EA Submissions Response Apex Energy Project Application No: 07_0103

Jointly Prepared by Apex Energy NL, EcoEngineers Pty Ltd, Biosis Research Pty Ltd and Olsen Consulting Group Pty Ltd

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1. RTA.	1.1 Specific Traffic Arrangements as identified within the Traffic Impact Summary shall be implemented at all site locations where the junctions of the site access point and the public road do not meet minimum Safe Intersection Sight Design Distance requirements for the posted speed limit as per AUSTROADS Guidelines.	Agree to comments and requests made by RTA. They are not inconsistent with commitments made in the EA. Apex will commission a Traffic Consultant/Management group to assist defining matters associated with AUSTROADS Guidelines. Also assist with preparation of Traffic Management Plan, submitting proposals to RTA etc. Apex have already met with two such companies, namely: • Traffic Management Services (Aust) Pty Ltd, and, • Stop Slow Traffic Control Pty Ltd.
RTA.	1.2 Specific Traffic Arrangements shall include the implementation of a Traffic Management Plan. The Traffic Management Plan shall be developed in consultation with the RTA prior to commencement of works within the site.	See response action proposed at **Item 1.1**. Agree to comments and requests made by RTA. They are not inconsistent with commitments made in the EA.

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RTA.	1.3 Section 138 concurrence under the Roads Act, 1993 shall be obtained from the RTA prior to commencement of works within the road reserve.	See response action proposed at **Item 1.1**. Agree to comments and requests made by RTA. They are not inconsistent with commitments made in the EA.
RTA.	1.4 The developer shall apply for a Road Occupancy Licence (ROL) from the RTA Traffic Operations Unit (TOU) prior to commencing work within the classified road reserve. The applicant will require a Traffic Management Plan (TMP) to be prepared by a person who is certified to prepare Traffic Control Plans. The developer shall submit the ROL application 10 business days prior to commencing work.	Agree to comments and requests made by RTA. They are not inconsistent with commitments made in the EA.
2. DWE.	DWE infer their approval and make the following comments. The DWE considers the groundwater assessment incomplete and requires the following to be included in conditions of project approval.	Reference DoP website (www.planning.nsw.gov.au). This type of information has not been requested by DWE nor has it been included in Major Project Approvals for the following Gas projects in NSW. Camden Gas Project Razorback Wells. (06_0137). Camden Gas Project Elizabeth Macarthur Agricultural Institute Wells (06_0138 and Camden Gas Project Expansion of Stage 2 (06_0291). In relation to Camden Gas Project Stage 3 (09_0048), the DGRs have only been issued and it is not possible to determine the level of groundwater information required by DWE.

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	2.1 A dedicated programme of groundwater investigation should be required for the proposal, investigating groundwater environments for undisturbed and goafed areas, with estimates of yield, reliability and groundwater migration to and from the site(s). The investigation must be undertaken in accordance with DWE guidelines "Groundwater Monitoring Guidelines for Mine Sites, 2003" and relevant Australian standards.	Apex undertook a detailed digital magnetotelluric (DMT) survey at 30 representative sites across the exploration area (**Refer EA Section4.2.2.4 Groundwater Interception at p54).** Part of the survey determined likely groundwater levels. Apart from Darkes Forest #1, the DMT survey failed to identify interstitial water, let alone any significant amount in either the goafs or the sandstone formations such as the Bargo Sandstone or the Scarborough Sandstone. Darkes Forest #1 borehole already exists and does not result in groundwater accumulating on the surface. (**Refer EA Section 4.2.2.4 Groundwater Interception**). Apex submits that a dedicated program of groundwater investigation prior to drilling is not required on the following grounds: • There have a been a significant number of independent consultant study reports conducted on groundwater environments within the Metropolitan Mine lease area. This includes part of the proposed exploration area and its immediate surroundings. The reports include estimates of storativity, hydraulic conductivity and flow directions (heads) etc particularly over the last 2 years. These study reports are: Heritage Computing, (2008); SCT Operations, (2008); Merrick, (2007); SCT Operations, (2007); Waring et al (ANSTO), (2007); Geosensing Solutions, (20080. • These studies have been carried out in relation to impacts of coal mining on deep hydrogeology and related stakeholder issues/concerns and have almost invariably been supplied to all stakeholders including DWE, SCA, DSC, DECC DoP etc. • Groundwaters investigated in the above-listed study reports have been investigated in accordance with DWE guidelines "Groundwater Monitoring Guidelines for Mine Sites, 2003" and relevant Australian standards. • The stratigraphy, lithology, hydrogeology and geochemistry of the Southern Coalfield is well understood. The wider area generally outside of the exploration area still mostly within the Woronora Plateau but also including analogous areas based on Triassic and Permian Sandstones has also been subject to a significant number of independent consultant study reports conducted on groundwater environments. The studies include estimates of storativity, hydraulic conductivity and flow directions (heads) etc particularly over the last 5 years, including in the BHP Billiton Dendrobium Mine lease area lying to the immediate south of the proposed exploration area. These studies are principally: Heritage Consulting, (2009); Madden, (2009); Ecoengineers, (2008); Kellog, Brown and Root, (2008); Merrick, (2007); GHD Geotechnics, (2007); Hammond, (2007); Alkhatib, M. and Merrick, N.P., (2006); Ecoengineers, (2006); Grey and Ross, (2003); Bennet et al. (2003). • These studies have been carried out in relation to impacts of coal mining on deep hydrogeology and related stakeholder issues/concerns and have almost invariably been supplied to all stakeholders including DWE, SCA, DSC, DECC DoP etc. **The references list for the proposed exploration area and Metropolitan lease area studies cited above is as follows:**

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		Geosensing Solutions (2008) A compilation of surface geological features in the western portion of Metropolitan Colliery. April 2008. Gilbert and Associates (2007) Review of Possible Effects of Subsidence on Surface Drainages for Subsidence Management Plan (Longwall Panels 18 to 19A). Heritage Consulting (2008) Metropolitan Coal Project Groundwater Assessment. A Hydrogeological Assessment in Support of Metropolitan Colliery Longwalls 20 to 44 Environmental Assessment. Project Number: MET-06-02 August 2008. Merrick, N. P. (2007) Groundwater information provided by piezometric monitoring in the Longwall 10 goaf hole at Metropolitan Colliery. AccessUTS Pty Ltd. for Helensburgh Coal Pty Ltd. Project C07/44/001, September 2007, 13p. SCT Operations Pty Ltd (2007) Summary of Results of Longwall 10 Goaf Hole Monitoring. Report No. MET3131 for Helensburgh Coal Pty Ltd, 30 May 2007. 16p & Appendices & CD. SCT Operations Pty Ltd (2008) Preliminary Results of VW Piezometer installation In Exploration Hole PM02. Waring, C., Hankin, S., and Peterson, M. (2007) Longwall 10 Goaf Hole Hydro-Geophysical and Hydro-Geochemical Investigations. ANSTO Report C-949 for Metropolitan Colliery, June 2007. 20p. **The references list for the wider Woronora Plateau Area studies and analogous areas of Triassic and Permian Sandstones (i.e. Blue Mountains, Kulnura-Mangrove Mountain) cited above is as follows:** Alkhatib, M. and Merrick, N.P. (2006) Groundwater Simulation and Optimisation Modelling of the Kulnura-Mangrove Mountain Aquifer Systems. Final Report for Gosford-Wyong Councils Water Authority, Research Report NCGM 2006/14, November 2006, 170p. Bennett, S., Keenan, H. and Butler, S. (2003) Hydrological and Water Quality Assessment of the Cataract River; June 1999 to October 2002. Department of Infrastructure, Planning and Natural Resources report, 44p. ISBN 0 7347 5418 3. Best, R. and Tammetta, P., (2006), Upper Nepean Borefield Development Groundwater Modelling Study. Coffey Geosciences Second Draft Report SE00097/01AG [22 May 2006] Brown, S. J. A., Kelly, B. F. J. and Merrick, N. P., (2005), Hydrogeology of the Blue Mountains, NSW: Simulating impacts of bore abstraction and sewer tunnel inflows on stream base-flow. In Acworth, Mackie & Merrick (eds.), CD Proceedings, *Where Waters Meet* International Conference, Auckland, 29 November – 1 December, 2005. New Zealand Hydrological Society.

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		ISBN 0-473-10627-2. Ecoengineers Pty Ltd (2006) Assessment of Catchment Hydrological Effects of Longwall Mining by Elouera Colliery Stage 1: Establishment of a Practical and Theoretical Framework. Report 2006/05A for BHP Billiton, August 2006. Ecoengineers Pty Ltd (2008) Groundwater Assessment Dendrobium Longwall 3 Inflow June 2007. Report for BHP Billiton Illawarra Coal, January 2008 Freed, S. J. (2005) The reservoir characteristics of the Hawkesbury Sandstone in the southern highlands in relation to Sydney Water shortages. School of Earth and Environmental Science, Honours thesis, University of Wollongong. 104 Gentz, M. L. (2006) A Pre-Mining Study of the Hawkesbury Sandstone and Aquifer Characteristics of Potential Longwall Mining Area, Appin Area 3'. School of Earth and Environmental Science, Honours thesis, University of Wollongong. GHD Geotechnics (2007) Dendrobium Area 3, Predicted Hydrogeologic Performance. Attachment F to the Dendrobium Area 3 Environmental Assessment. Grey, I. and Ross, J. (2003) Groundwater Investigation for Contingency Drought Relief in the Sydney Region – Results of Desk Study. Parsons Brinckerhoff Report 2114127A PR_2984 for Sydney Water Corporation and Sydney Catchment Authority. Hammond, M. S. (2007) Baseline Study of Hydrogeology above a Longwall Mine in Cordeaux Dam Catchment Area. Honours thesis Bachelor of Environmental Science. October 2007. University of Wollongong. Heritage Consulting Pty Ltd (2009) Dendrobium Colliery Groundwater Assessment. Mine Inflow Review, Conceptualisation and Preliminary Groundwater Modelling. February 2009 (for BHP Billiton Illawarra Coal). Report HC2009/2. Kellog, Brown and Root (2008) Upper Nepean (Kangaloon) Borefield Project Environmental Assessment. Report prepared for the Sydney Catchment Authority. Madden, A. (2009) Influence of Longwall Mining on Deep Groundwater at Dendrobium Colliery, Area 2. Master of Engineering research report, University of Technology, Sydney. Merrick, N.P. (2007) A Review of Groundwater Issues Pertaining to Underground Mining in the Southern Coalfield. AccessUTS Report for NSW Minerals Council, Project C07/044/004. Final Report July 2007. Russell, G.N. (2007) Hawkesbury Sandstone groundwater attributes and geological features. Poster paper in CD

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		Proceedings, 'Hydrogeology over the Years' UTS/UNSW 20th Anniversary Symposium, July 2007. Short, S. A., Waring, C. L., Peterson, M. A., Hammond, M. S., and Wood, J. (2009) Studies of near-surface hydrology and hydrogeology of the Woronora Plateau. Proceedings of the Groundwater in Sydney Basin Symposium. International Association of Hydrologists, Sydney 4 – 5 August 2009. Sydney Catchment Authority (2006) Technical Overview Report: Groundwater Investigations - Severe Drought Water Supply Sources for Sydney. Sydney Catchment Authority. Walsh, R. (2008) Dendrobium Mine Draft Longwall 3 Inflow Summary Report. Revision 0-DRAFT, 31 January 2008.
DWE.	2.2 Results from the investigation (as requested by DWE in 2.1) must be reported to DWE for assessment, and verification of any estimates of yield from differing strata provided within the reports.	Refer response to **Item 2.1** above in which Apex outline why they believe the study is not justified or required. There have been numerous prior independent consultant study reports conducted on groundwater environments within the exploration area, its immediate surroundings, and the wider area of the Woronora Plateau area of the Southern Coalfield over the last 5 years. These study reports include estimates of storativity, hydraulic conductivity and flow directions (heads) etc and they have almost invariably been supplied to all stakeholders including DWE, SCA, DSC, DECC, DoP etc. for assessment. There is broad general agreement across all major study reports regarding typical storativities, hydraulic conductivities and heads within the principal water–bearing strata of the region to a level of assurance that is considered more than adequate for the purposes of coal seam gas exploration.
DWE.	2.3 Groundwater quality protection criteria must also be established, and trigger thresholds determined for groundwater protection and remediation. The yield estimation must include an assessment of contamination of any aquifer as a result of introduction of drilling materials or solutions, or	Apex is of the view that there is no demonstrated need to establish such criteria <u>other than for relatively shallow groundwaters in particular the upper part of the Hawkesbury Sandstone</u> for the following reasons: • Only the upper Hawkesbury Sandstone is host to groundwater dependent ecosystems such as the upland swamps and the draining streams of near-pristine Sydney Catchment Authority Special Metropolitan Areas. • Only the upper Hawkesbury Sandstone is host to groundwaters which may drain to the lakes Woronora or Cataract i.e. Sydney drinking water storages. • There are no recognised aquifers, nor recognised groundwater resources (as per NSW DLWC guidelines) nor deep groundwater-dependent ecosystems in the exploration area. • Groundwaters encountered during coal mining in the area over more than a century have been found to be of low

