METROPOLITAN COAL PROJECT

RESPONSES TO SUBMISSIONS PART B

Peabody

HELENSBURGH COAL

HELENSBURGH COAL PTY LTD
METROPOLITAN COAL PROJECT – RECONCILIATION TABLE

Submitter No.	Name	Issues Raised
1 (also 75)	Wollongong City Council (Senior Development Project Officer)	1, 2, 3, 8, 15, 18, 20, 23, 24, 26, 27, 30, 42
2	Sutherland Shire Environment Centre (Graeme Booth – Development Officer)	1, 2, 6, 8, 10, 11, 15, 23, 30
3	Northern Illawarra Residents Action Group (Alex Peterson – President)	1, 2, 8, 10, 13, 15, 23
4	Nature Conservation Council of NSW (Cate Faehrmann – Executive Director)	1, 2, 8, 10, 13, 15, 16, 20, 30, 41
5	Illawarra Escarpment Coalition (June Pronk – Secretary)	1, 2, 8, 10, 13, 30, 32
6	Blue Mountains Conservation Society Inc (Dr Brian Marshall – For the Management Committee)	1, 2, 10, 13, 30, 32
7	The Colong Foundation for Wilderness Ltd (Keith Muir – Director)	1, 2, 4, 6, 8, 13, 30, 41, 49
8	Alliance for Sustainable Wellbeing (Andrew Gaines)	1, 2, 8
9	Wollongong Transport Coalition (Irene Tognetti – Spokesperson)	30
10	Sutherland Climate Action Network (Jonathan Doig – Convenor)	1, 2, 10, 15, 23, 30
11	CFMEU Mineworkers Helensburgh Lodge (Stephen Winter)	No concerns raised.
12	CFMEU National Mining Division (Tony Maher – General President)	No concerns raised.
13	The United Mine Workers South Western District (Graham White – South/Western District Vice-President)	No concerns raised.
14	Jamie Ross	No concerns raised.
15	Dr Janice Miller	1, 2, 3, 6, 8, 10, 15, 18, 20, 21, 22, 30, 32
16	Robert Miller (Principal Cumberland Flora & Fauna Interpretive Services)	1, 2, 6, 8, 10, 15, 18, 19, 20, 21, 23, 30, 32, 39, 40
17	Julie Marlow	1, 2, 3, 6, 8, 10, 13, 20, 21, 23, 32
18	Jill Walker	1, 2, 3, 6, 8, 10, 13, 20, 21, 23, 30, 32
19	Georgia Phillips	1, 2, 3, 6, 8, 10, 13, 20, 21, 23, 30, 32
20	Jill Merrin (also 44)	1, 2, 3, 5, 6, 8, 10, 15, 20, 23, 30, 32
21	John Crocker	1, 2, 3, 6, 8, 10, 13, 20, 21, 23, 30, 32
22 (and 62)	Keely Boom and Matty Woods	1, 2, 3, 10, 13, 20, 21, 23, 30, 32
23	Colin Ryan (also 36)	1, 2, 10, 23, 30
24	Dr Tassia Kolesnilow and Rick Cavicchiolli	1, 2, 13, 30
25	Sarah Kennedy	1, 2, 8, 10, 13, 23, 30
26	Katie Walford	1, 3, 10, 23, 30
27	Naomi Waizer	1, 2, 10, 23, 30
28	John Prats	1, 2, 5, 13, 15, 23, 30, 32

Submitter No.	Name	Issues Raised
29	Katharine Kline	1, 2, 10, 13, 15, 23, 30
30	James Ryan	1, 2, 10, 13, 23, 30
31	Gregory Churm	1, 2, 10, 23, 30
32	Jennifer Fitzgerald	1, 2, 10, 23, 30
33	Ruth Zeibots and John Zeibots	1, 30, 45
34	Dr Joseph Davis	1, 41
35	Jaden Harris	1, 8, 10
36	Colin Ryan (Also 23)	1
37	Sue Whitham	1, 48
38	John Spira	1, 2, 13
39	Norman Dixon	2, 5, 13
40	Leonard van der Steege	1, 13
41	Bev Atkinson	10, 13
42	Matt Mushalik	1, 10, 11, 12, 30, 47
43	Sutherland Shire Council	1, 2, 3, 6, 7, 9, 13, 14, 18, 22, 23, 25, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 41, 42, 46, 52
44	Healthy Cities Illawarra Inc (Jill Merrin [also 20] – Community Environmental Health Officer)	1, 2, 3, 5, 6, 8, 10, 15, 20, 23, 30, 32
45	Environmental Defender's Office Ltd (Tom Holden – Scientific Director)	16
46	Sada Pty Limited (Mark Brackenbury – Director)	No concerns raised.
47	Graham Daly	1, 2, 4, 10, 15, 30, 32
48	David Bowskill	2, 10, 13, 30
49	Betty Dixon	1, 2, 30
50	RTA (Jay Stricker – Regional Manager Southern Operations and Engineering Services)	No concerns raised. Consent conditions proposed.
51	Alliance for Sustainable Wellbeing (Andrew Gaines)	2, 8, 10, 30
52	Coast and Wetlands Society (Arthur Evans – Vice President)	2, 3, 6, 10, 17, 20, 21, 30, 32, 41
53	Walter Mining Pty Ltd (Wayne Bull – CEO)	No concerns raised.
54	Frank Edwards	1, 2, 10, 23, 30
55	Patricia Knowles	1, 2, 10, 23, 30
56	Prof. Rick Cavicchioli	1, 2, 10, 23, 30
57	Joyce Ryan	1, 2, 10, 23, 30
58	William Ryan	1, 2, 10, 23, 30
59	Murray Scott	1, 10, 30, 32
60	Michele Howie	1, 2, 10, 23, 30

Submitter No.	Name	Issues Raised
61	Hugo Figgis	10, 11, 30, 42, 57
62 (also 22)	Keely Boom and Matty Woods	1, 2, 3, 10, 13, 20, 21, 23, 30, 32
63	Karen Gough	1, 2, 8, 10, 18, 23, 51
64	Barbara Sharkey	1, 2, 10, 23, 30
65	Susanne Skates	1, 2, 10, 13, 23, 30
66	Ron Sokolowski	1, 8, 13
67	Sonya McKay	1, 10, 30
68	Wollondilly Shire Council (Sophie Perry – Senior Strategic Planner)	10, 31, 32, 35, 43, 44, 49
69	Marion Preston	1, 2, 10, 13, 23, 30
70	National Parks Association of NSW (Gary Schoer – Assistant Secretary)	1, 2, 4, 6, 9, 13, 15, 16, 18, 23, 30, 32, 46, 49, 50, 53, 54, 55, 56
71	Helensburgh Coal Community Reference Group	No issues raised.
73	Brienen Environment and Safety (P. Brienen)	No issues raised.
75 (also 1)	Wollongong City Council (Senior Development Project Officer)	2, 8, 15, 20, 23, 24, 26, 27, 30, 42
77	Rivers SOS (Julie Sheppard – Secretary)	1, 2, 3, 13, 14, 15, 18, 20, 46, 54,
78	Glenn Burgess	No issues raised.
79	P. Braz	No issues raised.
80	D. Coltman	No issues raised.
81	Hal Balderston	No issues raised.
82	Rhonda Wright	1, 2, 23, 24, 25
83	Ross Chapman	No issues raised.
84	Michael Milas	No issues raised.
85	Alan Phillips	No issues raised.
86	Michael Lee	No issues raised.
87	Ken Risk	No issues raised.
88	Kieron Forrest	No issues raised.

HELENSBURGH COAL PTY LTD
METROPOLITAN COAL PROJECT - RESPONSES TO SUBMISSIONS

No.	Subject	Issue Raised	Response
1	Surface Water	1A. Concerns were raised regarding the security of Woronora Reservoir water supply and quality.	Section 4.4.2 of the EA summarises the potential impacts of the Project on water supply and water quality: *Based on the analysis of the effects of mining at the Metropolitan Colliery on inflows to the Woronora Reservoir summarised in Section 4.4.1, Gilbert and Associates (2008) concluded that:* • *On the basis of recorded data from streamflow gauging stations in the area, streamflow patterns and magnitudes in the region are consistent.* • *Recorded streamflow data from Waratah Rivulet indicates that there is no evidence of flow loss at low flows in periods of prolonged dry weather and flow recession as might be expected if flow were being affected by mining activity.* • *The observed behaviour is consistent with no losses occurring from the catchment.* • *There has been no discernable departure of streamflow model-predicted inflows to the Woronora Reservoir from those calculated using recorded reservoir data following commencement of mining.* *These conclusions are consistent with the findings of the Groundwater Assessment. Detailed groundwater investigations have shown that the geological and hydrogeological regimes in the Metropolitan Colliery area are such that there is no mechanism by which the Project could result in a detectable loss of groundwater contribution to reservoir yield (Appendix B).* *All the investigations undertaken to date show that subsidence induced underflow re-emerges downstream of the subsidence area with no evidence of flow loss to Woronora Reservoir. As described in Section 4.4.1, this finding is supported by the SCPR (DoP, 2008).* *Based on the above and the Subsidence Assessment undertaken by MSEC (Appendix A), the Project is not expected to have an effect on catchment inflows to the Woronora Reservoir (Appendices B and C).* *The effect of subsidence on water quality is expected to be similar to that already observed and described in Section 4.4.1 (i.e. transient pulses of iron, and to a lesser extent, manganese, aluminium and conductivity increases which would likely occur following any instances of fresh cracking of the creek bed) (Appendix C).* ……

No.	Subject	Issue Raised	Response
	Surface Water	1C (Cont.)	*There is no evidence or reason to expect upward trends in water quality parameters or persistent change to water quality as a result of subsidence effects (Appendix C).* Also see responses provided in Responses to Submissions, Part C.
	Surface Water	1B. Concerns were raised regarding the aims, objectives and planning principles in the *Greater Metropolitan Regional Environmental Plan No. 3 – Georges River Catchment* (Greater Metropolitan REP).	Consideration of the Greater Metropolitan REP is discussed in Section 3.2.2 of the EA: *In deciding whether or not to approve the carrying out of the Project, the Minister may, take into account:* • *the aims and objectives of the Greater Metropolitan REP (as set out above);* • *the general planning principles of the Greater Metropolitan REP (as set out above);* • *the specific planning principles (where relevant) of the Greater Metropolitan REP; and* • *the likely effect of the Project on adjacent or downstream LGAs.* *As described in Sections 4.1 and 4.4, surface disturbance associated with the development of the Project and potential sources of erosion, sedimentation and pollution would be minimised. There would be no significant loss of native vegetation from the Project, as the mining operation is underground and clearing would be minimised (Section 4.6). The potential impacts of the Project on water resources, aquatic habitats and terrestrial habitats are addressed in Sections 4.3 to 4.7.* *There would be no significant cumulative effects on water quality or quantity in adjacent or downstream LGAs as a result of the Project. Similarly, identified potential effects of the Project on aquatic and terrestrial habitats (Sections 4.5 to 4.7) would be localised and would not result in significant downstream impacts within the Georges River Catchment. Relevant general principles of the Greater Metropolitan REP and plans of management and practice guidelines relating to water management have been considered in the preparation of the Surface Water Assessment (Appendix C) and in preparation of sections of this EA.*

No.	Subject	Issue Raised	Response
	Surface Water	1C. Concerns were raised regarding the *Drinking Water Catchments Regional Environmental Plan No. 1* (Drinking Water Catchments REP).	Section 3.2.3 of the EA describes the consideration of the Drinking Water REP: *The water quality protection measures implemented for the Project would be generally consistent with the recommended practices and performance standards of the SCA, where applicable to the protection of water quality (Section 4.4).* *Potential impacts on water quality as a result of Longwalls 20 to 44 would be localised (i.e. localised changes in Waratah Rivulet and tributaries). Water quality issues can be effectively managed on-site such that there are no adverse water quality impacts occurring off-site. Gilbert and Associates (Appendix C) indicates that although subsidence effects have resulted in isolated, episodic pulses in iron, manganese, aluminium and electrical conductivity in Waratah Rivulet, these pulses have not had any measurable effect on water quality in the Woronora Reservoir. The Project would not impact on the performance of Woronora Reservoir. Based on this, it is considered that the Project would have a neutral effect on water quality.*
	Surface Water	1D. Concerns were raised regarding water demand required for the mining activities and coal washing.	An increase in water demand would be required as part of the Project to supply the CHPP and for cooling and dust suppression in the underground mining operations. As stated in Section 2.9.1 of the EA: *During 2006 and 2007, HCPL has undertaken a significant upgrade of the operational water management system to increase recycling and reduce make-up water demand from Sydney Water in accordance with the Metropolitan Colliery Water Savings Action Plan (NSW Department of Commerce [DoC], 2007).* Notwithstanding these past improvements in water efficiency, Section 2.9.2 of the EA states: *The Project would continue to build on the Metropolitan Colliery initiatives undertaken to date under the Metropolitan Colliery Water Savings Action Plan (DoC, 2007) to increase the efficiency of water use and minimise the requirement for make-up water and off-site water releases from the Metropolitan Colliery Major Surface Facilities Area.* A predictive assessment of the performance of the Project water supply system was also conducted as part of the Surface Water Assessment (Appendix C of the EA) that concluded adequate water would be available for the Project.

No.	Subject	Issue Raised	Response
2	Surface Water	Concerns were raised regarding potential impacts on upland swamps.	Section 4.6.2 of the EA summarises the potential impacts on upland swamps: …… *As described in Section 4.3, surface cracking resulting from mine subsidence within the upland swamps in the Project Underground Mining Area or within the extent of mine subsidence effects is not expected to result in an increase in the vertical movement of water from the perched water table into the regional aquifer (Appendix B).* *The predicted tilts would not have any significant effect on the localised or overall gradient of the upland swamps (Appendix A) or the flow of water (Appendix C). Any minor mining-induced tilting of the scale and nature predicted is not expected to significantly increase lateral surface water movements which are small in relation to other components in the swamp water balance (Appendix C). Given the above, no change to the fundamental surface hydrological processes (Appendix C) and vegetation are expected within the upland swamps.*
3	Surface Water	Concerns were raised regarding the impacts on pools on the Waratah Rivulet and Eastern Tributary.	Section 4.4.2 of the EA summarises the potential impacts on pool water levels: *Underflow has been observed to result in lower water levels in pools as they become hydraulically connected with the fracture network.* *During periods of significant rainfall and runoff in Waratah Rivulet, the water level in subsidence affected pools would be similar to pools unaffected by subsidence. Under these flow conditions pools and their downstream rock bars would become "drowned out". During dry periods when flows in the rivulet are in a low, recessionary regime, the water level in pools affected by subsidence would in some cases recede faster than is the case in unaffected pools. As described in Section 4.4.1, water balance analysis of Pool A on Waratah Rivulet supports the view that there has been a significant reduction of underflow through the Pool A rock bar since a large runoff event occurred in February 2007 indicating a process by which fractures are being closed or "clogged" by silt and sediment infilling over time (i.e. some degree of natural healing) (Appendix C).* *Previous observations of pools in tributaries subject to mine subsidence indicate that although mine subsidence has the potential to increase the rate of leakage (and consequently pool level recession) of pools, it is likely that a portion of the pools subject to Project mine subsidence effects would hold some water during prolonged dry periods (Appendix C). These latter pools would remain full during most typical wetting and drying cycles.*

No.	Subject	Issue Raised	Response
3 (Cont.)	Surface Water		Section 5.2.5 of the EA describes the commitment to undertake restoration of rock bars in the Waratah Rivulet: *Successful restoration of the WRS4 rock bar has been completed at the Metropolitan Colliery (Section 5.1). HCPL is committed to undertaking restoration of rock bars WRS5, 6, 7 and 8 (Figure 5-1), in the case that mine subsidence results in a measurable increase in rock bar leakage rates at these locations.* *…HCPL considers that WRS5, 6, 7 and 8 would be amenable to restoration using the general injection methods, drilling techniques and environmental controls developed at the WRS4 rock bar (Section 5.1).* *…* *Restoration works would be undertaken at rock bars WRS5, 6, 7 and 8 following each successive longwall panel within the 600 m evaluation zone if required to retain pools upstream of these rock bars. It is expected that there would be primary, secondary and final restoration works following each phase of subsidence effect.*
4	Surface Water	Concerns were raised regarding potential impacts on the Hacking River and Royal National Park as a result of runoff from Camp Creek.	As described in Section 4.4.1 of the EA: *The Major Surface Facilities Area is located above Helensburgh Gully and adjacent to Camp Gully (Figure 1-3). Camp Gully has a catchment area of approximately 3.8 km^2 and drains directly into the Hacking River to the north-east (Figure 2-1). Runoff from most of the catchment is diverted around the Major Surface Facilities Area and either into Helensburgh Gully or Camp Gully. Runoff from the Major Surface Facilities Area is collected in the site water management system. As described in Section 2.9.1, HCPL releases excess treated water from the Major Surface facilities Area to Camp Gully in accordance with EPL No. 767 conditions.* As described in Section 4.4.2 of the EA, as water releases from the Major Surface Facilities Area to Camp Gully, which flows to the Hacking River would continue to be constrained by the existing EPL No. 767, it is expected there would be no material effect to downstream water quality (Appendix C). The DECC has initiated a number of pollution reduction programmes (PRPs) for the Major Surface Facilities Area via EPL No. 767, including PRPs that relate to the management of surface water (Section 4.4.1 of the EA).
5	Surface Water	Concerns were raised that mining not proceed until the results of the Sydney Catchment Authority's (SCA) research programme are known.	SCA has reviewed the EA and has provided a submission on the Project that is publically available on the DoP website. HCPL's response to the SCA's submission is also available on the DoP website.

