30 October 2012

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

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

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

<table>
<thead>
<tr>
<th>Date</th>
<th>pH</th>
<th>Total Suspended Solids (@ 105 Celsius)</th>
<th>Oil &amp; Grease (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24/08/1998</td>
<td>7.74</td>
<td>9</td>
<td>&lt;1</td>
</tr>
<tr>
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<td>20/10/1998</td>
<td>6.85</td>
<td>2</td>
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<tr>
<td>17/11/1998</td>
<td>6.77</td>
<td>9</td>
<td>&lt;1</td>
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<tr>
<td>16/12/1998</td>
<td>6.99</td>
<td>26</td>
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<tr>
<td>21/01/1999</td>
<td>6.56</td>
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<td>17/02/1999</td>
<td>7.67</td>
<td>5</td>
<td>&lt;1</td>
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<td>30/03/1999</td>
<td>6.49</td>
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<td>21/04/1999</td>
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<td>6.62</td>
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<td>30/06/1999</td>
<td>7.98</td>
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<td>&lt;1</td>
</tr>
<tr>
<td>21/06/2000</td>
<td>No sample</td>
<td>No sample</td>
<td>No sample</td>
</tr>
</tbody>
</table>

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 |
| | | 5-Jun-07 | 6.6 | 21 | 1.4 | 1710 |
| | June 2007 | 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 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?

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 CO₂/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 CO₂, 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 CO₂/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 CO₂-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 CO₂-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 CO₂ 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 CO₂-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 CO₂ 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.
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.
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  James Bailey
Senior Environmental Scientist  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


APPENDIX A

Pagoda & Gully Fauna Habitat Assessment
29 October 2012

Dorian Walsh
Hansen Bailey
6/127-129 John Street
Singleton, NSW, 2330

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

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

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

Species Profiles: Broad-headed Snake, Brush-tailed Rock Wallaby and Superb Lyrebird
A.1 Threatened Species Profiles

A.1.1 Broad-headed Snake

i. Likelihood of Occurrence in the Project Disturbance Boundary

The Broad-headed Snake (*Hoplocephalus bungaroides*) has not been detected within the Project Disturbance Boundary during targeted searches by Cumberland Ecology. No other surveys have found the species within the area proposed for mining. However, records of the snake exist in sandstone areas to the north, east and south of the Project Disturbance Boundary, including one record of an individual approximately 215 metres to the east of the proposed Project Disturbance Boundary. For this reason, it is considered that the snake has potential habitat in the Project Disturbance Boundary. Notwithstanding the potential habitat, the great majority of known records for the snake are to the east of the Project Disturbance Boundary and located within National Parks such as the Blue Mountains National Park, Wollemi National Park and the Royal National Park.

A map of known records for the Broad-headed Snake is provided in Appendix B.

ii. Conservation Status

The Broad-headed Snake is a species listed as Vulnerable by the TSC Act and EPBC Act.

iii. Distribution

Current distribution includes areas of Wollemi National Park in the north, the Clyde River catchment in ranges south-west of Nowra in the south, east to the Royal National Park and near Illawarra, and west to the upper Blue Mountains at Blackheath and Newnes. Major populations occur in the Blue Mountains, southern Sydney, an area north-west of the Cumberland Plain, and the Nowra hinterland (SEWPaC, 2012).

iv. Habitat and Seasonal Movements

Broad-headed Snakes show a seasonal, temperature induced shift in habitat use between summer and winter seasons. Sandstone pagodas and rocky escarpments provide autumn, winter and early spring habitat for adult snakes, while juvenile snakes remain in these habitats year round. Suitable rock habitat considered by Newell and Goldingay (2005), Webb and Shine (1998) and Goldingay (1998) are rocks positioned on a rock substrate, had less than 50% debris under them, were of an appropriate size class (>3cm thick and at least 10cm in length and width) and positioned relatively flat on the substrate. Dry sclerophyll woodland below these escarpments provide habitat for adult Broad-headed Snakes in late spring and summer where they shelter in tree hollows.
Broad-headed Snakes are sedentary and show a high degree of site fidelity. Individuals often return to the same area of woodland each year, and some individuals have been captured under the same rock in successive years (Webb & Shine 1997). This species prefers winter sites that have a west or north-west aspect that receive the most warmth from the sun, particularly in the afternoon, maximizing their body temperature and prey capture (Webb & Shine 1997).

Broad-headed Snakes are unlikely to move into unoccupied habitat due to the short dispersal distances of juveniles and strong site fidelity of adults (Webb & Shine 1997). The Broad-headed Snake occupies discrete home ranges in woodland habitat. The mean home range size of snakes in woodland was 3.43 ha (±2.86 SD) (n = 18) during a three-year study. Male home ranges did not overlap, and all snakes actively avoided sharing space with other Broad-headed Snakes over time (SEWPaC, 2012).

v. Threats

The major threat to this species is not from habitat clearance, but from the removal of “bush rock” – loose sheets and flakes of sandstone rock – under which the species shelters, and where it finds its main prey, the Velvet Gecko.