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	migration of groundwater from one aquifer to another.	flow/volume and variable quality. In respect of establishing groundwater criteria for the Hawkesbury Sandstone, Apex would be guided by the large body of existing data on the chemistry of draining streams and Sydney water reservoirs on the Woronora Plateau. In practical terms this would mean the proposed criteria would be a combination of (a) the default trigger values for slightly disturbed ecosystems in South East Australia as set out in Tables 3.3.2, 3.3.3 (for upland rivers) and 3.4.1 (95% protection levels) in the national water quality guidelines Volume 1 (ANZECC/ARMCANZ, 2000) and (b) the national drinking water guidelines (NHMRC/NRMMC, 2004). It is noted that this will mandate that the drilling fluid to be used while drilling through Hawkesbury Sandstone prior to immediate casing off of the entire depth interval of the Hawkesbury Sandstone would strictly be Sydney drinking water. This would be brought to site in tankers licensed for the transport of drinking water only and would not be dosed with any additives prior to use other than possibly a simple biodegradable starch gel. Apex intends to meet with the DWE as soon as the required DWE personnel are available in order to discuss any monitoring required during operations. C. Rogers of Apex had a telephone conversation with the DWE (Fergus Hancock) on 20/5/09 and was advised by Fergus that a detailed pre-drilling study was not required and that the DWE's concern was the possible cross contamination of in-ground water sources. For this reason it was agreed that a meeting should take place to discuss such measures with hydrogeological representation on both sides of the table to confirm if any monitoring is required during drilling operations.
DWE.	2.4 All bores must be fully cased to protect any higher yielding or higher quality aquifer than the gas producing strata.	This will be complied with. Apex believe the only aquifer of a critical nature as noted in the response to **Item 2.3** is the Hawkesbury Sandstone which hosts upland swamps. These are embedded in shallow, unconfined 'hillslope aquifers in weathered sandstone and hence are groundwater dependent ecosystems. To take into account any possible loss of drilling fluid downgradient to these hillslope aquifers Apex propose to drill the Hawkesbury Sandstone-hosted surface hole section with fresh water (i.e. Sydney drinking water) provided this does not produce drilling problems (considered unlikely). It is typical in the drilling industry to drill the top section of the borehole with fresh water (where surface water sands may be found). In the event of any drilling problems the only additive proposed to be used is a biodegradable starch-based gel 'mud'. Estimated drilling time for 100 m of Hawkesbury Sandstone strata is 24 hours. It is believed that the leakage of drilling fluid into the weathered bedding planes etc of the Hawkesbury Sandstone should be minimal over such a period. It is planned to have a surface casing set at a nominal 100 m depth for every gas exploration well proposed. This will case

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		off (i.e. isolate with cement and steel casing) the upper Hawkesbury Sandstone from any further losses from the rest of the well.
DWE.	2.5 All groundwaters intercepted by the project must be licensed, in accordance with any statutory sharing arrangements in force.	• There are no recognised groundwater resources in the exploration area. • There are no licensed bores in the exploration area. • No statutory groundwater sharing arrangements are in force in respect of the exploration area. Notwithstanding, Apex will comply with all legislative requirements in respect of licensing any encountered groundwater resources. In the event of encountering any significant groundwaters/aquifers an application for licensing of a water well would be made.
3. Dr Ann Young.	Dr Young has combined the gas exploration phase and the gas utilisation phase. These are two distinct and separate stages. Whether or not gas utilisation is eventually undertaken will depend on exploration results and will be subject to a separate application at some future time. 3.1 Comment re p2 of EA. Questions the areas of disturbance.	The area of disturbance of each vegetation type by the proposed development is identified in Section 5.1 (p53) of the Biosis Research Flora and Fauna Assessment. • In the original EA, a total of 1.2 ha of Upland Swamp vegetation had been identified as being disturbed by the proposal. Apex has revisited and re-assessed Borehole Site AI10 and decided to relocate the borehole to more elevated land immediately south of the Fire Road. This removes the site from Upland Swamp and reduces the area of Upland Swamp potentially affected to 0.56 ha. It is emphasised that this is the maximum potential area potentially affected. Final site design and operational layout will minimise the area eventually affected • It is emphasised that access to lay trenches etc is not part of this current proposal. Any additional works will be subject to a separate and subsequent approvals process and they will be assessed on their merits. Any future development application will be required to consider cumulative impacts of any and all previous development/disturbance (including the current proposal). Apex selected the sites to minimise vegetation disturbance. The sites were selected initially to meet drilling operational requirements and geological targets. The selected sites were then inspected over three days between 3rd to 5th September 2008 by a team consisting of the Apex representative, a drilling contractor representative, three representatives from the Aboriginal community, fauna and flora specialists, surface and groundwater specialists, archaeologists and Apex's Environmental Consultant. During the inspections and in response to actual site conditions, the selected sites were then re-located if necessary to avoid potential impacts. In addition, Apex committed to implementing a similar review and selection process, (including a representative from SCA as

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		appropriate) at the final site selection immediately prior to drilling set up. Immediately prior to site set up, the site layout would be confirmed with an objective to maximise use of disturbed area eg along tracks and fire roads, the site layout can be "stretched" and narrowed to maximise utilisation of the already cleared land associated with the track or road. The comment about subsurface pipelines and associated traffic relates to a potential future EA that may, or may not, be submitted depending on the exploration results. The information about pipelines was provided in the current EA to enable the proposed exploration and monitoring program to be understood in the context of potential future development. It is not directly relevant to impact assessment of the proposed works. (**Refer EA Section 2.2**).
Dr Ann Young.	3.2 Comments re p3 of EA. Clarification of topsoil storage for rehabilitation and sediment controls/silt fences.	Site preparation will typically involve the disturbance of soils resulting from the development of drilling sumps (surface and subsurface soil disturbance) and through general site access and activity (surface soil disturbance). • Only soil liberated from the sumps will be stockpiled for any length of time (duration of the borehole development and drilling operation is typically 10 weeks maximum). • Assuming the absolute maximum area cleared at 50 m x 60 m, the volumes of soil to be stockpiled at each site is in the order of 150 m^3 of O horizon soil and 300 m^3 of A horizon soil. • Soils associated with Upland Swamps are typically very sandy and do not provide a suitable substrate for the development of drilling sumps. • Section 5.2 (p54) of the Biosis Research Flora and Fauna Assessment identified the recommended amelioration measures to minimise impacts on terrestrial ecological values due to vegetation clearing and soil disturbance. **The recommendations included:** • Sediment and erosion control measures should be implemented on all sites to prevent erosion during and after construction; • Disturbance to native vegetation should be minimised, or, where disturbance is unavoidable, borehole sites should be rehabilitated using locally sourced tubestock and brush-matting. Rehabilitation should be undertaken by suitably

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		qualified bush regenerators; • Where clearing of native vegetation is unavoidable, native shrubs, logs and bush-rock should be stockpiled on the side of the proposed boreholes and access routes and replaced following completion of the works. • These recommendations will be incorporated into a site Environmental Management Plan that will include specific requirements for soil stock piling and vegetation stock piling. The Environmental Management Plan may include but will not be limited to the following general best practise activities. **Soil Translocation** **Background and Justification** Soil translocation is likely to be the most successful and cost effective form of rehabilitation/revegetation for the project. Topsoil harvested from cleared remnants should be viewed as a valuable resource containing a significant supply of seed (and other propagules), beneficial soil micro-organisms and essential plant nutrients. It is estimated that > 65% of native plants within plant communities such as those of the study area are not readily propagated. As a result, revegetation projects which rely on planting only generally appear as highly simplified ecosystems. Large scale soil translocation has been successfully utilised on the Tomago sand beds and in different parts of south-eastern Australia for the rehabilitation plant communities with a similar composition and structure as those that appear within the study area. **Soil Salvage and Handling** *Vegetation Clearing and Stockpiling* Vegetation shall be removed from boreholes sites and stockpiled further downslope of the downslope runoff detention bund wall, to protect it from erosive effects in storm events. Further seed collection from felled trees will be undertaken immediately post clearing. Rocks and logs which may be disturbed will be stockpiled separately e.g. above or on the run-on diversion bund or in the downslope runoff detention bund wall.

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		Soil Stockpiling Where practical, soil stockpiling will be minimised. Soils will not be stockpiled for long periods of time (N.B. short term stockpiling [several weeks] will be crucial to maximising the level of success). If topsoil is stockpiled for greater than 3 months, testing will be undertaken to account for any potential changes in nutrient status. Soil horizons will not be removed during or immediately following rain in order to minimise the composting process during stockpiling. Soil stockpiles shall be no greater than 2 metres high, and located immediately downslope of the downslope runoff detention bund wall, where they cannot be impacted by water inundation or vehicle traffic. All stockpiles will be pegged and appropriately labelled. A register of all stockpiles (soil horizons and vegetative waste) shall be maintained with reference to dates, donor site locations and recipient site locations. *Stripping of Soil Horizons* Avoiding excessive mixing of soil horizons will be crucial to maximising vegetation re-establishment. Plant operators will ensure that appropriate machinery is utilised to effectively undertake the soil translocation. Small scale soil translocations have been previously been achieved using an excavator with tilting bucket and a truck. The top 50 mm of soil (O horizon) will then be stripped and stockpiled in a separate stockpile located immediately downslope of the downslope runoff detention bund wall, covered by either a plastic membrane or a layer of woody material. This layer of soil contains the majority of soil stored seed and propagules, plant nutrients and beneficial soil microbes. The next 100 mm of the topsoil layer (A horizon) will then be stripped and stockpiled in a separate stockpile located immediately downslope of the downslope runoff detention bund wall, covered by either a plastic membrane or a layer of woody material. Some minor stripping and stockpiling of subsoil horizons (e.g. B and C soil horizons) may then be undertaken depending on depth of bedrock. Similar material will be obtained from excavation of the two ~25 m^3 sumps. This material being generally comprised of sandy soil and clayey material will be used to construct the downslope runoff detention bund wall and mechanically compacted. **Soil Translocation**

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		Respreading Soil Horizons Subsoil horizon material (B and C) will first be spread back over the allocated recipient sites (including back filling the sumps) in an upslope direction. Translocation of A horizon over B and C horizons will then be undertaken. Finally, the O horizon will be spread over the A horizon. *Redistribution of Logs, Rocks and Seed Bearing Vegetation on Recipient Sites*. All remaining stockpiles of rocks, logs and vegetation will then be redistributed over the recipient site. In the case where the area of disturbed soil is greater than the volume of vegetated material to be replaced over the top of the site, brush matting, involving the collection by hand of branches containing seed material (typically from myrtaceous plants or nearby native grasses) would be employed at the site. This is a relatively low cost, but effective mechanism of revegetation that has been successfully employed at drills sites throughout the Woronora Plateau, and across the entire Illawarra region. Avoiding excessive soil compaction (other than during construction of the downslope runoff detention bund wall) will be crucial to maximising plant establishment and all traffic should be excluded from the translocated soil horizons once all materials have been spread on the surface. **Revegetation Supplementary to Soil Translocation – in the event that natural regeneration of the site is not progressing quickly.** If necessary seed from nearby native vegetation could be collected prior to development and would then be spread over bare areas of the rehabilitating borehole sites in the unlikely event that natural regeneration did not result from the processes outlined above. Direct seeding will only be undertaken in spring and autumn where necessary. Where required (i.e. in areas that remain without any, or indeed poor natural regeneration for a period longer than 6 months), supplementary planting of local provenance tubestock may be undertaken to ensure vegetation is progressively reinstated. A list of suitable plant species for collection, propagation and installation has been derived from the terrestrial flora and fauna assessment. Where revegetation is required, site specific requirements will be identified including appropriate species mixes, planting densities and strategies. In order to achieve optimal species richness, structural diversity and genetic integrity at the borehole

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		site(s), a provenance native plant nursery would be engaged to undertake this work in consultation with the land owner. **References:** DITR 2006, *Mine Rehabilitation - Leading Practice Sustainable Development Program for the Mining Industry*, Commonwealth Government Department of Industry Tourism and Resources.
Dr Ann Young.	3.3 Comments re p5 of EA. The gas generation is predicted to supply only a 15MW turbine.	The comment about a 15 MW turbine relates to a potential future Major Project Application that may, or may not, be submitted depending on the exploration results. The information was included in the EA to enable the proposed exploration and monitoring program to be understood in the context of potential future development. It is not directly relevant to impact assessment of the proposed works. (**Refer EA Section 2.2**). This is an essential potential future stage of any logical development of the gas reserve.
Dr Ann Young.	3.4 Comments re p28 of EA. Ensure surface aquifers are not depleted.	The Hawkesbury Sandstone of the Woronora Plateau and the exploration area in particular is comprised of significantly weathered Hawkesbury Sandstone to depths of up to approximately 75 m maximum. The Sandstone often forms 'hillslope aquifers' with an average storativity around 0.05 and mean bulk hydraulic conductivity to at least 30 m depth typically in the 10^{-7} – 10^{-6} m/s range i.e. generally the most permeable strata. It is now recognised these hillslope aquifers sustain downslope upland swamps, particularly through periods of drought and during recovery from wild fires and provide baseflow to draining streams. Supporting studies in respect of this view are as follows: Gibbins, L. (2003) A geophysical investigation of two upland swamps, Woronora Plateau, NSW Australia: Unpublished BSc (Hons) thesis, Macquarie University. BHP Billiton Illawarra Coal (2004) Deep Borehole Investigations of Swamp 18a above Elouera Longwall Panels 9 and 10. April 2004. BHP Billiton Environment and Sustainable Development Dept. Ecoengineers Pty Ltd (2006) Assessment of Catchment Hydrological Effects of Longwall Mining by Elouera Colliery Stage 1: Establishment of a Practical and Theoretical Framework. Report 2006/05A for BHP Billiton, August 2006. Russell, G.N. (2007) Hawkesbury Sandstone groundwater attributes and geological features. Poster paper in CD Proceedings, Hydrogeology over the Years UTS/UNSW 20th Anniversary Symposium, July 2007. Hammond, M.S., 2007, Baseline Study of Hydrogeology above a Longwall Mine in Cordeaux Catchment Area. B.Env.Sci (Hons) thesis, Faculty of Science, University of Wollongong.