No.	Subject	Issue Raised	Response
6	Surface Water	Concerns were raised regarding the adequacy of the surface water assessment, including: • the adequacy of baseline data available on flows into Woronora Reservoir; and • consideration of studies from other locations and catchments.	The Surface Water Assessment (Appendix C of the EA) was conducted by Gilbert and Associates and was peer reviewed by Dr Walter Boughton. The Surface Water Assessment analysed a comprehensive data set including: • rainfall records from BoM, SCA and HCPL pluviometers; • SCA gauging station flow data (continuous – hourly) for Woronora River and Waratah Rivulet; • HCPL gauging station flow data for Waratah Rivulet; • DWE O'Hares Creek gauging stations (Darkes Forest/Wedderburn) flow data; • HCPL pool water level data for Waratah Rivulet and other local streams; • SCA and HCPL water quality data for Waratah Rivulet and other local streams; • SCA Woronora Reservoir spill volumes; • SCA Woronora Reservoir extraction volumes; and • SCA Woronora Reservoir water storage and quality data. In most aspects of the hydrological assessment more than two years of data was available and assessed. The available flow data used in the assessment on Waratah Rivulet and Woronora River was less than two years duration but it did provide a continuous flow record that captured both high flows and (based on the rainfall record) a significant, protracted low flow period. Over two years of data is now available from these sites for future assessment of Project impacts. Data continues to be collected at the Metropolitan Colliery and can be used to define specific triggers and adaptive management criteria. The Peer Review of the Surface Water Assessment conducted by Dr. Walter Boughton (included in Attachment 3 in Volume 1 of the EA) supports the findings of the Surface Water Assessment. The Director-General of the DoP (in consultation with the relevant government agencies) deemed that the EA adequately addressed the formal Environmental Assessment Requirements on 17 October 2008.

No.	Subject	Issue Raised	Response
6 (Cont.)	Surface Water		As described in Section 4.4.1 of the EA, Gilbert and Associates (2008) examined whether stream flows were being lost from the Woronora Reservoir catchment as a result of existing mining at the Metropolitan Colliery using three different methods, namely: • the examination and analysis of recorded stream flow data from Waratah Rivulet and comparison of this stream flows data with nearby unmined catchments; • modelling of stream flows with and without a flow loss factor to examine whether the observed stream behaviour supported a loss from Waratah Rivulet; and • a comparison of modelled and observed inflows derived form reservoir water balance analysis over the period 1977 to 2008 (including a substantial periods prior to and after longwall mining into the Woronora Reservoir. The comprehensive analysis of stream flow data and data on the yield behaviour of Woronora Reservoir indicates that past mining at the Metropolitan Colliery has had no discernable effect on the inflow to, or yield from, the reservoir. This finding is supported by the Southern Coalfield Panel Report (DoP, 2008) which states: *No evidence was presented to the Panel to support the view that subsidence impacts on rivers and significant streams, valley infill or headwater swamps, or shallow or deep aquifers have resulted in any measurable reduction in runoff to the **water supply system** operated by the Sydney Catchment Authority or to otherwise represent a threat to the water supply of Sydney or the Illawarra region.* Dr. Walter Boughton, an internationally recognised hydrological expert, conducted a Peer Review of the Surface Water Assessment (included in Attachment 3 in Volume 1 of the EA) and concurs that there is no evidence of any loss in the low flows in the Waratah Rivulet that might be attributed to effects of underground mining.

No.	Subject	Issue Raised	Response
7	Groundwater and Surface Water	Concern was raised regarding the integration of the surface water and groundwater impact assessment.	As described in Section 3.7.1 of the EA: *The EA has been drafted in consideration of the wholly integrated nature of various environmental consequences of subsidence effects. Various specialists were brought together on a regular basis and to cross-review each others work. This process is evidenced by the high degree of cross-referencing and integration of key findings between key specialist studies.* As stated in Section 3 of the Groundwater Assessment (Appendix B of the EA): *In addition some elements of linkage to the surface flow and groundwater (baseflow) interaction mechanisms described in the surface water assessment by Gilbert and Associates (2008) (Appendix C of the Environmental Assessment) have been considered.* In addition, as stated in Section 1.1 of the Surface Water Assessment (Appendix C of the EA): *The surface water assessment has drawn on subsidence predictions produced by Mine Subsidence Engineering Consultants (MSEC, 2008); a hydrogeological assessment undertaken by Heritage Computing (2008)* [i.e. the Groundwater Assessment]*; results of surface water monitoring of overlying and downstream water courses and ground reconnaissance of the catchment areas and drainages overlying both previously mined areas and the proposed mine development area.*
8	Groundwater	Concerns were raised regarding potential impacts on groundwater resources.	Potential impacts of the Project on groundwater resources were assessed in Appendix B of the EA. Section 4.3.2 of the EA summarises the results of this assessment including potential impacts on perched groundwater systems, shallow groundwater systems and inflows to the Woronora Reservoir and the deep groundwater system.
9	Groundwater	Concern was raised regarding the adequacy of the groundwater assessment.	The Groundwater Assessment was prepared by Heritage Computing and is provided in Appendix B of the EA. HCPL considers that baseline data has been collected at an appropriate frequency and scale. For example, the Groundwater Assessment analysed a comprehensive data set including: • Southern Coalfield geology mapping; • local and regional geological bore logs; • relevant data from the DWE register on the Natural Resources Atlas; • hydrogeological monitoring and assessments undertaken for Metropolitan Colliery and other Southern Coalfield mining operations; • hydrogeological investigations and assessments undertaken for the Upper Nepean (Kangaloon) Borefield Project for the SCA;

No.	Subject	Issue Raised	Response
9 (Cont.)	Groundwater		• Metropolitan Colliery deep borehole groundwater investigations (i.e. Longwall 10 goaf hole and PM02 hole); and • groundwater level and groundwater quality monitoring data from bores in the Woronora Special Area. Examination of the hydrogeological data has facilitated an understanding of the existing groundwater systems and the scale and nature of the existing effects of the Metropolitan Colliery (and other nearby mines) on local and regional groundwater systems. A Peer Review of the Groundwater Assessment was conducted by Dr. Frans Kalf and the findings are presented in Attachment B. The review states: *Based on the reports provided above and evidence to date, I agree with the Merrick report conclusion that the predicted potential effects to surface systems as a result of groundwater depressurisation at depth are simulated to be so small as to be within the limit of accuracy of modeling. Based on the modeling results presented by Dr Merrick, the effects on surface water flow overall would not be measurable, given the usual method of surface flow monitoring.* The Director-General of the DoP (in consultation with the relevant government agencies) deemed that the EA adequately addressed the formal Environmental Assessment Requirements on 17 October 2008.
10	Greenhouse Gas Emissions	Concerns were raised that greenhouse gas emissions generated by the Project and greenhouse gas emissions associated with the combustion of Project product coal by other parties overseas would contribute to global climate change, including climate change effects in NSW.	The assessment of Project greenhouse gas emissions was conducted involving a quantitative assessment of the potential greenhouse gas emission of the Project (Appendix K of the EA) and the qualitative assessment of the potential impacts of these emissions on the environment (Section 3.8.3 of the EA). As stated in Section 3.8.3 of the EA: *The total direct (i.e. Scope 1) emissions over the life of the Project is estimated to be approximately 6,310,336 t carbon dioxide equivalent (CO_2-e), which is an average of approximately 262,931 t CO_2-e per year over the life of the Project (Appendix K). This equates to average Scope 1 emissions over the life of the Project of 0.1 t CO_2-e /t ROM coal.* *The total indirect emissions (i.e. Scope 2 and 3) associated with the on-site use of fuel and electricity over the life of the Project are estimated to be 3,546,039 t CO_2-e, which is an average of approximately 147,752 t CO_2-e per year, or 0.056 t CO_2-e/t ROM coal (Appendix K).* *…*

No.	Subject	Issue Raised	Response
10 (Cont.)	Greenhouse Gas Emissions		*On the basis of the above estimates, the Project average combined (Scope 1, 2 and 3) CO2-e emissions (0.41 mt) would be around 0.073% of the total annual 2005 Australian emissions. The Intergovernmental Panel on Climate Change (IPCC) (2007) identifies that estimated anthropogenic global emissions in 2004 were approximately 49 Giga tonnes (Gt) of CO2-e (i.e. 49,000 Mt). Comparison of the Project combined (Scope 1, 2 and 3) emissions of 0.41 Mt per annum with the 2004 global estimate indicates the Project would on average contribute approximately 0.0008% of global emissions.* As stated in the Draft Statement of Commitments (Section 6 of the EA), The existing Metropolitan Colliery Energy Savings Action Plan (ESAP) would be reviewed and revised for the Project and would include an Energy Plan to further improve energy performance and management systems for the Project, having regard to the *Guidelines for Energy Savings Action Plans* (NSW Department of Energy, Utilities and Sustainability, 2005). As stated in Section 3.8.3 of the EA: *Total indirect emissions (i.e. Scope 3) from the export and end use of the Project coal by other parties are estimated to be 185,838,567 t CO_2-e, which is an average of 8,079,938 t CO_2-e per year (Appendix K). Greenhouse gas emissions resulting from the annual average export and end use of Project coal by other parties would be around 0.016% of the total annual global (2004) emissions (calculation assuming no clean emissions technology or abatement measures by end user).* The exact destination of the product coal from the Project and the future greenhouse gas emission abatement obligations of end use countries would be subject to change over the life of the Project. To require an assessment of the consequences of the emissions of greenhouse gases from unknown facilities in unknown locations the subject of unknown mitigation measures or offsets is to exceed the requirements of a reasonable level of assessment for the Project. There is no available evidence and no reasonable conclusion open to the Director-General to the effect that the mining of up to 3.2 million tonnes per annum (Mtpa) of ROM coal at the Project would result in a higher level of global greenhouse gas emissions than would otherwise occur; or have an impact on the environment of NSW that would not otherwise arise. The reason for this is that if coal was not mined from the Project, users of coal would inevitably, given the ample global reserves of coal and the active international market in coal, obtain coal from another source, and utilise it in lieu of any coal that they may have used from the Project. As a result, the Project would not affect the level of greenhouse emissions from facilities that utilise coal or the level of global greenhouse gas emissions.

No.	Subject	Issue Raised	Response
10 (Cont.)	Greenhouse Gas Emissions		Further, there is no evidence to demonstrate that the emission of greenhouse gases from the burning of 2.8 Mtpa of product coal in largely overseas destinations would be likely to have an effect on the environment within NSW. This lack of evidential connection between coal combustion and the export of Australian coal is endorsed by the following observations of Dowsett J in the Federal Court of Australia, dealing with precisely this issue in the context of the *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) (Cth): *"72. I have proceeded upon the basis that greenhouse gas emissions consequent upon the burning of coal mined in one of these projects might arguably cause an impact upon a protected matter, which impact could be said to be an impact of the proposed action. I have adopted this approach because it appears to have been the approach adopted by Mr Flanigan. However I am far from satisfied that the burning of coal at some unidentified place in the world, the production of greenhouse gases from such combustion, its contribution towards global warming and the impact of global warming upon a protected matter, can be so described. The applicant's concern is the possibility that at some unspecified future time, protected matters in Australia will be adversely and significantly affected by climate change of unidentified magnitude, such climate change having been caused by levels of greenhouse gases (derived from all sources) in the atmosphere. There has been no suggestion that the mining, transportation or burning of coal from either proposed mine would directly affect any such protected matter, nor was there any attempt to identify the extent (if any) to which emissions from such mining, transportation and burning might aggravate the greenhouse gas problem. The applicant's case is really based upon the assertion that greenhouse gas emission is bad, and that the Australian government should do whatever it can to stop it including, one assumes, banning new coal mines in Australia…"* *Wildlife Preservation Society of Queensland Proserpine/Whitsunday Branch Inc The Minister for Environment and Heritage and Ors [2006] FCA 736.*
11	Greenhouse Gas Emissions	Concerns were raised regarding the presentation of greenhouse gas assessment results.	The assessment of Project greenhouse gas emissions involved the quantitative assessment of the potential scope 1, 2, and 3 greenhouse gas emission of the Project (Appendix K of the EA) and the qualitative assessment of the potential impacts of these emissions on the environment (Section 3.8.3 of the EA). This assessment was determined to be in accordance with the requirements outlined in the Director-General's Environmental Assessment Requirements (EARs) provided in Attachment 1 of the EA. Section 3.8.3 of the EA presents available 2005 estimates of greenhouse gas emissions presented in the latest *National Greenhouse Gas Inventory* report (AGO, 2007) and *State and Territory Greenhouse Gas Inventories 2005* (AGO, 2005) for net emissions from Australia, NSW, the energy sector and the industrial sector for comparison with Project greenhouse gas emissions.

No.	Subject	Issue Raised	Response
12	Greenhouse Gas Emissions	Concern was raised that economic cost benefit analysis did not account for potential costs associated with potential impacts of climate change or that no consideration had been given to the possibility for future financial liabilities arising from legal cases that might link Project emissions to the global impacts of climate change.	As stated in Section 2.4.2 of the Socio-Economic Assessment (Appendix M of the EA), the economic benefit cost analysis considers the potential social, environmental and economic costs of greenhouse gas emissions. The Socio-economic Assessment considers the costs associated with emissions from the Project classified as scope 1, scope 2 and scope 3 (from on-site electricity use, diesel use, LPG use and transport of coal [to local coking works and Port Kembla] and coal rejects to Glenlee Washery). A sensitivity analysis was also conducted as part of the benefit cost analysis on variations in the costs of greenhouse gas emissions (Section 2.6 of Appendix M of the EA). As described above in response to Issue 10, there is no available evidence and no reasonable conclusion open to the Director-General to the effect that the mining of up to 3.2 million tonnes per annum (Mtpa) of ROM coal at the Project would result in a higher level of global greenhouse gas emissions than would otherwise occur; or have a climate change impact on the environment of NSW that would not otherwise arise. If approved, the Project Approval would authorise the direct greenhouse gas emissions of the Project.
13	Rehabilitation	Concerns were raised regarding the likelihood of success of the proposed rehabilitation programmes on Waratah Rivulet, including: • the suitability of the PUR injection method; • the effect of subsidence on restoration works; • the applicability of stream restoration methods to other areas on Waratah Rivulet; • the review of restoration works by independent specialists; • the potential impacts that may occur prior to rehabilitation; and • the implementation of response measures if rehabilitation success is not achieved.	As described in Section 5.1 of the EA: *HCPL conducted a restoration trial at a rock bar known as WRS4 on the Waratah Rivulet (approximately 200 m upstream of Flat Rock Crossing) in consultation with the SCA (Figure 5-1). The objective of the trial was to investigate the effectiveness of PUR grouting products and associated injection methods in reducing the hydraulic conductivity of the fractured rock mass. The restoration trial was conducted from March to May 2008.* *Successful restoration of the WRS4 rock bar was confirmed through measurement of a substantial decrease in hydraulic conductivity and further evidenced by the return of normal water flows over the rock bar and pool F (the pool behind the WRS4 rock bar) water level responses. Key outcomes of the restoration trial include (HCPL, 2008b):* • *PUR injection can be conducted without environmental harm.* • *Fracture spaces can be successfully filled from <1 mm fine cracks to larger (>100 mm) voids (Figure 5-2).* • *The hydraulic conductivity of the overall rock mass was decreased to the extent that the rock bar once again acted as a natural weir to maintain the persistence of its upstream pool.* • *The PUR products, method of injection, drilling equipment and drilling methods are technically feasible and transferable to other rock bars along the Waratah Rivulet, where future assessment indicates the need.*

No.	Subject	Issue Raised	Response
13 (Cont.)	Rehabilitation		As described in Section 5.1.4 of the EA: ***5.1.4 Technology Transfer of Restoration Techniques*** *The successful application of PUR products, method of injection, drilling equipment and drilling methods confirm their technical feasibility. Importantly, the WRS4 trial included the use of equipment of a type that would be utilised at more remote sites (HCPL, 2008b). The local conditions at rock bars WRS5, 6, 7 and 8 (Figure 5-1) are considered amenable to PUR injection methods (Section 5.2).* The WRS4 rock bar is still within an active subsidence zone. Movement is visually evident along the large diameter holes drilled for the stress relief slot. Recent survey results indicate 20 mm of subsidence in late 2008. This evidence indicates that additional subsidence has caused some near surface (<0.5 m) flow pathways to develop or a flow connection has established from fracturing along the stress relief slot. The remediation trial at Pool F commenced on 17 March 2008 and was completed on the 13 May 2008. Even with the recent additional cracking, which monitoring indicates has occurred in late 2008, Pool F is continuing to maintain water and provide ecological utility/refuge under extremely dry conditions. It is expected that primary, secondary and final restoration works would be conducted following each phase of subsidence effect (Section 5.2.5 of the EA). This recognises that each longwall has an incremental subsidence effect and that longwalls may affect rock bars prior to undermining, during undermining, or from mining in adjacent panels that are not directly beneath the rock bar. The PUR injection method lends itself to repeated treatments. The Project adaptive management approach is based on the commitment to treat key rock bars after each phase of active subsidence (as informed quantitatively by measurement of impacts such as pool level and surface versus sub-surface flow). The lower Waratah has been inspected for all aspects required to restore rock bars (heli-access, road access) etc and found to be amenable to the method. In regard to remediation activities at the Metropolitan Colliery, Professor Bruce Hebblewhite provides the following comments: *Inspection of the WRS4 remediation work confirms that the polyurethane (PUR) has been an effective injection material due to its ability to permeate readily through very low permeability fracture networks.*

No.	Subject	Issue Raised	Response
13 (Cont.)	Rehabilitation		and *Through the active involvement in remediation activities, HCPL has already developed management strategies for remediation of cracked rock-bars, where such impacts are predicted. Such techniques are clearly also applicable to any unpredicted impacts. The remediation techniques proposed are also amenable to repeat application, for expected incremental adverse impacts as successive longwalls pass through each location.* The potential impacts on environmental aspects that may occur prior to rehabilitation and during stream restoration works have been assessed as part of the EA and are summarised in Section 4 of the EA. As described in Section 4.4.3 of the EA, HCPL is committed to undertaking progressive restoration activities at rock bars WRS5, 6, 7, 8A and 8B, where future monitoring indicates the need. This means that in contrast to the impacts that occurred in the past at the Metropolitan Colliery, progressive stages of restoration works would reduce the impacts of successive subsidence effects of each longwall on these features. Consequent potential environmental impacts such as the diversion of surface flows, alteration of pool behaviour and change in aesthetic values at these features would occur for a significantly shorter period of time. The success criteria for restoration works would be detailed in the Trigger Action Response Plan (TARP) element of the Waratah Rivulet Management Plan (WRMP). HCPL's proposed success criteria are currently under development and are expected to be based on an achievement of a statistical variation of the pre-mining rockbar pool behaviour for given stream flow conditions. As described in Section 5.2.7 of the EA modified longwall extraction geometry would be implemented as a contingency measure under the following circumstances: *<u>TARP Contingency Measure - Modified Longwall Extraction Geometry</u>* *In the event that stream restoration performance criteria are not achieved (including the timeframe within which the works are completed) then modifications to the longwall extraction geometry would be implemented for subsequent longwall panels so as to reduce the cumulative subsidence effect. … In addition, in the event that there is a measurable reduction in the quality or quantity of the yield of Woronora Reservoir as a result of the Project, modification of the longwall extraction geometry would be undertaken.*

