NSW Planning Assessment Commission

Coalpac Consolidation Project Review: Appendices A to E

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Mr Garry Payne AM
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14 December 2012

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Appendix A: Minister's Terms of Reference

Request to the Planning Assessment Commission

Coalpac Consolidation Project

Section 23D(1)(b)(ii) of the *Environmental Planning and Assessment Act 1979.*
Clauses 268R(1)(a) and 268V of the *Environmental Planning & Assessment Regulation 2000.*

I, the Minister for Planning and Infrastructure request the Planning Assessment Commission to:

1. Carry out a review of the Coalpac Consolidation Project, and:
   - (a) consider the Environmental Assessment of the project, all issues raised in submissions on the project, and any information provided on the project during the course of the review;
   - (b) assess the merits of the project as a whole, paying particular attention to the potential:
     - local health and amenity impacts of the project, particularly dust, noise and blasting impacts; (noting proximity to village) #
     - biodiversity impacts of the project;
     - water resource impacts of the project; and
   - (c) recommend appropriate measures to avoid, minimise and/or offset these impacts.
2. Conduct public hearings during the carrying out of the review.
3. Submit its final report on the review to me by 14 November 2012, unless the Director-General of the Department of Planning and Infrastructure agrees otherwise.

Brad Hazzard

The Hon Brad Hazzard MP
Minister for Planning & Infrastructure

Sydney 22 JUL 2012 2012

Appendix B: Public Hearings - Summary of Issues Raised and Schedules

As requested by the Minister in his terms of reference, public hearings were held on 19 and 20 September 2012 so that the Commission members carrying out the review could hear peoples' thoughts on the project. The public hearing on 19 September 2012 was held in Lithgow, and 27 people spoke. The public hearing on 20 September 2012 was held in Cullen Bullen and 11 people spoke. The public hearing schedules listing the speakers from both days form part of Appendix B and are available following the dot points below.

All speakers registered prior to the public hearings had lodged a written submission on the application to the Department, and these submissions are available on the Department's website.[1] Some people who spoke at the hearings handed up information to the Commission, which is publicly available on the Commission's website unless it has been requested to be kept confidential.[2]

Below is the Commission's summary of concerns raised at the public hearings, with further information available in the written submissions:

Air Quality

- The project will result in greenhouse gas emissions and contribute to climate change.
- There are several mistakes in the EA about greenhouse emissions.
- The project will add 1.3% to the Australian carbon footprint which is huge.
- Dust impacts - including concern about prior/existing effects; the contents of the dust; particulate levels; and the impact on respiratory system and general health.
- Issues with the air quality modelling raising concerns about its accuracy and also underestimation of the effects (e.g. insufficient number of data points and assumed independence of PM_{10} between background and the project).
- Dust deposits currently affect property (e.g cars, pools, houses and guttering), and grass and tree health. Dust also affects water quality in creeks/rivers, water tanks, and stock water resources.
- Watering ineffective in managing dust.

Noise

- Noise impacts - including concern about prior/current noise levels; sleep disturbance; disturbance to the school students; amenity impacts; and associated mental and physical health effects.
- Background noise levels are being assumed as 30dBA but are often much lower in the area, hence residents will experience a high and unreasonable relative noise impact.
- Potential for residents being affected by noise, but not being within the acquisition or mitigation zones and hence with no recourse.

[1] Department application reference 10_0178: http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=4332

[2] The Commission's application reference R015/12 is available here: http://www.pac.nsw.gov.au/Projects/tabid/77/ctl/viewreview/mid/462/pac/238/view/readonly/myctl/rev/Default.aspx At the bottom of this page is a link to the Department's Coalpac project application page in footnote 1.

- Concern about the proposed noise monitor locations, the accuracy of the locations and the accuracy of the results.

Blasting

- Blasting impacts including vibration, impacts on personal and stock/animal safety and health, potential damage to property, noise, dust, and odour.
- Prior blasting activities have affected houses in the area (e.g. resulting in cracking) which Coalpac has not resolved and this matter needs resolution. There needs to independent dilapidation surveys carried out for houses and for a process to be formalised.
- Restrictions for emergency vehicles and residents during road closures to accommodate blasting are inconvenient, dangerous, and potentially life-threatening.
- Concern about the need and process to temporarily vacate homes during blasting.

Operating hours

- Not supportive of 24-hour operation due to air and noise impacts, and as no respite.
- Coalpac is currently not operating in accordance with its stated operating hours (e.g. 3am train loading, 1am trucks, workers starting earlier and staying later).

Visual

- Visual, scenic and outlook impact for local residents, and also impacting on bushwalkers and regional tourism (e.g. pagodas, the forest landscape).
- Lighting pollution, including a night-glow effect.
- Impacts associated with bunds including visual impact, timing of construction and dust generation.
- The region is trying to promote tourism. Mining detracts from this.

Biodiversity

- Support for the Gardens of Stone Stage II area (which includes part of the project area) to be incorporated into the Gardens of Stone National Park with open-cut mining operations in conflict with designation as a national park.
- Impact on the environment, and the need to apply the precautionary principle.
- The project alienates public land. Ben Bullen State Forest is a public asset and should remain publicly accessible and preserved for future generations.
- The flora and fauna survey and assessment prepared on behalf of the Proponent is incomplete and inaccurate with numerous species omitted/underrepresented (e.g. *Persoonia marginata*). On this basis, a new and independent flora and fauna survey and assessment should be prepared.
- Loss of environmentally valuable and irreplaceable flora, fauna and habitat including endangered ecological communities (EECs) which cannot be reinstated through rehabilitation processes.
- The 'edge effect' impacting on native flora and fauna (e.g. the Pagoda daisy).
- The offsets are not 'like for like' in relation to the pagoda landscape, and flora/fauna/habitat.
- The biodiversity in the project area is unique.

Pagodas

- The pagodas are unique and internationally significant, and they already show evidence of significant and recent cracking that does not appear to be from natural processes. Concern that the project will result in further damage to the pagodas and their collapse.

- Mining up to 50 metres from the pagodas is too close. Need to apply precautionary principle.

Rehabilitation

- Environmental degradation from removal of soil, rock and alteration of landform which cannot be reinstated through rehabilitation processes, for example tree hollows take 100s of years.
- Rehabilitation on the mine site is currently carried out haphazardly, and rehabilitated areas would not be appropriate for inclusion in Gardens of Stone National Park.

Water

- Existing and future water pollution (including of rainwater tanks, stock water supplies, farm dams, creeks/rivers, groundwater, and the Sydney Catchment).
- Non-compliance with licenses and red stain discharge at Invincible Borehole – Long Swamp which has also impacted Coxs River flora and fauna. This discharge should be shut and remedied.
- Potential lowering of the water table affecting availability of water for other users.
- Effect on soil quality and potential for acid-forming material.
- Concern about acid mine drainage.

Traffic

- Number and impacts of truck movements, and need to have overpass/other arrangements in place particularly before sand is trucked.
- Traffic safety and potential conflict with access along Red Springs Road.
- Mud and slurry deposited on the road from the trucks, and the need for a truck wash.

Economics and Justification

- Society needs to move away from coal power generation to alternate renewable sources, and approval of the Project would be contrary to and delay this process.
- General trend to lower energy use in NSW and to lower use of coal, and the project will provide poor quality coal and set a negative precedent.
- Project will not improve the community's short or long-term economic base and more economically and socially beneficial to broaden it with non-mining based industry (e.g. in green energies/renewables, tourism, farming).
- The economic benefits do not outweigh the impacts on the community.
- Impact on property prices. Property prices are also already low due to mining impacts to date and the uncertainty, affecting values of sales to private buyers or to Coalpac, and affecting residents' ability to buy comparable property elsewhere.
- Coalpac money should not be directed to services that Council should be funding through its rates and other funding sources.
- Concern about expansion of mining operations through modifications.
- Potential for the mine to be sold and only the minimum regulatory requirements followed, or for future unforeseen impacts that are then the Government and community's responsibility to resolve (e.g. rehabilitation or future acid mine drainage issues).
- Proposed mining of multiple seams is inefficient compared to say Hunter mines and it is low quality coal.

Health and Social

- Mining operations would be too close of Cullen Bullen village and school effectively forming a 'ring' around the village and being so close the mine will result in amenity and health impacts on the community.
- Residents in Cullen Bullen and the surrounding area currently have lower incomes and quality of health compared to other parts of NSW. The mine will exacerbate these disadvantages, especially impacting on children.
- Personal experiences of poor health (especially respiratory disease) in coalmining areas such as the Hunter, and also locally as open-cut has increased (especially asthma).
- Cumulative effect of existing and proposed numerous mining operations on health, and particularly on childrens' health.
- Potential that approval would force closure of Cullen Bullen School as even if 'compliant' with pollution criteria parents will choose to remove their children to avoid any risks, which would have a large social impact on the village.
- Current and increasing community divisions between those employed by the mine(s) (or not) and also those entitled to acquisition (or not).
- 'Home', family and the local community is something that develops over time and it is intangible, and it is more than a monetary value and it cannot be compensated.
- Coalpac does not provide significant local employment and no apprentices in the mines now.
- Need for Coalpac to make direct funding to offset impacts (e.g. to Medicare).
- Occupational health and safety impacts need assessment for mine workers and workers at Cullen Bullen School.
- The mining will devalue residents' properties.
- Request a health impact assessment.

Aboriginal Heritage

- Aboriginal cultural heritage requires protection and concern about the accuracy of the Proponent's survey as recently a new cave was discovered.

Other

- A number of people made reference to the National Party's recommended 5km buffer between towns and mines, with the project mainly within 5km of Cullen Bullen.
- Real-time monitoring has had limited testing. Lack of confidence in its effectiveness, and it is a monitoring tool and does not actually fix issues that arise.
- Compliance monitoring on noise and air levels should be publicly released in annual reports.
- Don't want to be another Hunter Valley.
- Don't want a shift from underground mining to open-cut mining methods.
- Mining operations would be too close to Cullen Bullen Cemetery, potentially affecting the stability of headstones and disrupting and upsetting mourners through visual impact, blasting and noise pollution.
- The 'edge effect' for adjacent farmers (e.g. feral animals, controlling/security of boundaries).
- Underground combustion impacts including odour, and need to address the issue.
- Cullen Bullen rubbish tip has not been addressed, despite potential pollution and contamination issues.
- Copies of the landholder agreements need to be provided to the Department, Council and the EPA.
- Concern about the review process, loss of appeal rights and actions/procedure of the parties.

- Concern about shift in Council position to not opposing the mine, positions made in public meetings and survey differences raising issue with survey integrity.
- Change in ownership and management and staff of the mines has led to companies and individuals avoiding responsibility.
- Project risk assessment was deficient and Department needs to impose additional mitigation measures.
- Need to monitor and enforce conditions.
- Applying self-regulation or conditions such as 'negligible' damage meaningless and ineffective.
- Coalpac and the mines' prior pollution and non-compliances are evidence of prior poor performance, and lack of confidence about the Proponent's future performance and compliance.
- Coalpac's slow or lack of response to prior complaints (including on dust, noise, damage to property and odour).
- Invitation for the Commission to visit the site accompanied by environmental groups.
- Highwall mining has been subject to failures and collapses.
- Request independent building surveys for damaged houses.

Below is the Commission's summary of matters raised in support at the public hearings, with further information available in the written submissions online.

Economics and justification

- Mining has been an industry in the local area for a long period of time and part of its culture and history.
- Employment in the mines.
- Employment and economic generation for other businesses and the community.
- Direct financial contributions to the community.
- Indirect financial contributions in the local economy and to the community (e.g. from exchange of goods and services/supporting industries).
- Supplier of coal to power stations and business (e.g. Shoalhaven Starches) supporting other industries and their employment base.
- The project would provide a local and reliable coal resource for local power stations.
- The proposal would help to maintain a lower retail electricity price.

Other

- Coalpac has been a better operator of the mines than some prior operators.

COALPAC CONSOLIDATED PROJECT REVIEW 10_0178

LITHGOW

Planning Assessment Commission Public Hearing
Schedule of Speakers (Submitters)

Date & Time: Wednesday, 19 September 2012 from 9.30am
Venue: The Lithgow & District Workmen's Club
Address: 3-7 Tank Street, Lithgow

Indicative Times	Ref.	Speakers
9.30am	L	Dr Neil Shepherd AM (Chair) – Opening Statement
*	1	Wayne Olling
	2	Isabel Higgins
*	3	Keith Muir – Colong Foundation for Wilderness
	4	Anne Dillon
	5	Jacqueline Seraglio
	6	Richard Stiles
*	7	Dr Haydn Washington – Colo Committee
11.10am		**Break**
11.30am	8	Andrew Muir - Lithgow City Council
*	9	Justin McKee and Brian Marshall – Blue Mountains Conservation Society
*	10	Eva Rizana
*	11	Christine Perrers, Tracey Carpenter and Bob Hill – Bathurst Community Climate Action Network
	12	Thomas Ebersoll
	13	Bart Beech

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1.10pm		**Lunch**
2.00pm	14	Speaker withdrew
	15	David Burgess – Total Environment Centre
	16	Reg Larkin
*	17	Graham Dowers – TRUenergy
*	18	Maren Botfield
*	20	Brian Hanley - Manildra
*	22	Chris Jonkers – Lithgow Environment Group
3.40pm - 4.00pm		**Break**
*	21	Ian Brown
	19	Cerin Loane – Nature Conservation Council of NSW
	23	Janis O'Leary
	24	Gae Mulvogue
	25	Speaker withdrew
	26	Ilan Salbe
Meeting Close		

* Used Powerpoint or handed up Submission to Commission Members

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COALPAC CONSOLIDATED PROJECT REVIEW 10_0178

CULLEN BULLEN

Planning Assessment Commission Public Hearing
Schedule of Speakers (Submitters)

Date & Time: Thursday, 20 September 2012 from 9.00am
Venue: Cullen Bullen Progress Association Hall
Address: 37-39 Castlereagh Highway, Cullen Bullen

Indicative Times	Ref.	Speakers
9.00am	CB	Dr Neil Shepherd AM (Chair) – Opening Statement
	1	Darcy William McCann
	2	Velma MacFadden
*	3	Michael Keats
	4	Daniel Bolotin
	5	Beverley Gilbert
	6	Caroline DiMauro
9.50am		**Break**
	7	Brian Emmott
	8	Bruce Tweedie
	9	Luis Cifuentes
	10	John Fuller
	11	Glenda McCann – on behalf of Toni Williams and herself
Meeting Close		

* Handed up Submission to Commission Members

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Appendix C: Meetings Summary

Date	*Summary of Matters Discussed*
2012 09 17 10.30am PAC Offices Department of Planning and Infrastructure	• Mining and operational history at the application site; • Coal market and electricity price context; • Other coal mine applications including Cobbora , Pine Dale Stage 2 Extension and Neubeck; • Types of issues raised in submissions; • Scope of meetings attended by the Department and issues raised in relation to the project; • Status of the Gardens of Stone Stage II; • Impacts on biodiversity and habitat; • Offsets and rehabilitation; • Dust; • Noise, including background noise levels; • Cumulative impacts, particularly on Cullen Bullen; • Risks associated with blasting especially in relation to the pagodas; • Ground and surface water; • Sand mining; • Operational matters including hours and reliance on real-time monitoring and best-practice management; • Underground combustion and impacts including odour and risk of bushfire; and • Highwall mining methodology.
2012 09 17 3.00pm LCC Offices Lithgow City Council (LCC)	• Outcome of local elections; • Referred back to written submission dated 14 September 2012, which states that the Council resolved not to object subject to resolution of a number of matters; • A primary concern is the need to provide a buffer zone to protect the community from impacts from mining operations (being 500m separation between the village, the cemetery, any residences and the mining operations); • LCC prefers imposition of a bond to address any non-compliance with conditions; • LCC support for Option 1 in relation to Red Springs Road; • Need for dilapidation reports to be independent and preference for referral back to the Department – ongoing community concern that needs resolution; • LCC not supportive of trucks going through Cullen Bullen township; • LCC discussions with RMS; • Sand mining is an afterthought and the impacts have not properly assessed, especially truck movements; • Support for real-time monitoring but results need to be reported, annual reports made public, and a feedback loop to ensure compliance; • Concern about the background noise level being applied and resultant noise impacts, due to the relative difference in noise conditions people would be expected to tolerate

Date	*Summary of Matters Discussed*
	within what has typically been a very quiet rural environment; • Concern that the background noise level applied and modelling will underestimate noise impacts with a lead-on effect on mitigation and acquisition rights; • Any landowner agreements should be made available to LCC, the Department and EPA, and need a mediation/dispute resolution process noting resource gaps between mining companies and local residents; • LCC requires information on the bund design and construction timing, noting visual and dust effects and for the bunds and other mitigation to be in place before 24-hour operation commences; • While noting employment generation benefits, LCC's main objective is to protect the community and to not exceed the predicted impacts, and if the predicted impacts will be or are exceeded then the project or its operation needs modification; • LCC outlined issues raised by its consultative committee including reliance on management plans, fires, burnt rehabilitation; and • Already damage to the pagodas which is thought to be associated with Baal Bone.
2012 09 18 8.30am Met at Invincible Colliery Carpark OEH	• Driving tour with OEH officers along fire access trails (see map[3]) with various stops to discuss and demonstrate the following: • Views from the pagodas over the project area; • Consideration of pagoda habitats; • Damage to existing pagodas; • Consideration of different types of vegetation and habitat in different environments (pagodas, talus slopes, gullies, woodland); • Accessibility of the pagodas; • Issues with accessibility related to 4WDs, trail bikes, dogs, fires etc; • The appropriateness of the proposed setback from the pagodas for pagoda habitat protection; and • The suitability of the flora and fauna surveys carried out and the assessment conclusions.
2012 09 18 1.00pm Invincible Colliery	• Briefing by the Proponent on the history of the mines, the project area's context with other mines, and a general overview of the project;[4] • The Proponent organised a helicopter tour for the Commission members over the project area and surrounds

[3] OEH Map, available at www.pac.nsw.gov.au

[4] The documents provided to the Commission by the Proponent at this meeting are available on the Commission website www.pac.nsw.gov.au

Date	*Summary of Matters Discussed*
Coalpac	with the relevant 'hover points' set out in the Proponent's handout;[5] • The Proponent drove the Commission members around the site, and showed them the various stages and quality of rehabilitation including an area that had died off due to the underground combustion; • The Proponent then provided a more detailed briefing on key issues and how these would be mitigated and resolved, including dust, noise, biodiversity, rehabilitation and socio-economic benefits. • Prior highwall mining attempts, the method in general and its application elsewhere; • The amount of coal to be sourced from highwall mining; • The viability of the scheme; • Risks to pagoda habitats and stability, and the pagoda buffer zone; • The impacts on Cullen Bullen village and cemetery, and rationale for the buffer zone in terms of blasting, dust, noise and visual impact; • The use of real-time monitoring and the Proponent's option to work from and stagger its working areas to minimise impacts; • Commission raised concern about the low margin for error in prediction and management of the noise/dust impacts and high reliance on real-time monitoring, which is not guaranteed to deliver the predicted results; • Timing of mitigation measures such as noise attenuation of machinery and bund construction; • Hours of operation; • Consolidation provides the opportunity to upsize and modernise machinery and operations that will have less impact on the community; • Variability of local weather patterns including inversions which influence operations such as blasting and spreading of topsoil; • The Proponent discussed various blasting techniques to minimise potential for damage; • The scope and reliance on management plans; • Product sand timing, market and transportation, which to the Commission appears as an after-thought within the application; • Transport of product coal and sand; • Route of conveyor and interrelationship with Centennial Coal land; • Potential for acid-forming material; • Adequacy of the offset areas with regard to achieving 'like for like';

[5] The documents provided to the Commission by the Proponent for the helicopter ride are available on the Commission website www.pac.nsw.gov.au

Date	*Summary of Matters Discussed*
	• Proponent advised it will provide an ecological assessment of Gulf Mountain being a new proposed offset property; [6] • Rehabilitation processes and effectiveness; • The site's context of significant tracts of conservation lands of similar or better conservation value; • Broader shifts in coal pricing, and the correlation between the price of power and the price of coal which the Commission would discuss with TRUenergy (see below on 17 October 2012); and • Discussion on the rest of the process, with the Commission to set out its specific queries.[7]
2012 10 17 4.00pm PAC Offices TRUenergy – now known as Energy Australia	• Alternative existing and future coal sources available to TRUenergy; • Constraints of alternative coal sources (e.g. rail infrastructure investment requirements in relation to Cobbora); • Price differentials between Coalpac and alternative fuel sources; • Energy Australia's modelling of the interrelationship between coal prices, wholesale electricity prices and retail electricity prices in the NSW energy market; • Specific qualities of coal sourced from Coalpac compared to other sources (e.g. calorific value, moisture, ash content) and any implications for energy generation; and • TRUenergy's reasons for support of the Coalpac proposal.
2012 11 01 12.00pm PAC Offices DRE and Professor Cliff	• Focus of meeting was underground combustion, with other DRE concerns discussed at a separate meeting; • Terminology; • Commission outlined its main concerns at this stage, being risk of external fire (including lack of application of the NSW Rural Fires Act under Part 3A); impact on rehabilitated areas; increased underground combustion by expansion of mining operations; and odour impacts on local residents; • DRE outlined its understanding of the cause and locations of underground combustion on the site being various locations within an OEA in a spur, and in the underground workings from an external source (likely a bushfire or burnt out vehicle); • DRE outlined its efforts to work with Coalpac to resolve the underground combustion impact on the rehabilitated areas, which first came to the attention of DRE in 2007; • DRE advised that in its opinion Coalpac need to appoint an independent expert on underground combustion; • DRE recommendation is for a 1km buffer measured horizontally between the Tyldesley workings and the

[6] This was subsequently submitted under covering letter by Hansen Bailey dated 2 November 2012 and it is available as Appendix D to this report and available on the Commission website www.pac.nsw.gov.au

[7] The letter from the Commission to the Proponent dated 11 October 2012 and the Proponent's response dated 30 October 2012 are available in Appendix D of this report and on the Commission website www.pac.nsw.gov.au

Date	*Summary of Matters Discussed*
	underground combustion, and for no mining above areas affected by underground combustion to provide time to resolve the issue; • DRE concern on potential lowering of the water level in the underground workings due to any increase in risk of combustion; • Potential issues with resolution of underground combustion based on the prior plans, and potential for inaccuracies in the underground workings plans; • Discussions about the Lithgow seam not being particularly prone to spontaneous combustion and slope implications for up-dip/down-dip; • Evidence of dead rehabilitation vegetation on site including implications of underground combustion, gas, slope and other potential factors; • Prof Cliff outlined main areas of risk including potential for intersection of open-cut and existing underground combustion areas, bursting of the East Tyldesley underground dam, and managing existing combustion in the uncompacted highwall/OEA; • Prof Cliff outlined general risk factors with underground combustion and coal; and highwall mining including up-dips, and inaccurate highwall drives and existing compromised pillars underground leading to subsidence/collapse/opening air pathways to fuel existing underground combustion; and • Potential methods for controlling underground combustion and their likely effectiveness in the long term.
2012 11 07 10.30am PAC Offices DRE – represented by the Mine Subsidence Board	• Underground combustion, with DRE expecting the impact will be managed and eventually extinguished, and if the 1km is tied to year 12 then this provides the Proponent time to resolve the issue. Preference for management of underground combustion to be in place, and progressive movement into the 1km zone; • Discussion on various processes to control underground combustion including capping, inundation, exposure and surface spread/extinguishment; • Potential impacts on rehabilitation, and possible alternate sources of damage, and potential risks; • Acid-mine drainage and how to resolve and manage this issue , and whether options set out are sufficient; • Commission reference to submissions raising various matters including the need for leachate tests, and query whether DRE agrees with the recommendations and whether these should be included in the management plan; • Prior acid-mine drainage issues in the Wallerawang Colliery OEA and any commonality with this site; • Sand extraction information and risk; • Discussions about the 20mm vertical movement standard which has been applied to the pagodas – Commission's

Date	*Summary of Matters Discussed*
	question is whether any damage to the pagodas should be accepted, and if not what is a criterion that would guarantee this (noting a range of uncertainties including accuracy of highwall drives, potential for a pillar to give way, and as the coal seam strength is unknown for the highwall area); • DRE considers the survey and highwall mining drives can be accurately done with deviations planned and managed, and main concern is likely to be the structural integrity of the pagodas themselves; • Commission notes no coal seam strength calculations on the site in the proposed highwall area, with potential for variation between estimates and what is actually found (e.g. Ulan) with a factor of safety of 1.3; • DRE advised a factor of safety of 2.1 is 1 in a million, whereas a factor of safety of 1.3 is clearly less; and • The Commission noted DRE's request for a condition on a maximum of 180ha 'open' at any one time.
2012 11 07 12pm PAC Offices OEH	• OEH updated the Commission on the Gardens of Stone Stage II proposal; • Primary Government focus is additions to existing national parks; and prioritisation acquisition of Icons Under Threat – there are currently 5 on the list including Gardens of Stone Stage II; • Issues include resource/mining objections, mix of tenures and the need to maximise connectivity to the existing national parks; • Aboriginal rock shelter discovery from September 2012 and need to verify its archaeological significance and maintain confidentiality of its location; • The scope of the Aboriginal cultural heritage survey and whether it is advisable to protect or collapse the unstable rock shelter; • OEH outlined its findings on the options for mitigating impacts on the flora and fauna associated with the pagodas and surrounds; the significance of additional species report in the project area; and the significance of vegetation on Permian sediments as set out in detail in the additional information provided dated 6 November 2012 (available in Appendix D); • An investment scheme is coming online for 'investment ready' projects, but there is a move away from funding of specific OEH projects; • Discussion on conservation management plans and heads of consideration on matters that should be included down the line, noting the Department does not usually tie these to planning approvals; and • Current Warkworth LEC appeal and potential precedent in relation to offsets.

Date	*Summary of Matters Discussed*
2012 11 15 11am PAC Offices NSW Health	• NSW Health advised the Lithgow LGA is similar to Singleton and it is currently disadvantaged and more susceptible to health impacts, especially Cullen Bullen which is disadvantaged both within the context of the State and the area. Asthma rates in under 5s is high and additive effects with maternal smoking, coal fire burning, the topography causing a 'bowl' effect; • Health provided a Social and Health Profile of Lithgow for the Commission's information;[8] • Currently affected by the power stations and existing mines; • Singleton for example has good public air quality monitoring, which is not available and is required in Lithgow. Lithgow area relies on Bathurst for air quality monitoring; • NSW Health has general concern about noise impacts especially on the school, but has assumed that the EPA will consider this issue in detail and has focussed on the air quality impacts; • NSW Health concern about peak PM_{10} impacts on residents who do not want to be acquired, but will experience extreme exposure and health impacts; • In Cullen Bullen there is a potential for a 30% increase effectively doubling PM_{10} from this project alone. The extent of increase is very high being 20 $\mu g/m^3$ at worst and otherwise between 5 $\mu g/m^3$ and 20 $\mu g/m^3$). Likely effects include increases in asthma, heart disease and health impacts will increase even when relying on all measures being applied and noting residents are starting off at a high base due to background poor health; • Discussion on the impact differences between short-term/peak and averaged amounts and cumulative airshed effects. Proposed real time management system will shave off the peaks but not necessarily reduce the annual average; • NSW Health advised Cullen Bullen currently experiences 13-14 $\mu g/m^3$ per annum and this would increase to over 20 $\mu g/m^3$ per annum (the WHO guideline is 20 $\mu g/m^3$ per annum but NSW Health notes the guidelines are ultimately a number on a sliding scale and don't in themselves determine health impacts). It is the increase that determines the impact; • NSW Health focus has been on PM_{10} as more of an issue than $PM_{2.5}$ in relation to mine impacts with a paper (Sheppeard et al, *Health effects of coarse particles*)[9] handed up with the main health effects on the respiratory tract system and potential to result in chronic community health impacts; • Evidence base in the Hunter region is broadening with studies commencing shortly and its modelling system is to be validated in 2013. Delay between first impacts and studies

[8] Available on the Commission's website www.pac.nsw.gov.au
[9] Available on the Commission's website www.pac.nsw.gov.au

Date	*Summary of Matters Discussed*
	being carried out; • Air quality management for this project has a number of challenges with reliance on a range of measures to mitigate impacts, and real-time monitoring can be operationally difficult; and • The 24-hour average of 150 $\mu g/m^3$ that triggers acquisition will affect peoples' health and warnings are not issued to the public. Health does not support this high PM_{10} level.
2012 11 30 10.40am Teleconference Energy Australia	• Differences between the modelling and forecasts by Energy Australia (EA)[10], and that of ACIL prepared on behalf of EA;[11] • For the impact of coal supply on electricity price the only change modelled is from removal of Coalpac from the equation (i.e. not considering broader electricity/market issues or demand changes etc); • EA explained that modelled impacts included both MPPS and WPS, not just MPPS. EA pools the coal resources for both WPS and MPPS. The Commission advised the Coalpac application is only to service MPPS and for limited supply to WPS; • Potential timing for closure of both WPS and MPPS and factors that would influence this decision; • EA responded to questions on various assumptions and references set out in its modelling and report; and • Confirmation of the confidentiality status of documents provided.
2012 11 30 11.30am PAC Offices Coalpac	• The Commission noted its receipt of the 'Gulf Mountain' information, but it is limited in how much comment it can make due to timeframes and lack of other input (e.g. OEH) and its recommendation in this regard is likely to be that OEH's views of Gulf Mountain be sought prior to any finalisation of the Department's assessment report; • Coalpac outlined its lengthy and on-going discussions with OEH on the flora/fauna surveys and offsets. Shift in government direction re offsets through the process from focussing on agricultural land to instead focus on 'like for like' and more intact offsets; • Potential for Warkworth Land and Environment Court case to set a precedent on offsets; • The scope and focus of the Proponent's flora survey on threatened species, and how it has been perceived publicly and potential to give more weight to ROTAP and other non-threatened flora species; • The Commission advised it will essentially make two recommendations being whether the project should go ahead, and if so what issues need resolving; • Commission advised it has a number of issues including in

[10] As supplied at the prior meeting on 17 October 2012

[11] As supplied under cover letter dated 2 November 2012. The cover letter is available in Appendix D, but the attached report is commercial-in-confidence and not publicly available.

Date	*Summary of Matters Discussed*
	relation to highwall mining distances to the cliffs/pagodas (and hence their stability), underground combustion, flora/fauna, air quality, noise, traffic over the Blue Mountains from transportation of sand, blasting and rehabilitation; • Coalpac concern that it perceives a shift in the Commission's view from being broadly positive to now broadly negative on the project; • Coalpac advised it has recently met again with DRE, and the additional information and modifications (e.g. hours of operation, Boral as a potential sand customer with rail access) already provided to resolve these issues. Particular reference was made to an independent audit of the noise modelling that would be provided to the Commission, and its understanding of the process to be followed prior to full operating hours being implemented; • Coalpac confirmed it has agreements in place with 3 of 4 noise impacted properties, and notes that EA sets out the 'worst-case' scenario; • Commission's concern that 'worst-case' scenarios do eventuate, and that if noise and air predictions are slightly out, due to their butting against the criteria, that significantly more residents would be affected (e.g. PM_{10} impacts and discussions with NSW Health); • Commission reiterated its timeframe to complete its review, and the process after it is received by the Department through to any subsequent determination. The Commission also outlined who it has met, what it has considered in its review, and its process for making available additional information it has received; and • Coalpac concern with transparency of review process (e.g. access to correspondence from other agencies) and lack of government consistency and policy framework (e.g. on final voids) and the cost, process and lack of transparency/integrity that results for Proponents.
2012 12 10 1.30pm PAC Offices Department of Planning and Infrastructure	• The Commission briefed the Department on the draft outcomes from the review.

Appendix D: Correspondence from and to the Commission during the Review

Note:
The purpose of Appendix D is to provide ready access to primary correspondence sent by and considered by the Commission in the course of its review.

Therefore, the correspondence in Appendix D is not a complete record of all correspondence sent and received by the Commission during the course of its review. The correspondence in Appendix D is also not necessarily complete, with some elements removed such as forwarded information or technical appendices.

Complete copies of correspondence, and other correspondence and submissions not referred to or included in Appendix D will be made available in due course on the Commission's website www.pac.nsw.gov.au (search under Projects for Coalpac, and the Commission's reference is R015/12).

Contact: Sera Taschner
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Ms Sally Barnes
Chief Executive
Office of Environment & Heritage
PO BOX A290
SYDNEY SOUTH NSW 1232

25 September 2012

Dear Ms Barnes

Proposed Coalpac Consolidation Project – Castlereagh Highway, Cullen Bullen

The Commission is currently conducting a Review, under section 23D(1)(b)(ii) and Schedule 3 of the *NSW Environmental Planning and Assessment Act 1979*, of the Coalpac Consolidation Project Proposal (10_0178) at Cullen Bullen, near Lithgow. The terms of reference are to:

Carry out a review of the Coalpac Consolidation Project, and:

a. *Consider the Environmental Assessment of the project, all issues raised in submissions on the project, and any information provided on the project during the course of the review;*
b. *Assess the merits of the project as a whole, paying particular attention to the potential:*
   - *Local health and amenity impacts of the project, particularly dust, noise and blasting impacts noting its proximity to the village;*
   - *Biodiversity impacts of the project;*
   - *Water resource impacts of the project; and*
c. *Recommend appropriate measures to avoid, minimise and/or offset these impacts.*

The Commission conducted an inspection of the project area and surrounds accompanied by officers from your department on 18 September 2012. Two issues emerged from the Commission's inspection:

(i) that a briefing from staff involved in any proposal for progressing Gardens of Stone 2 could assist the Commission in preparing its report; and

(ii) the project as currently presented involves open-cut mining to within 50m of the pagodas and escarpment to enable access for the high-wall mining equipment to the upper level coal seams beneath these features. While there are arguments as to whether a 50m setback will preserve the integrity of the geological features, little consideration appears to have been given to the impacts on native species that utilize either the pagoda or gully habitats exclusively, or to those species (such as the broad-headed snake, brush tail rock wallaby and lyrebird) which require access to both habitat types either seasonally or on some other basis.

The terms of reference for the review require the Commission to recommend appropriate measures to avoid, minimise and/or offset these impacts.