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		Ecoengineers Pty Ltd (2007) Surface Water Quality and Hydrology Assessment Dendrobium Mine Area 3. September 2007 (for Cardno Forbes Rigby Pty Ltd). Short, S. A., Waring, C. L., Peterson, M. A., Hammond, M. S., and Wood, J. (2009) Studies of near-surface hydrology and hydrogeology of the Woronora Plateau. Proceedings of the Groundwater in Sydney Basin Symposium. International Association of Hydrologists, Sydney 4 – 5 August 2009. Measures will be put in place to avoid contaminating these near–surface hillslope aquifers and their upland swamp and draining steam (shallow) groundwater dependent ecosystems or depleting them. The principal means of protection of the hillslope aquifers will involve: • Drilling the Hawkesbury Sandstone with a Sydney drinking water-based drilling fluid which contains no additive other than possibly a biodegradable starch gel to at least the base of the Hawkesbury. • All wells drilled will have a surface casing set to a nominal depth of 100 m. This will case off (i.e. isolate with cement and steel casing) the upper Hawkesbury Sandstone (the top 75m of concern), from any further losses from the rest of the well. • Estimated drilling time through the Hawkesbury Sandstone is 24 hours. It is believed that the leakage of drilling fluid into the weathered bedding planes etc of the Hawkesbury Sandstone should be minimal over such period. • The incremental time of exposure from drilling for the Hawkesbury Sandstone formation, between setting surface casing at 75 m and 100 m depth, at which it is proposed, is less than 2 hours. Casing to the 100 m will provide safety on casing off the upper sections of concern. The extra efflux or influx during the two hours required to drill from 75 m to 100 m would be minimal.
Dr Ann Young.	3.5 Comments re p32 of EA. Too little detail to judge the impacts of groundwater transfer to the surface. Series of questions directed at practical drilling activities.	Extensive detail has been provided in the EA on site containment of drilling fluid (which, below the Hawkesbury Sandstone, would generally be 3% potassium chloride (3% KCl). This additive is required to both ensure drilling through hard and dispersive clay shales and to provide weighting to the fluid so that it overcomes any pressure of water exogenous to the hole which may have gas pressure behind it. All spent drilling fluid, including any groundwater adventitiously transferred to the surface with the recirculating fluid will be tankered off site.

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Dr Ann Young.	3.6 Comments re p38 of EA. How quickly can flaring be stopped?	Flaring can be stopped instantaneously with manual valves and automatically operated valves that are designed to close during emergency fire events. The wellhead arrangements would be designed to withstand bushfire conditions. The proposed flaring unit is able to withstand fire and is designed to minimise the risk of fire escape. Apex recognises the risks associated with the exploitation of Coal Seam Methane and Coal Mine Methane. Apex's operational personnel are experienced drilling, mining and risk managers who have and will ensure that hazards are adequately identified and risks assessed and controlled. Apex recognises the need to work with the local community and local authorities such as the Rural Fire Service (RFS). Intensive liaison has already taken place between Apex and the RFS and this relationship will continue. Liaison so far includes RFS headquarters meetings, local meetings, liaison with local RFS personnel and an RFS presentation given by Apex to the Darkes Forest RFS personnel. Fire mitigation measures will also be developed by consultation with the Sydney Catchment Authority, the Department of Environment and Climate Change and the Department of Primary Industries. Flaring facilities will be provided by Apex to comply with appropriate legislation and for gas monitoring purposes. These are discussed below; **Compliance with Schedule of Onshore Petroleum Exploration and Production Safety Requirements** Clause 214 of the Schedule of Onshore Petroleum Exploration and Production Safety Requirements requires the following: **Precautions Against Fire** In all cases where internal combustion engines are used as prime movers for the operation of a drill rig and its ancillary-equipment, such engines, if permanently installed, shall be, if practicable, diesel engines. These shall be provided with efficient flame and/or spark arresters on their exhausts and be regularly checked and continuously used. No naked lights, smoking, or motor vehicles not provided with efficient flame and/or spark arresters shall be permitted within 30 metres radius of the hole provided that in any event requiring the use of welding plant or other equipment the site manager may permit the use of such motor vehicles, welding plant or blow torches under his personal supervision and subject to such special precautions as appear necessary. Where inflammable gas is met in a well and cannot be contained, it shall be conveyed away from the bore-hole head fittings by means of a flare line to a distance of not less than 30 metres from the well and ignited. The discharge end of such flare line shall set up in such a way that any condensate can be collected and the flame is contained so as no environment damage may result. The discharge end of such flare line shall be isolated so that no risk exists for people or animals.

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		Clause 728 of the Schedule of Onshore Petroleum Exploration and Production Safety Requirements requires the following: **Approval to Vent or Flare** The titleholder must ensure that except in an emergency the flaring or venting of petroleum is not carried out without approval. Therefore, in order to comply with the safety schedule as above as well as for testing purposes, Apex will be required to operate approved flaring facilities. Apex recognises that such flaring must take place in a controlled manner in order to protect persons associated with the drilling works, to protect the environment by mitigating the risk of bush fires being caused and adverse noise and light being emitted. In addition, the design and construction of the well head facilities must be fire proof with adequate intrinsic safety for the protection of personnel and the environment. The NSW Occupational Health and Safety Act 2000 requires construction work to be carried out after risk management processes have been applied to identify hazards, assess risk and control risk as appropriate. A full high level operational risk assessment was carried out for the drilling and construction phases in accordance with; • AS NZS 4360 2004 Risk Management • MDG1010 Risk Management Handbook for the Mining Industry • MDG 1014 The Apex operational risk assessment was completed on the 8th of April 2009 and included such measures as; • Control of hotwork to mitigate the risk of bushfire • Liaison with the rural fire service (the RFS were invited to the risk assessment but did not attend) • Liaison with the Department of Primary Industry and the Sydney Catchment Authority on fire control matters and flare facilities as per the Petroleum Act. • The provision of surface facilities designed and constructed so as to prevent and be protected from fire. • The provision of safety devises such as automatic shut down valves (activated by fire to stop gas flow). • Provision of other safety devices such as non return valves. • The use of flare chambers for environmental protection (see below) **AGL Flare Chambers** Apex has recognised the need to carry out flaring in a controlled manner so as to protect the public and the environment. There is a need to reduce flaring affects such as; • Noise

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		• Light • Heat. Apex plans to use a purpose designed flare chamber to meet the needs of Apex whilst operating around the Illawarra. This type of flare chamber is currently used by AGL at Camden. The provision of such a facility will follow detailed HAZOP analysis to assist in the design. The HAZOP analysis will address a range of issues including the following: • Transportability • Visibility • Fire risk mitigation • Noise • Controllability • Safety devices • Materials • Training of personnel • Maintenance **Figure 1** shows a wide view of similar gas flaring facilities used near Camden.

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		 **Figure 1 – Wide view of Flare Box and Control Trailer** **<u>Description of General Facilities</u>** Flame control will be via an external and separate control facility as shown in **Figure 2**. This trailer arrangement contains the ignition control, flame arrestors, shut down facilities and indeed all the facilities needed to make the facility fully controllable remotely. This arrangement allows for the ignition of the facility manually and automatically to comply with legislation and the ability to shut down the flare automatically or manually.

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		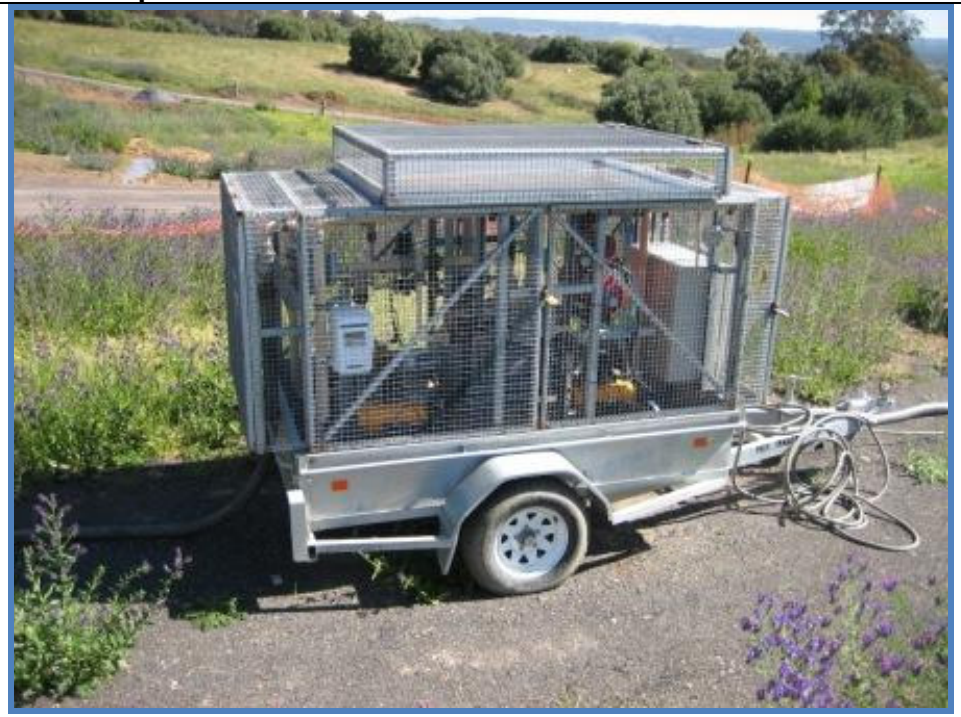 **Figure 2 – Control Trailer** **Figure 3** shows the interior of the flare chamber. The chamber is lined with fire proof and noise absorbing material. Gas is flared by means of a burning element as shown in **Figure 3**. The gas entering the chamber is spread along a long burner arrangement and the gas exits into the chamber via a series of nozzles on the burner. This arrangement therefore does two things; • Reduces nozzle pressure and therefore noise • Reduces flame height and therefore height (this also serves to contain the flares within the chamber and thus gives flame control)

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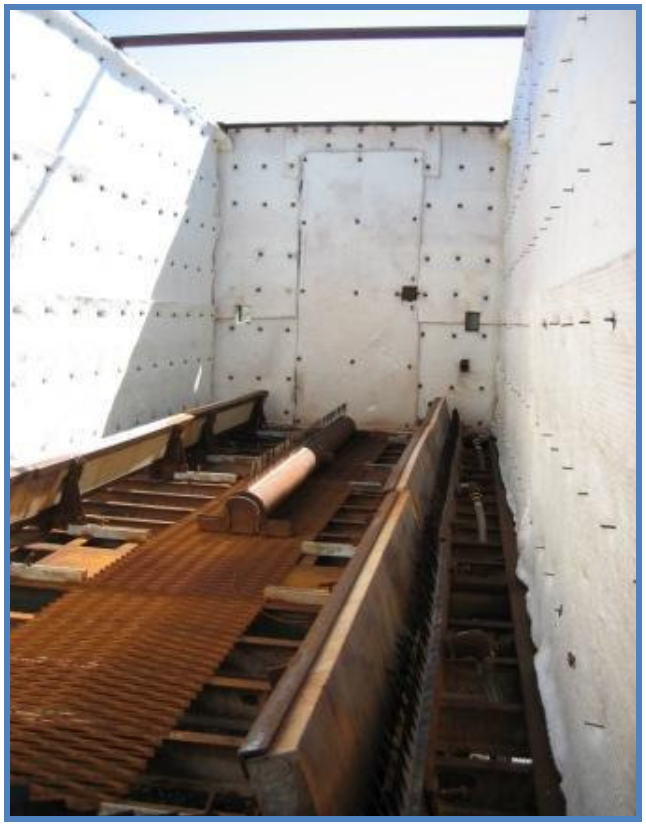
		Therefore in summary, these flare facilities are designed through engineering and environmental risk management and provide remote controllability. However, no flare will be lit whilst the facility is unattended and continuous liaison with the Rural Fire Service will take place during operations.  **Figure 3 – Interior of Flare Chamber**

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Dr Ann Young.	3.7 Comment re p41 of EA. Clarification of groundwater quality and quantity matters. Surprised that there is no provision for analysis of the nature and volume of groundwater extracted.	This has been partly clarified in our response to **DWE Item 2.1**. However, it is also noted that: • Groundwaters encountered during coal mining in the area over more than a century have been found to be of low flow/volume and variable quality. It is expected that only minor amounts of groundwater, perhaps driven by initial 'pulses' of gas pressure would be brought to the surface with recirculating drilling fluid. Any groundwater make will be continually monitored in real time through increased surface volume in pits/tanks, and water-diluted fluid returns. • It is not practical to either monitor-for, or sample for such minor amounts of groundwater. This results from the fact that the pH and salinity (Electrical Conductivity; EC) will be greatly affected by the geochemical effects of comminution of strata encountered, cation exchange of the majority potassium (noting the drilling fluid is 3% KCl below the Hawkesbury Sandstone) for other cations, and out gassing of dissolved CO_2. For these and other reasons it would therefore generally not be meaningful or productive to run a program of quality monitoring of any groundwaters encountered until well after completion, flushing with clean water and development of the wells for groundwater extraction. • EC measurements can be carried out but for the above reasons would generally not be too indicative of actual groundwater conditions. The drilling fluid system will be slightly overbalanced pressure-wise to the formation pressure (due to friction, rock chips, cuttings etc). It is typically difficult to see significant impact of formation waters into/on an overbalanced fluid system unless there is a very strong and productive (high flow rate) water 'kick' from a high pressure zone (e.g. artesian, gas over pressure) into the well. There is no reason to believe such conditions would be encountered in the exploration area. • As this is a coal seam gas exploration program there is no brief or need to flush completed boreholes with water or develop them for groundwater extraction.
Dr Ann Young.	3.8 Comment re p46 of EA. Requests a clearly coordinated strategy for project monitoring incorporated into the approval conditions.	It is most likely that Apex will have to submit to the DoP an environmental monitoring program for approval prior to commencing operations. This would form part of the EMP.