No.	Subject	Issue Raised	Response
14	Rehabilitation	Concern was raised regarding the adequacy of assessment of potential impacts associated with rehabilitation activities.	As stated in Section 5.1.5 of the EA: *The potential secondary effects of restoration works (e.g. vegetation clearance, water quality management and the aesthetic effect of grouts) are addressed in the relevant sections of this EA.* For example, Appendix G of the EA states: *Vegetation clearance activities would primarily be associated with ongoing surface exploration activities, the upgrade and extension of surface infrastructure, access tracks, environmental monitoring and management activities (e.g. installation of monitoring equipment), stream restoration activities and other minor Project-related surface activities.* *……..* *To minimise impacts on terrestrial vegetation, vegetation clearance would generally be restricted to the slashing of vegetation (i.e. leaving the lower stem and roots in-situ to maximise the potential for natural regrowth) and lopping of branches, where practicable, rather than the removal of soils or trees.* *Vegetation clearance (associated with Project works such as stream restoration activities, the establishment of monitoring stations and other surface facilities) would be managed through the development and implementation of a Flora and Fauna Management Plan (FFMP) …….* Section 5.1.1 of the EA describes the environmental management measures that were implemented during the restoration trial activities at the WRS4 rock bar as part of a prepared Environmental Management Plan: *Environmental management measures implemented included those relevant to soil management, vegetation management, erosion and sediment control, fuel and spill management, grout (i.e. PUR) handling, waste management, transport controls and bushfire preparedness. The environmental controls implemented during the restoration trial were considered by HCPL and the SCA to have worked effectively in providing the required control.* As stated in the Draft Statement of Commitments (Section 6 of the EA) a Waratah Rivulet Management Plan (WRMP) would be developed in consultation with the relevant authorities and would contain: *…….* • *environmental monitoring, environmental control measures (e.g. vegetation management, erosion and sediment control, fuel management and polyurethane (PUR) product management) and reporting for stream restoration works; and* *……..*

No.	Subject	Issue Raised	Response
15	Flora and Fauna	General concerns were raised regarding the potential impacts on flora, fauna and biological diversity.	Potential impacts of the Project on flora, fauna and biological diversity are assessed in the Terrestrial Flora and Fauna Impact Assessment (Appendix G of the EA). This assessment included an evaluation of the potential impacts on flora, fauna and biological diversity as a result of vegetation clearance and habitat disturbance, changes in fire regimes, dust and noise, road traffic, artificial lighting, spread of weeds, introduced pest species, amphibian Chytrid fungus, infection of native plants by *Pytophthora cinnamomi*, climate change, mine subsidence and cumulative impacts. An assessment of the potential impacts of the Project on aquatic ecology was undertaken as part of the Aquatic Ecology Assessment (Appendix D of the EA). The potential impacts of the Project on flora, fauna and biological diversity are summarised in Sections 4.5.2, 4.6.2 and 4.7.2 of the EA, while mitigation measures, management and monitoring are proposed in Sections 4.5.3, 4.6.3 and 4.7.3 of the EA. As described in the Draft Statement of Commitments (Section 6 of the EA), a Flora and Fauna Management Plan (FFMP) is proposed to be developed for the Project in consultation with the NSW Fisheries, the NSW Department of Environment and Climate Change (DECC) and the Sydney Catchment Authority (SCA), and to the satisfaction of the DoP.
16	Flora and Fauna	Concerns were raised regarding the adequacy of the assessment of potential impacts on the Prickly Bush-pea (*Pultenaea aristata*).	The locations of Prickly Bush-pea records are shown on Figure 4-16 of the EA. As discussed in Section 4.6 of Appendix E of the EA: *Within the longwall and associated draw and subsidence areas, occurrences of this species are represented in the graphics (see Figure 5 above) by a single point location; densities at these points range from individual plants up to 30 plants in a 2m x 2m (4m^2) sample area. Extensive stands are occasionally also represented by a single point location; these locations correspond to records in an accompanying database (refer to footnote 14), (e.g. as 'Edge [of distribution] not recorded - extends into adjacent areas of heathland and along woodland margins'). Records in adjacent areas also consist of records of individuals or densities of plants up to 5 plants in a 1m^2 area.* The potential impacts of the Project on the Prickly Bush-pea were evaluated in the Terrestrial Flora and Fauna Impact Assessment (Appendix G of the EA). Assessment of the Prickly Bush-pea was conducted in accordance with the Draft *Guidelines for Threatened Species Assessment* (DEC and DPI, 2005) and the *Significant Impact Guidelines – Matters of National Environmental Significance* (DEH, 2006b), which identify important factors that must be considered when assessing potential impacts on threatened species or their habitats. Evaluations of the Prickly Bush-pea are provided in Sections 4.5.3.1 and 7.4.1 of Appendix G. The evaluations concluded that it was unlikely the Project would have a significant impact on the Prickly Bush-pea.

No.	Subject	Issue Raised	Response
16 (Cont.)	Flora and Fauna		The Project has been referred to the Commonwealth Minister for the Environment, Heritage and the Arts for assessment in accordance with the *Environmental Protection and Biodiversity Conservation Act, 1999* and was determined 'Not a Controlled Action'. The Project was considered unlikely to have a significant impact on any matters of national environmental significance including threatened species.
17	Flora and Fauna	Concern was raised regarding potential impacts on the Giant Burrowing Frog and the Red Crowned Toadlet.	The potential impacts of the Project on the Giant Burrowing Frog and the Red Crowned Toadlet were assessed in the Terrestrial Flora and Fauna Impact Assessment (Appendix G of the EA). Evaluations have been conducted to assess the potential impacts of the Project on threatened fauna species and their habitats including the Giant Burrowing Frog and the Red Crowned Toadlet. The evaluations were conducted in accordance with the Draft *Guidelines for Threatened Species Assessment* (DEC and DPI, 2005) and/or the *Significant Impact Guidelines – Matters of National Environmental Significance* (DEH, 2006b), which identify important factors that must be considered when assessing potential impacts on threatened species or their habitats. Evaluations for the Giant Burrowing Frog are provided in Sections 5.6.2.1 and 7.4.2.1, and for the Red-crowned Toadlet in Section 5.6.2.2 of Appendix G. The evaluations indicate that the Project is unlikely to have a significant impact on the Giant Burrowing Frog or Red-crowned Toadlet.
18	Flora and Fauna	Concerns were raised regarding the adequacy of the terrestrial flora and fauna impact assessment, including: • potential impacts on riparian zones; • potential impacts on terrestrial fauna as a result of changes in natural flow regimes; • the assessment of potential impacts of subsidence on vegetation and endangered ecological communities (EECs); and • consideration of key threatening processes listed under the TSC Act.	The Director-General of DoP (in consultation with the DECC) deemed that the EA adequately met the Environmental Assessment Requirements (EARs) provided for its preparation. The potential impacts on riparian zones are described in Section 4.6.2 of the EA: *As described in Section 4.4, potential subsidence effects on streams and riparian zones include changes in stream gradients, increased scouring of stream banks, changes to stream alignments, cracking and/or changes in stream water levels and gas emissions. These subsidence effects have the potential to impact on riparian vegetation.* *…* *As has been observed at Metropolitan Colliery previously, potential mine subsidence impacts on riparian vegetation are expected to be relatively minor (i.e. localised area of dieback), with effects to vegetation condition predominantly being temporary (i.e. recovery has subsequently occurred) and limited in extent.*

No.	Subject	Issue Raised	Response
18 (Cont.)	Flora and Fauna		The potential impacts on terrestrial fauna as a result of changes in natural flow regimes are described in Section 4.7.2 of the EA: *As described in Section 4.4, mine subsidence would result in fracturing of the rock strata in watercourses which may result in conveyance of a portion of low flows via the fracture network, and a reduction in water level in pools as they become hydraulically connected with the fracture network.* *There is also likely to be reduced continuity of flow between affected pools during dry weather (Appendix C). During prolonged dry periods when flows recede to low levels, a greater proportion of the lower flows would be conveyed via the fracture network.* *…* *A range of fauna species are likely to utilise stream pools for drinking (e.g. the Eastern Grey Kangaroo), feeding (e.g. many lizards, small mammals and microchiropteran bats), bathing (e.g. small birds) or breeding (e.g. Hylid frogs such as Lesueur's Frog, Blue Mountains Tree Frog and Leaf Green River Tree Frog). In consideration of the nature of the potential impacts and the lifecycle components of terrestrial vertebrate fauna that may utilise the riparian/watercourse habitat, it is unlikely that any vertebrate population would be put at risk by the potential subsidence-related impacts.* *Many of the terrestrial vertebrate fauna species are known to utilise a range of habitats, or are mobile allowing them to move to alternative habitat in response to changes in stream flows or water levels. For species that are likely to utilise small pools in Waratah Rivulet rather than the large body of water in Woronora Reservoir, a number of micropools remain which hold water even during times of abnormally persistent low flows.* *The observations of pools in the Eastern Tributary and in tributaries of Waratah Rivulet indicate that although mine subsidence has the potential to increase the rate of leakage (and consequently pool level recession) of pools, it is likely that a portion of the pools subject to mine subsidence effects would hold some water during prolonged dry periods (Appendix C). These latter pools would remain full during most typical wetting and drying cycles.* *…….*

No.	Subject	Issue Raised	Response
18 (Cont.)	Flora and Fauna		Evaluations of threatened fauna species known to utilise riparian/watercourse habitat are provided in Appendix G of the EA. The potential impacts of surface and subsurface cracking on slope and ridgetop vegetation communities are discussed in Section 4.6.2 of the EA: *Mine subsidence has the potential to cause shallow surface cracking near the tops of slopes. To date, this type of surface tension crack has only been identified at Metropolitan Colliery on one occasion (namely, adjacent to Fire Road 9H). As described in Section 4.2, the size and extent of surface cracking on slopes and ridgetops as a result of the Project is expected to be minor (Appendix A).* *Shallow surface cracking has the potential to effect the movement of water (e.g. may become a preferred flow path for surface flow). However, as described in Section 4.4 the magnitude of the predicted subsidence effects is considered too small to influence the hydrological processes in these areas and is unlikely to have any biologically significant effect on the soil moisture regime that sustains the existing vegetation communities in these areas (Appendix C). There have been no reported observations of changes to ridgetop and slope vegetation at Metropolitan Colliery that have been attributed to mine subsidence.* The potential subsidence-related impacts on the Southern Sydney Sheltered Forest on Transitional Sandstone Soils EEC are discussed in Section 4.6.2 of the EA: *Assessment of the maximum potential subsidence on the Southern Sydney Sheltered Forest on Transitional Sandstone Soils in the Sydney Basin Bioregion EEC is provided in Appendix A. Surface cracking as a result of systematic subsidence movements at the occurrence of the Southern Sydney Sheltered Forest on Transitional Sandstone Soils in the Sydney Basin Bioregion EEC in the far north-east of the Project Underground Mining Area and surrounds is expected to be isolated and of a minor nature due to the relatively low magnitudes of the predicted strains and due to the relatively high depths of cover (Appendix A). Further, the maximum predicted systematic tilt is small when compared to the existing natural surface gradients.* *The magnitude of the predicted subsidence effects is considered too small to influence the hydrological processes in this area including the soil moisture regime that sustains the EEC in this area (Appendix C). As a result, it is unlikely that the Southern Sydney Sheltered Forest on Transitional Sandstone Soils in the Sydney Basin Bioregion EEC would be adversely affected by mine subsidence (Appendix G).*

No.	Subject	Issue Raised	Response
18 (Cont.)	Flora and Fauna		Evaluation of the potential impacts of the Project on the Southern Sydney Sheltered Forest on Transitional Sandstone Soils EEC is provided in Section 4.5.1 of Appendix G.
19	Flora	Concerns were raised regarding the adequacy of the baseline flora survey.	A comprehensive baseline flora survey was undertaken by Bangalay Botanical Surveys and the results are provided in Appendix E of the EA. The extent and effort of the survey is described in Section 3.1 of Appendix E of the EA: *Seasonal field surveys were conducted within the study area (including the associated draw and subsidence areas), in conjunction with threatened species searches in adjacent areas. The field surveys were conducted during spring 2006, summer 2006/2007 and spring/summer 2007/2008. Additional field surveys were conducted in adjacent areas (i.e. beyond the study area) in order to ascertain the extent of those threatened flora species recorded within the study area; survey dates were during late winter (29 and 30 August 2007) and spring 2007 (between 13 and 17 September 2007).* The design of the baseline flora survey is also described in Section 3.1 of Appendix E of the EA: *The design of all stages of the surveys (including the preliminary assessments, data and background information collection, general and threatened species field surveys and sampling techniques) accord with the requirements set out in the Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities Working Draft (Department of Environment and Conservation [DEC] 2004).* The identification of flora species is described in Section 3.2 of Appendix E of the EA: *Plant species identifications conform to recent nomenclature in Harden (1990, 1992, 1993, 2002), Harden and Murray (2000), and to recent name changes listed in Cunninghamia and Telopea.* As described in the Executive Summary of Appendix E of the EA: *…several specimens of Leucopogon species and Epacris species collected during field surveys were sent to the Herbarium at the Royal Botanic Gardens, Sydney for identification: several have been identified potentially as the threatened species Leucopogon exolasius and Epacris purpurascens var. purpurascens; however, fertile material required for confirmation of identification was not found during subsequent visits during spring and summer surveys, despite extensive searches.*

No.	Subject	Issue Raised	Response
20	Aquatic Ecology	General concerns were raised regarding potential impacts on aquatic habitat and the loss of stream connectivity.	Potential impacts of the Project on aquatic habitat and stream connectivity are summarised in Section 4.5.2 of the EA: *The effects of mine subsidence on surface water flows are described in detail in Section 4.4 and Appendix C. In summary, in the Project Underground Mining Area the effects of underflow would be most noticeable during periods of low flow and on the frequency of no flow, while the effects on the frequency and magnitude of high flows would be negligible (Appendix C).* *……..* ***Subsidence Effects on Pools*** *Fracturing of rock strata in watercourses can also result in a reduction in water level in pools due to the conveyance of a portion of natural surface flows via the fracture network (Appendix C). The effects of mine subsidence on pools are described in detail in Section 4.4 and Appendix C, including observations on the effects of previous mining at the Metropolitan Colliery on Waratah Rivulet pools and on tributary pools.* *In summary, during dry periods when flows are in a low, recessionary regime, the water level in pools affected by subsidence would in some cases recede faster than is the case in unaffected pools. The effects of subsidence on typical tributary pools can be seen as lower pool levels during the longer recessionary periods with little observable effect during periods of normal creek flow.* *In longer recessionary periods pool water levels can in some cases decline below the "cease to flow" level at a rate faster than it did prior to being undermined.* *It is likely that a portion of the pools subject to mine subsidence effects would hold some water during prolonged dry periods (Appendix C). These latter pools would remain full during most typical wetting and drying cycles.* ***Subsidence Effects on In-Stream Connectivity*** *As described in Section 4.4, the hydraulic capacity of the fracture network is not constant along the affected stream reach. Observations of flows along different reaches of Waratah Rivulet that have been subject to mine subsidence confirm that flows are sufficient to provide a continuous connection between some pools at times when there is not continuous flow connecting other pools (Appendix C).*

No.	Subject	Issue Raised	Response
20 (Cont.)	Aquatic Ecology		*During prolonged dry periods when flows recede to low levels, the number of instances where loss of flow continuity between pools occurs increases with a greater proportion of these lower flows being conveyed entirely in the subsurface fracture network. However, during these prolonged dry periods, some inter-pool reaches with "micro-pools" and shallow depressions in the bedrock that hold water have been observed and would provide refugia for some aquatic biota.*
21	Aquatic Ecology	Concerns were raised regarding potential impacts on threatened dragonfly species.	The Adams Emerald Dragonfly and Sydney Hawk Dragonfly have not been recorded during the numerous aquatic macroinvertebrate surveys carried out in streams in the local area for the Metropolitan Colliery (Marine Pollution Research, 2003-2005; The Ecology Lab, 2005-2006; Cummins et al., 2007a; 2007b; Roberts et al., 2008) or wider region (e.g. Ecowise Environmental, 2005a, 2005b, 2006). As discussed in Section 5.5 of Appendix D of the EA: *The Adams Emerald Dragonfly (Archaeophyta adamsi) is one of Australia's rarest dragonflies with only five adults ever collected from a few sites in the greater Sydney region (NSW Fisheries, 2002). Larvae of the Adams Emerald Dragonfly have been found in small creeks with gravel or sandy bottoms, in narrow, shaded riffle zones with moss and rich riparian vegetation (NSW Fisheries, 2002). Adam's Emerald Dragonfly larvae live for seven years or so and undergo various moults before metamorphosing into adults (NSW Fisheries, 2002).* *The known distribution of the Sydney Hawk Dragonfly (Austrocordulia leonardi) is extremely limited. The known distribution of the species includes three locations in a small area south of Sydney, from Audley to Picton (NSW Fisheries, 2007). The species is also known from the Hawkesbury-Nepean, Georges River and Port Hacking drainages. The Sydney Hawk Dragonfly was discovered in 1968 from Woronora River and Kangaroo Creek, south of Sydney and later recorded from the Nepean River at the Maldon Bridge near Wilton (NSW Fisheries, 2007). The Sydney Hawk Dragonfly has specific habitat requirements, including slow-flowing water in rocky rivers with steep sides that provide shady resting areas. All specimens collected have come from deep riverine pools with cooler water. The Sydney Hawk Dragonfly is found under rocks, where it may coexist with the Eastern Hawk Dragonfly. Decline in the species has occurred as neither exuviae or adults have been collected in recent times (Fisheries Scientific Committee, undated). Intensive surveys over recent years have failed to detect the presence of any of the life stages of the Sydney Hawk Dragonfly along Woronora River and Kangaroo Creek. The species has not been collected from the type locality since the removal of the weir in the Woronora River at Heathcote (Hawking and Theischinger, 2004 in Fisheries Scientific Committee, undated).*

No.	Subject	Issue Raised	Response
21 (Cont.)	Aquatic Ecology		In summary, none of the threatened aquatic biota listed in the schedules of the NSW *Threatened Species Conservation Act*, *1995*, NSW *Fisheries Management Act, 1994* or Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* have been recorded within streams in the Project underground mining area or surrounds. The Giant Dragonfly has not been recorded in the Woronora Special Area, however potential habitat for this species (i.e. upland swamps) occurs in the Project area and surrounds. An evaluation was conducted for the Giant Dragonfly and is provided in Section 5.6.1 of Appendix G of the EA. The evaluation indicates that the Project is unlikely to have a significant impact on the Giant Dragonfly.
22	Aquatic Ecology	Concerns were raised regarding the adequacy of aquatic macroinvertebrate surveys and assessment, including: • the location of baseline sampling sites and sampling techniques; • the taxonomic level of macroinvertebrate identification; and • the adequacy of the surveys in targeting the Sydney Hawk Dragonfly and Adams Emerald Dragonfly.	The Aquatic Ecology Assessment (Appendix D of the EA) was conducted by Bio-Analysis and was peer reviewed by Adjunct Professor David Goldney. The Director-General of DoP (in consultation with the DECC) deemed that the EA adequately met the Environmental Assessment Requirements (EARs) provided for its preparation. The locations of aquatic ecology sampling sites for the Bio-Analysis survey are shown on Figure 4-14 of the EA. Section 4.2 of Appendix D (Aquatic Ecology Assessment) states: ***Relation of Sampling Sites to Past, Future and Proposed Mining*** *The positioning of sampling sites was stratified to ensure coverage of past mining, proposed mining and areas not subject to mining (Table 1). Four sites were located where mining has been completed, nine in proposed mining areas, two outside of mining areas but immediately adjacent to proposed mining areas, and four west of current and proposed mining locations. Whilst the data from all sites is expected to contribute to baseline understanding, the latter four sites act as control sampling sites.* Data from adjacent streams (Woronora River, Bee Creek and Honeysuckle Creek) has been used as control streams for comparative purpose. In addition, sampling sites situated on sections of Waratah Rivulet and Eastern Tributary unaffected by mine subsidence also provide relevant data. The aquatic ecology analyses undertaken are considered adequate to justify the conclusions reached in the Aquatic Ecology Assessment. Quantitative sampling of macroinvertebrate communities was undertaken by the baseline surveys to enable statistical analysis of the data. As described in Section 4.5 of Appendix D, three replicate samples of macroinvertebrates were collected using timed 1-minute sweeps using a 250 micrometre (µm) dip net. Sweep netting is an accepted and standard method of sampling aquatic macroinvertebrates.

