requirements may be imposed by government authorities.
20	Requests for the development of Rail Traffic Noise and Road Traffic Noise Management Plans.	***Rail Traffic Noise and Road Traffic Noise Management Plan*** The DEC has requested Rail Traffic Noise and Road Traffic Noise Management Plans be prepared for the Project. WCPL agrees to prepare Rail Traffic Noise and Road Traffic Noise Management Plans.
21	Concerns regarding monitoring of the performance of mine revegetation and Enhancement and Conservation Areas, and final landforms.	***Regeneration Performance and Performance Criteria of the ECAs*** The quality of the woodland areas (including riparian vegetation) established in the regeneration areas would be monitored using the techniques described in Section 5.2.9, Volume 1 of the EIS for the rehabilitation areas, namely, visual inspections, Ecosystem Function Analysis (EFA) and flora survey quadrats. Consideration would be given to monitoring fauna usage of the regeneration areas. Management and monitoring of the regeneration areas would be described in the FFMP. Completion criteria for the regeneration areas are outlined in Section 5.5.2, Volume 1 of the EIS. With regard to performance of the ECAs, a flora and flora monitoring programme would be developed for the ECAs to assess the performance of the management measures in enhancing/improving habitats for flora and fauna. The monitoring programme would be detailed in the FFMP. An overview of the monitoring programme is provided in Section 5.4, Volume 1 of the EIS. Completion criteria for the ECAs are outlined in Section 5.5.2, Volume 1 of the EIS.

No.	Issue	Response
21	(Continued)	As stated in Section 5.2.7, Volume 1 of the EIS: "*On-going site specific trials and studies would be conducted to examine options and to optimise revegetation techniques. …* *Proposed trials and studies would be outlined in the MOP (Section 5.1.1.1) with results reported in the AEMR (Section 5.1.1.2) as part of the MREMP*." Section 5.2.7, Volume 1 of the EIS presents examples of trials and studies that may be undertaken over the life of the Project. As stated in Section M7.2 of Appendix M, Volume 5 of the EIS: "*Chemical and physical assessment of the soil properties within the Project disturbance area (Attachment MB) indicate that the soil resource in Table M-6 would be suitable for rehabilitation purposes provided appropriate management practices are implemented and relevant amelioration measures are applied where necessary.*" ***Final Landforms*** As stated in Section 5.2.8, Volume 1 of the EIS: "*Final landform concepts discussed in this section would be revised and refined throughout the Project life, utilising the outcomes of on-going consultation with relevant authorities, stakeholders and the results of trials.* *Final landform design concepts would remain consistent with the objectives presented in Section 5.2.1*." As stated in Section 5.2.4, Volume 1 of the EIS: "*Once completed mine landforms have been reprofiled, stripped subsoil and topsoil would then be spread to assist in vegetation establishment. If topsoil resources are unavailable or unsuitable, additional topsoil material would be stripped from disturbance areas where red podzolic soils occur (up to a further 30 cm – Appendix M) for use in rehabilitation works. Appropriate ameliorative measures (as described below) would also be applied where necessary.* *Following soil application, the rehabilitation area would be shallow ripped with a chisel plough or similar implement to encourage infiltration, increase the volume of soil readily accessible to plant roots and to bind the topsoil/subsoil to underlying mine waste rock material.* *WCPL would develop management strategies to ameliorate mine waste rock/soil materials used in rehabilitation where necessary. These ameliorative measures may include the use of lime, gypsum and/or fertiliser to improve the chemical and/or nutrient properties of the soil.*" Issues associated with final voids are addressed in Issue Nos. 36 and 56.

No.	Issue	Response
22	Concern regarding long term effects and mine closure, including: • responsibility post mining; and • long-term land management issues particularly relating to mine waste rock emplacements.	***Responsibility for the Project site Post Mining*** Section 5.5.2, Volume 1 of the EIS presents key completion criteria for project components including final landforms; tailings disposal areas; surface infrastructure; final voids; rehabilitation areas; regeneration areas; and Enhancement and Conservation Areas. The completion criteria would be utilised to evidence achievement of the objectives of the Environmental Protection Plan (Section 5, Volume 1 of the EIS). Upon cessation of mining operations, it would be expected that tenure of the mining lease would be maintained by WCPL until such time as these completion criteria are achieved along with any relevant statutory requirements (e.g. fulfilment of mining lease conditions). WCPL would then seek to relinquish the Project mining lease. ***Long-term Land Management Issues – Waste Rock Emplacements*** As stated in Section 4.1.1, Volume 1 of the EIS, mine infrastructure and landforms have been designed and located to integrate with existing topography and landscape features via: • "*progressive development of mine waste rock emplacements by backfilling behind the advancing open cut to integrate Project landforms with the existing topography and to reduce the need for remnant vegetation clearance associated with out-of-pit mine waste rock emplacements; and* • *progressive rehabilitation of Project landforms in a manner that maximises integration with the surrounding landscape*." As stated in Section 3.8 of Appendix A, Volume 2 of the EIS: "*… it is expected that drainage from mine waste rock emplacement areas would be non-saline and near neutral in pH*." Issues associated with mine closure and final voids are addressed in Issue Nos. 19, 36 and 56.
23	Concern over the quality of the coal and quantity of greenhouse gases produced by the Project during the mining and subsequent burning of the coal and the contribution this would make to global warming.	An assessment of Project greenhouse gas emissions is provided in Section 11 of Appendix E, Volume 2 of the EIS. The outcomes of the assessment is summarised in Section 4.6.4, Volume 1 of the EIS as follows: "***Potential Impacts*** *The major source of Project-related emissions of greenhouse gases would be the combustion of diesel fuel (used in diesel-powered equipment and in blasting). In addition, emissions would occur indirectly from the use of electricity to power mining equipment and to operate the CHPP and conveyors. Open cut mining can also result in emissions of methane (CH4) and carbon dioxide (CO2) that is currently trapped in the coal matrix and would be released as fugitive emissions as the coal is mined.*

No.	Issue	Response
23	(Continued)	*An assessment of Project greenhouse gas emissions was conducted in accordance with the provisions of the Australian Greenhouse Office (2003) (Appendix E). The emission estimate for the life of the Project is 1,948,473 tonnes CO2 equivalent (t CO2-e), which equates to an average of 92,784 t CO2-e per year over 21 years (ibid.). …* ***Mitigation Measures*** *Minimising fuel usage by mobile plant (and associated greenhouse gas emissions) is an objective of mine planning and Project cost control systems. Additional controls on greenhouse gas emissions associated with the Project would include:* • *regular maintenance of plant and equipment to minimise fuel consumption and associated emissions;* • *consideration of energy efficiency in plant and equipment selection/purchase; and* • *establishment of significant areas of woodland vegetation over the Project life (Sections 5.2 and 5.3).* *In addition, consideration would be given to the further usage of solar power for specific site applications. The existing Project meteorological station and stream gauging stations are solar powered.*" Over the lifetime of the Project, a total of approximately 251 Mt of run-of-mine coal would be mined. This would yield approximately 180 Mt of product coal, as detailed in Table 1-1, Volume 1 of the EIS: "*Approximately 147 Mt and 33 Mt of product coal would be produced for domestic use and export, respectively.*" The characteristics of the Project coal working sections are presented in Table 2-1, Volume 1 of the EIS. As stated in Section 2.1, Volume 1 of the EIS: *"The Ulan Seam is approximately 15 metres (m) thick and comprises plies of good to fair quality coal, plies of poorer quality (i.e. high ash) stony coal and partings of carbonaceous claystone, claystone, tuffs and other non-coal lithologies."* Further to this, it is stated in Section 11 of Appendix E, Volume 2 of the EIS: "*Tests have been undertaken to estimate the quantity of fugitive CH_4 and CO_2 likely to be released from the coal seams as they are mined. The test results were provided in a report by* ***GeoGAS Systems Pty Ltd (2005)****. Five samples from two boreholes were analysed. The quantity of gas liberated ranged from 0.41^{6}m^3/t (from the WL-03 samples at a depth of approximately 32 m) to 0.60 m^3/t (from the WL-04 sample at a depth of approximately 32 m) to 0.60 m^3/t (from the WL-04 sample at a depth of approximately 16 m). The average value was 0.51 m^3/t."*

No.	Issue	Response
23	(Continued)	Greenhouse gas emissions that are emitted from coal being combusted for energy generation are not an environmental impact of carrying out this Project and is therefore not relevant to the assessment of this Project.
24	Concern regarding the EIS structure and presentation of information during preparation of the EIS.	The structure of the EIS is described in Section 1.4, Volume 1 of the EIS. The EIS has been prepared in accordance with Director-General's Requirements issued by DIPNR, as well as EIS requirements provided by Integrated/Other Authorities including DIPNR, DEC, DPI-MR, RTA, DPI-Fisheries and MWRC, following the Planning Focus Meeting conducted in August 2004. Volume 1 of the EIS presents the actual Environmental Impact Statement based on the technical studies presented in Volumes 2 to 5. Abbreviations, acronyms and terms used in the main report are defined in Section 8, Volume 1 of the EIS. An interactive CD was made available during the exhibition period for interested parties to view and search the EIS electronically. The CD included hyperlinks between the EIS Volumes, Table of Contents, Sections, Tables and Figures. The Project Overview booklet was also made available on the Excel Coal website for downloading during the exhibition period. During the preparation of the EIS, the posters displayed during community meetings were made publicly available on the Excel Coal website (http://www.excelcoal.com.au/community/index.htm) as was the WCPL presentation made to the public forum during finalisation of the EIS. There is a need to have cross-referencing between the technical studies presented in Volumes 2 to 5, and between Volume 1 and each of the technical studies. This is because many of the technical studies are inter-related and share information (e.g. the Surface Water Assessment and the Groundwater Impact Assessment). The water management section of the main report, Section 2.9, Volume 1 of the EIS, provides a summary of the water management strategy which is detailed in Appendix A, Volume 2 of the EIS. Section 2.9, Volume 1 of the EIS is divided into sub-sections describing the water management system (including upslope diversion works, floodplain water management, system inflows, water consumption, Cumbo Creek relocation and reconstructed creek features over rehabilitated landforms), site water supply and Project water supply borefield, and contains figures of the Project water management system (Figure 2-16) and Cumbo Creek relocation corridor (Figure 2-17). A description of the Project water supply borefield and CHPP water supply storage, required as part of the initial construction and other development activities, is provided in Section 2.3.6, Volume 1 of the EIS.

No.	Issue	Response
25	Concern regarding: • the interaction between the Project and the Wollar-Wellington 330 kV transmission line being developed by TransGrid; • the potential for the sharing of infrastructure; and • cumulative impacts with existing and proposed mining activities.	WCPL has consulted extensively with TransGrid in regard to route selection and environmental assessment for the proposed Wollar-Wellington 330 kV transmission line in the vicinity of WCPL-owned land. It is understood that TransGrid completed an EIS for the transmission line in August 2005. WCPL will continue to consult with TransGrid in regard to: easements over WCPL-owned land (and any associated compensation); interaction between the Wilpinjong Coal Project development and the transmission line; and the disturbance of any structures on WCPL-owned land by the development of the transmission line (and any associated compensation). ***Potential Sharing of Common Infrastructure*** WCPL and White Mining Limited (proponent for the Moolarben Coal Project) have been engaged in discussions regarding the potential future sharing of common infrastructure such as the 66 kV powerline from Ulan. These discussions are ongoing. ***Cumulative Impacts with Existing Mining Activities*** Potential cumulative impacts with respect to the Ulan Coal Mines (including the as yet undeveloped components of Stage 2 which it is understood are proposed to be developed as part of the Moolarben Coal Project) are considered where relevant in the EIS, as stated in Section 1.4, Volume 1 of the EIS. For example: • the Surface Water Assessment considers potential cumulative impacts with Ulan Coal Mines on Wilpinjong Creek and on the Goulburn River (Section 5.4 of Appendix A, Volume 2 of the EIS); • the Groundwater Impact Assessment considers potential cumulative impacts with Ulan Coal Mines (Section 13.1 of Appendix B, Volume 2 of the EIS); • the Construction, Operation and Transportation Noise and Blasting Impact Assessment considers potential cumulative impacts with Ulan Coal Mines (Section 9 of Appendix D, Volume 2 of the EIS); • the Air Quality Impact Assessment considers potential cumulative impacts with Ulan Coal Mines (Section 9 of Appendix E, Volume 2 of the EIS); • the Community Infrastructure Assessment considers potential cumulative impacts with Ulan Coal Mines (Section J4.6 of Appendix J, Volume 5 of the EIS); • the Road Transport Assessment considers potential cumulative impacts with Ulan Coal Mines (Section K6.7 of Appendix K, Volume 5 of the EIS); and • the Visual Impact Assessment considers potential cumulative visual impacts with Ulan Coal Mines, including potential cumulative night-lighting impacts (Section K6.7 of Appendix K, Volume 5 of the EIS).

No.	Issue	Response
25	(Continued)	It should be noted that the Moolarben Coal Project is not yet approved. It is understood that the proponent of the Moolarben Coal Project (White Mining Limited) is currently preparing a project description and environmental assessment. It is envisaged that this environmental assessment would be required to consider the cumulative impacts of Ulan Coal Mines, Wilpinjong Coal Project and the Moolarben Coal Project, in accordance with any Department of Planning assessment requirements.
26	Concerns were raised with respect to transport and traffic, including issues in relation to: • The intersection of the mine access road and Wollar Road. • The intersection of the temporary access roads and Ulan-Wollar Road. • Condition and traffic flows on Ulan-Wollar Road. • Realignment of Ulan-Wollar Road later in the mine life. • Condition and traffic flows on Wollar Road. • The intersection of Ulan Road and Wollar Road. • Traffic accidents and road safety. • Heavy and oversize vehicle movements during construction. • Roadwork specifications.	A Road Transport Assessment was conducted for the EIS and is presented in Appendix K, Volume 5 of the EIS. The Road Transport Assessment includes: • a description of the existing traffic flows and conditions in the region surrounding the Project; • a quantification of traffic generated by the Project during the construction and operational phases; • an assessment of the potential impacts of the Project on traffic flows; and • traffic management measures. Sections 3.11 and 4.12, Volume 1 of the EIS, summarise the findings of the Road Transport Assessment. WCPL is working with the Mid Western Regional Council (MWRC) regarding: the conduct of a road conditions audit as part of a route assessment; the design of road improvements; suitable design specifications; and funding contributions. ***Mine Access Road and Wollar Road Intersection*** In regard to the intersection between the proposed mine access road (to be formed by the realignment of the existing Wilpinjong Road on the southern boundary of the Project site and Wollar Road, Section 4.12.2, Volume 1 of the EIS provides the following description of the proposed intersection design: *"Alignment of the intersection of the mine access road with Wollar Road would be undertaken to improve visibility (from the current Wilpinjong Road intersection) and the intersection would be designed as a "Type B" (basic) intersection incorporating a "Type AUR" (auxiliary turn lane) right turn treatment from Wollar Road and a "Type BAL" (basic left turn treatment) from Wollar Road, in accordance with the Road Design Guide (RTA, 1996) (Appendix K).* *The detailed design of the intersection should accommodate turning manoeuvres of B-Doubles as defined by the Guide to Traffic Engineering Practice: Part 5 – Intersections at Grade (Austroads, 1988) with these vehicles turning without crossing the centrelines of the intersection approaches in Wollar Road. This would require the widening to be sealed and extended over a distance of about 190 m, subject to detailed design. Intersection pavement design would be prepared in accordance with A Guide to the Structural Design of Road Pavements (Austroads, 1992).* *Approximately 100 m of the mine access road would be sealed on the approach to the intersection with Wollar Road to minimise transport of gravels onto the Wollar Road pavement."*

No.	Issue	Response
26	(Continued)	The predicted traffic volumes (i.e. number of vehicles) at the intersection of Wollar Road and the mine access road during both the morning and afternoon peak periods are within the 'Type A' category of the warrants on Figure 5.23b of the Guide to Traffic Engineering Practice: Part 5 – Intersections at Grade (Austroads, 1998). On this basis, a left turn taper to assist entry into the site is required. A Type B intersection with a right turn auxiliary lane (Type AUR) as proposed in the EIS is an over-design which has been adopted to provide a higher level of safety. It has been suggested that a Type AUL left turn rather than a Type BAL left turn should be provided. WCPL considers this inappropriate as the expected volumes do not meet the warrant for a Type AUL treatment. WCPL would comply with MWRC requirements with respect to drainage, setback distances and appropriate signposting for the intersection of the mine access road and Wollar Road. ***Intersection of the Temporary Access Roads with Ulan-Wollar Road*** Temporary access roads to and from the site and the Project construction camp would be required from Ulan-Wollar Road during the Project construction. As stated in Section K7 of Appendix K, Volume 5 of the EIS, during the construction phase: "*…the Project would require temporary access to Ulan-Wollar Road at the Project and at the construction camp and this would require suitable intersections to be constructed with Ulan-Wollar Road. The traffic would travel for a short distance on Ulan-Wollar Road to avoid the need for an additional road crossing of the Gulgong-Sandy Hollow rail line. No sealing of these intersections would be required due to the low traffic volumes and short term nature of their use*." As described in Section K6.2 of Appendix K, Volume 5 of the EIS, the temporary access roads: *"…would require suitable splays to accommodate safe turns and no sealing would be required."* During the operational phase, the temporary access roads would not be required. WCPL could require the mine access road to be used at all times through employment contracts or contractor agreements, if necessary. Operational phase traffic generation on the Ulan-Wollar Road is described in Section K5.2 of Appendix K, Volume 5 of the EIS: *"The mine operation activity is estimated to generate an additional 26 vpd* [vehicles per day] *on this route, including 24 light vehicles and 2 small truck/heavy vehicles. This includes traffic travelling via Main Road 214 to link with the Golden Highway (State Highway No. 27) to access Singleton, Muswellbrook and Dubbo, as well as traffic continuing to the west at Ulan to travel to Gulgong. Accordingly, traffic volumes on this route would increase from 175 vpd to 201 vpd or 15%."*

No.	Issue	Response
26	(Continued)	Given the low traffic volumes described above, auxiliary turning lanes or sealing of the intersection between the temporary access road and Ulan-Wollar Road would not be warranted. WCPL would comply with MWRC requirements with respect to drainage, setback distances and appropriate signposting for the intersection of the temporary access roads and Ulan-Wollar Road. ***Condition of Ulan-Wollar Road*** Use of Ulan-Wollar Road during the construction phase (primarily for access to and from the construction camp) would be a short-term impact and traffic volumes would revert to levels only slightly above existing volumes when the operational phase commences (as discussed above). WCPL considers only limited works on Ulan-Wollar Road are required in support of the Project as stated in Section K7, Appendix K, Volume 5 of the EIS: *"During the construction phase, the Ulan-Wollar Road between Ulan and the Project site would require an unsealed 8.0 m wide formed carriageway comprising two lanes each 3.0 m wide with 1 m wide shoulders. This configuration is presently available (subject to a detailed road conditions audit) and accordingly this road would need to be maintained to current standards. Sealing of the unsealed sections of the road is not warranted for the short term nature of the construction phase. Less Project-related traffic would use Ulan-Wollar Road during the operational phase when compared to the construction phase traffic volumes so the road would be satisfactory for the life of the Project*." For the short term nature of Project construction effects on the Ulan-Wollar Road, WCPL considers that the provision of an 8.0 metre carriageway would be satisfactory as it would provide two traffic lanes of 3.5 metres, with 1 metre wide shoulders. The Austroads "Guide to the Geometric Design of Rural Roads" does not address 'short-term' construction effects. Additional traffic on Ulan-Wollar Road during the operational phase relates to some additional 26 vpd, (i.e. an increase from an estimated 175 vpd to 201 vpd) as shown in Table K-10 of Appendix K, Volume 5 of the EIS. This minor increase would easily be accommodated with the road specifications described above for the construction phase. Sealing of the road is not considered to be warranted. ***Realignment of Ulan-Wollar Road*** The development of the Project open pits requires the realignment of sections of Ulan-Wollar Road during the Project life. As stated in Section 2.3.9, Volume 1 of the EIS:

No.	Issue	Response
26	(Continued)	*"The extent of the Project open pits in the north of the Project area would require the realignment of two sections of Ulan-Wollar Road (Figures 2-7 and 2-9). The realigned sections would be approximately 3 km in length in the north-west and approximately 800 m in length in the north-east. Realignment of Ulan-Wollar Road would occur in the north-east prior to development of the Cumbo Creek relocation corridor (approximately Year 8) and in the north-west prior to mining operations commencing in Pit 5 (approximately Year 13)."* A Traffic Management Plan would be prepared for the Project to address roadwork on the public road network, as stated in Section 5.1.2.9, Volume 1 of the EIS: "*A Traffic Management Plan (TMP) would be prepared in consultation with the RTA and MWRC and would be updated when required (e.g. prior to the relocation of part of Ulan-Wollar Road, later in the mine life)*." ***Condition of Wollar Road*** As stated in Section K7 of Appendix K, Volume 5 of the EIS: *"During the construction phase, Wollar Road (west of the Mine Access Road) (Table K-6) would carry total volumes of approximately 290 vpd at Site 4 and approximately 480 vpd West of Cooyal (Site 3). During the operational phase, this section would carry volumes of 358 vpd at Site 4 (Figure K-3) and 544 vpd at Site 3 (Figure K-3). These traffic volumes would require minimum lane widths of 3.0 m, with road shoulders of minimum width 1.0 m and this is generally provided on the route. However, there is a total length of approximately 2.3km that requires widening to provide 3.0 m lanes. No other significant improvements are required. This should be confirmed as part of a road conditions audit prior to Project construction."* As Wollar Road is a classified main road (MR 208), specifications for these upgrades should be assessed against the RTA requirements described in the RTA Road Design Guide. This guideline provides carriageway widths for volumes between 500 vpd and 2,000 vpd. In view of the relatively low predicted traffic volumes (substantially less than 2,000 vpd) a width of 6 m (with 1 m wide shoulders) is considered to be appropriate and would result in an overall improvement in road conditions. The specific locations where road widening is required would be determined by a road conditions audit as described in Section K7 of Appendix K, Volume 5 of the EIS. It is anticipated that the majority of road widening would involve extension of the bitumen seal, without any significant alterations to the overall road reserve corridor. WCPL is currently in consultation with the MWRC regarding the scope of the road conditions audit.