While a recommendation for refusal may satisfy the avoidance component, in the Commission's view it must also consider options for more effective mitigation of impacts in the event that the project proceeds.

The Commission would appreciate the considered views of OEH on what such mitigation options might entail in relation to the flora and fauna of the pagodas and adjacent areas and how any such options might be implemented. In this context the Commission notes that simply extending the 50m buffer (to some other fixed distance such as 100m or 310m as proposed by different Special Interest Groups) may be simplistic and that a more sophisticated assessment of the critical areas of habitat proposed for high-wall mining may be more appropriate.

In addition to the above matters, it appears from the Special Interest Group submissions that additional threatened species have been found in the project area to those reported in the EA. Can OEH please advise the Commission on the significance of these additional reports and any steps that may be required to avoid, mitigate or manage any impacts from the project on these species?

Could you please advise as soon as possible whether you would be able to assist the Commission with these requests? The Commission's report is due mid November 2012 and timeframes for assembling information are therefore tight.

Following the Commission's briefing by OEH and in addition to the above, two further issues have arisen that may require advice from the OEH.

The first relates to the presentation by the Colong Foundation at the Public Hearing. They assert that underlying geology of the Project Area is different to the surrounding areas in that the Project area contains Permian sediments of the Illawarra Group that have produced rolling and flattish terrain of higher nutrient levels and that this has implications for the conservation value of the project area. Further details on this are being sought from the Colong Foundation. Once this information is to hand the Commission is likely to request advice from OEH as to the importance of this for considering potential biodiversity impacts of the project.

The second is that on 19 September 2012 OEH registered an Aboriginal cave site [redacted] within the Project area, with a subsequent site visit carried out on 21 September 2012. The proponent has provided initial advice it is in consultation with OEH, and that it intends to carry out an assessment and include the cave within its proposed Aboriginal Archaeological and Cultural Heritage Management Plan for the Project. Following the proponent's formal response, it is anticipated that the OEH will advise the Department and Commission on the significance of this discovery, and whether the proponent's suggested measures would avoid, mitigate or manage any impact on the cave.

Ms Sera Taschner (Commission Secretariat) can assist with any enquiries concerning the Commission's requests on (02) 9383 2117 or email sera.taschner@planning.nsw.gov.au.

Yours sincerely

Dr Neil Shepherd AM
Chair, Coalpac Commission

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Ms Sally Barnes
Chief Executive
Office of Environment & Heritage
PO BOX A290
SYDNEY SOUTH NSW 1232

11 October 2012

Dear Ms Barnes

Proposed Coalpac Consolidation Project – Castlereagh Highway, Cullen Bullen

I refer to the Planning Assessment Commission's correspondence to the OEH dated 25 September 2012 in relation to the above project review.

This prior correspondence made reference to a presentation made by the Colong Foundation for Wilderness at the public hearing. In this, the group asserted that the underlying geology of the Project Area is different to the surrounding areas in that the Project Area contains Permian sediments of the Illawarra Group that have produced rolling and flattish terrain of higher nutrient levels and that this has implications for the conservation value of the project area.

Further details on this have now been provided by the Colong Foundation for Wilderness as set out in their attached correspondence dated 28 September 2012. Could the OEH please advise whether you have any views on this correspondence?

The Commission would be happy to meet with representatives of the OEH to discuss the above matter and any other aspects of the project. As the Commission's report is due to be provided to the Minister by mid November any written response would need to be received by close of business 7 November 2012.

Ms Sera Taschner (Commission Secretariat) can assist with any enquiries concerning the Commission's requests on (02) 9383 2117 or email sera.taschner@planning.nsw.gov.au.

Yours sincerely

Dr Neil Shepherd AM
Chair, Coalpac Commission

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Friday 28th September, 2012

Ms Sera Taschner
Commission Secretariat
GPO Box 3415
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Dear Sera,

The Relative Importance of Vegetation Associated with the Permian Sedimentary Rocks in the Proposed Coalpac Project Area

Description of the land unit type

The Colong Foundation for Wilderness Ltd has been asked to provide further information on the attributes of the ecosystems and landforms arising upon Permian sedimentary rocks of the Illawarra Coal Measures, comprising the Wallerawang, Charbon and Cullen Bullen Stratigraphic Subgroups.

The stratigraphic relationships for the sedimentary rocks in the project area are described in figure 4 on page 20 in Volume 1 of the Environmental Assessment and by a geology map (Drawing 6) on page 79 of Appendix O in volume 5 of the Environmental Assessment. These Illawarra Coal Measures are annotated as Pi on that geology map, which is a small part of the 1992, 1:100,000 Western Coalfield (Southern Part) Geological Series Map Sheet (Edition 1) - a composite map based on the topographic series sheets 8931 and part of 8830, 8831, 8930 and 8932, compiled by E.K. Yoo (Geologist) and G. Majchrzak Hamilton (Cartographer) published by the Department of Mineral Resources.

The landscape unit that the Colong Foundation believes is unique to this area can be described as a gently undulating landform of shallow valleys with ephemeral streams on Illawarra Coal Measures, capped in places by outliers[1] of Burra Moko Head sandstone of the Narrabeen Group of sedimentary rocks. The vegetation for the project area has been described at a regional level by Benson, D.H. and Keith, D.A. (1990) as consisting of Tablelands Grassy Woodland Complex on the Permian rocks and the Pagoda Rock Complex and Scribbly Gum – Stringybark Woodland developed on the Narrabeen Group of Triassic sedimentary rocks.

Comparison of Cumberland Ecology Vegetation Mapping with Regional Mapping of the Vegetation

The Benson and Keith vegetation mapping at 1:100,000 is coarse for project assessment work, but reveals the misleading vegetation mapping performed by Cumberland Ecology for the Environmental Assessment. The vegetation mapped by Cumberland Ecology as 'Exposed Blue Mountains Sydney

[1] Note: an outlier is geological term for a stratigraphically younger unit surrounded by older rocks as seen in map view.

Peppermint – Silvertop Ash Shubby Woodland' is a vegetation community named after the two most commonly found eucalypt trees in the Greater Blue Mountains Region. For the same locations within the project area Benson and Keith (1990) have identified and mapped 'Tablelands Grassy Woodland Complex', which is a poorly reserved plant community.

Benson and Keith report plant communities on the western part of the Wallerawang "map sheet associated with Permian and Devonian geology are also very poorly conserved." … "Other woodland communities in the western part of the area (in map units 10h, 10m & 10n), and the Coxs River Swamps (20b) are not represented in any local reserves" (Benson & Keith, 1990, pg 330).

The Wallerawang_Veg_sht_and_Fig_3.1_App_J_composite.jpg image shows the different vegetation types compared for the project area on two inset maps, one by Benson and Keith, the other by Cumberland Ecology. The poorly reserved mapping unit "10h", the Tablelands Grassy Woodland Complex has been misleadingly named and mapped by Cumberland Ecology as an Exposed Blue Mountains Sydney Peppermint – Silvertop Ash Shubby Woodland. So what is actually poorly reserved and rare is mapped by Cumberland Ecology as common.

<u>Comparison of Cumberland Ecology Vegetation Mapping with Detailed 2006 Vegetation Mapping</u>

A comparison of the Cumberland Ecology vegetation typing and mapping with the 2006, 1:25,000 Western Blue Mountains Vegetation Map by the then Department of Environment and Conservation (NSW)[DEC (NSW), 2006)] for the Hawkesbury-Nepean Catchment Management Authority is also informative.

The DEC (NSW), 2006) vegetation mapping is of a much finer detail than the mapping by Cumberland Ecology, although Cumberland Ecology state that the DEC (NSW), 2006) mapping was used to "assist with identifying and describing the vegetation" (see page 2.1, Appendix J).

Cumberland Ecology claims that its 'Exposed Blue Mountains Sydney Peppermint – Silvertop Ash Shrubby Woodland' mapping unit corresponds to DEC (NSW) (2006) Mapping Unit 30 of the Western Vegetation Map. This Cumberland Ecology mapping unit is not just Mapping Unit 30. This Cumberland Ecology unit would also capture DEC (NSW) 2006 Mapping Units 33 and 37, as well as units 35, 4, 44 and 11, when mapping the project area.

Similarly the Cumberland Ecology mapping unit titled 'Cox's Permian Red Stringybark – Brittle Gum Woodland' is too generalised to capture the ecological diversity for project planning and does not just contain DEC (NSW)(2006) MU 37. This Cumberland Ecology mapping unit would contain MUs 30, 33 and 11 as well. Figure EA_Fig3.1_CoxsValley-Newnes_Merged.jpg shows the difference in mapping detail between DEC (NSW) 2006 and Cumberland Ecology's efforts.

The generalisation of the Cumberland Ecology mapping in the manner described above would tend to hide the diversity of plant communities present on the Project Area. In other words, the Cumberland Ecology vegetation mapping units are inconsistent with and of a far more generalised nature than the 1:25,000 scale mapping compiled in 2006 by DEC (NSW).

The mapping by Cumberland Ecology is unsuitable for detailed consideration of a proposed mining project in this environmentally sensitive area. The generalisations made by Cumberland Ecology are

also inconsistent with the more generalised mapping by Benson and Keith, defining a map unit with a name that denotes a very common and well reserved forest type, rather than the poorly reserved forest type identified in 1990 at the regional level. These concerns are consistent with the evidence provided by Mr Chris Jonkers of Blackmans Flat for the Lithgow Environment Group regarding vegetation in the project area.

Mr Jonkers has observed the presence of 'Sheltered Gully Brown Barrel Ferny Forest', MU4 of DEC(NSW) (2006). In Lithgow Environment Group's submission it was argued that areas of this type were not identified by Cumberland Ecology, would be cleared by the mining operations, and were not covered by Biodiversity Offsets. This mapping unit occurs in the deep gullies east of the highway below the escarpment of the Great Dividing Range, including the cave art site gully. Mr Jonkers has also observed isolated patches of MU1 'Sandstone Canyon Warm Temperate Rainforest', indicated by the presence of a patch of Black Wattle (*Callicoma serratifolia*) not far from this cave.

In relation to MU 20, 'Capertee Rough Barked Apple – Red Gum Yellow Box Grassy Woodland' (this MU includes the EEC of Grassy White Box Woodlands), this veg unit was not identified on the DEC (NSW) 2006 Vegetation Map Sheet but has been observed by Mr Jonkers in the north-west corner of Ben Bullen State Forest on both sides of the Baal Bone Rail Loop, where Mr Jonkers found *Persoonia marginata*. Mr Jonkers believes that Yellow Box and occasional Blakely's Red Gum (a tree that is also found in MU20) occur at the southern end of the project area east of the Highway and were not identified by Cumberland Ecology.

The Cumberland Ecology Flora Assessment of areas with Tableland Broad-leaved Peppermint – Brittle Gum – Red Stringybark Grassy Open Forest (equivalent to DEC (NSW) 2006 MU 33) didn't identify *Bursaria spinosa* ssp *lasiophylla*, but Mr Jonkers found it at four sites in mainly this vegetation type within the proposed open-cut disturbance area. This plant is critical habitat for the Bathurst Copper Butterfly (*Paralucia spinifera*) that is listed nationally as a vulnerable species under section 178 of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). Native Blackthorn, *Bursaria spinosa* subsp. *lasiophylla* is the larval food plant of the Bathurst Copper Butterfly.

The boundary between the gently undulating shallow valleys on Illawarra Coal Measures capped in places by pagoda outliers of Burra Moko Head sandstone is also an identified Priority Fauna Habitat. The Office of Environment and Heritage (2012) found that the 'rocky escarpments and pagoda formations are another important fauna habitat in Gardens of Stone National Park as they provide habitat for at least four high or moderate priority fauna species. Though the status of the broad-headed snake and brush-tailed rock wallaby in the park is uncertain, the rocky escarpments and pagoda areas, together with adjacent sheltered rocky gorges, provide the highest quality available habitat for these species in the park. Both the large-eared pied bat and eastern cave bat are highly likely to roost in these environments, with the potential for maternity roosts of either or both species. The eastern bentwing-bat may temporarily roost in deeper overhangs or caves. Rosenberg's goanna also uses these environments' (page 79). These observations apply to the project area, where the broad-headed snake has been recorded by Mr Ian Brown.

The 'Tablelands Grassy Woodland Complex' is of course where the majority of the thirteen threatened vertebrate species are found.

Irreplaceability of the Project Area vegetation and its relation to offsets

When considering the irreplaceability of the native vegetation proposed for open-cut mining, it is very important to consider the past and potential future cumulative losses of native vegetation from the Lambert's Gully Mine, Ivanhoe, Invincible and Cullen Valley Mines, Pine Dale and Neubeck's Creek open-cast coal mines upon map unit Benson and Keith (10h), Tablelands Grassy Woodland Complex. In regard to the more detailed 1:25,000 by DEC (NSW) 2006 the mapping units MU4, as well as MU 20, 33, 37 and possibly others may become critically endangered within the broader (10h) community.

DEC (NSW) (2006) only found 71ha of MU4, Sheltered Gully Brown Barrel Ferny Forest in the study area of 157,356ha. Only 1,041 ha of MU 33, the Tableland Broad-leaved Peppermint – Brittle Gum – Red Stringybark Grassy Open Forest were identified and 3,048 ha of MU 37 Cox's Permian Red Stringybark - Brittle Gum Woodland.

There were 797 ha of MU35 Tableland Gully Mountain Gum - Broad-leaved Peppermint Grassy Forest, 1586ha of MU11 and Tableland Gully Snow Gum - Ribbon Gum Montane Grassy Forest and of MU44. Fragments of the MU1 'Sandstone Canyon Warm Temperate Rainforest' that covers only four hectares of the DEC (NSW) 2006 study area, while MU8 'Newnes Plateau Sheltered – Brown Barrel Forest' is not extensive either, covering 2,200ha and may be present. These constituent vegetation communities are components of the Tablelands Grassy Woodland Complex and are all at risk of being open-cut mined. All are situated upon the Illawarra Coal Measures.

It is reasonable to reserve examples of all these vegetation types. Given that the best coal seam, the Lithgow Seam, has been mined by underground methods below the Ben Bullen State Forest, this forest represents the most appropriate locality for these rare vegetation types to be reserved under the *National Parks and Wildlife Act, 1974*.

The proposed off-sets and trade-offs not located on flatter Illawarra Coal Measures are irrelevant to the future conservation efforts for these forest types. These vegetation communities are associated with a geological substrate and it is perplexing that Cumberland Ecology claims and maps their presence where Permian Illawarra Coal Measures are not present. For example, the western half of the Hillcroft property is situated upon undifferentiated Palaeozic metamorphic rocks. The proposed new offset of Gulf Mountain is also not located on Permian sedimentary rocks. Such proposed exchanges are not a 'like for like' biological offset as the geologies are so different.

Exchanges of vegetation communities on talus slope Permian sedimentary rocks (i.e. 10i – the well reserved Talus Slope Woodland of Benson and Keith) for flatter valleys of Permian sedimentary rocks are also proposed (i.e. 10h - the poorly reserved map unit).

The only apparent exception is perhaps the remote area proposed at Yarran View to the north. The Yarran View property is of course not located upon Illawarra Coal Measures but rather the Shoalhaven Group and Narrabeen Sandstones (Reference: 1:500,000 Sydney Basin Geological Sheet (Special)).

This leaves only the small isolated fragment at Hillview as the sole offset on the appropriate geology.

Reservations since 1990 mapping did not improve reservation status of the community at risk

Since the publication of the Benson and Keith regional vegetation mapping the Gardens of Stone National Park was reserved in 1994. This park is mostly Permian sedimentary rocks of the Shoalhaven Group, the basement Palaeozoic metamorphic rocks and even some Silurian limestone.

The Illawarra Coal Measures rocks do not outcrop extensively in the Gardens of Stone National Park and the Mugii Murum-ban State Conservation Area. Where these strata do outcrop in these reserves they do so on a steeply sloping talus slopes that develop different vegetation, mapped by Benson and Keith as the Talus-slope Woodland (10i), not (10h). This latter talus slope community (10i) may be also present on Blackmans Crown to the north (it is just off the Wallerawang vegetation map). Neither the Talus-slope Woodland vegetation type nor the Tablelands Grassy Woodland Complex on Permian sedimentary rocks extends to the Turon National Park to the north-west. Turon National Park is located on older geology.

Significance of the Project Area's Geodiversity

The Tablelands Grassy Woodland Complex on undulating Illawarra Coal Measures located within the Coalpac proposal represent a unique reservation opportunity. These poorly reserved forests form a 'carpet' below platy pagodas, that is, those pagodas with ironstone banding which are 'distinct and significant' on the world scale as explained in Washington, H. and Wray, R (2011). These pagodas are found in the project area along the edge of the Great Dividing Range, on the Ben Bullen Range and as nearby outliers of Triassic sedimentary rock.

There is no doubt that the pagodas found on the escarpment next to the proposed open cuts are platy pagodas, as Dr Washington has observed them.

Pagodas are found in the Grose Sandstone in the Triassic, particularly the Banks Wall and Burramoko Head series. The proposed open-cut coal mining would not destroy pagodas by wholesale removal, since the open-cut is restricted to the outcrop of Permian sedimentary rocks. The Foundation and other environment groups believe that blasting and high wall mining could shake and crack the pagodas and so cause collapse through these mechanisms.

Coalpac appears to be ignoring a peer-reviewed scientific paper, co-authored by Dr Wray, a sandstone geomorphologist who co-wrote the book 'Sandstone Landforms' and has visited sandstone landforms all around the world. Dr Wray has never seen anything like platy pagodas anywhere else in the world other than in the Gardens of Stone region.

The Project Area represents a unique opportunity to reserve under the NPW Act poorly protected, publicly-owned forests at risk of becoming threatened by on-going open-cut coal mining. The 'Tablelands Grassy Woodland Complex' on undulating Illawarra Coal Measures is also associated with good examples of the unique pagoda landscape, and can be reserved without loss of the high quality Lithgow Coal Seam, that seam having already been mined.

Notes on the relationship between the proposed Coalpac open-cut mine, the Western Coalfield of NSW and the Gardens of Stone Stage 2 Reserve Proposal

The Coal Industry in the Western Coalfield is Healthy

The coal industry in the Western Coalfield continues to be healthy. In the last twenty years production of raw coal has doubled and employment been more or less steady. The main growth continues to be to the north at Ulan.

Comparative figures for the three mining centres in the Western Coalfield are presented below:

	Employment			**Raw Coal Production (MT)**		
	1979-80	1991-92	2006-07	1979-80	1991-92	2006-07
ULAN	150 approx	562	558	0.52	6.79	9.44
RYLSTONE	150 approx	143	120	-	-	1.12
LITHGOW	930	1,195	1,064	3.55	6.77	11.13
TOTAL	**1,230**	**1,900**	**1,742**	**4.67**	**14.18**	**21.7**

Coal production has continued to increase with total saleable coal production in the Western coalfield for 2008-09 at 24.79Mt (NSW Minerals Council website).

Coal Reserves

In the last 30 years despite a production increase from 4.67 million tonnes to 21.7 million tonnes of coal annually, coal reserves in the Western Coalfield have risen from 250 million tonnes in 1962 to nearly 1,000 million tonnes of recoverable coal in 1991-92 to 1,793.25 million tonnes of recoverable coal reserves in 2006-07 (Coal Industry Profile data, 2008).

For the Western Coalfield and for the proposed Gardens of Stone National Park, the most recent semi-detailed information available is still the Sniffin, M. Sayers, P. and Beckett J., 1986, *NSW Coal Resources and Reserves* report prepared by the Department of Mineral Resources.

Total coal resources in the Western Coalfield are 4,340 million tonnes based on the 1986 report and includes inferred reserves. This figure refers to coal within coal mining and exploration tenements, although the figure apparently does not include large areas held by the Department of Mineral Resources.

COAL RESOURCES (million tonnes, 1986 data)

	Western coalfield	NSW
Measured and indicated reserves	2,630	34,356

COAL RESOURCES (million tonnes, 2006-07 data)

	Measured reserves	Indicated reserves	Total
ULAN	405.8	995.3	**1,401.1**
RYLSTONE	43.4	23.2	**66.6**
LITHGOW	378.5	377.7	**756.2**
TOTAL	**827.7**	**1,396.2**	**2,223.9**

Within the Western coalfield 1,793.25 million tonnes were believed to be recoverable coal reserves in 2006-07 by the mining industry (Industry Profile, page 131, 2008), which would yield saleable reserves of about half that figure. These estimates are consistent with the above mining industry profile data for the individual coal mines in the western coalfield for the returns of that financial year.

Even allowing for production growth the above data indicate that there is sufficient coal available to meet power station demand of up to 8 million tonnes per year for the foreseeable future. The Atlas of NSW states that the "southern sector of the Western coalfield, between Lithgow and Ben Bullen, supplies coal to the local power stations and the export thermal market. The Lithgow seam is most important followed by the Katoomba seam that is mined east of Lithgow".

In 1993 the Springvale Colliery was specifically developed for the needs of Mt Piper Power Plant. The Angus Place Colliery has a purpose built haul road to this power plant. The Springvale and Angus Place coal mines can produce 8.5 million tonnes of coal a year. In 2006-07 the combined measured coal resources for these two mines was 154.3 million tonnes and the combine indicated resources were 171.2 million tonnes, giving a total of 325.5 million tonnes of coal. These two mines alone can provide coal to both power plants for over a decade and probably two. The Airly Colliery and the mines of Rystone District, combined with the Clarence Colliery could extend these resources for the foreseeable future. It is perplexing that power generators in developing countries are purchasing thermal coal from these mines for power generation at a higher price than Tru-Energy/Energy Australia (a Chinese owned company) is willing to pay to feed power plants specifically located on this coal field.

The claim that Coalpac's coal is essential to the on-going operation of Mt Piper Power Plant is nonsense. There cannot be anything more than a small marginal price difference between domestic and overseas coal prices. As export prices fall, local consumers will be advantaged and long term contracts more readily secured.

Claims made by Shoalhaven Starches

Shoalhaven Starches operate under a 2003 Department of Planning approval that has a consent condition that only allows the plant to use coal with a sulphur content not exceeding 1%. The claim that Coalpac is the only suitable coal has no basis.

Below is an extract from their 2008 Environmental Assessment for the plant. Shoalhaven Starches do not commit to replacing coal-fired boilers but it was given serious consideration, though not budgeted.

5.1.3 Fuel use switching

Natural gas

The proposed plant will mainly use natural gas as the primary fuel source (refer to Table 4). Natural gas produces much lower greenhouse emissions than the amount of coal of equivalent energy. Using natural gas in the proposed plant instead of coal saves approximately 187,680 t CO2-e/a.

Coal

Following the plant expansion, 109 kt of coal will be used at Bomaderry (gross). Coal is a very emissions intensive fuel, and its use will create approximately 274,000 t CO2-e, or 34% of all gross emissions. If the existing coal-fired boiler was replaced with a natural gas fired boiler, emissions could be reduced by around 81,000 t CO2-e (a reduction of 30% compared to the coal emissions, and 10% of the total gross emissions). Replacement of the coal-fired boiler has not been included in the current budget for the proposed plant.

Diesel

Shoalhaven Starches uses 660 kL of diesel fuel annually, and this volume will not change following the upgrade. This results in annual emissions of approximately 1,910 t CO2-e. By switching to a biodiesel blend, emissions could be reduced. A 10% biodiesel (canola) blend would result in total emissions of 1,880 t CO2-e, a reduction of 30 t CO2-e annually, or 0.004% of gross emissions. Any changes would be insignificant.

Shoalhaven Starch can use any coal from NSW. It certainly has not used Coalpac coal from before 2006. The following table shows the specifications of NSW coal resources:

Coalfield Coal type		Southern			Western			Hunter			Newcastle			Gunnedah*		Gloucester		Oaklands
		Export/ Domestic Hardcoking	Export Thermal	Cement	Export Thermal	Domestic Thermal	Cement	Export Thermal	Domestic Thermal	Export Soft Coking	Export Thermal	Domestic Thermal	Export/ Domestic Soft Coking	Export Thermal	Export Soft Coking	Export Thermal	Export/ Domestic Coking	Domestic Thermal
Coal Quality Parameters																		
Moisture %	(ad)	1.0	1.1	1.5	2.5	2.6	3.2	2.7	3.0	2.7	2.3	2.3	2.3	4.0	4.0	1.5	1.5	-
	(ar)	7.9	6.4	5.5	8.9	8.0	-	9.1	9.5	8.9	8.5	7.5	8.1	-	-	9.0	9.0	28.0
Ash %	(ad)	9.3	19.5	30.0	13.7	20.4	24.5	13.5	25.9	8.9	15.1	22.0	8.1	10.0	6.5	17.5	10.0	12.0
Vm %	(ad)	22.9	20.8	27.0	30.5	28.7	25.3	32.7	30.4	34.7	30.6	26.7	35.3	37.0	37.9	26.8	29.3	22.0
Ts %	(ad)	0.40	0.45	0.50	0.65	0.55	0.40	0.60	0.90	0.55	0.60	0.40	0.90	0.45	0.45	0.65	0.65	0.20
Se	(kcal/kg)	7570	6750	5550	6890	6600	5460	6810	5430	7250	6760	6010	7480	7050	7400	6800	-	4180
	(Mj/kg)	31.8	28.2	23.2	28.8	27.6	24.5	28.5	22.7	30.4	28.3	25.0	31.4	29.1	-	28.9	-	17.5
CSN		6.5	1.5	4.0	1.0	1.0	-	1.5	2.0	5.0	2.0	1.5	6.0	-	5.0	-	-	-
Aft (°C)	Deform	1560	1460	1500	1420	1460	-	1270	1330	1380	1380	1480	1290	1400	-	1530	1530	1390
	Flow	1590	1530	1560+	1560	1570	-	1510	1510	1540	1540	1590	1550	1550	-	1600	1600	1540
HGI		68	64	55	49	45	49	50	49	51	52	52	49	45	45	65	65	100
Gray-King		G3	-	-	-	-	-	-	-	G2	-	-	G6	-	20	-	G8	-
Max. Fluid	(ddm)	1800	-	1000	-	-	-	100	-	130	-	-	7420	-	200	-	5000+	-
Phosphorus %	(ad)	0.061	0.030	0.002	0.011	0.009	0.010	0.027	0.031	0.025	0.032	0.024	0.045	0.006	0.005	-	0.060	0.002

The total sulphur (Ts%) is highest in the Hunter and Newcastle coal fields but all meet the consent condition requirement. The Industry Profile (2008) reports coal from Cullen Valley as having a moisture content of 8%, ash from 13.5 – 24%, volatile matter 24.5 to 26.9, total sulphur of 0.5%,

specific energy of 5580 to 6510 (k/cal/kg) or 23.4 to 27.2 (Mj/kg) and a crucible swelling number of 1 (Invincible has a CSN of 2). The Cullen Valley coal has an ash fusion temperature for deformation of 1260 °C and flow of 1600 °C and a hardgrove grindability index of 45 to 46. Invincible colliery gives its phosphorus content as 0.007% and has similar characteristics to Cullen Valley except for a higher moisture content. There is nothing special about these characteristics, except that it probably has lower energy and higher ash contents than claimed in the statistical returns provided for the Industry Profile 2008.

From the above considerations it can be readily adduced that Shoalhaven Starches can source its coal from any mine in NSW, except perhaps for the higher sulphur content coal arising from certain mines in the Hunter and Newcastle areas.

Proposed National Park Extensions in relation to the Coal Resource

In the last two decades most of the coal exploration effort and investment in coal mining infrastructure has occurred in the Ulan section of the Western Coalfield where very thick coal seams are mined by open-cut methods.

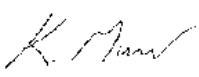
In the Lithgow and Rystone areas there are two different coal seams, the Lithgow seam and the Katoomba seam, which are mined largely by underground techniques (Industry Profile, 2008, page 51). Coal mining is confined to areas where relatively clean coal occurs over a height of 1.5-2.5 metres, the so-called "working section". Further north at Ulan, very large open-cut mines work a 12 metre coal thickness known as the Ulan seam. The coal from the Ulan mine is transported by a custom-built 150 kilometre Sandy Hollow railway to Muswellbrook and thence to Newcastle. During the 1980's the Department of Mineral Resources carried out several large coal drilling programmes in the Western coalfield. This Government exploration has extended from Ulan south to Rylstone, and has shown that the thickness of coal increases northwards towards Ulan.

Compared to the Ulan, Lithgow and Katoomba coal seams, the Lidsdale and Irondale seams are inferior in quality, and the others, the Middle River and Moolarben seams, are hardly worth mining. Australia is a wealthy country and it can well afford to protect a representative example of the Tablelands Grassy Woodland Complex on undulating Permian Illawarra Coal Measures.

In making such a decision no unique coal resources will be sterilized or the security of the national power grid affected. Such claims have no basis in fact and a casual examination of the coal resources of the Western Coalfield establishes that there are decades of alternative resources available for energy supply.

Thank you for the opportunity to make a further submission.

Yours faithfully,



Keith Muir O.A.M.
Director
The Colong Foundation for Wilderness Ltd

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NSW GOVERNMENT | Office of Environment & Heritage

Our reference: ED12/739
Contact Peter Christie
02 6883 5317

Dr Neil Shepherd
Chair
Coalpac Commission
Planning Assessment Commission
GPO Box 3415
Sydney NSW 2001

- 6 NOV 2012

Dear Dr Shepherd

Planning Assessment Commission Review of the Proposed Coalpac Consolidation Project

I refer to your correspondence of 25 September and 11 October 2012 in which the Planning Assessment Commission (PAC) made a number of requests for advice from the Office of Environment and Heritage (OEH) with regard to the Coalpac Consolidation Project. Specifically, I note the following requests:

1. with regard to potential impacts of highwall mining on pagodas and adjacent areas, OEH's views on options for mitigating impacts to flora and fauna associated with these areas, including an assessment of critical habitat in proposed highwall areas;

2. with regard to reports by Special Interest Groups of additional threatened species within the Project Area that were not reported in the Environment Assessment, OEH's response to the significance of these species, and suggested steps to avoid, mitigate or manage impacts to them; and

3. OEH's response to an assertion by the Colong Foundation for Wilderness that the underlying geology of the Project Area (Permian sediments of the Illawarra Group that have produced rolling and flattish terrain of higher nutrient levels) is different to surrounding areas, and that this has implications for the conservation value of the Project Area.

Responses to the above requests are provided in the three enclosures to this letter.

In addition, a fourth issue was raised in your correspondence of 25 September regarding the discovery of an Aboriginal cave site within the Project Area. OEH is of the understanding that Coalpac is working towards a thorough investigation of the site which will assist in determining significance and appropriate protective measures. OEH has not yet received an update from Coalpac on the investigation but will inform the Commission once this has occurred.

An examination of OEH's records show that Aboriginal art sites are more numerous in the Blue Mountains compared to other regions of the State. Aboriginal art sites in all forms (whether painted, stencils, engravings, pecked or charcoal drawn) are of high cultural value to Aboriginal people and a major draw for domestic and international tourists. OEH considers that specialised investigations are required in order to form a modern interpretation of the site and its regional context. The recently discovered art site within the Coalpac project boundary needs to be examined within the regional art context. OEH therefore believes that it is worthwhile considering a regional study of Aboriginal art sites of the Blue Mountains and to use

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such an endeavour as a positive step toward Aboriginal community engagement, and measured conservation outcomes.

Should the PAC have any further enquiries, please do not hesitate to contact Peter Christie on (02) 6883 5317.

Yours sincerely

TERRY BAILEY
Acting Chief Executive

Enclosure 1. Options for Mitigating Impacts to Flora and Fauna associated with Pagodas and Adjacent Areas.

Enclosure 2. Significance of Additional Species Reported from the Project Area.

Enclosure 3. Significance of the Vegetation on Permian sediments.

Enclosure 1. Options for Mitigating Impacts to Flora and Fauna associated with Pagodas and Adjacent Areas.

The PAC requests:

> with regard to potential impacts of highwall mining on pagodas and adjacent areas, OEH's views on options for mitigating impacts to flora and fauna associated with these areas, including an assessment of critical habitat in proposed highwall areas.

OEH notes that the PAC refers to "critical habitat". The TSC Act defines critical habitat explicitly as that which is critical to the survival of a species, population or ecological community. Moreover, the habitat of only Critically Endangered or Endangered entities are eligible to be identified as "critical habitat", and there is no such identified critical habitat in this area. The following assessment has taken the PAC's reference to critical habitat to mean habitat that is *crucial* to the survival of local populations of particular species based on knowledge of their specific ecological requirements.

Potential Impacts to Biodiversity Associated with Pagodas and Adjacent Areas

As the PAC is aware, through the course of the Project review process, OEH has raised concerns over the potential for impacts to geodiversity and associated biodiversity. OEH reasserts that impacts are not limited to the potentially destructive consequences of blasting or subsidence on the geodiversity features themselves, but include direct habitat loss for species that utilise both the escarpment and adjoining areas downslope, and also indirect impacts of disturbance that increases with decreasing distance from the open-cut edge (i.e. edge effects).

Defining and Mapping Pagodas and Adjacent Areas

OEH has sought clarification and functional definitions of the geodiversity features that occur within and adjacent to the Project Area from the Proponent in order to assess the relative significance of these features and to review proposed avoidance and mitigation measures intended to protect them. No such definitions have been provided by the Proponent. In spite of this, the Proponent proposed the following protective measures:

> "a standoff zone from the open cut highwall crest of ... 50m ... from all pagodas or significant sandstone cliffs or escarpments ... [and] a standoff zone of a minimum of 20m from any significant exposed outcrop or formation that does not fall under the above categorisation" (EA Main Report, p. 45).

The latter two geodiversity references have no practical application. The Proponent delineated "Sandstone Escarpments and Pagodas" (Figure 5, EA Main Report, p. 24); however, this delineation appears to include all areas of high relief, and not just those that include rocky areas.

OEH has therefore attempted to delineate all rocky areas including outcrops, pagodas and cliffs, and high relief areas continuous with and upslope of such features (Figure E1.1). This was undertaken using ADS40 aerial imagery with reference to a 25m resolution digital elevation model. Given considerably more time and resources, this map would be improved by ground-truthing to accurately

delineate feature boundaries and to subdivide geodiversity features based on recognised geomorpholigical terms (it was not possible to distingish all pagodas using ADS40 imagery). However, this representation provides a precautionary basis for comparison of ecologically-meaningful standoff zones.