No.	Subject	Issue Raised	Response
22 (Cont.)	Aquatic Ecology		The aquatic ecology studies generally identified aquatic macroinvertebrates to Family level as described in the EA. While there is ongoing debate about the advantages and disadvantages of family versus species level identifications, Family level identification is routinely used in monitoring programmes. Although species-level identification provides more information, it is a specialised and laborious task. The design of the monitoring programme and associated statistical analyses are considered to be pertinent in identifying impacts on macroinvertebrates. Searches of literature and various databases including those provided by the Atlas of NSW Wildlife (Department of Environment and Climate Change [DECC], 2007) Department of the Environment, Water, Heritage and the Arts (www.environment.gov.au/epbc), NSW Fisheries (Department of Primary Industries [DPI]) (www.dpi.nsw.gov.au/fisheries) and the NSW Government BioNet system (www.bionet.nsw.gov.au) were carried out for threatened aquatic species, populations, ecological communities or their habitats that have the potential to occur in the study area. Data collected from previous field surveys were also used as part of this assessment. This review was undertaken prior to the field surveys to ensure that appropriate field methods were selected to target any threatened aquatic biota. Section 6.6 of Appendix D of the EA concludes: *Examination of taxa collected from within the study area at different times, both before and after mining, indicated that there had been no changes or loss in taxa.* *…Furthermore, there were no significant differences detected in assemblages of macroinvertebrates (richness and abundance) in areas where mining has occurred compared with reference locations sampled at the same time.*

No.	Subject	Issue Raised	Response
23	Aboriginal Heritage	General concerns were raised regarding potential impacts on Aboriginal heritage sites.	To assist in identifying whether Project is likely to have a significant effect on the Aboriginal heritage, an evaluation of the potential impacts of the Project was undertaken as part of the Aboriginal Cultural Heritage Assessment (Appendix H of the EA). As described in Section 4.8.2 of the EA, it is considered that the likelihood of direct damage to Aboriginal heritage sites is low. There is very little evidence of impacts to such features from the existing mine subsidence at the Metropolitan Colliery: *As part of the Project detailed design phase, the final location of some of the ancillary infrastructure (ventilation systems and groundwater monitoring bores) and surface works (exploration works, construction and/or management of access tracks, subsidence monitoring, subsidence restoration works and surface rehabilitation works) would be determined. Project surface development works are further described in Section 2 and have the potential to directly impact Aboriginal heritage sites.* *…* *Potential impacts from underground mining on Aboriginal heritage sites include the cracking of sandstone and (where cracking coincides with a sandstone overhang) isolated rock fall.* *Maximum predicted tensile strains greater than 0.5 mm/m may result in the cracking of sandstone at open sites (i.e. grinding grooves and engraving sites) and closed sites (i.e. sandstone overhang sites). Maximum predicted compressive strains greater than 2 mm/m may result in the cracking of sandstone at open sites (i.e. grinding grooves and engraving sites) (Appendix A).* *Sixty-eight of the 188 Aboriginal heritage sites are predicted to experience tensile strains greater than 0.5 mm/m, including five sites of high archaeological significance (i.e. FRC 12, FRC 185, FRC 191, FRC 195 and NEW 2). No open sites have a maximum predicted compressive strain greater than 2.0 mm/m. Appendix A explains the conservative nature of these predictions as they are based on a conservative empirical methodology that takes into account a comprehensive data set of previously recorded subsidence magnitudes.*

No.	Subject	Issue Raised	Response
23 (Cont.)	Aboriginal Heritage		*The predictions include subsidence resulting from the extraction of Longwalls 20 to 44, as well as the cumulative subsidence effect resulting from the previously extracted or approved longwalls (i.e. Longwalls 1 to 19A). Therefore, it is likely that subsidence effects would be less than the maximum predicted. Appendix A states that:* *Potential fracturing of the exposed sandstone is expected to be isolated and of a minor nature, due to the relatively low magnitudes of the predicted strains and the relatively high depth of cover. The potential for fracturing to occur at the grinding grooves would, therefore, be considered low.* *Appendix A also notes that although impact is possible, based on experience in the Southern Coalfield, the likelihood of significant impact on sandstone overhang sites as a result of mine subsidence is also low.* *…* *Monitoring of approximately 41 Aboriginal heritage sites (subject to mine subsidence) has been undertaken between 1995 and 2008 at the Metropolitan Colliery. Of the 41 sites monitored, 21 had maximum predicted tensile or compressive strains greater than 0.5 mm/m and/or 2 mm/m respectively.* *The majority of sites monitored had no observable change following mine subsidence, with observable change identified in six Aboriginal heritage sites. Changes noted during monitoring include: potential natural weathering; cracks noted in sandstone platforms away from engravings/grinding grooves; cracking along existing bedding planes; and rear wall blockfall (Appendix H).* *…it is expected that the majority of identified Aboriginal heritage sites would experience no significant change, particularly when compared to natural deteriorating processes unrelated to mining and given the conservative nature of the subsidence predictions.* Further, the below provides a "Risk of Impact" rating for Aboriginal heritage sites of high archaeological significance. This risk rating has been determined by informed consideration by MSEC Pty Ltd, Kayandel Archaeological Services and HCPL. ***FRC 12 52-2-0255 Open Site*** This site is an open sandstone platform with low predicted systematic compressive and tensile strains. The site has a depth of cover of approximately 490 m and has maximum predicted compressive and tensile strains of 0.4 and 0.6 mm/m, respectively. The presence of pre-existing structures would tend to focus any systematic or non-systematic strains, thereby further reducing the likelihood of impacts. There is a negligible risk of impact to this site.

No.	Subject	Issue Raised	Response
23 (Cont.)	Aboriginal Heritage		***FRC 32 52-2-0194 Open Site*** This site is an open sandstone platform with low predicted systematic compressive and tensile strains. The site is located over a pillar, has a high depth of cover and is positioned on a slope. The site has a depth of cover of approximately 450 m and has maximum predicted compressive and tensile strains of 0.5 and 0.4 mm/m, respectively. Non-systematic strains, if evident, would very likely concentrate about existing pot holes and the drainage channel, thereby providing protection for the grinding grooves present. There is a negligible risk of impact to this site. ***FRC 62 52-2-0168 Sandstone Overhang*** This site has a low predicted systematic tensile strain and it is positioned on a ridgetop. The site's volume is greater than 50 m^3 and it is located above a goaf area although it has a large depth of cover. The site has a depth of cover of approximately 530 m and has a maximum predicted tensile strain of 0.5 mm/m. The sandstone has an existing area subject to water seepage, which has resulted in the creation of a pool in the floor of the overhang. The sandstone has existing joints and cracks which would absorb much of the systematic and non-systematic (if present) subsidence strains. There is a very low risk of impact to this site. ***FRC 68 52-2-0186/52-2-0326 Sandstone Overhang*** This site has a very low predicted systematic tensile strain and it is positioned on a ridgetop. The site's volume is less than 50 m^3 which places it outside the risk category of larger sites and it is located over a pillar. The site has a depth of cover of approximately 450 m and has a maximum predicted tensile strain of 0.4 mm/m. There has been no observed/recorded water seepage through the sandstone. There is a negligible risk of impact to this site.

No.	Subject	Issue Raised	Response
23 (Cont.)	Aboriginal Heritage		***FRC 185 52-2-0223 Sandstone Overhang*** This site has a low predicted systematic tensile strain. The site's volume is greater than 50 m^3 and it is located above a goaf area although it has a large depth of cover. The site has a depth of cover of approximately 445 m and has a maximum predicted tensile strain of 0.8 mm/m. A silica skin on the sandstone surface and some evidence of water seepage has previously been recorded. The sandstone has existing joints and cracks which would absorb much of the systematic and non-systematic (if present) subsidence strains. Fracturing and shear movements of strata, and rock falls associated with cliffs have been reported in similar situations. There is a low risk of impact to this site. ***FRC 191 52-2-0183 Sandstone Overhang*** This site has a low predicted systematic tensile strain. The site's volume is greater than 50 m^3 and it is located above a goaf area although it has a large depth of cover. The sandstone has existing joints and cracks which would absorb much of the systematic and non-systematic (if present) subsidence strains. The site has a depth of cover of approximately 445 m and has a maximum predicted tensile strain of 0.8 mm/m. There has been no observed/recorded water seepage through the sandstone. Fracturing and shear movements of strata, and rock falls associated with cliffs have been reported in similar situations. There is a low risk of impact to this site. ***FRC195 52-2-0264 Sandstone Overhang*** This site has a low predicted systematic tensile strain. The site's volume is only just greater than 50 m^3 and it is located above a goaf area although it has a large depth of cover. The sandstone has existing joints and cracks which would absorb much of the systematic and non-systematic (if present) subsidence strains. The site has a depth of cover of approximately 435 m and has a maximum predicted tensile strain of 0.6 mm/m. Damage due to water seepage has previously been recorded. Fracturing and shear movements of strata, and rock falls associated with cliffs have been reported in similar situations. There is a very low risk of impact to this site.

No.	Subject	Issue Raised	Response
23 (Cont.)	Aboriginal Heritage		

FRC 322 ***N/A*** ***Open Site***

This site is an open sandstone platform with very low predicted systematic compressive and tensile strains. The site is located over a pillar and is positioned on a slope. The site has a depth of cover of approximately 480 m and has maximum predicted compressive and tensile strains of 0.3 and 0.4 mm/m, respectively. The presence of pre-existing structures would tend to focus any systematic or non-systematic strains, thereby further reducing the likelihood of impacts. There is a negligible risk of impact to this site.

NEW 2 ***N/A*** ***Sandstone Overhang***

This site has a low predicted systematic tensile strain and it is positioned on a slope. The site's volume is greater than 50 m^3 and it is located above a goaf area. The site has a depth of cover of approximately 525 m and has a maximum predicted tensile strain of 0.6 mm/m. There is a negligible risk of impact to this site.

Summary of Risk of Impact to Sites of High Archaeological Significance

Site Number	Site Name	Site Type	Risk of Impact
52-2-0255	FRC 12	Open Site	Negligible
52-2-0194	FRC 32	Open Site	Negligible
52-2-0168	FRC 62	Sandstone Overhang	Very Low
52-2-0186/52-2-0326*	FRC 68	Sandstone Overhang	Negligible
52-2-0223	FRC 185	Sandstone Overhang	Low
52-2-0183	FRC 191	Sandstone Overhang	Low
52-2-0264	FRC195	Sandstone Overhang	Very Low
N/A	FRC 322	Open Site	Negligible
N/A	NEW 2	Sandstone Overhang	Negligible

* Single Aboriginal heritage site registered more than once on the AHIMS database (Illawarra Prehistory Group, 2007).

N/A Information provided to the DECC although not yet registered on the AHIMS database.

No.	Subject	Issue Raised	Response
23 (Cont.)	Aboriginal Heritage		As stated in the Draft Statement of Commitments (Section 6 of the EA) an Aboriginal Cultural Heritage Plan (ACHMP) would be developed for the Project in consultation with the Aboriginal community.
24	Aboriginal Heritage	Concern was raised regarding support of Aboriginal Heritage projects and other Aboriginal programs in the local community.	HCPL has committed to developing a protocol/program for the sponsorship of existing or new projects that benefit the wider Aboriginal community. Specifically, Sections 4.8.3 and 6 of Volume 1 of the EA state: *A protocol/program for HCPL to sponsor existing or new projects that benefit the wider Aboriginal community. These may include (for example): Aboriginal community field days; restoration of culturally significant buildings; rehabilitation/protection of areas with high cultural values; and/or potential employment/skill development opportunities. Any such sponsorship should be made available to the wider Aboriginal community with submissions presented to HCPL and projects selected by HCPL based on their individual merit and benefit to the wider Aboriginal community.* As described in the EA, this protocol/program would be developed as part of the Aboriginal Cultural Heritage Management Plan in consultation with the DECC and the Aboriginal community. During consultation with the Aboriginal community as part of the EA, it became apparent that some Aboriginal community groups are actively committed to existing programs aimed at providing economic and cultural support/education to the Aboriginal community. During consultation, those community groups involved in the operation of these programs expressed the desire to both continue these existing programs and develop new programs. An outline of such programs provided by one of the Aboriginal community groups consulted with is provided in Appendix H of the EA: *… the NIAC dairy at Menagle which supplies free A2 milk on a weekly basis to needy families throughout the region"; the "Bellambi Lagoon Landcare group"; "Aboriginal language books and CD's" for educational purposes; restoring the "historic UAM Colebrook Memorial Church on the Old La Perouse Mission" for use as a "community meeting place and craft centre, and possibly a day-care centre for Aboriginal children"; "restoring the Old Menangle Primary School" for use as an Aboriginal sports centre, "Aboriginal language school, and as a craft centre/shop"; and "developing picnic and bushwalking facilities … on and about the Elladale Homestead.* HCPL has acknowledged the benefit of such programs to the wider Aboriginal community and as such is committed to supporting their continuation and/or development through the sponsorship protocol/program outlined in the EA (and quoted above) to be developed as part of the Aboriginal Cultural Heritage Management Plan should the Project be approved.

No.	Subject	Issue Raised	Response
25	Aboriginal Heritage	Concern was raised regarding the effectiveness of proposed mitigation measures for Aboriginal heritage sites.	As described in Section 4.8.2 of the EA, it is considered that the likelihood of direct damage to Aboriginal heritage sites is low. There is very little evidence of impacts to such features from the existing mine subsidence at the Metropolitan Colliery: An Aboriginal Cultural Heritage Management Plan (ACHMP) would be developed for the proposal in consultation with the Aboriginal community (Section 6 of the EA). The ACHMP would include mitigation measure for Aboriginal heritage sites and a protocol for determining the most appropriate management or mitigation measures. Section 4.8.3 of the EA describes management/mitigation measures that may be implemented: *These measures would be site specific and dependant on the nature and extent of the observed/predicted subsidence effect. Potential measures include:* • *installing standing supports in sandstone overhangs (e.g. timber props, timber cogs, sandbags, and metal [hydraulic] props);* • *installing a stress relief slot or stress focus notch adjacent to an open site;* • *installing an artificial dripline to direct increased moisture/water seepage away from art panels; and* • *implementation of general reinforcement techniques (e.g. rock bolts, cement sprays [shotcrete] and injection [with PUR or similar]).* *Development of these measures should acknowledge that while the measures may reduce the risk of further decrease in integrity, they also have a potential to cause damage to a particular Aboriginal site or its setting.* A protocol would also be developed as part of the ACHMP for determining the most appropriate management and/or mitigation measures and for presenting guiding principles for managing Aboriginal heritage (Section 4.8.3 of the EA). This protocol would ensure that management and/or mitigation measure would not be conducted that may cause greater damage to an Aboriginal heritage site than unmitigated mining-related impacts. Appendix 5 of the ACHA provides full copies of formal correspondence received from all registered Aboriginal community groups/parties.