A.1.2 Brush-tailed Rock Wallaby

i. Likelihood of Occurrence in the Project Disturbance Boundary

The Brush-tailed Rock Wallaby (*Petrogale penicillata*) has not been detected within the Project Disturbance Boundary during targeted searches by Cumberland Ecology. No other surveyors have found the species within the area proposed for mining.

Records of the wallaby exist in sandstone areas to the north, east and south of the Project Disturbance Boundary. For this reason, it is considered that the wallaby has potential habitat in the Project Disturbance Boundary.

There is no evidence that the species has a colony remaining in the immediate vicinity of the Project.

A map of known records for the Brush-tailed Rock Wallaby is provided in Appendix B.

ii. Conservation Status

The Brush-tailed Rock Wallaby (*Petrogale penicillata*) is a species listed as Vulnerable by the TSC Act and EPBC Act.
iii. Distribution

The Brush-tailed Rock-wallaby is now patchily distributed along the Great Dividing Range from Yarraman (north of Toowoomba, Queensland) to the upper Snowy River in eastern Victoria. It is predominantly distributed on the eastern scarp of the Great Dividing Range, with outlying populations occurring in the Warrumbungle Ranges and at Mt Kaputar, well inland of the Great Dividing Range in northern New South Wales.

Within this broad distribution, three Evolutionarily Significant Units (ESUs; as defined by Moritz 1994) that are substantially genetically distinct from one another have been identified: a Southern ESU that is currently restricted to East Gippsland and a reintroduced population in the Grampians in western Victoria; a Central ESU in central NSW; and a Northern ESU in northern NSW and south-eastern Queensland (Browning et al. 2001).

iv. Habitat

The Brush-tailed Rock Wallaby has two habitat types that it moves between for food and refuge. During daylight hours the species shelters or sun bakes on refuge sites of steep rocky slopes, cliffs, rock stacks and boulder piles (DECC (NSW) 2008). At night, the species utilises vegetation on or below cliffs as a source of food and shelter (Wong 1993). Throughout their range, this wallaby feeds on a wide variety of grasses and shrubs, and has flexible dietary requirements, though grasses and forbs make up the bulk of their diet (DECC (NSW) 2008).

This species is also territorial and individuals tend to remain in one area. However, some individuals do disperse over large distances. The species is far more mobile than the Broad-headed Snake and is known to occupy different aspects of an escarpment or cliff line, with a general preference to northerly aspects.

v. Threats

According to the National Recovery Plan for the Brush-tailed Rock Wallaby, predation by the European Red Fox is the major threat to the survival of existing populations of this species. The primary objective of the current Recovery Plan is to protect important populations of the species. The Project will not occur near or impact upon an important population of the species. As Rock Wallabies have not been seen within the Project Boundary, or on nearby pagodas, it is unlikely that the proposed mining will exacerbate predation pressure by Red Fox.

A.1.3 Superb Lyrebird

i. Likelihood of Occurrence in the Project Disturbance Boundary

The Superb Lyrebird (Menura novaehollandia) occurs in the valleys of the Project Disturbance Boundary, around the pagoda habitat that will not be mined, and widely across the great dividing ranges. Very high numbers of records of detections of this bird species are available on the Wildlife Atlas, illustrating that it occurs widely in valley habitats in the Blue Mountains and other adjacent parts of the Great Dividing Ranges.
A map of known records for the Superb Lyrebird is provided in Appendix B.

ii. Conservation Status

iii. The Superb Lyrebird is not a threatened species and so is not is not listed under the EPBC Act or TSC Act. Distribution

The Superb Lyrebird is found along the Eastern seaboard of Australia (east of the Great Dividing Range) and also in Tasmania. In NSW, the species is widespread from the coast to approximately 150 km west.

The OEH (previously DECC) assessed the conservation status of a range of vertebrates in south-western Sydney in 2007 and provided the following assessment of the Superb Lyrebird. A similar situation exists for the greater Blue Mountains, including the Project Disturbance Boundary. According to DECC (2007) the population in south-western Sydney region is common and stable:

The Superb Lyrebird is protected under the NSW NP&W Act (1974) and was nominated as a Species of Conservation Concern due to its cultural significance to some of the Indigenous communities in the area. It is still widespread and common in the three coastal Bioregions in NSW, with fewer records on the eastern tablelands. Within the Sydney Basin Bioregion it is common in most areas except the drier locations such as the Hunter Valley floor, Cumberland Plain and the Capertee Valley. In the South Eastern Highlands Bioregion it is restricted to the wetter eastern areas, though it is common around Kosciuszko NP. Within both these Bioregions, records occur within many NPWS reserves.