No.	Issue	Response
26	(Continued)	***Ulan Road and Wollar Road Intersection*** As stated in Section 4.12.2, Volume 1 of the EIS: *"The existing traffic flows at the Ulan Road/Wollar Road intersection (Main Road 208) already requires an upgrade of the intersection geometry to provide a passing lane for traffic on Ulan Road (Appendix K). As the construction and operational phases of the Project would contribute additional traffic to this intersection the Road Transport Assessment (Appendix K) recommends upgrading of this intersection."* Section K7 of Appendix K, Volume 5 of the EIS provides additional information on the type of upgrade required: *"The existing traffic flows at the intersection of Wollar Road (Main Road 208) with Ulan Road (Main Road 208/214) presently requires a Type BAR right turn from Ulan Road into the Wollar Road, with an unsealed passing lane (Section K2.4)."* The RTA or MWRC may wish to upgrade this right turn by providing an unsealed passing bay (to provide a Type BAR right turn facility); or by sealing the passing bay (to a Type AUR right turn facility). However, neither of these improvements are required as a direct consequence of the Project, which would not trigger any threshold warrant. Similarly, the left turn traffic volumes (existing plus that expected to be generated by the Project) from Ulan Road into Wollar Road fall well below the required warrant for a Type AUL left turn treatment so that a Type A treatment is not justified in support of the development. The intersection of Wollar Road with Ulan Road is presently approximately at right angles at the position where a vehicle exiting Wollar Road will be stationary while waiting for a suitable gap to turn either left or right. Accordingly, the driver's observation angle is satisfactory and no geometric improvement is necessary. WCPL considers that the additional traffic generated by the development (192 vpd), as shown in Table K-10 of Appendix K, Volume 5 of the EIS does not introduce a significant new accident potential. ***Traffic Accidents and Road Safety*** Table K-4 in Appendix K, Volume 5 of the EIS provides a summary of accident data provided by the RTA with respect to accidents involving human injuries; accidents where at least one vehicle was towed away; and accidents involving human fatalities. As stated in Section K2.5, Volume 5 of the EIS: *"The accident data in Table K-4 does not indicate any safety issues associated with the local road network that are of particular relevance to the Project."*

No.	Issue	Response
26	(Continued)	Accidents that have not been reported to the RTA would not appear in the abovementioned data set. As stated in Section K6.6 of Appendix K, Volume 5 of the EIS: *"Impacts of Project-related traffic on State Highways would be minimal and no change in road safety conditions is expected. The current accident rates on local roads (Table K-4) are typical for rural areas and the Project is not likely to significantly alter the existing local road safety environment. The proposed road audit discussed in Section K8 would however provide a possible opportunity for minor improvements in road safety."* ***Heavy Vehicle Movements During Construction*** Predicted peak daily small truck and general heavy vehicle movements during construction (24 per day) are detailed in Table 4-16 in Section 4.12.1, Volume 1 of the EIS. The transport of oversize loads during the construction phase was described in the Section 4.12.1, Volume 1 of the EIS: *"A number of over-width, over-height or over-weight loads would be generated during the construction phase, however, the number of these oversize loads would be small. All such loads would be transported with the relevant permits, licences and escorts, as required by the relevant regulatory authorities. The proposed route for these oversize loads would be selected in consultation with the relevant local councils. However, it is expected that they would travel only along State Highways and Main Roads to the Project site."* Ulan-Wollar Road is not a State Highway or Main Road and was therefore not considered a preferred route for the transport of oversize loads. Section K7 of Appendix K, Volume 5 of the EIS states: • *."It is recommended that prior to and following road improvements, a road safety audit is undertaken to check compliance with relevant standards.* • *It is recommended that regular consultation be undertaken with the RTA and Mid-Western Regional Council as appropriate during the Project construction and operational phases."* A route assessment for oversize loads has been requested by the MWRC. WCPL has commenced the route assessment in consultation with the MWRC. The proposed route assessment would identify the requirements of any special vehicles during the construction and operational phases. ***Roadwork Specifications*** WCPL is currently engaged with the MWRC in regard to roadwork specifications.

No.	Issue	Response
27	Concerns were raised in regard to integrated approval requirements.	WCPL has withdrawn its development application lodged under Part 4 of the *Environmental Planning and Assessment Act* 1979 (EP&A Act), and lodged an application for "Project Approval" for the same Project under Part 3A of the EP&A Act. Part 3A of the EP&A Act does not incorporate the former integrated development provisions of Part 4 of the EP&A Act. If any planning approval is granted, certain former integrated approvals such as water management approvals will not be required. However, an Environment Protection Licence will be required for the Project. The change under Part 3A of the EP&A Act does not alter the environmental assessment conducted for the Project.
28	Requests were made for a Commission of Inquiry.	Two submissions requested that the Minister for Infrastructure and Planning (now Minister for Planning) direct that a Commission of Inquiry be held to further assess the Wilpinjong Coal Project development application. This is a matter for the Minister to determine, however the following should be noted: • WCPL has withdrawn its development application lodged under Part 4 of the *Environmental Planning and Assessment Act* 1979 (EP&A Act), and lodged an application for "Project Approval" for the same Project under Part 3A of the EP&A Act. • Under Part 3A of the EP&A Act, the Minister may convene a Panel of Experts or the Minister may direct that a Commission of Inquiry be held. The Minister has announced that a Panel of Experts be formed to assess the Wilpinjong Coal Project.
29	Requests were made for the rehabilitation and remediation of past mining impacts prior to the approval of the Wilpinjong Coal Project.	A concern was raised that no further mining projects should be approved (i.e. by the NSW Minister for Planning) until such time as rehabilitation and remediation of past mining impacts (i.e. from other mining projects across NSW) has been successfully undertaken. This is a matter for the NSW Minister for Planning, however Section 5, Volume 1 of the EIS presents a comprehensive rehabilitation concept for the Wilpinjong Coal Project. WCPL is not responsible for the rehabilitation of other mining projects undertaken by other companies. Applications for project approval for mining activities in New South Wales are assessed in accordance with the *Environmental Planning and Assessment Act, 1979*. Each application is assessed on its own merits (including the consideration of cumulative impacts) by the NSW Minister for Planning and consideration of unrelated sites is not relevant to the merits of the Wilpinjong Coal Project.
30	Concerns were raised regarding the water supply requirements for the Project including: • the derivation of 6.2ML/day water demand requirement; • the sustainability of the source of the mine water supply over the life of the Project and its storage; • the source of the potable water supply; and • the effect of saline water use in the CHPP.	***Water Supply Requirements - 6.2 ML/day Water Demand*** Section 2.9.2, Volume 1 of the EIS describes the water supply requirements for the Project as follows: "*The main water usage for the Project would be associated with the washing of ROM coal in the CHPP. Other water supply requirements include water for dust suppression on haul roads and other non-potable water uses. A small potable supply would also be required to service the construction camp and for drinking water and ablution facilities in the office and crib areas (Section 2.10.4).*

No.	Issue	Response
30	(Continued)	*The peak total make-up water demand including the operation of the CHPP at 8.5 Mtpa and accounting for recycling of water from the tailings thickener is estimated to be approximately 6.2 ML/day (Appendix A).* *Where practicable, Project water supply would be prioritised as follows (Figure 2-16):* *1. Recycling of water from the tailings thickener overflow. Capture of incident rainfall and runoff across the mining operational areas (i.e. CHPP, mine facilities area, ROM and product coal stockpile areas).* *2. Recovery of supernatant waters and seepage collected from tailings disposal areas. Dewatering of active open cut mining areas including groundwater inflows, incident rainfall and infiltration/runoff from adjacent mine waste rock emplacements. Advance dewatering via temporary bores (Section 2.4.8).* *3. Dewatering of inactive open cut mining areas including groundwater inflows, incident rainfall and infiltration/runoff from adjacent mine waste rock emplacements.* *4. Licensed groundwater extractions from Project water supply borefield to the north of the open cut mining operations.* *The majority of the Project make-up water supply requirements would be met by dewatering of the open cut mining areas and the Project water supply borefield. Mine water would be suitable for use in the CHPP and for dust suppression purposes (Appendix A). The groundwater quality in the Ulan Seam aquifer (Appendix B) is considered suitable for use in the CHPP. Further details of the Project water supply borefield are provided in Section 2.9.3.* *A predictive assessment of the performance of the Project water supply system is presented in Appendix A. The simulated water supply reliability[1] is 95% (Appendix A). The predictive assessment indicates that from Year 11 of the Project there is unlikely to be a need to source water from the Project water supply borefield, with demand being met by mine water sources alone (i.e. Project water supply priorities 1, 2 and 3 described above).*" **Note:** [1] Expressed as a volume of water supplied divided by volume required. Appendix A, Volume 2 of the EIS, presents the results of the water balance modelling undertaken for the Project in more detail. The water balance modelling and simulation of water supply requirements indicates a water demand requirement of 6.2ML/day. The groundwater modelling presented in Appendix B, Volume 2 of the EIS indicates that this water demand requirement can be met over the life of the Project by site water sources, including the proposed water supply borefield. As described in Section 5.1.2.4, Volume 1 of the EIS, the site water balance would be subject to review over the life of the Project.

No.	Issue	Response
30	(Continued)	***Sustainable Water Management Objectives*** As described above, it is considered that the Project can achieve a high volumetric water supply reliability from the nominated sources. Section 3.1 of Appendix A, Volume 2 of the EIS lists the sustainable water management objectives in accordance with standard management practices in the Australian mining industry: *"Water management requirements for the Project have been assessed consistent with the standard water management practices in the Australian mining industry (MCA, 1997), which include:* *1. Efficient use of water based on the concepts of 'reduce, reuse and recycle'.* *2. Avoiding or minimising contamination of clean water streams and catchments.* *3. Protecting downstream water quality for beneficial uses.*" ***Potable Water Supply*** As described in Section 2.10.4, Volume 1 of the EIS, potable water would be stored in a 35,000 litres (L) storage tank which would be located in the mine facilities area. Potable water would be provided from town water supply delivered by tanker truck. A potable water supply reticulation system would service the appropriate areas around the site (e.g. office buildings, crib rooms and maintenance areas). WCPL would expect to be charged for this water by the MWRC in accordance with standard council rates. ***Mine Water Quality*** The quality of mine waters is discussed in Section 3.2 of Appendix A, Volume 2 of the EIS. Different water types (collectively referred to as mine water) would be produced from the different areas of the operation, including: • Water from dewatering of the active open cut – comprising both groundwater inflow and runoff from rainfall over the catchment area of the active mine. • Runoff and seepage from active and partially rehabilitated mine waste rock emplacement areas. • Runoff and seepage from the run-of-mine (ROM) coal and product coal stockpiles. • Decant recovery and rainfall yield from the tailings disposal areas. • Runoff from haul road and operational hardstand areas. • Runoff from the mine facilities area (i.e. workshop and vehicle re-fuelling area). • Effluent from the domestic sewage treatment facility.

No.	Issue	Response
30	(Continued)	As discussed in Section 3.2 of Appendix A, Volume 2 of the EIS, the management of the abovementioned mine waters would depend on their rate of generation and the capacity for reuse and/or recycling. Depending on the quality of different mine waters, it would be used for different purposes such as: CHPP make-up demand; for washdown of mobile plant; for dust suppression on haul roads; and for dust emission control in the ROM and product coal stockpile areas. As stated in Section 2.9.2, Volume 1 of the EIS: "*Mine water would be suitable for use in the CHPP and for dust suppression purposes (Appendix A). The groundwater quality in the Ulan Seam aquifer (Appendix B) is considered suitable for use in the CHPP*." As stated in Section 5.2.5 of Appendix B, Volume 2 of the EIS: "*The quality of groundwater in the Ulan Seam is reasonable with groundwater electrical conductivity (EC) varying between 1,020 µS/cm (ERUL27) and 3,390 µS/cm (DMCM12), as shown in Table 6*." The sources of mine waters are of a quality suitable for use in the CHPP.
31	Concerns were raised regarding the water balance data presented in the EIS.	***Water Balance Data*** As stated in Section 1 of Appendix A, Volume 2 of the EIS: "*Water balance and hydrological models have been used to assess the performance and capacity requirements for water supply and water management infrastructure during the operational phase of the Project. The post closure water balance dynamics of the final voids and the impacts of the Project on flows and water quality in Wilpinjong Creek have also been assessed with the aid of hydrological models*." An overview of the water management system is provided in Section 3.2 of Appendix A, Volume 2 of the EIS. The water management system is shown in schematic form on Figure 2-16 of Section 2, Volume 1 of the EIS, and would be progressively developed. As stated in Section 2.9.1, Volume 1 of the EIS: "*The water consumption requirements and water balance of the system would fluctuate with climatic conditions and as the extent of the mining operation changes over time*."
32	Concerns were raised regarding the potential cumulative impacts on base flows in unregulated streams in the Upper Hunter River catchment.	***Cumulative Impacts*** Potential cumulative impacts of the Project (including the existing Ulan Coal Mines) on groundwater and surface water are discussed in Section 13.1 of Appendix B and Section 5.4 of Appendix A, Volume 2 of the EIS, respectively. As stated in Section 13.1 of Appendix B, Volume 2 of the EIS: "… *it is concluded that there would be no overlap in the cone of depression generated by the Ulan Coal Mines (including Ulan Stage 2) and the Project and therefore no cumulative groundwater impacts are predicted*."

No.	Issue	Response
32	(Continued)	As stated in Section 5.4 of Appendix A, Volume 2 of the EIS: *"… there would be no discernible increased or cumulative adverse impacts on the Goulburn River as a result of the Project."* *"… it is not expected that the Ulan Stage 2 would have any surface water impacts on Wilpinjong Creek and negligible effect on the Goulburn River."* The surface water assessment (Appendix A, Volume 2 of the EIS) assessed the potential impacts of the Project on surface water resources. As stated in Section 4.3.2, Volume 1 of the EIS: *"The potential maximum flow reduction in Wilpinjong Creek equates to an 11% reduction of annual average flow. Downstream of the confluence of Wilpinjong and Wollar Creeks the affects would diminish due to the inflows from unaffected catchments (Appendix A).* *Whilst the predicted changes to low flows in Wilpinjong Creek would be expected to be noticeable as reduced flow persistence, the magnitude of predicted effects can be compared to those that occur due to other changes in catchment condition and landuse such as changes in livestocking rates, construction of farm dams, water harvesting or bushfires which can also result in noticeable changes to low flows (Appendix A). …* *The actual magnitude of the potential flow reductions in Wilpinjong Creek annual average flow would vary with time and would be less than that described above and presented in Table 4-4, depending on the area of catchment excised by Project operations and on the level of usage of the Project water supply borefield. In periods of the Project life when catchment excision and borefield extractions are less, the reduction in flow would also be expected to be less. Revegetation associated with the creek enhancement works would develop through the Project life in parallel to any flow effects (Sections 5.3 and 5.4)."* As stated in Section 5.1.3.6, Volume 1 of the EIS: *"Surface water flow rate (via water level) would be monitored continuously at installed gauging stations on Wilpinjong and Cumbo Creeks (Figure 5-1). …* *The site water balance would be reviewed annually to optimise performance and validate predictions. These reviews would be linked to borefield performance reviews. The reviews would also facilitate the preparation of contingency/remediation plans for managing adverse impacts of the Project on surface water, where necessary (Section 5.1.2.4)."*

No.	Issue	Response
32	(Continued)	Further, Australasian Groundwater and Environmental Consultants' (AGEC) prepared the groundwater impact assessment for the Wilpinjong Coal Project (Appendix B, Volume 2 of the EIS). AGEC's model simulated the development and extent of the cone of depression in the main groundwater aquifers in the Project area. It is stated in Section 4.4.1, Volume 1 of the EIS: *"No bores or wells installed in the Wilpinjong Creek alluvium or Wollar Creek alluvium are expected to be affected."*
33	Concerns were raised regarding the management of surplus water on site and the potential for saline mine water to be discharged off site during wet weather conditions.	***Surplus Water Storage*** Section 3.2 of Appendix A, Volume 2 of the EIS states: "*Water in active open cuts would be pumped out to enable ongoing safe access for mining. If required, water would be stored in inactive open cut voids and sourced progressively to supplement the CHPP water supply storage during dry periods. During wet periods, when there may be an excess of water being generated, water captured in active open cuts would be pumped to inactive open cut voids and/or tailings disposal areas for temporary storage*." ***Discharge of Saline Mine Water*** As stated in Section 4.2.1 of Appendix A, Volume 2 of the EIS: *"Results of modelling indicate that there would be sufficient on-site storage capacity available in the open cut voids and other storage areas to provide secure containment for all mine water and tailings in all simulated climatic sequences. Under some conditions secure containment would necessitate the pumped transfer of excess water from active open cut areas and/or the active tailings disposal areas to inactive open cut voids for temporary containment."* An assessment of post mining surface water impacts presented in Section 6 of Appendix A, Volume 2 of the EIS investigated the behaviour of the final voids using a water and salt balance model. The results of the model indicate: "…*the voids in both Pits 3 and 6 would slowly fill with water and in the long-term, water levels would approach an equilibrium level significantly below the spill level of the final voids. Model results indicate that that it would take over 300 years for water levels to reach equilibrium in the Pit 6 final void (which would be empty at the end of the 21-year Project life)*." Based on the above, the Project description does not include a proposal to release mine waters to Wilpinjong Creek. All mine waters generated by the Project are to be stored on-site.
34	Concerns were raised regarding the relocation of Cumbo Creek, the location and design of clean water diversions and reconstruction of creek features over rehabilitated landforms.	As stated in Section 4.3.2, Volume 1 of the EIS: "*Creeks situated within the limits of the Project open pits would be removed or altered as a result of open cut mining, including Planters, Spring, Narrow, Bens and Cumbo Creeks*."

No.	Issue	Response
34	(Continued)	***Cumbo Creek Relocation*** The Project would include the relocation of Cumbo Creek. A description of the Cumbo Creek relocation corridor is provided in Section 2.9.1, Volume 1 of the EIS and is shown on Figure 2-17, Volume 1 of the EIS: "*The corridor would comprise a low flow path within a high flow flood path. Alluvium from alluvial/colluvial deposits associated with the drainages within the open pit limits would be excavated as part of mining operations and relocated to the low flow path to provide natural creek bed material and help minimise erosion during high flow events. Below the relocated alluvium, the invert of the creek would be lined with an engineered low permeability zone (comprising more weathered mine waste rock selectively placed and compacted to engineering specifications) to reduce the potential for leakage of flows to the underlying mine waste rock emplacement. The low permeability zone would be supported on an engineered bridging/transition zone (comprising more weathered mine waste rock selectively placed and compacted as part of ROM operations). The bridging/transition zone would be supported by mine waste rock (ROM placed).* *The relocation works would be subject to detailed geotechnical, hydrological and hydraulic design.* *The low flow path would be designed to convey flows up to the 1 in 10 year peak flood discharge. Larger flows would be allowed to flow over the adjacent land surface (i.e. high flow flood path). Containment landforms would be formed on both sides of the high flow flood path to act as a flood levee between the Cumbo Creek relocation corridor and the mine workings to reduce the risk of flood water entering the mine area during the Project life.* *The actual design flow capacity of the high flow flood path would be determined as part of detailed design studies using a risk analysis approach incorporating a comparative assessment of the integrity of the original and reconstructed creek under high flow conditions. The corridor would be revegetated with native riparian vegetation to enhance stability during high flow events. The Cumbo Creek relocation corridor would be constructed 12 months prior to being commissioned to allow vegetation elements time to commence establishment and provide stability.* *Based on the planned mining schedule, the Cumbo Creek relocation corridor would be constructed in Year 8. The detailed design of the corridor would be developed in the SWMP and Cumbo Creek Relocation Plan (CCRP) (Sections 5.1.2.4 and 5.1.2.6) in consultation with the relevant authorities, based on the principles and approach to be adopted as follows (Appendix A):* • *Consideration would be given to the development of pools and riffle zones within the low flow path to provide for aquatic habitat.* • *The alignment of the low flow path within the corridor would be designed to simulate the existing alignment of Cumbo Creek as far as practicable.*

No.	Issue	Response
34	(Continued)	• *The low flow path geometry and geomorphology would be developed such that flow velocities and boundary shear stresses developed under design flood flow conditions would be similar to those in the existing Cumbo Creek under similar flows and would not exceed critical values for long-term stability.* *The approach for the detailed design of the Cumbo Creek relocation is provided in Appendix A."* As stated in Section 4.3.1, Volume 1 of the EIS: "…*the potential environmental impacts associated with the relocation of Cumbo Creek would be minimised through the detailed geotechnical, hydrological and hydraulic design that would be implemented prior to construction. The Cumbo Creek relocation corridor and bunds would be revegetated with native riparian vegetation. A Cumbo Creek Relocation Plan would be developed for the Project as described in Section 5.1.2.6*." Section 5.1.2.6, Volume 1 of the EIS describes the Cumbo Creek Relocation Plan (CCRP) to be developed for the Project. The CCRP would be developed for the Project in consultation with relevant authorities and incorporated in the Site Water Management Plan (SWMP). The CCRP would include: • "*design and specifications for creek relocation works;* • *a construction programme for the creek relocation, describing how the work would be staged and progressively integrated with mining operations;* • *a revegetation programme using appropriate native riparian species consistent with upstream regeneration works (Section 5.2.5);* • *design of the block bund foundation to provide for the diversion of sub-surface flow associated with Cumbo Creek alluvium;* • *water quality, ecological and geomorphic performance criteria for the creek relocation;* • *a programme to monitor water quality and ecological and geomorphic integrity of the creek relocation; and* • *a programme to inspect and maintain the creek relocation and revegetation works until they stabilise*." ***Location and Design Specifications for Clean Water Diversions and Drainage*** As described in Section 2.9.1, Volume 1 of the EIS: *"Both temporary and permanent upslope diversion bunds/drains and temporary interception dams would be constructed over the life of the Project, so as to divert runoff from undisturbed areas around the open cut and mine waste rock emplacement areas to off-site drainages."*