No.	Subject	Issue Raised	Response
25 (Cont.)	Aboriginal Heritage		Some relevant quotes from Section 5 of the ACHA in regard to the Aboriginal communities comments on the proposed management and mitigation measures and the offset strategy are provided below: "*The KEJ Tribal Elders Corporation and Wodi Wodi Elders Corporation indicated their support of the Project, provided that the recommendations and/or management measures outlined in the ACHA are implemented*". "*The Illawarra Local Aboriginal Land Council, KEJ Eloura, Mr Gary Caines and Wodi Wodi Elders Corporation indicated that they supported the development of the Aboriginal Cultural Heritage Management Plan (ACHMP), which includes the application of the management and mitigation measures proposed in Sections 9 and 10*". "*Cubbitch Barta, the Illawarra Local Aboriginal Land Council and the Tharawal Local Aboriginal Land Council indicated that they support the proposed management and mitigation measures except for the undertaking of invasive survey techniques at Aboriginal heritage sites*". "*Cubbitch Barta, Illawarra Local Aboriginal Land Council, KEJ Tribal Elders Corporation, Mr Gary Caines, Northern Illawarra Aboriginal Collective, Tharawal Local Aboriginal Land Council and Wodi Wodi Elders Corporation all expressed their interest in being consulted and involved in all aspects of Aboriginal heritage management at the Metropolitan Colliery, including the development and implementation of the ACHMP, mitigation and management measures, recording and monitoring of Aboriginal heritage sites."*
26	Aboriginal Heritage	Concerns were raised regarding the adequacy of the Aboriginal heritage assessment, including: • the level of consultation conducted as part of the assessment; • the assessment of impacts on Aboriginal communities and culture as a result of changes to the natural environment; • the assessment of impacts on Aboriginal heritage sites of a lower significance; • the consideration of the approval processes that would be used for the disturbance of Aboriginal heritage sites; • the assessment of Aboriginal heritage sites located outside the mine working zone but within the area of potential impact; and • the comparison of mining induced impacts on Aboriginal heritage with natural deterioration.	The Aboriginal Cultural Heritage Assessment (Appendix H of the EA) was conducted by Kayandel Archaeological Services and was peer reviewed by R.G. Gunn (provided in Attachment 3 of the EA). This assessment was determined to be in accordance with the requirements outlined in the Director-General's Environmental Assessment Requirements (EARs) provided in Attachment 1 of the EA. Section 5 of the Aboriginal Cultural Heritage Assessment (ACHA) details the comprehensive consultation undertaken with the Aboriginal community throughout the Aboriginal cultural heritage assessment in accordance with the DECC's Aboriginal consultation guidelines (National Parks and Wildlife Act 1974: Part 6 Approvals Interim Community Consultation Requirements for Applicants [2004]). Section 3.5.8 of the EA summarises the consultation undertaken as follows: *Project consultation with Aboriginal stakeholders was extensive during the development of the Project EA and has been undertaken in general accordance with the Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (NSW Department of Environment and Conservation [DEC], 2005a) and National Parks and Wildlife Act 1974: Part 6 Approvals Interim Community Consultation Requirements for Applicants (DEC, 2004a).*

No.	Subject	Issue Raised	Response
26 (Cont.)	Aboriginal Heritage		*In accordance with these guidelines identification of indigenous stakeholders was undertaken via:* • *public advertisement;* • *correspondence with the WCC, the DECC, the NSW Department of Aboriginal Affairs and the NSW Native Title Services; and* • *correspondence with indigenous stakeholders previously identified by earlier studies at the Metropolitan Colliery.* *Subsequent consultation with registered indigenous stakeholders during the preparation of the EA included:* • *provision of draft Aboriginal heritage assessment methodology to stakeholders and consideration of comments received prior to fieldwork;* • *Aboriginal heritage assessment fieldwork with representation from each of the registered indigenous stakeholders;* • *discussions with registered indigenous stakeholders regarding the cultural significance of individual Aboriginal heritage sites and the Project area;* • *provision of a copy of the draft Aboriginal heritage assessment report to each of the registered indigenous stakeholders for review and comment;* • *meetings with registered indigenous stakeholders to discuss the draft Aboriginal heritage assessment report; and* • *finalisation of the Aboriginal heritage assessment report including consideration of the comments received from registered indigenous stakeholders.* Appendix 5 of the ACHA provides full copies of formal correspondence received from all registered Aboriginal community groups/parties. Section 7.2 of Appendix H of the EA discusses the potential impacts of the Project on the cultural significance of the area. As discussed above, the Aboriginal Cultural Heritage Assessment was provided to registered indigenous stakeholders for review and comment, and their comments were considered in the finalisation of the report. The cultural significance of the area and individual Aboriginal heritage sites was discussed with registered indigenous stakeholders (Section 3.5.8 of the EA). As discussed in Section 4.2 of Appendix H of the EA:

No.	Subject	Issue Raised	Response
26 (Cont.)	Aboriginal Heritage		*Following the 2007 supplementary survey and inspections, a re-assessment of archaeological significance was undertaken for each of the known sites within the study area. The archaeological significance assessment was based on: the C.E. Sefton Pty Ltd (2004) assessment; the Kayandel Archaeological Services (2006 and 2007) archaeological significance assessment; information provided by the Illawarra Prehistory Group in 2007 and 2008; information on sites cards registered on the DECC AHIMS database (data retrieved in 2006 and 2008); information collected as part of the comprehensive baseline recording of Aboriginal heritage sites within the Longwall 14-17 area (Gunn, R. G. and Kayandel Archaeological Services, 2007a); and data gathered during the 2007 supplementary survey and site inspections.* *The assessment of archaeological significance was undertaken in accordance with the Aboriginal Cultural Heritage: Standards and Guidelines Kit (NPWS, 1997) and the Burra Charter (Marquis-Kyle and Walker, 2004) value criteria (i.e. scientific, aesthetic, social, spiritual and historical). With consideration of these value criteria, an overall archaeological significance assessment (low, medium or high) of each of the sites within the study area was determined on a context with consideration of the Woronora Plateau…* *As part of the cultural heritage assessment and as outlined above, representatives of the Aboriginal community have inspected the Study Area and a representative sample of Aboriginal heritage sites and site types within the Study Area and surrounds. The cultural significance of the study area and known sites within the study area is primarily to be determined by representatives of the registered Aboriginal community groups/parties.* As stated in the Draft Statement of Commitments (Section 6 of the EA): *An ACHMP will be developed for the Project in consultation with the Aboriginal community.* *The ACHMP will include:* *…* • *Statutory requirements.* *…* The Aboriginal Cultural Heritage Assessment considered the potential impacts on all Aboriginal heritage sites located within the 'study area' (Section 1.1 of Appendix H of the EA). The 'study area' is defined in Section 2.1 of the Subsidence Assessment (Appendix A of the EA):

No.	Subject	Issue Raised	Response
26 (Cont.)	Aboriginal Heritage		*The extent of the Study Area has been calculated by combining the areas bounded by the following limits:-* • *The 35 degree angle of draw line,* • *The predicted vertical limit of subsidence, taken as the 20 mm subsidence contour, and* • *Features sensitive to far-field movements.* Subsidence predictions were calculated and the potential impacts were evaluated for all Aboriginal heritage sites located within the 'study area'. As described in Section 4.8.2 of the EA, it is considered that the likelihood of direct damage to Aboriginal heritage sites is low. There is very little evidence of impacts to such features from the existing mine subsidence at the Metropolitan Colliery: Appendix A states that: *Potential fracturing of the exposed sandstone is expected to be isolated and of a minor nature, due to the relatively low magnitudes of the predicted strains and the relatively high depth of cover. The potential for fracturing to occur at the grinding grooves would, therefore, be considered low.* Appendix A also notes that although impact is possible, based on experience in the Southern Coalfield, the likelihood of significant impact on sandstone overhang sites as a result of mine subsidence is also low. *Monitoring of approximately 41 Aboriginal heritage sites (subject to mine subsidence) has been undertaken between 1995 and 2008 at the Metropolitan Colliery. Of the 41 sites monitored, 21 had maximum predicted tensile or compressive strains greater than 0.5 mm/m and/or 2 mm/m respectively.* *The majority of sites monitored had no observable change following mine subsidence, with observable change identified in six Aboriginal heritage sites. Changes noted during monitoring include: potential natural weathering; cracks noted in sandstone platforms away from engravings/grinding grooves; cracking along existing bedding planes; and rear wall blockfall (Appendix H).* On this basis, it is estimated that up to 10 of the 188 Aboriginal heritage sites mapped within the vicinity of the Project Underground Mining Area may have some subsidence related effect of the nature described above over the life of the Project.

No.	Subject	Issue Raised	Response
26 (Cont.)	Aboriginal Heritage		Section 8 of Appendix H of the EA evaluates the cumulative impacts of mining and natural deterioration process (discussed in Section 6.2 of Appendix H of the EA). It was determined for the majority of sites the potential direct impacts of the Project are predicted to be minor and limited in extent. Hence, it was noted that the sites would not experience a significant change compared to natural deteriorating processes unrelated to mining (i.e. the cumulative impact would be comparable to the impact of natural deterioration without the Project). However, the assessment also notes that the Project also has the potential to exacerbate some existing natural deterioration processes such as those observed during field surveys and described in Section 6.2 (e.g. cracking of sandstone and rockfall) (Section 8 of Appendix H of the EA).
27	Non-Aboriginal Heritage	Concern was raised regarding the non-Aboriginal heritage assessment for the Project, including: • consideration of the significance for the Metropolitan Colliery; • the detail provided on potential impacts of the Project on the Metropolitan Colliery heritage values and the staging of works; • closure of older components of the mine, including the area containing the Pit Pony Stables would reduce the heritage significance of the site; • consideration of relics provisions of the *Heritage Act, 1977* (NSW) and the requirements for permits under this Act; and • consideration of the recommendations in the document 'Strategic Management Plan for Historic Coal Mining Sites of the Illawarra'.	The Non-Aboriginal Heritage Assessment was conducted by Heritage Management Consultants and is contained in Appendix I of the EA. This assessment was determined to be in accordance with the requirements outlined in the Director-General's Environmental Assessment Requirements (EARs) provided in Attachment 1 of the EA. As described in Section 2.2. of Appendix I of the EA: *In identifying places with heritage significance in the vicinity of the Metropolitan Coal Project developments, the places listed in the NSW State Heritage Register, the Illawarra REP, the Wollongong LEP, and the Strategic Management Plan for Historic Coal Mining Sites in the Illawarra, (OHM Consultants, 2006) were considered.* Schedule 1 of the Wollongong LEP (1990) lists the Metropolitan Colliery as an item of regional significance. As stated in Section 2 of Appendix I of the EA: *The listing of elements of Regional Heritage Significance within the Metropolitan Colliery site is quite general, and little detail is provided. There are a number of smaller elements and artefacts that are worthy of consideration for their heritage values. … It is recommended below that a Conservation Management Plan (CMP) be developed for the Metropolitan Colliery, in which the recording and management of this material would be addressed together with the already identified elements.* As stated in Section 4.9.3 of the EA: *Potential impacts to non-Aboriginal heritage items within the Major Surface Facilities Area include impacts associated with:* • *upgrades/extensions to the CHPP, material handling (conveyor) systems, water management systems and electrical reticulation and control systems; and*

No.	Subject	Issue Raised	Response
27 (Cont.)	Non-Aboriginal Heritage		• *construction of additional infrastructure such as a demountable bathhouse, coal reject paste plant and associated coal reject stockpile, pumping, pipeline and underground delivery systems.* *The specifics of these works would be determined by detailed engineering design. Notwithstanding, potential impacts to the listed heritage items within the Major Surface Facilities Area are summarised in Table 4-16.* *Appendix I provides further detail of the general potential for impact on identified sites of heritage significance within the Major Surface Facilities Area.* As stated in Table 4-16 of the EA, access to the old Pit Pony Stables (located in a pervious underground mining area) may not be available in the future. The Draft Statement of Commitments (Section 6 of the EA) commits to conducting a detailed inspection of this area and recording of all items. As stated in Section 3.1.2 of the EA: *Sections 75U(1) and (2) of the EP&A Act outline the authorisations that are not required for a Project approved under Part 3A. These authorisations are those ordinarily required under the following legislative provisions:* *…* • *Division 8 of Part 6, Part 4 and Section 139 of the Heritage Act, 1977;* *…* The Draft Statement of Commitments (Section 6 of the EA) describes the development and implementation of a Conservation Management Plan (CMP), in particular: *The CMP process will include:* 1. *Further detailed inspection of all items of heritage significance or potentially of heritage significance within the Major Surface Facilities Area and recording of these items.* 2. *Further literature and archival review to inform the CMP, where relevant.* 3. *Consultation with relevant agencies including the DoP (Heritage Office) regarding the detailed design of any heritage controls.* 4. *Consideration of heritage-related requirements of relevant planning instruments (e.g. the Wollongong Local Environmental Plan, 1990 and Illawarra Regional Environmental Plan No. 1).* 5. *Consideration of contingency measures to address future (i.e. unforeseen) potential effects to heritage.*

No.	Subject	Issue Raised	Response
28	Non-Aboriginal Heritage	Concern was raised that commitments in the non-Aboriginal heritage assessment regarding minimising strain impacts at the Garrawarra Centre were not in the EA main text or Statement of Commitments.	As stated in Section 4.9.3 of the EA: *For the longer buildings of higher significance* [at the Garrawarra Centre]*, MSEC (2008) has provided conservative performance criteria that would result in predicted strain impacts of similar magnitude to that described above (i.e. resulting in no more than hairline cracks or fine cracks which would not require repair). HCPL has committed to these performance criteria in the Project Statement of Commitments (Section 6), and detailed future mine design in the vicinity of the Garrawarra Centre would be constrained by these criteria.* *Accordingly, all of the buildings within the Garrawarra Centre would experience negligible tilt impacts and strain impacts no greater than hairline cracks or fine cracks which would not require repair (Appendix I).* The Statement of Commitments (Section 6 of the EA) states: *The mine design in the vicinity of the Garrawarra Centre will be constrained by performance criteria such that any impacts to the associated structures are negligible (i.e. would not require repair). Specific monitoring of the Garrawarra Centre will be included in relevant SMPs.*
29	Landholder Consultation	Concern was raised regarding whether consultation had been undertaken with owners of the sites where subsidence related damage is possible.	As described in Section 4.1.1 of the EA: *Landuses in the Project Underground Mining Area include:* • *the Woronora Special Area (and associated fire trails and Woronora Reservoir);* • *the Garrawarra Centre aged care facility, associated housing and cemetery;* • *an old quarry (now used for a model aeroplane club);* • *public road corridors including the F6 Southern Freeway and Princes Highway; and* • *infrastructure (e.g. electricity transmission lines, optical cables and water pipelines).* *A limited number of rural residences/sheds are also located in close proximity to the Project Underground Mining Area (Appendix A)*. In addition to the Technical Working Group and Executive Working Group meetings, HCPL met with the SCA on several occasions during the development of the EA. Consultation with the South Eastern Sydney Illawarra Area Health Service (the operators of the Garrawarra Centre, an aged care facility), the Roads and Traffic Authority, Wollongong City Council, infrastructure owners and other landholders in relation to mine subsidence is described in Section 3.5 of the EA.

No.	Subject	Issue Raised	Response
29 (Cont.)	Landholder Consultation		Where landholdings are held by private parties, HCPL made efforts to contact the landholders and discuss the Project. In cases where houses or buildings were identified in the Subsidence Assessment (Appendix A) and may potentially be subject to mine subsidence, HCPL contacted the private landholders to discuss the Project and provide subsidence predictions to the landholders, prior to the lodgement of the EA.
30	Project Justification and Consideration of Project Alternatives	Concerns were raised regarding the consideration of: • the need for the Project; • the length of the Project life sought as part of the proposal (23 years); • the potential application of bord and pillar techniques or modification of the mine plan (e.g. widening pillars or use of buffer zones) to reduce subsidence impacts; • the potential use of coal seam gas as an energy source, rather than disposal by flaring; and • the environmental impacts and road safety impacts of hauling coal to local coking plants, rather than using rail.	As stated in Section 3.9.5 of the EA: *The Project would provide up to 50 direct construction jobs and would continue to provide employment for 320 existing Metropolitan Colliery staff and on-site contractors for the life of the Project.* *Employment and expenditure associated with the Project is also predicted to have significant flow-on effects in the regional and NSW economy (Section 4.13). The Socio-Economic Assessment (Appendix M) indicates that the Project is predicted to generate up to 700 direct and indirect jobs in the Illawarra economy and up to 1,951 direct and indirect jobs in the wider NSW economy.* *The Socio-Economic Assessment (Appendix M) has indicated the development of the Project would provide a net production benefit of approximately $592M, and a net benefit of approximately $436M would be forgone if the Project is not implemented. These significant economic benefits to Australia (and the State of NSW) would be foregone if the Project does not proceed.* HCPL, like many other companies in the Southern Coalfield, is required to obtain Project approval for the Metropolitan Colliery coal mining operations by August 2010 in accordance with Part 3A of the *Environmental Planning and Assessment Act, 1979* and the *State Environmental Planning Policy (Major Projects) 2005*. The Project proposes a mine life of 23 years that incorporates a long term approach to mine planning, environmental management, rehabilitation and closure. If approved, it is anticipated that the Project Approval would involve a range of consent conditions that would require the implementation of mitigation, management measures and monitoring that would be conducted throughout the life of the Project. As discussed in the Draft Statement of Commitments (Section 6 of the EA), HCPL would be required to progressively prepare SMPs and obtain DPI-MR approval for the Project underground mining activities prior to mining being undertaken. In accordance with the SMP Guideline, a number of SMPs would be required over the like of the Project, as SMP applications are limited to a mining area extending over a maximum of seven years (Section 6 of the EA).

No.	Subject	Issue Raised	Response
30 (Cont.)	Project Justification and Consideration of Project Alternatives		The consideration of alternatives to the proposal is provided in Section 3.9.2 of the EA. As stated in Section 3.9.2 of the EA the SCPR (DoP, 2008) stated that: *Safety, productivity and cost considerations dictate that longwall mining is now the only major, viable, high production mining method in the majority of Australian underground coal mines that operate at a depth of greater than about 300 m and in virtually all new coal mines (irrespective of depth).* HCPL conducted a detailed consideration of a number of mine layout options, which included the evaluation of setbacks. This evaluation is described in detail in Section 3.9.2 of the EA and is summarised in Section ES6.1 of the EA: *In late 2007, HCPL conducted a detailed consideration of a selection of mine layout options for the Project based on the underground mining experience gained from over 100 years of mining, management of gas/ventilation and hauling of coal at the Metropolitan Colliery. Each layout case had several options of longwall panel arrangements. HCPL's comparative analysis of the options resulted in the selection of an East-West Orientation as suitable for further consideration in this EA.* *The potential to minimise impacts to Waratah Rivulet was considered by an iterative process of applying 50 m incremental setbacks to determine the setback required to minimise rock bar leakage and associated effects on pools. MSEC concluded that a longwall setback of between 450 m and 500 m would be required.* *The adoption of a 500 m setback would have a number of potential environmental benefits. However, a 500 m setback would still result in some subsidence effects to Waratah Rivulet. The adoption of such a 500 m setback to reduce effects on the Waratah Rivulet would also have significant economic costs.* *Based on the evaluation described in the EA, Project Approval for full extraction is being sought for the Project.* The management of coal seam gas associated with the Project is discussed in Section 2.5.5 of the EA: *HCPL would install the methane flare unit during the early years of the Project if gas compositions within the Project Underground Mining Area are considered amenable. ... Methane flaring is not expected to be amenable later in the Project life because the percentage of methane in coal seam gas is expected to fall as mining progresses north (i.e. the percentage of carbon dioxide [CO2] in the coal seam gas would increase to almost 90%).* The decreasing percentage of methane in the coal seam gas as the Project moves north indicate that both flaring and combustion for use as an energy source would not be viable.