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Dr Ann Young.	3.9 Comments re p48 of EA. There is no indication of just how much community consultation occurred.	The community consultation undertaken by Apex was suitable for an exploration drilling program. Apex undertook several face to face meetings with landholders potentially affected by the project. Apex met with Darkes Forest Community at the initiation of Rural Fire Services and they gave a presentation of their proposals. Should a future Major Project Application be made as a result of the proposed gas exploration, a community liaison program suitable for that possible future development would be implemented.
Dr Ann Young.	3.10 Dr Young's first conclusion. A detailed and workable rehabilitation Plan be established for each site.	An Environmental Management Plan (EMP) will cover the entire operation. Site specific EMPs will be developed for each site by the contractor and these will be consistent with the overall EMP. The overall EMP will have a generic description of site rehabilitation procedures and objectives, while the site specific EMP will have a rehabilitation plan for each site. In addition, arrangements with landholders including SCA, will require Apex to rehabilitate the site. The DPI-Mineral Resources will hold an Apex rehabilitation bond, which would encourage appropriate rehabilitation performance and provision of finances for rehabilitation should the proponent fail to adequately rehabilitate any disturbed areas.
Dr Ann Young.	3.11 Dr Young's second conclusion. Drilling at each site should not commence before the previous site has been cleaned up, re-shaped where necessary, mulched or otherwise protected from rainfall, wind erosion and seeded or planted to begin re-vegetation.	This is unnecessary and would make the process discontinuous. SCA, DPI – Mineral Resources and landholders will be observing Apex's performance and there is appropriate control in that to ensure the rehabilitation performance is acceptable. Additionally, DPI-Mineral Resources will hold a rehabilitation bond to address rehabilitation performance and provide funds if the DPI have to repair any sites.
Dr Ann Young.	3.12 Dr Young's third conclusion. Extracted groundwater should be assessed for volume, quality and likely geological stratum source.	Refer to our responses to **Items 3.5** and **3.7** above.

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Dr Ann Young.	3.13 Dr Young's fourth conclusion. The proposed sites be re-assessed to prioritise them in order of likely significance so that if possible, fewer sites will be drilled.	Sites will be drilled in a priority order. Commercial reasons should ensure that Apex is unlikely to drill more sites than are necessary to define the resource.
Dr Ann Young.	3.14 Dr Young's fifth conclusion. A clear coordinated strategy for environmental monitoring by relevant authorities be imposed on the company, with approval for continuing operation dependent on satisfactory environmental management. Ideally, a community consultative committee to involve other stakeholders should be part of this strategy.	Apex expect Project Approval to include a condition requiring appropriate environmental monitoring. A community consultative committee is not justified for a 15 borehole gas exploration activity.
4. David Harper	4.1 Requested that noise barriers be installed at the two potentially problematic borehole sites prior to drilling commencing.	Two matters are worthy of note in relation to Mr Harpers comment. • Noise abatement screens will be erected and maintained during the drilling of AI05 and AI06 which have been identified as the sites where night time drilling may affect local residents if noise is not controlled,. These screens can be seen in use on **Figure 4** where the screens were used in the Camden area by McDermott Drilling. The screens were found to reduce noise by circa 5 dB(A). Note that after further site inspections and consideration with NPWS, Apex no longer propose to drill at AI05. • The drilling operations at sites AI05 and AI06 which are near to Mr Harper's residence were originally planned and assessed to be drilled using compressed air hammer drilling. The operational risk assessment, however, identified that it is necessary to use rotary mud drilling which is a quieter drilling method. Note that after further site

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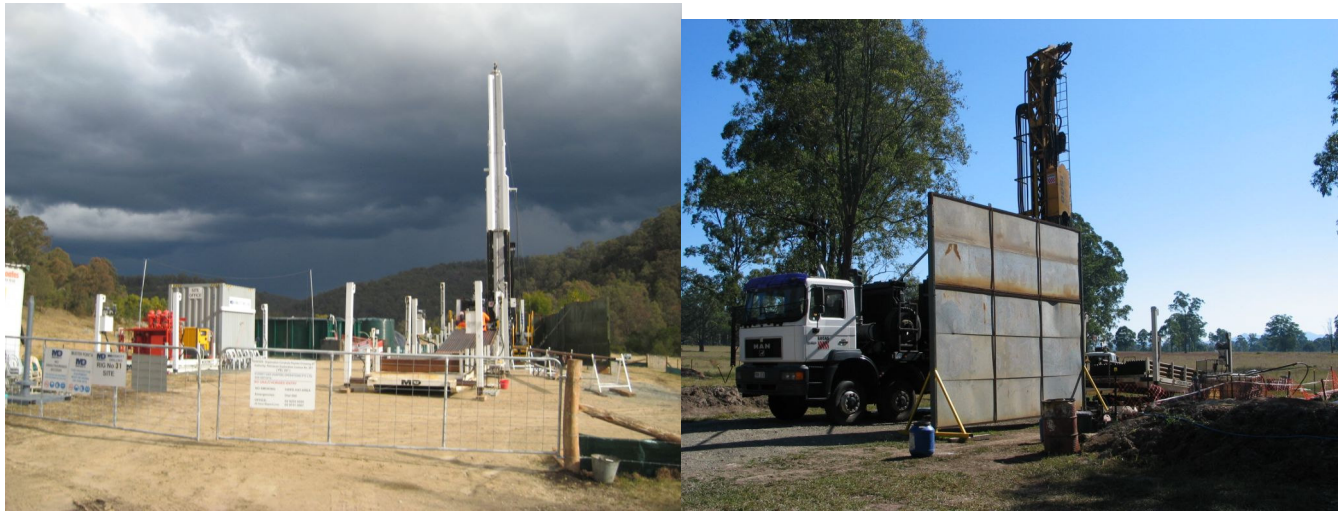
		inspections and consideration with NPWS, Apex no longer propose to drill at AI05. Therefore, with the noise abatement screens, Best Practice Management Methodologies and rotary mud drilling, it is unlikely that nearby residents will be affected by noise.  **Figure 4 – McDermott Drilling Noise Barrier Trial.** In the situation photographed (adjacent to the engine) McDermott achieved a 10dB reduction in noise levels from one side of the barrier to the other. Another three, 6m X 3m barriers have since been manufactured to enable a total of 24m of barrier 3m high. McDermott Drilling recently completed a hole in the Hunter Valley where a professional 3rd party noise survey was conducted. The Rig, an LF 230 met noise level goals of 45dB at 200m. The company then used these barriers to further reduce the Rig noise levels toward a nearby house by a further 5 dB. Apex will use this type of barrier as required.

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5. Sydney Catchment Authority.	SCA concludes that if work is undertaken as detailed in the EA and identified environmental controls and mitigation measures in the EA and requirements and conditions of approval identified by the SCA in its submission are implemented then, (a) There will be a neutral effect on water quality, (b) The ecological integrity of the Metropolitan Special Area will not be significantly impacted and (c) Adverse environmental impacts as a result of the proposal will not be significant. 5.1 SCA requests a meeting with DoP to discuss the most appropriate approach with regard to recommended conditions of approval by the SCA, including which public authority is best placed to take enforcement action if necessary and which conditions may be relevant to sites other than those of interest to SCA.	This is a matter for DoP and Sydney Water. Apex is available to assist if required.
Sydney	5.2 At sites AI10, AI14, AI18	In-ground sumps are standard (and demonstrably successful) features of drilling activity in catchment areas. Surface tanks

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Catchment Authority.	and AI16, above ground water tanks must be used rather than in-ground sumps to avoid/minimise ground disturbance, soil erosion and sediment runoff.	require increased vehicle activity for maintenance and can require similar site disturbance as in-ground tanks. Apex will construct both clean run-on diversion drain or bund wall and a runoff detention bund wall on the site. These will minimize run-on and contain runoff any minor drilling fluid spillage. It is possible to line inground drilling sumps with plastic liners if demanded by SCA. It is noted that at the end of drilling, all spent drilling fluid would be pumped out of the sumps into tankers and transported off site, (to a licensed waste disposal facility). Plastic liners may mitigate drainage through the sides and bottoms of sump. However, typically drilling sumps are not lined. Because the drilling fluid invariably contains comminuted rock fines and clays which form a low permeability coating on the sumps. Therefore in combination with a run-on diversion drain / runoff detention bund on low side of the drill site and the ability to implement protective plastic covers for deployment during large storm events this would normally be a reasonable alternative to sump-less drilling (which uses tanks or tankers to contain recirculating drilling fluid). Cuttings and drilling fluid may also typically be left in the pits. When the fluids dry up, the sumps are normally back filled with soil over the top and respread. Typically vegetation covers them quickly due to the fertilizing effects of starch and potassium in the mud residue left in the pits. Apex recommend that subject to consultation with SCA, in-ground sumps be permitted to be used.
Sydney Catchment Authority.	5.3 Appropriate runoff controls shall be designed in accordance with the LANDCOM publication Managing Urban Stormwater – Soils and Construction Volume 1, 2004 and the DECC (2008) publication, Managing Urban Stormwater; Soils and Construction - Volume 2A: Installation	Agree. Subject to agreement from SCA as appropriate.

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	of Services, Volume 2C: Unsealed Roads and Volume 2E Mines and Quarries.	
Sydney Catchment Authority.	5.4 To avoid cross contamination of groundwater aquifers, the whole length of the borehole must be cased and cemented with a cement-bentonite mixture.	It is planned that every borehole drilled will have surface casing set at nominal 100 m. This will case off (i.e. isolate with cement and steel casing) the upper Hawkesbury Sandstone (the top 50 to 75m of concern), from any further losses from the rest of the well. The time of exposure for drilling these upper formations, between setting surface casing at 75m - 100m should be less than 2 hours. The 100m will provide safety on casing off the upper sections of concern. The extra leak off or influx in two hours would be minimal (refer comments below). This section of drilling will be done with water (no additives). It is typical in the drilling industry to drill top hole with fresh water (where surface water sands may be found). 3% KCl would then be used to drill the lower hole sections only – and in particular through the coal sequence where high smectite/kaolinite tuffaceous shale beds are expected. Without KCl, these clays in the tuffs would cause drilling problems. Therefore KCl leak off is nil to the upper 50 m to 75 m of Hawkesbury Sandstone as the surface casing set at 100 m prevents losses / leak off during drilling lower hole sections. It should also be noted that Apex's well design options allow casing off with an additional casing string cemented to surface again prior to entering the goaf, or prior to coring the coals. This means in most well design options there are two casing strings consisting of two layers of steel and cement protecting the upper Hawkesbury Sandstone. Whilst drilling below the surface casing the ingress of water is often detected with increased surface volume in pits / tanks, and water cut mud returns. If that occurs, Apex would add weighting material (KCl) to control the water kick, and once under control and influx has been stopped, Apex would then drill ahead to planned casing point. Casing throughout the well would then be carried out. The casing would then be cemented by a certified service provider (Halliburton/Viking) to ensure casing/cementing integrity. In this way, water and gas flow influx the well is controlled and cross contamination of aquifers is prevented. The management strategy is to treat the losses, or "treat the influx" (until cured), not withdraw rods and run and cement casing at an intermediate point.
Sydney Catchment Authority.	5.5 All wastewater generated from the borehole drilling activities (apart from that recycled during drilling)	Agreed. **Refer EA Section 4.2.3.2** Site Specific Water Retention Requirements. Also **Item 25** in Draft Statement of Commitments.