No.	Issue	Response
34	(Continued)	The conceptual layout and extent of the proposed upslope diversion works is provided in Appendix A, Volume 2 of the EIS. As described in Section 5.1.2.4, Volume 1 of the EIS, a SWMP would be developed for the Project in consultation with relevant authorities. The SWMP would describe the Project site water management system, including: "*location and design specifications for all clean water diversions, including channel design and stabilisation, sediment retention storages and other structures;*" This issue has been dealt with in more detail in response to Issue No. 58. ***Alternatives to Cumbo Creek Relocation*** As stated in Section 1.7.9, Volume 1 of the EIS, three options were considered for the portion of Cumbo Creek that is within the Project disturbance area, namely: preservation of the existing creek corridor and sterilisation of the significant coal resource beneath the corridor; straightening of the creek (to reduce the amount of coal sterilisation); and relocation of the creek within an adjacent corridor which has been previously mined (no sterilisation of coal resource required). The first and second options would result in the sterilisation of approximately 13 Mt and 6 Mt of coal, respectively. Associated state royalties and taxes and economic benefits would also be forgone. The potential environmental impacts associated with the relocation would be minimised through the detailed geotechnical, hydrological and hydraulic design that would be implemented prior to construction. The Cumbo Creek relocation corridor and bunds would be revegetated with native riparian vegetation. Section 5, Volume 1 of the EIS, presents the Environmental Protection Plan for the Wilpinjong Coal Project which includes the following in the proposed regeneration areas (Section 5.3): "*The establishment of woodland vegetation in the regeneration areas would include the revegetation of banks of Wilpinjong and Cumbo Creeks. The revegetation of the creek banks would include native flora species such as Casuarina cunninghamiana and would increase the quantity of riparian vegetation along these creeks.*" A further 4 km of riparian vegetation is provided through the proposed Enhancement and Conservation Areas (Section 5.4, Volume 1 of the EIS): *"the opportunity to establish riparian vegetation along Wilpinjong and Cumbo Creeks through natural regeneration/selective planting (approximately 4 km of Wilpinjong Creek is situated within ECA-B and approximately 1.25 km of Cumbo Creek is situated within ECA-A as shown on Figure 5-2);"*

No.	Issue	Response
34	(Continued)	The regeneration areas and ECAs described above would result in approximately 10 km of creek revegetation (i.e. ecological offset). Combined with the other measures presented in the EIS, this is considered to be an adequate ecological offset for the Project's potential impacts on Cumbo Creek. A Cumbo Creek Relocation Plan (CCRP) would be developed for the Project in consultation with relevant authorities (Section 5.1.2.6, Volume 1 of the EIS).
35	Concerns were raised regarding the possible loss of groundwater supply to local landholders including the source of the replacement water supply in the event of an identified loss.	The potential impacts of the Project on groundwater resources are discussed in response to Issue No. 44. As stated in Section 4.4.1, Volume 1 of the EIS: "*…only two existing groundwater bores not owned by WCPL are expected to be affected by the Project. If the data obtained from the groundwater monitoring programme indicates that the Project is having an adverse effect on existing groundwater users (i.e. reduced groundwater yield from existing bores), then the water supply would be re-instated by WCPL either by deepening the existing bore, construction of a new bore or by providing an alternate water supply*." If an alternative water supply source is to be provided, it would be WCPL's responsibility to obtain a licence and pay for this source, in consultation with the relevant landowner(s). The nature of the source would depend on the location of the affected landowner and the availability of nearby sources. As a contingency, it may be possible to use waters of suitable quality from the mine.
36	Concerns were raised regarding the size and volume of final voids.	The key features of the water management system at each stage, from initial infrastructure development through to post-mining, are described in 3.9 of Appendix A, Volume 2 of the EIS and are shown on Figures 7 to 15 of Appendix A, Volume 2 of the EIS. The locations of final voids are shown on various figures throughout the EIS, including Figure 15 of Appendix A, Volume 2 of the EIS. The management of final voids would be the subject of the Final Void Management Plan (Section 5.5.1, Volume 1 of the EIS).
37	Concerns were raised regarding the assessment of the water management system under a range of climatic conditions.	The Project water management simulation model was run over a large number of different daily rainfall sequences compiled from the historical record. As described in Section 4.1 of Appendix A, Volume 2 of the EIS: "*Each sequence comprised a 21-year period – corresponding to the planned Project life. The sequences were formed by moving along the historical record one year at a time with the first sequence comprising the first 21 years in the record. The second sequence comprised years 2 to 22 in the record while the third sequence comprised years 3 to 23 and so on. Using this methodology, 96 21-year sequences of daily rainfall were formulated for use in the model simulations. This method effectively includes all possible historical climatic events in the water balance model, including high, low and median rainfall periods*." **Note:** A record of 116 years (1889-2004) was obtained for the site from the Queensland Department of Natural Resources and Mines Silo Data Drill – refer http://www.nrm.qld.gov.au/silo/datadrill/. A 116-year evaporation data set for the site was also obtained from this source. These simulations show that the site waters can be managed (i.e. stored on site) under the range of climatic conditions modelled. The proposal does not include the requirement to discharge mine water.

No.	Issue	Response
38	Concerns were raised regarding the potential impact on stock water supply from Wilpinjong Creek immediately downstream of the Project site.	The surface water assessment (Appendix A of the EIS) assessed the potential impacts of the Project on surface water resources. As stated in Section 4.3.2, Volume 1 of the EIS: *"The potential maximum flow reduction in Wilpinjong Creek equates to an 11% reduction of annual average flow. Downstream of the confluence of Wilpinjong and Wollar Creeks the affects would diminish due to the inflows from unaffected catchments (Appendix A).* *Whilst the predicted changes to low flows in Wilpinjong Creek would be expected to be noticeable as reduced flow persistence, the magnitude of predicted effects can be compared to those that occur due to other changes in catchment condition and landuse such as changes in livestocking rates, construction of farm dams, water harvesting or bushfires which can also result in noticeable changes to low flows (Appendix A). …* *The actual magnitude of the potential flow reductions in Wilpinjong Creek annual average flow would vary with time and would be less than that described above and presented in Table 4-4, depending on the area of catchment excised by Project operations and on the level of usage of the Project water supply borefield. In periods of the Project life when catchment excision and borefield extractions are less, the reduction in flow would also be expected to be less. Revegetation associated with the creek enhancement works would develop through the Project life in parallel to any flow effects (Sections 5.3 and 5.4)."* Further, Australasian Groundwater and Environmental Consultants' (AGEC) prepared the groundwater impact assessment for the Wilpinjong Coal Project (Appendix B of the EIS). AGEC's model simulated the development and extent of the cone of depression in the main aquifers in the Project area. It is stated in Section 4.4.1, Volume 1 of the EIS: *"No bores or wells installed in the Wilpinjong Creek alluvium or Wollar Creek alluvium are expected to be affected."* As stated in Section 5.1.3.6, Volume 1 of the EIS: *"Surface water flow rate (via water level) would be monitored continuously at installed gauging stations on Wilpinjong and Cumbo Creeks (Figure 5-1). …* *The site water balance would be reviewed annually to optimise performance and validate predictions. These reviews would be linked to borefield performance reviews. The reviews would also facilitate the preparation of contingency/remediation plans for managing adverse impacts of the Project on surface water, where necessary (Section 5.1.2.4)."*

No.	Issue	Response
38	(Continued)	A Site Water Management Plan (SWMP) would be developed for the Project in consultation with relevant authorities as stated in Section 5.1.2.4 of Volume 1 of the EIS. The SWMP would describe the Project site water management system, including investigation triggers and contingency/remediation plans for managing adverse impacts of the Project on surface water and groundwater resources including existing users, should they arise. In addition to the above, surface water monitoring would be undertaken at selected waterholes on Wilpinjong Creek, immediately downstream of the Project, in consultation with relevant landowners.
39	The following concerns were raised in regard to the community infrastructure assessment: • Additional demand on council services (e.g. waste disposal) as a result of the Project and the need for developer contributions to offset perceived additional demand. • The relative contribution of local employment to the Project workforce and the impact of the Project on population growth and demand for housing. • Potential impacts on demand for industrial land. • Potential impacts on the availability and demand for pre-school and child care places. • Potential impacts on the availability and demand for general practitioners and health services.	A Community Infrastructure Assessment of the Wilpinjong Coal Project was undertaken by Martin and Associates and is presented in Appendix J, Volume 5 of the EIS. Section J5 of Appendix J, Volume 5 of the EIS states: *"The review undertaken in this study of the existing social and economic structure in the primary study area found that the socio-economic benefits of the existing Ulan Mine and smaller operations in the former Rylstone Shire have led to significant benefits for local employment and income, with no evidence of any negative marginal social costs to community infrastructure in the surrounding region. The social survey undertaken in June 2004 found that Mudgee and Gulgong were typical of many urban communities in rural NSW. There was a high standard of living enjoyed and community infrastructure (particularly physical infrastructure) was also considered to well provided and with excess capacity."* ***Additional Demand on Council Services*** Demand on Council services will be addressed through conditions of any approval under section 94 or 94A and/or a voluntary planning agreement. ***Employment, Population Growth and Demand for Housing*** As stated in Section J2.2 of Appendix J, Volume 5 of the EIS: *"After research into commuter behaviour for the existing Ulan Mine, 80 km or 1 hour travelling time was considered to be the employment catchment area which coincides approximately with the most accessible areas of the former Shires of Mudgee, Rylstone and Merriwa. The former local government areas of Mudgee, Rylstone and Merriwa were therefore adopted as the* ***primary study area****. The local government boundary changes in 2004 have resulted in the majority of the primary study area falling into the Mid-Western Regional Council Area..."* As stated in Section 4.14.1, Volume 1 of the EIS, during the construction phase: *"It is anticipated that 200 people would be employed on average over a six month period to undertake Project construction activities. During short-term peaks in construction activity, up to a maximum of 250 people may be employed.*

No.	Issue	Response
39	(Continued)	*A significant proportion of the construction workforce is expected to be sourced from the local region."* Table J-12 in Appendix J, Volume 5 of the EIS presents an example of the expected breakdown of the construction workforce as follows: 140 semi-skilled, 60 skilled trades and 20 management and professional positions. As stated in Section J2.4.2 of Appendix J, Volume 5 of the EIS: *"There are approximately 1,100 people currently registered as unemployed within the four Mudgee employment agencies. Of these, 30% to 40% were described as being long term unemployed. This leaves approximately 700 workers available for employment in the study area*." As stated in Section J4.3.1 of Appendix J, Volume 5 of the EIS, it is assumed: *"…that 60% of the direct construction jobs are allocated to non-local employees*. *Given the current employment situation in Mudgee, it was considered that most of the semi skilled personnel would be available locally* [i.e. 40% would be sourced from the existing labour pool]." WCPL considers that it is reasonable to expect that 80 to 100 construction personnel could be sourced from the unemployed (and underemployed) people already living within the primary study area. The Project has already generated a great deal of interest in the local community in regard to employment opportunities. Many people have already lodged an expression of interest in this regard. As stated in Section 4.14.1, Volume 1 of the EIS, an on-site camp is proposed to minimise potential impacts on short term housing during the construction phase : *"… an on-site construction camp to accommodate up to 100 employees is proposed to alleviate short-term accommodation requirements in the general community (Section 2.3.1)."* With the construction camp it was estimated that the total rental housing demand from direct and flow-on employment would be some 55 rental units. The potential impacts of this demand were discussed in Section J4.3.1 of Appendix J, Volume 5 of the EIS as follows: *"Based on the results of the social survey in June 2004 and further discussion with local real estate agents in January 2005, this additional demand for 55 rental accommodation units for shorter term rental during the construction phase may cause some pressure on the market, particularly at the lower end. This would tend to affect the flow-on employment workers rather than the direct construction workers. The direct workers would generally have higher salaries and would have more choices available to them in the existing rental housing market. This effect would tend to lead to workers seeking cheaper rental accommodation in Mudgee and in the smaller towns and surrounding rural areas."*

No.	Issue	Response
39	(Continued)	It should be noted that of this predicted demand for 55 rental units, 35 were predicted to be required to house the population effects of flow-on employment. However, as stated in Section J4.3.6 of Appendix J, Volume 5 of the EIS, flow-on population effects have been considered quite conservatively in the EIS assessment: *"The most important variable in determining the total impact is the amount of non-local employment generated by the Project. In the preceding analysis, there is a considerable component of the impact due to flow-on employment coming from non-local sources. It should be remembered that there are at least 700 officially classified unemployed people already living within the primary study area who have the necessary skills to fill flow-on employment jobs. Consequently, it can be argued that 100% of the flow-on employment could potentially be absorbed by unemployed and under-employed people in the local employment market. The effect of this would be to considerably reduce the potential incoming population. Consequently, it is considered that the estimates used in this report are in the higher end of the range. This is done intentionally so that the total impact on population and housing would be conservative."* If a greater proportion of flow-on employment is captured by the local population in the primary study area, then the potential population effects and associated requirement for rental housing during the construction phase would be reduced. As stated in Section J4.3.2 of Appendix J, Volume 5 of the EIS, the potential impacts of both a peak and an average workforce for the operational phase (i.e. for Years 2 to 21) were assessed: *"Two scenarios of the operational phase population and housing impacts were developed for the analysis. The first scenario used the estimate of average operational phase employment of 100. This scenario takes into account that over the life of the Project that there may well be fluctuations in the workforce, but the average is predicted to be approximately 100 people over the life of the mine. The second scenario takes account of the peak operational workforce (162) that may occur and is considered here (including maximum flow-on employment effects) in order to assess a maximum likely impact."* Table J-12 in Appendix J, Volume 5 of the EIS presents the expected breakdown of the peak operational phase workforce as follows: 108 semi-skilled, 34 skilled trades and 20 management and professional positions. As stated in Section J2.4.2 of Appendix J, Volume 5 of the EIS: "*There are approximately 1,100 people currently registered as unemployed within the four Mudgee employment agencies. Of these, 30% to 40% were described as being long term unemployed. This leaves approximately 700 workers available for employment in the study area*."

No.	Issue	Response
39	(Continued)	As stated in Section 4.14.2, Volume 1 of the EIS: *"For both scenarios, it was estimated that 50% of the operational workforce (i.e. 50 to 81 employees) and 70% of flow-on jobs would be sourced from within the local region (Appendix J)."* WCPL considers that it is reasonable to expect that 50 to 81 directly employed operational phase workers could be sourced from the unemployed (and underemployed) people already living within the primary study area. The Project has already generated a great deal of interest in the local community in regard to employment opportunities. Many people have already lodged an expression of interest in this regard. Section 4.14.2, Volume 1 of the EIS summarises the potential population effects and housing demand of the two operational phase employment scenarios as follows: *"The total population effects of the Project have therefore been calculated to range from 193 to 312 people for the average and peak employment scenarios, respectively (Table 4-18).* *…* *The likely demand for housing in Mudgee, Gulgong and the surrounding rural areas associated with the Project operational phase direct workforce and flow-on employment would be in the range of 95 to 154 housing units (Table 4-19). This includes accommodation for families and individuals who may be attracted to Mudgee to fulfil flow-on employment.* *As Mudgee has over 1,500 houses in the rental market, and the normal annual rate of residential building activity in the Mudgee LGA has been approximately 120 building applications per annum for new housing (with approximately 50 per year in Mudgee), the increase in demand is expected to be able to be serviced without any undue pressure on land and physical infrastructure services (Appendix J)."* It should be noted that the potential additional demand for housing resulting from the operational phase is expected to be spread over approximately two years, with an estimated 48 to 78 houses per year being required for the average and peak operational phase scenarios respectively. This demand would be spread between rentals and purchases of new and existing housing stock and between the localities of Mudgee (80%), Gulgong (10%) and the surrounding rural areas (10%). The potential impacts of rental demand were discussed with local real estate agents in June 2004 and January 2005 as described in Section J4.3.4 of Appendix J, Volume 5 of the EIS: *"The estimated range for the number of housing units required for rental accommodation would be 24 to 38 units each year over the first two years. This represents between 14% to 23% of the apartment/flat/unit stock of 336 units or approximately 1.6% to 2.5% of the rental housing stock in Mudgee in 2001.*

No.	Issue	Response
39	(Continued)	*This was an area of some concern during the social survey conducted in June 2004, however, a follow up survey in January 2005 found that the market in all residential listings had flattened considerably over the previous six months and it was considered that the local market could absorb the projected numbers without any undue upward pressure on rents and availability."* In addition, as described above for the construction phase (as stated in Section J4.3.6 of Appendix J, Volume 5 of the EIS) flow-on population effects have been considered quite conservatively in the EIS assessment. If a greater proportion of flow-on employment is captured by the population within the primary study area, then the potential population effects and associated requirement for additional housing during the operational phase would be reduced. WCPL understands that a number of housing developments have recently been approved or are before the MWRC, including the Ulan Coal Mines proposal for a 81 lot housing estate in Gulgong. ***Demand for Industrial Land*** As described in Section J4.3.5 of Appendix J, Volume 5 of the EIS, the majority of specialised capital purchases and equipment during the construction phase would be made outside of the primary study area: *"The demand for additional industrial land that would be generated by the Project depends on the existing capacity of engineering and metal fabricating companies in the primary study area. It is assumed that the majority of specialised capital purchases and equipment for the construction phase would be made outside of the primary study area. During operations, more demand on local industry is expected. In Mudgee, there are up to 6 companies presently servicing the mine at Ulan and there is one existing engineering company servicing the industrial and mining sector between Kandos and Rylstone. As the Ulan mine and the Charbon Colliery and Kandos Cement Works have experienced periodic fluctuations in production over the years, with no apparent fluctuation in the number of firms servicing the industry, the situation suggests considerable excess capacity exists and the demand for additional industrial land from mining related demand during the construction and operational phases is considered to be low. The pressure on industrial land in Mudgee appears to be more based on the demand for larger bulky goods and wholesale warehouse developments selling direct to the public."* Industrial development in support of the operational phase of the mine is not expected to result in any requirement for a new heavy or general industrial land precinct.

No.	Issue	Response
39	(Continued)	***Availability and Demand for Pre school and Child Care Places*** Section J3.4.2 of Appendix J, Volume 5 of the EIS, recognises that, common to most of New South Wales, one existing issue in Mudgee is a shortage of childcare places: *"All centres in Mudgee have a waiting list and the community has identified the need for another day care centre. These centres include Mudgee Pre-School Kindergarten, South Mudgee Preschool, Mudgee Childcare Centre, Squeakers Long Day Care Centre and Gulgong Preschool Inc. There are long waiting lists particularly for infant care. Current enrolments cater for approximately 500 places."* As stated in Section J4.3.1 of Appendix J, Volume 5 of the EIS, during the construction phase: *"The percentage of the incoming (non-local) direct Project workforce assumed to be married with families was 10%, with the rest single. This is due to the fact that the construction workforce in the mining industry and large infrastructure projects generally is very mobile and tends not to have accompanying spouses and children."* It is estimated that the Project would lead to an increase of 16 children in the primary study area from direct and flow-on employment during the construction phase (Table J-15 in Appendix J, Volume 5 of the EIS). A proportion of these children may be of pre-school or childcare age. During the operational phase the number of children (of all ages) moving into the primary study area is predicted be higher as stated in Section J4.4.2 of Appendix J, Volume 5 of the EIS: *"The estimated number of children that would be moving into the Mudgee/Gulgong area ranged from 49 in the average case scenario up to 79 for the maximum case scenario during the operational phase. When these numbers are distributed spatially between Mudgee, Gulgong and the surrounding smaller country primary schools it was concluded that even though the numbers are moderate in terms of the total school population, there is more than adequate capacity within the existing system to deal with such numbers."* Section 4.14.2, Volume 1 of the EIS states: *"In both Mudgee and Gulgong, elements of community infrastructure such as education, health and other community services and recreational services generally have sufficient excess capacity to accommodate the increase in population and housing/land demand that would be caused by the Project.* *Notwithstanding, existing shortages in … childcare places may be exacerbated by the moderate increase in population associated with the Project.*

No.	Issue	Response
39	(Continued)	MWRC has advised that the current waiting list for childcare in the age groups 0-5 comprises some 136 children. The Project operational phase is likely to add to this existing demand for additional childcare services in the primary study area. WCPL is currently consulting with MWRC regarding contributing to council services that have a direct link to the Project. ***Availability and Demand for Medical Practitioners and Health Services*** A description of the existing availability of general practitioners is provided in Section J3.4.3 of Appendix J, Volume 5 of the EIS: *"There are three medical practices in Mudgee (12 doctors) and 1 in Gulgong (2 doctors) and the Mudgee Medical Centre has been trying to recruit 2 additional doctors from overseas. Clients often wait several days to see a doctor for non urgent matters. There was no female doctor in Mudgee at the time of the survey. Since that time three additional doctors have been recruited from out of the local area to address a shortage of general practitioners and to reduce non-emergency waiting times. According to a report in the Mudgee Guardian (4/2/05) Dr Peter Roberts of the Mudgee Medical Centre said that although the three new doctors will help the situation, the town "is still 4 to 5 doctors short."* Construction phase effects on the provision of medical services are described in Section J4.5.1 of Appendix J, Volume 5 of the EIS: *"At this stage, consultation has found that no significant impact on the delivery of acute hospital care is anticipated as the level of in-migrating population is quite modest (up to 100 people) and can be serviced by either Mudgee or Gulgong hospitals.* *Community health services may experience some increase in due to the presence of a moderately sized construction work force of up to 100 personnel living in the construction camp in the relatively isolated location near Wollar. These workers would in the main be unaccompanied by spouses and children."* Operational phase effects on the provision of medical services are described in Section J4.5.2 of Appendix J, Volume 5 of the EIS: *"No significant potential impacts are anticipated upon hospital services or community health services during the operational phase as the numbers of direct workers and their dependants are very modest and there would be adequate time for normal planning procedures to occur. There is an existing shortage of General Practitioners in Mudgee and this may be accentuated by the Project-related population increase."*