No.	Subject	Issue Raised	Response
30 (Cont.)	Project Justification and Consideration of Project Alternatives		Section 3.9.2 of the EA states the following regarding the consideration of options for transporting coking coal from the Metropolitan Colliery: *Consideration was given to whether alternative transport modes to these coke works were available, including utilisation of the rail network. This included consideration of the building of additional rail infrastructure and a combination of railing the product coal to Port Kembla, unloading and trucking the coal north to the Corrimal Coke Works. Initial feasibility evaluation undertaken by HCPL indicated that these options would not be economically viable.* *Given that road transport was considered to be the most feasible method for continuation of coal transport to the Corrimal and Coalcliff coke works, consideration was given to whether the current transport routes to these coke works were using the most environmentally acceptable route. Masson Wilson Twiney concluded that the existing routes to the Coalcliff and Corrimal coke works were more acceptable with regard to environmental impacts than the alternative routes that were identified (Appendix L).* *Importantly, the Project does not involve any change to the current maximum annual truck movements associated with the transport of product coal to the Corrimal and Coalcliff coke works (Section 2.7.1).*
31	Project Components	Concerns were raised regarding: • the underground injection of coal reject paste and the assessment of potential impacts on groundwater resources; • the assessment of potential impacts associated with the installation of Ventilation Shaft No. 4 and surface exploration activities; and • the extent and location of vegetation clearance and the assessment of potential impacts on vegetation communities, significant flora or Aboriginal heritage.	A description of the underground goaf injection method is provided in Section 2.8.4 of the EA. The underground goaf injection technique was developed in Germany and involves the placement of high density paste via trailing pipelines which inject the coal reject paste material into the voids and spaces that occur in the unconsolidated goaf material. As described in Section 4.3.2 of the EA: *Underground backfilling of the mine void by goaf injection or underground emplacement into the old underground workings has been considered in the Groundwater Assessment. Relative to other transmissive and storage properties of overburden rock, backfilling would have negligible influence on the groundwater resource (Appendix B).* As stated in the Statement of Commitments (Section 6 of the EA): *Periodically over the life of the Project, HCPL will test coal reject material that is produced to confirm that the coal reject geochemistry is generally consistent with that observed to date and does not require the implementation of any specific management measures with respect to reject disposal or surface water management.*

No.	Subject	Issue Raised	Response
31 (Cont.)	Project Components		Section 2.2 of the EA indicates that surface-to-seam exploration activities would generally require only small surface disturbance areas and would involve the use of surface drilling rigs and supporting equipment above the Project Underground Mining and surrounds. Section 2.5.4 of the EA describes the installation of an additional upcast shaft and associated fan installation (Ventilation Shaft No. 4) adjacent to the main roadways to the west of the F6 Southern Freeway. Ventilation Shaft No. 4 would be similar to the existing ventilation shafts (Ventilation Shafts No. 2 and 3), which are 4.5 m and 5 m in diameter respectively. The potential impacts of surface exploration activities and the installation of Ventilation Shaft No. 4 were assessed with respect to landuse, topography, soil and erosion potential, terrestrial flora and fauna, Aboriginal heritage and visual character. Noise and air quality impacts associated with Ventilation Shaft No. 4 were also assessed. In particular, Section 4.1.2 of the EA notes: *…Ventilation Shaft No. 4 would be located to the east of the Woronora Special Area immediately west of the F6 Southern Freeway in an area that has already been disturbed by previous extraction of materials for road building (Figure 1-2).* *In addition, the Project would require additional limited areas of land disturbance associated with on-going surface exploration activities, environmental monitoring equipment installation and other Project surface activities such as stream restoration. The majority of these activities would occur in the Woronora Special Area, and would require only short-term disturbance (e.g. exploration bores) with the disturbance area subsequently being rehabilitated.* Section 4.6.2 of the EA describes the extent of vegetation clearance required and vegetation clearance activities associated with the Project: *…It is estimated that the Project would involve less than 10 ha of proposed vegetation clearance. Vegetation clearance activities would primarily be associated with on-going surface exploration activities, the upgrade and extension of surface infrastructure (e.g. Ventilation Shaft No. 4, access tracks, environmental monitoring and management activities, stream restoration activities and other minor Project-related surface activities).* *Project vegetation clearance would occur progressively over the life of the mine. As a result, at any one time some small areas are likely to be disturbed (in the order of two hectares), while previously disturbed areas would be in various stages of natural regeneration/rehabilitation.*

No.	Subject	Issue Raised	Response
31 (Cont.)	Project Components		*A network of fire trails managed by the SCA already exists and no further roads would be required, with the exception of some short temporary access tracks from the main fire trails to surface infrastructure. Such access tracks would involve minimal disturbance to vegetation, would be closed when no longer needed, and allowed to regenerate from the soil seed bank to minimise impacts on native vegetation.* *Given the localised nature of the Southern Sydney Sheltered Forest on Transitional Sandstone Soils EEC and O'Hares Creek Shale Forest EEC, Project infrastructure (including surface works such as surface exploration activities, access tracks and environmental monitoring equipment) would be located to avoid vegetation clearance in these EECs.* *Further, vegetation clearance for surface infrastructure would not take place in upland swamps except for environmental monitoring purposes. Establishment of environmental monitoring sites would involve minimal vegetation clearance for equipment and access.* *The Project also has the potential to increase the frequency of fire trail maintenance measures due to an increase in vehicular traffic in the Woronora Special Area. However, road/track maintenance measures are not expected to require additional vegetation clearance as a result of the Project.* As described in the Draft Statement of Commitments for the EA (Section 6): *A FFMP* [Flora and Fauna Management Plan] *will be developed for the Project and will include the following management measures for aquatic and terrestrial ecology:* *…* • *identification of areas in which specific surface works involving vegetation clearance will be avoided or limited;* *…*

No.	Subject	Issue Raised	Response
32	Assessment of the Proposal	Concerns were raised regarding: • compliance of the EA with statutory requirements; • detail provided on mitigation measures and monitoring programmes and preparation of environmental management plans; • peer review; • consideration of ecologically sustainable development, in particular the precautionary principle and the principles of intragenerational and intergenerational equity; • consideration of the reverse onus of proof recommended by the Southern Coalfield Inquiry; and • referral of the proposal under the *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act).	The Director-General of DoP (in consultation with the relevant government agencies) deemed that the EA adequately met the Environmental Assessment Requirements (EARs) provided for its preparation. The Draft Statement of Commitments (Section 6 of the EA) describes the environmental management plans that are proposed to be prepared in consultation with relevant government agencies and implemented for the Project. These management plans would provide further detail on the management measures and monitoring programmes that would be conducted at the Project. The EA was prepared by Resource Strategies Pty Ltd with specialist input provided by a number of organisations and individuals including Mine Subsidence Engineering Consultants (MSEC) (*subsidence assessment*), Associate Professor Noel Merrick (*groundwater assessment*); Gilbert and Associates Pty Ltd (*surface water assessment*), Bio-Analysis Pty Ltd (*aquatic ecology assessment*), Western Research Institute (*terrestrial fauna survey and assessment*), FloraSearch (*terrestrial flora assessment*) and Kayandel Archaeological Services (*Aboriginal cultural heritage assessment*). In addition to the above, Peer Review was undertaken by the following specialists: • Dr Walter Boughton (*surface water assessment - catchment hydrology*); • Adjunct Professor David Goldney (*flora and aquatic ecology assessments*); and • Mr Robert (Ben) Gunn (*Aboriginal cultural heritage assessment*); Peer review letters are provided in Attachment 3 of the EA. As described in Section 3.7.1 of the EA: *The EA has been drafted in consideration of the wholly integrated nature of various environmental consequences of subsidence effects. Various specialists were brought together on a regular basis and to cross-review each others work. This process is evidenced by the high degree of cross-referencing and integration of key findings between key specialist studies.* Section 3.9.3 of the EA describes the consideration and application of the principles of ecological sustainable development to the Project, in particular: *Project design, planning and assessment have been carried out applying the principles of ESD, through:* • *incorporation of risk assessment and analysis at various stages in the Project design and environmental assessment and within decision-making processes;* • *adoption of high standards for environmental and occupational health and safety performance;*

No.	Subject	Issue Raised	Response
32 (Cont.)	Assessment of the Proposal		• *consultation with regulatory and community stakeholders; and* • *optimisation of the economic benefits to the community arising from the development of the Project.* *Assessment of potential medium and long-term impacts of the Project was carried out during the preparation of this EA on aspects of surface water and groundwater, transport movements, air quality emissions (including greenhouse emissions), noise emissions, aquatic and terrestrial ecology, coal reject management, heritage and socio-economics.* *The Project design takes into account biophysical considerations, including the principles of ESD as defined in section 6(2) of the Protection of the Environment Administration Act, 1991.* *In addition, it can be demonstrated that the Project can be operated in accordance with ESD principles through the application of mitigation and management measures to minimise environmental impacts of the Project.* The consideration and application of the precautionary principle is discussed in detail in Section 3.9.3 of the EA. The precautionary principle was addressed by conducting a Preliminary Hazard Analysis (Appendix N of the EA) and an Environmental Risk Analysis (Appendix O of the EA). Risk and uncertainty were considered by conducting sensitivity testing as part of the assessments. Measures to mitigate potential impacts of the Project are described in Section 4 of the EA. The principles of intragenerational and intergenerational equity (social equity) were considered, as described in Section 3.9.3 of the EA: *The principles of social equity are addressed through:* • *assessment of the socio-economic impacts of the proposal, including the distribution of impacts between stakeholders and consideration of the potential socio-economic costs of climate change (Appendix M);* • *management measures to be implemented in relation to the potential impacts of the Project on water resources, land resources, noise, air quality, ecology, transport, hazards and risks, greenhouse gas emissions and socioeconomics (Section 4);* • *implementation of environmental management and monitoring programmes (Section 4) to minimise potential environmental impacts (which include environmental management and monitoring programmes covering the Project life); and* • *implementation of compensatory measures and ecological initiatives during the life of the Project to compensate for potential localised impacts that have been identified for the development (Sections 4 and 5).*

No.	Subject	Issue Raised	Response
32 (Cont.)	Assessment of the Proposal		*…* *The Project incorporates a range of environmental management and mitigation measures to minimise potential impacts on the environment and the costs of these measures would be met by HCPL. These costs have been included in the economic assessment, the potential benefits to current and future generations have therefore been calculated in the context of the mitigated Project.* It is considered that the approach taken in the EA is generally consistent with the intent of SCPR recommendation 5: *5. Due to the extent of current knowledge gaps, a precautionary approach should be applied to the approval of mining which might unacceptably impact highly-significant natural features. The approvals process should require a 'reverse onus of proof' from the mining company before any mining is permitted which might unacceptably impact highly-significant natural features.* *Appropriate evidence should include a sensitivity analysis based on mining additional increments of 50 m towards the feature. If such mining is permitted because the risks are deemed acceptable, it should be subject to preparation and approval of a contingency plan to deal with the chance that predicted impacts are exceeded.* The consideration of recommendation 5 of the SCPR is discussed in Section 3.7.1 of the EA: • *MSEC has considered the reliability and confidence of subsidence predictions…* • *Sensitivity analysis and multiple data sources have been built into a number of the EA key studies…* • *The adaptive management approach to be adopted by HCPL (Section 5) further enhances HCPL's level of confidence that the mine can be managed so as not to exceed the predicted subsidence effects and consequent potential environmental impacts.* • *Contingency plans for the Project mining in the vicinity of the Waratah Rivulet have been included in the EA (Section 5).* • *MSEC has analysed the potential subsidence effects of mining in proximity to the Waratah Rivulet in 50 m increments (Appendix A).* The proposal has been referred to the Commonwealth Minister for the Environment, Heritage and the Arts for assessment in accordance with the *Environment Protection and Biodiversity Conservation Act, 1999* and the Project was determined 'Not a Controlled Action' as the Project was considered unlikely to have a significant impact on any matters of national environmental significance including threatened species.

<table>
<tr><th>No.</th><th>Subject</th><th>Issue Raised</th><th>Response</th></tr>
<tr><td>33</td><td>Air Quality</td><td>Concern was raised regarding the potential impact of Project particulate matter emissions (including .$PM_{2.5}$ emissions) on elderly residents, schools and other sensitive receptors.</td><td>
An assessment of the potential particulate matter impacts of the Project was undertaken as part of the Air Quality Impact Assessment (Appendix K of the EA).
Relevant particulate matter criteria are described in Section 3 of Appendix K:
The criteria in Table 1 have been developed to protect against adverse health effects.
Table 1 : DECC assessment criteria for particulate matter concentrations
<table>
<tr><th>Pollutant</th><th>Criterion</th><th>Averaging period</th></tr>
<tr><td>Total suspended particulate matter (TSP)</td><td>90 μg/m^3</td><td>Annual mean</td></tr>
<tr><td rowspan="2">Particulate matter less than 10 microns in size (PM_{10})</td><td>50 μg/m^3</td><td>24-hour maximum*</td></tr>
<tr><td>30 μg/m^3</td><td>Annual mean</td></tr>
</table>
* This goal is taken to be non-cumulative for assessment purposes, provided the mine operates with best-practice dust control measures.
μg/m^3 = micrograms per cubic metre
Fine particles (i.e. those in the 0 to 2.5 micron range) are primarily liberated from combustion procees or via chemical reactions between gases in the atmosphere (secondary particles). Only a very small fraction are derived from the disturbance and handling of soils, rocks or minerals. Typically, for mining dust, the percentage mass of particles that are in $PM_{2.5}$ size range is 12% of that in the PM_{10} size range. Thus even the closest receptors to the mine boundary are unlikely to experience annual $PM_{2.5}$ concentration from mining emissions greater than 1 to 2 μg/m^3. In addition, NSW has Project specific PM_{10} goals that have been addressed in the Air Quality Impact Assessment. $PM_{2.5}$ goals are long-term reporting goals that are not applicable to individual industrial projects in NSW.
Section 4.11.3 of the EA summarises the results of the particulate matter assessment:
Maximum 24-hour average PM_{10} concentrations modelled for Years 3 and 15 were not predicted to exceed the DECC assessment criterion (Project only) of 50 μg/m^3 at any receiver (Appendix K). Residences located in close proximity to the Major Surface Facilities Area on Parkes Street (i.e. 48, 50 and 52/54 Parkes Street) were predicted to experience maximum 24 hr PM_{10} concentrations close to the DECC criteria (i.e. 49 μg/m^3) in Year 15 due to their close proximity to the coal stockpiles and train loading activities.
</td></tr>
</table>

No.	Subject	Issue Raised	Response
33 (Cont.)	Air Quality		*…* *Predicted annual average PM_{10} (Project plus background) concentrations modelled for Years 3 and 15 were not predicted to be above the 30 µg/m^3 DECC assessment criterion at any receiver (Appendix K).* *…* *Annual average TSP (Project plus background) concentrations modelled for Years 3 and 15 were not predicted to be above the NHMRC goal of 90 µg/m^3 at any receiver (Appendix K).* As stated in Appendix K, the above Project plus background predictions are conservative, as the existing emissions of the Metropolitan Colliery have been double counted: *… Note that the measured levels would be expected to already include some contribution from the existing Metropolitan Colliery operations, so the approach of added measured levels to predicted Project levels involves some element of double-counting and is conservative.* Mitigation measures, management and monitoring for dust emission s are described in Section 4.11.4 of the EA.
34	Air Quality	A concern was raised regarding the ability of the proponent to manage dust emissions, and whether adequate water would be available to mitigate dust emissions.	The proposed mitigation measures and management to minimise the potential impacts of dust emissions are described in Section 4.11.4 of the EA: *A range of controls would continue to be employed by HCPL to reduce air quality emissions from the Major Surface Facilities Area. The dust controls that would be implemented for the Project can be summarised in two broad categories:* • *engineering controls; and* • *operational controls which vary operations when adverse meteorological conditions occur.* *Engineering controls involve measures such as covering/enclosing conveyors and enclosing transfer points (Appendix K).* *The specific air quality control measures that are currently used and would continue to be used at the Project are listed in Section 4.11.1.* Section 4.1.1 of the EA outlines current dust management measures which include: • *watering of unsealed haul roads and hardstand areas;* • *enclosure of crushing and screening processes;* • *enclosure of transfer conveyors;*

No.	Subject	Issue Raised	Response
34 (Cont.)	Air Quality		• *fixed water sprays located on conveyors and stockpiles (sprays can be operated manually or automatically by wind speed and direction sensor);* • *truck wash for all heavy vehicles travelling off-site; and* • *HCPL has been undertaking progressive sealing of car parks and yard areas.* A predictive assessment of the performance of the Project water supply system for a range of different climate scenarios was conducted as part of the Surface Water Assessment (Appendix C of the EA). Adequate water would be available to implement dust control measures over the life of the Project. The results of the air quality monitoring would be used to optimise air quality controls, validate the air quality modelling predictions and would be reported to relevant authorities via the AEMR (Section 4.11.4 of the EA).
35	Air Quality	Concerns were raised regarding the air quality impact assessment, including: • the effect of local weather conditions on baseline PM_{10} air quality results; • the meteorological data set used and consideration of local topographic effects; • the consideration of cumulative impacts with bushfires; • the consideration of potential cumulative impacts of dust fallout on nearby streams, vegetation and rainwater tanks; • consideration of existing air quality impacts associated with the movement of coal and coal reject trucks on the public road network; • the consideration of potential impacts associated with increased transport by diesel trains or as a result of road transport contingencies (i.e. in the event that rail transport is not available).	The Air Quality Impact Assessment was prepared by Holmes Air Sciences and is provided in Appendix K of the EA. This assessment was determined to be in accordance with the requirements outlined in the Director-General's Environmental Assessment Requirements (EARs) provided in Attachment 1 of the EA. As stated in Section 6 of Appendix K of the EA: *In August 2005, the DECC published guidelines for the assessment of air pollution sources using dispersion models (DEC, 2005). The guidelines specify how assessments based on the use of air dispersion models should be undertaken. They include guidelines for the preparation of meteorological data to be used in dispersion models, the way in which emissions should be estimated and the relevant air quality criteria for assessing the significance of predicted concentration and deposition rates from the proposal. The approach taken in this assessment follows as closely as possible to the approaches suggested by the guidelines.* Section 4.11.2 of the EA presents a summary of the results of PM_{10} monitoring by the high volume air sampler (HV1) at Helensburgh where particulate matter data was collected every sixth day for twelve months: *The estimated annual average PM10 concentration at HV1 is 14 μg/m3, which is well below the DECC air quality goal of 30 μg/m3 (Appendix K).* *The PM10 monitoring at HV1 indicates that 24-hour average concentrations have generally been well below the DECC's 24-hour assessment criterion of 50 μg/m3. The highest 24-hour PM10 concentration recorded to date was 36 μg/m3, measured on 20 October 2007 (Appendix K).* The results of the monitoring represent ambient conditions over the monitoring period (i.e. including the variability of humidity and rainfall experienced in Helensburgh).