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	must be removed from the drill site and transported for disposal outside of the Special Area.	
Sydney Catchment Authority.	5.6 The applicant must be required to prepare site specific environmental management plans including site specific layout plans and environmental mitigation measures.	Agreed. **Refer EA Section 5.2.** Apex would anticipate that this would be a consent condition required by the Minister for Planning. All operating plans will be incorporated into the Apex Environmental Management Plan. This Plan will be prepared by Apex and cover the entire project. The Contractor will also be required to prepare a site-specific EMP before commencing work at each site. This will be consistent with the Apex EMP and will ensure that site specific environmental management requirements are identified before each site is commenced.
Sydney Catchment Authority.	5.7 Groundwater quality monitoring parameters must include Dissolved Oxygen.	Due to the nature of the drilling operation Dissolved Oxygen (DO) levels in any drilling fluid returning to the surface, possibly mixed with adventitious groundwater or otherwise would not be reflective of *in situ* DO groundwater conditions. After a period of storage on site, drilling fluid, that could be admixed with adventitious groundwater or otherwise, as a consequence, picks up DO from the surface pit or tank will be tankered off site after completion of the exploration borehole. It is expected that only minor amounts of groundwater, perhaps driven by initial 'pulses' of gas pressure would be brought to the surface with recirculating drilling fluid. Any groundwater make will be continually monitored in real time through increased surface volume in pits/tanks, and water-diluted fluid returns. It is not practical to either monitor for, or sample for such minor amounts of groundwater. This is due to the fact that the pH and salinity (Electrical Conductivity; EC) will be greatly affected by the geochemical effects of comminution of strata encountered, cation exchange of the majority potassium (noting the drilling fluid will be 3% potassium chloride from the bottom of the Hawkesbury Sandstone) for other cations and out gassing of dissolved CO_2. For these and other reasons it would generally not be meaningful or productive to run a program of quality monitoring of any groundwaters i.e. for DO or other major parameters encountered until after borehole completion, flushing with clean water and development of the wells for groundwater extraction. EC measurements can be carried out but, for the above reasons, would generally not be too indicative of the local groundwater. The drilling fluid system will be slightly overbalanced pressure-wise to the formation pressure (due to friction, rock chips and cuttings etc). It is unlikely there would be significant impact of formation waters on such an overbalanced fluid system unless there is a very strong and productive (high flow rate) water 'kick' from a high pressure zone (i.e. artesian/over pressure) into the well. There is no reason to believe such conditions would be encountered in the exploration area.

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		As this is a coal seam gas exploration program there is no brief or need to flush completed boreholes afterwards with water or develop them for groundwater extraction. All spent drilling fluid, including any groundwater adventitiously transferred to the surface with the recirculating fluid will be contained on site and tankered off site as and when necessary (or at borehole completion).
Sydney Catchment Authority.	5.8 In order to minimise direct impacts of vegetation clearing and habitat loss or fragmentation, the final location of each borehole and site facilities must be determined in consultation with and to the satisfaction of the SCA.	Agreed. **Refer Item 8. Draft Statement of Commitments. EA Section 4.3.6.2.** This SCA comment only applies to AI10, AI14, AI16 and AI18 located on SCA land, however, Apex have determined a final site selection process that incorporates site environmental conditions.
Sydney Catchment Authority.	5.9 More clarity and agreement is required between SCA and Apex on site rehabilitation post drilling both for sites which will become production wells and sites which will not.	Agreed. This will result from the proposed liaison with SCA before and during borehole construction and operation.
Sydney Catchment Authority.	5.10 Offsets are not currently proposed by Apex in the EA. SCA considers offsets may be required once it is better able to assess the extent of native vegetation which needs to be cleared.	Offsets as normally determined through legislation are not required because there is no significant impact, but this will be clarified with SCA.

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Sydney Catchment Authority.	5.11 SCA considers it necessary to impose specific environmental management conditions where land managed by the SCA is affected. SCA will be able to do this through the issuing approval for Apex to enter its land.	This is standard practice and acceptable to Apex.
Sydney Catchment Authority.	5.12 A site specific Environmental Management Plan (EMP) shall be prepared in consultation with and to the satisfaction of the SCA. To include a number of specific items identified by SCA in their response submission to DoP.	Agreed. A Project EMP will be prepared by Apex. The Contractor will also be required to prepare a site-specific EMP before commencing work at each site. This will be consistent with the Apex EMP and will ensure that specific site environmental management requirements are identified before each site is commenced.
Sydney Catchment Authority.	5.13 Apex shall provide updates (by email or fax) on the progress of the drilling program once per week to the SCA.	Acceptable. This SCA comment only applies to AI10, AI14, AI16 and AI18 located on SCA land.
Sydney Catchment Authority.	5.14 Within 3 months of the completion of each borehole or within any other time agreed to by SCA, Apex will provide a report to SCA detailing	Agreed. This SCA comment only applies to AI10, AI14, AI16 and AI18 located on SCA land.

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	compliance with the safeguards and mitigation measures detailed in the EA, EMP and as specified in any conditions of approval.	
Sydney Catchment Authority.	5.15 No pollution of waters shall occur unless authorised under the Protection of the Environment Operations Act 1997.	Agreed.
Sydney Catchment Authority.	5.16 Crossing using any type of vehicle of permanent creek lines or ephemeral creek lines where significant water is flowing is not permitted.	Agreed. Except crossing will occur where formed SCA crossings/roads/tracks already exist.
Sydney Catchment Authority.	5.17 A Groundwater Contingency Management Plan shall be prepared to address groundwater brought to surface that exceeds the capacity of on site detention structures.	A Groundwater Contingency Management Plan will be prepared as part of the Environmental Management Plan. The core basis of this Management Plan will be as follows: • It is expected that only minor amounts of groundwater, perhaps driven by initial 'pulses' of gas pressure would be brought to the surface with recirculating drilling fluid. Any groundwater make will be continually monitored in real time through increased surface volume in pits/tanks, and water-diluted fluid returns. • The drilling fluid system will always be slightly overbalanced pressure-wise to the formation pressure (due to friction, rock chips and cuttings etc). It is unlikely there would be significant impact of formation waters on such an overbalanced fluid system unless there is a very strong and productive (high flow rate) water 'kick' from a high pressure zone (i.e. artesian/over pressure) into the well. There is no reason to believe such conditions would be encountered in the exploration area. • Extensive detail has been provided in the EA on site containment of drilling fluid (which, below the Hawkesbury Sandstone, would generally be 3% potassium chloride (3% KCl). This additive is required to both ensure drilling through hard and dispersive clay shales and to provide weighting to the fluid so that it overcomes any pressure of

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		water exogenous to the hole which may have gas pressure behind it. • All spent drilling fluid, <u>including any groundwater adventitiously transferred to the surface</u> with the recirculating fluid will be contained on site and tankered off site as and when necessary (or at borehole completion).
Sydney Catchment Authority.	5.18 Adequate spill control equipment/materials shall be available at drill sites.	Agreed. Details will be incorporated in EMP.
Sydney Catchment Authority.	5.19 Workers shall use a purpose built trailer mounted portable toilet provided by Apex. The contents of the toilet shall be removed from the Special Area for disposal at a suitable location.	Agreed. Details will be incorporated in EMP.
Sydney Catchment Authority.	5.20 Apex shall detail and implement an evacuation and response plan for fire preparedness.	Agreed. This matter was addressed during Risk Assessment. The OH&S Act and the Petroleum Act both require emergency procedures to be created and Apex's operational risk assessment identified and addressed this need. Apex will formulate Emergency Response Plans that are site specific in consultation with the drilling contractor.
Sydney Catchment Authority.	5.21 Hot Work is to be carried out in accordance with the SCA Hot Work Policy for the Bushfire Season.	Agreed. The issue of hot work control was addressed in the Apex operational risk assessment in order to achieve OH&S Act compliance and compliance with SCA requirements.
Sydney Catchment Authority.	5.22 Apex or its contractors must notify SCA of incidents causing or threatening material harm to personnel, the	Agreed. Was addressed during Risk Assessment. Apex and the drilling contractor will ensure that incidents are reported as per statutory requirements in liaison with the Department of Primary Industry, WorkCover and the SCA.

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	environment or SCA operations as soon as practicable after the person becomes aware of the incident.	
Sydney Catchment Authority.	5.23 Apex shall meet with SCA prior to the completion of the work period at each site to ensure that the site is decommissioned to the satisfaction of SCA and to determine site specific rehabilitation requirements and offset requirements. General rehabilitation measures are listed in the SCA submission.	Generally agreed, but with reservations about "offsets" as these have not been demonstrated/assessed as necessary. General rehabilitation measures acceptable.
6. DPI-Mineral Resources	The DPI have reviewed the EA and support the proposed project as an appropriate investigation of the State's petroleum resources. They make a number of observations/requests as follows. 6.1 Surface Disturbance Notice lodged prior to commencement of any activity on site.	Agreed.
DPI-Mineral	6.2 Clearing of intact native	Apex agree with the sentiments of this statement. The precise location of the proposed boreholes has been developed in

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Resources	vegetation communities should be avoided or at least minimised.	response to a number of factors including: • Need to locate boreholes to intercept the relevant underground target strata/goaf • Accessibility • The need to avoid competing landuse or significant ecological or cultural values. Regardless of whether vegetation clearing would be required, a site inspection was undertaken with the project team and qualified ecologists in order to determine a suitable location for the borehole which aimed to satisfy all of the site selection criteria. Further, the final location of each site has been developed in consultation with an ecologist in order to minimise vegetation clearing as far as is practicable and the proposed program includes a commitment to best practice site rehabilitation at the completion of drilling. As stated in Section 5.2 of the Biosis Research – Terrestrial Flora and Fauna Assessment – a suitably qualified ecologist should be on site during the initial site set up for each borehole to ensure significant habitat features and species are not impacted. Apex have committed to this recommendation. Apex selected the sites to minimise vegetation disturbance. The sites were selected initially to meet drilling operational requirements and geological targets. The selected sites were then inspected over three days between 3rd to 5th September 2008 by a team consisting of the Apex representative, a drilling contractor representative, three representatives from the Aboriginal community, fauna and flora specialists, surface and groundwater specialists, archaeologists and Apex's Environmental Consultant. During the inspections and in response to actual site conditions, the selected sites were then re-located if necessary to avoid potential impacts. In addition, Apex committed to implementing a similar review and selection process, (including a representative from SCA as appropriate) at the final site selection immediately prior to drilling set up.
DPI-Mineral Resources	6.3 Aquifers encountered in the drilling must be isolated to ensure there is no mixing of waters.	The drilling fluid system will always be slightly overbalanced pressure-wise to the formation pressure (due to friction, rock chips and cuttings etc). It is unlikely there would be significant impact of formation waters on such an overbalanced fluid system unless there is a very strong and productive (high flow rate) water 'kick' from a high pressure zone (i.e. artesian/over pressure) into the well. There is no reason to believe such conditions would be encountered in the exploration area. Extensive detail has been provided in the EA on site containment of drilling fluid (which, below the Hawkesbury Sandstone, would generally be 3% potassium chloride (3% KCl). This additive is required to both ensure drilling through hard and dispersive clay shales and to provide weighting to the fluid so that it overcomes any pressure of water exogenous to the hole which may have gas pressure behind it.

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		Boreholes, when completed, will be grouted for the full length of the hole ensuring isolation of any aquifers, that no gas can escape, and to provide compliance with appropriate mine safety standards. All spent drilling fluid, including any groundwater adventitiously transferred to the surface with the recirculating fluid will be contained on site and tankered off site as and when necessary (or at borehole completion).
DPI-Mineral Resources	6.4 Boreholes, where no longer required, must be grouted for the full length of the hole ensuring isolation of aquifers, that no gas can escape, and compliance with appropriate mine safety standards.	It is planned that every borehole would have surface casing set at nominal 100 m. This will case off (i.e. isolate with cement and steel casing) the upper Hawkesbury Sandstone (the top 50 to 75 m of concern), from any further losses from the rest of the well. The time of exposure for drilling these upper formations, between setting surface casing at 75 m/100 m should be less than 2 hours. The 100m will provide safety on casing off the upper sections of concern. The extra leak off or influx during the two hours iut would take to drill from 75 m to 100 m would be minimal (refer comments below). This section of drilling will be done with water (no additives). It is typical in the drilling industry to drill top hole with fresh water (where surface water sands may be found). 3% potassium chloride (3% KCl) would then be used to drill the lower hole sections only – and in particular through the coal sequence where high smectite/kaolinite tuffaceous shale beds are expected. These clays in the shales would cause drilling problems without the use of KCl. Therefore KCl leak off is nil to the upper 50 m to 75 m of Hawkesbury Sandstone because the surface casing set at 100 m prevents losses / leak off during drilling lower hole sections. It should also be noted that Apex's well design options allow casing off with an additional casing string cemented to surface again prior to entering the goaf, or prior to coring the coals. This means in most well design options there are two casing strings consisting of two layers of steel and cement protecting the upper Hawkesbury Sandstone. When drilling is occurring below the surface casing the ingress of water is often detected with increased surface volume in pits / tanks, and water cut mud returns. In this case, the driller would add weighting material (KCl) to control the water kick. Once under control with the influx stopped, Apex could then drill ahead to planned casing point. Casing throughout the well would then be carried out. The casing would then be cemented by a certified service provider (Halliburton/Viking) to ensure casing/cementing integrity. In this way water and gas flow into the well is controlled and cross contamination of aquifers is prevented. The management strategy is to treat the losses, or "treat the influx" (until cured), not withdraw rods and run and cement casing at an intermediate point.
DPI-Mineral	6.5 A method of determining	Agreed. Will be incorporated in Site Specific EMP.