Standoff Zones

The Proponent's proposed mitigation of such impacts has concentrated on the potential for damage to geodiversity features. The following discussion concerns the mitigation of impacts to habitat associated with and including geodiversity features.

Standoff zones suitable for Broad-headed Snake

The Broad-headed Snake (*Hoplocephalus bungaroides*) is known to depend on sandstone escarpments with exfoliating slabs and crevices for winter refuge, and to move away from the escarpment into woodland and forest areas in summer where it uses tree hollows (Webb and Shine 1997a). A comprehensive study of the species' movements in Morton National Park (160km south of Sydney) found individuals moved between 80 and 780m away from sandstone cliffs, with a mean distance of 318m (Webb and Shine 1997b). Notwithstanding potential differences between habitats in Morton National Park and Ben Bullen State Forest, this data provides several options for prescribing standoff zones from the delineated geodiversity features (Table E1.1).

In addition, the Threatened Species Profile Database (TSPD, the repository for threatened species information used by the Biometric tool for Property Vegetation Planning and Biobanking, of which OEH is the custodian) provides the following prescription regarding disturbance to Broad-headed Snake habitat: "No loss of breeding or foraging habitat within 500m of cliffs or escarpments".

Standoff zones suitable for cave-roosting bats

The Proponent identified habitat within the Project Area for three threatened cave-dwelling microbats: the Little Bentwing bat (*Miniopterus australis*), Eastern Bentwing Bat (*M. schreibersii oceanensis*) and Large-eared Pied Bat (*Chalinolobus dwyeri*). Considering its distribution, the Little Bentwing Bat is only likely to occur in the Project Area on an occasional basis; however, a large number of recent and proximal records are known for the other two species, and the Proponent recorded the Eastern Bentwing Bat in the Project Area. Therefore, the Project Area may with confidence be considered occupied habitat for both species.

The Eastern Bentwing Bat roosts in caves and forages in forested valleys. The microclimate requirements of summer maternity caves are highly specific, although during winter this species seeks cold hibernation roosts. OEH notes that nearby records of the Eastern Bentwing Bat were recorded in most months of the year, indicating the potential for a maternity site or sites to occur in the vicinity, and for roosting habitat in the Project Area to not be limited to over-wintering use.

The Large-eared Pied Bat also roosts in caves, and has been found to roost and breed in relatively shallow sandstone overhangs. In the absence of a detailed assessment of the suitability of different areas of exposed sandstone for breeding by either of these species, it should be assumed that the Project Area contains potential breeding habitat for both of these species, in addition to roosting, foraging and over-wintering habitat.

The TSPD provides the following prescriptions regarding disturbance in the vicinity of Large-eared Pied Bat breeding habitat: "No loss of breeding habitat. No loss of foraging habitat within 500m of breeding habitat". The TSPD prescription for Eastern Bentwing Bat is similar – "No loss of natural breeding or roosting habitat. No more than 10% loss of foraging habitat within 500m of breeding habitat" – and would preclude open-cut mining.

Standoff zones suitable for Brush-tailed Rock-wallaby

The Brush-tailed Rock-wallaby (*Petrogale penicillata*) occupies rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops, or cliff lines, especially those with fissures, caves, ledges or overhangs, and usually with some degree of vegetation cover. The Project Area therefore represents potential habitat for this species. Although the Brush-tailed Rock-wallaby has not been recorded from the Project Area, colonies are known from the Wolgan Valley and Glen Davis, and recent isolated records are known from nearby in Gardens of Stone National Park, and Newnes State Forest.

The TSPD prescribes "No loss of breeding, foraging or shelter habitat" for this species, and defines foraging habitat as "Vegetation within 500m of shelter/breeding habitat". This restriction can therefore inform standoff zones in order to accommodate potential Brush-tailed Rock-wallaby habitat in the Project Area (Table E1.1).

Options for ecologically-meaningful standoff zones

Table E1.1 lists potential buffer distances to delineate standoff zones, based on the information above (Figures E1.1 and E1.2). Standoff zones were delineated with reference to the geodiversity features layer described above and excluding existing Coalpac open-cut approvals for the Cullen Valley and Invincible mines. Thus, the respective area of each standoff zone was calculated given a particular buffer.

Table E1.1 also provides an indication of comparative mitigation of habitat for Broad-headed Snake, Large-eared Pied Bat and Brush-tailed Rock-wallaby. Assuming an optimal buffer of 500m (as prescribed by the TSPD), the proportion of habitat that would be protected by different standoff zones relative to the area protected within a 500m standoff zone is presented. In addition, the proportion of maximum known summer habitat for Broad-headed Snake has been calculated separately based on its maximum known movement distance of 780m.

Table E1.1. Options for buffer distances to delineate standoff zones from pagodas and adjacent areas

Buffer	Rationale	Mitigation of threatened species[1] habitat associated with pagodas and adjacent areas
50m	Distance proposed by Proponent to avoid damage to "significant" geodiversity features (subject to monitoring) (EA).	Standoff Zone = 205ha • 19% of TSPD prescribed habitat protected. • 15% of maximum known *H. bungaroides* summer habitat protected.
80m	Minimum recorded distance travelled by *H. bungaroides* from escarpment to adjacent valley vegetation (Webb and Shine 1997b).	Standoff Zone = 310ha • 28% of TSPD prescribed habitat protected. • 22% of maximum known *H. bungaroides* summer habitat protected.
318m	Mean distance travelled by *H. bungaroides* from escarpment to adjacent valley vegetation (Webb	Standoff Zone = 836ha • 76% of TSPD prescribed habitat protected.

	and Shine 1997b).	• 60% of maximum known *H. bungaroides* summer habitat protected.
500m	Prescribed protection of habitats for *H. bungaroides*, *C. dwyeri* and *P. penicillata* (TSPD).	Standoff Zone = 1,103ha • 100% of TSPD prescribed habitat protected. • 79% of maximum known *H. bungaroides* summer habitat protected.
780m	Maximum distance travelled by *H. bungaroides* from escarpment to adjacent valley vegetation (Webb and Shine 1997b)	Standoff Zone = 1,403ha • 127% of TSPD prescribed habitat protected. • 100% of maximum known *H. bungaroides* summer habitat protected.

[1] *H. bungaroides*, *C. dwyeri*, *M. schreibersii* and *P. penicillata*.

As illustrated above, a 50m standoff would not adequately protect the habitat of these three threatened species. Moreover, and regardless of the proportion of habitat retained, the continued suitability of such areas for these species could not be assured considering the impacts of edge effects. Extending the standoff to 80m would increase the proportion of protected habitat only marginally.

Illustrative of the apparent inadequacy of a 50m standoff is that an ecologically meaningful buffer of 318m, in which TSPD prescriptions would be 76% achieved, would more than double the amount of area required to be retained within the standoff zone. In order to follow the TSPD prescription for all three species, the standoff zone would be more than trebled with a buffer of 500m.

Conclusions

OEH adopted a precautionary approach in this assessment, both in the delineation of geodiversity features and under the assumption that all features are equally important. However, in the absence of adequate data to indicate otherwise, OEH consider that the Project Area contains occupied habitat for the Broad-headed Snake and for at least two species of cave-dwelling microbat. Consequently, in the event of proposed mining operations being approved, adequate protection of geodiversity features and associated habitats should be considered.

OEH consider that a standoff zone of 50m has little ecological basis and would not adequately protect threatened species habitat. Notwithstanding that a greater buffer would preclude open-cut mining across much of the Project Area (Figure E1.2), this assessment suggests that a standoff zone would need to be much greater than that proposed in order to protect the biodiversity dependent on pagodas and adjacent areas.

References

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Webb JK, Shine R (1997b) A field study of spatial ecology and movements of a threatened snake species, *Hoplocephalus bungaroides*. *Biological Conservation* **82**, 203-217.

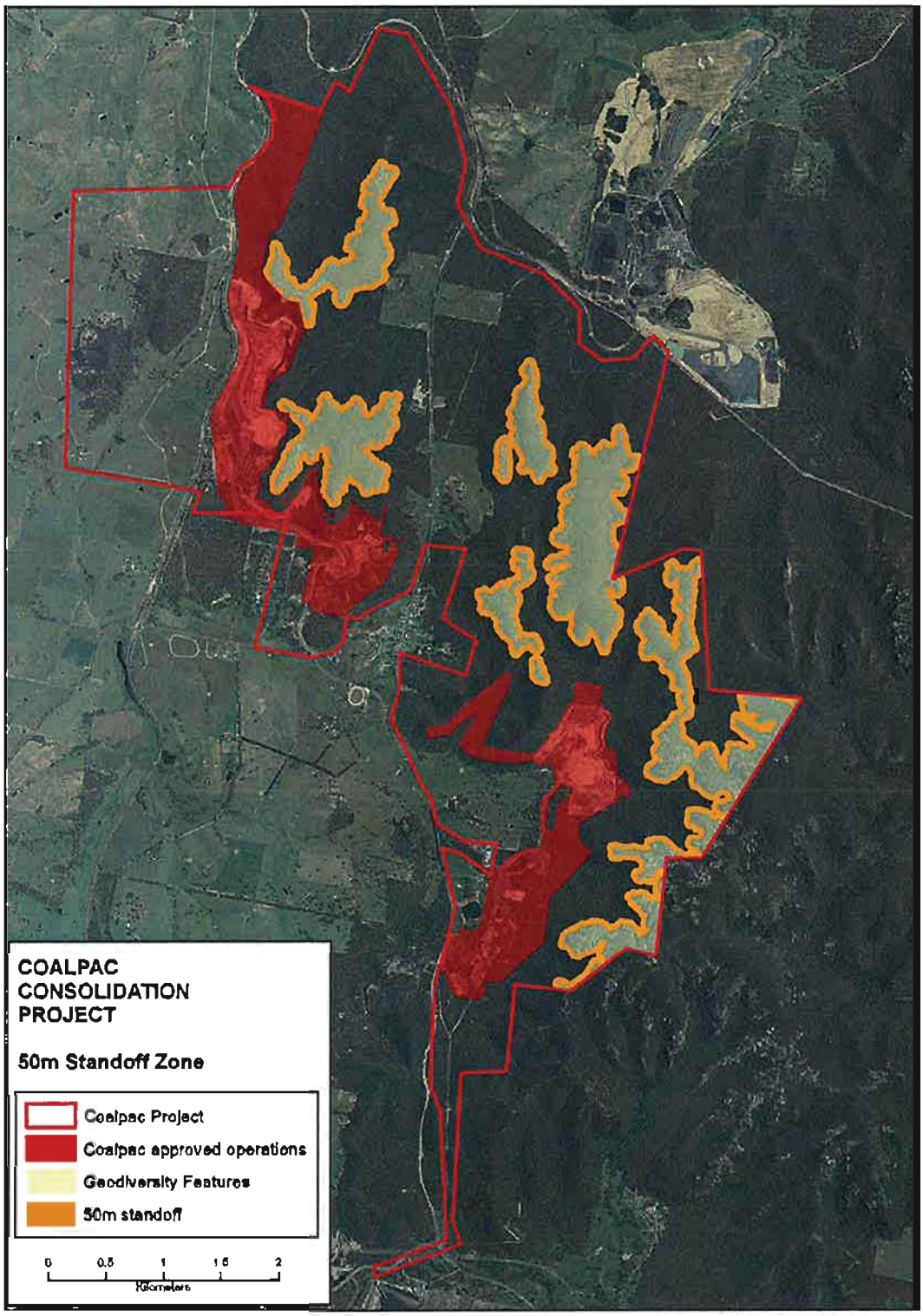

Figure E1.1. Coalpac approved mines, geodiversity features and a 50m standoff zone.

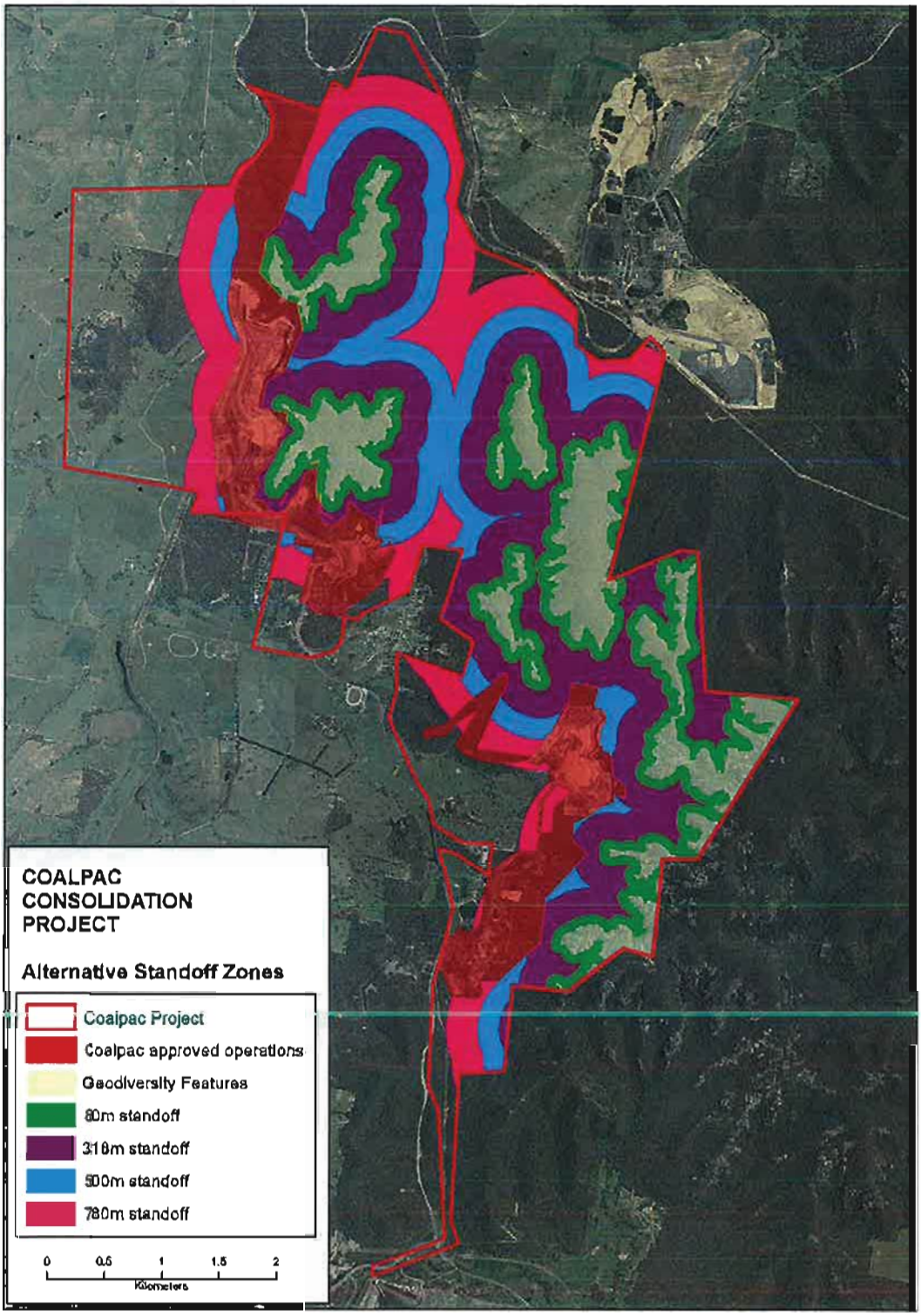

Figure E1.2. Coalpac approved mines, geodiversity features and alternative standoff zones.

Enclosure 2. Significance of Additional Species Reported from the Project Area.

The PAC requests:

> with regard to reports by Special Interest Groups of additional threatened species within the Project Area that were not reported in the Environment Assessment, OEH's response to the significance of these species, and suggested steps to avoid, mitigate or manage impacts to them.

OEH is not aware of any additional records from within the Project Area of species that are listed as threatened under either State (TSC Act) or Federal (EPBC Act) legislation. In the exhibited Environmental Assessment (EA), the proponent identified the presence of the following threatened species and the presence of suitable habitat for the following threatened fauna species within the Project Area:

Black Gum (present)
Capertee Stringybark (present)
Clandulla Geebung (present)
Broad-headed Snake (habitat)
Rosenberg's Goanna (habitat)
Barking Owl (habitat)
Black-chinned Honeyeater (habitat)
Brown Treecreeper (present)
Diamond Firetail (habitat)
Flame Robin (habitat)
Gang-gang Cockatoo (present)
Glossy Black-cockatoo (habitat)
Grey-crowned Babbler (habitat)
Hooded Robin (habitat)
Little Eagle (habitat)
Little Lorikeet (habitat)
Masked Owl (habitat)
Painted Honyeater (habitat)
Powerful Owl (present)
Regent Honeyeater (habitat)
Satin Flycatcher (present)
Scarlet Robin (present)
Speckled Warbler (present)
Square-tailed Kite (present)
Swift Parrot (habitat)
Turquoise Parrot (habitat)
Varied Sittella (present)
Brush-tailed Rock-wallaby (habitat)
Eastern Pygmy-possum (habitat)
Koala (habitat)
Spotted-tailed Quoll (habitat)
Squirrel Glider (present)
Yellow-bellied Glider (habitat)
Eastern Bent-wing Bat (present)
Eastern False Pipistrelle (habitat)
Eastern Freetail-bat (habitat)
Greater Broad-nosed Bat (habitat)
Large-eared Pied Bat (habitat)
Little Bent-wing Bat (habitat)
Greater Long-eared Bat (habitat)
Yellow-bellied Sheathtail-bat (habitat)

A representative of one of the Special Interest Groups identified a number of flora species from within the Project Area that were not identified in the EA. These records have only recently become available in the Wildlife Atlas. Of particular note are four "rare" plants ("ROTAP" (Rare or Threatened Australian Plants) after Briggs and Leigh 1995), which at present are not listed as threatened; and a subspecies that indicates potential habitat for the State and Federally listed Purple Copper Butterfly. Table E2.1 describes their conservation status, and the location of these records are depicted in Figure E2.1.

ROTAP Species

Although the four ROTAP species are not listed as threatened, considering their restricted distribution and the general lack of information on the reservation status of three of these species, OEH considers that potential impacts to them are of concern. Moreover, in the absence of detailed assessment information, OEH cannot gauge the significance of predicted or potential impacts resulting from the Project.

Table E2.1. Conservation status of additional flora species reported from the Project Area.

Species	Conservation Status[1]	Description
Acacia asparagoides	ROTAP: **2R**	**2**: range in Australia <100km **R**: rare in Australia but without identifiable threats (e g. large population within a restricted area)
Leionema lamprophyllum subsp. *orbiculare*	ROTAP: **2R-P3**	**2R**: (as for A. asparagoides) **P3**: poorly known taxon, in need of further survey
Leucochrysum graminifolium	ROTAP: **2R**	**2R** (as for A. asparagoides)
Philotheca obovalis	ROTAP: **3RCa**	**3**: range in Australia >100km **R**: rare in Australia but without identifiable threats (e.g. large population within a restricted area) **Ca**: at least one population of ≥1,000 plants is reserved
Bursaria spinosa subsp. *lasiophylla*	(NA)	Potential habitat for the State and Commonwealth listed Purple Copper Butterfly

[1] Status and descriptive codes follow Briggs and Leigh (1995).

In its submission on the exhibited EA, OEH raised concerns over the adequacy of threatened flora surveys. OEH maintains that the probability of detecting any species and in particular cryptic species is greatly improved through dedicated targeted surveys. In its submission, OEH identified six threatened plants that warranted specific attention in this manner, in addition to the eight that were stated to have been targeted in the EA.

OEH concedes that it would be unusual for a Proponent to undertake targeted surveys for non-threatened species such as ROTAPs; however, just as the adequacy of avoidance, mitigation and offset measures are required to be considered for non-listed ecological communities, the adequacy of such measures for plants that are rare in the landscape and by nature difficult to replace should also be considered. OEH considers it unlikely that these species would occur within the offset areas currently proposed by the Proponent.

Purple Copper Butterfly Habitat

The presence within the Project Area of potential habitat for the Endangered Purple Copper Butterfly (in the form of Blackthorn, *Bursaria spinosa* subsp. *lasiophylla*) is of considerable concern to OEH; moreover, judging from Figure 3.2 of the EA (Appendix J, p. 3.32), the location of this record appears to fall within the Project disturbance boundary. The presence of this particular subspecies of Blackthorn does not necessarily indicate the occurrence of Purple Copper Butterfly, which has highly specific habitat requirements; however, the survey requirements for this species are equally specific, and populations are known from Ben Bullen State Forest at similar altitudes less then 5km to the south-east. Therefore, in the absence of an appropriate assessment that indicates otherwise, it is possible that Purple Copper Butterfly could occur in the Project Area (as conceded in the EA, Appendix J, p. 3.36).

Regardless, the Project Area contains potential habitat for this species that was not identified in the EA and was thus not considered for avoidance, mitigation or offsets. OEH notes that known or potential habitat for the Purple Copper Butterfly has not been identified within any of the offset areas.

References

Briggs JD, Leigh JH (1995) 'Rare or Threatened Australian Plants.' (CSIRO Publishing: Collingwood, Vic)

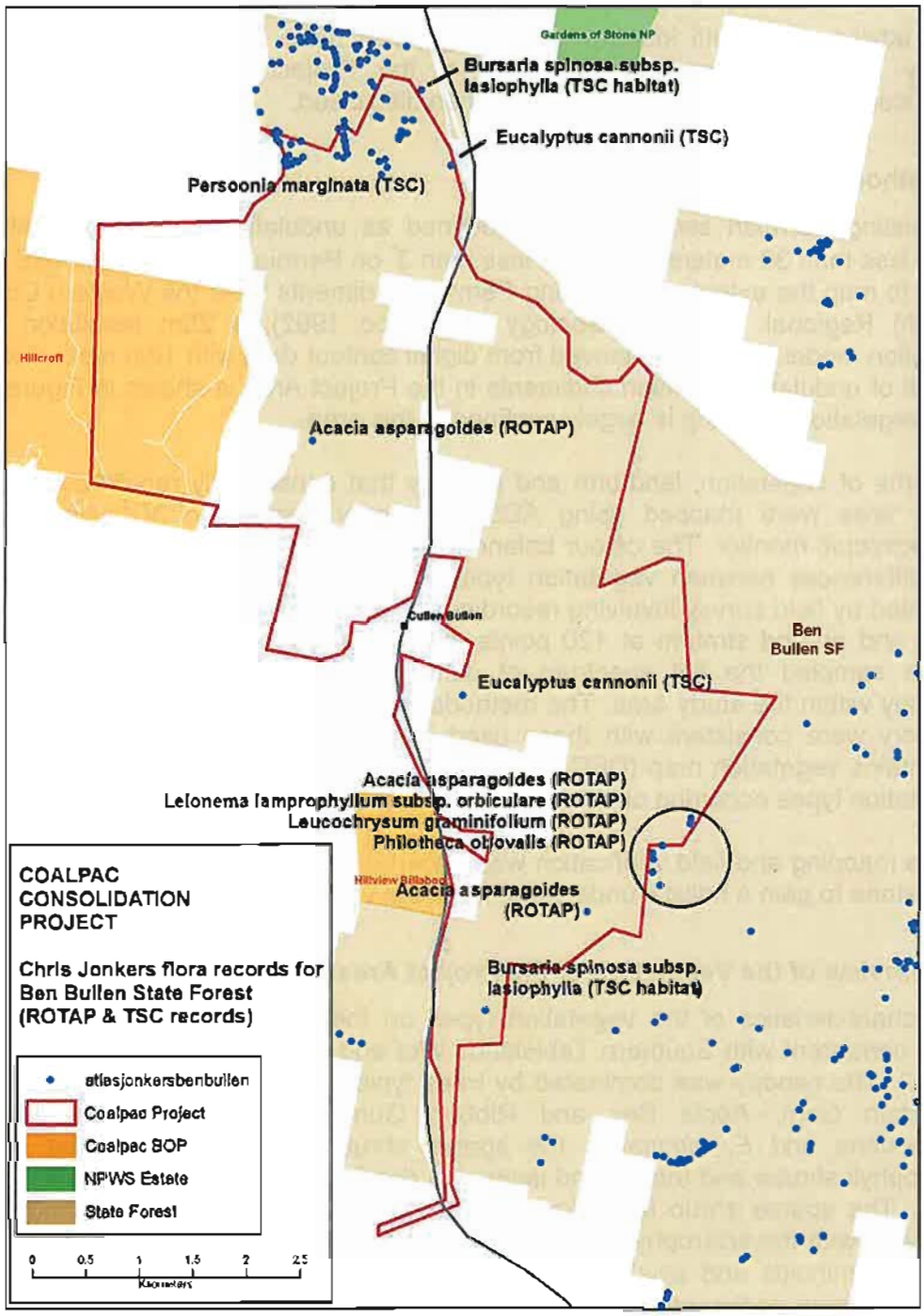

Figure E2.1. Additional flora records of conservation significance.

Enclosure 3. The Significance of the Vegetation on Permian Sediments.

The PAC requests:

> OEH's response to an assertion by the Colong Foundation For Wilderness that the underlying geology of the Project Area (Permian sediments of the Illawarra Group that have produced rolling and flattish terrain of higher nutrient levels) is different to surrounding areas, and that this has implications for the conservation value of the Project Area

This advice deals with identifying the vegetation types found on the more fertile, gently undulating Permian sediments of the Project Area. The conservation significance of these vegetation types is then discussed.

1. Methods

Undulating Permian sediments were defined as undulating terrain generally with relief less than 30 meters and slope less than 3° on Permian geology. The GIS layers used to map the extent of undulating Permian sediments were the Western Coalfield (south) Regional 1:100,000 Geology Map (Yoo 1992), a 25m resolution digital elevation model, and slope derived from digital contour data with 10m resolution. The extent of undulating Permian sediments in the Project Area is shown in Figure E3.1. The vegetation mapping is largely confined to this area.

Patterns of vegetation, landform and geology that consistently recurred across the study area were mapped using ADS40 imagery, viewed in 3D with a Planar Stereoscopic monitor. The colour balance of the imagery was adjusted to maximise the differences between vegetation types. The interpretation of the imagery was informed by field survey involving recording the dominant plants in the canopy, shrub layer and ground stratum at 120 points within the study area. These rapid survey points sampled the full spectrum of combinations of vegetation, landform and geology within the study area. The methods used in the interpretation of the ADS40 imagery were consistent with those used in the preparation of the Western Blue Mountains vegetation map (DEC 2006). The end product is a fine scale map of the vegetation types occurring on undulating Permian sediments.

Some mapping and field verification was undertaken on steeper Permian slopes and sandstone to gain a holistic understanding of the vegetation patterns in this locality.

2. Overview of the Vegetation of the Project Area

The characteristics of the vegetation types on the undulating Permian sediments were consistent with Southern Tablelands Wet and Dry Sclerophyll Forests of Keith (2006). The canopy was dominated by trees typical of colder environments such as Mountain Gum, Apple Box and Ribbon Gum (*Eucalyptus dalrympleana*, *E. bridgesiana* and *E. viminalis*), the sparse shrub layer was composed of non-sclerophyll shrubs and the ground layer was dominated by cool climate grasses and forbs. The sparse shrub layer and grassy ground layer of these tableland forests contrasts with the sclerophyll shrub layer and ground layer dominated by litter, hardy forbs, graminoids and small shrubs that are typical of vegetation on sandstone or steep Permian sediments. A different suite of trees (Blaxlands Stringybark, Sydney Peppermint, Silvertop Ash and Narrow-leaved Stringybark – *E. blaxlandii*, *E. piperita*, *E. sieberi* and *E. sparsifolia*) is also typically present on sandstone or steep Permian

sediments. Localised occurrences of trees typical of sandstone such as Sydney Peppermint, Silvertop Ash and Narrow-leaved Stringybark were sometimes present on undulating Permian sediments, particularly where sandstone was in close proximity. Inland Scribbly Gum (*E. rossii*) was widespread on both sandstone and Permian geology.

3. The vegetation types of the study area

3.1 Undulating Permian sediments

Four vegetation types were identified on undulating Permian sediments. These are discussed in order from on the most fertile soils in the study area to the least fertile.

1. The larger alluvial flats along drainage lines were dominated by Ribbon Gum with a ground layer of palatable grasses such as Snow Grass (*Poa*), *Microlaena* and relatively abundant forbs. This is equivalent to the Tableland Ribbon Gum Blackwood Apple Box vegetation type mapped by Cumberland Ecology.
2. The gently undulating footslopes at the base of hills, or in smaller drainage lines with less developed alluvial flats, support a grassy forest with Mountain Gum, often with Apple Box and sometimes with Blakelys Red Gum (*E. blakelyi*). The ground layer is grassy with palatable species such as Snow Grass, *Themeda*, *Echinopogon*, *Microlaena* dominating, and coarser grasses such as Red-anther Wallaby Grass (*Joycea*) are relatively uncommon or absent. This is equivalent to the Tableland Mountain Gum Broad-leaved Peppermint vegetation type mapped by Cumberland Ecology.
3. The gently rising slopes above footslopes or small rises adjacent to drainage lines support a grassy forest with Brittle Gum (*E. mannifera*), Red or Capertee Stringybark (*E. macrorhyncha / E. cannonii*) and Broad-leaved Peppermint (*E. dives*). Inland Scribbly Gum is less abundant or absent. The ground layer is grassy with palatable species such as Snow Grass, *Themeda*, *Echinopogon*, *Microlaena* dominating, and coarser grasses such as Red-anther Wallaby Grass typically present but less abundant than the palatable grasses. This is equivalent to the Tableland Broad-leaved Peppermint Brittle Gum Red Stringybark vegetation type mapped by Cumberland Ecology.
4. The gentle rises with poorer soils, or more exposed aspects support a grassy or litter dominated forest with Inland Scribbly Gum, Red or Capertee Stringybark, Brittle Gum and Broad-leaved Peppermint. Red-anther Wallaby Grass is typically the most abundant grass, clearly more abundant than palatable grasses such as Snow Grass. The ground layer is often dominated by litter rather than grasses. This vegetation type is also widespread on steeper Permian sediments within the Project Area. This is equivalent to the Tableland Slopes Brittle Gum Broad-leaved Peppermint vegetation type mapped by Cumberland Ecology.

The distribution of these vegetation types is shown in Figure E3.1.

3.2 Steeper Permian sediments and sandstone

An open forest with Inland Scribbly Gum and Narrow-leaved Stringybark with the ground layer dominated by litter and Red-anther Wallaby Grass occurs on the driest Permian slopes. An open forest with Blaxlands Stringybark and Sydney Peppermint with a shrubby understorey occurs on protected sites on steep Permian slopes with sandstone talus, and among sandstone pagodas. This grades into an open forest with Silvertop Ash, Sydney Peppermint and Narrow-leaved Stringybark on more exposed, steep Permian slopes with sandstone talus. A densely shrubby forest with Inland Scribbly Gum, Narrow-leaved Stringybark and Silvertop Ash occurs on

sandstone ridges. Finally, Blue Mountains Mallee Ash (*E. laophila* /*E. stricta*) mallee heath occurs on skeletal soils near sandstone pagodas.

4. Conservation Significance

4.1 Statewide

The Ribbon Gum grassy forest belongs to the Southern Tableland Wet Sclerophyll Forests of Keith (2004). Keith (2004) goes on to state that "The majority of Southern Tableland Wet Sclerophyll Forests in the north of their range have been cleared for pasture or pine plantation, especially in the Moss Vale and Oberon districts, and little is protected in reserves". This is consistent with OEH's understanding of the status of this vegetation type. In the Central Tablelands region, small samples only are reserved in Wollemi National Park, Marrangaroo National Park, Winburndale Nature Reserve and Kanangra-Boyd National Park.

The remaining vegetation types on the undulating Permian sediments belong to the Southern Tableland Dry Sclerophyll Forests of Keith (2004). When discussing their conservation significance, Keith (2004) states that "Given the poverty of the soils compared with those of the adjacent grassy woodlands, surprisingly large areas of these sclerophyll forests have been cleared or developed for rough livestock grazing, especially where the soils are less stony and the topography more gentle". Keith (2004) also states that these vegetation types are best conserved in the south of their range, in reserves such as Tinderry Nature Reserve and the foothills of Snowy Mountains. Two vegetation types in this group - the Mountain Gum, Apple Box grassy forest and the Brittle Gum, Red or Capertee Stringybark and Broad-leaved Peppermint grassy forest - both occur on more fertile, undulating sites and are likely to have been subject to clearing.

The remaining vegetation type of undulating Permian sediments is Inland Scribbly Gum, Red or Capertee Stringybark, Brittle Gum and Broad-leaved Peppermint with coarse grasses in the ground layer. This occurs on poorer soils and would thus not have been subject to heavy clearing, and it is moderately reserved in Marrangaroo National Park, Gardens of Stone National Park, Winburndale Nature Reserve and Turon National Park. Consequently, this vegetation type is of lower conservation significance. Likewise, the vegetation on steeper Permian sediments and sandstone is of lower conservation significance because it has not been heavily cleared and its reservation status is reasonable to good.

Hence, the following vegetation types are of higher conservation significance due to a high level of clearing, and low level of reservation (Figure E3.2) (area figures show the area of each vegetation type within the Project Area and excluding areas within approved operations):

1. Ribbon Gum grassy forest on alluvial flats (area = 21.1ha);

2. Mountain Gum Apple Box Blakelys Red Gum grassy forest on small drainage lines and footslopes (area = 65.5ha); and

3. Broad-leaved Peppermint Brittle Gum Red Stringybark grassy forest on small rises (area = 192.5ha).

For these reasons, there is a case that impacts to these vegetation types within the Project Area should be avoided.

4.2 Regional

The same vegetation types that are of higher statewide conservation significance have also been more heavily affected by clearing for mining and agriculture in the Western Coalfield. Specifically, interpretation of the ADS40 images suggests that the clearing associated with the existing Baal Bone and Invincible mines primarily affected the lower parts of the landscape, i.e. alluvial flats, small gullies and low rises. The Ribbon Gum dominated grassy open forest on alluvial flats, the Mountain Gum, Apple Box grassy forest grassy open forest, and the Broad-leaved Peppermint Brittle Gum Red Stringybark grassy forest appear to be the primary vegetation types that would have occurred within the area already cleared for mining. Figure E3.3 shows the configuration of the vegetation types that directly adjoin these existing mines. The current mining proposal would also affect vegetation types of higher conservation significance, continuing the trend of depletion of these vegetation types in the region.