No.	Subject	Issue Raised	Response
35 (Cont.)	Air Quality		The Bureau of Meteorology station located at Lucas Heights (approximately 15 km to the north of the Project) was used to determine general climatic conditions (e.g. temperature, rainfall and humidity data) (Section 4.2 of Appendix K of the EA). However, as discussed in Section 4.1 of Appendix K of the EA, wind speed and direction data required for modelling was generated using the Commonwealth Scientific and Industrial Research Organisation's (CSIRO) prognostic model known as The Air Pollution Model (TAPM). TAPM is a prognostic model which has the ability to generate meteorological data for any location in Australia based on synoptic information determined from the six hourly Limited Area Prediction System (LAPS) (Appendix K of the EA). TAPM uses information such as terrain and landuse data to predict meteorological data on a smaller scale (Appendix K of the EA). Section 4.3.1 of Appendix K of the EA discusses the air quality impacts of naturally occurring events, such as bushfires and dust storms: *Events such as bushfires or dust storms are often the cause of elevated PM_{10} concentrations, which can be observed over large geographical areas.* Section 10 of Appendix K of the EA notes: *It is possible however that widespread events, such as bushfires and regional dust storms, may cause elevated background levels in the future. In these circumstances, the potential for the mine related dust emissions to cause exceedances of 50 µg/m^3 also increases.* The potential cumulative dust deposition impacts are discussed in Section 4.11.3 of the EA: *Annual average dust deposition due to the Project plus background was not predicted to be above the applicable 4 g/m^2/month DECC amenity criterion at any receiver in the vicinity of the Project in Year 3 (Appendix K).* *…* *Annual average dust deposition due to the Project plus background was not predicted to be above the applicable 4 g/m^2/month DECC amenity criterion at any receiver in the vicinity of the Project in Year 15 (Appendix K).* As stated in Appendix K, the above Project plus background predictions are conservative, as the existing emissions of the Metropolitan Colliery have been double counted: *… Note that the measured levels would be expected to already include some contribution from the existing Metropolitan Colliery operations, so the approach of added measured levels to predicted Project levels involves some element of double-counting and is conservative.* Since the predicted cumulative dust deposition levels are not predicted to exceed the DECC amenity criterion it is not expected that dust deposition would have a significant effect on the use of rainwater tanks at nearby residencies or on local streams. The potential impacts of dust on vegetation are discussed in Section 4.6.2 of the EA:

No.	Subject	Issue Raised	Response
35 (Cont.)	Air Quality		*The potential effect of dust caused by the Project on the health and viability of surrounding vegetation would be localised. It is relevant to note the Project is situated in a relatively high rainfall area (Section 4.1). Regular rainfall reduces dust generation potential and dust build-up on foliage.* *Project-related vehicle traffic in the Woronora Special Area has the potential to increase dust generation. However, the potential for dust generation in the Woronora Special Area is expected to be low. Vehicle-generated dust would be concentrated close to the road verge and is unlikely to be a sufficient amount for the effect to be noticeable (Appendix G). Consequently, no significant effect to vegetation condition is expected.* As stated in Section 4.12.2 of the EA: *As stated in Section 2.7.1, the Project would not involve any significant changes to the annual tonnage of product coal trucked to the Corrimal Coke Works and Coalcliff Coke Works or coal reject to Glenlee Washery, or the hours of trucking.* As described in Section 2.7.2, it is anticipated that the number of Project trains would increase from 1.5 trains per day to three trains per day on average over a year. The maximum number of trains is likely to increase from three trains per day to six trains per day during peak periods. Particulate emissions associated with the movement of up to three additional trains per day would not warrant specific inclusion in air quality modelling as diesel particulate emissions from locomotives are minor in comparison to the key sources of on-site emissions (e.g. dozers working on coal stockpiles and movement of haul trucks on unsealed surfaces). As described in Section 6 (Statement of Commitments) a Transport Management plan would be prepared for the Project and would include the following management measures: • *a cap on the Project public road haulage of coal reject at the existing Metropolitan Colliery maximum annual haulage levels;* • *maintenance of the existing level of product coal* [road] *haulage;* • *maintenance of the existing Metropolitan Colliery heavy vehicle night-time curfew (i.e. large vehicle access to the site is restricted during night-time hours);* • *measures to work with suppliers to minimise the use of heavy vehicles for the delivery of small items to the major surface facilities area that could be delivered via a light vehicle or van, where practicable;* • *measures to encourage the mine operational workforce and Project construction workforce to car-pool and minimise workforce related light vehicle movements to the site;* • *liaison with Railcorp to minimise Project night-time train movements as far as practicable within train scheduling restraints; and*

No.	Subject	Issue Raised	Response
35 (Cont.)	Air Quality		• *liaison with the Metropolitan Colliery CRG and Railcorp to facilitate the resolution of any particular rail noise or vibration issues (e.g. on-site train whistle noise) that may arise with respect to on-site or off-site rail haulage noise or vibration over the life of the Project, as required.*
36	Noise	Concern was raised regarding the predicted noise impacts of the Project Major Surface Facilities Area on nearby residents in Helensburgh.	A Noise Impact Assessment for the Project was undertaken by Heggies Pty Ltd (Heggies) in accordance with the requirements of the INP (EPA, 2000), *Environmental Noise Control Manual* (ENCM) (EPA, 2004) and *Environmental Criteria for Road Traffic Noise* (ECRTN) (EPA, 1999), and is presented in Appendix J of the EA. As described in Section 4.10.1 of the EA the Metropolitan Colliery has been operating since the 1880s and the township of Helensburgh originally developed around the Major Surface Facilities Area in order to accommodate the mine workforce. As a result, suburban residential areas of Helensburgh are located in close proximity to the Major Surface Facilities Area. Some residences in Helensburgh are therefore exposed to industrial noise associated with the operation of the Major Surface Facilities Area. As described in Section 4.10.2 of the EA, noise measurements of the existing operations indicated existing mine noise levels at the nearest residences located in Oxley Place and Parkes Street are up to 56 dBA during normal Metropolitan Colliery operations. Section 4.10.4 provides a summary of the results of the Noise Impact Assessment of predicted operational noise emissions (inclusive of on-site train loading activity) and the potential impacts on Helensburgh residents: ***Predicted Intrusive Operational Noise Emissions*** *The modelling of existing Metropolitan Colliery and Project noise emissions indicates that no privately owned residences would experience an increase in operational noise as a result of the Project (Appendix J).* *At the majority of private residences that are located in close proximity to the Major Surface Facilities Area, the Project is predicted to provide significant operational noise reductions in comparison to the existing noise emissions of the Metropolitan Colliery (Appendix J).* *Operational noise levels at receivers near the Project boundary to the north are generally predicted to remain unchanged by the Project (or be slightly reduced) due to the contribution of train loading activities which are in close proximity and dominate noise emissions at these locations (Appendix J).*

No.	Subject	Issue Raised	Response
36 (Cont.)	Noise		*Predicted intrusive noise emissions exceed the relevant assessment criteria for some receivers nearest the Project boundary during all three noise emission scenarios. However, significant operational noise reductions would be achieved as the Project progresses, with the number of private residences in the Noise Affectation Zone falling from 29 to 14, as shown in Table 4-24.* *The number of dwellings predicted to fall within the Noise Management Zone for the existing Metropolitan Colliery and the Project Year 3 and Year 15 is detailed in Table 4-24. The number of residences in the marginal noise management category increases, as Project noise emissions fall and dwellings move out of the Noise Affectation Zone into the Noise Management Zone (Table 4-24) with the progressive implementation of Project noise mitigation measures.* *…* ***Predicted Amenity Operational Noise Emissions*** *Predicted Project amenity noise emissions are below the relevant assessment criteria (Table 4-21) for all non-residential receptors (i.e. Holy Cross Catholic Church, Holy Cross Primary School and nearby public recreation areas) surrounding the Major Surface Facilities Area during all noise emission scenarios (Appendix J).* *Comparison of Project noise emissions to applicable residential amenity noise criteria indicates that the Project would reduce the number of residences with exceedances of the criteria from 14 (existing Metropolitan Colliery) to three residences in Year 3, and no exceedances of the applicable amenity criteria are predicted in Project Year 15 (Appendix J).* As described in Section 4.10.5, the Project noise modelling included a range of noise mitigation and management measures including: • *enclosure of the coarse washery building (HCPL underway with this work);* • *CHPP upgrade to include the installation of modern low-noise equipment where practicable, and/or additional sound insulation, or specific mitigation of key noise sources (e.g. drives);* • *replacing existing exhaust silencers on pumps and compressors with high performance mufflers;* • *relocating or enclosing the MD1 conveyor drive fan as a component of Project conveyor upgrades;*

No.	Subject	Issue Raised	Response
36 (Cont.)	Noise		• *partial enclosure or construction of a barrier to the south/west of MD1 conveyor drive as part of Project conveyor upgrades;* • *implementation of a low noise conveyor idler replacement system on surface transfer conveyors as a component of Project conveyor upgrades;* • *enclosure of the new coal reject paste plant;* • *use of modern low-noise 30 t off-road trucks and FEL for on-site coal reject handling (between the CHPP and the temporary coal reject stockpile or coal reject paste plant);* • *project surface construction activities to be restricted to daytime hours;* • *no off-site road haulage of product coal or coal reject during the evening or night-time periods (continuation of an existing Metropolitan Colliery operational noise control measure);* • *no haulage of coal reject between the CHPP and the temporary stockpile or between the CHPP and the coal reject paste plant to be undertaken in the evening and night-time periods; and* • *continued use of broadband noise alarms on existing and future equipment adjusted to meet Occupational Health and Safety (OHS) requirements.* As described in Section 4.10.5, if the Project is approved, it is anticipated that the Pollution Reduction Programme (PRP) process under the Environment Protection License (EPL) would continue to provide the mechanism to identify and implement further operational noise management or improvement measures that may be practicable over the life of the Project: *In addition, HCPL would over the life of the Project implement a noise improvement programme under the PRP that would involve, where practicable, the implementation of:* • *the best available technology for Project upgrades including considering acoustical specifications for new Project equipment;* • *desktop design validation and supplier shop acoustical testing;* • *in-situ acoustic testing of new equipment;* • *acoustical field testing during plant commissioning (e.g. coal reject paste plant);*

No.	Subject	Issue Raised	Response
36 (Cont.)	Noise		• *refitting and/or replacement in the event of non-compliance with acoustic specifications;* • *computer-based acoustical modeling of installed plant using achieved sound power levels; and* • *measuring acoustical compliance of Project upgrades via on-site and off-site operator-attended noise measurements of acoustically significant plant.* *…* *The PRPs and associated noise monitoring would be used to optimise noise controls, validate the noise modelling predictions and results would be reported to relevant authorities via the AEMR…*
37	Noise	Concern was raised regarding: • noise and vibration impacts as a result of increased Metropolitan Colliery train movements; and • the standards used for the assessment of blast emissions.	Section 2.7.2 of the EA describes the increase in rail movement that is part of the proposal: *It is anticipated that the number of trains would increase from 1.5 trains per day to three trains per day on average over a year. The maximum number of trains is likely to increase from three trains per day to six trains per day during peak periods.* Noise associated with train movements on the South Coast rail is regulated by Rail Corp's Environmental Protection Licence (EPL) No. 12208. EPL No. 12208 provides railway operating noise objectives as follows: *It is an objective of this licence to progressively reduce noise levels to the goals of 60 dB(A) Leq, (24hr) and 85 dB(A) max pass by noise, at one metre from the facade of the nearest affected residential property through the implementation of the Pollution Reduction Programs.* *In the development of new works, the licensee is required to work towards the planning goals of 55 dB(A) Leq, (24hr) and 80 dB(A) max pass by noise, at one metre from the facade of the nearest affected residential property.* The Noise Impact Assessment (Appendix J of the EA) conducted an assessment of the potential noise impact of the increased rail movement as a result of the proposed Project and calculated the existing and cumulative daily (24 hour) equivalent continuous noise level ($L_{Aeq(24\ hour)}$) and the maximum passby level (L_{Amax}) (i.e. the maximum noise level that would be experienced at any time of the day).

No.	Subject	Issue Raised	Response
37 (Cont.)	Noise		Section 4.10.4 provides a summary of the results of the Noise Impact Assessment in regards to potential noise as a result of increased train movement: *A comparison of the existing rail noise levels with the future cumulative train noise including additional Project train movements (Section 2.7.2) indicates only a negligible noise increase (i.e. < 1 dBA) due to the increased Project train movements at the nearest residential receivers to the rail line, as there is only a small number of additional train movements arising from the Project (Appendix J).* The Noise Impact Assessment (Appendix J of the EA) also conducted an assessment of the potential vibration impact of the increased rail movement as a result of the proposed Project and concluded: *It is anticipated that trains travelling at a speed of 40 km/hr (or less) would generate vibration levels below the most stringent night-time annoyance risk criterion of 0.2 mm/s at a distances of 60 m (or greater).* *Similarly, it is anticipated that trains travelling at a speed of 80 km/hr (or less) would generate vibration levels below the most stringent night-time annoyance risk criterion of 0.2 mm/s at a distances of 90 m (or greater).* *The damage risk criterion of 5 mm/s for residential dwellings is unlikely to be exceeded by train movements on the South Coast rail network at the nearest residential dwellings.* As described in Section 4.10.3, the criteria used for the assessment of blast emissions is based on the following: *The DECC has recommended the adoption of the ANZECC (1990) Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration for assessing potential annoyance from blast emissions (including blasting vibration) during daytime hours (Appendix J).* *The assessment of blast emission impacts outside the hours advocated by ANZECC (1990) are described by the ENCM in Chapter 154 Noise Control Guidelines – Blasting (EPA, 1994) (Appendix J).* The above blast emission criteria are generally derived from the lower limiting values for human comfort and structural damage specified in Appendix J of *Explosive – Storage and Use Part 2: Use of Explosives* (AS 2187.2-2006). Where ground vibration criteria are specified in Tables J4.5(A) and 4.5(B) (pg. 110) and airblast criteria are specified in Tables J5.4(A) and J5.4(B) (pg. 112) of Appendix J of AS 2187.2-2006.

No.	Subject	Issue Raised	Response
38	Subsidence Predictions	Concern was raised regarding the adequacy of the subsidence assessment.	The Subsidence Assessment was prepared by Mine Subsidence Engineering Consultants (MSEC) and is provided in Appendix A of the EA. The Director-General of DoP (in consultation with the relevant government agencies) deemed that the EA adequately met the Environmental Assessment Requirements (EARs) provided for its preparation.
39	Stream Bank Erosion	Concern was raised regarding stream bank erosion.	As stated in Section 5.2.2.2 of Appendix A of the EA: *An increased potential for scouring of the stream banks can occur at locations where the predicted tilts considerably increase the natural pre-mining stream gradients and the potential for scouring is greatest in stream sections with alluvial deposits. Since the stream bed of the Waratah Rivulet in the Study Area is predominantly Hawkesbury Sandstone the potential for scouring is expected to be very low.*
40	*Phytophthora cinnamomi*	Concern was raised over the potential for the spread of *Phytophthora cinnamomi* and management measures to reduce the spread of *P. cinnamomi*.	As described in Section 4.6.2 of the EA: *The spread of P. cinnamomi occurs through movement of spores which may swim to new hosts or be dispersed over large distances in flowing water, such as storm runoff. Some spread within a site may be by mycelial growth from infected roots to roots of healthy plants.* *Propagules of P. cinnamomi may also be dispersed by vehicles (e.g. cars and earth moving equipment) used in a range of activities (e.g. transport, road making and maintenance), animals (e.g. feral pigs) and walkers. In all these cases, movement of P. cinnamomi involves infected soil and/or root material.* *Project-related activities have the potential to introduce or spread the infection of native plants by P. cinnamomi. However, appropriate management measures to minimise this risk are presented in Section 4.6.3 below.* Management measures to minimise the potential for the introduction or spread of *Phytophthora cinnamomi* are provided in Section 4.6.3 of the EA: *Measures for the management of P. cinnamomi would be developed in consideration of DEH (2006c) Management of Phytophthora cinnamomi for Biodiversity Conservation in Australia. Management measures to minimise the potential for the introduction or spread of P. cinnamomi include:* • *Restricting the movement of vehicles to formed tracks and pre-existing roads, where practicable.* • *Limiting activities that cause soil disturbance.* • *Encouraging natural regeneration in areas requiring revegetation.*