Within the Greater Southern Sydney Region, the Superb Lyrebird is common in all areas other than the dry open forests, such as the Cumberland and Illawarra Coastal Plains and to a lesser extent the Burragorang Valley. The moist forests of the Illawarra Escarpment and the Hacking Valley in Royal NP have a high density of records (DEC 2005a). The abundance of this species is highlighted by the fact that during the current surveys, over 300 records were collected, with its loud distinctive call often being recorded off-site during systematic bird searches. The lack of records from the Cumberland Plain suggests that this species may have declined in this area, though it is never likely to have been common in the open woodlands that predominated in this area. Systematic surveys of the Cumberland Plain in 2006 found Superb Lyrebird to persist in sandstone transition forest along the Nepean River and Bargo River in south-western Sydney and at Monkey Creek near The Oaks (DEC 2006b). All of these areas are larger patches of remnant vegetation that are connected to the Woronora Plateau or Southern Blue Mountains.

A presence-only model for the Superb Lyrebird predicts habitat in higher rainfall areas with a coverage of tall forest, rainforest and the woodlands and forests of the rainshadow valleys of the Southern Blue Mountains, particularly where there was greater canopy cover.
The resulting model particularly highlights moist forest above and below the Illawarra Escarpment and moister gullies in the rest of the Study Area. The model is broad scale and of good quality. It reflects the fact that this species will often be found outside of wetter gullies, occasionally even being found on dry ridgetops. Large quantities (74%) of this predicted habitat occur within conservation reserves, so the Lyrebird is likely to remain a feature of the forests of the Greater Southern Sydney Region.

Recommendations

The Superb Lyrebird is common within the Study Area and there are large amounts of habitat within protected areas. It is therefore a lower conservation priority for the Region.

Few management actions are required for the conservation of the Superb Lyrebird in this area, though the control of Foxes and Cats is likely to be beneficial.

The Lyrebird remains a common and characteristic species within traditional Wodi Wodi land in the northern Illawarra and there is no evidence of declines in this area.

iv. Species Description & Habitat

According to DECC (2007), the Superb Lyrebird is a large, distinctive, mostly ground-dwelling bird with long legs and a long prominent tail. The male has a spectacular tail composed of a variety of feathers and an amazing vocal repertoire, intensifying in late summer and autumn when territorial birds rake up numerous low display mounds, on which they sing and dance. This bird species is famous for its ability to mimic other species, and has been known to copy mechanical noises such as chainsaws. The Superb Lyrebird spends a significant amount of time foraging on the forest floor, where it turns over large amounts of litter, soil and rotting logs in search of invertebrates. It mostly inhabits moist forests, ranging from just east of Melbourne along the east coast and ranges to Stanthorpe in south-east Queensland.

The preferred habitat of the Superb Lyrebird is damp forests including eucalypt open forest and rainforest. Habitat is often very rugged and dense. The species does not tend to utilise the dry pagoda areas – rather it forages in more mesic patches of vegetation around the pagodas and in the gullies. It has been observed within the tablelands forests and dry sclerophyll forest described earlier in this report as comprising gully habitats.
A.2 References


Appendix B

Wildlife Atlas Records for Broad-headed Snake, Brush-tailed Rock Wallaby and Superb Lyrebird
Your Selection: Public Report of all Valid Records of Broad-headed Snake (Species: Hoplocephalus bungaroides) returned a total of 217 records of 1 species.

Report generated on 23/10/2012 1:50 PM
Atlas of NSW Wildlife records

Data from the BioNet Atlas of NSW Wildlife website, which holds records from a number of custodians. Location accuracy varies. Maps from the website are interactive: map displays can be modified from the original extent and a maximum of 5 species can be selected to display. Map may contain errors and omissions. Neither the Office of Environment and Heritage nor any other data custodian will accept liability for any loss, damage, cost or expenses incurred as a result of the use of, or reliance upon, the information in the map. Map copyright the State of NSW through the Office of Environment and Heritage.

Your Selection: Public Report of all Valid Records of Brush-tailed Rock-wallaby (Species: Petrogale penicillata) returned a total of 1,044 records of 1 species.

Report generated on 23/10/2012 2:32 PM
Atlas of NSW Wildlife records

Data from the BioNet Atlas of NSW Wildlife website, which holds records from a number of custodians. Location accuracy varies. Maps from the website are interactive: map displays can be modified from the original extent and a maximum of 5 species can be selected to display. Map may contain errors and omissions. Neither the Office of Environment and Heritage nor any other data custodian will accept liability for any loss, damage, cost or expenses incurred as a result of the use of, or reliance upon, the information in the map. Map copyright the State of NSW through the Office of Environment and Heritage.

Your Selection: Public Report of all Valid Records of Superb Lyrebird (Species: Menura novaehollandiae) returned a total of 7,714 records of 1 species.
Report generated on 23/10/2012 2:43 PM
APPENDIX B

Potential Sand Market Expression of Interest
16 October 2012

Ian Follingon
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

Telephone: 02 4860 2296
Fax: 02 4860 2366
Email: barry.george@boral.com.au