5. Consistency with Prior Vegetation Surveys

The technology available to OEH (high resolution digital ADS40 imagery viewed in 3D using Planar stereoscope) was superior to the imagery and technology available to previous studies. The availability of this technology has enabled OEH to plot the boundaries of the different vegetation types with greater accuracy than previous studies.

This study has concluded that Southern Tableland Wet and Dry Sclerophyll Forests occur on the undulating Permian sediments. This is largely consistent with Benson and Keith (1990). The primary improvement in the current work is that OEH has mapped the individual vegetation types, whereas Benson and Keith (1990) mapped a complex of several vegetation types on Permian sediments without discriminating between the individual types comprising the complex.

The work by Cumberland Ecology also identified Tableland Open Forest on the undulating Permian sediments. The primary difference is that Cumberland Ecology has identified areas with Blakelys Red Gum as the White Box Blakelys Red Gum Yellow Box Endangered Ecological Community (Box-Gum EEC) in the northern part of the Project Area. This is an understandable conclusion given the presence of one of the indicator canopy species (Blakelys Red Gum), and may represent an application of the precautionary principle. However, OEH has reached a different conclusion after sampling a number of sites. The most consistently occurring canopy species on the footslopes and minor drainage lines on Permian sediments in this locality is Mountain Gum. Apple Box is commonly co-dominant, though it is also absent at some sites. Blakelys Red Gum is sometimes present, and can be locally dominant. The ground layer is dominated by grasses, with cool climate species such as Snow Grass being prominent. The consistent presence of Mountain Gum, and more occasional presence of Blakelys Red Gum suggests that this is a tableland grassy forest. Cumberland Ecology also identified Box-Gum EEC near the Invincible mine. OEH did not visit this part of the study area.

Less substantial differences are that OEH considers that the Cox's Permian Red Stringybark Brittle Gum Woodland mapped in the vicinity of the Invincible mine is more likely to comprise Mountain Gum Apple Box grassy forest and the Broad-leaved Peppermint Brittle Gum Red Stringybark grassy forest. Cox's Permian Red Stringybark Brittle Gum Woodland is an unusual vegetation type in so far as the ground layer is dominated by forbs rather than grasses. The ground layer in all of the vegetation types on undulating Permian sediments in the Project Area was dominated by grasses rather than forbs. Finally, OEH considers the Exposed Blue

Mountains Sydney Peppermint Silvertop Ash shrubby woodland to be less extensive than shown by Cumberland Ecology. This vegetation type does occur on talus slopes below sandstone. The Scribbly Gum Narrow-leaved Stringybark shrubby open forest also occurs on these steeper slopes, in areas mapped as Sydney Peppermint Silvertop Ash shrubby woodland. From a conservation perspective, this is not a substantial issue because both vegetation types are well conserved.

Over five weeks ago OEH did request access to Cumberland Ecology's quadrat data (which included the cover abundance of each plant) to further explore the reasons for these differences in interpretation, but this information was not provided.

6. References

Benson DH, Keith DA (1990) Natural vegetation of the Wallerawang area. *Cunninghamia* **2** (2).

DEC (2006). The vegetation of the Western Blue Mountains. Department of Environment and Conservation, Hurstville.

Keith DA (2004) Ocean shores to desert dunes; the native vegetation of New South Wales and the ACT. Department of Environment and Conservation, Hurstville

Yoo EK (1992) Western Coalfield Regional Geology (southern part) 1:100 000, 1st edition. Geological Survey of New South Wales, Sydney. http://www.resources.nsw.gov.au/geological/geological-maps/coalfield-maps2/1-100-000/western-coalfield-south-regional-1100-000-geology-map

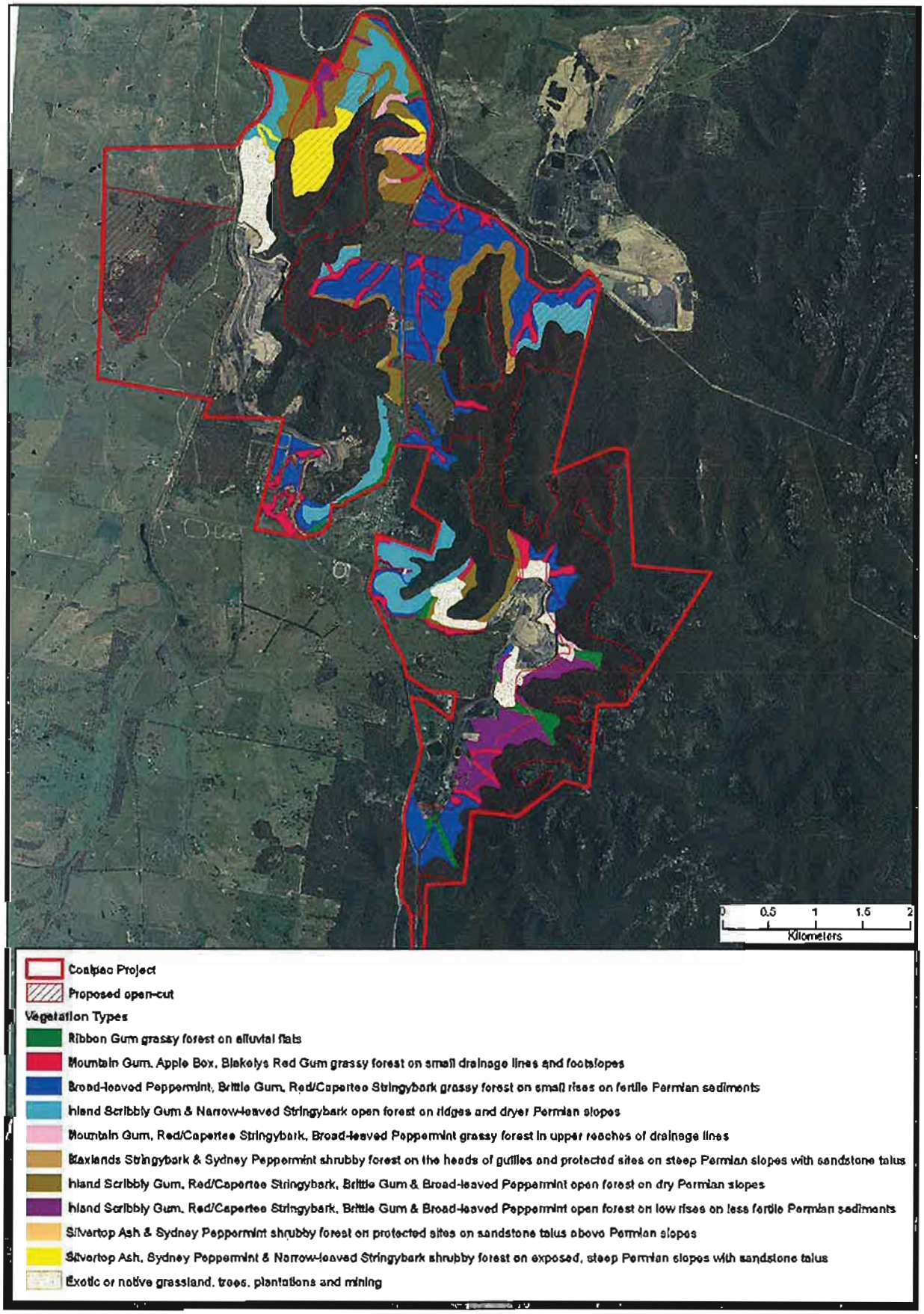

Figure E3.1. Mapped vegetation types in the Project Area.

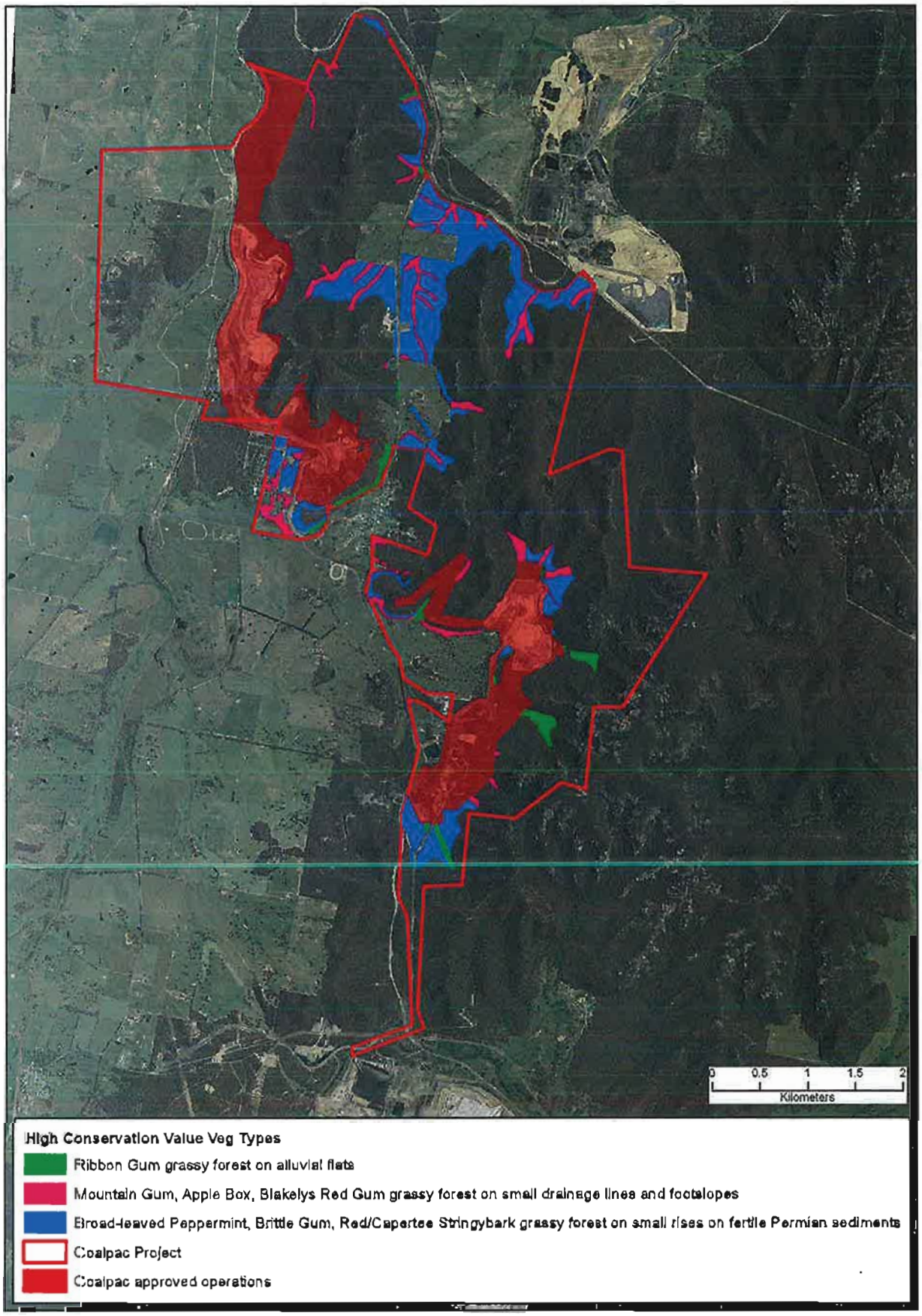

Figure E3.2. Vegetation types of conservation significance in the Project Area.

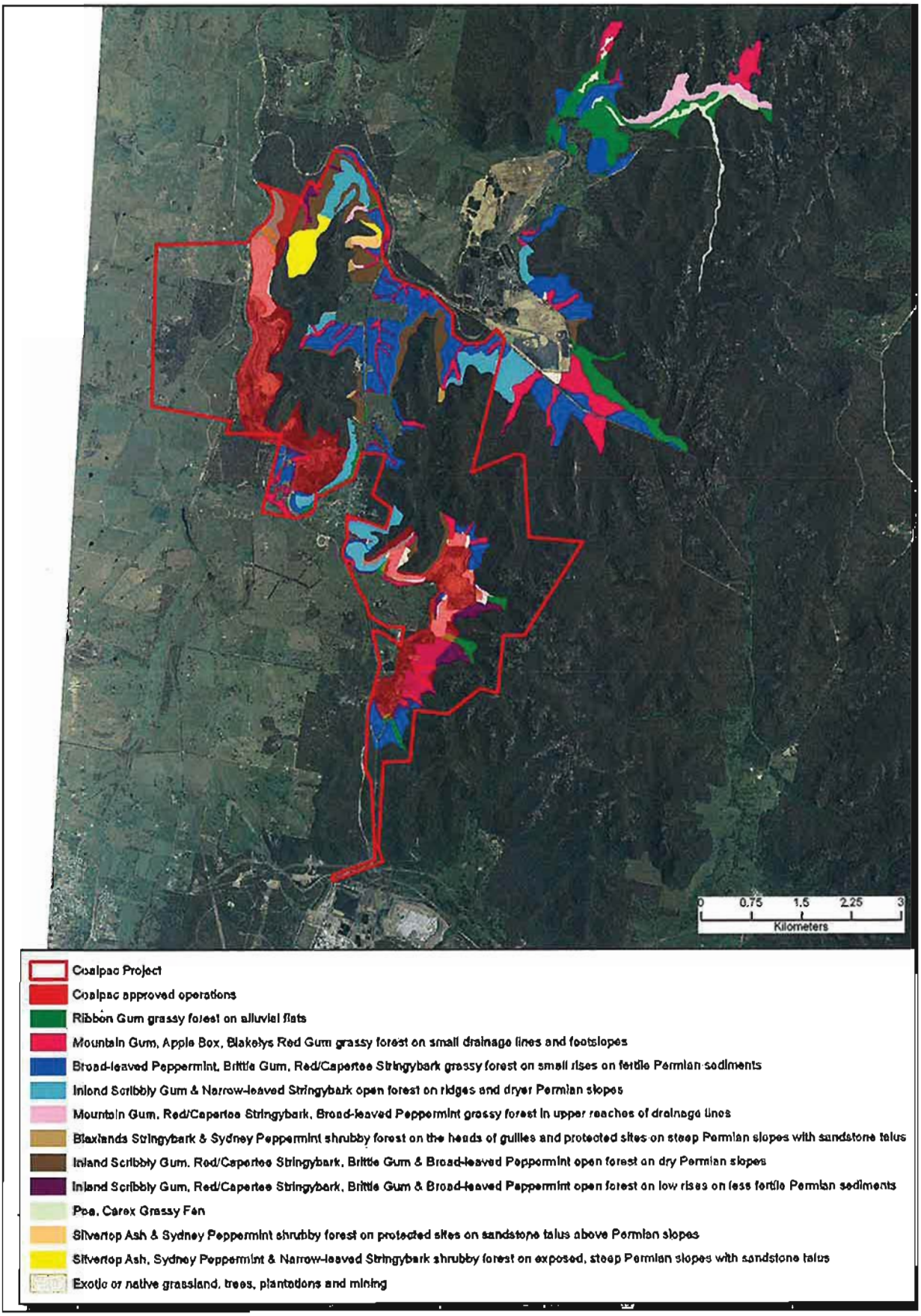

Figure E3.3. Mapped vegetation types relative to existing mines near the Project Area.

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Our reference:DOC12/49353
Contact: Peter Christie 68835 317

Dr Neil Shepherd
Chair Coalpac Commission
Planning Assessment Commission
GPO Box 3415
Sydney NSW 2001

Dear Dr Shepherd

I write with reference to the meeting of representatives of the Office of Environment and Heritage (OEH) with the Planning Assessment Commission (PAC) on 7 November 2012 at which OEH presented additional information in response to specific requests from the PAC. At this meeting, a number of additional issues were raised with regard to the assessment of and impact to Aboriginal cultural heritage and the foraging habitat for bat species. The OEH response to these issues is addressed below.

Value of the Project Area for Threatened Bat Species

OEH has presented information to the Department of Planning and Infrastructure and to the PAC with regard to the considerable known and potential value of foraging and breeding habitats within and adjacent to the Project Area for the threatened bat species Large-eared Pied Bat (*Chalinolobus dwyeri*) and Eastern Bentwing Bat (*Miniopterus schreibersii oceanensis*). At the 7 November meeting, OEH also presented information that demonstrated a large portion of the Project Area consists of wet and dry grassy forests and woodlands that are characteristic of the Southern Tablelands, and that consequently the Proponent had over-represented Sydney Sandstone vegetation types that typically occur on less fertile soils.

It has been asserted by the Proponent that the latter vegetation types are well represented within the large areas of NPWS Estate to the east of the Project Area, which therefore provide considerable alternative habitat for these bat species. However, given the relative fertility of soils upon which they occur and the resulting greater productivity of these ecosystems (including macroinvertebrate prey items), habitats within the Project Area are likely to be of greater foraging value for bats than Sydney Sandstone vegetation types. OEH therefore considers that a lack or unsatisfactory level of avoidance of foraging habitat by the Project may have significant implications for local threatened bat populations. Suggested avoidance and mitigation of impacts to foraging habitat (in the form of supportable standoff zones) were presented to the PAC at the 7 November meeting.

Adequacy of field survey for Aboriginal Cultural Heritage

OEH has reviewed the Coalpac Consolidation Environmental Assessment (EA) and have determined that the field survey methodology used by the company's consultant, AECOM, is generally consistent with the professional standards in EIA assessment for Aboriginal cultural heritage prescribed by OEH. However, AECOM reports that only 11.3% of the Project Area was inspected through survey transects, and that the survey was constrained by rugged terrain and poor ground surface visibility. Despite this, the map showing the location of survey transects indicates that the landforms most likely to have shelters (this was further checked by OEH using contour mapping), identified in the

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report as "Ridgelines and associated cliffs", and "Steep hill slopes" were subject to field inspection during several of the survey transects marked on the map.

Artefact Scatters

The AECOM report indicates that the artefact scatters to be harmed are of low significance and recommends the management option of collection for curation and analysis. OEH agrees with the significance assessment and proposed management. Artefact analysis offers the most common and tested means for determining the significance by using comparative analysis with sites previously investigated in the region. In the Part 3A planning process this usually occurs post approval through the Aboriginal Cultural Heritage Management Plan (ACHMP).

Rock Shelters

Five Aboriginal rock shelters are listed as having potential to collapse from subsidence and or vibration from the nearby open cut mine. AECOM has reported that site-specific impact assessment was not possible due to lack of specialised geotechnical data. Of the five rock shelter sites one is confirmed to have cultural material present, and 2 have potential for subsurface material. The report rightly categorises the shelters within the range of low to moderate significance based on presence or absence of significant artefacts, absence of art, and commonality for the region. It remains uncertain whether the shelters will survive the blasting and underground mining. Retrieving information from the shelters is therefore the only practical means to mitigate loss from roof fall collapse. The report recommends monitoring and excavation for three of the shelters. On the basis of the information provided, OEH considers that excavation is warranted as a form of proactive mitigation. Details about the excavation should be provided in the ACHMP.

Consultation with the Aboriginal community

Letters from the Aboriginal community support the field coverage efforts and recognise the constraints placed on finding sites in rugged forest landscapes. The Aboriginal cultural heritage report contains signed comments of endorsement from each of the Registered Aboriginal Parties about the methodology and results.

Management of the recently discovered art site

In light of the recent discovery of the art site OEH advises that the appropriate actions are as follows:

- Undertake a thorough recording of the art site and shelter
- Assess potential threats to the site from the mine operation, including impacts of dust affecting the art.
- Prepare mitigation strategies if threats are identified.
- Document the site's contents including a comparative analysis of the art for the region and compile information onto AHIMS.
- Consult with the Registered Aboriginal Parties in all aspects of the points above.
- Prepare a summary report of the site and its local and regional scientific and cultural significance.

OEH has advised Coalpac of this approach, and Coalpac has agreed to undertake this work. It is also appropriate that the summary report for the site inform any required management actions in the ACHMP.

Should the PAC have any further enquiries, please do not hesitate to contact me on 6883-5317.

Yours sincerely

4/12/12

PETER CHRISTIE
Regional Co-ordinator Conservation & Regulation

Planning Assessment Commission

Shoalhaven Starches Pty Ltd
Manildra Group
PO Box 123
NOWRA NSW 2541

Attention: Brian Hanley, Manildra Group Manager

25 September 2012

Dear Mr Hanley

Proposed Coalpac Consolidation Project – Castlereagh Highway, Cullen Bullen

As you are aware, the Commission is currently conducting a Review, under section 23D(1)(b)(ii) and Schedule 3 of the *NSW Environmental Planning and Assessment Act 1979*, of the Coalpac Consolidation Project Proposal (10_0178) at Cullen Bullen, near Lithgow. The terms of reference are to:

Carry out a review of the Coalpac Consolidation Project, and:

a. Consider the Environmental Assessment of the project, all issues raised in submissions on the project, and any information provided on the project during the course of the review;

b. Assess the merits of the project as a whole, paying particular attention to the potential:

- *Local health and amenity impacts of the project, particularly dust, noise and blasting impacts noting its proximity to the village;*
- *Biodiversity impacts of the project;*
- *Water resource impacts of the project; and*

c. Recommend appropriate measures to avoid, minimise and/or offset these impacts.

Shoalhaven Starches Pty Ltd made a written submission on the Environmental Assessment for this project on 9 May 2012. The company also made an oral submission at the Public Hearing held at Lithgow on 19 September 2012. These submissions have expressed support for the Project based on the current supply of competitively priced coal to Shoalhaven Starches. However the submissions were of a general nature and lacked information to substantiate the claims made. As a result, without further information the Commission can accord them very little weight in the review process.

The concluding statement at the Public Hearing was that 'the coal from Invincible Colliery is absolutely essential for the continued competitive operations of our Shoalhaven Starches facility at Bomaderry". The Commission's interpretation of this concluding statement is that Shoalhaven Starches will cease operations when coal from Invincible Colliery is no longer available.

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Can you please advise:

(i) whether this is the correct interpretation;

(ii) if not, what interpretation should be given to this statement;

(iii) given that the Coalpac approval process will inevitably extend beyond December 2012, can Shoalhaven Starches confirm whether alternative sources of coal have been identified to maintain production at Shoalhaven Starches?

(iv) can Shoalhaven Starches advise the proportional contribution to total production cost for Coalpac-sourced coal, and the possible alternatives?

If Shoalhaven Starches considers that any other information would be of use to the Commission in its review then please feel free to provide it. Any written response containing answers to the above questions or providing additional information would need to be received by close of business 19 October 2012.

Ms Sera Taschner (Commission Secretariat) can assist with any enquiries concerning the Commission's requests on (02) 9383 2117 or email sera.taschner@planning.nsw.gov.au.

Yours sincerely

Dr Neil Shepherd AM
Chair, Coalpac Commission

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10 October 2012

Dr Neil Shepherd AM
Chair, Coalpac Commission
Commission Secretariat
GPO Box 3415
SYDNEY NSW 2001

Dear Dr Shepherd

Re: PROPOSED COALPAC CONSOLIDATION PROJECT – CASTLEREAGH HIGHWAY, CULLEN BULLEN

We refer to your letter dated 25 September 2012 regarding the above and provide further information to you as requested.

Our two coal fired boilers and the coal handling equipment which supply approximately 50% of our steam requirements are designed to handle nut coal with low ash and small amounts of fines.

The coal handling equipment is a pneumatic system which transfers the coal from an in ground hopper up to the boiler bins and then the coal flows under gravity into the coal spreaders and into the furnace of the boilers. When high levels of fines get wet in outside storage they block the transfer system. High ash coal causes clinkering as well as increasing freight costs. Coal size is important because oversize pieces do not fully burn out before being discharged with the ash.

There are very few coal mines in New South Wales where nut coal can be purchased, to our knowledge only four, one at Newcastle, two at Lithgow (Invincible and Clarence Collieries) and one at Boggabri.

The Newcastle facility can only deliver coal by rail and there are no rail unloading facilities at the plant at Nowra for coal. We purchase some coal from Boggabri by road and our main source of coal is from the Invincible Colliery by road. Obviously, the further the coal has to be transported the more expensive it is.

The price of coal from the mines other than Invincible is significantly more expensive. The road freight cost from Clarence mine is similar to the freight cost from the Invincible mine.

In January 2011 Shoalhaven Starches therefore entered into a long term contract with Coalpac for the supply on a take or pay basis of up to 72,800 tonnes per annum of nut coal from the Invincible Colliery to the Bomaderry plant. However with the delays to date in the approval of Coalpac's proposed Consolidation project, Shoalhaven Starches has been recently advised by Coalpac that without an approval for its Consolidation project by the end of September 2012, it will be unable to supply coal under the contract beyond December 2012.

Accordingly, Shoalhaven Starches has been recently compelled to enter into a contract for nut coal supply from the Clarence Colliery near Lithgow at a cost of approximately $4.5M delivered to the plant for 30,000 tonnes covering the period from 1st January 2013 through to 30 June 2013.

This six months of back up coal supply is $1.35M more expensive than the coal we purchase from Invincible Colliery. If the Invincible Colliery is not in a position to supply us coal by 30 June 2013 then we will incur further additional costs to purchase coal to keep the Bomaderry Plant operating.

It is imperative, for us to remain internationally competitive at Shoalhaven Starches, that we contain any operating cost increases as we export around $250 million per annum of our products to countries such as Asia and the United States which have significantly lower operating costs in key areas including labour costs. For example, labour costs in the Australian manufacturing sector are around twice those in the US and several times higher than in Asia.

Unlike the countries we compete with internationally, we are currently experiencing additional costs of approximately $8.4M per annum at our Bomaderry plant alone as a result of the new requirements for the carbon pollution reduction scheme. The business is also under extreme pressure as a result of the high Australian dollar because we export a large proportion of our products, in particular, most of our gluten is sold overseas. We are also confronted by trade tariff barriers imposed on our products in a number of potential overseas markets (for example, Europe) while we face competition from the same products which can be imported to Australia without any duty being imposed.

Furthermore our sales of ethanol are only half of what we they should be because of the failure to date by the NSW Government to enforce the mandated 6 per cent of ethanol content in petrol sold in NSW. As we cannot slow down the ethanol production without making Manildra's overall business throughout NSW unviable, we are being forced to store large quantities of ethanol in rented storage facilities at considerable cost to the business and/or to export the ethanol to Asian markets at a loss..

Therefore, the cumulative effects of the abovementioned cost pressures on the international competitiveness of our Bomaderry plant, including additional costs such as more expensive coal from sources other than Invincible put in serious jeopardy the ongoing viability of our operations at Shoalhaven Starches.

I trust this further information in relation to our written and oral submissions in support of the proposed Coalpac Consolidation project is of assistance to you. Please do not hesitate to contact the undersigned should you require any additional information.

Yours faithfully

B. A. Hanley

BRIAN A HANLEY
MANAGER
ENERGY & SUSTAINABILITY
SHOALHAVEN STARCHES PTY LTD

Planning Assessment Commission

NSW GOVERNMENT

TRUenergy Pty Ltd
Level 33, 385 Bourke Street
MELBOURNE VIC 3000

Attention: Mark Collette, Group Executive Manager
Energy Markets, TRUenergy

25 September 2012

Dear Mr Collette

Proposed Coalpac Consolidation Project – Castlereagh Highway, Cullen Bullen

As you are aware, the Commission is currently conducting a Review under section 23D(1)(b)(ii) and Schedule 3 of the *NSW Environmental Planning and Assessment Act 1979*, of the Coalpac Consolidation Project Proposal (10_0178) at Cullen Bullen, near Lithgow. The terms of reference are to:

Carry out a review of the Coalpac Consolidation Project, and:

a. *Consider the Environmental Assessment of the project, all issues raised in submissions on the project, and any information provided on the project during the course of the review;*
b. *Assess the merits of the project as a whole, paying particular attention to the potential:*
    - *Local health and amenity impacts of the project, particularly dust, noise and blasting impacts noting its proximity to the village;*
    - *Biodiversity impacts of the project;*
    - *Water resource impacts of the project; and*
c. *Recommend appropriate measures to avoid, minimise and/or offset these impacts.*

TRUenergy provided a submission to the Department of Planning and Infrastructure in support of the project dated 30 May 2012. That submission makes general claims concerning the importance of the continued supply of coal from Coalpac but provides no substantiation for any of these claims. A representative of TRUenergy made similar generalised claims at the Public Hearing held at Lithgow as part of the Commission's review.

As you would be aware, the Commission can accord little weight in the review process to unsubstantiated assertions. The claims of particular interest to the Commission are:

(i) *'Without approval for the consolidation project, Coalpac will exhaust its current mine in the short term with significant consequences for the supply of coal to the Mt Piper Power Station…..'*

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(ii) 'Any supply interruptions would require the sourcing of alternative, higher priced coal from other mines located in parts of New South Wales that are more remote from the power station. …'

(iii) 'Increased costs would need to be reflected in wholesale prices bid into the National Electricity Market by Mt Piper.'

In relation to the first two of these statements, the Commission has been advised by Coalpac that mining will cease in December 2012. The likely timeframes for the completion of the approval process mean that, even if approval were to be forthcoming for the project, there will be a significant gap in supply of coal from Coalpac to Mt Piper Power Station (MPPS). The Commission seeks advice as to whether it is intended to close or reduce production from MPPS under these circumstances or whether an alternative source of coal will have been secured to cover the eventuality.

Can TRUenergy confirm:

(i) whether one or more alternative sources of coal have been secured;

(ii) whether there is a positive or negative price differential* between the Coalpac coal supplied and the alternative source(s); and

(iii) if there is a price difference, the magnitude of any such difference; and whether there is any difference in the quality of the coal to be sourced from alternative supplier(s) to that supplied by Coalpac.

*coal price is taken to be as-delivered to MPPS, including transport.

In relation to the third statement, can TRUenergy advise:

(i) the magnitude of any increase in wholesale power prices anticipated;

(ii) the relationship between coal price and wholesale power price (i.e. the proportion of wholesale power price attributable to the cost of coal used to produce it given that coal is only one of the inputs to production cost);

(iii) whether alternative sources of coal may provide improvements in combustion efficiency at MPPS and, if so, whether this could alter the cost of power production assuming no change in the cost of coal supplied; and

(iv) the anticipated real increase in retail power costs to NSW consumers if MPPS has to use an alternative coal source.

As you will appreciate, these are the obvious questions that the Commission will require answers to as it works through the complex issues associated with this Project Review. If TRUenergy considers that there are additional relevant matters that it wishes to bring to attention, the Commission is prepared to facilitate this.

The Commission would be happy to meet with representatives of TRUenergy and/or receive a written response. Please note, any written response containing answers to the above questions or providing additional information would need to be received by close of business 19 October 2012.

Ms Sera Taschner (Commission Secretariat) can assist with any enquiries concerning the Commission's requests on (02) 9383 2117 or email sera.taschner@planning.nsw.gov.au.

Yours sincerely

Dr Neil Shepherd AM
Chair, Coalpac Commission

CC: Graham Dowers - graham.dowers@truenergy.com.au
Mark Frewin - mark.frewin@truenergy.com.au

2 November 2012

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Dr Neil Shepherd
Chair Coalpac Commission
Planning Assessment Commission
Level 13, 301 George Street
SYDNEY NSW 2000

Re: Coalpac Consolidation Project and coal supply to Mount Piper Power Station

Dear Dr Shepherd,

Thank you for the opportunity to meet with the Review Panel on Wednesday 17 October 2012. I appreciated the opportunity to follow up the issues raised in your letter of 25 September 2012. I write today to follow up on a number of issues we discussed in this meeting.

Economic Impact of the Coalpac Project

EnergyAustralia sees the Coalpac Consolidation Project as a critical coal supplier for the Mt Piper Power Station, and in turn the state of NSW. As discussed in the meeting, EnergyAustralia has modelled that wholesale price increases of 35% and retail price increases of 13% could be seen by 2022 without Coalpac supplying Mt Piper.

To independently verify this analysis, EnergyAustralia has commissioned economic consultancy ACIL Tasman to consider the potential price increases that could be faced by NSW in the absence of Coalpac supply to Mt Piper. ACIL's modelling (attached to this letter) shows that NSW wholesale electricity prices could rise by 42% and retail prices by 12% by 2018.

In the context of recent significant increases in electricity prices and the NSW's Government's desire to reduce future pressure on electricity prices, ACIL Tasman's price forecasts reinforce the conclusions of EnergyAustralia's earlier modelling – the Coalpac Consolidation Project is a supplier of economic importance for the state of NSW.

Environmental Impact of Coalpac

EnergyAustralia understands the Commission has a number of concerns about the Coalpac project. These include in particular:

- Proximity of mining activities to the town of Cullen Bullen and the potential impacts arising from unmitigated dust and noise associated with mining activity; and
- Effects of the mine development in the Ben Bullen State forest and proximity to associated stone formations.

EnergyAustralia notes that Coalpac has proposed mitigations for each of these concerns which can form the basis for an effective mitigation strategy.

Alternate Fuel Supply Issues

EnergyAustralia reiterates that all coal supply options to Mt Piper could present their own issues for consideration.

For example, we discussed in the meeting the potential to supply Mt Piper from northern coal deposits such as Cobbora. Such a supply option will introduce challenges including:

- The need for a rail upgrade between Gulgong and Kandos. Estimates for this upgrade are in the order of $300M;
- The introduction of regular coal transportation through towns such as Mudgee; and
- Longer supply chains increase the risk of potential disruptions of supply, lessening security of electricity supply for the state.

Further, other potential suppliers to Mt Piper also face issues related to water management, noise and dust.

Importance of the Coalpac Consolidation Project

Without Coalpac, NSW faces wholesale electricity price increases of ~40% and retail price increases of ~13%. Coupled with price increases of recent years, such wholesale electricity price increases will increase the pressure on energy users in the state. The local area would also be denied significant economic and employment benefits.

Given the potential economic impacts, EnergyAustralia believes NSW should approve the project as it provides the most favourable and potentially least impact option for the supply of coal to MPPS.

Energy Australia as a significant user of fuel in the region, is committed to work with the state of NSW and the regional stakeholders to ensure cost effective, sustainable, healthy mining operations and with it local power production, which continues to provide a benefit to the region.

EnergyAustralia once again thanks the Commission for the discussions to date and invites the Commission to discuss these issues further as the process continues.