No.	Issue	Response
39	(Continued)	Section J5 of Appendix J, Volume 5 of the EIS states that: *"In both Mudgee and Gulgong the other elements of community infrastructure such as education, health and other community services and recreational services generally have sufficient excess capacity to accommodate the increase in population and housing/land demand that would be caused by the Project. Notwithstanding, existing shortages in General Practitioners ... may be exacerbated by the moderate increase in population associated with the Project."* The Project has the potential to add to existing demand for General Practitioner services in Mudgee. It is understood that a feasibility study is to be undertaken for the establishment of a new medical centre at the Mudgee District Hospital grounds.
40	Concerns have been raised regarding the impacts of noise, blasting, blasting dust, vibration, flyrock, increased vehicle and rail traffic upon: • local rural landholders and residents in Wollar; and • the Munghorn Gap Nature Reserve and Goulburn River National Park (including potential impacts on escarpments).	The Construction, Operation and Transportation Noise and Blasting Impact Assessment is presented in Appendix D, Volume 2 of the EIS. The assessment has been undertaken in accordance with the NSW Department of Infrastructure, Planning and Natural Resources (DIPNR) Director General's Requirements, which includes the NSW Department of Environment and Conservation's (DEC) and Mid-Western Regional Council's (formerly Mudgee Shire Council) assessment requirements. ***Cumulative Noise Impact*** The potential for the simultaneous operation of adjoining mine developments to exceed amenity criteria can be assessed on a worst case scenario basis by adding the predicted intrusive noise emissions from the Project to the approved noise limits for the Ulan Coal Mines and Ulan Stage 2. The cumulative intrusive level is then adjusted and compared with the relevant amenity criteria in the NSW Industrial Noise Policy 2000 (INP) (EPA, 2000). As stated in Section 4.5.1, Volume 1 of the EIS: "…*the cumulative noise levels in the Murragamba locality (the locality between the Project and Ulan Coal Mines) have been assessed to be within the relevant amenity criteria for industrial noise (i.e. non-transport related) during the daytime, evening and night-time*." The noise impact assessment has been conducted in accordance with the NSW INP. As stated in Section 1.3 of the INP (EPA, 2000): *"examples of noise sources that are NOT dealt with by the policy are:* • *transportation corridors (roadways, railway and air corridors) …* *Noise from vehicle movements associated with an industrial source is covered by the industrial noise policy if the vehicles are not on a public road. If the vehicles are on a public road, the Environmental Criteria for Road Traffic Noise (EPA 1999) apply."*

No.	Issue	Response
40	(Continued)	***Noise from Fixed Plant and Mobile Equipment*** As described in Section 4.5.2, Volume 1 of the EIS, fixed plant and mobile equipment would be commissioned and maintained to remain at or below the specified maximum operating L_{Aeq} sound power levels detailed in Appendix D, Volume 2 of the EIS. Based on current mine planning and predictive noise modelling, some Project mobile equipment would be modified from Year 6 to meet more stringent maximum operating L_{Aeq} sound power levels to further reduce noise emissions as the open cut operations move towards the extremities of the Project area and closer to receptors, as stated in Section 4.5.2, Volume 1 of the EIS. The timing of this would be confirmed based on noise monitoring data collected as the Project progresses. ***Noise Assessment for Private Dwellings*** The noise assessment included assessment of operating noise levels during years 3, 9, 13, 14 and 21. The estimated timing of the Project activities is based on the planned development schedule. The selected years are considered to be representative of the various phases/locations of mining activities, dependent on actual mine production and progression. The predicted intrusive noise emissions (under various scenarios) to the nearest affected noise sensitive receivers are shown on Figures 4-6 to 4-9 of Section 4, Volume 1 of the EIS. Land tenure details of the Project area and surrounds are shown on Figures 1-5 and 1-6. As detailed in Table 4-6 of Section 4, Volume 1 of the EIS, the private dwellings where noise emissions are predicted to be above Project-specific noise assessment criteria can be divided into a noise management zone (1 to 5 dBA above Project-specific criteria) and a noise affectation zone (greater than 5 dBA above Project specific criteria). Proposed noise management procedures for these zones are detailed in Section 4.5.2, Volume 1 of the EIS. "*Noise Management Zone* *Depending on the degree of exceedance of the Project-specific criteria, noise impacts in the noise management zone could range from negligible to moderate (in terms of the perceived noise level increase). In addition to the noise mitigation measures included in the predictive modelling, noise management procedures would include:* • *noise monitoring on-site and within the community;* • *prompt response to any community issues of concern;* • *refinement of on-site noise mitigation measures and mine operating procedures, where practicable;* • *discussions with relevant landowners to assess concerns;*

No.	Issue	Response
40	(Continued)	• *consideration of acoustical mitigation at receptors; and* • *consideration of negotiated agreements with landowners.* *Noise Affectation Zone* *Exposure to noise levels greater than 5 dBA above Project-specific criteria may be considered unacceptable by some landowners. Management procedures for the noise affectation zone would include:* • *discussions with relevant landowners to assess concerns and develop practical mitigation;* • *implementation of acoustical mitigation at receptors (e.g. double glazing of windows); and* • *negotiated agreements with landowners.*" As stated in Section 5.1.3.3, Volume 1 of the EIS, a Project noise monitoring programme would comprise quarterly attended and unattended monitoring. Further, noise monitoring would be conducted in accordance with AS 1055-1997 *Acoustics-Description and Measurement of Environmental Noise* and the NSW INP (EPA, 2000). The noise monitoring programme would incorporate mechanisms for responding to noise-related complaints. The results of the noise monitoring programme would be used to optimise noise emission controls, validate EIS predictions and would be reported in the Annual Environmental Management Report (AEMR). ***Road Transportation Noise Assessment*** As described in Section 4.5.4, Volume 1 of the EIS, road transport noise impacts have been considered for three sections of Wollar Road (which will form the primary access to the Project from Mudgee): Section A – west of the mine access road; Section B – west of Cooyal; and Section C – east of Ulan Road. The predictions were calculated using equations that take into account various traffic characteristics, including traffic volume, vehicle speed and type, passby duration and location. As stated in Section 4.5.4, Volume 1 of the EIS: *"Peak cumulative daytime noise levels on all three sections of Wollar Road are below the 60 dBA $L_{Aeq(1hour)}$ criterion at distances of 25 m or more from the roadway. Night-time peak cumulative noise levels are no more than 2 dBA above the 55 dBA $L_{Aeq(1hour)}$ criterion for peak hour flows (i.e. between 6.00 am and 7.00 am*) [at 25 m from the road]*."* ***Rail Transportation Noise/Vibration Assessment*** Existing and consented train movements in addition to Project-related train movements and the associated rail noise levels have been determined for the Gulgong-Sandy Hollow railway.

No.	Issue	Response
40	(Continued)	Predicted cumulative rail noise impacts are summarised in Section 4.5.5, Volume 1 of the EIS as follows: "*Daytime* *A comparison of the combined existing and consented average rail movement $L_{Aeq(15hour)}$ noise emissions against the cumulative rail noise emissions (which include the average movements of four trains per day associated with the Project) indicates that existing noise levels are predicted to increase by 1 dBA and would meet the daytime 65 dBA criterion at a distance of 30 m from the track. Similarly, peak rail movement $L_{Aeq(15hour)}$ noise emissions would increase by between 1 dBA and 2 dBA and meet the daytime 65 dBA criterion at a distance of 30 m from the track with the addition of Project peak rail movements (i.e. six trains per day).* *Night-time* *A comparison of the consented average rail movement $L_{Aeq(9hour)}$ noise emissions with the cumulative train noise emissions (including average Project movements) indicates that existing noise levels would increase by up to 1 dBA and would meet the night-time 60 dBA criterion at a distance of 70 m (and greater). Similarly, peak rail movement $L_{Aeq(9hour)}$ noise emissions would increase by between 1 dBA and 2 dBA and meet the night-time 60 dBA criterion at a distance of 80 m (and greater) with the addition of Project peak rail movements (i.e. six trains per day).* *Passby Noise* *As is the case for the consented train noise emissions, the maximum (L_{Amax}) noise criterion of 85 dBA would be achieved by all train movements at a distance of 30 m (and greater).*" The cumulative rail noise impacts on the Main Northern railway are also summarised in Section 4.5.5, Volume 1 of the EIS as follows: "*Daytime* *A comparison of the existing $L_{Aeq(15hour)}$ noise emissions with the cumulative train noise emissions (including peak Project movements) indicates that existing noise levels would increase marginally (1 dBA to 2 dBA) and would meet the daytime 65 dBA criterion at a distance of 35 m (and greater).* *Night-time* *A comparison of the existing $L_{Aeq(9hour)}$ noise emissions with the cumulative train noise emissions (including peak Project movements) indicates that existing noise levels would increase marginally (1 dBA) and would meet the night-time 60 dBA criterion at a distance of 90 m (and greater).*

No.	Issue	Response
40	(Continued)	*Passby Noise* *As is the case for the existing train noise emissions, the maximum (L_{Amax}) noise criterion of 85 dBA is likely to be achieved by train movements at a distance of 60 m (and greater).*" As stated in Section 4.5.5, Volume 1 of the EIS, WCPL and the rail service provider would liaise with the Australian Rail Track Corporation (ARTC) to establish appropriate timetabling with the objective of reducing night-time train movements, particularly in relation to the Gulgong-Sandy Hollow railway. In addition, the noise emissions from the Gulgong-Sandy Hollow and Main Northern railways would continue to be regulated via ARTC's Environment Protection Licence 3142. ***Noise Assessment for Munghorn Gap Nature Reserve and Goulburn River National Park*** Table 4-5, Volume 1 of the EIS includes the INP based noise amenity criteria (L_{Aeq} 50 dBA) applicable to Passive Recreational Areas and was used to assess the potential noise impacts on the Munghorn Gap Nature Reserve and Goulburn River National Park. The predicted intrusive noise emissions (under various scenarios) to the nearest affected noise sensitive receivers are shown on Figures 4-6 to 4-9 in Section 4, Volume 1 of the EIS. The intrusive noise emission levels can be conservatively de-rated by approximately 3 dBA for comparison with the amenity criteria. In all scenarios the mine noise emission is estimated to be within the L_{Aeq} 50 dBA amenity criteria along the Project Site and Munghorn Gap Nature Reserve and Goulburn River National Park boundaries. ***Blast Impact Assessment*** As stated in Section 2.4.5, Volume 1 of the EIS, the Project open cut development would require an average of one blast per week. As described in Section 4.5.6, Volume 1 of the EIS, the blast emission assessment found that the building damage criteria of 10 mm/s and 133 dBL (peak) would be met at all dwellings. Similarly, emission levels would be well below the Australian Standard (AS) 2187.2-1993 damage criteria (5 mm/s and 133 dBL [peak]) for the two churches in Wollar. With regard to human comfort, the Australian and New Zealand Environment and Conservation Council (ANZECC) recommend the maximum level for ground vibration is 5 mm/s peak vector sum (PVS) vibration velocity. It is recommended, however, that 2 mm/s PVS vibration velocity be considered as the long-term regulatory goal for the control of ground vibration. As described in Section 4.5.6, Volume 1 of the EIS, the vibration velocities would be at or below the ANZECC human comfort vibration criterion of 5 mm/s at all dwellings. Incorporating blast design modifications for selected dwellings (i.e. detonating no more than approximately 342 kg [or 2 blast holes] within 8 milliseconds in the delay sequence), the recommended long-term regulatory target of 2 mm/s could be achieved at all receptors except for Close (14) (Figure 1-5 of Section 1, Volume 1 of the EIS). The PVS vibration level at Close (14) during Year 14 (Pit 6) is predicted to be 5.0 mm/s.

No.	Issue	Response
40	(Continued)	A Blast Management Plan would be developed for the Project. The Blast Management Plan would include, as stated in Section 5.1.2.12, Volume 1 of the EIS: • "*a blast monitoring programme (including ground vibration and airblast overpressure) to verify blast predictions and to assist future blast designs;* • *methods to reduce the potential for flyrock impacts;* • *details of temporary closures of Wollar Road, Ulan-Wollar Road and the Gulgong-Sandy Hollow railway when blasting is undertaken within 500 m of the road or railway; and* • *notification of occupants of the Close (14) dwelling when blasting is undertaken within 1,000 m of the dwelling.*" An assessment of the potential impacts of ground-borne vibration was undertaken at three archaeological/geological sites as part of the Blast Emission Impact Assessment presented in Appendix D, Volume 2 of the EIS. The sites (WCP 72, WCP 153 and WCP 152 as shown in Appendix B1 of Appendix D, Volume 2 of the EIS) are in sandstone/conglomerate rock formations and are located outside of the Project disturbance area. Two of the shelters occur in rock tors on slopes and the third is situated at the base of a high escarpment. As stated in Section 4.5.6, Volume 1 of the EIS, there are no regulatory criteria nominated in Australia for the assessment of damage to archaeological/geological structures from vibration. Research, however, has been undertaken by the US Army Corps of Engineers into the effects of large surface blasts on the dynamic stability of unlined tunnels of various diameters in sandstone and granite (Dowding, 1985). The results of the research indicated that intermittent rock fall or observable damage did not occur until vibration levels exceeded 460 mm/s. The German Standard DIN 4150-3 *Structural Vibration Part 3: Effects of Vibration on Structures* (February 1999) includes a vibration velocity guideline of 80 mm/s for evaluating the effects of "short-term" vibration on buried clay and concrete pipework. The assessment indicates that vibration velocities are below the 80 mm/s German Standard and well below the US Army Corps of Engineers rock fall observable damage vibration level of 460 mm/s at the three sites. As a result, it is also considered that the vibration velocities in the nearest escarpments of the Munghorn Gap Nature Reserve and Goulburn River National Park which are at similar distances from potential blasting areas would also be expected to be below the relevant criterion. With regard to flyrock impacts, as stated in Section 4.5.6, Volume 1 of the EIS: "*Consideration of potential flyrock impacts would be incorporated into the blast design, particularly in regard to stemming length and bench spacing. Notwithstanding, given the proximity of the Close (14) dwelling, notification of the occupants of the Close (14) dwelling would be undertaken for blast events within 1,000 m of the dwelling.*

No.	Issue	Response
40	(Continued)	*Wollar Road, Ulan-Wollar Road and the Gulgong-Sandy Hollow railway would be temporarily closed during blast events within 500 m of the road or railway, as discussed in Sections 4.12.1 and 4.13.1.* *Given the location and nature of the rock art sites and surrounds, it is considered that the potential for flyrock damage occurring at these sites would be limited. Notwithstanding, for blasts within 500 m of these sites appropriate stemming length and burden spacing would be incorporated into the blast design in order to reduce the potential for flyrock (Appendix D).*" Based on the implementation of general flyrock control measures in the blast design described above, it is considered that the potential for flyrock damage occurring within the Munghorn Gap Nature Reserve and Goulburn River National Park which are at similar distances from potential blasting areas would be limited. ***Potential Impacts of Blasting Dust*** With regard to the potential impact of blasting dust on human health, as stated in Section 4.6.1, Volume 1 of the EIS: "*Human health effects of dust are related to exposure to suspended particulates rather than deposited dust. The effects of dust particles when inhaled are related to the types of particles inhaled, particle sizes and the ability of the respiratory tract to capture and eliminate the particles*. *Such particles (TSP) are typically less than 50 micrometers (μm) in size and can be as small as 0.1 μm. PM_{10} particles are of particular importance in air quality assessments because they can reach the sensitive regions of the respiratory system*." Details of the air quality criteria for concentrations of particulate matter are provided in Table 4-12 of Section 4, Volume 1 of the EIS. The predicted Project-related annual average PM_{10} concentrations at the nearest receptors are shown for Years 3, 9, 14 and 21 on Figures 4-14 to 4-17 of Section 4, Volume 1 of the EIS. Land tenure details of the Project area and surrounds are shown on Figures 1-5 and 1-6. Mitigation measures for the control of respirable and non-respirable dust are described in Section 4.6.2, Volume 1 of the EIS. A Project PM_{10} monitoring programme is presented in Section 5.1.3.2, Volume 1 of the EIS. A Blast Management Plan would be developed for the Project as stated in Section 5.1.2.12, Volume 1 of the EIS. The air, noise and blasting studies presented in Volume 2 of the EIS were conducted in accordance with regulatory requirements and are considered appropriate for the EIS.

No.	Issue	Response
41	Concerns were raised with respect to the Project impacts on groundwater and general amenity (e.g. due to air quality, noise and blasting emissions) could depress local property values and result in financial difficulty for local landholders if they want to move.	Section 4, Volume 1 of the EIS and the specialist appendices (Volumes 2 to 5 of the EIS) provide a detailed consideration of the potential environmental impacts of the Project and the proposed means of mitigation. Potential environmental impacts are considered from an economic perspective in Section I2.3.2 of Appendix I, Volume 5 of the EIS. As stated in Section I2.3.2 of Appendix I, Volume 5 of the EIS, potential groundwater impacts were considered: *"**Groundwater** – Potential impacts on groundwater resources due to open cut mining and the use of bores to supply make-up water to the Project include impacts on the depth of the water table, impacts on other groundwater users and the possible transference of pollutants to groundwater. The groundwater assessment identified the potential for the drawdown of the local water table due to the dewatering of the open cut workings and pumping from water supply bores, and the potential reduction of expression of groundwater into Wilpinjong Creek. The groundwater table would be expected to recover gradually following the completion of mining. WCPL would monitor the effect of the Project on the groundwater system. Mitigation measures would include deepening of water supply bores or lowering of pump-set positions if monitoring indicates an adverse impact on existing groundwater users.* *Where the groundwater impacts of the Project reduce artesian expression of groundwater to the streams in the Project area, it may impact on any production reliant on stream flows as well as consumer surpluses associated with use or non-use of streams which could potentially be measured by the productivity method, travel cost method, contingent valuation or choice modelling. Modelling indicates a maximum potential reduction in annual average flow in Wilpinjong Creek of 11%. The reduction in baseflow contribution would have lesser impact on the average flows of Wollar Creek (below the Wilpinjong Creek confluence).* *Any impacts on registered private and domestic bores could potentially be valued at the cost of any required treatment or provision of an alternative water resource. "* Further, Section 4.4.1, Volume 1 of the EIS states: *"…only two existing groundwater bores not owned by WCPL are expected to be affected by the Project. If the data obtained from the groundwater monitoring programme indicates that the Project is having an adverse effect on existing groundwater users (i.e. reduced groundwater yield from existing bores), then the water supply would be re-instated by WCPL either by deepening the existing bore, construction of a new bore or by providing an alternate water supply."* Based on the assessment presented in the EIS (including the proposed mitigation measures) it is considered that the Project impacts on groundwater resources would have negligible effect on local property values for non-WCPL owned lands.

No.	Issue	Response
41	(Continued)	In addition, Section I2.3.2 of Appendix I, Volume 5 of the EIS also states: ***"Noise and Blast Vibration –*** *noise and blasting on-site has the potential to impact on sensitive receptors such as nearby residences and buildings. Analysis indicates that Project vibration effects would exceed relevant criteria at one residence to the immediate north of the Project open pits. An increase in noise levels associated with the open cut workings and product coal rail movements would be experienced at sensitive receptors in close proximity to the development. Noise mitigation measures have been included in the development where practicable to minimise these impacts (e.g. the use of noise reduction measures on mobile and fixed equipment) and an ongoing noise and blast vibration monitoring program would be implemented over the life of the Project.* *Any impact on adjoining landholders could potentially be valued using the property valuation method ie. how property prices are affected by the noise and blast vibration. However, the land included in the estimation of the opportunity cost of land in Section I2.3.1 is considered to already include all land that would be adversely impacted by the mine via noise and blast vibration. This impact has therefore already been incorporated into the analysis.* ***Air Quality -*** *potential air quality impacts include dust generation and minor gaseous emissions from the CHPP and open cut mining operations to the surrounding environment. However, any potential externality costs would be largely internalised. Dust suppression methods such as hoods, shrouds, dust suppressants and road watering would be used where appropriate. Also, the land included in the estimation of the opportunity cost of land in Section I2.3.1 is considered to already include all land that would be adversely impacted by the mine via dust emissions. This impact has therefore already been incorporated into the analysis."*
42	Concern regarding the potential impact of dust on vegetation in Munghorn Gap Nature Reserve and Goulburn River National Park.	The EIS recognises the potential impact of dust from mining operation and blasting to affect vegetation as stated in Section 4.7.1, Volume 1 of the EIS: "*Studies have shown that excessive dust generation can impact on the health and viability of surrounding vegetation. Dust can affect vegetation by inhibiting physiological processes such as photosynthesis, respiration and transpiration, and allow penetration of phytotoxic gaseous pollutants (Farmer, 1993; Eller, 1977). Open cut mining operations have the potential to result in the generation and dispersion of atmospheric dust.*" As described in Section 4.7.1, Volume 1 of the EIS, the effect of dust caused by the Project on the health and viability of surrounding vegetation is likely to be localised. Any potential dust-related effects on vegetation (including vegetation on the edges of the Munghorn Gap Nature Reserve and Goulburn River National Park) are likely to be short in duration given the progressive mining of the Project open pits.