No.	Subject	Issue Raised	Response
40 (Cont.)	*Phytophthora cinnamomi*		• *Potential measures in the event any infestation areas are identified include:* - *limiting access to infestation areas;* - *limiting access to uninfested areas following entry to infested sites;* - *implementation of hygiene protocols (e.g. clean footwear, equipment, vehicles and/or hygiene stations) when accessing and/or exiting known infestation areas; and* - *the inclusion of P. cinnamomi general awareness and procedure information in HCPL staff and contractor inductions, particularly for those requiring access to identified infestation areas.* As described in the Draft Statement of Commitments for the EA (Section 6): *A FFMP* [Flora and Fauna Management Plan] *will be developed for the Project and will include the following management measures for aquatic and terrestrial ecology:* *…* • *soil and weed management measures;* • *P. cinnamomi management measures;* *…* *The FFMP will be developed in consultation with the NSW Fisheries, the NSW Department of Environment and Climate Change (DECC) and the Sydney Catchment Authority (SCA), and to the satisfaction of the DoP. The FFMP will be prepared prior to the extraction of Longwall 20.*
41	Methane Gas Emissions	Concern was raised over the potential impacts of methane gas releases from the coal seam.	Section 5.31.2 of Appendix A of the EA provides: *It is known that the mining of coal causes fracturing of the strata above the coal seam and this may result in the liberation of methane and other gases. Methane, being a lighter gas, would tend to move upwards to fill the voids in the rock mass and diffuse towards the surface through any continuous cracks or fissures.* *The seam gas composition at the Metropolitan Colliery is greater than 90% CO_2 (HCPL, 2008). A large proportion of the methane present is pre-drained in the underground mine to allow a safe working environment.* *Discussion of the low permeability of the overburden strata is provided in the groundwater assessment (Appendix B of the Metropolitan Coal Project Environmental Assessment).*

No.	Subject	Issue Raised	Response
41 (Cont.)	Methane Gas Emissions		*If the strata were to be fractured by subsidence it is possible that some gas and/or water could move upwards/downwards through the cracks. As described in Section 5.28, there is separation of the fractured zone above the proposed longwalls and the near surface superficial cracks. Therefore, the likelihood of methane and other gases being liberated to the surface from the deep coal seam is low.* *Gas bubbles at the surface can originate from a number of sources including mechanical action (e.g. riffles), biological activity, decay of organic matter, and dislodgement of air from cavities as a result of changes in stream water levels.* *Gas emissions at the surface as a result of longwall mining in the Southern Coalfield have typically occurred within deep river valleys such as the Nepean, Cataract and Georges Rivers, although some gas emissions have also been observed in smaller creeks and in water bores. Analyses of gas compositions indicate that the coal seam is not the direct and major source of the gas and that the most likely source is the Hawkesbury Sandstone (APCRC, 1997).* *The emission of gases at the surface generally tends to be short-lived temporary events and the consequences are generally minor and readily managed.* *Gas released from the stream beds would be released directly to the atmosphere and would not have time to dissolve in any surface water which is present.* *It is possible that substantial gas emissions at the surface could result in localised vegetation die back. This occurred at Tower Colliery along the Cataract River over small areas in the base of the Cataract Gorge, as a result of near-surface gas emissions directly above Longwalls 10 and 14. These impacts were however limited to small areas of vegetation, local to the points of emission where composting occurred. There have been no reported cases of significant gas releases in the Southern Coalfield that have resulted in the death of vegetation.* *While no gas emissions or odours have previously been observed by HCPL during mining beneath the Waratah Rivulet at the Metropolitan Colliery, gas emissions could potentially occur at the surface as a result of mine subsidence.* Section 9 of Appendix C of the EA states: *There is also no evidence or reason to expect any adverse water quality effects as a result of gas emissions in the mine development area (if any) as gas releases are short-lived temporary events, are released directly to the atmosphere, and would not have time to dissolve in any surface water which is present.*

No.	Subject	Issue Raised	Response
42	Rail Transport	Concerns were raised regarding the proposed increases in rail movements and the capacity of the rail system to cater for the proposed increases (without affecting passenger services).	Section 2.7.2 of the EA describes the increase in rail movement that is part of the proposal: *It is anticipated that the number of trains would increase from 1.5 trains per day to three trains per day on average over a year. The maximum number of trains is likely to increase from three trains per day to six trains per day during peak periods.* The majority of product coal is transported by train to the Port Kembla Coal Terminal and the increase in coal production and the requirements of train scheduling indicate that the Project would require 24 hour train loading up to seven days per week. The 24 hour train loading is proposed to reduce the potential for train path conflicts with passenger train movements on the Illawarra Railway (which are significantly reduced during the night-time). As described in Section 4.12.2 the Project increase corresponds to: *…an average net rail traffic increase of approximately 2.6% to 3.8% during mid-week and weekend periods respectively (Appendix J), and is considered to be minor.* HCPL have an existing contract in place with a rail transport provider that provides for movement of approximately 60,000t per week (approximately 3 Mtpa) of product coal. This existing contract provides sufficient capacity for the proposed increases in rail transport of product coal associated with the Project.
43	Road Transport	Concerns were raised regarding road transport including: • whether road transport of product coal would increase; • whether traffic modelling was completed for the Project operational phase; • the contribution of Project coal reject haulage trucks to traffic flows on Appin Road and Narellan Road; and • the assessment of the impact of Project truck numbers on traffic safety and volumes.	As described in Section 2.7.1 of the EA, up to 120,000 tpa of product coal is currently transported by truck to the Corrimal and Coalcliff Coke Works and this would continue as a component of the Project. This is also restated in Section 4.12.2 of the EA: *As stated in Section 2.7.1, the Project would not involve any significant changes to the annual tonnage of product coal trucked to the Corrimal Coke Works and Coalcliff Coke Works or coal reject to Glenlee Washery, or the hours of trucking.* The Traffic Assessment was undertaken by Masson Wilson Twiney and is contained in Appendix O of the EA. This assessment was determined to be in accordance with the requirements outlined in the Director-General's Environmental Assessment Requirements (EARs) provided in Attachment 1 of the EA. As stated in Section 6.3 of Appendix L of the EA considers traffic from the Metropolitan Colliery for three scenarios: • *2007 to 2010 – existing operations.* • *2010 to 2014 – expanded operations plus construction.* • *2014 to 2032 – expanded operations.*

No.	Subject	Issue Raised	Response
43 (Cont.)	Road Transport		As stated in Section 4.4 of Appendix L, *…the Colliery makes only a minor contribution to total traffic volumes on the haulage routes. With the exception of Parkes Street and Lawrence Hargrave Drive, Metropolitan Colliery traffic contributes less than three percent of total traffic on the public roads used by the Colliery trucks.* As stated in Section 4.12.2 of the EA: *The Traffic Assessment concluded that with the additional Project traffic, the Metropolitan Colliery would continue to make only a small contribution to total traffic volumes on the existing haulage routes (Appendix L).* *…* *As the Project would not significantly alter traffic flows, or the type of vehicles on the key haulage routes, the Project is considered unlikely to have any adverse affects on road safety.*
44	Other (Risk Assessment)	Concern was raised regarding the adequacy of the risk assessment, including: • the consideration of multiple mine layouts; • the review and input from independent experts and stakeholders; and • the consideration of repair and remediation of potential impacts.	The Environmental Risk Assessment is contained in Appendix O of the EA. The Director-General of DoP (in consultation with the relevant government agencies) deemed that the EA adequately met the EARs provided for its preparation. The evaluation of mine layout options is discussed in detail in Section 3.9.2 of the EA, which considers the environmental and economic costs and benefits of each alternative. The Environmental Risk Assessment only considers the mine layout that is sought as part of the Project Approval. Details of the team members present at the Environmental Risk Assessment workshop and their relevant qualifications and experience are included in Table 1 of Appendix O of the EA. These members included specialists involved in the Subsidence Assessment, Groundwater Assessment, Surface Water Assessment, Aquatic Ecology Assessment, Baseline Flora Survey, Terrestrial Vertebrate Fauna Survey, Noise Impact Assessment and Air Quality Assessment, as well as experienced, senior site personnel. These specialists have extensive experience within their field and within the mining industry. The Environmental Risk Analysis considers the consequences of both the success and failure of proposed mitigation measures. For example, Table 7 and Figure 5 of Appendix O of the EA provide a risk rating for cracking of the base of Waratah Rivulet with and without remediation.
45	Other (Public Health)	Concern was raised regarding the use of polyurethane (PUR) and drinking water.	Water quality monitoring conducted before, during, and after PUR injection indicated that there was no impact on water quality from the use of PUR products or injection methods. PUR injection can be conducted without environmental harm.

No.	Subject	Issue Raised	Response
46	Other (Rock Falls)	Concern was raised regarding the potential impacts of rock falls.	As described in Section 4.2.4, potential subsidence impacts to cliffs, overhangs and slopes include: • *The magnitudes of the predicted systematic and/or valley related movements are likely to result in some fracturing of sandstone at cliffs and overhangs, and potentially some cliff instabilities and rock fall.* • *The lengths of potential instabilities along the cliffs and overhangs resulting from the extraction of the Longwalls 20 to 44 are anticipated to be less than 3% of the lengths of these cliffs and overhangs.* • *The aesthetics of the landscape could potentially be temporarily altered by isolated rock falls (e.g. exposure of fresh rock faces and debris around the base of cliffs).* • *The incidence of rock falls is expected to be low.* ……. Section 4.7.2 describes the potential impacts of rock falls on terrestrial vertebrate fauna: *Rock falls occur naturally, however subsidence has the potential to further reduce the stability of features (e.g. cliffs and overhangs) and increase the incidence of rock fall. Rock falls have the potential to reduce terrestrial fauna habitat resources (e.g. roost sites for bats, nest sites for birds, and shelter for reptiles) or result in the loss of individuals in a few cases, either by entrapment or direct fatal rock fall. Given the predicted low incidence of rock falls (Appendix A), it is considered unlikely that mine subsidence would result in a significant impact on any fauna species utilising these habitat types. In particular, there is limited potential for rock falls in the heath and mallee habitats given the dominant rock forms are pavement platforms, with scattered stable formations of boulder formations and limited minor cliff faces and overhangs.*

No.	Subject	Issue Raised	Response
47	Other (Mercury Emissions)	A concern was raised regarding the lack of assessment of atmospheric mercury levels.	The Air Quality Impact Assessment was prepared by Holmes Air Sciences and is provided in Appendix K of the EA. This assessment was determined to be in accordance with the requirements outlined in the Director-General's Environmental Assessment Requirements (EARs) provided in Attachment 1 of the EA. As described in Section 1 of Appendix K: *The assessment follows the procedures outlined by the NSW Department of Environment and Climate Change (DECC, formerly the Department of Environment and Conservation [DEC]) in their guidance document titled "Approved Methods for the Modelling and Assessment of Air Pollutants in NSW" (DEC, 2005). Consideration was also given to the requirements of the Protection of the Environment (Clean Air) Regulation , 2002, however the requirements of this regulation are only of limited applicability to the Project, as it is a mine, not a major chemical or industrial facility that would emit pollutants in sufficient quantities that require licensing under this regulation.*
48	Other (Bridge Stability)	Concern was raised regarding the stability of bridges as a result of underground mining.	In accordance with the recommendations of the Subsidence Assessment and in consultation with the RTA, HCPL commissioned a supplementary assessment *Bridges near Proposed Longwalls 18 to 44 at Metropolitan Colliery* (Cardno, 2008) for three key structures on the F6 Southern Freeway (viz. Underpass No. 1; Princes Highway Underpass No. 2 and the Cawley Road Overbridge) (Section 4.2.5 of the EA). Cardno (2008) identified that Underpass No. 2 and Cawley Bridge have the capacity to tolerate only low magnitudes of ground movement. Cardno (2008) indicated that potential impacts from far field movements can be managed through the establishment of a suitable management plan. As described in the Draft Statement of Commitments for the EA (Section 6): *Monitoring, management and response plans will be prepared for:* *…* • *F6 Southern Freeway including bridges to the satisfaction of the RTA;* *…*

No.	Subject	Issue Raised	Response
49	Other (Coal Reject Emplacement)	Concerns were raised regarding storage of coal rejects in Camp Gully.	As described in Section 2.8.5 of the EA: *HCPL holds an existing development consent granted by WCC for development of a Coal Reject Emplacement in Camp Gully adjacent to the existing product coal stockpiles (Section 3.2.1) (Figure 2-2) with a capacity of some 1 Mt of coal reject.* *A portion of the area of the approved Coal Reject Emplacement would be utilised for the short-term coal reject stockpile to be constructed adjacent to the coal reject paste plant (Figure 2-2). While the Coal Reject Emplacement is approved, HCPL does not currently intend to develop the Coal Reject Emplacement as a component of the Project, and therefore it is not included as part of the Project and is not assessed in this EA. However, the existing development consent would be retained in case a need for the approved Camp Gully Emplacement arises in the future.*
50	Other (Water Releases)	Concern was raised regarding licensed discharges from the Major Surface Facilities.	As stated in Section 2.9.1 of the EA: *Runoff within the existing Metropolitan Colliery Major Surface Facilities Area currently reports to a number of storages within the site including the Taj and Turkeys Nest storages (Figure 2-2). Sediment ponds are used to reduce the level of sediment in site water and to provide additional balancing storage capacity.* *During periods of heavy rainfall, overflow from the sediment ponds report to the downslope Turkeys Nest storages.* *Float level switches have been installed at the Turkeys Nest storages to control the operation of the pumps and storage water levels. When the level in the Turkeys Nest storages reaches 15% capacity, the water is pumped automatically to the water treatment plant. Water from the water treatment plant is either re-used in the underground mine and CHPP or discharged to Camp Gully (in accordance with EPL No. 767 licence conditions).* Water releases at the Project would continue to be conducted in accordance with the relevant Environmental Protection Licence (EPL) issued by the NSW Department of Environment and Climate Change (DECC).
51	Other (Carbon Sequestration)	A concern was raised as to whether carbon sequestration technology would be implemented by the end users of the Project coal.	The exact destination of the product coal from the Project and the future greenhouse gas emission abatement obligations of end use countries would be subject to change over the life of the Project. The management of greenhouse gas emissions from these facilities (including the use of carbon sequestration technology) would be governed by the approval processes and greenhouse gas abatement obligations of the end use countries.

No.	Subject	Issue Raised	Response
52	Other (Geological Investigations)	Concern was raised regarding the timing of geological investigations.	As stated in the Draft Statement of Commitments (Section 6 of the EA): *Geological investigations will be undertaken progressively during the life of the Project. Key components of the Project geological investigations will include:* • *long in-seam exploration boreholes to identify any geological anomalies in advance of longwall mining;* • *mapping of geological structures intersected by underground workings;* • *surface mapping (ground-truthing) of geological characteristics; and* • *further analysis of geomorphic expressions.* *The above activities will focus on the identification of potential conduits (e.g. faults, dykes, joint seams) consistent with Recommendation 18 of the SCPR (DoP, 2008) and include extrapolation from areas external to the Project Underground Mining Area.*
53	Other (Cost of Management Measures)	Concern was raised regarding the cost of proposed management measures and the ability of the proponent to meet these costs.	The Draft Statement of Commitments (Section 6 of the EA) outlines the proposed management and mitigation measures, monitoring programmes and rehabilitation works for the Project. HCPL would be required to implement management measures in accordance with any Project Approval. In addition to the environmental management and mitigation measures, the Draft Statement of Commitments also outlines the compensatory measures and other ecological initiatives that are proposed to be implemented for the Project.
54	Other (Community Consultation)	Concern was raised regarding the level of community consultation.	The level of consultation undertaken during the preparation of this EA is considered to be in accordance with the EARs and is adequate and appropriate for a Major Project under Part 3A of the EP&A Act. The consultation programme has provided an effective avenue to identify issues of concern or interest to stakeholders and to address these issues in this EA document, where applicable. The Southern Coalfield Inquiry also provided an opportunity for a range of stakeholders with an interest in mining in the Illawarra Region to express their views and raise issues with underground mining in the region. Issues specifically relating to the Metropolitan Colliery operations were raised in these submissions. The consultation programme conducted during the preparation of the EA is described in Section 3.5 of the EA.

No.	Subject	Issue Raised	Response
54 (Cont.)	Other (Community Consultation)		In regard to public consultation, Section 3.5.8 of the EA states: *HCPL formed a Community Reference Group (CRG) for the Metropolitan Colliery in May 2008. Expressions of interest to participate in the CRG were submitted by members of the community following HCPL: placing an advertisement in the Helensburgh and District News; posting a CRG advertisement to all mail recipients in the Helensburgh postcode; and forwarding expression of interest forms to a number of local schools and businesses.* *The Metropolitan Colliery CRG comprises thirteen members from the local community.* *The CRG met on four occasions prior to completion of this EA (28 May 2008, 25 June 2008, 30 July 2008, 27 August 2008) and provided a mechanism to discuss the existing Metropolitan Colliery, the Project environmental assessment process and key findings of the air, noise, surface water, groundwater, Aboriginal heritage, non-Aboriginal heritage, rock bar restoration and transport assessments. The CRG has also acted as a forum for issues of interest to the CRG participants and/or the wider community to be raised.* *…* *At the CRG meetings, participants were also given copies of Project Information Leaflets. These are available on Peabody's website at: http://www.peabodyenergy.com.au/nsw/metropolitan-mine.html*
55	Other (Involvement of the DECC)	Concern was raised regarding the involvement of the DECC in the formulation of management plans.	As stated in the Draft Statement of Commitments (Section 6 of the EA), the Flora and Fauna Management Plan (FFMP) would be developed in consultation with the DECC.
56	Other (Southern Coalfield Inquiry)	Concern was raised regarding consideration of the government response to the findings and recommendations of the Southern Coalfield Inquiry.	As stated in Section 3.7 of the EA: *The Project Application was made in September 2007 and the development of the Project EA has been progressively conducted since that time, including progressive consultation with and presentations to key regulatory agencies (Section 3.5).* *The SCPR was released by the DoP on 10 July 2008 and hence the EA was substantially complete prior to its release. Notwithstanding, the SCPR recommendations have been considered in the preparation of this EA. Presented in the following sections is a summary discussion of how the recommendations have been considered.*

No.	Subject	Issue Raised	Response
57	Other (Advertisement of Project Description)	Concern was raised regarding the advertised project description on the DoP exhibition website.	The DoP website (http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=2672) incorrectly states that the Project would involve "…extracting up to 3 million tonnes of run-of-mine coal a year…" However, the Application Form (available on the DoP website) that was lodged on the 25 July 2008 correctly states that there would be: • *Upgrades of the existing mining and materials handling systems to facilitate an increased ROM coal production rate (up to approximately 3.2 Mtpa).* The Application Form is consistent with the information contained within the EA.