Yours sincerely,

Mark Collette
Group Executive Manager, Energy Markets
Energy Australia

Mr Robert Greenwood
General Manager
Blue Mountains City Council
Locked Bag 1005
KATOOMBA NSW 2780

26 September 2012

Dear Mr Greenwood

Proposed Coalpac Consolidation Project – Castlereagh Highway, Cullen Bullen

The Commission is currently conducting a Review under section 23D(1)(b)(ii) and Schedule 3 of the *NSW Environmental Planning and Assessment Act 1979*, of the Coalpac Consolidation Project Proposal (10_0178) at Cullen Bullen, near Lithgow. The terms of reference are to:

Carry out a review of the Coalpac Consolidation Project, and:

a. *Consider the Environmental Assessment of the project, all issues raised in submissions on the project, and any information provided on the project during the course of the review;*
b. *Assess the merits of the project as a whole, paying particular attention to the potential:*
    - *Local health and amenity impacts of the project, particularly dust, noise and blasting impacts noting its proximity to the village;*
    - *Biodiversity impacts of the project;*
    - *Water resource impacts of the project; and*
c. *Recommend appropriate measures to avoid, minimise and/or offset these impacts.*

Details of Coalpac's Project Proposal are available on the Commission's website www.pac.nsw.gov.au.

The Proposal primarily involves the supply of coal to the Mount Piper Power Station via a proposed conveyor, but it also seeks approval to haul coal and sand to domestic customers primarily on the east coast including in Sydney.

The Environmental Assessment (EA) estimates about 0.45 Mtpa of product coal will be transported by road via the Great Western Highway, requiring up to 51 one-way truck movements for up to 290 haul days. In addition, an estimated 0.64 Mtpa of sand product will also be transported via the Great Western Highway by up to 64 one-way truck movements for up to 290 haul days. It is assumed all trucks will return empty doubling the daily movements quoted above. The proponent advises the Bells Line of Road will not be used as a truck haulage route.

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In addition, 1 Mtpa of coal for export will be moved by train from the mine through the Blue Mountains to Port Kembla. Coalpac suggests this will require 290 one-way rail movements each year. Again, it is assumed that all trains will also return doubling the movements quoted above.

Subject to project approval, transport of sand to Sydney would commence in year 2 through to year 14. Transport of coal by rail and road would extend over the life of the project which is for 21 years.

To assist the Commission with its review of the Coalpac Consolidation Project the views of your Council would be appreciated, particularly with respect to road and rail traffic and any potential impacts for your Council and community.

The Commission would be happy to meet with representatives of Blue Mountains City Council and/or receive a written response. Any written response would need to be received by close of business 19 October 2012, as the timeframe for the Commission review is restricted with a report and recommendation due to be provided to the Minister by mid November 2012.

Ms Sera Taschner (Commission Secretariat) can assist with any enquiries concerning the Commission's requests on (02) 9383 2117 or email sera.taschner@planning.nsw.gov.au.

Thank you for your cooperation.

Yours sincerely

Dr Neil Shepherd AM
Chair, Coalpac Commission Chair

18 October 2012

Office of the General Manager

Reference File: F05049 - 12/160428

Dr Neil Shepherd AM
Chair, Coalpac Commission Chair
GPO Box 3415
SYDNEY NSW 2001

Dear Dr Shepherd,

SUBJECT **Blue Mountains submission to the Proposed Coalpac Consolidated Project - Castlereagh Highway, Cullen Bullen**

The Council welcomes the opportunity to express its views on the Coalpac Consolidated Project proposal and offers the following comments for your consideration.

The Council considers the proposed additional 102 coal trucks and 128 sand truck (delivery and return) movements per day for up to the 290 haul days as totally unacceptable. This increase of 230 truck movements per day would have a detrimental effect on the life style, amenity of residents in the Blue Mountains. The changes in vehicle movement numbers as detailed in the proposal will change the current and tolerated movements residents have, to some extent, accepted.

The Blue Mountains Corridor already attracts approximately 1018 truck movements per day (359,523 total movements in 2011). The proposed increase in truck movements within this application represents a 23% increase on the current levels.

The issue of road freight movement in the Blue Mountains is highly contentious and requires careful management to secure the highest possible standards of road safety and amenity for all road users. The Council continues to advocate for an increased use of rail freight to transport bulk products such as coal, gravel, sand and fuel.

The current Draft NSW Long Term Transport Master Plan and the re-working of the NSW State Metropolitan and Transport plans provides further opportunity to advocate for the establishment of improved rail freight infrastructure into and within the Sydney basin. It is essential that the objective of securing a long term transferral of freight from the road to rail can be achieved by continuing to lobby the appropriate state and federal agencies. The Council is aware that capacity currently exists on the western railway line to accommodate growth in freight movements and considers that it remains the imperative for both the State and Federal Governments to shift freight from our roads to rail.

At present, the highway through the Blue Mountains is currently under pressure from both the high volume and impact of trucks which currently access the Sydney basin via the Great Western Highway and Bells Line of Road. The highway is also

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experiencing unprecedented disruption due to the state governments upgrade program, when completed will provide significant road safety and functional improvements.

Recommendations
The following recommendations are provided for consideration in the Environmental Assessment being conducted under section 23D(1)(b)(ii) and Schedule 3 of the NSW Environmental Planning and Assessment Act 1979, of the Coalpac Consolidation Project Proposal (10_0178) at Cullen Bullen.

The Council strongly recommends that the impact of additional heavy traffic travelling through the City is properly assessed and that, in particular, the following recommendations are considered and addressed:

- Blue Mountains City Council objects to any increase in the number of heavy vehicles routinely using Harley Avenue;
- Blue Mountains City Council strongly urge that Coalpac Consolidation Project prepare a detailed investigation into the use of rail transport for the haulage of coal to a central depot/s with the intention that coal and sand is stockpiled in the Hunter/Central Coast region, south coast region and a western region. The coal then be loaded onto trucks at the stockpile for delivery to individual customers. The investigation should include all costs and logistical issues relevant to the haulage of coal, including the savings of not hauling the coal by road such as fuel costs, reasonable estimates of wear and tear on infrastructure, road crash reductions and consequent savings, repair and replacement costs of vehicles and labour costs for drivers for the life of the consent. A comparison of the complete and reasonable cost alternatives should be included in the Environmental Assessment;
- The planned upgrade of the road between Mt Victoria and Lithgow could impact significantly on the proposal and may eliminate impacts on Harley Road. Blue Mountains City Council requests that the Coalpac Consolidation Project make representation to the Roads and Maritime Services as to the route and the timing for the upgrade and that this information be included in the Environmental Assessment. Blue Mountains City Council requests that the advice be factored into the assessment and properly addressed within the proposal;
- Blue Mountains City Council requests that if the above information alters the proposed haulage strategy, then Coalpac Consolidation Project advise Blue Mountains City Council with a view to amending their requirements in accordance with the probable impacts from the additional information; and
- Blue Mountains City Council notes concerns about the impact that increased coal mining will have on our World Heritage status, given the contribution of coal to the threat posed by climate change.

Determinations - Consent Approval
In the event that consent is approved Blue Mountains City Council will strongly urge that the Planning Assessment Commission require Coalpac Consolidation Project to undertake the following:

- That Harley Avenue be upgraded in accordance with Blue Mountains City Council design plans;
- That Coalpac Consolidation Project enter into a formal agreement with whom with respect to the road maintenance of Harley Avenue based on either an average number of truck movements or the actual number of truck movements as a percentage of the total of the trucks using Harley Avenue;

I trust that this submission conveys the seriousness of the issue and the significant concern with which the Council views the proposal by Coalpac Consolidation Project.

Ensuring that the quality and values of the Blue Mountains are not negatively impacted by this proposal is critical and that the aims and objectives of the Great Western Highway Management Plan are adhered to in addition, at the time of seeking World Heritage status, the listing was significantly jeopardised by the challenge of a city and major transport corridor being contained within a World Heritage area recognised for its natural values. Ongoing vigilance in protecting those values is therefore essential.

If you require any further information on this matter then please Andy Turner, Manager City Planning on (02) 4780-5513 or aturner@bmcc.nsw.gov.au

Yours faithfully

Robert Greenwood
General Manager

Planning Assessment Commission

Contact: Sera Taschner
Phone: 02 9383 2117
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Email: sera.taschner@planning.nsw.gov.au

Mr Barry Buffier
Chair
Environment Protection Authority
PO BOX A290
SYDNEY SOUTH NSW 1232

cc: Mr Richard Whyte – Manager, Bathurst

2 October 2012

Dear Mr Buffier

Proposed Coalpac Consolidation Project – Castlereagh Highway, Cullen Bullen

The Commission is currently conducting a Review, under section 23D(1)(b)(ii) and Schedule 3 of the *NSW Environmental Planning and Assessment Act 1979*, of the Coalpac Consolidation Project Proposal (10_0178) at Cullen Bullen, near Lithgow. The terms of reference are to:

Carry out a review of the Coalpac Consolidation Project, and:

a. *Consider the Environmental Assessment of the project, all issues raised in submissions on the project, and any information provided on the project during the course of the review;*
b. *Assess the merits of the project as a whole, paying particular attention to the potential:*
   - *Local health and amenity impacts of the project, particularly dust, noise and blasting impacts noting its proximity to the village;*
   - *Biodiversity impacts of the project;*
   - *Water resource impacts of the project; and*
c. *Recommend appropriate measures to avoid, minimise and/or offset these impacts.*

As part of its review, the Commission has considered submissions from the NSW Environment Protection Authority (EPA) dated 4 June 2012 on the proponent's Environmental Assessment (EA), and dated 18 September 2012 on the proponent's Response to Submissions (RTS). The Commission has also reviewed the proponent's supporting documents, submissions received, visited the site, and listened to submissions made over a day and a half of public hearings.

From this material, a number of matters have arisen that are within the regulatory responsibilities and/or expertise of the EPA. The Commission will need to explore these matters as part of its review. The specific issues are set out below.

(1) Submissions to the Review, including from Lithgow City Council, have raised concern about noise impacts from the project for residences located away from the Castlereagh Highway. These residences have measured night-time background noise levels below the 30dBA default background level adopted in the NSW Industrial Noise Policy 2000 (INP) and the differential between background and the level at which acquisition would normally become available under Department of Planning and Infrastructure practice (40 dBA) is therefore >10dBA. The Council, and other submitters, have indicated that this will lead to a substantial level of justifiable complaint by affected residents. The Department of Planning and Infrastructure has also informally advised that this pattern of complaints commonly occurs where coal mines are located in proximity to rural residences and night-time operations are permitted.

You would be aware that the Commission recently addressed this issue in the context of the Boggabri Coal Project determination (DPI Project Application Reference: 09_0182). In that determination the Commission adopted a position based on a recommendation from OEH (which was at the time responsible for EPA functions) to provide for acquisition at a lower level (35 dBA). The Department of Planning and Infrastructure strongly contested this approach arguing that research demonstrated that the impact at 40 dBA was acceptable and provided informal advice that the EPA agreed with this position. The research information was not provided. Nor has the EPA withdrawn its earlier advice.

The Commission therefore requests formal advice from the EPA as follows:

(i) does the EPA consider that occupants of rural residences should be subjected to noise impacts more than 10 dBA above background during night-time operations from coal mines; and

(ii) if so, can the EPA please provide details of the research on which this position is based including the places in which the research was conducted and the range of conditions under which it was conducted.

(2) The proponent's EA (Section 8.6.2) acknowledges that construction noise should be assessed under the INP, not the Interim Construction Noise Guidelines (ICNG). The EA then says that the noise has been assessed under ICNG but compared to INP. Is the EPA satisfied with the assessment and conclusions in relation to construction noise?

(3) The EPA submission dated 4 June 2012 (EPA reference: LIC07/1337-07:DOC12/12747) has recommended that any Air Quality Management Plan include 'performance based outcomes aimed at minimising particulate emissions for the following sources' and goes on to list a range of potential sources. Is the EPA able to provide more specific advice on the suggested performance based outcomes that would be acceptable?

(4) Several submissions claim that the surface and mine water quality monitoring required by the EPA is inadequate as it does not cover the full range of likely pollutants. Contamination with metals was a particular focus. Preliminary assessment by the Commission suggests that the concerns raised may be well-founded and that

the Environment Protection Licence (EPL) requirements are not consistent with best practice. The EPA's response to these concerns would be appreciated.

(5) Some submissions claimed that Invincible Colliery's LDP001 licensed discharge to Long Swamp has caused pollution. Despite Coalpac's claim that the discharge meets EPA criteria, the Commission was provided with photos taken by special interest groups showing red staining on the walls of the collection pond at the discharge point (see attached). As Coalpac has not used this discharge point since 2008 and claims it should not be needed in future, can the EPA justify retaining this discharge point in the EPL?

(6) At the Commission's public hearing at Lithgow, a special interest group presented a list of non-compliances by Coalpac with licence requirements (see attached). Can the EPA provide advice on the performance of Coalpac in meeting its environmental obligations, including a summary of licence or other breaches of the environmental legislation? Can the EPA advise what regulatory action has been taken?

(7) The EPA submission dated 4 June 2012 (EPA reference: LIC07/1337-07:DOC12/12747) referred to a commitment by Coalpac to replace the high pitch reversing alarms on all mobile equipment with broad-spectrum alarms and noted that this work had not been completed. The proponent has since advised that this work has now been completed. Is EPA able to advise if these reversing alarms are now operating satisfactorily?

(8) The EA notes some occasions where pH levels have been low in collecting dams, presumably as a result of acid forming material. The Project involves exposing further acid forming materials and suggests management of these will be included in the Water Management Plan. In essence the Proponent has committed to capturing all potentially acid forming water and treating it before discharge. Is the EPA able to provide any advice to the Commission on the adequacy of the Environmental Assessment and proposed measures for ensuring there are no adverse impacts, either short or long term, to surface or ground waters.

The Commission would be happy to meet with representatives of the EPA to discuss the above matters and any other issues that the EPA wishes to raise in connection with this project proposal. As the Commission's report is due to be provided to the Minister by mid November 2012 any written response would need to be received by close of business 19 October 2012.

Ms Sera Taschner (Commission Secretariat) can assist with any enquiries concerning the Commission's requests on (02) 9383 2117 or email sera.taschner@planning.nsw.gov.au.

Yours sincerely

Dr Neil Shepherd AM
Chair, Coalpac Commission

Contact: Sera Taschner
Phone: 02 9383 2117
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Mr Barry Buffier
Chair
Environment Protection Authority
PO BOX A290
SYDNEY SOUTH NSW 1232

cc: Mr Richard Whyte – Manager, Bathurst

11 October 2012

Dear Mr Buffier

Proposed Coalpac Consolidation Project – Castlereagh Highway, Cullen Bullen

As you are aware and as set out in my previous correspondence dated 2 October 2012, the Planning Assessment Commission (Commission) is carrying out a review of the Coalpac Consolidation Project.

Since my prior correspondence, the Commission's review process has been on-going and a subsequent query has arisen.

The project predicts exceedances of the air quality criteria at some residences and proposes acquisition of these properties in accordance with usual practices. It is common practice for acquisition to be triggered when the 24hr average PM_{10} is predicted to exceed 50 $\mu g/m^3$ for mine-only emissions or 150 $\mu g/m^3$ for emissions for all sources.

For the current project NSW Health has provided a comprehensive submission dated 12 September 2012 (see attached) expressing concern about PM10 emissions particularly those greater than 50 $\mu g/m^3$. The EPA made no specific comment in relation to the proposed acquisition criteria in its submission on the Environmental Assessment.

Given the EPA's Standard Methods for Modelling and Assessment of Air Pollutants refers to the 50 $\mu g/m^3$ but makes no reference to 150 $\mu g/m^3$, and the increased concerns raised by NSW Health, the Commission would appreciate any additional views the EPA may have in relation to the appropriateness of the 150 $\mu g/m^3$ criteria for acquisition.

The Commission would be prepared to meet with the EPA to discuss this matter as well as the matters raised in our previous letter, should the EPA so wish. As the Commission's report is due to be provided to the Minister by mid November 2012 please provide any written response to the above query by close of business 31 October 2012.

Ms Sera Taschner (Commission Secretariat) can assist with any enquiries concerning the Commission's requests on (02) 9383 2117 or email sera.taschner@planning.nsw.gov.au.

Yours sincerely

Dr Neil Shepherd AM
Chair, Coalpac Commission

NSW EPA

Our reference: DOC12/42742, DOC12/41018, LIC07/1337-08
Contact: Jude Futcher, 9995 5544

Dr Neil Shepherd AM
Chair, Coalpac Commission
Commission Secretariat
GPO Box 3415
SYDNEY NSW 2001

ATTENTION: SERA TASCHNER

Dear Dr Shepherd Neil

Thank you for your letters dated 2 and 11 October 2012 and request for the Environment Protection Authority (EPA) to provide the Planning Assessment Commission ("Commission") with further information on a range of matters relating to the Coalpac Consolidation Project.

The EPA has prepared responses to each of the questions raised in your letters. These responses are provided at Attachment 'A'. If you have any immediate queries about the advice provided the EPA's Manager Bathurst, Mr Richard Whyte can be contacted on 02 6332 7600 for further advice.

I also note the Commission's interest in meeting with representatives of the EPA to discuss the issues raised in your letter. We are willing to meet with the Commission and in addition, I would like to meet with you personally to discuss these issues further at a mutually convenient time.

Please contact Jude Futcher on 9995 5544 to arrange a time that suits the Commission and the EPA if you wish to take up this opportunity.

Yours sincerely

BARRY BUFFIER
Chair and CEO
Environment Protection Authority

cc: Sam Haddad (DP&I)

24 OCT 2012

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NSW EPA

ATTACHMENT 'A'

EPA RESPONSES TO QUESTIONS RAISED BY THE PAC

Questions from letter dated 2 October 2012

Question (1)(i) ***does the EPA consider that occupants of rural residences should be subjected to noise impacts more than 10 dBA above background during night-time operations from coal mines;***

Question (1)(ii) ***if so, can the EPA please provide details of the research on which this position is based including the places in which the research was conducted and the range of conditions under which it was conducted?***

The EPA considers that occupants of rural residences should not be subjected to noise impacts more than 10dBA above background during night time operations from coal mines, except when background levels are less than 30dBA, in which case they are taken to be 30dBA.

The Commission has noted that some potentially affected residences have measured night-time background noise levels below the 30dBA default background level in the NSW Industrial Noise Policy (EPA, 2000) (INP) and the differential between the background noise and the minimum level at which acquisition rights would normally be granted (40dBA) would therefore be greater than 10dBA.

The INP says on page 24 that, "Where the rating background level is found to be less than 30dBA, then it is set to 30dBA." No explanation is provided for this in the policy but it reflects the available acoustic research referenced on page 55 and at the end of each Appendix to the policy.

There are three issues that need to be understood in relation to this point:

- firstly, the noise criteria in the INP and how the "background plus 5dB" applies to rural areas;
- secondly, why a minimum background noise level of 30dBA is used; and
- thirdly, the variation in community response to noise and how this relates to the "background plus 5dB" criterion.

i) INP Criteria

The noise goals used in the INP to assess the noise implications for any new proposal consist of two components. These components are:

1. The extent to which the contributed L_{Aeq} noise levels emitted by the development exceeds the L_{A90} background noise level. This is referred to as the intrusiveness criteria and is set at background plus 5dB; and
2. The noise contributed by the new proposal should not raise the ambient noise level of the area above the target amenity noise criteria for the appropriate land-use - to protect amenity by preventing continually increasing ambient levels.

The threshold at which noise mitigation measures need to be considered is normally set by whichever component of the noise criteria is the most stringent. In rural areas the first component is generally the most stringent and so typically forms the Project Specific Noise Level (noise goal) for new proposed industries in these areas. This criterion was in place when the Environmental Noise Control Manual was published by the State Pollution Control Commission in 1985 and its origin is identifiable in historical documents (British and International Standards and the like) dating from the 1960s and 1970s.

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ii) Minimum Background

There are two basic reasons for the current stipulation in the INP of a minimum background noise level of 30dBA. The first is to ensure that amenity is protected and the second is to avoid the situation where applying a very low background noise level would not improve the level of protection but may impose very strict requirements on a new development.

At the time the INP was published, there was no real evidence in the literature to suggest that noise impacts on amenity occurred at levels lower than 35dBA. By adopting a minimum background noise level of 30 dBA, the intrusive noise criterion becomes 35 dBA. At that time the World Health Organisation (WHO)[1] recommended the use of a steady internal noise level of 30-35dBA for continuous sources and a maximum internal level of 45dBA for single sound events to protect against sleep disturbance.

Accounting for a noise reduction of approximately 10dB through an open window these levels equate to steady external noise levels of 40-45dBA for continuous noise and a maximum external level of 55dBA for intermittent noise. The WHO "recommended" external noise levels are 5-10dB above the intrusive criterion level of 35dBA. Therefore the minimum background of 30dBA was considered a very conservative figure.

This is not to say that a noise would be inaudible at a level of 35 dBA. However, just because a person can hear a sound it does not necessarily follow that their amenity will be affected to an unacceptable level. There are many noises we hear every day that do not cause annoyance.

iii) Community Response

Because of the widely varying nature of people's reaction to noise it is difficult to assign a criterion level that would satisfy everyone. Also, many non-acoustic factors play a significant role in how people react to the noise they hear. Kosten & Van Os presented a good summary of the factors that determine whether or not an individual will complain about noise:

- characteristics of the noise (sound pressure level, frequency content, pure tones, continuous or intermittent, impulsive, low frequency content);
- characteristics of the individual (personal likes and dislikes);
- characteristics of the environment (very quiet suburban, suburban, residential urban, near industry etc);
- miscellaneous circumstances (noise avoidance possibilities, cognitive noise, unpleasant associations etc); and
- human activity being interrupted (sleep, communicating, reading, working, listening to radio and TV, recreation).[2]

Even with the variation in response to noise and the range of factors that can influence the response, the available scientific evidence suggested that setting a minimum background noise level of 30 dB(A) would ensure that the vast majority of the community would be protected from unacceptable impacts on their amenity.

iv) INP Review

Since the INP was published, new research has become available especially the Night Noise Guidelines for Europe, World Health Organisation, 2009. Very briefly, this study found that although individual sensitivities and circumstances differ, it appears that no substantial biological effects are observed up to $L_{night\ outside}$ 30dBA. Between 30 and 40dB $L_{night\ outside}$ some effects occur but even in the worst cases they are modest.

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[1] Berglund, B. & Lindvall, T. (eds) 1995, *Community Noise*, Stockholm University and Karolinska Institute 'Archives of the Centre for Sensory Research' on behalf of the World Health Organisation, vol. 2, issue 1, ISBN 91-887-8402-9; World Health Organisation, *Guidelines for Community Noise*, 1999.

[2] Kosten, C.W. & Van Os, G.J. 1962, 'Community reaction criteria for external noises', Nat Physical Lab Symposium 12, pp 373 - 382.

The World Health Organisation therefore recommended a health based target of $L_{night,outside}$ 40dBA and an interim target for Europe of $L_{night\ outside}$ of 55dBA.

The descriptor $L_{night,outside}$ is generally equivalent to $L_{Aeq,night\ (10pm\ to\ 7am)}$ as used in the INP but averaged over a longer term, for example, a year.

These findings will be taken into account by the EPA in the current review of the INP. Consideration will also be given to whether a change in the minimum background noise level is warranted taking into account the latest acoustic research.

v) Night time impacts

Your letter of 2 October 2012 noted that submissions had raised concerns about night time impacts. In the EPA's submissions dated 4 June and 8 September 2012 to the Department of Planning and Infrastructure for the Coalpac Consolidation Project, the EPA recommended that, for at least the first two years, the project conditions of approval should specify project hours of operation whereby only low noise equipment maintenance activities should be permitted between 10pm and 7am on Monday to Saturday and between 6pm and 7am on Sundays, with no operation on public holidays. This was intended to protect night-time amenity for affected residents.

vi) Boggabri decision

Your letter also noted that in the Commission's determination on the Boggabri Coal project (DPI Project Application reference: 09_0182) the Commission adopted a position to provide for acquisition at a level of 35dBA in line with a recommendation from the then Office of Environment and Heritage. The advice provided by the former EPA in relation to that project was specific to that case and reflected the proponent's willingness to enter into negotiations for property acquisition if the existing licence limit of 35dBA was likely to be exceeded.

The EPA believes that the threshold for property acquisition is a matter for planning authorities. The INP specifically says in Section 1.4.8 that, "The noise criteria in this document have not been derived for the purpose of land acquisition." As a general rule, the EPA supports the long standing practice that acquisition would be warranted where predicted noise levels exceed the background noise level by more than 10dBA as this is a level at which a significant volume of complaints may be anticipated. In the interests of greater transparency, I will be writing to the Director General of the Department of Planning and Infrastructure (DP&I) to ask that his Department finalise a policy on the circumstances in which negotiated agreements for property acquisition would be warranted. A copy of this correspondence will be provided to the Commission.

On a related matter, I have also had discussions with the DP&I in relation to the appropriate noise criteria for non-network rail lines exclusively servicing an industrial site. This is a new matter not covered by existing policies. The EPA is currently finalising a Rail Infrastructure Noise Guideline which will specify the agreed approach in Appendix 3. Basically, the guideline recommends that where non-network rail lines extend beyond an industrial site, the noise impacts should be assessed against the amenity based "acceptable noise levels" in the INP. The EPA Board has endorsed this approach and the guideline will be published once it has been approved by the Ministers for the Environment, Transport and Planning. I will keep you informed of developments in this regard.

Question (2) ***The proponent's EA (Section 8.6.2) acknowledges that construction noise should be assessed under the INP, not the Interim Construction Noise Guidelines (ICNG). The EA then says that the noise has been assessed under the ICNG but not the INP. Is the EPA satisfied with the assessment and conclusions in relation to construction noise?***

The EPA is satisfied with the assessment and conclusions in relation to construction noise. The EPA's Interim Construction Noise Guideline provides that it does not cover noise from mining, including

construction associated with mining - this is to be assessed under the Industrial Noise Policy (EPA, 2000). This is essentially what has been done in that all noise ("construction" and operation") has been assessed against an intrusive criterion of background + 5dB(A). Mitigation measures for noisier "construction" activities include appropriate scheduling of such activities, in this case the scheduling is to restrict such activities to "standard hours of construction". Where predicted noise levels greater than background + 5dB(A) remain then these residual impacts need to be addressed in accordance with the INP.

Question (3) ***The EPA submission dated 4 June 2012 has recommended that any Air Quality Management Plan include 'performance based outcomes aimed at minimising particulate emissions for the following sources' and goes on to list a range of potential sources. Is the EPA able to provide more specific advice on the suggested performance based outcomes that would be acceptable?***

In order to answer the Commission's question, the EPA's performance based outcomes for the respective dust sources are as follows:

Wheel generated dust – the performance based outcome will be to achieve a wheel-generated dust control efficiency of 80 percent with the measurement of soil moisture, silt content, the frequency of haul road dust watering and the use of dust suppressants as the parameters to be assessed.

Loading, Dumping and Bulldozing Overburden – the performance based outcome will be to not undertake these activities during adverse weather conditions, which are to be identified for each mine. Parameters that will be used to define avoiding adverse weather conditions include wind direction and strength, relationship to sensitive receptors, placement of meteorological stations, management response protocols etc.

Wind erosion of overburden and exposed areas – the performance based outcomes are still to be developed as part of the Dust Stop Program.

The Commission should also note that the EPA is continuing with its Coal Mine Dust Stop Program, which will require coal mines to implement practicable best practice controls for particulate matter (dust) which have been identified in the site-specific determination report for each mine. As this Program is implemented (a second round of Pollution Reduction Programs is expected to be rolled out in 2013) for a range of potential sources for dust, performance based outcomes will be developed and applied for each mine.

Question (4) ***Several submissions claim that the surface and mine water quality monitoring required by the EPA is inadequate as it does not cover the full range of likely pollutants. Contamination with metals was a particular focus. Preliminary Assessment by the Commission suggests that the concerns raised may be well founded and that the Environment Protection Licence (EPL) requirements are not consistent with best practice. The EPA's response to these concerns would be appreciated.***

To address the Commission's concerns, the EPA's response is set out below for Invincible Colliery (surface and underground water) and Cullen Valley Mine (surface water), with a summary to complete this response. The summary indicates to date the EPA has been satisfied with the monitoring requirements, and that the licence(s) can be varied if additional monitoring is required in the future.

Invincible Colliery – Surface Water

Invincible Colliery has one Licensed Discharge Point (LDP2) on its Environment Protection Licence (EPL No. 1095) which is a wet weather discharge from the Main Colliery Dam. The monitoring parameters are Oil and Grease, pH and Total Suspended Solids, which are typical for wet weather discharges authorised by an EPL, in line with best practice for handling stormwater discharges.

In its Annual Returns submitted since 2007-08, Coalpac Pty Ltd has reported that Invincible Colliery has only discharged twice from LDP2. Invincible collects surface runoff and uses it from its Main Colliery Dam for dust suppression around the mine and washing coal. At Invincible the poorest quality surface water (low pH), draining from the coal reject area, is collected in the Environment Dam and this water is pumped to the Main Dam, as required. Invincible Colliery does not have an authorised discharge point to discharge Environment Dam water directly off-site. However, the water from the occasional pumping from the Environment Dam to the Main Colliery Dam, would involve considerable dilution with the Main Dam Water. In terms of a comparison, the storage volumes of the Main Colliery Dam and the Environment Dam are 115 and 0.03 Megalitres (ML), respectively.

Given the infrequent discharges from the Main Dam Colliery (LDP2), and the relative storage volumes of the two dams, to date the EPA has not sought to require Coalpac Pty Ltd to monitor the discharge from LDP2 for metals, or a wider range of pollutants beyond what is typically required for a wet weather surface water discharge from a mine site.

Invincible Colliery – Underground Mine Water

Coalpac's EPL 1095 does have a discharge point (LDP1) for the discharge of mine water from its underground workings. These are historical workings and no longer mined.

In terms of monitoring Coalpac is required to monitor any discharge from LDP1 for 22 pollutants, of which 13 are metals or elements. These are: arsenic, cadmium, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, sodium and zinc.

These monitoring requirements are adequate; however, LDP1 is no longer used by Invincible Colliery. The circumstances relating to LDP1 are described below in the answer to Question 5.

Cullen Valley Mine – Surface Water

The Lithgow Coal Company has two LDPs on its Environment Protection Licence (EPL No. 10341) for the Cullen Valley Mine. Both are for the discharge of surface water after rain. The monitoring parameters are Oil and Grease, pH and Total Suspended Solids, which are similar to those for Invincible Colliery, being typical for wet weather discharges authorised by an EPL. For Cullen Valley Mine, additional monitoring is required for Electrical Conductivity, iron and manganese (put on the licence at the commencement of the mine in 2000).

In its Annual Returns submitted since 2006-07, the Lithgow Coal Company has reported that Cullen Valley Mine has only discharged once, in 2009-10. Like Invincible Colliery, the Cullen Valley Mine collects surface runoff and uses it for dust suppression around the mine.

Summary – Surface Water Discharges

In summary, for the infrequent discharge of surface water after rain from either mine, the monitoring of pH, Oil and Grease and total suspended solids is adequate. Both mines manage their surface water to maximise its use on-site so that they will only infrequently discharge from their respective mine sites. These infrequent discharges are typically after prolonged or heavy rain, and not when it is dry. The EPA understands that this arrangement will be maintained should the Coalpac Consolidation Project be approved. From the EA Coalpac proposes a series of sediment dams to be used in relation to the mining stage at the time, and that any discharge of surface water from an approved Project would be from storage dams that will be sized to contain stormwater runoff from the 10 Year Average Return Interval (ARI) 72 hour storm event (171 millimetres).

Presumably, should approval be granted, Coalpac will apply for a variation to combine the two existing licences. At that time the EPA could take into account the need to put limits on the licence and to monitor for metals.

Question (5) ***Some submissions claimed that Invincible Colliery's LDP001 licensed discharge to Long Swamp has caused pollution. Despite Coalpac's claim that the discharge meets EPA criteria, the Commission was provided with photos taken by special interest groups showing red staining on the walls of the collection pond at the discharge point (see attached). As Coalpac has not used this discharge point since 2008 and claims it should not be needed in future, can the EPA justify retaining this discharge point in the EPL?***

The retention of this LDP is now not justified and after considering the issues that have re-surfaced within the Commission via public interest groups about the 2007-08 discharge, on 4 October 2012 the EPA sent to Coalpac for comment a Draft Notice removing LDP1 from its EPL. The EPA will take into consideration any comments from Coalpac prior to making a decision about issuing the notice. Coalpac has until 31 October 2012 to respond to the EPA's Draft Notice.

For the Commission's information it was always the EPA's intention to remove LDP1 from the EPL following the conclusion of the planning process for the Coalpac Consolidation Project (in association with other changes that may be required, regardless of whether or not approval was granted by the Minister for Planning and Infrastructure).

Nevertheless, it is important that the Commission understands the circumstances of the discharge event in 2007-08 which was displayed at the Commission on 18 September 2012. Historically, the old underground workings by Invincible Colliery required the use of a bore for dewatering and an authorised discharge point (LDP1). LDP1 had remained on Coalpac's EPL because the company had indicated to the EPA that conceptually it may again expand its underground workings to the east and at some point in the future it would need to discharge into Long Swamp (following an upgrade to treat the water to a discharge quality acceptable to the EPA).

However, in 2007-08 Coalpac activated the discharge at the request of Delta Electricity so that the water could ultimately flow into the Coxs River and Lake Wallace for use by Wallerawang Power Station which was running short of water because of several years of drought.

On 22 May 2008 Coalpac ceased the discharge following an on-site meeting with the EPA on 21 May 2008 when the EPA told Coalpac the discharge from the old bore was unacceptable in terms of quality (higher salinity and iron than in the 1990's) and the iron staining of the vegetation in Long Swamp. On 26 June 2008 the EPA wrote to Coalpac advising before discharging again from LDP1 it needed to demonstrate that the discharge was not adversely impacting on Long Swamp or to consider other options if Delta was desperate for water (eg piping the water to the power station). The EPA understands that Coalpac has recently removed the pump from the bore located at LDP1.