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Resources	rehabilitation success must be described in the Surface Disturbance Notice (Refer 6.1 above). Before and after photographs are to be submitted with the Exploration Rehabilitation and Relinquishment Report (EDG 13).	
DPI-Mineral Resources	6.6 Apex must calculate the cost of rehabilitation of each borehole and submit to DPI-Mineral Resources for approval. No drilling activity can be undertaken until the rehabilitation security has been received.	Agreed. Apex plans to comply with all statutory matters and will be advised by the Government Agencies as appropriate.
DPI-Mineral Resources	6.7 PELs 442 and 444 overlie various coal exploration and/or mining titles held by others. DPI-Mineral Resources recommends that Apex contact the affected title holders to inform them of the proposed drilling program.	PEL 444 and 442 do not overly any operational coal leases. However, Apex has and will continue to work closely with local coal operators.
DPI-Mineral Resources	6.8 DPI-Mineral Resources comments on the benefits of	It is beneficial for Apex to complete the entire exploration program as quickly as possible. Lucas – Mitchell Drilling have the capability to provide multiple rigs depending on operational needs at the time. However, Apex feels that the number of rigs and speed of completion of the individual wells and the drilling program is not relevant to the Part 3A submission. The drilling

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	commissioning two rigs and that 24/7 drilling operations are not substantiated.	program and rig deployment is dependent on commercial constraints and time line does not impact on safety or the environment. SCA consider 24/7 drilling substantiated for specific Apex proposals.
7. DPI_ Fisheries	7.1 Erosion and sediment mitigation devices should be erected in a manner consistent with currently accepted Best Management Practice (ie Blue Book) prior to any earthworks being undertaken.	Already committed to this. Would be incorporated into EMP.
DPI_ Fisheries	7.2 The erosion and sedimentation mitigation devices are to be maintained in good working order for the whole duration of the drilling works and subsequently until the site has been stabilised. Exposed soil should be reseeded or turfed.	Agree. Appropriate seeding/turfing would be subject to SCA/landowner agreement where appropriate. Would be incorporated into EMP.
DPI_ Fisheries	7.3 Have an independent and suitably qualified person or organisation carry out an audit of erosion and sediment controls at approximately the half way point of the project and provide DoP copy of the report.	Apex do not see any value in doing this and note that it is additional to requirements; but would implement it if required to do so. Rehabilitation and site erosion control will be supervised by external groups including SCA, landowners, DPI- Mineral Resources. In addition Apex will implement audit/control on its own performance in this area. Site specific erosion and sediment control installation would be incorporated into EMP.

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8. Department of Environment and Climate Change. (DECC).	DECC has reviewed the EA and has determined that it is able to support the proposal subject to the DoP addressing the following matters. 8.1 DECC would appreciate the opportunity to review the draft Director General's Environmental Assessment Report to ensure that DECC's concerns have been adequately addressed.	This is a matter between DECC and DoP. Apex is available to assist if required.
Department of Environment and Climate Change. (DECC).	8.2 DECC advise that an Environment Protection Licence will **not** be required at this stage of the project.	Noted.
Department of Environment and Climate Change. (DECC).	8.3 Table 12 of the Noise and Vibration Assessment includes night time intrusive noise criteria for monitoring locations four and five. Based on the information provided in Tables 6 and 7, night time noise monitoring does not appear to have been undertaken for these monitoring locations and so it is	The intrusive criteria for Locations Four and Five in Table 12 of the Noise and Vibration Assessment have indeed been based on the evening LA90(15minute) background noise levels measured during the operator attended noise surveys, as presented in Table 7. In relation to Location Four, reference to Table 7 indicates that the noise survey commenced at 2147 hours and a judgment was made by the engineer conducting the survey that the LA90(15minute) background noise level would be representative of the period 2200 hours to 0700 hours at that location. At Location Five, reference to Table 7 indicates that the LA90(15minute) background noise level was controlled by the noise from the ocean, being "the dominant noise source", and consequently would not decrease over the period 2200 hours to 0700 hours. Notwithstanding the above, even if the difference between the evening and night-time LA90(15minute) noise levels presented in Table 5 (from the unattended noise logging conducted at Locations One, Two and Three) of 4 dBA was adopted, the night-

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	unclear as to how the intrusive criteria has been derived. It appears that the same criteria for the evening period has been for the night time period which is not appropriate.	time Operational Noise Objectives for Locations Four and Five would be LAeq(15minute) 35 dBA (minimum INP criterion) and 43 dBA respectively. Reference to Table 16 indicates that if the noise objectives of 35 dBA and 43 dBA were adopted, there would be no additional night-time exceedances.
Department of Environment and Climate Change. (DECC).	8.4 Table 14 identifies indicative daytime drilling operational noise levels. For drill sites AI07, AI08, AI09, AI10, AI11 and AI13, the table states that the day time operational noise objective is 55dB(A). According to Table 12, for Location Two which is identified as the representative background noise monitoring location for these boreholes, the correct noise limit should be 43dB(A).	Reference to Table 14 indicates that the nearest receivers to drill sites AI07, AI08, AI09, AI10, AI11 and AI13 are golf courses, not residences. Hence, the appropriate Noise Objective, in accordance with Table 2.1 of the INP, is 55 dBA LAeq which applies to "Active recreational areas" such as golf courses, when in use. This criterion is presented in Table 13 of the Noise and Vibration Assessment and its application to the golf courses is described in the paragraph under the table.
Department of Environment and Climate Change. (DECC).	8.5 The noise assessment does not address the issue of sleep disturbance. Given that the proposed drilling activities are to be carried out 24 hours a day, seven days a week	The DECC's most recent policy considers sleep disturbance as the emergence of the maximum or LA1(1minute) level above the LA90(15minute) level at the time. An appropriate screening criterion for sleep disturbance is therefore an LA1(1minute) level 15 dBA above the Rating Background Level (RBL) for the night-time period (2200 hours to 0700 hours). When the criterion is not met, a more detailed analysis may be required which should cover the maximum noise level or LA1(1minute), the extent that the maximum noise level exceeds the background level and the number of times this happens during the night-time period. Some guidance on possible impacts is contained in the review of research results in the appendices to the NSW Environmental Criteria for Road Traffic Noise (ECRTN).

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	and that Table 16 predicts up to a 23dB(A) exceedance of the noise criteria, Apex Energy must ensure that all appropriate noise mitigation measures are implemented to ensure compliance with the Department's sleep disturbance criteria.	Other factors that may be important in assessing the extent of impacts on sleep include: • How often high noise events will occur • Time of day (normally between 10.00 pm and 7.00 pm) • Whether there are times of the day when there is a clear change in the noise environment (such as during early morning shoulder periods) It is noteworthy that there are no specific criteria for sleep disturbance nominated in the INP, in the INP Application Notes or in the ECRTN. This is consistent with the statement in the ECRTN that "at the current level of understanding, it is not possible to establish absolute noise level criteria that would correlate to an acceptable level of sleep disturbance". A substantial portion of the ECRTN is a review of international sleep disturbance research, indicating that: • A maximum internal noise levels below 50-55 dBA are unlikely to cause awakening reactions, and • One or two noise events per night with maximum internal noise levels of 65-70 dBA are not likely to significantly affect health and wellbeing. Reference to Table 16 of the subject Noise and Vibration Assessment indicates that there may be an exceedance of the nominated LAeq(15minute) night-time noise objective of 23 dBA at drill site AI05 only, in the absence of any of the mitigation measures outlined in Section 4.5.5 of the Assessment. Note that after further site inspections and consideration with NPWS, Apex no longer propose to drill at AI05. This assessment was based on the use of a hammer drill during the night-time. However, it is now understood from the proponent that there will be no hammer drilling, only core drilling on this project. This will result in a predicted LAmax night-time noise level of 51 dBA at the closest residence to drill site AI05. The night-time LAmax noise level (of 51 dBA) is 20 dBA above the background noise level adjacent to this drill site. However, this corresponds to an internal noise level of 31 dBA to 41 dBA. These noise levels are up to 24 dBA lower than the 50-55 dBA noise levels nominated in the ECRTN and are consequently "unlikely to cause awakening reactions". Further, reference to Figure B4 in Appendix B of the DECC's ECRTN indicates that internal maximum noise levels of between 31 dBA and 41 dBA would result in 0% "Probability of Awakening". At the receiver adjacent to drill site AI06 an LAmax night-time noise level of 45 dBA is predicted. This noise level is 15 dBA

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		above the background noise level at this location and corresponds to an internal noise level of 25 dBA to 35 dBA. These noise levels are up to 30 dBA lower than the 50-55 dBA noise levels nominated in the ECRTN and are consequently "unlikely to cause awakening reactions". Further, reference to Figure B4 in Appendix B of the DECC's ECRTN indicates that internal maximum noise levels of between 25 dBA and 35 dBA would result in 0% "Probability of Awakening".
Department of Environment and Climate Change. (DECC).	8.6 To address construction work the Department also recommends the addition of a new Statement of Commitment which states that: "All construction work will be conducted between 7am and 6pm Monday to Friday and between 7am and 1pm Saturdays and at no time Sundays and public holidays, unless inaudible at any residential properties.".	This recommendation is noted and, because construction work relates to site development only and not to the 24 hour drilling activity proposed, it is accepted by Apex.
Department of Environment and Climate Change. (DECC).	8.7 DECC comment that the extraction of coal seam gas appears to require dewatering of the coal seams prior to extraction of gas. They then request that the Statement of Commitments be modified to include the following, "There will be no discharge of polluted waters to either surface	The extraction of coal seam gas does not require dewatering of the coal seams prior to extraction of gas. Apex agree to include in the Statement of Commitments be modified the following, "There will be no discharge of polluted waters to either surface waters or groundwaters from the site activities".

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	waters or groundwaters from the site activities".	
Department of Environment and Climate Change. (DECC).	8.8 DECC requested that Apex commit to preparation and implementation of an Environmental Management Plan and lists the minimum requirements for that EMP.	Agreed. Apex have already committed to this. A Project EMP will be prepared by Apex. The Contractor will also be required to prepare a site-specific EMP before commencing work at each site. This will be consistent with the Apex EMP and will ensure that specific site environmental management requirements are identified before work at that site commences.
Department of Environment and Climate Change. (DECC).	8.9 DECC noted some apparent discrepancies with the area of native vegetation cleared.	The "apparent discrepancy" arises as a result of three boreholes over Metropolitan Colliery being removed from the proposal immediately prior to lodging the EA for review. In agreement with the DoP, the main volume of the EA was modified to reflect this reduction in boreholes (and subsequent reduction in areas affected). The specialist consultant report (Biosis) was not modified. The change was described in the EA (p59 Section 4.3.1).
Department of Environment and Climate Change. (DECC).	8.10 DECC commented on the need to clear Coastal Upland Swamp in relation to AI10.	An additional site inspection and assessment of Borehole AI10 was undertaken on 2nd June 2009. Water consultants, ecologists and Archaeological specialists participated in the inspection and assessment. It was determined that the proposed site could be relocated approximately 40m to the south southwest. This would locate the borehole south of the Fire Road and on a slightly elevated section of land that did not support any Upland Swamp vegetation community. Apex selected the sites to minimise vegetation disturbance. The sites were selected initially to meet drilling operational requirements and geological targets. The selected sites were then inspected over three days between 3rd to 5th September 2008 by a team consisting of the Apex representative, a drilling contractor representative, three representatives from the Aboriginal community, fauna and flora specialists, surface and groundwater specialists, archaeologists, landowners and Apex's Environmental Consultant. The selected sites were then re-located in response to specific site conditions. In addition, Apex committed to implementing a similar site review and selection process, (including a representative from SCA) at the final site selection immediately prior to drilling set up. Site layout can be modified to maximise use of disturbed area eg along tracks and fire roads, the site layout can be "stretched" and narrowed to maximise utilisation of the already cleared land associated with the track or road.

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Department of Environment and Climate Change. (DECC).	8.11 DECC commented on the impact of clearing Coastal Sandstone Ridgetop Woodland and Sandstone Gully Forest communities. They request a commitment as follows, "In the event where clearing of the Coastal Sandstone Ridgetop Woodland Forest communities cannot be avoided, any disturbance to these vegetation communities will be to the minimum extent necessary when undertaking the activity at the site".	Refer response to **Item 8.10** above and to **Item 6.2**. Apex selected the sites to minimise vegetation disturbance. The sites were selected initially to meet drilling operational requirements and geological targets. The selected sites were then inspected over three days between 3rd to 5th September 2008 by a team consisting of the Apex representative, a drilling contractor representative, three representatives from the Aboriginal community, fauna and flora specialists, surface and groundwater specialists, archaeologists, landowners and Apex's Environmental Consultant. The selected sites were then re-located in response to in specific site conditions. In addition, Apex committed to implementing a similar site review and selection process, (including a representative from SCA) at the final site selection immediately prior to drilling set up. Site layout can be modified to maximise use of disturbed area eg along tracks and fire roads, the site layout can be "stretched" and narrowed to maximise utilisation of the already cleared land associated with the track or road. The commitment recommended by DECC is acceptable to Apex.
Department of Environment and Climate Change. (DECC).	8.12 DECC requested the following approval condition, "Seed banks will be established for each of these boreholes and at the conclusion of the testing program the areas would be rehabilitated to the satisfaction of DECC".	Apex do not believe it is necessary to establish a seed bank for every borehole site. The Environmental Management Plan for the project includes provision for a revegetation procedure that has lead to high quality revegetation success at various borehole sites which are of a similar size and nature to those identified in the current proposal. Given the small area of vegetation that will be disturbed by the proposal, the continuity of these vegetation types in the vicinity of the boreholes sites and the proposed revegetation methodology, it is not considered necessary to establish a separate seed bank for rehabilitation purposes. As identified in the proposed rehabilitation methodology, should revegetation of the disturbed areas proceed at an unsatisfactory pace, seed or propagated plant material sourced from vegetation adjacent to the disturbance footprint could be easily employed at each site to improve the revegetation success.
Department of Environment and Climate Change. (DECC).	8.13 DECC commented on matters pertaining to O'Hares Creek Shale Forest Community associated with boreholes AI05, AI06	**Section 4.2 of the Biosis Research – Terrestrial Flora and Fauna Assessment** acknowledges the presence of Sydney Shale Ironstone Cap Forest within the study area. This section of the report and again specifically in **Section 4.2.1** of the report identifies that none of the boreholes are located within any EEC.