No.	Issue	Response
42	(Continued)	Further, a range of dust controls would be employed, including watering of potential dust generating surfaces, use of dust control equipment and progressive revegetation, as outlined in Section 4.6, Volume 1 of the EIS. The Project air quality monitoring programme would monitor dust deposition and concentrations of the PM_{10} proportion of suspended particulates utilising a network of dust deposition gauges and three high volume samplers (measuring PM_{10}), as described in Section 5.1.3.2, Volume 1 of the EIS.
43	Concern regarding the surface water flow data used in the EIS.	As stated in Section 3.2.1, Volume 1 of the EIS: "*DIPNR maintains gauging stations on the Goulburn River. A summary of the streamflow statistics obtained from DIPNR gauging stations of relevance to the Project are provided in Table 3-3. Approximate locations are shown on Figure 3-4 and include streamflow gauges at the localities of Sandy Hollow, Kerrabee, Coggan and Ulan (refer inset on Figure 3-4). …* *A gauging station was maintained by DIPNR from 1969 to 1997 on Wollar Creek near Wollar (Figure 3-4). Streamflow statistics from this DIPNR gauging station are provided in Table 3-3*." As stated in Section 2.3 of Appendix A, Volume 2 of the EIS: *"In the absence of streamflow data for the local catchments in the Project area, streamflow records from other regional catchments have been collated, and have been used to guide the development of catchment models of the local creeks."* The characteristics of the two nearby gauged streams (Wollar Creek and Goulburn River) are considered to represent those of Wilpinjong Creek by virtue of their proximity and physical similarity. The surface water data used in the EIS is considered adequate. As stated in Section 3.2.2, Volume 1 of the EIS: "*Gauging stations have been installed on Cumbo and Wilpinjong Creeks by WCPL (Figure 3-4) and would continue to be maintained during development of the Project. No streamflow records for the local catchments were available for reporting in the EIS*." Further, stated in Section 5.1.3.6, Volume 1 of the EIS: "*Surface water flow rate (via water level) would be monitored continuously at installed gauging stations on Wilpinjong and Cumbo Creeks (Figure 5-1)*."

No.	Issue	Response
44	Concerns were raised regarding: • potential impacts on regional groundwater and surface water resources; and • potential cumulative impacts on the catchment of the Upper Goulburn River.	***Potential Impacts on Regional Groundwater Resources*** The Project Groundwater Impact Assessment (Appendix B, Volume 2 of the EIS) has assessed the potential impacts of the Project on groundwater resources. The assessment included: • the collation of existing geological and hydrogeological data; • a hydrogeological investigation and groundwater monitoring programme; • a bore census to identify existing groundwater users in the vicinity of the Project and to obtain relevant data (i.e. bore location, depth, usage and extraction aquifer); and • the development of a numerical groundwater flow model. The groundwater flow model was used to simulate the potential effects of the Project on the local aquifer systems and to estimate the potential quantity of groundwater inflow to the Project open cuts and the potential yield from the Project water supply borefield. Measures to mitigate the impact of the project on groundwater resources are presented in Section 4.4.1, Volume 1 of the EIS. As stated in Section 4.4, Volume 1 of the EIS: "*Numerical modelling of the aquifer drawdown in the Ulan Seam and the Marrangaroo Sandstone as a result of the development of the Project open cuts and water supply borefield indicates a cone of depression with a radius of approximately 2.5 km to the east, 5 km to the west and 6.5 km to the north of the extremities of the Project open pit limits (Appendix B). The drawdown in the underlying Marrangaroo Sandstone is expected to be of a similar or slightly larger extent (Appendix B). The numerical modelling showed only a limited effect on the water levels in the alluvium/colluvium aquifer. Large sections of the alluvium remained saturated at the end of the 21 year Project life (Appendix B). The model also indicated that there would be no discernible effect on the groundwater and surface water regimes in the sandstone plateau (i.e. Narrabeen Group) that forms the Goulburn River National Park (Appendix B)*." As stated in Section 12.4 of Appendix B, Volume 2 of the EIS: "*On completion of mining, pit dewatering and extraction of water from the borefield would discontinue. As a result, the extent of the cone of depression would stabilise and groundwater levels in and around the Project area would be allowed to recover*."

No.	Issue	Response
44	(Continued)	As discussed in Section 5.1.3.7, Volume 1 of the EIS, a borefield monitoring programme would be developed and detailed in the Water Supply Borefield Plan (WSBP) (Section 5.1.2.5, Volume 1 of the EIS). Data collected by the programme would provide input to borefield performance reviews and enable verification and refinement (where necessary) of the groundwater modelling results (Appendix B, Volume 2 of the EIS). Groundwater monitoring would also be undertaken at selected existing bores surrounding the Project area, in consultation with relevant landholders. Groundwater monitoring, water level measurements and sample collection, storage and transportation would be undertaken in accordance with the procedures outlined in the *Murray Darling Basin Groundwater Quality Sampling Guidelines* (Murray Darling Basin Commission, 1997). Potential cumulative impacts of the Project on groundwater resources are discussed below. ***Potential Impacts on Regional Surface Water Resources*** A Surface Water Assessment has been undertaken as part of the development of the water management system for the Project and to assess potential impacts on surface water resources. The Surface Water Assessment is presented as Appendix A, Volume 2 of the EIS and is summarised in Section 4.3, Volume 1 of the EIS. Appendix A, Volume 2 of the EIS includes an assessment of potential surface water impacts during the operational phase of the Project as well as an assessment of surface water impacts post mining. The assessment included data collation, monitoring of local creeks to characterise baseline conditions, catchment modelling, development of a Project water balance model, water management planning, post-mining water management concepts and final void modelling. A description of the existing water quality and flow characteristics of creeks in the vicinity of the Project is provided in Section 3.2, Volume 1 of the EIS and Appendix A, Volume 2 of the EIS. Measures to mitigate the impact of the project on surface water resources are presented in Section 4.4.1, Volume 1 of the EIS. As stated in Section 4.3.2, Volume 1 of the EIS: "*Creeks situated within the limits of the Project open pits would be removed or altered as a result of open cut mining, including Planters, Spring, Narrow, Bens and Cumbo Creeks. The Project also has the potential to impact on surface water flows in creeks located outside the Project disturbance area*." The predicted effect on flows in Wilpinjong and Wollar Creeks is summarised in Table 4-4 of Section 4, Volume 1 of the EIS. The potential maximum flow reduction in Wilpinjong Creek equates to an 11% reduction of annual average flow. The potential maximum flow reduction in Wollar Creek (at the Goulburn River National Park boundary) equates to a 4.8% reduction of annual average flow.

No.	Issue	Response
44	(Continued)	The relative effects on the magnitude and duration of low flows would reduce significantly downstream of the confluence of Wilpinjong and Wollar Creeks due to additional inflows from Wollar Creek that will be unaffected by the Project. As such, the effects of flow reductions further downstream in Wollar Creek (and upstream of the Goulburn River National Park) would not be discernible from other normal variations in flows that occur due to other changes in catchment condition and landuse. ***Potential Cumulative Impacts*** Potential cumulative impacts of the Project and the existing Ulan Coal Mines on surface water resources are discussed in Section 5.4 of Appendix A, Volume 2 of the EIS. Potential regional and cumulative impacts of the Project and the existing Ulan Coal Mines on groundwater resources are discussed in Section 13.1 of Appendix B, Volume 2 of the EIS. As stated in Section 5.4 of Appendix A, Volume 2 of the EIS: "… *there would be no discernible increased or cumulative adverse impacts on the Goulburn River as a result of the Project*." The Surface Water Assessment also considered Stage 2 of the Ulan Coal Mines with regard to cumulative impacts and concluded in Section 5.4 of Appendix A, Volume 2 of the EIS: "…*it is not expected that the Ulan Stage 2 would have any surface water impacts on Wilpinjong Creek and negligible effect on the Goulburn River*." In terms of potential cumulative groundwater impacts, as stated in Section 13.1 of Appendix B, Volume 2 of the EIS: "… *it is concluded that there would be no overlap in the cone of depression generated by the Ulan Coal Mines (including Ulan Stage 2) and the Project and therefore no cumulative groundwater impacts are predicted*."
45	Concern regarding the validity of the groundwater model, particularly the assumed steady state conditions, recharge mechanisms and model calibration. Concern regarding the sensitivity to the presence of geological faults and therefore effects of fracture permeability.	A plot of monthly excess/deficit rainfall and Residual Mass Curve (RMC) is shown in Figure 2 of Appendix B, Volume 2 of the EIS. As stated in Section 5.2.3 of Appendix B, Volume 2 of the EIS: *"Fluctuations in the groundwater table result from temporal changes in rainfall recharge to the aquifers. Typically, changes in the groundwater elevation reflect the deviation between the long term monthly (or yearly) average, and the actual rainfall, usually described as the Residual Mass Curve (RMC). Normally the groundwater levels are expected to reflect the RMC curve. That is, the groundwater levels recorded during periods of rising RMC are also expected to rise while those recorded during periods of declining RMC are expected to decline. …* *Figure 2 shows the RMC curve essentially stabilising between years 2000 and 2004, that is, at the time when groundwater levels were recorded in the Project area. This indicates that the recorded levels can be considered to represent steady state conditions for that period of time."*

No.	Issue	Response
45	(Continued)	Recharge, discharge and surface water flows and their inter-relationships are discussed in Section 5.2.4 of Appendix B, Volume 2 of the EIS. A summary of the calibrated hydraulic parameters specified in the model (including recharge rates [mm/year] to the different model layers) is presented in Table 9 of Appendix B, Volume 2 of the EIS. The methodology and results of the model calibration are presented in Section 11.0 of Appendix B, Volume 2 of the EIS. Anderson and Woessner (1992), state: "*If the ratio of the RMS error to the total head loss in the system is small, the errors are only a small part of the overall model response*". The total head loss in the system is understood to refer to the whole model domain. For the Wilpinjong groundwater model, the total head loss was 180 m as reported in Section 11.0 of Appendix B, Volume 2 of the EIS. In conclusion, as stated in Section 11.0 of Appendix B, Volume 2 of the EIS: "*Based on the above calibration analysis, it is considered that calibration is accomplished in that the simulated heads and fluxes match field measured values within an acceptable range of error*." Dr Noel Merrick from the National Centre for Groundwater Management, University of Technology Sydney, conducted a review of the Wilpinjong groundwater model and calibration and concluded that it "… *is suitable for the purpose of predicting regional impacts due to dewatering of the proposed open cut coal mine*." In regard to the presence of geological faults, it is stated in Section 5.1.3 of Appendix B, Volume 2 of the EIS: *"No major faulting is indicated from available data. Faults of seam height may be present, although they are not predictable based on the current borehole spacing. Minor faults with small throws are expected."* As a result, fracture permeability was not used in the groundwater model.
46	Concern was raised that the Narrabeen Group underlying the Munghorn Gap Nature Reserve was excluded from the groundwater model.	Table 9 of Appendix B, Volume 5 of the EIS states that the model extent included the Narrabeen Group for: • the peaks of the Munghorn Gap Nature Reserve in Layer 1; • the Munghorn Gap Nature Reserve above the base of the surrounding valley floor in Layer 2; and • the entire model area in Layer 3.

No.	Issue	Response
47	Concerns were raised regarding water supply reliability.	A summary of information regarding the Project water supply is provided in Section 2.9.2, Volume 1 of the EIS: "*Where practicable, Project water supply would be prioritised as follows (Figure 2-16):* 1. *Recycling of water from the tailings thickener overflow. Capture of incident rainfall and runoff across the mining operational areas (i.e. CHPP, mine facilities area, ROM and product coal stockpile areas).* 2. *Recovery of supernatant waters and seepage collected from tailings disposal areas. Dewatering of active open cut mining areas including groundwater inflows, incident rainfall and infiltration/runoff from adjacent mine waste rock emplacements. Advance dewatering via temporary bores (Section 2.4.8).* 3. *Dewatering of inactive open cut mining areas including groundwater inflows, incident rainfall and infiltration/runoff from adjacent mine waste rock emplacements.* 4. *Licensed groundwater extractions from Project water supply borefield to the north of the open cut mining operations.*" A predictive assessment of the performance of the Project water supply system is presented in Appendix A, Volume 2 of the EIS. The simulated water supply reliability (expressed as a volume of water supplied divided by volume required) is 95% (Appendix A, Volume 2 of the EIS). The predictive assessment indicates that from Year 11 of the Project there is unlikely to be a need to source water from the Project water supply borefield, with demand being met by mine water sources alone (i.e. Project water supply priorities 1, 2 and 3 described above).
48	Concerns regarding potential groundwater drawdown on the Goulburn River National Park (Narrabeen Group geological structures).	As stated in Section 4.7.1, Volume 1 of the EIS: *"Results of the groundwater modelling predicted only a limited affect on alluvial and colluvial deposits adjacent to Wilpinjong Creek, with no discernible affect on the shallow seepage from the adjacent elevated Goulburn River National Park to the alluvial/colluvial aquifer (Appendix B). As a result, it is considered that riparian vegetation would not be deleteriously affected by the Project."* Further, as stated in Section 4.4, Volume 1 of the EIS: "*The model also indicated that there would be no discernible effect on the groundwater and surface water regimes in the sandstone plateau (i.e. Narrabeen Group) that forms the Goulburn River National Park (Appendix B).*"

No.	Issue	Response
48	(Continued)	Section 12.3.3 of Appendix B, Volume 2 of the EIS describes groundwater connectivity with respect to alluvium and deeper aquifers: *"The simulated impact of open cut dewatering and extraction of groundwater from the borefield on groundwater levels in different aquifers varied depending on the hydraulic connection between these aquifers and the aquifers being dewatered. As such, the greatest simulated impact was on the main aquifers in the Project area (i.e. the Ulan Seam and the Marrangaroo Sandstone). A similar impact occurs in the Illawarra Coal Measures (model Layer 3), as this aquifer is in direct hydraulic connection with the main aquifers being dewatered and will also be dewatered by open cut mining of overburden above the Ulan Seam. Modelling showed negligible effect in the Narrabeen Group (model Layers 1 and 2). Similarly, modelling showed only a limited affect on the water levels in the alluvium/colluvium aquifer. Large sections of the alluvium remained saturated at the end of 21 year Project life."* Hydraulic tests including pump out and slug tests were conducted in the Project area to determine hydraulic parameters of aquifers. The results of these tests are shown in Table 4 of Appendix B, Volume 2 of the EIS.
49	Concern regarding the reported groundwater salinity values for select DIPNR registered bores presented in Table 3-9, Volume 1 of the EIS.	Table 7 in Appendix B, Volume 2 of the EIS (sourced from Geoterra, 2004) incorrectly tabulates groundwater salinity values for a number of DIPNR registered bores in units of microsiemens per centimetre (μS/cm). These salinity units should have been reported in milligrams per litre (mg/L). As a result, the salinity values presented in Table 7 in Appendix B, Volume 2 of the EIS are approximately 0.68 of the correct values for the bores. Other salinity units presented in the EIS including the salinity values for the Ulan Seam in Table 3-9, Volume 1 of the EIS are correct. The incorrectly tabulated data has no material effect on the assessments and conclusions made in the EIS.
50	Concerns regarding post-closure water management and re-pressurisation of aquifers following mining.	As stated in Section 5.5.1, Volume 1 of the EIS: *"Prior to the completion of mining operations, a* [Mine Closure Plan] *MCP would be developed in consultation with relevant authorities and the Project CCC. The MCP would document the final mine closure process, final rehabilitation works and post-closure maintenance and monitoring requirements appropriate to established completion criteria.* *The MCP would address long-term landuse for the site and would take into consideration:* • *management of the ECAs in accordance with relevant commitments;* • *experience and data obtained from progressive rehabilitation and revegetation activities;* • *results of monitoring programmes;* • *relevant regional planning strategies;*

No.	Issue	Response
50	(Continued)	• *integration with surrounding landuses (e.g. Munghorn Gap Nature Reserve and Goulburn River National Park); and* • *performance against relevant completion criteria.* *A* [Final Void Management Plan] *FVMP would form a component of the MCP. Issues addressed by the FVMP would include:* • *assessment of the hydrological behaviour of the final voids (e.g. long-term water quality and water balance);* • *groundwater and surface water management(e.g. final landforming works to minimize surface water inflows to the voids);* • *long-term geotechnical stability of the voids(e.g. profiling requirements);* • *public safety;* • *access requirements; and* • *water quality monitoring requirements.* *During the development of the FVMP, options for the future beneficial use of the final voids would be investigated. WCPL would work with the MWRC to investigate the amelioration of adverse socio-economic effects that may occur due to the loss of Project employment at closure (Appendix I)."* Section 12.4 of Appendix B, Volume 2 of the EIS describes the recovery of groundwater levels in and around the Project area: "*On completion of mining, pit dewatering and extraction of water from the borefield would discontinue. As a result, the extent of the cone of depression would stabilise and groundwater levels in and around the Project area would be allowed to recover. However, for some time after mine closure, the cone of depression would persist until new steady state conditions are established. The rate of groundwater recovery would largely depend on climatic conditions.* *Once the groundwater recovery stabilises, the overall groundwater gradient would return to the eastnortheast, consistent with the existing groundwater conditions. Any tendency for development of 'dryland salinity' developing in the Project area would be mitigated by the proposed woodland revegetation presented in Section 5 of the EIS. In addition, due to the dominance in evaporation over rainfall in this region localised sinks (localised depression in groundwater levels towards which there is a groundwater gradient) would form around the final voids in Pits 3 and 6. Appendix A of the EIS presents the results of a final void water balance.*"

No.	Issue	Response
50	(Continued)	As discussed in Section 5.1.3.7, Volume 1 of the EIS, a borefield monitoring programme would be developed and detailed in the Water Supply Borefield Plan (WSBP) (Section 5.1.2.5, Volume 1 of the EIS). Data collected by the programme would provide input to borefield performance reviews and enable verification and refinement (where necessary) of the groundwater modelling results (Appendix B, Volume 2 of the EIS).
51	Request for the results of bore census conducted in the February 2005.	WCPL has, and will continue to upon request, provide individual landowners with the details obtained during the bore census for their own bores/wells/springs.
52	Concerns were raised regarding the impacts of the Project lowering the groundwater table.	The potential impacts of the lowering of the water table on existing local groundwater users are described in Section 4.4.1, Volume 1 of the EIS: *"Existing groundwater users in the vicinity of the Project include 14 groundwater bores which extract from the Ulan Seam aquifer within the Year 21 cone of depression (Appendix B). Of these, with the exception of one bore on privately-owned land to the north of Wollar village (property 100 – Figure 1-5) and one bore located on land owned by Ulan Coal Mines to the west of the Project (property 32 – Figure 1-5), all of these bores are on WCPL-owned land (Appendix B). Bores located to the south of the Project open pits are either beyond the extent of the predicted cone of depression or are located in a different aquifer system from those being affected by the Project and are not expected to be impacted. No bores or wells installed in the Wilpinjong Creek alluvium or Wollar Creek alluvium are expected to be affected.* *All known springs on privately-owned land are located beyond the extent of the cone of depression and/or in different aquifer systems from those being affected by the Project and are not expected to be impacted."* Section 4.4.1, Volume 1 of the EIS lists the mitigation measures to ensure continued water supply to existing groundwater users: *"A groundwater monitoring programme to monitor the impact of mining on existing bores/wells is discussed in Section 5.1.3.7. As discussed above, only two existing groundwater bores not owned by WCPL are expected to be affected by the Project. If the data obtained from the groundwater monitoring programme indicates that the Project is having an adverse effect on existing groundwater users (i.e. reduced groundwater yield from existing bores), then the water supply would be re-instated by WCPL either by deepening the existing bore, construction of a new bore or by providing an alternate water supply."*

No.	Issue	Response
52	(Continued)	The potential impacts on local creeks as a result of lowering the groundwater table is presented in Section 4.4.2, Volume 1 of the EIS: *"Groundwater model predictions indicate that mine dewatering and operation of the Project water supply borefield would reduce the average annual baseflow of Wilpinjong Creek due to the reduction in upward leakage from the underlying artesian aquifer formed in the Ulan Seam and underlying Marrangaroo Sandstones. The simulated long-term average annual baseflow in Wilpinjong Creek declined from 2,230 cubic metres per day (m3/day) in pre-mining conditions to 1,566 m3/day in Year 14 of the Project, at which time in the simulation it was assumed that extractions from the Project water supply borefield would cease. Results of the groundwater modelling showed that after cessation of borefield extractions, gradual groundwater level recovery was accompanied by a corresponding recovery of creek baseflow. Interflow/underflow associated with the alluvial and colluvial deposits adjacent to the creek and shallow seepage from the adjacent elevated Goulburn River National Park escarpment, which are the dominant contributors to the long-term average annual baseflow of Wilpinjong Creek (Appendix A), would remain relatively unchanged (Appendix B).* *Simulation results indicated negligible impact on the rate of groundwater discharge to Wollar Creek which is at the eastern limit of the potential cone of depression and no impact on direct groundwater discharge to Goulburn River."* The proposed mitigation measures are described in the Section 4.4.2, Volume 1 of the EIS: *"Mitigation of the predicted reduction in average annual flows in Wilpinjong Creek would include designing the Project water management system to maximise the diversion of runoff from undisturbed areas around Project construction/development and operational areas, together with progressive rehabilitation to allow the free-draining of completed landforms. These measures would minimise the degree of catchment excision at any one time. Sections 2.9 and 4.3.1 present the design objectives of the Project site water management system. Section 5.1.2.4 presents the scope and framework of the proposed SWMP. Section 5.2 presents the rehabilitation programme and concepts for the Project final rehabilitated landforms."*
53	Concerns suggesting the impacts on springs and wells were not addressed in the EIS.	Several springs were identified during the bore census conducted in February 2005. The locations of the springs are shown on Drawing No 12 of Appendix B, Volume 2 of the EIS. Australasian Groundwater and Environmental Consultants' (AGEC) prepared the groundwater impact assessment for the Wilpinjong Coal Project (Appendix B, Volume 2 of the EIS). AGEC's model simulated the development and extent of the cone of depression in the main aquifers in the Project area. Attachment 1 of Appendix B, Volume 2 of the EIS summarises the predicted impacts on individual bores/wells/springs in the Project area and surrounds. Section 13.2 of Appendix B, Volume 2 of the EIS details the effect of the cone of depression on springs:

No.	Issue	Response
53	(Continued)	*"All known springs on privately owned land are located beyond the extent of the cone of depression and/or in different aquifer systems from those being dewatered by the Project and are not expected to be impacted."* A groundwater monitoring programme to monitor the impact of mining is presented in Section 5.1.3.7, Volume 1 of the EIS. In addition to the groundwater monitoring programme presented in Table 5-3 in Section 5, Volume 1 of the EIS, groundwater monitoring would be undertaken at selected existing bores/wells/springs surrounding the Project area, in consultation with relevant landholders. As stated in Section 4.4.1, Volume 1 of the EIS: *"If the data obtained from the groundwater monitoring programme indicates that the Project is having an adverse effect on existing groundwater users (i.e. reduced groundwater yield from existing bores), then the water supply would be re-instated by WCPL either by deepening the existing bore, construction of a new bore or by providing an alternate water supply."*
54	In regard to the relocation of Cumbo Creek, concerns were raised in relation to: • measures to be undertaken for assessment of stream status (for the purpose of developing offset provisions); • diversion design based on the current geomorphology; • requests for a more detailed stream relocation plan; • revegetation establishment and long-term stability of the relocated stream; and • potential effects on stream flow velocities and flood peaks.	***Cumbo Creek Relocation Design and Long-term Stability*** Section 2.9.1, Volume 1 of the EIS presents a description of the proposed Cumbo Creek Relocation including: a layout figure; typical cross-section and construction methodology; expected timing of the construction of the diversion; detailed design considerations (e.g. flow capacity determination and pools and riffle zones); and a commitment to undertake detailed design in the Site Water Management Plan (SWMP) and Cumbo Creek Relocation Plan (CCRP) in consultation with the relevant authorities. Figures 2-6 to 2-11 (Section 2, Volume 1 of the EIS) also show the expected staged development of the Cumbo Creek Relocation and its integration with the overall Project progressive rehabilitation programme. Further information on the design of the Cumbo Creek Relocation is provided in Section 3.5 of Appendix A, Volume 2 of the EIS as follows: *"The flow path geometry and geomorphology are to be developed such that flow velocities and boundary shear stresses developed under design flood flow conditions would be similar to those in the existing Cumbo Creek under similar flows and would not exceed critical values for long-term stability.* *Prior to detailed design, the following should be undertaken:* • *A hydrological assessment of the post mined catchment of Cumbo Creek should be undertaken to establish expected flow characteristics including high flow events. Data from the gauging station installed on Cumbo Creek by WCPL would be used in this assessment.* • *A geomorphological investigation of local* [i.e. including Cumbo Creek] *and regional creeks should be undertaken to establish flow path form for optimal long-term stability.*

No.	Issue	Response
54	(Continued)	*In carrying out the design, attention should be given to the following:* • *Oversizing the low flow path to allow some sedimentation and to limit potential scour during the early establishment phase.* • *Incorporation of a temporary retardation storage upstream of the inlet of the reconstructed creek to ameliorate potential scour associated with high flows during the establishment phase.* • *Incorporation of an active alluvial layer in the floor and bank toe areas of the low flow path to provide continuity of sediment movement through the catchment. The need for, and extent of this layer should be identified during the geomorphological investigation.* • *Use of temporary armouring and reinforcement of banks in riffle zones to provide stability during the vegetation establishment.* • *Allowances for any predicted settlement (i.e. consolidation) of mine waste rock through a trial using in situ overburden/interburden.* *Research into the settlement (i.e. consolidation) of spoil (e.g. overburden/interburden) in mine waste rock emplacements indicates that a main primary settlement occurs during and immediately after spoil placement. A smaller secondary settlement then occurs during subsequent wetting of spoil by rainfall (Nadieran, 1997). Actual post-placement settlements can be reduced by compaction of the upper layers of fill.* *Following construction, monitoring should be undertaken to assess ongoing performance of the relocation corridor. Geotechnical/geomorphological monitoring should focus on settlement, bed and bank stability, movement of bed sediment and changes to flow path geometry. Environmental monitoring should focus on vegetation and habitat establishment as well as water quality. Inspections should be undertaken during and following significant flow events to determine if maintenance works are required.* *The final design of the Cumbo Creek relocation corridor would be subject to DIPNR approval and would be documented in the Cumbo Creek Relocation Plan as part of the overall site water management reporting process (i.e. Site Water Management Plan)."* The above geomorphic design considerations include a geomorphological study of Cumbo Creek to determine "flow path geometry and geomorphology".

No.	Issue	Response
54	(Continued)	Sections 5.1.2.4 and 5.1.2.6, Volume 1 of the EIS, present the proposed content of the SWMP and CCRP, respectively. In regard to the Cumbo Creek Relocation, Section 5.1.2.4, Volume 1 of the EIS states that the SWMP will include: • *"details of surface water management structures including the design of the Cumbo Creek relocation (Cumbo Creek Relocation Plan [CCRP] – Section 5.1.2.6);* • *location and design specifications for all clean water diversions, including channel design and stabilisation, sediment retention storages and other structures."* In regard to the Cumbo Creek Relocation, Section 5.1.2.6 states that the CCRP will include: • *"design and specifications for creek relocation works;* • *a construction programme for the creek relocation, describing how the work would be staged and progressively integrated with mining operations;* • *a revegetation programme using appropriate native riparian species consistent with upstream regeneration works (Section 5.2.5);* • *design of the block bund foundation to provide for the diversion of sub-surface flow associated with Cumbo Creek alluvium;* • *water quality, ecological and geomorphic performance criteria for the creek relocation;* • *a programme to monitor water quality and ecological and geomorphic integrity of the creek relocation; and* • *a programme to inspect and maintain the creek relocation and revegetation works until they stabilise."* The level of information presented in the EIS (as referenced above) is considered adequate for the purposes of describing the Cumbo Creek Relocation and how the design process will incorporate consideration of long-term stability. ***Stream Status and Offset Provisions*** In regard to the assessment of stream status and the adequacy/provision of offsets, the EIS includes the following: • Section 3.2.2 and 3.2.3, Volume 1 of the EIS, present descriptions of the local hydrology including catchment and water quality characteristics; • Sections 2.1 and 2.4 of Appendix A, Volume 2 of the EIS, present further information in regard to catchment and water quality characteristics; and

No.	Issue	Response
54	(Continued)	• Appendix HD, Volume 4 of the EIS presents the results of the Aquatic Ecosystem Assessment undertaken for the EIS. In regard to the aquatic habitat characteristics of Cumbo Creek, Section HD4.1.3 of Appendix HD concluded: *"Cumbo Creek has been heavily modified by land clearing and grazing and there is very little riparian vegetation along the creek. Aquatic macrophytes include Typha domingensis, Typha orientalis, Phragmites australis and Aster subulatus. The upper parts of the creek drain through some extensive low-lying marshes, which provide some ecological function to the creek system (Plate HD-7). The banks of the creek are not very high and are gently sloped. There was evidence of erosion caused by cattle on both the streambanks and in the streambed itself (Plate HD-8). Cumbo Creek is heavily infested in places with the introduced emergent species Juncus acutus (Plate HD-9) which forms monospecific stands at the expense of native species. This species has become a widespread invasive problem in wetlands in NSW. Cumbo Creek was given a poor to moderate rating, due to the occurrence of Juncus acutus and the extent of erosion and other weeds which reduce its ecological quality."* In regard to assemblages of macroinvertebrates, Section HD4.3 of Appendix HD, Volume 4 of the EIS concluded that the two sites sampled on Cumbo Creek indicated severe water pollution (when measured by the average SIGNAL values). In regard to assemblages of fish, Section HD4.4 of Appendix HD concluded that based on the SIMPER procedure the introduced Mosquito Fish (*G. holbrooki*) was ranked as the species that contributed most to the structure of the assemblages. Section 5, Volume 1 of the EIS, then presents the Environmental Protection Plan for the Wilpinjong Coal Project which includes the following in the proposed regeneration areas (Section 5.3, Volume 1 of the EIS): "*The establishment of woodland vegetation in the regeneration areas would include the revegetation of banks of Wilpinjong and Cumbo Creeks. The revegetation of the creek banks would include native flora species such as Casuarina cunninghamiana and would increase the quantity of riparian vegetation along these creeks.*" A further 4 km of riparian vegetation is provided through the proposed Enhancement and Conservation Areas (ECAs) (Section 5.4, Volume 1 of the EIS): • *"the opportunity to establish riparian vegetation along Wilpinjong and Cumbo Creeks through natural regeneration/selective planting (approximately 4 km of Wilpinjong Creek is situated within ECA-B and approximately 1.25 km of Cumbo Creek is situated within ECA-A as shown on Figure 5-2);"*

No.	Issue	Response
54	(Continued)	The regeneration areas and ECAs described above would result in approximately 10 km of creek revegetation (i.e. ecological offset). Combined with the other measures presented in the EIS, this is considered to be an adequate ecological offset for the Project's potential impacts on Cumbo Creek. In addition to the above, ameliorative measures have been developed to minimise the potential impacts of the Project on aquatic ecosystems and are described in Section 4.9.2, Volume 1 of the EIS as follows: *"The following measures have been developed to minimise the potential impacts (including cumulative impacts) of the Project on aquatic ecosystems:* *…* • *In order to minimise the length of time fish passage may be restricted during construction activities, construction of the floodway crossing across Cumbo Creek and burial of pipelines across Wilpinjong Creek would be scheduled during periods of no/low flow. Works associated with the relocation of Cumbo Creek would also be scheduled so as to minimise the interruption of flows and fish passage in Cumbo Creek.* • *Further to riparian revegetation in the rehabilitation areas, riparian vegetation would also be established along Wilpinjong and Cumbo Creeks in the regeneration areas and the ECAs through natural regeneration/selective planting. These initiatives would increase the quantity of riparian vegetation along these watercourses and improve the condition of habitats available to aquatic biota. Some 10 km of creekline along Wilpinjong and Cumbo Creeks would be revegetated/enhanced by the Project. The Wilpinjong Creek and Cumbo Creek revegetation/enhancement initiatives in the regeneration areas and ECAs would be detailed in the FFMP.* • *The CCRP would also include a revegetation programme for the Cumbo Creek relocation corridor and would use native riparian species consistent with upstream regeneration works. The CCRP would also include: design and specifications for creek relocation works; a construction programme for the creek relocation, describing how the work would be staged and progressively integrated with mining operations; design of the block bund foundation to provide for the interception of sub-surface flow associated with Cumbo Creek alluvium; water quality, ecological and geomorphic performance criteria for the creek relocation; and a programme to inspect and maintain the creek relocation and revegetation works until they stabilise.*

No.	Issue	Response
54	(Continued)	• *An aquatic monitoring programme would be developed to monitor the aquatic macroinvertebrate assemblages, in-situ water quality, characteristics and health of Wilpinjong and Cumbo Creeks. The ecological integrity of the Cumbo Creek relocation would also be monitored. Components of the aquatic monitoring programme would be detailed in either the FFMP or CCRP. Consideration would also be given to monitoring creek features established in the final landforms later in the Project life to assess their provision of habitat for aquatic biota. Surface and groundwater monitoring programmes would be developed for the Project to monitor Wilpinjong, Cumbo and Wollar Creeks, as described in Sections 5.1.3.6 and 5.1.3.7."* Based on the above, it is considered that the EIS adequately addresses the Cumbo Creek Relocation and associated design and assessment issues.
55	Concern was raised regarding potential impacts on Wilpinjong Creek, Wollar Creek and the Goulburn River, in relation to compensation for impact (reduction in flows) on downstream water users and ecosystems. The suggestion was made that flow analysis was not undertaken to assess the change in flows across a range of flow conditions.	The surface water assessment presented in Appendix A, Volume 2 of the EIS, assessed the potential impacts of the Project on Wilpinjong Creek, Wollar Creek and the Goulburn River. Section 5.2 of Appendix A presents the results of the modelling and assessment of potential effects on Wilpinjong Creek, Wollar Creek and the Goulburn River. This includes flow duration curves (Figure 17 in Appendix A, Volume 2 of the EIS) showing the estimated change in flow over a range of simulated flow conditions in Wilpinjong Creek and Wollar Creek (just upstream of the Goulburn River National Park). As stated in Section 4.3.2, Volume 1 of the EIS: *"The potential maximum flow reduction in Wilpinjong Creek equates to an 11% reduction of annual average flow. Downstream of the confluence of Wilpinjong and Wollar Creeks the affects would diminish due to the inflows from unaffected catchments (Appendix A).* *Whilst the predicted changes to low flows in Wilpinjong Creek would be expected to be noticeable as reduced flow persistence, the magnitude of predicted effects can be compared to those that occur due to other changes in catchment condition and landuse such as changes in livestocking rates, construction of farm dams, water harvesting or bushfires which can also result in noticeable changes to low flows (Appendix A).* *The relative effects on the magnitude and duration of low flows would reduce significantly downstream of the confluence of Wilpinjong and Wollar Creeks due to additional unaffected inflows from Wollar Creek. As such, the effects of flow reductions further downstream in Wollar Creek (and upstream of the Goulburn River National Park) would not be discernible from other normal variations in flows resulting from the types of changes in catchment condition and landuse described above, or from the proposed 10 km of creek enhancement works (i.e. exclusion of livestock and riparian revegetation) on WCPL-owned lands which are described in Section 5.*

No.	Issue	Response
55	(Continued)	*The actual magnitude of the potential flow reductions in Wilpinjong Creek annual average flow would vary with time and would be less than that described above and presented in Table 4-4, depending on the area of catchment excised by Project operations and on the level of usage of the Project water supply borefield. In periods of the Project life when catchment excision and borefield extractions are less, the reduction in flow would also be expected to be less. Revegetation associated with the creek enhancement works would develop through the Project life in parallel to any flow effects (Sections 5.3 and 5.4)."* Based on the above, the potential impact on the Goulburn River would be significantly less than that described for Wollar Creek (i.e. not discernible from normal flow variations). Monitoring will be undertaken to validate the estimated potential effect on Wilpinjong Creek flows. As stated in Section 5.1.3.6, Volume 1 of the EIS: *"Surface water flow rate (via water level) would be monitored continuously at installed gauging stations on Wilpinjong and Cumbo Creeks (Figure 5-1). …* *The site water balance would be reviewed annually to optimise performance and validate predictions. These reviews would be linked to borefield performance reviews. The reviews would also facilitate the preparation of contingency/remediation plans for managing adverse impacts of the Project on surface water, where necessary (Section 5.1.2.4)."* Further, Australasian Groundwater and Environmental Consultants (AGEC) prepared the groundwater impact assessment for the Wilpinjong Coal Project (Appendix B, Volume 2 of the EIS). AGEC's model simulated the development and extent of the cone of depression in the main aquifers in the Project area. As stated in Section 4.4.1, Volume 1 of the EIS: *"No bores or wells installed in the Wilpinjong Creek alluvium or Wollar Creek alluvium are expected to be affected."* Section 5, Volume 1 of the EIS, then presents the Environmental Protection Plan for the Wilpinjong Coal Project which includes the following in the proposed regeneration areas (Section 5.3): "*The establishment of woodland vegetation in the regeneration areas would include the revegetation of banks of Wilpinjong and Cumbo Creeks. The revegetation of the creek banks would include native flora species such as Casuarina cunninghamiana and would increase the quantity of riparian vegetation along these creeks.*"

No.	Issue	Response
55	(Continued)	A further 4 km of riparian vegetation is provided through the proposed Enhancement and Conservation Areas (Section 5.4, Volume 1 of the EIS): *"the opportunity to establish riparian vegetation along Wilpinjong and Cumbo Creeks through natural regeneration/selective planting (approximately 4 km of Wilpinjong Creek is situated within ECA-B and approximately 1.25 km of Cumbo Creek is situated within ECA-A as shown on Figure 5-2);"* Based on the Environmental Protection Plan (EPP) presented in Section 5, Volume 1 of the EIS, including the proposed 10 km of riparian revegetation/regeneration works described in Sections 5.3 and 5.4, Volume 1 of the EIS, it is considered that adequate protection/compensation is provided for downstream water users (of which there are two on Wilpinjong Creek) and ecosystems. The level of information presented in the EIS in regard to potential impacts on Wilpinjong Creek, Wollar Creek and the Goulburn River is considered to be adequate for the purposes of environmental assessment.
56	Concerns were raised regarding: • the salinity buffering potential from Wilpinjong Creek and the potential long-term salinisation of Wilpinjong Creek; • salinity budgeting and exports from Wilpinjong Creek; • the potential for overflow from the final voids and associated preventative measures; • long-term seepage from the disturbed area; and • impacts of the beneficial use of groundwater resources.	The potential impact of the Project on flows and salinity in Wilpinjong Creek has been comprehensively assessed in the EIS, in particular: • Section 3.2, Volume 1 of the EIS and Section 2.4 of Appendix A, Volume 2 of the EIS, describe the existing water quality characteristics of Wilpinjong Creek. • Section 3.3, Volume 1 of the EIS presents a description of the local hydrogeology including groundwater quality. • Section 5.0 of Appendix B, Volume 2 of the EIS presents a description of the hydrogeological regime including water levels and quality. • Sections 5.2 and 5.3 of Appendix A, Volume 2 of the EIS present the results of the assessment of potential impacts on local creek systems. • In regard to long-term seepage from the disturbed area and the beneficial use of groundwater resources, Appendix C, Volume 2 of the EIS presents the results of an Assessment of the Acid Forming Potential and Salinity of Overburden, Coal and Coal Washery Waste. The results indicated that overburden (i.e. mine waste rock material) at Wilpinjong is expected to be non-saline. With regard to the salinity of coarse rejects, Section 4.2 of Appendix C, Volume 2 of the EIS states: *"The EC values for raw and product coal samples ranged from 102 and 112 μS/cm, which suggests very low soluble salts. The EC values for the five coarse rejects samples were higher at between 211 and 445 μS/cm, but these values are still indicative of low soluble salt contents. Based on these results, it is expected that raw coal, product coal, and coarse rejects at Wilpinjong will be non-saline."*

No.	Issue	Response
56	(Continued)	With regard to the likely salinity and acid drainage potential of the tailings (i.e. fine reject material and slimes from the coal handling and preparation plant), Section 5.2 of Appendix C, Volume 2 of the EIS states: *"The results of this study suggest that most tailings will be at least moderately saline and have some capacity for acid generation. Since the tailings originate from the Ulan Seam and will be disposed of in-pit, it is expected that the groundwater flux through the tailings disposal areas in the long-term will be of a similar groundwater quality[3] to that which currently exists in the Ulan Seam, provided that the tailings management recommendations are implemented…"* **Note:** [3] EC values of 1,020 to 3,390 μS/cm have been reported for groundwater in the Ulan Seam. Reference: Australasian Groundwater and Environmental Consultants Pty Ltd (2005). An assessment of post-mining surface water impacts is provided in Section 6.0 of Appendix A, Volume 2 of the EIS. The principal water management issue for mine rehabilitation is the behaviour of the final voids, in particular the long-term water balance and likely salinity. The behaviour of the final voids was investigated using a water and salt balance model (based on a mass balance), including 116 year rainfall data. As stated in Section 6.0 of Appendix A, Volume 2 of the EIS: "*Two final voids would remain at the completion of mining, including a final void at the northern end of Pit 3 and another at the southern end of Pit 6 (Figure 15). …* *Inflows to the final voids would comprise incident rainfall over the void lake surface, runoff and seepage from the sides of the voids and runoff from their adjacent contributing catchment. In the longer term, it is anticipated that there would be groundwater inflows once groundwater levels in remnant coal measures down-dip recover and infiltration of seepage from the rehabilitated mine waste rock emplacement areas creates flow toward these voids.* *Post recovery groundwater seepage rates and groundwater levels were estimated by AGEC (2005). Equilibrium (zero pit inflow) groundwater levels of 365 m AHD and 397 m AHD were estimated for Pits 3 and 6 respectively. Runoff inflows were estimated using the catchment model (incorporating the AWBM) to estimate yield from the rehabilitated areas that would drain to each void.* *The salt concentrations in the voids were simulated by applying concentrations to inflows reflective of the salinity in the coal seam for groundwater inflows (2,000 mg/L total dissolved solids - TDS[5]) and indicative values for surface water runoff taken from regional monitoring data (200 mg/L TDS).*

No.	Issue	Response
56	(Continued)	*[[5] As stated in EGi (2005) "… groundwater flux through the tailings disposal areas in the long term will be of a similar groundwater quality to that which exists in the Ulan Seam, provided that the following tailings management recommendations are implemented…"]* *The results of these simulations indicate that the voids in both Pits 3 and 6 would slowly fill with water and in the long-term, water levels would approach an equilibrium level significantly below the spill level of the final voids. Model results indicate that that it would take over 300 years for water levels to reach equilibrium in the Pit 6 final void (which would be empty at the end of the 21-year Project life). The period of time to reach equilibrium in Pit 3 would depend on the water level contained in the final void at the end of mining as this pit may be used as water storage in the latter years of mining.* *Once the groundwater recovery stabilises the overall groundwater gradient would be to the east-northeast, consistent with the existing groundwater conditions (Appendix B of the EIS). Any tendency for development of dryland salinity developing in the Project area would be mitigated by the proposed woodland revegetation presented in Section 5 of the EIS. In addition, due to the dominance of evaporation over rainfall in this region localized sinks (localised depressions in groundwater levels towards which there is a groundwater gradient) would form around the final voids in Pits 3 and 6 (Appendix B of the EIS).* *The salinity of void waters would slowly increase with time, as a result of the ongoing slow migration of saline groundwater. In the longer term, salt concentrations would also be affected by evapo-concentration. The simulated behaviour of the two voids is shown on Figure 18.* *It is recommended that detailed planning and confirmatory void modelling be conducted prior to completion of mining and a Final Void Management Plan be developed as a component of the Mining Operation Plan."* Based on the above final void modelling it is considered that no further preventative measures for overflow potential from the final voids are required. As stated in Section 5.5.1, Volume 1 of the EIS, a Final Void Management Plan (FVMP) would be developed as a component of the Mine Closure Plan including consideration of the potential future beneficial use of the final voids. The FVMP would include: • *"assessment of the hydrological behaviour of the final voids (e.g. long-term water quality and water balance);* • *groundwater and surface water management (e.g. final landforming works to minimise surface water inflows to the voids);* • *long-term geotechnical stability of the voids (e.g. profiling requirements);* • *public safety;*