Q (6) ***At the Commission's public hearing at Lithgow, a special interest group presented a list of non-compliances by Coalpac with licence requirements (see attached). Can the EPA provide advice on the performance of Coalpac in meeting it's environmental obligations, including a summary of licence or other breaches of the environmental legislation?***

The EPA is satisfied with the performance of Coalpac and the Lithgow Coal Company in relation to their EPLs. Below is a summary of licence non-compliances and the EPA's response for Invincible Colliery and the Cullen Valley Mine.

<u>Invincible Colliery – EPA Regulation</u>

Coalpac has reported in its Annual Returns since 2005-06 for Invincible Colliery that it has only had three non-compliances (refer to Table 1). One non-compliance was for a water pollution limit (L3) exceedance, and the second was for a failure to monitor and a blasting limit exceedance. All three exceedences were considered to be minor and the EPA did not to take any regulatory action against the company.

Table 1. The non-compliances reported by Coalpac for Invincible Colliery since 2005-06.

Annual Return	Reported Non-compliance (Licence Condition)	Coalpac's Reason for the Non-compliance	EPA Response
28 February 2011 to 27 February 2012	L6.1 – on 28 June 2011 a blast overpressure of 120.3 dB (Lin Peak) was recorded – 0.3 dB above the licence limit of 120 dB (Lin Peak).	The likely cause was due to energy escaping via a face-burst above an old underground tunnel. The ground vibration velocity was 0.56 mm/s, inside the 10 mm/s EPL limit. No public complaints were received due to the blast event.	No action warranted. Coalpac's reason was accepted. The exceedance was minor and did not result in any complaints to Environment line.
28 February 2008 to 27 February 2009	L3.1 – one discharge of 42 mg/L TTS above the licence limit 30 mg/L TSS.	Caused by a predominance of iron oxide	The discharge ceased on 22 May 2008 following the EPA's advice on 21 May 2008 that the discharge from LDP1 was unacceptable.
28 February 2005 to 27 February 2006	M2 – requirement to monitor concentration of pollutants discharged.	There was no monitoring done because there were no discharges from LDP1 and 2.	No action warranted. Coalpac's reason was accepted. Technical breach.

Invincible Colliery was in care and maintenance for the early 2000's up until 2006. Since 2007 the EPA has received 28 complaints from the public (4 for noise, 7 for dust, 5 for blasting, 11 for tracking coal fines/mud off-site on the Castlereagh Highway and 1 for vegetation clearing).

A summary for the EPA's regulation of Invincible Colliery is as follows:

- Since 2007 the EPA has conducted 6 inspections of the mine.
- Since 2008 three Pollution Reduction Programs (PRPs) have been placed on the licence. One for reducing noise emissions from haul trucks and the Invincible Coal Preparation Plant (ICPP), the second to implement measures to reduce tracking of coal fines and mud off-site; and, the third requiring the licensee to assess site performance against best practice for reducing coal dust.
- The EPA has not considered it necessary to issue Penalty Infringement Notices (PINS) to Coalpac.
- In 2011 the EPA sent Coalpac a Warning Letter for tracking of material on to the Castlereagh Highway.

Cullen Valley Mine – EPA Regulation

Since 2005-06, Cullen Valley Mine has reported two non-compliances with its licence (refer to Table 2). One was for the malfunctioning of a meteorological station and the other was for a minor water pollution limit exceedance. In each case the EPA did not take any regulatory action.

Table 2. The non-compliances reported by Lithgow Coal Company for the Cullen Valley Mine since 2005-06.

Annual Return	Reported Non-compliance (Licence Condition)	Lithgow Coal Company's Reason for the Non-compliance	EPA Response
10 December 2009 to 9 December 2010	L3 – one discharge of 84 mg/L TSS and pH 6.2 exceeded 50 mg/L TSS limit and 6.5 pH minimum limit, respectively.	Approximately 125 mm of rain fell mostly in two events. Capacity was sufficient for the first event however discharge occurred during the second.	No action warranted. The regional rainfall was intense and prolonged. Lithgow Coal's reason was accepted. In November – December 2010 the EPA's Environment Line received 39 Self Reports of discharges in the extreme wet, 14 from mines (none from Lithgow Coal).
10 December 2010 to 9 December 2011	P (P1.1 – EPA Identification Point No. 5) – Location of monitoring/discharge points and areas.	Technical and equipment failure. Several attempts were made to rectify the unit. Met. Data was used from an adjacent weather station (2.6 km away) for the reporting period. New Met. Station installed in January 2012.	No action warranted. Coalpac's reason was accepted. Coalpac relied on data collected from an adjacent Met. Unit and did replace the malfunctioning unit

Since 2001 the EPA has received 29 complaints (14 for noise, 9 for dust, 2 for odour, 1 for blasting and 3 for the tracking of mud off-site) about the Cullen Valley Mine. For your information, prior to 2001 the EPA received 120 complaints about dust being emitted from the mine. The operator at the time, the Lithgow Coal Company (before Coalpac assumed ownership), was convicted in the Land and Environment Court in 2003 as a result of this dust impacting on the village of Cullen Bullen in 2001.

A summary of the EPA's regulation of Cullen Valley Mine is as follows:

- Since 2007 the EPA has conducted six inspections of the mine.
- Since 2010 two PRPs have been placed on the licence. One for improving drainage/haul road profiling to reduce tracking of mud and the second requiring the licensee to assess site performance against best practice for reducing coal dust;
- The EPA has not considered it necessary to issue any PINS to the Lithgow Coal Company (Coalpac subsidiary);
- Previously, in 2003 the Lithgow Coal Company was fined $30,000 following dust emissions from the site impacting on the village of Cullen Bullen in 2001.

Summary

Overall, the EPA is satisfied with the performance of Coalpac and Lithgow Coal Company in operating their respective mines to comply with the conditions of their EPLs. Since 2005-06 any non-compliances reported on the Annual Returns have been minor, and infrequent.

Notwithstanding this, in its advice to the Department of Planning and Infrastructure (DP&I) on 4 June 2012 the EPA has been critical of Coalpac's responses to one PRP (with several components) that was

negotiated for Invincible Colliery on 26 August 2008. The EPA has expressed concerns about Coalpac's commitment and ability to fully and effectively implement the required noise mitigation measures for the proposed Coalpac Consolidation Project. For example, in 2008 Coalpac committed to implementing noise attenuation works on the Invincible Coal Preparation Plant (ICPP) to reduce the sound power level from 120 dB(A) to 110 dB(A). The PRP negotiated by the EPA was for measures to attentuate noise (eg cladding of the Bradford Breaker and the washery) and these were implemented within the timeframe of the PRP but failed to reduce the noise. On 24 October 2008 Coalpac supplied a report to the EPA stating that the works had been completed; however, the EPA found that negligible noise reduction had been achieved.

Instead of attempting further measures, Coalpac negotiated a buy-out with the affected residents as a solution. This was acceptable to the EPA.

Question (7) ***The EPA Submission dated 4 June 2012 referred to a commitment by Coalpac to replace the high pitch reversing alarms on all mobile equipment with broad-spectrum alarms and noted that this work has not been completed. The proponent has since advised that this work has now been completed. Is the EPA able to advise if these reversing alarms are now operating satisfactorily?***

On 19 October 2012 the EPA was advised by Coalpac that all the mobile plant and equipment used by the company and its contractors (Big Rim and LCR Mining Group) were now fitted with broad spectrum reverse alarms. The EPA no longer receives complaints from the community about the noise from reversing alarms, which indicates that the equipment used and the reversing alarms are now operating satisfactorily.

Question (8) ***The EA notes some occasions where pH levels have been low in collecting dams, presumably as a result of acid forming material. The project involves exposing further acid forming materials and suggests management of these will be included in the Water Management Plan. In essence the Proponent has committed to capturing all potentially acid forming water and treating it before discharge. Is the EPA able to provide any advice to the Commission on the adequacy of the Environmental Assessment and proposed measures for ensuring there are no adverse impacts, either short or long term, to surface or ground waters?***

The EPA considers the EA to be adequate in dealing with the handling of potentially acid forming water. Appendix P (Geochemical Assessment of Overburden and Coal Reject Materials) identifies processes for handling both Potentially Acid Forming (PAF) and Non-Acid Forming (NAF) material.

According to the EA the placement of PAF coarse reject material in the open pit and/or co-disposal with overburden should involve covering as soon as practical (within a few weeks) with 5 metres of NAF overburden material to minimise the length of exposure time to oxidising conditions and minimise the potential for acid and metalliferous drainage (AMD). This procedure is recommended to be implemented by assessment using kinetic leach column tests and cover design investigations. Appendix P states that both overburden materials and coal reject materials associated with the project are likely to be NAF and 'have a high factor of safety with respect to acid generation', apparently a characteristic of the Lithgow Seam.

Regarding the protection of surface water, the EPA notes that Section 5.2 of Appendix P recommends the monitoring of any surface water seepage from all overburden and coal reject emplacement areas for a range of pollutants including pH, electrical conductivity, total suspended solids, dissolved metals and sulphate. The concept is to include this monitoring within the Water Management Plan that will form a component of the Mine's Environmental Management System (EA, Chapter 9 - Statement of Commitments, Environmental Management).

Should the Project be approved, it would be the EPA's intention to require the monitoring of this surface water seepage for these pollutants (with proper construction of the co-disposal areas the ingress of surface water and rain should be prevented or at least minimised). Similarly groundwater bores could be monitored to determine if the encapsulation of PAF is protecting groundwater.

Finally, in its Statement of Commitments the EPA notes:

No. 31 Coalpac will undertake groundwater and surface monitoring for the Project in consultation with relevant regulators, including the installation of two additional bores and four replacement bores.

No. 33 Coalpac will maintain its existing licensed water discharge points and operate them to the approval of relevant regulators.

No 35. Potentially acid forming coarse rejects will be covered as soon as practical with at least 5 metres of Non Acid Forming overburden material to minimise the length of exposure time to oxidising conditions and minimise the potential for acid mine drainage.

No 36 All inert waste from the washing of crushed sandstone will be pumped into the flooded Tyldesley Colliery underground workings via boreholes drilled intersect the workings or co-disposal in-pit. In the unlikely event that any waste material is determined to be PAF this will be buried deep in-pit with Potentially Acid Forming overburden.

Given the above, it is the expectation of the EPA that surface and groundwater can be protected and monitoring put in place to determine if there are any unpredicted trends contrary to this objective.

Question from the Commission's letter dated 11 October 2012

Given the EPA's Standard methods for Modelling and Assessment of Air Pollutants refers to the 50 µg/m^3 but makes no reference to 150 µg/m^3, and the increased concerns raised by NSW Health, the Commission would appreciate any additional views the EPA may have in relation to the appropriateness of the 150 µg/m^3 criteria for acquisition.

The EPA has concerns with the DP&I's 150 µg/m^3 acquisition criteria and will progress discussions with DP&I and NSW Health to work through this particular issue with the intention of developing an updated acquisition framework. We would be happy to discuss this further with the Commission.

In order for the Commission to better understand the EPA's approach to the various aspects of controlling particle emissions from coal mines the following advice is provided.

1. Rationale for best practice for reducing PM_{10} emissions

The EPA acknowledges that:

- PM_{10} is associated with adverse health impacts;
- there is currently no evidence of a threshold below which health effects do not occur;
- the health impacts of PM_{10} decrease with decreasing exposure; and
- there are incremental health benefits in reducing particle concentrations and exposure, even if concentrations are below standards.

The EPA's policy response is to require best management practice to reduce PM_{10} emissions. This is consistent with the objectives and requirements of the *Protection of the Environment Operations Act 1997* (POEO Act):

- Best management practice is the guiding principle in meeting an objective of the *Protection of the Environment Operations Act 1997* (POEO Act), which is to reduce the risks to human health by reducing emissions to harmless levels (Chapter 1, Section 3).

- Best management practice is also the guiding principle for meeting the requirements sections 124 to 126 of the POEO Act. These sections require that air pollution related activities be conducted in a proper and efficient manner, while section 128 requires that all necessary practicable means are used to prevent or minimise air pollution.

2. The EPA is requiring best management practice to reduce PM_{10} emissions at all operating coal mines in NSW.

The EPA has required all 60 operating coal mines in NSW through the "Dust Stop" to assess their current operations against best management practice and determine the most effective way to significantly reduce their on-site dust emissions. The EPA is now negotiating air quality mitigation measures via a second set of PRPs.

The air quality mitigation measures will take into account site specific factors, be transparent and legally enforceable, with the methods for determining compliance clearly identified. The EPA is negotiating license conditions that will include:

- Key performance indicator;
- Monitoring method;
- Location, frequency and duration of monitoring;
- Record keeping;
- Response mechanisms; and
- Compliance reporting.

For example, the EPA is targeting an 80% efficiency outcome for haul roads. Below is an example of how a licence condition may developed for haul roads.

3. Coal Mine Particulate Matter Control Best Practice Implementation – Wheel Generated Dust

1. The Licensee must achieve and maintain a dust control efficiency of 80% or more on all haul roads by <date>.

   The control efficiency is calculated as:

$$CE = \frac{E\ (\text{uncontrolled}) - E\ (\text{controlled})}{E\ (\text{uncontrolled})} \times 100$$

   Where E = the emission rate of an activity.

2. The Licensee must assess its conformance with Condition 1 by monitoring the following parameters under varying meteorological conditions, including temperature, rainfall, solar radiation and evaporation rates:

   - haul road moisture and silt content;
   - frequency, duration and rate of water/suppressant application to haul roads;
   - compliance with manufacturer's specifications for chemical or organic dust stabilisers or suppressants; and
   - haul road dust levels.

3. Should the Licensee wish to use an alternative set of parameters to the ones specified in Condition 2, the licensee must submit a written request and supporting report to the EPA providing details of the parameters proposed to be used. The report must contain a detailed justification of the applicability of the proposed parameters.

4. The Licensee must prepare and submit a Monitoring Program that details the following:

- the locations where each parameter will be monitored;
- the methods to be used to monitor each parameter;
- the frequency at which each parameter will be monitored; and
- the Key Performance Indicators that will be used to determine whether the Licensee has complied with Condition 1.

5. The Licensee must submit a written report to the EPA providing the results of the Monitoring Program. The report must include an assessment of the dust control effectiveness achieved and the Licensee's compliance with Condition 1.

Finally, the EPA considers that any new planning approvals for coal mines should be consistent with the approach EPA is taking to regulate operating mines.

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Mr Ian Follington
Chief Executive Officer
Coalpac Pty Ltd
Invincible Colliery
Castlereagh Highway
CULLEN BULLEN NSW 2790

11 October 2012

Dear Mr Follington

Proposed Coalpac Consolidation Project – Castlereagh Highway, Cullen Bullen

As you are aware, the Commission is currently conducting a Review, under section 23D(1)(b)(ii) and Schedule 3 of the *NSW Environmental Planning and Assessment Act 1979*, of your Coalpac Consolidation Project Proposal (10_0178) at Cullen Bullen, near Lithgow. The terms of reference are to:

Carry out a review of the Coalpac Consolidation Project, and:

a. *Consider the Environmental Assessment of the project, all issues raised in submissions on the project, and any information provided on the project during the course of the review;*
b. *Assess the merits of the project as a whole, paying particular attention to the potential:*
    - *Local health and amenity impacts of the project, particularly dust, noise and blasting impacts noting its proximity to the village;*
    - *Biodiversity impacts of the project;*
    - *Water resource impacts of the project; and*
c. *Recommend appropriate measures to avoid, minimise and/or offset these impacts.*

The Commission met with Coalpac representatives on 18 September 2012 to visit the site and to provide Coalpac with an opportunity to brief the Commission on the proposal. Some issues requiring clarification or further information arose at the meeting and at the public hearings. You will already be aware of most of these and my understanding is that Coalpac is undertaking the necessary work to provide the relevant information on at least some of them. However, for the sake of completeness the issues are set out below along with the Commission's questions.

(1) At the meeting of 18 September the issue of the potential impacts on native species that utilise either the pagoda or gully habitats exclusively, or to those species (such as the broad-headed snake, brush-tailed rock wallaby and lyrebird) which require access to both habitat types either seasonally, or on some other basis was raised. The Commission noted that the focus on setback distances in the EA and Response

to Submissions appeared to be on maintaining structural integrity of the pagodas and not on the impacts on the fauna that utilised the pagodas and adjacent slope and gully areas as habitat. The response was that the issue had not been given detailed consideration by Coalpac.

What further consideration has Coalpac given to this issue and what, if any, proposals does Coalpac wish to advance to deal with it?

(2) At the meeting of 18 September Coalpac was unable to provide the differential production figures for the two main mining techniques proposed to be used (open cut and highwall). Coalpac undertook to provide these figures. The Commission considers that the figures should be available by area and by year. Please provide both ROM and product quantities for each.

(3) Submissions were made at the public hearings that the Long Swamp discharge point (LDP001) has caused pollution, including showing photos of red staining on the walls of the collection pond at the discharge point.

(a) Can Coalpac provide the Commission with all available test results for this LDP?

(b) Coalpac state that the LDP has not been used since 2008, but that it is to be retained for 'flexibility'. The Commission does not consider 'flexibility' to be adequate justification for retention. Does Coalpac wish to provide further argument in support of retention?

(4) At the meeting of 18 September, and on multiple occasions during the public hearings, concern was raised that to meet noise and dust criteria in Cullen Bullen and the surrounding areas all the mitigation and management strategies proposed by Coalpac would have to operate with 100% effectiveness.

A proposition that there be no night time operations until such time as:
- all mitigation and management strategies are implemented,
- those strategies are demonstrated to be fully effective, and
- revised modelling has confirmed that 24 hr criteria will be met

was suggested as one way of dealing with this situation.

Can Coalpac advise:

(a) what would be the anticipated period (years) of restricted operations for Coalpac to demonstrate that it could meet the 24 hr criteria when operating 24/7?

(b) Whether such an approach is feasible in the context of the proposed mining operation?

(c) What the impact would be on the viability of the project if Coalpac could not demonstrate compliance and was restricted to day and evening operations for the duration of the project?

(5) Submissions have been made querying the greenhouse gas calculations presented in the EA. The EA estimates the greenhouse gas emissions from the project at 0.0069 Gigatonnes of carbon dioxide equivalent per annum. A claim made is that the EA then compared this to the total CO2 amount in the atmosphere, rather than

against total annual anthropogenic emissions of greenhouse gases, and hence vastly underestimated the project's proportional generation of global greenhouse gases. The relevant submissions are attached, including advice from academics in the field provided to the Commission at the public hearing.

Can Coalpac advise the Commission whether it continues to support the calculations in the EA in the face of these criticisms?

(6) As set out in the Acoustic Impact Assessment (EA Appendix H by Bridges Acoustics from Section 4.4) a number of best-practice noise control measures, including specific machinery noise attenuation works, are required to achieve compliance with the Potential Specific Noise Criteria (PSNC). Without these proposed mitigation measures Bridges Acoustics advises that the project would be unacceptable from both social-economic and environmental perspectives. In section 4.5.7 of the Response to Submissions, there are conflicting statements as to whether 'no' receivers within Cullen Bullen would receive noise levels above the PSNC, or whether there would be 'no significant exceedences' of the PSNC. Can Coalpac clarify its noise impacts in relation to Cullen Bullen village residential receivers and the Cullen Bullen public school against the PSNC?

Responses to these issues, or any other information Coalpac may wish to provide following the meetings, would need to be provided to the Commission by close of business 2 November 2012. However, it would assist the Commission if completed responses to individual issues could be forwarded as soon as they are available, rather than waiting for the whole package of responses to be assembled.

Other issues on which the Commission may wish to obtain Coalpac's views may arise during the rest of the Review. The Commission recognises that the timeframes for response on such issues will, of necessity, be short. The Commission will therefore keep such requests to a minimum.

Ms Sera Taschner (Commission Secretariat) can assist with any enquiries concerning the Commission's requests on (02) 9383 2117 or email sera.taschner@planning.nsw.gov.au.

Yours sincerely

Dr Neil Shepherd AM
Chair, Coalpac Commission

30 October 2012

Dr Neil Shepherd
Chair, Coalpac Commission
NSW Planning Assessment Commission
GPO Box 3415
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Dear Sir

COALPAC CONSOLIDATION PROJECT (10_0178)
RESPONSE TO PLANNING ASSESSMENT COMMISSION INQUIRIES

1 INTRODUCTION

We refer to your letter dated 11 October 2012 requesting a response to questions that have arisen from your site inspection on 18 September 2012 and the public hearings for the Coalpac Consolidation Project (the Project) on 19 and 20 September 2012.

Each of the inquiries in your letter of 11 October 2012 is reproduced below in italics, along with a response. Where required, additional input from technical specialists involved in the preparation of relevant impact assessments for the 'Coalpac Consolidation Project Environmental Assessment' (Hansen Bailey, 2012) (EA) have also been appended to this letter.

2 PAC LETTER RESPONSE

2.1 IMPACTS TO PAGODA AND GULLY FAUNA HABITAT

PAC Inquiry

1) *At the meeting of 18 September the issue of the potential impacts on native species that utilise either the pagoda or gully habitats exclusively, or to those species (such as the broad-headed snake, brush-tailed rock wallaby and lyrebird) which require access to both habitat types either seasonally, or on some other basis was raised.*

The Commission noted that the focus on setback distances in the EA and Response to Submissions appeared to be on maintaining structural integrity of the pagodas and not on the impacts on the fauna that utilised the pagodas and adjacent slope and gully areas as habitat. The response was that the issue had not been given detailed consideration by Coalpac.

Response

Coalpac has commissioned Cumberland Ecology to conduct a further review of the fauna habitat provided by the pagoda and gully areas within the Project Disturbance Boundary, with a particular focus on key species which may either partially or entirely rely on this habitat (i.e. the Broad-headed Snake, Brush-tailed Rock Wallaby and the Superb Lyrebird).

Their response is presented in **Appendix A**.

2.2 OPEN CUT AND HIGHWALL MINING METHODS

PAC Inquiry

2) *At the meeting of 18 September Coalpac was unable to provide the differential production figures for the two main mining techniques proposed to be used (open cut and highwall). Coalpac undertook to provide these figures. The Commission considers that the figures should be available by area and by year. Please provide both ROM and product quantities for each.*

Response

An indicative breakdown of annual coal extraction from open cut and highwall mining methods over the life of the Project is provided below in **Table 1**. This shows that approximately 13% of the ROM coal resource to be extracted for the Project will be accessed via the highwall mining method.

Table 1
Annual ROM and Product Coal Volumes

Project Year	Open Cut Coal (ROM tonnes)	Highwall Mining Coal (ROM tonnes)*	Total Coal (ROM tonnes)	Product Coal (t)
1	2,400,000	0	2,400,000	2,068,800
2	3,000,000	300,000 - 500,000	3,300,000	2,713,500
3	3,925,000	500,000 - 750,000	4,425,000	3,497,525
4	4,045,000	500,000 - 750,000	4,545,000	3,499,650
5	4,045,000	500,000 - 750,000	4,545,000	3,499,650
6	4,045,000	500,000 - 750,000	4,545,000	3,499,650
7	4,045,000	500,000 - 750,000	4,545,000	3,499,650
8	4,045,000	500,000 - 750,000	4,545,000	3,499,650
9	4,045,000	500,000 - 750,000	4,545,000	3,499,650
10	4,045,000	500,000 - 750,000	4,545,000	3,499,650
11	4,045,000	500,000 - 750,000	4,545,000	3,499,650

Project Year	Open Cut Coal (ROM tonnes)	Highwall Mining Coal (ROM tonnes)*	Total Coal (ROM tonnes)	Product Coal (t)
12	4,045,000	500,000 - 750,000	4,545,000	3,499,650
13	4,045,000	500,000 - 750,000	4,545,000	3,499,650
14	4,045,000	500,000 - 750,000	4,545,000	3,499,650
15	4,045,000	500,000 - 750,000	4,545,000	3,499,650
16	4,045,000	500,000 - 750,000	4,545,000	3,499,650
17	4,045,017	750,000 - 1,000,000	5,045,017	3,499,650
18	4,045,018	750,000 - 1,000,000	5,045,018	3,499,650
19	4,045,019	750,000 - 1,000,000	5,045,019	3,422,650
20	4,045,020	750,000 - 1,000,000	5,045,020	3,422,650
21	4,045,021	750,000 - 1,000,000	5,045,021	3,422,650
TOTAL:	**82,135,095**	**12,300,00 - 16,000,000**	**94,435,095**	**71,042,525**

** Note that the lower range of ROM coal from highwall mining methods has been assumed for calculation of total ROM coal*

The minimum standoff from the base of the pagodas, significant sandstone escarpments and outcrops has been specifically designed to ensure their structural integrity whilst at the same time providing access at the correct reduced level to the coal seams proposed to be highwall mined. It is noted that Coalpac has successfully open cut mined within 38 m of pagodas under their current planning approval for Cullen Valley Mine without any noticeable impact. For conservatism, under this application, Coalpac is only seeking to open cut mine within up to 50 m of any significant pagoda or significant sandstone escarpment or outcrop.

2.3 INVINCIBLE COLLIERY LICENSED DISCHARGE POINT LD001

PAC Inquiry

3) Submissions were made at the public hearings that the Long Swamp discharge point (LDP001) has caused pollution, including showing photos of red staining on the walls of the collection pond at the discharge point.

a) Can Coalpac provide the Commission with all available test results for this LDP?

b) Coalpac state that the LDP has not been used since 2008, but that it is to be retained for 'flexibility'. The Commission does not consider 'flexibility' to be adequate justification for retention. Does Coalpac wish to provide further argument in support of retention?

Response

Background

LD001 was originally applied for and granted as part of the underground mining operations of Invincible Colliery. The Original Location of LD001 was at the ventilation fan shaft site (see **Figure 1**) and it is understood that the pump was located in one of the two ventilation fan shafts.

The ventilation fan shafts were 70 m deep to the roof of the Lithgow seam (and 73 m to the floor of the seam). Water extracted from the underground workings was captured in the existing concrete tanks at the ventilation fan shaft site, treated as necessary and then discharged into the Cox's River. LD001 was relocated to the north to the current location (indicated by the green circle on **Figure 1**), as the longwall panels developed into the northern section of the lease. The relocation of LD001 allowed dewatering of the underground workings at a lower Reduced Level (RL) as mining operations progressed down dip of the original location.

LD001 was used as a dewatering borehole at the current location prior to the suspension of operation of Invincible Colliery in 1988, when Shell Coal (as the parent company of Austen & Butta) temporarily closed the mine and sold it to Coalpac in 1989. LD001 was not used again until 1997, when it was recommissioned for the purposes of dewatering the underground workings to permit further underground mining development.

a) Historical Groundwater Monitoring Data

Monitoring of underground water quality discharged from LD001 between 1997 and 2002 was undertaken in accordance with Environment Protection Licence (EPL) 1095. Monitoring results available to Coalpac include a period between 1998 and 2000 at monthly intervals. These results indicate that the quality of the discharged water met the criteria of EPL 1095 during this period, except on two occasions (19 January 2000 and 27 October 1999) where pH readings were marginally lower than the criteria.

Table 2 presents a summary of the monitoring results between 1998 and 2000. Relevant compliance criteria from EPL 1095 for each are presented below and include:

- pH, 6.5 – 8.5 (100 percentile concentration limit);
- Total Suspended Solids (TSS), 30 mg/L (100 percentile concentration limit); and
- Oil and grease, 30 mg/L (100 percentile concentration limit).

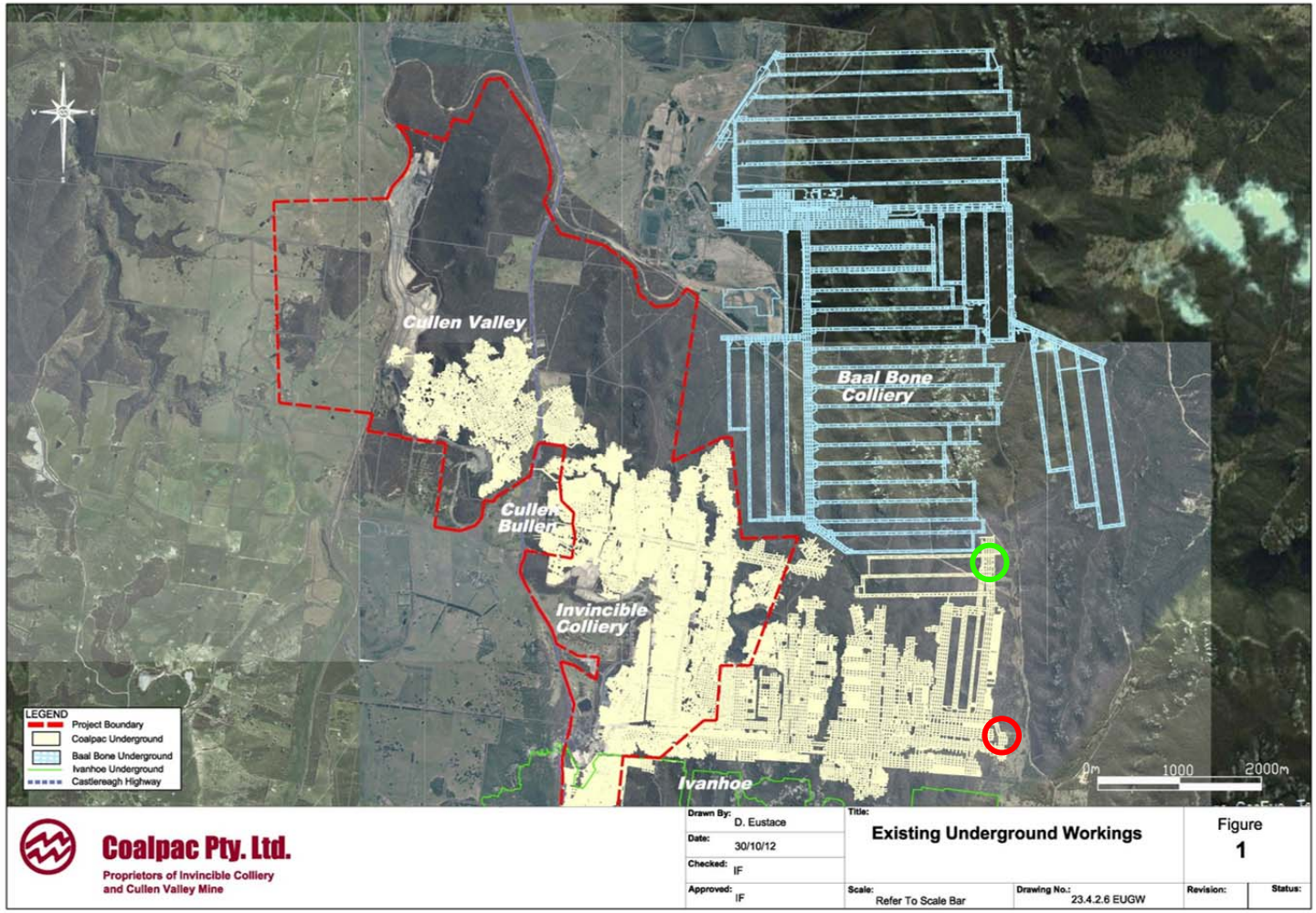


Figure 1

Invincible LD001 Site (Original Location in red, Current Location in green)

Table 2
LD001 Water Sampling Results (August 1998- May 2000)

Date	pH	Total Suspended Solids (@ 105 Celsius)	Oil & Grease (mg/L)
24/08/1998	7.74	9	<1
22/09/1998	7.32	4	<1
20/10/1998	6.65	2	<1
17/11/1998	6.77	9	<1
16/12/1998	6.99	26	<1
21/01/1999	6.56	18	<1
17/02/1999	7.67	5	<1
30/03/1999	6.49	21	<1
21/04/1999	6.60	19	<1
26/05/1999	6.62	10	<1
30/06/1999	7.98	9	<1
22/07/1999	7.66	3	<1
18/08/1999	6.66	11	<1
29/09/1999	6.59	16	<1
27/10/1999	**6.45**	21	<1
17/11/1999	6.64	12	<1
15/12/1999	6.64	8	<1
19/01/2000	**6.30**	21	<1
16/02/2000	6.89	6	<1
15/03/2000	6.78	7	<1
3/05/2000	8.15	1	<1
31/05/2000	8.22	3	<1
21/06/2000	No sample	No sample	No sample

Results in bold indicated exceedance of ELP 1095 criteria

Results compiled from original sheets by Mr G. Muir of Craven Elliston and Hayes (Lithgow) Pty. Ltd.

Recent Use

In 2007, Coalpac was contacted by Delta Electricity (Delta) to negotiate access to LD001 and the underground water storage due to the need to secure water supply for both Wallerawang and Mount Piper power stations during the drought at that time. As the old pump was unserviceable and the extent of damage to the casing was unknown as a result a new bore was drilled adjacent to the old bore and a new pump installed.

The existing electrical supply was refurbished and reconnected. Pumping at LD001 recommenced in May 2007. Water was discharged into a minor tributary adjacent to Long Swamp, which forms the headwaters of the Cox's River. The Cox's River then flows into Lake Wallace further downstream, which is the draw point for Delta's water supply for both local power stations.

Water quality results generally met the EPL1095 criteria as shown in **Table 3**.

There were electrical and mechanical issues from July 2007 through to January 2008, and as a result, minimal volumes were pumped during this time. Despite the low volumes pumped from the underground workings, red staining occurred on the ground around the discharge point. It is likely that the red staining at the LD001 location occurred as a result of oxidation of Iron and Manganese:

- At low (acidic) pHs, metals such as Iron and Manganese are more soluble, and do not precipitate out of a solution as solids; and
- When the pH of the solution increases (i.e. becomes closer to neutral) the metals will begin to precipitate out as solids and settle out.

Therefore it appears likely that water held in the flooded underground workings has a slightly acidic pH with elevated concentrations of Iron and Manganese in solution. When this water was released from LD001 into Long Swamp Gully, which has a higher pH, the metals precipitated out as solids and were deposited around the discharge point as the red stains identified in a number of submissions to the PAC.

A mechanical solution involving the aeration of the water was installed and trialled from January 2008 onwards with some success; there was a substantial reduction in visible iron and manganese.