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	and AI13. This is an Endangered Ecological Community (EEC) and would require specified assessment.	
Department of Environment and Climate Change. (DECC).	8.14 Boreholes AI15 and AI17 are located on land that was gazetted on 2 March 2009 and is now part of Dharawal State Conservation Area (SCA). This gazettal occurred subsequent to lodgement of the EA. Borehole AI05 is located in the SCA and this was identified in the EA. DECC identify AI05 as being located in a frog inhabited area. DECC requested relocating borehole AI05 and also suggested a commitment as follows, "All activities associated with AI05, AI15 and AI17 must be carried out in accordance with the Dharawal Nature Reserve and State Conservation Area Plan of Management (2006), the National Parks and Wildlife Act 1974 and Regulations, and the Threatened Species	The location of Borehole AI05 was reviewed and discussions held with NPWS. Apex has decided to relocate Borehole AI05 to an area of Crown Land adjacent to the Darkes Forest Community Hall. This area of land has been radically disturbed and supports mown grass providing a fire break around the Community Hall and Fire Station. A borehole can be located on this site without interfering in its use as a Community Hall and Fire Station. Apex notes the incorporation of Borehole sites AIO15 and AI17 into the Dharawal State Conservation Area. This occurred subsequent to the EA being available for review. Apex agrees to the commitment suggested by DECC provided it is not interpreted as prohibiting the operation of Boreholes AI15 and AI17. Apex will work with NPWS to ensure activities are undertaken in a way that helps achieve the objectives of the Management Plan.

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	Conservation Act.	
Department of Environment and Climate Change. (DECC).	8.15 DECC requested that Apex commit to repairing and damage NPWS access roads and tracks.	Agree. Security bond with DPI-Mineral Resources will also be relevant to control of this commitment.
Department of Environment and Climate Change. (DECC).	8.16 DECC recommended that DoP obtain copies of correspondence with Aboriginal communities in relation to the Aboriginal Cultural Heritage Study.	Correspondence that has been received has been forwarded to the Department of Planning in an updated **Biosis Report dated March 2009**.
9. Wollongong City Council.	In general Council is supportive of the proposal as there are significant and real environmental benefits in utilising such a resource as an alternate and additional energy source. They make the following comments. 9.1 Because of its KCl content, the drilling mud will need to be appropriately contained on site and disposed of at an approved waste disposal site.	The spent drilling fluid will need to be appropriately contained on site at all times and will be disposed of at completion of each borehole to an approved waste disposal site. In accord with standard practice, mud material will be left in the sumps, and will be covered with soil material prior to revegetation.
Wollongong City Council.	9.2 Waste water from cleaning machinery should be collected and	Any waste water generated from cleaning machinery or the drill rig etc will be contained on site with drilling fluid pit or tanks, transferred to tanker and disposed of to an approved waste disposal site.

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	contained in portable tanks and disposed of at an approved waste disposal site. No such waste water should be permitted to be discharged in the local creeks or drainage lines.	No waste water will be discharged into local creeks or drainage lines.
Wollongong City Council.	9.3 Mine water collected during the process should be contained in portable tanks and disposed of at an approved waste disposal site.	It is highly unlikely that any water contained in goafs drilled into or through would be transferred to the surface as the drilling fluid system will always be slightly overbalanced pressure-wise to the formation pressure (due to friction, rock chips and cuttings etc). Extensive detail has been provided in the EA on site containment of drilling fluid (which, below the Hawkesbury Sandstone, would generally be 3% potassium chloride; KCl). This additive is required to both ensure drilling through hard and dispersive clay shales and to provide weighting to the fluid so that it overcomes any pressure of water exogenous to the hole which may have gas pressure behind it. All spent drilling fluid, including any mine water adventitiously transferred to the surface with the recirculating fluid will be contained on site and tankered off site as and when necessary (or at borehole completion) and disposed of at an approved waste disposal site.
Wollongong City Council.	9.4 Topsoil should not be located from one site to another.	Agree. Not proposed and will be addressed in EMP documentation.
Wollongong City Council.	9.5 Cut and fill for the positioning of the drill rig must be kept to a minimum.	Agree. Cut and fill required for safety and sites have been selected accordingly to minimise requirement. Would be addressed in EMP documentation.
Wollongong City Council.	9.6 After completion the disturbed areas will be replanted with native species and monitored and watered regularly to ensure their	Note that replanting is proposed only if, 6 months after rehabilitation, soil return and seeding have not been successful. There will be no need to water, as this is a high rainfall area, making it unnecessary and, if implemented, it would result in increasing the amount of site access required.

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	establishment and survival.	
Wollongong City Council.	9.7 Drilling residue to be appropriately contained and removed from site.	Drilling residues will be contained in the sumps. It is standard practice (and preferable) to leave this material in the sump rather than remove it from the site. The material is allowed to dry and compact in-situ and is then covered with stockpiled topsoil during rehabilitation.
Wollongong City Council.	9.8 Aboriginal community comments should be included.	Correspondence that has been received has been forwarded to the Department of Planning in an updated **Biosis Report dated March 2009.**
Wollongong City Council.	9.9 The Council requested that DoP consider the Council's "Combined City Wide and City Centre Section 94A Development Contribution Plan 2008", in its assessment of the project and imposition of any conditions of approval.	Apex believe that this Plan is not relevant to their application. Paragraph 7 of the Wollongong City Council Section 94A Development Contributions Plan 2008 limits the application of the Plan to development for which Council has granted consent. The Minister is the determining authority for this application. Paragraph 8 identifies that the Plan applies to all applications for development consent and complying development certificates required to be made under Part 4 of the Act. This application has been made under Part 3A of the Act.
Wollongong City Council.	The Traffic Section of Wollongong City Council lodged a separate submission. They have reviewed the documentation and raise no concerns, suggesting the following conditions be imposed on any approval. 9.10 Parking arrangements should be in accordance with AS2890.	Apex do not believe that this Standard is relevant to the type of parking required for this exploration development. Parking arrangements will be temporary and designed to minimise site disturbance. The Site Management Plan will address safety issues associated with vehicle movement and parking.

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Wollongong City Council.	9.11 Any proposed structures adjacent to the driveway shall comply with the latest requirements of the latest version of AS/NZ 2890.2.	Apex are not proposing structures adjacent to any driveway.
Wollongong City Council.	9.12 As part of an application for a permit under Section 138 of the Roads Act 1993, a Site Management, Pedestrian and Traffic Management Plan shall be submitted to the Council's Manager Regulation and Enforcement for approval prior to the works commencing on the site. Council specify the objectives, contents and matters to be addressed in the Plan.	Apex would engage a recognised Traffic Management Consultant to prepare the appropriate Traffic Management Plan in accordance with the requirements of both Council and RTA.
Wollongong City Council.	9.13 If a local road closure is required, an approval must be obtained from the City of Wollongong Traffic Committee.	Apex do not propose to close a local road. Should this need arise, approval would be sought from the Traffic Committee as requested.
10. Environment Illawarra	This is a submission from a conservation group stated to represent 12 of the major environmental protection groups working in the	**Recirculating or spent drilling fluid is not particularly toxic for the following reasons:** • While drilling through the Hawkesbury Sandstone, it is proposed to use only local drinking water as the drilling fluid. • For drilling all strata below the Hawkesbury Sandstone, it is proposed to use only 3% potassium chloride (3% KCl)

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	Illawarra. They are extremely concerned about the potential for environmental damage to Sydney's water catchment. They are also aware of major impacts in other areas associated with similar gas exploration proposals. They attached a copy of a report to their submission. CM Atkinson 2005, "Coal Bed Methane Hazards in NSW".	dissolved in drinking water as the drilling fluid. Potassium chloride is a neutral pH, relatively harmless salt. The only other additive which might be added is a biodegradable starch-based gel. • It is expected that only minor amounts of groundwater, perhaps driven by initial 'pulses' of gas pressure, would be brought to the surface with recirculating drilling fluid. Any groundwater make will be continually monitored in real time through increased surface volume in pits/tanks, and water-diluted fluid returns. • The drilling fluid system will always be slightly overbalanced pressure-wise to the formation pressure (due to friction, rock chips, cuttings etc). It is unlikely there would be significant impact of formation waters on such an overbalanced fluid system unless there is a very strong and productive (high flow rate) water 'kick' from a high pressure zone (i.e. artesian, gas over pressure) into the well. There is no reason to believe such conditions would be encountered in the exploration area. • In the view of Apex, the only 'aquifer' of an environmentally critical nature to this project is groundwater located within the Hawkesbury Sandstone. The Sandstone hosts upland swamps which are embedded in shallow, unconfined hillslope aquifers in weathered sandstone and hence are groundwater dependent ecosystems. To minimise the likelihood of any possible loss of drilling fluid upgradient of these hillslope aquifers Apex propose to drill the Hawkesbury Sandstone-hosted surface hole section with fresh water i.e. Sydney drinking water tankered onto site in tankers licensed for the transport of drinking water. It is noted that it is typical in the drilling industry to drill the top section of the borehole with fresh water (where surface water sands may be found). In the event of any drilling problems the only additive proposed to be used is a biodegradable starch-based gel 'mud'. • Estimated drilling time for 100 m of Hawkesbury Sandstone strata is 24 hours. It is believed that leakage of drilling fluid into the weathered bedding planes etc of the Hawkesbury should be minimal over such a period. • It is planned that every proposed borehole will have a surface casing set at a nominal 100 m depth. This will case off (i.e. isolate with cement and steel casing) the upper Hawkesbury Sandstone from any further losses from the rest of the well. • Extensive detail has been provided in the EA on site containment of drilling fluid (which, below the Hawkesbury Sandstone, would generally be 3% potassium chloride; 3% KCl). This additive is required to both ensure drilling through hard and dispersive clay shales and to provide weighting to the fluid so that it overcomes any pressure of water exogenous to the hole which may have gas pressure behind it. • All spent drilling fluid, including any groundwater adventitiously transferred to the surface with the recirculating fluid will be contained on site and tankered off site as and when necessary (or at borehole completion).

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		The stormwater runoff detaining downslope bund walls are neither 'simple, nor small' for the following reasons: • For the majority of sites which have a slope <5% the size of the storm for which stormwater runoff is captured and detained, generally for at least 24 hours (to allow settling) and then discharged through silt fences and hay bales etc is a one in 20 year, 6 hour storm of 42 mm magnitude generating a total volume of runoff not exceeding 190 m^3. • For the majority of sites which have a slope >5% the size of the storm for which stormwater runoff is captured and detained, generally for at least 24 hours (to allow settling) and then discharged through silt fences and hay bales etc is a one in 20 year, 10 hour storm of 84 mm magnitude generating a total volume of runoff not exceeding 380 m^3. **The use of tarpaulins to cover inground drilling fluid sumps in the case of heavy rainfall is considered very reasonable for the following reasons:** • Should inground sumps be used (rather than tanks or tankers) there would be two such sumps of no more than 25 m^3 each (i.e. approximately 3 m x 4 m x 2 m deep). • Thus for a site of low <5% slope the minimum dilution factor which would apply to the 3% potassium chloride drilling fluid on the event that it was all mixed with the maximum amount of stormwater runoff detained behind the bund wall would be (190+50)/50 = 4.8 times. This would reduce the maximum potassium chloride concentration of site runoff to about 0.6% potassium chloride. • Conversely for the steeper site of >5% slope the minimum dilution factor which would apply to the 3% potassium chloride drilling fluid on the event that it was all mixed with the maximum amount of stormwater runoff detained behind the bund wall would be (380+50)/50 = 8.6 times. This would reduce the maximum potassium chloride concentration of site runoff to about 0.3%. • Noting well that these are minimum dilutions which would occur in the event the tarpaulins would be completely swept away and that potassium chloride is a neutral pH harmless salt, it is not considered that release of this diluted salt solution (generally after detention for at least 24 hours to allow for settling of suspended clays etc.) could have a significant impact on down gradient swamps or streams or pose a risk to the integrity of the catchment-based Sydney drinking water supply. • There has indeed been extensive prior investigation in the structure of the local groundwater systems. There have been a significant number of independent consultant study reports conducted on groundwater environments within the Metropolitan Mine lease area (which includes part of the proposed exploration area and its immediate surroundings. These study reports include estimates of storativity, hydraulic conductivity and flow directions (heads) etc particularly over the last 2 years. These study reports are: Heritage Computing, (2008); SCT Operations,

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		(2008); Merrick, (2007); SCT Operations, (2007); Waring et al (ANSTO), (2007); Geosensing Solutions, (2008). • These studies have been carried out in relation to impacts of coal mining on deep hydrogeology and related stakeholder issues/concerns and have almost invariably been supplied to all stakeholders including DWE, SCA, DSC, DECC DoP etc. • Groundwaters investigated in the above-listed study reports have been investigated in accordance with DWE guidelines "Groundwater Monitoring Guidelines for Mine Sites, 2003" and relevant Australian standards. • The stratigraphy, lithology, hydrogeology and geochemistry of the Southern Coalfield is very well understood. The wider area generally outside of the exploration area still mostly within the Woronora Plateau but also including analogous areas based on Triassic and Permian Sandstones has also been subject to a significant number of independent consultant study reports conducted on groundwater environments. These include estimates of storativity, hydraulic conductivity and flow directions (heads) etc particularly over the last 5 years, including in the BHP Billiton Dendrobium Mine lease area lying to the immediate south of the proposed exploration area. These studies are principally: Heritage Consulting, (2009); Madden, (2009); Ecoengineers, (2008); Kellog, Brown and Root, (2008); Merrick, (2007); GHD Geotechnics, (2007); Hammond, (2007); Alkhatib, M. and Merrick, N.P., (2006); Ecoengineers, (2006); Grey and Ross, (2003); Bennet et al. (2003). • These studies have been carried out in relation to impacts of coal mining on deep hydrogeology and related stakeholder issues/concerns and have almost invariably been supplied to all stakeholders including DWE, SCA, DSC, DECC DoP etc. **Major references cited above are tabulated below:** Geosensing Solutions (2008) A compilation of surface geological features in the western portion of Metropolitan Colliery. April 2008. GHD Geotechnics (2007) Dendrobium Area 3, Predicted Hydrogeologic Performance. Attachment F to the Dendrobium Area 3 Environmental Assessment. Gilbert and Associates (2007) Review of Possible Effects of Subsidence on Surface Drainages for Subsidence Management Plan (Longwall Panels 18 to 19A). Ecoengineers Pty Ltd (2006) Assessment of Catchment Hydrological Effects of Longwall Mining by Elouera Colliery Stage 1: Establishment of a Practical and Theoretical Framework. Report 2006/05A for BHP Billiton, August 2006.

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		Merrick, N. P. (2007) Groundwater information provided by piezometric monitoring in the Longwall 10 goaf hole at Metropolitan Colliery. AccessUTS Pty Ltd. for Helensburgh Coal Pty Ltd. Project C07/44/001, September 2007, 13p. Merrick, N.P. (2007) A Review of Groundwater Issues Pertaining to Underground Mining in the Southern Coalfield. AccessUTS Report for NSW Minerals Council, Project C07/044/004. Final Report July 2007. Heritage Consulting (2008) Metropolitan Coal Project Groundwater Assessment. A Hydrogeological Assessment in Support of Metropolitan Colliery Longwalls 20 to 44 Environmental Assessment. Project Number: MET-06-02 August 2008. Heritage Consulting Pty Ltd (2009) Dendrobium Colliery Groundwater Assessment. Mine Inflow Review, Conceptualisation and Preliminary Groundwater Modelling. February 2009 (for BHP Billiton Illawarra Coal). Report HC2009/2 Merrick, N.P. (2007) A Review of Groundwater Issues Pertaining to Underground Mining in the Southern Coalfield. AccessUTS Report for NSW Minerals Council, Project C07/044/004. Final Report July 2007. SCT Operations Pty Ltd (2007) Summary of Results of Longwall 10 Goaf Hole Monitoring. Report No. MET3131 for Helensburgh Coal Pty Ltd, 30 May 2007. 16p & Appendices & CD. SCT Operations Pty Ltd (2008) Preliminary Results of VW Piezometer installation In Exploration Hole PM02. Waring, C., Hankin, S., and Peterson, M. (2007) Longwall 10 Goaf Hole Hydro-Geophysical and Hydro-Geochemical Investigations. ANSTO Report C-949 for Metropolitan Colliery, June 2007. 20p.
11. Northern Illawarra Residents Action Group	• Some of the risks associated with this proposal include further loss of water supplies, water contamination, and continued deterioration of the health of threatened flora and fauna species and their habitats. • The Environment Assessment report recognises the likelihood	The EA recognises the existence of deep groundwaters associated with certain strata which may be potentially ecotoxic if brought to the surface in sufficient quantity and released to a local upland swamp or other form of receiving water. The strata in which such waters reside were clearly identified. There is a large amount of hydrogeological information in the public domain and previously made available to NSW government departments in respect to the Metropolitan Mine lease area (which includes part of the proposed exploration area and its immediate surroundings). These reports include estimates of storativity, hydraulic conductivity and flow directions (heads) etc particularly over the last 2 years. These reports are mainly: Heritage Computing, (2008); SCT Operations, 92008); Merrick, (2007); SCT Operations, (2007); Waring et al (ANSTO), (2007); Geosensing Solutions, (2008). The full reference list is tabulated below. Furthermore, the stratigraphy, lithology, hydrogeology and geochemistry of the Southern Coalfield is well understood. The wider area generally outside of the exploration area still mostly within the Woronora Plateau but also including analogous

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	of toxic groundwater but there is very little information about groundwater, its quality, location, age or movement, either horizontally or vertically. • Not only is there lack of scientific data to back up the proposal, but the report also recognises that there will quite possibly be a release of contaminated groundwater into the catchments from the proposed containments. • The report recognises the presence of habitat for a large number of threatened species, but does not allow that there will be an impact on these species. • NIRAG asks that this proposal be referred to the Minister for the Environment as a Matter of National Environmental Significance.	areas based on Triassic and Permian Sandstones has also been subject to a significant number of independent consultant study reports conducted on groundwater environments. These include estimates of storativity, hydraulic conductivity and flow directions (heads) etc particularly over the last 5 years, including in the BHP Billiton Dendrobium Mine lease area lying to the immediate south of the proposed exploration area. These studies are principally: Heritage Consulting, (2009); Madden, (2009); Ecoengineers, (2008); Kellog, Brown and Root, (2008); Merrick, (2007); GHD Geotechnics, (2007); Hammond, (2007); Alkhatib, M. and Merrick, N.P., (2006); Ecoengineers, (2006); Grey and Ross, (20030; Bennet et al. (2003). Thus adequate information is indeed available prior to exploration drilling for coal seam gas (CSG) in the area. The assertion that there is a lack of scientific data on the hydrogeology of the exploration area is completely untrue. The EA recognises that there could be a release of contaminated groundwater into the catchments if, and only if, normal best practice management measures associated with exploration drilling for CSG were not in place. However, normal best practice management measures will be in place and hence the risk of such a release is very small. A summary of the local hydrogeological background and the best practice management measures which will be followed is as follows: • Only the upper Hawkesbury Sandstone is host to groundwater dependent ecosystems such as the upland swamps and the draining streams of near-pristine Sydney Catchment Authority Special Metropolitan Areas. • Only the upper Hawkesbury Sandstone is host to groundwaters which may drain to the lakes Woronora or Cataract i.e. Sydney drinking water storages. • There are no recognised aquifers, nor recognised groundwater resources (as per NSW DLWC guidelines) nor deep groundwater-dependent ecosystems in the exploration area. • Groundwaters encountered during coal mining in the area over more than a century have been found to be of insufficient flow/volume and variable quality. It is expected that only minor amounts of groundwater, perhaps driven by initial 'pulses' of gas pressure would be brought to the surface with recirculating drilling fluid. Any groundwater make will be continually monitored in real time through increased surface volume in pits/tanks, and water-diluted fluid returns. • Apex believe that the only 'aquifer' of an environmentally critical nature to this project is groundwater located within the Hawkesbury Sandstone. The Sandstone hosts upland swamps which are embedded in shallow, unconfined hillslope aquifers in weathered sandstone and hence are groundwater dependent ecosystems. To minimise the likelihood of any possible loss of drilling fluid upgradient of these hillslope aquifers Apex propose to drill the Hawkesbury Sandstone-hosted surface hole section with fresh water i.e. Sydney drinking water tankered onto site in

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		tankers licensed for the transport of drinking water. It is noted that it is typical in the drilling industry to drill the top section of the borehole with fresh water (where surface water sands may be found). In the event of any drilling problems the only additive proposed to be used is a biodegradable starch-based gel 'mud'. • Estimated drilling time for 100 m of Hawkesbury Sandstone strata is 24 hours. It is believed that the leakage of drilling fluid into the weathered bedding planes etc of the Hawkesbury Sandstone should be minimal over such a period. • Each well (i.e. all of them) are proposed to have a surface casing set at a nominal 100 m depth. This will case off (i.e. isolate with cement and steel casing) the upper Hawkesbury Sandstone from any further losses from the rest of the well. • It is expected that only minor amounts of groundwater, perhaps driven by initial 'pulses' of gas pressure would be brought to the surface with recirculating drilling fluid. Any groundwater make will be continually monitored in real time through increased surface volume in pits/tanks, and water-diluted fluid returns. • The drilling fluid system will always be slightly overbalanced pressure-wise to the formation pressure (due to friction, rock chips and cuttings etc). It is unlikely there would be significant impact of formation waters on such an overbalanced fluid system unless there is a very strong and productive (high flow rate) water 'kick' from a high pressure zone (e.g. artesian, gas over pressure) into the well. There is no reason to believe such conditions would be encountered in the exploration area. • Extensive detail has been provided in the EA on site containment of drilling fluid (which below the Hawkesbury Sandstone would generally be 3% potassium chloride; KCl). This additive is required to both ensure drilling through hard and dispersive clay shales and to provide weighting to the fluid so that it overcomes any pressure of water exogenous to the hole which may have gas pressure behind it. • It is not practical to either monitor-for, or sample for such minor amounts of groundwater. This is due to the facts that the pH and salinity (Electrical Conductivity; EC) will be greatly affected by the geochemical effects of comminution of strata encountered, cation exchange of the majority potassium (noting the drilling fluid is 3% potassium chloride below the Hawkesbury) for other cations and out gassing of dissolved CO_2. For these and other reasons it would therefore generally not be meaningful or productive to run a program of quality monitoring of any groundwaters encountered until well after completion, flushing with clean water and development of the wells for groundwater extraction. • EC measurements can be carried out but for the above reasons would generally not be too indicative of groundwater quality. The drilling fluid system will be slightly overbalanced pressure-wise to the formation pressure

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		(due to friction, rock chips / cuttings etc). It is typically difficult to see significant impact of formation waters into/on an overbalanced fluid system unless there is a very strong and productive (high flow rate) water 'kick' from a high pressure zone (i.e. artesian/, gas over pressure) into the well. There is no reason to believe such conditions would be encountered in the exploration area. • As this is a coal seam gas exploration program there is no brief or need to flush completed boreholes with water or develop them for groundwater extraction. • All spent drilling fluid, including any groundwater adventitiously transferred to the surface with the recirculating fluid will be contained on site and tankered off site as and when necessary (or at borehole completion). **Major references cited above are tabulated below:** Geosensing Solutions (2008) A compilation of surface geological features in the western portion of Metropolitan Colliery. April 2008. GHD Geotechnics (2007) Dendrobium Area 3, Predicted Hydrogeologic Performance. Attachment F to the Dendrobium Area 3 Environmental Assessment. Gilbert and Associates (2007) Review of Possible Effects of Subsidence on Surface Drainages for Subsidence Management Plan (Longwall Panels 18 to 19A). Ecoengineers Pty Ltd (2006) Assessment of Catchment Hydrological Effects of Longwall Mining by Elouera Colliery Stage 1: Establishment of a Practical and Theoretical Framework. Report 2006/05A for BHP Billiton, August 2006. Merrick, N. P. (2007) Groundwater information provided by piezometric monitoring in the Longwall 10 goaf hole at Metropolitan Colliery. AccessUTS Pty Ltd. for Helensburgh Coal Pty Ltd. Project C07/44/001, September 2007, 13p. Merrick, N.P. (2007) A Review of Groundwater Issues Pertaining to Underground Mining in the Southern Coalfield. AccessUTS Report for NSW Minerals Council, Project C07/044/004. Final Report July 2007. Heritage Consulting (2008) Metropolitan Coal Project Groundwater Assessment. A Hydrogeological Assessment in Support of Metropolitan Colliery Longwalls 20 to 44 Environmental Assessment. Project Number: MET-06-02 August 2008. Heritage Consulting Pty Ltd (2009) Dendrobium Colliery Groundwater Assessment. Mine Inflow Review, Conceptualisation

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		and Preliminary Groundwater Modelling. February 2009 (for BHP Billiton Illawarra Coal). Report HC2009/2 Merrick, N.P. (2007) A Review of Groundwater Issues Pertaining to Underground Mining in the Southern Coalfield. AccessUTS Report for NSW Minerals Council, Project C07/044/004. Final Report July 2007. SCT Operations Pty Ltd (2007) Summary of Results of Longwall 10 Goaf Hole Monitoring. Report No. MET3131 for Helensburgh Coal Pty Ltd, 30 May 2007. 16p & Appendices & CD. SCT Operations Pty Ltd (2008) Preliminary Results of VW Piezometer installation In Exploration Hole PM02. Waring, C., Hankin, S., and Peterson, M. (2007) Longwall 10 Goaf Hole Hydro-Geophysical and Hydro-Geochemical Investigations. ANSTO Report C-949 for Metropolitan Colliery, June 2007. 20p. Apex acknowledge that the report recognises the presence of habitat for a number of threatened species. However, Biosis have assessed likely impact in accordance with the legislation and have determined that there will not be a significant impact on these species. Consequently , there is no need for the proposal be referred to the Minister for the Environment as a Matter of National Environmental Significance.