No.	Issue	Response
56	(Continued)	• *access requirements; and* • *water quality monitoring requirements.* *During the development of the FVMP, options for the future beneficial use of the final voids would be investigated."* The FVMP would include further consideration of the long-term options for the management of final voids. The FVMP would also include further mass balance modelling (i.e. in addition to that presented in the EIS) based on data obtained over the life of the Project. Monitoring would be undertaken to validate the predictions made in this modelling. Based on the assessments referenced above in relation to potential salinity impacts on Wilpinjong Creek, Section 4.3.1, Volume 1 of the EIS concludes: "*Surface water runoff from mine landforms and disturbance areas could potentially contain sediments, soluble salts, process reagents (i.e. flocculant/magnetite), fuels, oils and grease. The potential surface water quality impacts of the Project that relate to these contaminants are summarised in Table 4-3.* *The results of geochemical testwork undertaken for the Project indicate that mine waste rock is expected to be non-saline and non-acid forming (Appendix C). The coarse reject and tailings materials are expected to have some capacity for acid generation and the tailings material is expected to be moderately saline (Appendix C). Surface water management measures would be implemented to minimise potential surface water quality impacts as described below.* *In addition to potential impacts associated with surface water runoff, the long-term water balance of the final voids (Appendix A) indicates that the salinity of void waters would slowly increase with time, as a result of on-going migration of saline groundwater infiltration into the voids. In the longer term, salt concentrations would also be affected by evapo-concentration. The voids would slowly fill with water and approach an equilibrium level below the overflow level of the final voids (Appendix A). Groundwater inflows to the voids are predicted to be small compared with direct rainfall runoff and infiltration through the mine waste rock emplacements. Groundwater inflows would reduce as the water level in the voids reaches the equilibrium level (Appendix A).* *The use of groundwater resources by the Project also has the potential to impact on stream water quality as a result of changes in the contribution that groundwater from the Ulan Seam makes to creek baseflow in Wilpinjong and Wollar Creeks (described in Section 4.4). Groundwater quality monitoring records in the Ulan Seam indicate EC ranges from 1,020 to 3,390 μS/cm.*

No.	Issue	Response
56	(Continued)	*The Ulan Seam is a source of the total salt load that is observed in Wilpinjong Creek, when compared to that contributed by the relatively fresher alluvial/colluvial aquifer (Appendix A). Therefore, any reduction in the rate of contribution that groundwater from the Ulan Seam makes to the creek baseflow would result in a corresponding reduction in the salt load in Wilpinjong and Wollar Creeks (Appendix A). This potential reduction in salt load, combined with the Project creek enhancement works, would be beneficial to the aquatic assemblages of Wilpinjong and Wollar Creeks (Appendix HD)."* Based on the above, it is considered that potential salinity impacts on Wilpinjong Creek are adequately assessed in the EIS.
57	Concerns were raised suggesting that a site water balance and description of the integrated water circuit was not presented in the EIS.	***Water Balance Data*** The water management system for the Wilpinjong Coal Project is described in Section 2.9.1, Volume 1 of the EIS. In terms of water supply requirements, Section 2.9.2, Volume 1 of the EIS states: "*The main water usage for the Project would be associated with the washing of ROM coal in the CHPP. Other water supply requirements include water for dust suppression on haul roads and other non-potable water uses. A small potable supply would also be required to service the construction camp and for drinking water and ablution facilities in the office and crib areas (Section 2.10.4).* *The peak total make-up water demand including the operation of the CHPP at 8.5 Mtpa and accounting for recycling of water from the tailings thickener is estimated to be approximately 6.2 ML/day (Appendix A).* *Where practicable, Project water supply would be prioritised as follows (Figure 2-16):* *1. Recycling of water from the tailings thickener overflow. Capture of incident rainfall and runoff across the mining operational areas (i.e. CHPP, mine facilities area, ROM and product coal stockpile areas).* *2. Recovery of supernatant waters and seepage collected from tailings disposal areas. Dewatering of active open cut mining areas including groundwater inflows, incident rainfall and infiltration/runoff from adjacent mine waste rock emplacements. Advance dewatering via temporary bores (Section 2.4.8).* *3. Dewatering of inactive open cut mining areas including groundwater inflows, incident rainfall and infiltration/runoff from adjacent mine waste rock emplacements.* *4. Licensed groundwater extractions from Project water supply borefield to the north of the open cut mining operations.*

No.	Issue	Response
57	(Continued)	*The majority of the Project make-up water supply requirements would be met by dewatering of the open cut mining areas and the Project water supply borefield. Mine water would be suitable for use in the CHPP and for dust suppression purposes (Appendix A). The groundwater quality in the Ulan Seam aquifer (Appendix B) is considered suitable for use in the CHPP. Further details of the Project water supply borefield are provided in Section 2.9.3.* *A predictive assessment of the performance of the Project water supply system is presented in Appendix A. The simulated water supply reliability[1] is 95% (Appendix A). The predictive assessment indicates that from Year 11 of the Project there is unlikely to be a need to source water from the Project water supply borefield, with demand being met by mine water sources alone (i.e. Project water supply priorities 1, 2 and 3 described above)."* **Note**: [1] Expressed as a volume of water supplied divided by volume required. The results of detailed modelling of the site water balance are presented in Sections 4.1 and 4.2 of Appendix A, Volume 2 of the EIS: *"**4.1 Project Water Management System Simulation Model*** *The ability of the water management system to achieve its broad design objectives (Section 3.1) was assessed by simulating the dynamic behaviour of the Project water balance over the Project life under variable climatic conditions (based on historic rainfall data). The water balance model developed for the Project simulates all the inflows, outflows, transfers and changes in storage of water on site on a daily basis in ten water storages (including the CHPP and box cut water supply storages, active and inactive open cut voids and tailings disposal areas). The model simulates inflows from rainfall-runoff, groundwater inflows to open cut voids, extraction from the Project water supply borefield and advance dewatering of pit areas. Simulated outflows comprise evaporative losses, water used to satisfy the demands of the CHPP, moisture content in product coal and water used for dust suppression. The general components and linkages of the water management system simulated by the model are shown in schematic form on Figure 6.* *The model was set up to run over a large number of different daily rainfall sequences compiled from the historical record[2]. Each sequence comprised a 21-year period – corresponding to the planned Project life. The sequences were formed by moving along the historical record one year at a time with the first sequence comprising the first 21 years in the record. The second sequence comprised years 2 to 22 in the record while the third sequence comprised years 3 to 23 and so on. Using this methodology, 96 21-year sequences of daily rainfall were formulated for use in the model simulations. This method effectively includes all possible historical climatic events in the water balance model, including high, low and median rainfall periods.*

No.	Issue	Response
57	(Continued)	**Note**: [2] A record of 116 years (1889-2004) was obtained for the site from the Queensland Department of Natural Resources and Mines Silo Data Drill – refer http://www.nrm.qld.gov.au/silo/datadrill/. A 116-year evaporation data set for the site was also obtained from this source. *The AWBM model (Boughton, 1993) was used to simulate runoff from rainfall on the various catchments and landforms across the Project area. Model rainfall-runoff parameters have been taken from studies conducted at similar mining operations (ACARP, 2002), with calibration against local streamflow records and experience with similar projects. Groundwater inflow rates to the active open cut workings and open cut voids were derived from inflow rates provided by AGEC (2005) and adjusted for the modelled water level in the open cut voids. Evaporative losses from open cut voids and on site water storages (including tailings disposal areas) were estimated on the basis of evaporation rates derived from the same source as the rainfall data and storage/void surface areas. Allowance was also made for evaporative losses from seepage from the highwall faces of the open cut.* *The net make-up water demand for the CHPP was derived from data provided by Thiess (2005). Haul road (dust suppression) demands were estimated on the basis of active haul road length derived from Project layout plans (Figures 7 to 14) and evaporation allowance. The peak total make-up water demand (accounting for recycling of water from the tailings thickener) including the operation of the CHPP at 8.5 Mtpa is estimated to be approximately 6.2 ML/day.* ***4.2 Simulated Performance*** ***4.2.1 Containment of Mine Water*** *Results of modelling indicate that there would be sufficient on-site storage capacity available in the open cut voids and other storage areas to provide secure containment for all mine water and tailings in all simulated climatic sequences. Under some conditions secure containment would necessitate the pumped transfer of excess water from active open cut areas and/or the active tailings disposal areas to inactive open cut voids for temporary containment.* ***4.2.2 Make-up Water Supply Requirements*** *Results of modelling indicate that, under most climatic conditions and particularly during the first half of the Project life, extractions from the borefield, supplemented by advance dewatering within pit areas, are required to maintain operation of the CHPP at design capacity. During the first 10 years of the Project, model predictions indicate that there would be a need to store water pumped from the water supply borefield in water storages available at the time (including inactive open cut voids and tailings disposal areas).* *Model results indicate that from Year 11 of the Project there is unlikely to be a need to source water from the water supply borefield, with demand being met by mine water sources alone. This is mainly as a result of higher predicted inflows to the open cut (AGEC, 2005).*

No.	Issue	Response
57	(Continued)	*The simulated water supply reliability[3] averaged over all modelled climatic sequences is 95% (including 4 L/s provided by advance dewatering bores and supply drawn from the borefield)."* **Note**: [3] Expressed as a volume of water supplied divided by volume required. Based on the above, it is considered that an adequate description of the site water management system, site water balance and site water balance performance is presented in the EIS.
58	Concerns were raised suggesting that: • no layout plans or descriptions of clean water diversions or internal drains were provided in the EIS; and • no measures to prevent the contamination of Cumbo Creek were provided.	The clean water diversions and internal collection drains required over the life of the Wilpinjong Coal Project are comprehensively described in Section 3.0 of Appendix A, Volume 2 of the EIS. With respect to the layout of the drainage systems, Figures 7 to 15 in Appendix A, Volume 2 of the EIS show the development of the drainage layout for Years 1, 3, 7, 9, 10, 13, 14, 21 and post-mining. The design of these drainage systems would be further developed in the Site Water Management Plan as described in Section 5.1.2.4, Volume 1 of the EIS. With regard to the description and design specifications of the drainage systems, the following are excerpts from Appendix A, Volume 2 of the EIS: ***"3.3 Drainage from Undisturbed Catchments*** *The accepted approach to managing runoff from catchments areas which are undisturbed by surface mining activities is to isolate them and, where practicable, divert them around surface disturbance areas. The objective of this strategy is to minimise the volume of mine water that would need to be managed on site. Over the life of the Project, this would involve the construction of diversion bunds, drains and temporary interception dams around the open cut and mine waste rock emplacement areas so as to divert runoff from undisturbed areas to off site drainages. Toe drains and isolation bunds would also be constructed around the perimeter of any temporary out-of-pit mine waste rock emplacements (Figures 8 and 9) and other areas disturbed by mining to collect and convey drainage from these areas to containment storages thereby isolating drainage disturbed by mining away from undisturbed area runoff. Upslope diversion works would be designed in consultation with DIPNR. The design capacity of these diversion works would depend on:* • *the size and nature (eg. soil type) of the upslope catchment;* • *the design life of the diversion; and* • *the consequences of a breach.* *Depending on the above, the design capacity would range from the peak flow generated by the 1 in 2 year average recurrence interval (ARI) through to that generated by the 1 in 100 year ARI. Diversions would be designed to be stable (non-eroding) at the design flows. Stabilisation would be achieved by design of appropriate channel cross-sections and gradients and the use of channel lining with grass or rockfill as required. The conceptual layout and extent of the proposed upslope drainage diversion works is shown on Figures 7 to 15 and described in Section 3.9."*

No.	Issue	Response
58	(Continued)	***"3.6 Water Management in Open Cut Areas*** *The general sequence of open cut mining operations for the Project is described in Section 2 of Volume 1 of the EIS.* *Upslope diversions as described in Section 3.3 and temporary interception dams with pump out systems would be constructed to limit inflows of undisturbed runoff in active/inactive open cut areas. Groundwater inflows to active open cut areas would combine with rainfall-based runoff from adjacent catchment areas and incident rainfall on the floor of the open cut voids. This water would need to be removed to enable ongoing mining operations to be undertaken safely and efficiently.* *Hydrogeological investigations by AGEC (EIS Appendix B) indicate that groundwater inflows to the open cuts would vary significantly during the Project life depending on the elevation of the pit base.* *Inflows are expected to be greatest in Years 13 to 14 - coincident with mining of the deeper coal in the north and north-west of the Project area (ie. Pits 4, 5 and 6) coupled with infiltration through the rehabilitated mine waste rock emplacements reporting to the open cut workings in the north.* *Whilst inflow derived from direct rainfall and surface water inflows would be predominant during wet periods, groundwater inflow is expected to be more significant in terms of total volume over the Project life. Results of water balance modelling indicate that efficient mine dewatering is likely to necessitate pump-out capacity in the order of 150 L/s. Where the potential for high groundwater inflows from the Ulan Seam is identified, advance dewatering using temporary bores ahead of the open cut mining operation may be conducted.* *During mining operations any direct groundwater inflows from alluvium exposed in the highwall of the open cut would be intercepted prior to it reaching the floor of the open cut and pumped back to the nearest creek. This would be achieved by the installation of sumps and a pump/pipe system located on a bench of the open cut (as is the current practice for similar circumstances at coal mines in the Hunter Valley). As discussed in Section 3.5, the proposed relocation of Cumbo Creek would include a block bank and sub-surface cut-off wall across Cumbo Creek upstream of the Project open cut to divert both surface and subsurface flows into the new creek alignment.* *Where areas of alluvium intersect the open cut highwall, and there is a potential for significant leakage of waters from the alluvium to the mine waste rock emplacements, specific control measures may be necessary. This would be assessed by detailed investigations and appropriate control measures implemented as required to control these inflows. These measures may include selective placement of more weathered materials against the alluvium, as the open cut excavation is backfilled with mine waste rock. Placement methodologies for these materials (i.e. placement in thinner layers and trafficking with mine fleet) would be developed to achieve the desired degree of seepage control.*

No.	Issue	Response
58	(Continued)	***3.7 Water Management in Tailings Disposal Areas*** *Two waste streams would be produced from the CHPP - a coarse-grained, rocky waste material comprising sandstone and shale material (coarse rejects) and a fine grained silty material (fine rejects/slimes). The coarse reject would be placed as a "dry" solid fill in the mine waste rock emplacements (ie. it would be mixed with overburden and interburden). The fine-grained waste stream would be produced as a tailings slurry. CHPP tailings would pass through a thickener to recover water for reuse in the CHPP. The tailings underflow fraction from the thickener is to be pumped to a disposal area. Thickened tailings are expected to have an average solids density[1] of 40% by weight (Thiess, 2005).* **Note**: [1] Mass of solids as a proportion of total mass. *Tailings would be predominantly disposed of into completed open cut voids. In all, it is expected that six voids would be backfilled with tailings during the Project life.* *Following discharge, tailings would settle out and form a beach deposit in the void sloping away from the discharge point. Supernatant would pond at the downslope end of the formed beach from where it would be recovered in a decant facility and pumped to the CHPP water storage for reuse. It is expected that the average dry weather water recovery from tailings disposal areas would be a minimum of 25% of the original tailings slurry water volume discharged (Thiess, 2005). The remainder is lost to evaporation, retained within the interstices of the tailings or is lost to seepage."* ***"3.8 Water Management in Mine Waste Rock Emplacement Areas*** *Mine waste rock (ie. overburden and interburden) would be placed in worked out portions of the mine and in temporary mine waste rock emplacement areas adjacent to the open cut. Coarse reject from the CHPP would also be placed (mixed) with overburden in the open cut voids.* *The final surface of the mine waste rock emplacements would be constructed to approximate the existing (pre-mine) drainage topography. Valley areas would be shaped into a network of flow paths located similarly to the existing flow paths (eg. Narrow Creek) (Figure 15).* *Sediment retention storages would be constructed at intervals along these flow paths to retard flows and to settle sediment carried in runoff - particularly during the vegetation establishment phase. Sediment retention storages would be provided with low flow outlets so that stored water slowly drains following rainfall-runoff events.* *Wide, shallow by-wash spillways would be provided at these storages to facilitate low energy overflows during more intense rainfall events. In areas where high energy flows or high flow volumes are likely to concentrate, specific hydraulic works such as rip rap scour protection, drop structures or other energy dissipation devices would be installed. A combination of riparian vegetation and rock mulching would also be used to stabilise flow paths.*

No.	Issue	Response
58	(Continued)	*Freshly placed mine waste rock may have a relatively high infiltration capacity depending on its degree of weathering. Water infiltrating waste rock material would either be retained in the interstices or would seep through the waste rock. Pore water retention would be high initially (after placement) and reduce as an 'equilibrium' moisture profile developed in the mine waste rock emplacement profile. A proportion of the rainfall that infiltrates through the surface of the mine waste rock emplacement would be returned to the atmosphere as evapotranspiration.* *As vegetation becomes established on rehabilitated mine waste rock emplacement areas the hydrological balance would tend to change, with a greater proportion of rainfall contributing to evapotranspiration and a reduced proportion of deep seepage. As the surface vegetation matures, moisture levels in the near surface root zone would decrease compared to the non-vegetated condition, creating additional storage within the near surface soils for rainfall infiltration, with the result that surface runoff would tend to decrease. The erosion potential associated with decreased runoff would also be reduced by the stabilising effect of vegetation, resulting in a significant reduction in sediment movement off the rehabilitated and revegetated mine waste rock emplacement areas."* A detailed description of the staged development of the Project water management system is provided in Section 3.9 of Appendix A, Volume 2 of the EIS. The above description of the site drainage system from the EIS is considered adequate. The site drainage system would provide for the prevention of contamination of Cumbo Creek, particularly when combined with the proposed Erosion and Sediment Control Plan as described in Section 5.1.2.2, Volume 1 of the EIS.
59	A concern was raised suggesting that no specific remedial recommendations were presented in the EIS in regard to water systems and that proposed monitoring systems were inadequate.	Comprehensive water system monitoring programmes are described in Section 5.1.3, Volume 1 of the EIS, including: ***"5.1.3 Environmental Monitoring*** *An environmental monitoring programme would be developed for the Project. Table 5-3 provides an overview of the programme and Figure 5-1 shows the proposed location of each monitoring site. Monitoring results as well as monitoring site locations, parameters and frequencies would be reviewed annually through the AEMR process, in consultation with relevant authorities and the Project CCC.* *This section provides an outline of each component of the monitoring programme with the exception of the monitoring programmes associated with rehabilitation areas, regeneration areas and ECAs, which are described in Sections 5.2, 5.3 and 5.4, respectively.*

No.	Issue	Response
59	(Continued)	*5.1.3.1 Meteorology* *An automated meteorological station at the Project currently records temperature (at heights of 2 m and 10 m above ground level), relative humidity, net solar radiation, rainfall, wind speed, wind direction and sigma theta (the rate of change of wind direction). Meteorological data is continuously monitored and the data averaged over 10 minute periods. A meteorological station would continue to be utilised for the life of the Project."* *"5.1.3.5 Erosion and Sediment Control* *WCPL would conduct monthly inspections of all operational erosion and sediment control structures. Inspections of erosion and sediment control structures would also be conducted following significant rainfall events (i.e. greater than 20 mm in 24 hours).* The structures would be assessed for structural stability and effectiveness in controlling erosion and sediment migration. Appropriate remedial works would be implemented as required. *5.1.3.6 Surface Water* *An outline of the surface water monitoring programme is provided in Table 5-3 and described below.* ***Surface Water Quality*** *The surface water monitoring programme for the Project would include monthly sampling at a network of surface water quality monitoring sites on Wilpinjong Creek, Cumbo Creek and Wollar Creek. Creek water quality samples would be analysed for a range of parameters including pH, electrical conductivity (EC), total dissolved solids (TDS), total suspended solids (TSS) and sulphate (SO_4). Significant rainfall events (i.e. greater than 20 mm in 24 hours) would also trigger surface water quality sampling of Wilpinjong, Cumbo and Wollar Creeks.* *Monitoring of EC would also be conducted on a continuous basis at installed gauging stations on Wilpinjong and Cumbo Creeks (Figure 5-1).* *The quality of drainage (pH and EC) from active tailings disposal areas (i.e. decant water) would also be monitored monthly.* ***Surface Water Level/Flow*** *Surface water flow rate (via water level) would be monitored continuously at installed gauging stations on Wilpinjong and Cumbo Creeks (Figure 5-1). Surface water flow from active tailings disposal areas (i.e. decant water) would also be monitored continuously.* *The site water balance would be reviewed annually to optimise performance and validate predictions. These reviews would be linked to borefield performance reviews. The reviews would also facilitate the preparation of contingency/remediation plans for managing adverse impacts of the Project on surface water, where necessary (Section 5.1.2.4).*