Following some interaction with local Department of Environment and Climate Change (DECC) officers regarding local community concerns with flooding of Long Swamp, Coalpac volunteered to cease pumping. An alternative arrangement was discussed with DECC to pipe the water further south (to a location near the previously used fan shaft site) where the Cox's River waters were flowing. The relocation of the discharge point via pipeline to a point further south, such as the original discharge point near the fan shaft site, would allow water to be discharged into flowing water rather than increasing the standing water levels at Long Swamp. Water pumping ceased in May 2008.

Table 3
LD001 Monitoring Results 2007

Monthly Water Quality Monitoring – EPL 1095 Discharge Point No.1					
Month/year	**Date**	**pH**	**Total Suspended Solids (mg/L)**	**Oil and Grease (mg/L)**	**Electrical Conductivity (uS/cm)**
May 2007	14-May-07	6.8	8	0	NS
June 2007	5-Jun-07	6.6	21	1.4	1710
	6- Jun -07	**6.3**	NS	NS	1750
	7-Jun-07	6.6	NS	NS	1718
	27-Jun-07	6.9	**32**	0	NS
July 2007	26-Jul-07	6.5	19	0	NS

Note 1: Discharge ceased July 2007
NS= No Sample
Source: Coalpac Pty Ltd, Invincible Colliery AEMR 2007

b) Retention of LD001

In light of the apparent community concern over the potential for water quality impacts from discharging underground mine water from LD001, Coalpac will not seek to retain LD001 under the *Protection of the Environment Operations Act 1997* for the Project and as such planning approval is no longer sought for this activity.

Despite the above, it is noted that the Groundwater Impact Assessment appended to the supporting EA (Section 12, AGE 2012) states that:

> *"The Baal Bone Colliery will cease operations early in the Project life and dewatering will cease. The Baal Bone Colliery underground workings will slowly flood with groundwater and eventually an equilibrium water pressure in the coal seam will be reached over time. No post-closure measures for the Baal Bone Colliery were available for review during this assessment.*
>
> *The rate of groundwater transfer from the Invincible Colliery flooded workings into the flooded Baal Bone workings will likely be reduced by this increased water pressure. The impact on the Project will likely be to increase the availability of groundwater in flooded workings of the Old Invincible Colliery."*

As a result of this, Coalpac may need the flexibility to install a bore to drawdown the underground water levels, if they were ever to reach a level where it caused an impact on open cut workings. If required, this new bore would be located on Coalpac owned land adjacent to the Cox's River (in close proximity to the Original Location of LD001) as shown in **Figure 1**. A discharge point at this location would permit underground water of suitable quality to be discharged into a point along the Cox's River where water flows and as such it could not stagnate or cause localised flooding, as was the case during discharge adjacent to the Current Location of LD001 near Long Swamp.

2.4 NOISE AND DUST MITIGATION AND MANAGEMENT

PAC Inquiry

4) At the meeting of 18 September, and on multiple occasions during the public hearings, concern was raised that to meet noise and dust criteria in Cullen Bullen and the surrounding areas all the mitigation and management strategies proposed by Coalpac would have to operate with 100% effectiveness.
A proposition that there be no night time operations until such time as:
- all mitigation and management strategies are implemented,
- those strategies are demonstrated to be fully effective, and
- revised modelling has confirmed that 24 hr criteria will be met was suggested as one way of dealing with this situation.

Can Coalpac advise:

a) what would be the anticipated period (years) of restricted operations for Coalpac to demonstrate that it could meet the 24 hr criteria when operating 24/7?

b) Whether such an approach is feasible in the context of the proposed mining operation?

c) What the impact would be on the viability of the project if Coalpac could not demonstrate compliance and was restricted to day and evening operations for the duration of the project?

Response

4a) Coalpac has carefully considered this inquiry and can commit to the following to demonstrate its ability to meet the predictions in the Environmental Assessment (EA) prior to commencing any night time (i.e. 10 pm to 7 am Monday to Saturday; 10 pm to 8 am on Sundays and Public Holidays) mining operations:

- Independent compliance auditing to confirm that all noise and dust mitigation and management measures committed to in the EA and Response To Submissions (RTS) are in place (relevant to each individual active work area) and then following this;
- Independent compliance monitoring to confirm that predicted noise and dust criteria are met over the day and evening periods in each Project mining area for a minimum period of three months.

4b) It is considered that the above approach represents the most feasible way to demonstrate that the mitigation measures to be implemented for the Project will operate effectively as predicted in meeting noise and dust compliance criteria for private receivers in the Cullen Bullen township and surrounding areas.

4c) If Coalpac was restricted to operating only during day / evening periods, approximately 25% of the coal resource proposed to be extracted over the 21 year life of the Project would not be able to be accessed. This would be due to the reduced time periods during which mining operations could occur and impacts on the economic viability of the Project.

Similarly, a 25% reduction in production per annum would reduce the annual quantities of coal that could be sold to Mount Piper Power Station (MPPS) and export to 1.875 Mtpa and 0.75 Mtpa respectively, using the same equipment fleet as proposed in the EA. This would have a material impact on the viability of the Project and Coalpac's ability to meet the requirements of their customers. The lower production rate would have a significant negative impact upon the financial viability of Coalpac as a low operating cost supplier for MPPS as contracted.

2.5 GREENHOUSE GAS CALCULATIONS

PAC Inquiry

5) *Submissions have been made querying the greenhouse gas calculations presented in the EA. The EA estimates the greenhouse gas emissions from the project at 0.0069 Gigatonnes of carbon dioxide equivalent per annum. A claim made is that the EA then compared this to the total CO_2 amount in the atmosphere, rather than against total annual anthropogenic emissions of greenhouse gases, and hence vastly underestimated the project's proportional generation of global greenhouse gases.*

The relevant submissions are attached, including advice from academics in the field provided to the Commission at the public hearing.

Can Coalpac advise the Commission whether it continues to support the calculations in the EA in the face of these criticisms?

Response

The relevant bullet points within the PowerPoint presentation made by Dr. Haydn Washington at the PAC public hearing at Lithgow are presented below in italics, along with responses drafted by PAEHolmes, who prepared the Air Quality and Greenhouse Gas impact assessment for the EA.

- *Coalpac EA states on p. x Exec. Summ. that:*

'estimated current global emissions of 3000 gigatonnes of carbon dioxide equivalent per annum'.

- *Repeated on p. 119 main report*
- *Human anthropogenic emissions are in fact c. 28.9 Gt CO_2/yr, as noted by their consultant, PAE Holmes, on p. 110 of Appendix G*
- *Coalpac is using the figure for the total atmospheric reservoir of CO_2, not human emissions. By so doing they seek to reduce the % this project increases human emissions.*

There was a transcription error between PAEHolmes technical report (Appendix G of the EA) and the main body of the EA document. The former correctly states:

"The estimated quantity of carbon dioxide stored in the atmosphere now is approximately 3,000 Gigatonnes (Gt)."

This transcription error was addressed within the RTS document, which states that 3,000 Gt corresponds to the world's current carbon dioxide load.

- *7 Mt CO_2/yr is 0.007 Gt and this is 0.02% of world emissions not 0.0003 % as repeatedly stated in the Coalpac EA.*

- *This mistake was pointed out in submissions and yet Coalpac continues in its 'Response to Submissions' to seek to deny their basic mistake in climate science.*

The RTS document compares the project's estimated annual contribution (0.007 Gt CO_2-e/annum) against world's current carbon dioxide load (3,000 Gt). It is acknowledged that if one wishes to compare the Project's estimated annual contribution against the estimated global anthropogenic annual emissions (~28.9 Gt CO_2-e/annum), this indeed represents 0.02%. This represents a different (not invalid) calculation to that used in the PAEHolmes Air Quality and Greenhouse Gas Assessment (a common approach for the calculation of the annual contributions from development in previously completed environmental impact assessments).

- *Confusion over scope 1, 2, and 3*
- *P. 55 Coalpac response says Australia's carbon footprint already includes emissions of scope 2 and 3, yet clearly they don't include emissions for a mine that is not yet built.*
- *It also states 'any coal bound for export markets (currently accounted for within the Project's Scope 3 emissions) will comprise part of Australia's annual GHG emissions'*
- *This is incorrect. The Australian National Accounts data does not include exported coal. The CO_2 in exported coal amounts to 520 Mt/ yr and is clearly not part of the total footprint of 546 Mt/yr.*

Section 4.4.8 of the RTS states:

"Australia's contribution of GHG emissions in 2011 of 546.3 Mt CO_2-e would already include the Scope 2 and 3 emissions associated with domestic consumption of coal as reported by the power stations that generate the electricity as their Scope 1 emissions."

This statement is correct.

It is acknowledged that the intent of the following sentence presented in the RTS, was to include the (omitted) word in bold:

"Similarly, any coal bound for export markets (currently accounted for within the Project's Scope 3 emissions) will ***not*** *comprise part of Australia's annual GHG emissions."*

- *The proposed increase of 7 Mt CO_2 is thus significant and does in fact* ***represent 1.3% of the current Australian carbon footprint****. It is misleading to refer only to scope 1 emissions (fuel use on site) in regard to a coal mine. Its greenhouse impact occurs when the coal is burnt.*

In view of the comments above, a significant proportion of the Scope 3 emissions that may occur as a result of the Project are already captured within the (current) Scope 1 emissions assigned to base-load power generation within a calculation of Australia's total annual GHG

emissions. It is therefore incorrect to infer that the Project in isolation represents a 1.3% increase to the current Australian carbon footprint.

More correctly, one may say that the coal produced annually by the Project is likely to replace 1.3% of Australia's total current annual GHG emissions, when combusted at a base-load power station. This also assumes that all product coal for the Project is destined for domestic consumption, when in fact only a maximum of 2.625 Mtpa of the total 3.5 Mtpa saleable limit, or 75%, is destined for MPPS.

This actual domestic combustion represents a total of 0.98% of the current Australian carbon footprint.

2.6 NOISE IMPACTS PREDICTED FOR CULLEN BULLEN

PAC Inquiry

6) *As set out in the Acoustic Impact Assessment (EA Appendix H by Bridges Acoustics from Section 4.4) a number of best-practice noise control measures, including specific machinery noise attenuation works, are required to achieve compliance with the Potential Specific Noise Criteria (PSNC).*
Without these proposed mitigation measures Bridges Acoustics advises that the project would be unacceptable from both social-economic and environmental perspectives.
In Section 4.5.7 of the Response to Submissions, there are conflicting statements as to whether 'no' receivers within Cullen Bullen would receive noise levels above the PSNC, or whether there would be 'no significant exceedances' of the PSNC. Can Coalpac clarify its noise impacts in relation to Cullen Bullen village residential receivers and the Cullen Bullen public school against the PSNC?

Response

There are no significant or moderate exceedances of the PSNC predicted within the Cullen Bullen township.

There are four properties in Cullen Bullen township (two of which contain residences) that are predicted to experience mild exceedances of the PSNC. None of these are predicted to experience exceedances of the PSNC at the residence. The four properties are only included as they are predicted to experience a mild exceedance over more than 25% of their total area.

The location of impacted properties within and in the vicinity of the Cullen Bullen township are discussed below and shown on **Figure 2**.

Significant Noise Impacts

- Receiver 200 (this block is a property with no residence and is located outside of Cullen Bullen township to the north. Coalpac has an agreement with the owner in relation to exceedance of noise and air quality impacts); and
- Receiver 198 (this block has a residence and is located outside of Cullen Bullen township to the north. Coalpac has an agreement with the owner in relation to exceedance of noise and air quality impacts).

Moderate Noise Impacts

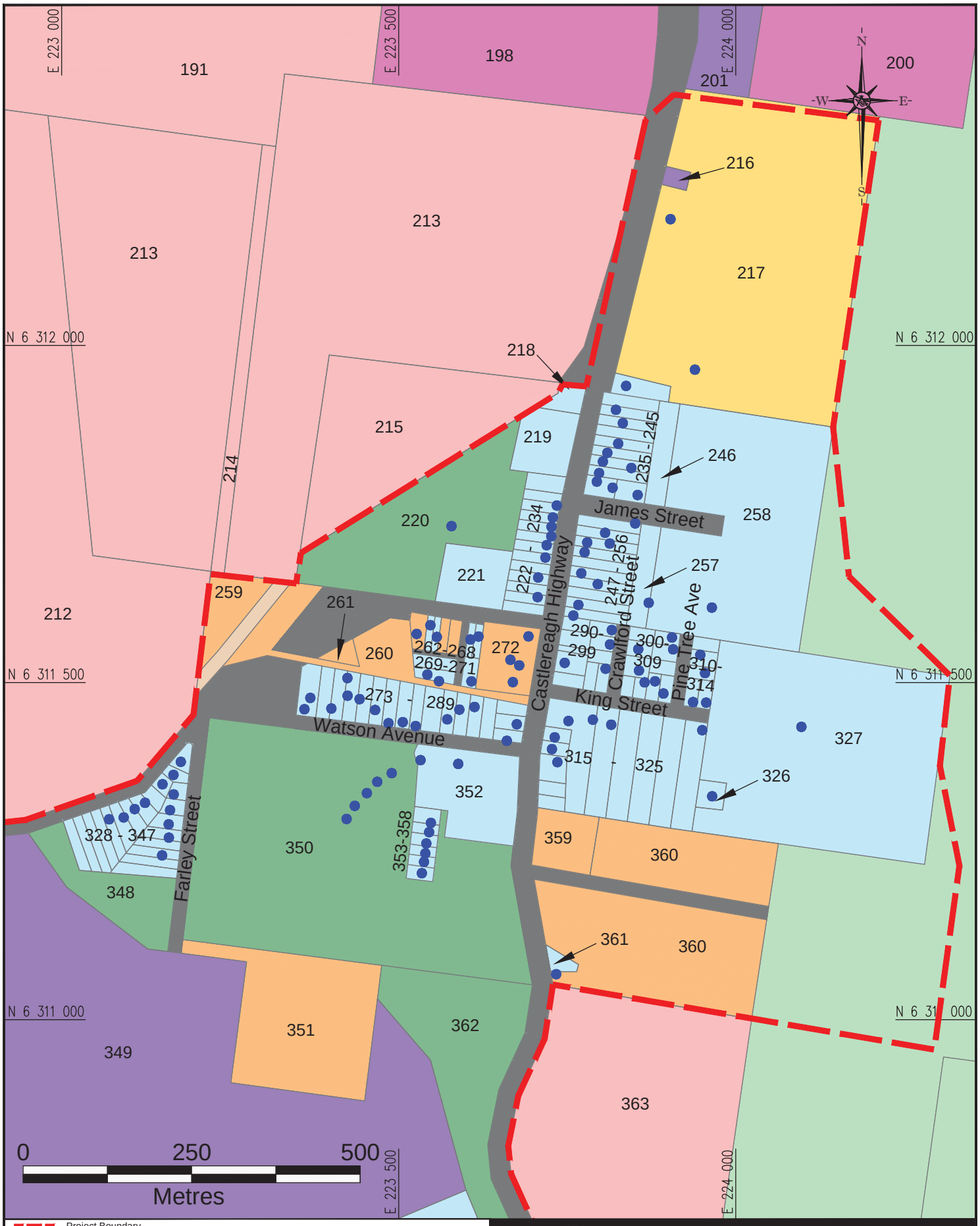
- Receiver 198 (this block has a residence and is located outside of Cullen Bullen township. Coalpac has an agreement with the owner in relation to exceedance of noise and air quality impacts);
- Receiver 201 (this block is a property with no residence located outside of Cullen Bullen township to the north);
- Receiver 216 (this block is a property with no residence and is located to the north of Cullen Bullen township);
- Receiver 217 (this block is a Crown block with two residences present to the north of Cullen Bullen township); and
- Receiver 349 (this block has a residence located to the south-west of Cullen Bullen township).

Mild Noise Impacts

- Receiver 220 (this block has a residence and is located on the north-west corner of Cullen Bullen);
- Receiver 348 (this block is a property with no residence and is located on the south-west corner of Cullen Bullen);

- Receiver 350 (this block has five residences and is located on the south-west corner of Cullen Bullen); and
- Receiver 362 (this block is a property with no residence and is located outside of Cullen Bullen township to the south).

As noted in Section 4.5.7 of the RTS report, Appendix H of the EA did not predict any exceedance of noise impact criteria for Cullen Bullen Public School (Receiver 272) as a result of the Project (i.e. less than the relevant INP residential criteria of 37 LAeq, 15 min during the day and less than 35 LAeq, 15 min during the night, although it should be noted that the school is closed at night). The maximum external noise level predicted for the Cullen Bullen Public School property is 32.2 dBA LAeq during day/evening prevailing conditions (see Figure 26 of the EA), which is well below the INP criterion for school noise levels of 35 LAeq inside a classroom.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King Street
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Watson Avenue
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Project Boundary
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Crown - Moderate Noise Impact
Private Freehold - No Noise Impact
Private Freehold - Mild Noise Impact
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Private Freehold - Significant Noise Impact
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Coalpac
Rail Corporation NSW
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3 ADDITIONAL INFORMATION

This section provides further information Coalpac wishes to provide although not specifically requested by the PAC in their correspondence of 11 October 2012.

3.1 SAND COMPONENT OF THE PROJECT

Overview

Sand is a vital resource for the built environment; it is an essential component in the building and construction markets of the Greater Sydney region. Existing supplies in this region are challenged and new sources of supply are required to meet the demand.

The Project proposes to develop a resource that is close to the Sydney market and would not result in an increase to the disturbance footprint from that resulting from open cut mining. Development of this resource would also minimise the social, economic and environmental costs associated with longer transport distances from other sources including financial cost, road and rail use and greenhouse gas emissions. The Project's local sand resource would partly address Sydney's industrial/construction sand demand.

The Coalpac Sand Product

The northern extent of the current open cut workings of the Cullen Valley Mine exposes friable Marrangaroo Conglomerate sandstone from below the Lithgow Seam, the lowest coal seam in the sequence. Tests conducted by Australian Soil Testing Pty Ltd indicate that crushed Marrangaroo sandstone has the potential to supply a range of medium to coarse sand products as well as a limited amount of gravel.

Sand Consumption Overview

Annual market demand for silica sand in the Sydney market is approximately 7 Million tonnes per annum (Mtpa). Of this volume, approximately one third is medium to coarse grained sand.

Current Sand Supply and Projected Shortages

Based on the projections and assumptions detailed within a report by Don Reed & Assoc. (Sydney Construction Materials 2010), Sydney Metropolitan area markets are expected to experience shortages in the order of:

- 74% or 4.9 Mtpa during the period 2010/11 to 2014/15; and
- 86% or 5.95 Mtpa during the period 2015/16 to 2019.

Coarse sand resources within the Sydney region are limited and longer term supplies of medium to coarse sand will be sourced from Somersby, Newnes Plateau and the Southern Highlands. The Penrith Lakes deposits, once the major source of coarse sand for the Sydney region, have diminished. The Kurnell deposit is also thought to have a relatively short life.

Potential Market

Potential markets in the Sydney region for the Marrangaroo sand include concrete batching plants, concrete products manufacturers, the Roads and Maritime Services (RMS) and its contractors, major construction companies and local government authorities.

- The RMS and its contractors are major consumers of sand for road construction and maintenance. The Project would be in an ideal location for supplying sand and gravel products for the proposed upgrade of the Great Western Highway between Lithgow and Mount Victoria (proposed to be completed by mid 2016 (RMS 2012)).
- There are many concrete batching plants in the Sydney region. Whilst most concrete batching plants are owned by large companies that own sand and/or hard rock resources, a considerable amount of sand is purchased from other suppliers.

Following comments by the PAC representatives at the site inspection on 18 September 2012, Coalpac has sought feedback from potential suppliers in order to provide a response on potential markets and transport options for the proposed sand mining component of the Project.

An expression of interest from Boral Cement Limited regarding the potential to supply the Berrima Cement works has since been provided (see **Appendix B**). This facility has the ability to receive sand product via both the road and rail network.

4 CONCLUSION

We trust that the above response addresses inquiries. Should you have any further queries please do not hesitate to contact me.

Yours faithfully
HANSEN BAILEY

Dorian Walsh
Senior Environmental Scientist

James Bailey
Director

Cc: Bret Leisemann, Coalpac Chief Development Officer
Sera Taschner, PAC Senior Planner

5 REFERENCES

- Geos Mining Minerals Consultants 2009. *Assessment and Identification of Markets for Sands from the Marrangaroo Conglomerate, NSW*. Geos Mining Project 2253-1. 5 February 2009
- Roads and Maritime Services 2012. *Great Western Highway Revised Upgrade*. http://www.rta.nsw.gov.au/roadprojects/projects/great_western_hway/revised_upgrade.html
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APPENDIX A

Pagoda & Gully Fauna Habitat Assessment

29 October 2012

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RESPONSE TO COALPAC PLANNING ASSESSMENT COMMISSION INQUIRY:
IMPACTS TO HABITAT FOR BROAD-HEADED SNAKE, ROCK WALLABY AND SUPERB LYREBIRD.

Dear Dorian

The purpose of this letter is to provide an ecological context and response to an issue that was raised during the Planning Assessment Commission (the PAC) review of the Coalpac Consolidation Project (the Project). The issue is summarised in italics below:

> *"(1) At the meeting of 18 September the issue of the potential impacts on native species that utilise either the pagoda or gully habitats exclusively, or to those species (such as the broad-headed snake, brush-tailed rock wallaby and lyrebird) which require access to both habitat types either seasonally, or on some other basis was raised.*
>
> *The Commission noted that the focus on setback distances in the EA and Response to Submissions appeared to be on maintaining structural integrity of the pagodas and not on the impacts on the fauna that utilised the pagodas and adjacent slope and gully areas as habitat. The response was that the issue had not been given detailed consideration by Coalpac.*
>
> *What further consideration has Coalpac given to this issue and what, if any, proposals does Coalpac wish to advance to deal with it?"*

Cumberland Ecology has now given more detailed consideration of this issue. In order to do so and prepare this response, Cumberland Ecology staff re-examined the gully forest areas to be directly impacted by means of reviewing existing GIS vegetation maps, by literature review and by field inspections of pagoda and gully areas.

We have re-examined the vegetation within pagoda and gully habitats, and re-examined the implications of the Project for three species noted by the PAC that have potential to use both pagoda and gully habitats: Broad-headed Snake, Brush-tailed Rock Wallaby and Superb Lyrebird.

Our findings are provided below.

1. Pagoda & Gully Habitats

1.1 Vegetation Types of Pagoda & Gully Habitats

For the purposes of analysing the habitats referred to by the PAC, it is important to first describe the "pagoda" and "gully habitats" to which the PAC made reference.

Pagodas are residual sandstone outcrops that form a distinctive and spectacular shape along the edges of the sandstone plateaus (DEC 2006). The gully habitats include very small gullies amid and between pagoda formations, larger gullies or valley floor areas, and lower hillsides. The larger gully habitats and hillsides are largely but not entirely west of the pagodas within the Project study area.

Pagoda and gully habitats are quite different for fauna. Pagodas largely lack soil, are highly exposed to the elements, and are sparsely vegetated. By contrast, the gully habitats have soils (sometimes deep soils) that are typically thickly covered by leaf litter and in some cases, lush vegetation such as grasses and ferns. The gully forests are thus more mesic and protected and so support taller forest and woodland vegetation. Notwithstanding the differences between the two types of habitats, two threatened species of fauna covered in the Ecological Impact Assessment (Cumberland Ecology 2012) are adapted to make use of both habitats. These are the Broad-headed Snake and the Brush-tailed Rock Wallaby; the ecology of both species is explained within **Appendix A**. The Superb Lyrebird, which is not a threatened species, is a bird that forages and has nests in the deeper gully habitats. A summary of its ecology is also provided in **Appendix A**.

The vegetation of these areas consists of a form of heathland on the pagodas themselves, while the gullies are vegetated by a mosaic of three forest types, and one woodland type. The following descriptions of vegetation are taken from the Ecological Impact Assessment within the Environmental Assessment (EA), and also directly from vegetation descriptions within "*The Vegetation of the Western Blue Mountains* (DEC 2006)".

The lower gully habitats within the Project Disturbance Boundary have evidently been disturbed by past logging and are not pristine old growth forests. Notwithstanding that, they consist of a diverse range of plant species and a number of the dominant tree species within these communities contain tree hollows of various sizes, as has been described in the Ecological Impact Assessment (Cumberland Ecology 2012).

The pagoda rock formations are largely vegetated by heathland referred to as "Pagoda Rock Sparse Shrubland" (DEC 2006). This low shrubby formation is found extensively throughout the Gardens of Stone and Western Wollemi National Park (DEC 2006). This plant community is not an endangered ecological community (EEC) and will not be directly cleared within the Project Disturbance Boundary.

The gullies amid and below the pagodas support the following forest and woodland types. Note that the map unit number is also provided from DEC (2006):

- Exposed Blue Mountains Sydney Peppermint – Silvertop Ash Shrubby Woodland (DEC Map Unit 30);
- Tableland Gully Mountain Gum - Broad-leaved Peppermint Grassy Forest (DEC Map Unit 35);
- Tableland Gully Ribbon Gum Blackwood Applebox Forest (DEC Map Unit 13); and
- Tableland Slopes Brittle Gum – Broad-leaved Peppermint Grassy Forest (DEC Map Unit 34).

As explained in the Ecological Impact Assessment (s.3.2 of the Coalpac Consolidation Project Ecological Impact Assessment), none of these communities are listed as EECs. This is because they are widespread, have not been extensively cleared in the past (though they have been subjected to logging), and are represented to variable degrees in conservation reserves (see below).

Exposed Blue Mountains Sydney Peppermint – Silvertop Ash Shrubby Woodland is a form of dry sclerophyll woodland. It is extensively distributed throughout the north, south and east of the western Blue Mountains and occurs throughout the more elevated area of the Blue Mountains and Wollemi reserves.

Tableland Gully Mountain Gum - Broad-leaved Peppermint Grassy Forest is a form of tablelands grassy forest. It is not currently well reserved within the western Blue Mountains but it is found within the Mount Walker area of the Blue Mountains reserve network.

Tableland Gully Ribbon Gum Blackwood Applebox Forest is also a form of Southern Tablelands Grassy Forest. It occurs in the western Blue Mountains and also in the adjoining catchment of the Hawkesbury-Nepean. Reservation status in the western Blue Mountains is low and it has suffered from clearing in the past.

Tableland Slopes Brittle Gum – Broad-leaved Peppermint Grassy Forest is also a form of tablelands grassy forest. It is not currently well reserved within the western Blue Mountains but like the aforementioned forest type, it is found within the Mount Walker area of the Blue Mountains reserve network.

1.2 Representation of Gully Habitats in Offsets

The Biodiversity Offset package that is proposed has representation of the aforementioned gully forest and woodland communities. The Offset Package also includes other similar tablelands forests and other mesic vegetation types. Examples are listed below:

Hillcroft Property

- Tableland Broad-leaved Peppermint - Brittle Gum – Red Stringybark Grassy Open Forest (similar to OEH Map Unit 34);
- Tableland Slopes Brittle Gum – Broad-leaved Peppermint Grassy Forest (OEH Map Unit 34); and
- Tableland Gully Snow Gum - Ribbon Gum Grassy Forest (OEH Map Unit 11).

Hyrock Hartley Property

- Blue Mountains Escarpment Complex (BMCC Map Unit 7);
- Blue Mountains Riparian Complex (BMCC Map Unit 6);
- *Eucalyptus oreades* Open-forest/Tall Open-forest (BMCC Map Unit 2g);
- Exposed Blue Mountains Sydney Peppermint – Silvertop Ash Shrubby Woodland (OEH Map Unit 30); and
- Montane Gully Forest (BMCC Map Unit 2j).

Gulf Mountain Property

- Sheltered Gully Ribbon Open Forest (similar to OEH Map Unit 13 and 35); and
- Tableland Slopes Brittle Gum – Broad-leaved Peppermint Grassy Forest (OEH Map Unit 34).

1.3 Reservation Status of Similar Habitats

The tablelands grassy forest types and the dry sclerophyll woodland habitats that occur within and adjacent to the Project Disturbance Boundary (and a suite of closely related forest and woodland habitats) are widespread along the western side of the Great Dividing Ranges in New South Wales. Habitats with similar characteristics for fauna habitats also occur broadly across the Blue Mountains, as is illustrated by the past and present distributions of Broad-headed Snake, Brush-tailed Rock Wallaby and Superb Lyrebird (see **Section 2**). Moreover, although such habitats have been subjected to logging, a high proportion remains uncleared and there is substantial representation of such forest and woodland communities within the reserve network of the Sydney Basin Bioregion.

The Project Boundary lies along the western edge of the Sydney Basin Bioregion (3,627,008 ha in total), which supports extensive areas of habitat in conservation tenure and has the third highest area of conservation-oriented tenures of the NSW bioregions. Together, this land occupies about 1,384,418 hectares or 38.20 per cent of the Sydney Basin Bioregion, as explained within the Ecological Impact Assessment (Cumberland Ecology, 2012).

The Project Boundary occurs on the western edge of one of the most extensively conserved landscapes of NSW. The Greater Blue Mountains World Heritage Area covers one million hectares and half of it is wilderness. Eight major conservation reserves make up the Greater Blue Mountains World Heritage Area:

- Blue Mountains National Park;
- Wollemi National Park;
- Kanangra-Boyd National Park;
- Yengo National Park;
- Gardens of Stone National Park;
- Nattai National Park;
- Thirlmere Lakes National Park; and
- Jenolan Karst Conservation Reserve.

Most of these sizeable conservation areas consist largely of sandstone landscapes, and include broad areas of comparable gully forest and woodland habitats to those which occur within and near the Project Boundary.

2. Fauna Species of Concern to the PAC

The PAC requested further information about impacts to three fauna species that may jointly use the pagoda habitats and the slope and gully forests. These include the:

- Broad-headed Snake (*Hoplocephalus bungaroides*);
- Brush-tailed Rock Wallaby *(Petrogale penicillata*); and
- Superb Lyrebird *(Menura novaehollandiae*).

Species profiles and information about the likelihood of occurrence of these animals within the Project Disturbance Boundary and more widely in the region is provided in **Appendix A** and **Appendix B**.

The Broad-headed Snake and Brush-tailed Rock Wallaby are threatened species listed under the EPBC Act and TSC Act that have potential habitat in the Project Boundary. As stated in the EA, neither species has been detected within habitat identified in the Project Boundary, despite extensive targeted searches by Cumberland Ecology. The Broad-headed Snake has been detected to the east of the Project Boundary, upon plateau areas around the pagodas. For the purposes of impact assessment, this was taken to mean that potential habitat occurs in the proposed Project Disturbance Boundary and as such would be cleared.

Analysis of records of occurrence of both Broad-headed Snake and Brush-tailed Rock Wallaby shows that the habitats of the Project Disturbance Boundary are not prime habitats for either species. Many more records for both species occur further to the east within the extensive network of conservation reserves that comprise the Blue Mountains World Heritage Area referred to in the section above.

The Superb Lyrebird is not a threatened species. It is widespread and abundant (see **Appendix A** and **Appendix B**) and occurs widely throughout the Great Dividing Range. It is present in the wetter valleys and hillsides of the Project Boundary. It also occurs widely on the eastern side of the Blue Mountains area, and in other gully forest areas in the greater Sydney Region, where it is not of high conservation concern.

Based on data collected during detailed surveys, the slopes and gullies that occur within the Project Boundary are unlikely to support significant areas of habitat of either the Broad-headed Snake or the Brush-tailed Rock Wallaby. However, the slopes and gully habitat does support populations of the Superb Lyrebird. Such slope and gully habitats are extensive and well conserved within the locality, the Blue Mountains and Sydney Basin Bioregion. This is why none of the forest or woodland types that occur within the slope and gully areas and lower hillsides are listed as endangered ecological communities.

We maintain the view that the Project is unlikely to have a significant detrimental impact upon populations of the Broad-headed Snake, Brush-tailed Rock Wallaby or Superb Lyrebird in the region.

3. Conclusion

The gully habitats amid and below the pagoda outcrops and within the Project Disturbance Boundary are neither unique nor confined to the proposed open cut mining area. None of these communities are listed as EECs. This is because they are widespread, have not been extensively cleared in the past (though they have been subjected to logging), and are generally represented within conservation reserves of the Greater Blue Mountains World Heritage Area.

The examples of gully habitats within the Project Disturbance Boundary have evidently been disturbed by past logging and are not pristine old growth forests (Cumberland Ecology 2012). Notwithstanding that, the vegetation supports a variety of threatened species and so the proponent has proposed an Offset Package to help compensate for the predicted ecological impacts. In consultation with the Office of Environment and Heritage, the proponent has recognised the need to boost the offsetting of a variety of forest and woodland types. Since exhibition, the proponent has added the property “Gulf Mountain” to the offset package and this

will augment the offsetting of tablelands grassy forests and dry sclerophyll woodland – vegetation of the gully habitats in the Project Disturbance Boundary.

With the addition of the Gulf Mountain property, there are significant areas of several types of tablelands grassy forest and dry sclerophyll woodland that are now proposed for conservation within the Project Offset Package. This also includes areas within the Hillcroft and Hyrock Hartley properties. The Offset Package will thus conserve habitat for Superb Lyrebird and also potential habitat for the Broad-headed Snake and Brush-tailed Rock Wallaby.

In addition to the Offset Package, the proponent will continue its successful program of rehabilitation of mined areas back to forest and woodland. The gully forest areas within the Project Disturbance Boundary will be rehabilitated in the longer term and this will help to replenish habitats that are mined.

The Broad-headed Snake has been threatened by illegal collection of bush rock and by collection of animals as pets (see **Appendix A**). Rehabilitation after mining should be conditioned to help restore bush rock to selected habitat areas in order to benefit this species.

Brush-tailed Rock Wallabies are likely to have historically inhabited the pagodas in the region. They are now absent from a large part of their range (including the Project Boundary) due to fox predation. Restoration of a Brush-tailed Rock Wallaby population within the Project Boundary is not a feasible option for the Project, nor is it consistent with the NSW recovery objectives for the species (DECC 2008). Notwithstanding that, fox control on the mine lease during the mining process will benefit this species and may encourage Rock Wallabies to recolonise the pagodas in the Project Boundary in the future.

Superb Lyrebird is predicted to remain in the areas surrounding the mine as mining proceeds. Populations are also predicted to eventually recolonise mine rehabilitation areas. Fox control will also benefit this species. No other mitigation measures are considered warranted to protect this species.