No.	Issue	Response
59	(Continued)	*5.1.3.7 Groundwater* *The borefield monitoring programme would be developed and detailed in the WSBP (Section 5.1.2.5). Data collected by the programme would provide input to borefield performance reviews and enable verification and refinement (where necessary) of the groundwater modelling results (Appendix B).* *The following sites would be monitored by the programme (Figure 5-1):* • *four alluvium bores (and two coal measure bores) along Wilpinjong Creek (sites GWa1 to GWa4, GWc1 and GWc2);* • *two alluvium bores (and one coal measure bore) along Cumbo Creek (sites GWa5, GWa6 and GWc3);* • *one coal measure bore along Wollar Creek (site GWc4);* • *one alluvium bore (and one coal measure bore) in Wollar Village (sites GWa7 and GWc5); and* • *19 water supply bores (sites GWs1 to GWs19).* *Monitoring of water level, pH and EC would be conducted on a monthly basis at the alluvium, coal measure and water supply bores along Wilpinjong and Cumbo Creeks and quarterly at the alluvium and coal measure bores along Wollar Creek and in Wollar Village. The volume of water extracted from water supply bores GWs1 to GWs19 would also be monitored monthly. The following suite of groundwater quality parameters would be analysed bi-annually for the alluvium and coal measure bores shown on Figure 5-1: sodium (Na); magnesium (Mg); calcium (Ca); chloride (Cl); carbonate (HCO_3); sulphate (SO_4); and total iron (Fe).* *In addition to the above, groundwater monitoring would be undertaken at selected existing bores surrounding the Project area, in consultation with relevant landowners.* *Groundwater monitoring, water level measurements and sample collection, storage and transportation would be undertaken in accordance with the procedures outlined in the Murray Darling Basin Groundwater Quality Sampling Guidelines (Murray Darling Basin Commission, 1997). Bore licences would be obtained from DIPNR prior to the installation of any of the abovementioned monitoring bores that are not currently developed.* *5.1.3.8 Aquatic Biology* *An aquatic monitoring programme would be developed to monitor the aquatic macroinvertebrate assemblages, in-situ water quality, characteristics and health of Wilpinjong and Cumbo Creeks. The ecological integrity of the Cumbo Creek relocation would also be monitored. The components of the aquatic monitoring programme would be detailed in either the FFMP or CCRP.*

No.	Issue	Response
59	(Continued)	*Consideration would also be given to monitoring creek features established in the final landforms later in the Project life to assess their provision of habitat for aquatic biota."* The above measures show that adequate monitoring systems are proposed as part of the Project. The monitoring programmes presented above are based on the outcomes arising from: • the Surface Water Assessment (particularly Section 7.0 of Appendix A, Volume 2 of the EIS); • the Groundwater Impact Assessment (particularly Section 15 of Appendix B, Volume 2 of the EIS); and • the Aquatic Ecosystem Assessment (Appendix HD, Volume 4 of the EIS). In regard to remedial recommendations, these are integrated throughout the EIS as mitigation measures or specifically as contingency measures. Examples of these contingency measures include the following: As stated in Section 2.4.8, Volume 1 of the EIS: *"During mining operations any direct groundwater inflows from alluvium exposed in the highwall of the open cut would be intercepted prior to it reaching the floor of the open cut and pumped back to the nearest creek. This would be achieved by the installation of sumps and a pump/pipe system on a bench of the open cut (as is the current practice for similar circumstances at other mines in the Hunter Valley). These areas would be sealed during the backfilling of the completed open cuts. This would be achieved by the selective placement of more weathered materials against the alluvium intersect as the open cut excavation is backfilled with waste rock. These materials would be sourced from pre-stripping operations. If necessary, placement methodologies for these materials (i.e. placement in thinner layers and trafficked with mine fleet) would be developed to achieve the desired degree of compaction."* As stated in Section 4.4.1, Volume 1 of the EIS: ***"Mitigation Measures*** *A groundwater monitoring programme to monitor the impact of mining on existing bores/wells is discussed in Section 5.1.3.7. As discussed above, only two existing groundwater bores not owned by WCPL are expected to be affected by the Project. If the data obtained from the groundwater monitoring programme indicates that the Project is having an adverse effect on existing groundwater users (i.e. reduced groundwater yield from existing bores), then the water supply would be re-instated by WCPL either by deepening the existing bore, construction of a new bore or by providing an alternate water supply."*

No.	Issue	Response

59	(Continued)	Further contingency/remedial measures would be developed as part of each relevant management plan, e.g.:
		• Site Water Management Plan (Section 5.1.2.4, Volume 1 of the EIS):
		  • *"investigation triggers and contingency/ remediation plans for managing adverse impacts of the Project on surface water and groundwater including existing users; and*
		  • *details of strategies for the decommissioning of water management structures."*
		• Water Supply Borefield Plan (Section 5.1.2.5, Volume 1 of the EIS):
		  • *"processes for validating measured groundwater drawdowns against those predicted to occur;*
		  • *a schedule of on-going borefield performance reviews through the mine life; and*
		  • *contingency measures to mitigate any adverse impacts on existing water supply bores, groundwater users or borefield users."*
		• Cumbo Creek Relocation Plan (Section 5.1.2.6, Volume 1 of the EIS):
		  • *"a programme to monitor water quality and ecological and geomorphic integrity of the creek relocation; and*
		  • *a programme to inspect and maintain the creek relocation and revegetation works until they stabilise."*

60	A concern was raised suggesting that potential impacts on groundwater dependent ecosystems were not assessed.	Section 4, Volume 1 of the EIS, presents a comprehensive assessment of potential impacts on flora, terrestrial fauna and aquatic fauna, including groundwater dependent ecosystems, based on the results of the flora and fauna studies presented in Volume 4 of the EIS. In regard to groundwater dependent ecosystems, Sections 4.7, 4.8 and 4.9, Volume 1 of the EIS, concluded the following, respectively: ***"Groundwater Dependent Terrestrial Vegetation*** *Terrestrial vegetation that use groundwater include plants that grow where groundwater discharges to the surface (i.e. river baseflow systems) and other plants whose roots are tapped into the water table at some depth (DLWC, 2002a). Examples of terrestrial vegetation dependent on groundwater in NSW include those on the coast (e.g. Melaleuca communities), in some types of hilly country (e.g. rainforest plants along spring-fed creeks) and inland (e.g. River Red Gums along river banks and on floodplains of large rivers in the Murray Darling Basin). The only terrestrial vegetation in the Project area or surrounds that may be dependent on groundwater occurs in the riparian zone of local creeks.*

No.	Issue	Response
60	(Continued)	*Changes to the groundwater system have the potential to impact on riparian vegetation by de-saturating the alluvial and colluvial deposits adjacent to streams. Results of the groundwater modelling predicted only a limited affect on alluvial and colluvial deposits adjacent to Wilpinjong Creek, with no discernible affect on the shallow seepage from the adjacent elevated Goulburn River National Park to the alluvial/colluvial aquifer (Appendix B). As a result, it is considered that riparian vegetation would not be deleteriously affected by the Project."* ***"Groundwater Dependent Terrestrial Fauna*** *Watercourses provide sources of drinking water for terrestrial fauna. In addition, riparian vegetation provides terrestrial fauna with potential habitat resources for lifecycle components such as foraging and nesting/breeding. As a result, disturbance to aquatic and riparian ecosystems that are dependent on groundwater also has the potential to impact on terrestrial fauna. Section 4.9.1 discusses the potential impact of the Project on groundwater dependent aquatic and riparian ecosystems. In view of the predicted small changes to average annual flow in Wilpinjong Creek and that modelling showed only a limited effect on the water levels in the alluvial/colluvial aquifer (Sections 4.3 and 4.4), it is considered that the Project would not impact upon any terrestrial fauna that utilise habitat resources associated with Wilpinjong Creek."* ***"Groundwater Dependent Aquatic and Riparian Ecosystems*** *River flow is often maintained by groundwater, which provides baseflows long after a rainfall event (DLWC, 2002a). The baseflow typically emerges as springs or as diffuse flow from saturated sediments or rock underlying the stream and banks (ibid.). In addition, water exchange occurs between the surface and groundwater in the hyporheic zone[1], which provides habitat for aquatic invertebrates (Boulton et al., 1998 in DLWC, 2002a). As a result, aquatic and riparian ecosystems can be dependent on the baseflows supplied by groundwater to a stream.* *Potential impacts of the Project on aquatic biota associated with changes in creek flow are discussed above. In summary, the predicted changes to flows in Wilpinjong Creek associated with the Project are small and would not alter the physical structure of the habitats in the creek. The small-scale predicted changes are considered unlikely to affect the existing aquatic ecological components (Appendix HD).* *Changes to the groundwater system also have the potential to impact on riparian vegetation by de-saturating the alluvial and colluvial deposits adjacent to streams. Results of the groundwater modelling predicted only a limited affect on alluvial and colluvial deposits adjacent to Wilpinjong Creek, with no discernible affect on the shallow seepage from the adjacent elevated Goulburn River National Park to the alluvial/colluvial aquifer (Appendix B). As a result, it is considered that riparian vegetation would not be deleteriously affected by the Project."*

No.	Issue	Response
60	(Continued)	**Note:**[1] Hyporheic zone - the saturated interstitial sediments below streams and their banks where water exchanges between the surface and sub-surface. A groundwater impact assessment is presented in Appendix B, Volume 2 of the EIS. It is considered that potential impacts on groundwater dependent ecosystems are adequately assessed in the EIS.
61	A concern was raised querying why the Nile Subgroup geological strata was not included in the groundwater model presented in Appendix B, Volume 2 of the EIS.	The response below has been prepared by Australasian Groundwater and Environmental Consultants on behalf of WCPL: • The Nile Subgroup consists of claystone with minor coal seams. • The exploration borehole ELCOM Wollar DDH14, located about 2 km east of Wollar Creek showed over 12 m of the siltstone underlying the Marrangaroo Sandstone. The bore did not penetrate to the base of the siltstone. • It is assessed based on the lithology of the units that there is a contrast in hydraulic conductivity between the Marrangaroo Sandstone and Nile Subgroup of at least 2 orders of magnitude. A contrast of 2 orders of magnitude in flow models justifies treating the lower hydraulic conductivity material as a no flow boundary, [Anderson and Woessner (1992)[1]]. **Note:** [1] Mary P. Anderson, William W. Woessner, (1992), *"Applied Groundwater Modelling, Simulation of Flow and Advective Transport",* Academic Press Inc.
62	Concerns were raised regarding the specific content of the groundwater monitoring programme and the use of the data to further calibrate the groundwater model.	As described in Section 5.1.2.4, Volume 1 of the EIS, a Site Water Management Plan (SWMP) would be developed for the Project in consultation with relevant authorities. The SWMP would include a groundwater monitoring programme, as well as investigation triggers and contingency/remediation plans for managing adverse impacts of the Project on groundwater including existing users. The SWMP would be reviewed and revised as required in consultation with relevant authorities and would be periodically updated over the mine life. As discussed in Section 5.1.3.7, Volume 1 of the EIS, a borefield monitoring programme would be developed and detailed in the Water Supply Borefield Plan (WSBP), to be incorporated in the SWMP. Groundwater monitoring of bores and wells would be based upon the Australian and New Zealand Environment Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000), including the livestock drinking water guidelines where relevant. Parameters to be monitored would be determined in consultation with the relevant authorities and include those described in Section 5.1.3.7, Volume 1 of the EIS:

No.	Issue	Response
62	(Continued)	"*Monitoring of water level, pH and EC would be conducted on a monthly basis at the alluvium, coal measure and water supply bores along Wilpinjong and Cumbo Creeks and quarterly at the alluvium and coal measure bores along Wollar Creek and in Wollar Village. The volume of water extracted from water supply bores GWs1 to GWs19 would also be monitored monthly. The following suite of groundwater quality parameters would be analysed bi-annually for the alluvium and coal measure bores shown on Figure 5-1: sodium (Na); magnesium (Mg); calcium (Ca); chloride (Cl); carbonate (HCO3); sulphate (SO4); and total iron (Fe).* *In addition to the above, groundwater monitoring would be undertaken at selected existing bores surrounding the Project area, in consultation with relevant landowners.* *Groundwater monitoring, water level measurements and sample collection, storage and transportation would be undertaken in accordance with the procedures outlined in the Murray Darling Basin Groundwater Quality Sampling Guidelines (Murray Darling Basin Commission, 1997)*." As stated in Section 5.1.3.7, Volume 1 of the EIS: "*Data collected by the programme would provide input to borefield performance reviews and enable verification and refinement (where necessary) of the groundwater modelling results (Appendix B, Volume 2 of the EIS)*". That is, WCPL would reassess the groundwater model during the life of the Project. The groundwater model would be further calibrated using data collected from the proposed bore and stream monitoring programme and measured mine pit inflows. The results of this reassessment will provide a comparison of predicted and actual impacts on aquifer systems.
63	Request for the re-creation of equivalent agricultural uses and agricultural land values in post mining rehabilitation.	As described in Section 5, Volume 1 of the EIS, a net increase in woodland vegetation is proposed in the Project area and this would result in a reduction in the area of land available for agriculture. Notwithstanding, as stated in Section 5, Volume 1 of the EIS: *"The revegetation programme for Project rehabilitation areas provides for a combination of woodland and pasture outcomes."* In addition, Section 5.2.5, Volume 1 of the EIS states: "*The pasture areas would be revegetated using either native and/or improved pasture species. A proposed list of native grasses that could potentially be used in the revegetation of mixed woodland/pasture areas is provided in Table 5-5. Rehabilitation of the pasture areas would be conducted in consideration of guidelines such as those presented in the Rehabilitation of Open Cut Coal Mines using Native Grasses: Management Guidelines (DLWC, 2003) and of species which are commercially available.* "

No.	Issue	Response
64	Potential impacts of reduction in flows on downstream environment were not addressed in Appendix A, Volume 2 of the EIS.	The potential impacts of the Project on aquatic ecosystems are addressed in Appendix HD, Volume 4 of the EIS. Section 4.9, Volume 1 of the EIS summarises these impacts and presents proposed mitigation measures. The potential impacts on the downstream water users and ecosystems is addressed further in response to Issue Nos. 38 and 55.
65	Concerns were raised regarding: • quantification of the average capture of overland flow as a result of the Project and mitigation measures for Project reduction in downstream surface water stream flows. • offset measures to compensate for Project impacts on aquatic ecosystems.	The Project water management simulation model was run over a large number of different daily rainfall sequences compiled from the historical record. As described in Section 4.1 of Appendix A, Volume 2 of the EIS: "*Each sequence comprised a 21-year period – corresponding to the planned Project life. The sequences were formed by moving along the historical record one year at a time with the first sequence comprising the first 21 years in the record. The second sequence comprised years 2 to 22 in the record while the third sequence comprised years 3 to 23 and so on. Using this methodology, 96 21- year sequences of daily rainfall were formulated for use in the model simulations. This method effectively includes all possible historical climatic events in the water balance model, including high, low and median rainfall periods*." As described in Section 5.1.2.4, Volume 1 of the EIS, a Site Water Management Plan would be prepared for the Project which would include a site water balance. The Site Water Management Plan would also include location and design specifications for all clean water diversions and details of internal drainage of the mine water circuit. Mitigation measures for potential impacts on aquatic ecosystems are described in Section 4.9.2, Volume 1 of the EIS and include: *"Mitigation of the predicted reduction in average annual flows in Wilpinjong Creek would be in the form of designing the Project water management system to maximise the diversion of runoff from undisturbed areas around Project construction/development and operational areas, together with progressive rehabilitation to allow the free-draining of completed landforms. These measures would minimise the degree of catchment excision at any one time.* *A number of measures would be implemented to minimise potential impacts on surface water quality and are described in Section 4.3.1. For example, surface water management structures would be utilised to control erosion and water runoff in accordance with the ESCP and to minimise the potential for Project activities to adversely affect downstream water quality. A water management system would be developed as a component of the Site Water Management Plan to minimise potential surface water quality impacts.*

No.	Issue	Response
65	(Continued)	*In order to minimise the length of time fish passage may be restricted during construction activities, construction of the floodway crossing across Cumbo Creek and burial of pipelines across Wilpinjong Creek would be scheduled during periods of no/low flow. Works associated with the relocation of Cumbo Creek would also be scheduled so as to minimise the interruption of flows and fish passage in Cumbo Creek.* *Further to riparian revegetation in the rehabilitation areas, riparian vegetation would also be established along Wilpinjong and Cumbo Creeks in the regeneration areas and the ECAs through natural regeneration/selective planting. These initiatives would increase the quantity of riparian vegetation along these watercourses and improve the condition of habitats available to aquatic biota. Some 10 km of creekline along Wilpinjong and Cumbo Creeks would be revegetated/enhanced by the Project. The Wilpinjong Creek and Cumbo Creek revegetation/enhancement initiatives in the regeneration areas and ECAs would be detailed in the FFMP."* The above mitigation measures (and particularly the revegetation/enhancement of some 10 km of riparian vegetation in the Project area) are considered to be appropriate to the potential scale and nature of Project impacts on aquatic ecosystems.
66	Concerns were raised regarding the capture and pumping of alluvial groundwater inflows into open cut pits to local streams.	As described in Section 2.4.8, Volume 1 of the EIS: *"During mining operations any direct groundwater inflows from alluvium exposed in the highwall of the open cut would be intercepted prior to it reaching the floor of the open cut and pumped back to the nearest creek. This would be achieved by the installation of sumps and a pump/pipe system on a bench of the open cut (as is the current practice for similar circumstances at other mines in the Hunter Valley)."* This approach avoids the capture of good quality inflows from alluvium associated with local creeks and acts to reduce the volume of water reporting to the mine water management system. Such an action would be subject to relevant licensing requirements.
67	Concerns were raised regarding the long term fate and licensing of in-stream water management structures post-mining.	As described in Table 5-6, Volume 1 of the EIS, key completion criteria for final landforms would include the geomorphic stability of creek features being comparable to existing creeks. If required, appropriate licensing or approvals for any post mining water management structures would be addressed in the Mine Closure Plan. The Mine Closure Plan is described in Section 5.5.1, Volume 1 of the EIS.

No.	Issue	Response
68	Rehabilitation principles for the Project.	The Project rehabilitation principles and objectives are stated in Section 5.2.1, Volume 1 of the EIS: *"The following principles form the basis for Project rehabilitation planning and design:* • *Integration of open cut mining and rehabilitation planning to minimise the area of disturbance at any one time.* • *Progressive rehabilitation of disturbed areas, including partial rehabilitation of temporarily inactive mine waste rock emplacements.* • *Creation of post-mining landforms that enhance the amenity of the local landscape and contribute to local and regional habitat corridors.* • *Consideration of issues of public safety in the design of final landforms.* • *Consultation with relevant authorities and stakeholders (e.g. DPI, DIPNR, DEC, MWRC and the Project CCC).* • *Implementation of trials and design studies as necessary to maximise effectiveness of the rehabilitation programme.* • *Routine monitoring to track the progression of the rehabilitation areas.* *Rehabilitation objectives for the Project are as follows:* • *To create safe, stable, adequately drained post-mining landforms that are consistent with the local surrounding landscape.* • *To produce a net increase in woodland vegetation.* • *To increase the continuity of woodland vegetation by establishing links between woodland vegetation in the rehabilitation areas, regeneration areas and existing remnant vegetation in the Munghorn Gap Nature Reserve, Goulburn River National Park and ECAs.* • *To preserve the existing beneficial use of water resources."*
69	Concerns were raised regarding the area of biodiversity conservation offset with respect to endangered ecological communities.	As detailed in Section HE3.3.1 of Appendix HE, Volume 4 of the EIS, of the approximately 180 ha of the White Box, Yellow Box, Blakely's Red Gum Woodland Endangered Ecological Community and the Grassy White Box Woodlands Endangered Ecological Community (WBYBBRG EEC) mapped by FloraSearch in the Project area and surrounds, approximately 50 ha occurs in the proposed disturbance area and will be cleared or modified by the Project.

No.	Issue	Response
69	(Continued)	Section 4.7.2, Volume 1 of the EIS describes a number of measures which have been developed to mitigate potential impacts on flora, including the WBYBBRG EEC. As stated in Section 4.7.2, Volume 1 of the EIS: "*Some 295 ha of remnant vegetation would be conserved and enhanced by the ECAs, including more than 80 ha of the WBYBBRG EEC. Further, some 185 ha of woodland vegetation would be established in the ECAs through natural regeneration/selective planting, including some 50 ha of the WBYBBRG EEC.*" Section HE3.3.1 of Appendix HE, Volume 4 of the EIS describes further measures which have been developed for the Project to minimise potential impacts on the WBYBBRG EEC within the Project area including: "*Enhancement and conservation of remnants – to enhance and conserve approximately 480 ha of remnant woodland habitat and adjacent farmland in the Wilpinjong Enhancement and Conservation Areas (ECAs). Management measures would include:* – *1:1 long-term re-establishment plus greater than 1:1 conservation of the WBYBBRG community, ie. greater than 80 ha of the endangered community is conserved in the ECAs, and an additional 50 ha will be re-established in the long-term. ...*" Further, progressive rehabilitation will result in the establishment of significant areas of woodland which will include areas containing species characteristic of the WBYBBRG community [eg. White Box (*Eucalyptus albens*), Yellow Box (*E. melliodora*) and Blakely's Red Gum (*E. blakelyi*)].
70	Concern was raised regarding the identification of risks associated with mining activities and the development of management options.	A Preliminary Hazard Analysis (PHA) was presented in Appendix L, Volume 5 of the EIS. As stated in Section L1.1 of Appendix L, Volume 5 of the EIS: *"The objective of this PHA is to assess the risks posed by the Project to the environment and surrounding land users and compare the identified risks with applicable qualitative criteria."* The methodology employed during the preparation of the PHA included: identification of hazards associated with the Project; examination of the potential consequences of identified events; qualitative estimation of the likelihood of events; proposal of risk mitigation measures; qualitative assessment of risks to the environment, members of the public and their sudden and unexpected incidents and compare these to applicable qualitative criteria; and recommendation of further risk mitigation or remedial measures if considered warranted.