Based on current data collected by Cumberland Ecology, the slopes and gullies that occur within the Project Boundary are unlikely to support significant areas of habitat of either the Broad-headed Snake or the Brush-tailed Rock Wallaby. However, they do support Superb Lyrebirds. The Project is unlikely to have a significant detrimental impact upon Broad-headed Snake, Brush-tailed Rock Wallaby or Superb Lyrebird.

Yours sincerely

David Robertson

Dr David Robertson
Director
david.robertson@cumberlandecology.com.au

APPENDIX B

Potential Sand Market Expression of Interest

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16 October 2012

Ian Follington
Chief Executive Officer
Coalpac Pty Ltd
PO Box 330
INDOOROOPILLY QLD 4068

Dear Ian

RE: **POTENTIAL MARKET FOR COALPAC SAND**

Boral Cement (Bc), a subsidiary of Boral Limited, operates a cement manufacturing facility at Berrima in New South Wales. The Berrima Cement Works is the flagship facility in the Boral Cement network. It is responsible for the supply of 60 percent of the total need for cement products in NSW and the ACT.

We note that Coalpac is seeking approval for a small sand extraction operation in conjunction with its Consolidation Project (the "Project"). BC would be interested in discussing the supply of sand to its Berrima operation following the receipt of Project Approval by Coalpac. BC has the ability to receive raw materials for cement production by both road and rail; with existing rail infrastructure including existing unloading facilities and storage gantries on site.

We would like to register our interest in exploring a potential commercial agreement with you and wish to remain apprised of the status of your approval.

Sincerely,

Barry George
Procurement Manager

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Fax: 02 4860 2366
Email: barry.george@boral.com.au

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2 November 2012

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FAUNA HABITAT VALUES OF GULF MOUNTAIN. A PROPOSED BIODIVERSITY OFFSET PROPERTY FOR THE COALPAC CONSOLIDATION PROJECT

Dear Dorian

The purpose of this letter is to summarise the results of spring 2012 fauna investigations on "Gulf Mountain" (the Property), a proposed Biodiversity Offset Property for the Coalpac Consolidation Project (the Project).

The key findings are summarised below, whilst detailed survey information is provided in **Appendix A**. **Appendix B** provides a full list of fauna species detected during surveys, while **Appendix C** contains an earlier letter about the vegetation of Gulf Mountain by Cumberland Ecology based upon preliminary surveys undertaken in July 2012.

1. Background

Gulf Mountain comprises 1,277 ha of native forest and woodland. It is a recent addition to the Revised Biodiversity Offset Proposal (BOP) of the Project. It was added to the BOP to increase the area of intact forest and woodland within the offset package, particularly gully forest habitats and the threatened species that inhabit them.

Earlier in 2012, Cumberland Ecology conducted a preliminary site investigation of Gulf Mountain and mapped vegetation within it. However, no vertebrate fauna surveys were conducted at the time. The results of the preliminary site investigation were reported in Cumberland Ecology Letter 19 dated 16 July 2012 (**Appendix C**). The letter was submitted to the NSW Department of Planning and Infrastructure (DP&I) as part of the Project's Response to Submissions (RTS) process.

During review of the Project's RTS, the NSW Office of Environment and Heritage (OEH) and the Planning Assessment Commission (the PAC) requested further information in order to fully assess the value of the BOP in providing adequate compensatory habitat for threatened species predicted to be impacted by the Project, such as the Squirrel Glider, Broad-Headed Snake, Brush-tailed Rock Wallaby, and Powerful Owl. The PAC also queried the impacts of the project upon Superb Lyrebird, which is not a threatened species, but is a species of concern within some non-government submissions.

Coalpac commissioned Cumberland Ecology to conduct targeted threatened fauna investigations of the Property to provide data about the faunal values of the proposed offset and to verify the presence of threatened species on the Property. The fauna investigations were completed in spring, on 15-19 October 2012.

2. Key Findings

The forest and woodland habitats of Gulf Mountain are intact and the faunal habitats are in good condition. The majority of vegetation comprises low open forest and woodland on slopes with areas of tall forest along sheltered gullies. The land includes frontage to the Turon River and therefore provides riparian habitats that are not represented within the Project Disturbance Boundary.

The October surveys detected a suite of fauna species that are predicted to be impacted by the Project, including the following threatened fauna species listed as Vulnerable under the NSW *Threatened Species Conservation Act 1995* (TSC Act):

- Powerful Owl (*Ninox strenua*);
- Gang-gang Cockatoo (*Callocephalon fimbriatum*);
- Scarlet Robin (*Petroica boodang*);
- Varied Sittella (*Daphoenositta chrysoptera*); and
- Squirrel Glider (*Petaurus norfolcensis*).

One threatened frog and two migratory birds that are not predicted to be impacted by the Project were also found on Gulf Mountain:

- Booroolong Frog (*Litoria booroolongensis*) listed Endangered under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- Rainbow Bee-eater (*Merops ornatus*) listed Migratory under the (EPBC Act); and
- Satin Flycatcher (*Myiagra cyanoleuca*) listed Migratory under the (EPBC Act).

The Property also supports the Superb Lyrebird (*Menura novaehollandiae*), within gully forest.

Given the size of the Property and the quality of faunal habitats within it, more species of conservation significance are likely to be detected with additional survey effort. Based upon habitat types and database records for the locality surrounding Gulf Mountain, the following species may also occur: Rosenberg's Goanna, Eastern Bentwing Bat, Eastern False Pipistrelle, Large eared Pied Bat, Greater Broad-nosed Bat, Large-footed Myotis, Masked Owl, Barking Owl, Square-tailed Kite, Turquoise Parrot, Regent Honeyeater, Flame Robin, Koala and Spotted-tail Quoll. Please note that bat calls are currently being identified.

3. Conclusion

Based upon the October survey data, the gully forest and riparian forests of Gulf Mountain contain important habitat for many of the threatened species that have the potential to be impacted by the Project including: Scarlet Robin, Varied Sittella, Powerful Owl, Gang Gang Cockatoo and Squirrel Glider. Other listed species detected on the Property that are not predicted to be impacted by the Project include the Booroolong Frog. Given the size of the Property and the quality of faunal habitats within it, more species of conservation significance are likely to be detected with additional survey effort.

The gully forests, although different in species composition, contain important habitat features for a number of threatened species, such as the Powerful Owl, Gang-gang Cockatoo and Squirrel Glider. The detection of such species, in particular the Powerful Owl and Squirrel Glider, is significant as these species are likely to utilise the Property for breeding which reflects the quality of habitats provided.

The spring fauna surveys have verified the existence of key threatened species and demonstrate the suitability of Gulf Mountain as an offset to contribute towards compensating for impacts to forest fauna. We remain of the view that this large, forested Property can be a valuable part of the Revised BOP.

Yours sincerely,

Dr David Robertson
Director

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7 December 2012

Planning Assessment Commission
Attn: Ms Sera Taschner
Senior Planning Officer
GPO Box 3415
Sydney NSW 2001

Dear Planning Assessment Commission

PROPOSED COALPAC CONSOLIDATION PROJECT

Thank you for the opportunity to discuss the Industry and Investment NSW—Division of Resources and Energy (DRE) response dated 4 October 2012 to the Coalpac Consolidation Project.

As I had not previously been involved with the project, and attended at late notice, I apologise for the delay in responding whilst I sought input from DRE staff. I discussed the PAC questions regarding the management of acid generating material with the Environmental Sustainability Unit (ESU) and forwarded them a copy of the submissions from Dr Washington that were kindly provided by the Planning Assessment Commission.

ESU believes the best method to address the acid drainage issues are through a Management Plan that would include testing, treating and monitoring. The acid generating material Management Plan could be a stand alone Management Plan or incorporated into the Rehabilitation Management Plan condition of the project approval. The Management Plan would need to be to the satisfaction of DRE and could include issues raised by the PAC relating to sand extraction proposed to occur early in the project. At this time DRE's main concerns are to ensure the washery rejects are treated as a potential acid generating material and managed separately from general overburden emplacement and the Invincible Colliery Tailings Drying Area are remediated.

The PAC raised three other matters;

1. The control of the highwall mining layout – this can be achieved through good mine survey practise.
2. Subsidence impacts on rock pagoda features - I sought advice from the Principal Subsidence Engineer and he was unable to provide informatiom detailing pagoda features within the zone of mining in recent years. I also consulted with a private organisation who indicated mining had occurred in the vicinity of rock column style features but they had not been involved with rock pagoda features. However, it is understood that Baal Bone Colliery had mining in close proximity to pagodas in their most recent SMP extraction area. In any event the applicant needs to demonstrate the rock pagoda features will not incur mining-induced damage and most importantly, pillar stability is such that there is no risk of further subsidence after mining is complete.
3. DRE's requirement for a 1km barrier for the extinguishing of existing combustion in emplacement areas and underground workings – As these areas will not be reached until Y12 of the project; DRE believes there is sufficient time to address this matter. The 1km provides a 'trigger' to ensure action has been taken and results can be reviewed in discussion with DRE based on Coalpac's findings and actions.

I trust this information is of assistance and thank the Planning Assessment Commission members for convening the meeting.

Yours sincerely
G J Cole-Clark
Chief Executive Officer

Appendix E: Professor Cliff's Advice on Underground Combustion dated 6 December 2012

Review of Risk of Spontaneous Combustion Associated with the Coalpac Consolidated Coal Mine Project in the Lithgow LGA

Prepared by Professor David Cliff

6 December 2012

Minerals Industry Safety & Health Centre The Sustainable Minerals Institute, The University of Queensland, Australia
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INTRODUCTION

On 4 October 2012 the NSW Planning and Assessment Commission invited Professor Cliff of the University of Queensland to tender to review the risk of spontaneous combustion associated with the proposed Coalpac consolidated coal mine project in the Lithgow LGA. Specifically advice was sought to address the following:

1) *Whether the proposed project poses any risk(s) of increased sub-surface heating including advice on the nature and potential seriousness of these risks;*

2)

   a) *Whether the management strategies proposed in the Environmental Assessment and the Response to Submissions are sufficient to detect and manage the risks adequately*

   b) *If not, what additional measures (if any) might be employed to achieve adequate management;*

3)

   a) *Noting the area within which the proposed project is situated, whether there are increased risk(s) of surface fires (e.g. bushfire) arising from the project;*

   b) *Whether the management strategies proposed in the Environmental Assessment and Response to Submissions are sufficient to avoid or manage the risks(s) of surface fires;*

4) *Whether subsurface heating associated with the project could impact upon the safety and/or amenity of the residents of Cullen Bullen either directly or indirectly including advice on the nature and potential seriousness of any such impacts;*

5) *Any other matters related to subsurface heating in the context of this project proposal that the consultant believes should be considered by the Commission in its review.*

Large parts of the project area have been previously subject to underground mining. Subsurface heating has been in evidence in some of these underground workings since at least the 1970s. This was exacerbated in 2003 when the abandoned underground workings were intersected by open cut excavation. Submissions relating to this application have raised concerns about the risks associated with subsurface heating. In addition historic episodes have generated complaints about odour in the village of Cullen Bullen. There is also evidence of dead rehabilitation vegetation which is reported to have been caused by the underground heating.

Professor Cliff provided a tender aimed at preparing a report to address these concerns. The current document is that report. It is based upon documents supplied by the Planning Assessment Commission both as part of the project application and subsequent to that provided by the proponent of the application. In addition Professor Cliff visited the mine site on Friday 2 November 2012. As a result of that visit the proponent has provided

additional information.

The report is based upon this information and thus the accuracy and relevance of the report is limited to the accuracy of this information. Should information be discovered that renders the current information invalid or modifies any of the underlying assumptions then the conclusions reached in this report will no longer be valid. Similarly the recommendations contained with this report are only valid within the current information base.

Documents accessed to provide information include:

- Copy of powerpoint presentation made to Professor Cliff during the site visit by the proponent.
- Cullen Valley Mine Heating – Current Status and Mitigating Strategy. Prepared by Coalpac Pty Ltd dated 27 September 2010.
- Cullen Valley Mine – Plan of Management for Subsurface Heating. Prepared by Coalpac Pty Ltd dated 27 September 2012
- Environmental Assessment (EA Coalpac Consolidation Project particularly Volume 1 section 8.4; and Volume 2 Appendix G section 11.6
- Submissions by the Division of Resources and Energy of the Department of Trade and Investment, Regional Infrastructure and Services commenting on the EA.
- The Response to Submissions by the proponent, section 4.3.
- Submission to the Planning Assessment Commission by the Colo Committee commenting on the EA.
- Additional figures provided outlining the proximity of open cut and highwall mining to the underground workings
- Relative Ignition Temperature tests on five coal samples carried out in 2011

THE CURRENT SITUATION

Based upon the information provided and observations made during the site visit the following situation appears to exist.

- There are two distinct heating areas:
    - Carbonaceous material that has been buried in the loose material used to backfill the open cut
    - The old underground workings apparently adjacent to the highwall of the old open cut mining.
- Pertinent to this is:
    - At Invincible Colliery they are currently mining the old underground workings in the Lithgow seam. There are no reports of any spontaneous

combustion in this mine. This is consistent with the anecdotal evidence that the old workings in the Cullen Valley Mine did not auto-ignite but may have been catalysed by an external source.

- The area where there is still some activity has not been capped with any clay layer and so is porous.
- The area where there is dead vegetation is quite steep, well beyond the recommended angle of repose of the slope, not well compacted, with no clay barrier.
- Most of the areas of visible activity are associated with the intersection of the old underground workings and the highwall of the open cut.
- Limited laboratory testing of the propensity for spontaneous combustion as determined by the relative ignition temperature does not suggest that the Lithgow seam or indeed any of the other seams will be particularly prone to spontaneously combust.

The key to controlling any spontaneous combustion is to remove at least one leg of the fire triangle – fuel, oxygen or heat. Fuel control is achieved by removing it, oxygen control is achieved by preventing air ingress into areas where the fuel exists. Heat control is achieved by removing the heat as fast as it is produced.

Coalpac has prepared a plan of management for subsurface heating (dated 27 September 2012 and I am advised it is confidential until such time as it is adopted by DRE). In essence the plan aims to achieve the management of the heating through:

- Progressive treatment of shallow heating affected material in the overburden
- Reconstruction of the extracted areas including reducing the angle of repose of the face of the fill and covering in an impervious layer of clay
- The underground heating areas will be contained and isolated from air ingress through the clay capping
- Ongoing monitoring of surface temperatures and water levels in the adjacent underground workings, as well as the performance of the rehabilitation.

Dealing with subsurface heatings of this nature is not simple. It is clear from recent experience that hot spots appear via fumes being emitted through cracks to the surface and the historical practice of covering and compacting the surface above the hot spot simply seems to encourage the hot spot to migrate to another location. This is because in the past no systematic attempt was made to prevent air from filtering into the backfill, probably largely through the face of the fill and chimneying out, creating an air flow path. The bulk of the backfill is not compacted and there is no capping over most of the area.

The recent site visit identified a number of hot spots most of which were consistent with being on the interface between the existing underground workings, the highwall and the backfilled area. There were some evidence of residual heating in the backfilled area but thermal scanning of the surface does not indicate that it is widespread. It would seem that the heating in the underground workings is quite extensive and entrenched. A number of

small fissures were observed during the site visit and one fissure emitting quite significant gas volumes. Gas analysis and temperature analysis are consistent with areas of coal being in excess of 300 ^{o} C. The actual mass of coal involved cannot be estimated as the rate and type of reactions occurring depend upon the temperature of the coal and the amount of air supplied as well as the mass of coal. In essence, identification of hot spots is via the emissions at the highwall via the 50 m high chimney fissures from the coal seam to the surface with no guarantee that the path is vertical. To directly attack each location would be very expensive and give no guarantee that it would not migrate to another location. Simply trying to quench the hot spot with water may have the opposite effect as the water may increase the size of the fissure and raise the airflow, thus increasing the size and intensity of the hot spot. Filling each underground roadway would be prohibitively expensive and difficult to achieve in practice, due to the terrain and the unknown condition of the underground workings. Inertisation of the underground workings, such as was done at Blair Athol is only effective as a temporary measure to control the activity of a heating whilst alternative measures are carried out – in the case of Blair Athol, this involved plugging all entry points to the old workings with clay. In this case there was a small number of headings to block. Explosives were used to collapse the old workings. Inertisation is only a temporary measure and very expensive to use for any significant period of time. Exclusion of air from the hot spots will cause the heatings to lose activity and slowly cool down.

In general the plan proposed by Coalpac seems reasonable with a good chance of success, provided it is properly and diligently applied. Any plan to control hearings should be regarded as a work in progress and subject to revision depending on the effectiveness of the controls applied and the extent of the heating. It should not be necessary to insist on greater and more expensive activities such as filling all the underground voids, when the simpler, quicker and cheaper alternatives of effective surface capping, may well be effective. Key to the Coalpac proposal is the effective rework of the back filled area, removing and treating any near surface heatings, regrading the face slope and capping with a clay barrier. This clay barrier may well need to be reinforced and repaired regularly to ensure all surface cracks are closed.especially on the highwall back fill interface. Provided a proper program of monitoring is maintained and corrective actions are undertaken promptly should the proposed plan not be effective then, the proposed plan seems a reasonable initial approach.

Dealing with heatings such as these are complex operations that take time (maybe years) as the reactions and associated heat generation cannot be quickly extinguished. The full complexity of the heating materials and geographic spread will only be known once excavation is undertaken. It will be important to ensure a good seal along the surface interface between the highwall and the backfill area and also over the sloping face of the backfilled area. This may require repeated placement/rework of clay and maintenance of the seal between the highwall and the backfill area so that no significant cracks can develop. If it is assumed that there are no old shafts or surface connections to the underground workings then the air must be diffusing through the uncompacted backfill and on occasion seeping down cracks under the diurnal atmospheric pressure fluctuations. Advice from DRE and the proponent indicate that extensive searching of the surface area above the old workings has been undertaken and no unsealed shafts or vents have been located.

Once the process of digging out the backfill, quenching any hot spots in the backfill, reburying and then capping with clay is initiated, the situation with the highwall hot spots will become clearer and any need for supplementary controls such as direct quenching with water, or targeted filling voids with flyash or clay will be clarified.

The experience of the proponent when treating the noise bund for hot material clearly demonstrated that the backfill is currently porous and can act as a flow path to convey air from the face of the backfill to the highwall, if it is not adequately sealed.

A possible mine-related activity that could upset the control process and cause an exacerbation and spreading of heating would be if the projected highwall mining in the area to the north of the current area of concern, was to mine into the old workings and either create an air path into the workings or cause the water that is currently covering the majority of the underground workings to drain away. Coalpac propose to leave a 50 m barrier between the underground workings and the highwall mining. It is not possible to assess the adequacy of this distance from the information supplied. Caution should be exercised in assuming that the old mine plans are accurate (eg the Gretley experience). This highwall mining activity is not projected to occur before about year 12 of the mining plan, which would give Coalpac time to gain a more quantitative picture of the separation distances. In addition some open cut mining will occur in the seams overlying the old workings where the separation will only be of the order of 15 m. This separation will be solid sandstone however care will need to be exercised to ensure that cracking of the sandstone does not occur during open cut mining. This would allow the water to escape from the underground workings. This will present less of a potential problem if there has been no evidence of activity in the highwall areas for some years prior to this mining occurring. Maps outlining the mining activity have been provided by the mine and are attached as figures 1 and 2.

THE QUESTIONS RAISED BY THE PLANNING ASSESSMENT COMMISSION

1) *Whether the proposed project poses any risk(s) of increased sub-surface heating including advice on the nature and potential seriousness of these risks;*

With the possible exception of the proposed highwall mining, and if the plan of management for the subsurface heating is fully implemented and monitored for effectiveness, the proposed project is very unlikely to cause any increased sub-surface heating activity. The plan proposes a staged long term approach to treat the problem with response dependent upon further exploration and quantification of the size and nature of the spontaneous combustion events. The potential concern with highwall mining is that this activity does not intrude upon the old underground workings. The proponent is proposing a 50 m barrier of solid coal between the highwall mining and the old workings, but this is based upon the available plans of he old underground workings, which may or may not be accurate.

2)

a) *Whether the management strategies proposed in the Environmental Assessment*

and the Response to Submissions are sufficient to detect and manage the risks adequately

Based upon the information supplied to me, it would seem that the plan of management dated 27 September 2012 for subsurface heating, if properly implemented and monitored will manage the risks adequately. However the plan should not be seen as a final document rather as a work in progress, to be reviewed based upon achieving milestones. These could include:

- Time taken to regrade and cap back fill areas, including reducing angle of repose (targets could be set by area).
- Decrease in temperatures at monitoring locations (and any others deemed necessary) (for example: target consistently less than 100 ^{o} C)
- Success in establishing and maintaining regrowth
- Reduction in number of detectable centres of activity – target would be no active areas within five years.

b) If not, what additional measures (if any) might be employed to achieve adequate management;

It would be prudent to ensure that the proposed highwall and open cut mining will not encroach upon the underground workings, also a more detailed understanding of the water levels within the workings and their changes over time should be obtained. I cannot assess whether or not a proposed 50 m barrier between the proposed limit of higwall mining and the location of the underground mine workings as defined by old plans, as I have no means of assessing the accuracy of these plans. There should be a commitment from Coalpac to regularly review the effectiveness of the plan in consultation with DRE and commit to consider alternative actions, such as selective void filling, if necessary A formal review of the effectiveness of the plan should be undertaken in conjunction with external stakeholders within five years. It should be noted that highwall mining adjacent to the old underground workings is not proposed to commence until at least ten years into the mining operation, giving ample time to demonstrate extinction of any underground heating activity. This is essentially consistent with the DRE requirement for extinguishment before getting within 1 km. of the old underground workings.

3)

a) Noting the area within which the proposed project is situated, whether there are increased risk(s) of surface fires (e.g. bushfire) arising from the project;

The surface area of the mine is in a bushfire prone area. However the subsurface heatings are either deeply buried (highwall approx 50m deep) or will be dug out and remediated then covered with an impervious clay barrier. It is thus difficult to see how the subsurface heatings can create significant surface heatings. The only potential exception to this would be during the treatment of hot spots within the backfill area. These will need to be rapidly quenched with water to ensure no possibility of open fire being created. In addition activity on high wind days should be avoided so that no

embers can be transported into the adjacent bushland.

b) Whether the management strategies proposed in the Environmental Assessment and Response to Submissions are sufficient to avoid or manage the risks(s) of surface fires;

As outlined above, if the sub surface heating management plan is conscientiously applied and monitored for effectiveness then there should be adequate management of risks of surface fire.

4) Whether subsurface heating associated with the project could impact upon the safety and/or amenity of the residents of Cullen Bullen either directly or indirectly including advice on the nature and potential seriousness of any such impacts;

There is a potential minor impact on nearby residents from odour should a significant sized hot spot be uncovered and allowed to vent. The closest resident to the area has complained in the past of odours. This issue can be minimised through careful processing of the backfill to ensure rapid quenching of any exposed hot spots, and by being cognisant of the wind directions. Whilst the reworking of the backfill is being undertaken, plugging of any fissures adjacent to the highwall will reduce the emissions coming from the old underground workings. If anything it is more likely that the dust created by the reworking of the backfill would be an issue, if not adequately managed.

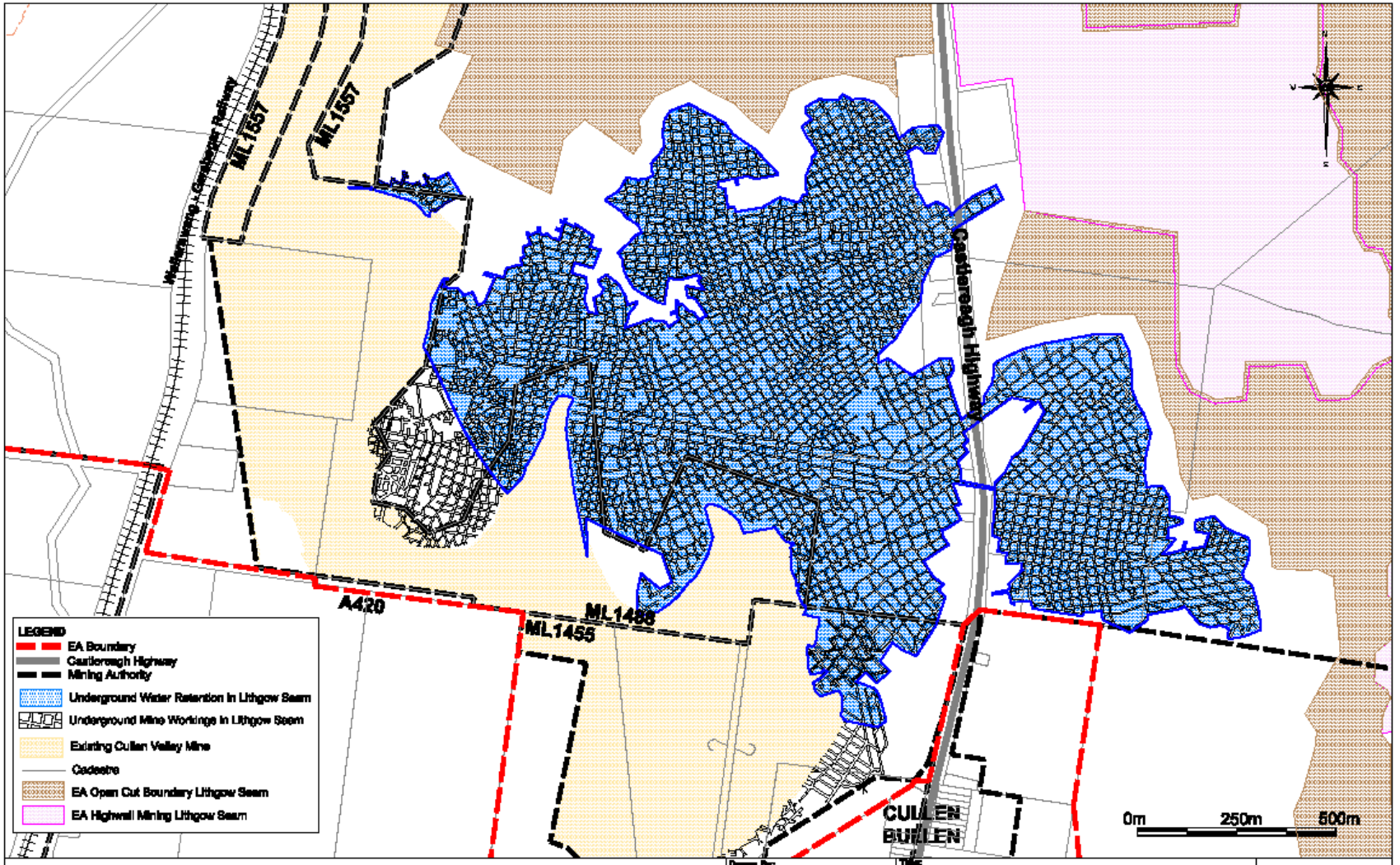
5) Any other matters related to subsurface heating in the context of this project proposal that the consultant believes should be considered by the Commission in its review.

A question was raised regarding the potential for subsidence due to the weakening of the underground pillars due to the heatings. The question of pillar stability is beyond my area of expertise. It is true that the pillars where heatings occur will suffer some loss of integrity through potential fracturing and delamination. However these pillars are most likely to be the pillars nearest the highwall adjacent to the air supply. These pillars would also likely to have suffered damage due to the adjacent use of explosives in the open cut. Pillars deeper into the mine are not likely to be damaged as they are unlikely to be undergoing heating unless there is air flow into the mine, rather than Air flowing just around the perimeter. It is understood that there have been extensive works carried out to seal all surface entries and shafts to the mine so this is thought to be unlikely.

Treating and burying deeply the reactive material in the back fill will deal with this issue quite quickly. Dealing with the residual heating in the underground mine will take longer and relies upon the exclusion of air. Time will be required for the heat to dissipate – this can take years and be frustrated by any accidental re-ventilation of heating sites. It may be necessary in some cases to consider injecting a filler into a particular roadway or onto a hot spot, should the capping activity prove unsuccessful. This is not a simple operation, both to gain access to the desired area and then to inject sufficient material in a suitable form to make an effective seal and smother a heating. To control a heating at Newstan Colliery over 10 000 tonnes of fly ash slurry was used primarily to seal surface cracks and create airtight seals in several underground roadways. In this case the air entered the underground mine via

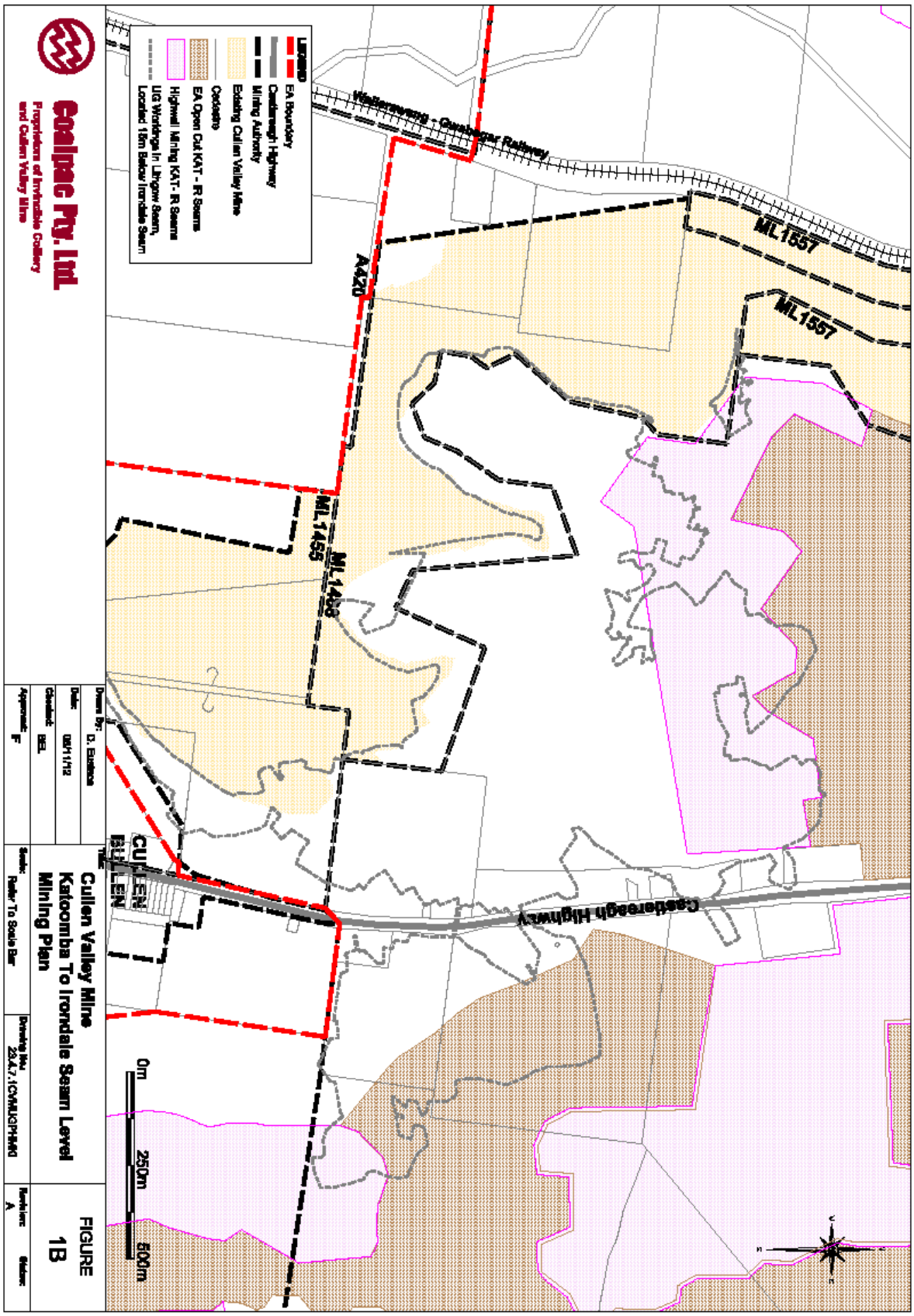
subsidence cracks from the surface some 90 m above the coal seam. Due to the presence of a state forest on the surface above the underground mine, compaction of the cracks, the cheaper option, was not possible. Use of a fly ash slurry may be effective where areas of intense heating are identified.

I am not competent to comment on the likelihood of success of the rehabilitation and revegetation program. This requires detailed environmental knowledge and experience in revegetation. Consensus suggests that the current failure of revegetation on the sloping ground is due to heat from the subsurface heatings. If the plan succeeds in controlling the heatings then this heat will dissipate and it could reasonably be assumed that it would not cause damage to the plants. To some extent the success of the clay barrier, in excluding air from the workings and subsurface areas, and the compaction of the backfill, may work against promotion of vegetation growth. The reshaping of the toe of the backfilled area including reducing the angle of repose to 18^{o} should reduce the likelihood of any underground heating affecting the regrowth. Having to rework the clay capping will impact upon the potential for regrowth, however it is most likely that this reworking would be limited to the interface between the highwall and the backfill area.



Coalpac Pty. Ltd.
Proprietors of Invincible Colliery and Cullen Valley Mine

Drawn By: D. Eustace	Title: Cullen Valley Mine Lithgow Seam Level Mining Plan		FIGURE 1A
Date: 08/11/12			
Checked: BEL			
Approved: F	Scale: Refer To Scale Bar	Drawing No: 23.4.7.1CVMUGPHMLSH	Revision: D Status:


Coalpac Pty. Ltd.
Proprietors of Invincible Colliery and Cullen Valley Mine
LEGEND
EA Boundary
Castlereagh Highway
Mining Authority
Existing Cullen Valley Mine
Cockatoo
EA Open Cut KAT - R Seams
Highwall Mining KAT- R Seams
UG Workings In Lithgow Seam, Located 18m Below Ironbale Seam
Main Western Railway - Gwabegar Railway
ML1557
ML1557
A420
ML1455
ML1458
Castlereagh Highway
CULLEN BULLEN
0m
250m
500m
Cullen Valley Mine
Kakoomba To Irondale Seam Level
Mining Plan
FIGURE
1B
Drawn By: D. Eastmure
Date: 09/11/12
Checked: BEL
Approved: F
Scale: Refer To Scale Bar
Drawing No: 23.4.7.(CVM)KIPM(K)
Revision: A
Status: