



Lithgow Environment Group Inc.

PO Box 3081 Bowenfels, NSW 2790

www.lithgowenvironment.org

Preserving the Balance of Nature

The Director
Major Infrastructure Assessment
Department of Planning
GPO Box 39, SYDNEY NSW 2001

28 April 2014

Dear Sir/Madam

**RE: Part 3A Modification 4 – Invincible Mine Extension (07_0127 MOD 4) and
Part 3A Modification 2 – Cullen Valley Mine Extension (DA 200-5-2003 MOD 2)**

The Lithgow Environment Group (LEG) unanimously opposes the proposed Modifications for the Invincible and Cullen Valley coal mines because we believe they will adversely impact upon an internationally significant pagoda landform complex located on the western edge of the Great Dividing Range in Ben Bullen State Forest. Open-cut mining is incompatible with this part of Ben Bullen State Forest, and should instead be fully reserved in a State Conservation Area as soon as possible.

LEG members regard this as a stealthy reincarnation of the twice-rejected Coalpac Consolidation Project – and if it is approved a never ending stream of Modifications and Extensions will ramp the mines up to the originally intended scale, just like Invincible Mine's seven (7) Modifications and Extensions between 2006 -2010. We believe that local residents and environmental groups have a right to know what they are lodging a submission on – not unwritten agendas of death by a 1000 cuts.

The Invincible modification proposal is less than one kilometre and Cullen Valley only 2.6km distant from Cullen Bullen township. Dust from coal trucks and blasting on this project will lead to increased morbidity and mortality in the community from respiratory and cardiovascular disease.

LEG members totally oppose the Modifications for the following reasons:

1. INADEQUATE ABORIGINAL & CULTURAL HERITAGE ASSESSMENT
2. INADEQUACIES IN THE FLORA ASSESSMENT
3. INACCURATE DESCRIPTIONS OF VEGETATION COMMUNITIES
4. IMPACT ON THREATENED PLANT SPECIES
5. IMPACT ON ROTAP LISTED SPECIES
6. IMPACT ON OVERALL SPECIES RICHNESS
7. IMPACT ON FAUNA
8. INADEQUATE BIODIVERSITY OFFSETS
9. ADVERSE IMPACTS ON THE SIGNIFICANT BEN BULLEN PAGODA LANDSCAPE
10. INADEQUATE REHABILITATION
11. IMPACT ON WORLD HERITAGE VALUES
12. UNACCEPTABLE WATER POLLUTION ISSUES
13. INTENSIFICATION OF MINING AFTER APPROVAL
14. UNACCEPTABLE DUST and NOISE LEVELS and BLASTING IMPACTS

1. ABORIGINAL ARCHAEOLOGY & CULTURAL HERITAGE

1 (a) Aboriginal Heritage

Section 6.15 Aboriginal Heritage, page 109 of the Environmental Assessment ¹ states that:

"A total of 15 Aboriginal archaeological sites are known to occur in the vicinity of Cullen Valley Mine and Invincible Colliery. Of these sites, four occur within the Modification Disturbance Boundary at Invincible Colliery and will be directly impacted by this Modification; no sites have been found in the Modification Disturbance Boundary at Cullen Valley Mine."

Figure 21 and summary in **Table 21** claims to represent –

"The locations of all Aboriginal sites identified within the Modification Boundaries and in proximity to the existing Invincible Colliery and Cullen Valley Mine."

And on page 111: *"As noted above, no Aboriginal archaeological sites or artefacts have been located in the Modification Disturbance Boundary at Cullen Valley Mine."*

And on page 109: *"All sites recorded from the detailed filed (sic) surveys undertaken for the above assessments have been registered on the AHIMS database."*

Yet on 6 April 2014 members of Lithgow Environment Group found an Aboriginal Hand Stencil in a cave within the proposed Disturbance Area of Cullen Valley Mine (Latitude -33.265050°, Longitude 150.028320°). Several other Potential Habitation Sites (ie. caves) occur in this same escarpment.



Photo 1 & 2: Aboriginal Cave Art Site within the proposed Disturbance Area of Cullen Valley Mine



Photo 3 & 4: Three of many other Potential Habitation Sites within the Disturbance Area of Cullen Valley Mine

LEG contacted the Heritage Division, NSW Office of Environment & Heritage, and Mr Stewart Watters, Senior Team Leader Heritage Databases advised on 10 April 2014 that no recorded sites occur within the search area, and this site is not registered on the AHIMS Database (see below).

From: Stewart Watters [mailto:Stewart.Watters@environment.nsw.gov.au]
Sent: Thursday, 10 April 2014 2:59 PM
To: Julie Favell
Subject: RE: Aboriginal hand Stencil Site - Ben Bullen State Forest
Importance: High

Hi Julie,

Please find attached a search conducted on your behalf. The search has found no recorded sites within the search area. Please double check the co-ordinates used to ensure that the correct area has been searched.

You can conduct these searches yourself via Aboriginal Web Services. Registration is required. The basic search is of no charge. Other extensive and site card requests do incur a charge. Further information can be found at
<http://www.environment.nsw.gov.au/licences/WhatInformationCanYouObtainFromAHIMS.htm>

As it does not appear that the site is listed you can complete an AHIMS Site recording form and submit it to OEH. Further information can be found towards the bottom of this page
<http://www.environment.nsw.gov.au/licences/DECCAHIMSSiteRecordingForm.htm>

Please let me know if you require further information.

Regards
Stewart

Stewart Watters
Senior Team Leader Heritage Databases
Heritage Division
Office of Environment and Heritage
NSW Department of Premier and Cabinet
PO Box 1967, Hurstville BC, NSW 1481
T: 9585 6448
W: www.environment.nsw.gov.au

This Cave Art site is clearly within the proposed Disturbance Area of Cullen Valley Mine, and LEG has serious concerns that mine subsidence induced by highwall mining beneath this escarpment will destabilise the cliffs and collapse this cave, resulting in the permanent loss of irreplaceable Cave Art and potentially other yet to be reported/recorded habitation sites, cave art sites, and aboriginal artefacts.

Further, LEG has been approached by members of the aboriginal community in the Windy Gully Road area of Cullen Bullen. They have raised concerns about a cave art site in that vicinity, as well as a trail of 'white rocks' which apparently mark a traditional walking path. This area is likely to be impacted by highwall mining in the proposed Invincible Open-cut area. Yet LEG can find no mention of either of these aboriginal heritage items in the EA¹?

The DoPI will recall that on 28 June 2012 bushwalker Mr Yuri Bolotin and his party discovered a cave shelter with Aboriginal Hand Stencils and Stone Artefacts within the previous Coalpac Consolidation Project Proposal Area north of Invincible Mine. The OEH advised that this site had not previously been

recorded or registered on the AHIMS Database either. Appendix K (AECOM 2012) for that EA did not identify any cave art sites within the Project Boundary, nor any rock shelter or PAD sites in that vicinity.

LEG also reminds the DoPI that despite eight (8) Aboriginal Heritage assessments over 30 years for the adjacent Baal Bone Colliery, in April 2011 LEG found a previously unreported and unrecorded Cave Shelter with Rock Art near the eastern end of Baal Bone Colliery LW 19.

It is an offence under the *National Parks and Wildlife Act 1974* not to notify the Director-General of the OEH of the location of an Aboriginal Heritage object or site.

LEG questions the veracity of the Aboriginal Heritage Assessment for the Proposal, and formally requests –

- An independent Aboriginal Archaeological and Cultural Heritage Impact Assessment of the Aboriginal Cave Art Site within the proposed Disturbance Area and including edge-effects of Cullen Valley Mine at Latitude -33.265050°, Longitude 150.028320°;
- A comprehensive re-assessment of other unidentified Potential Habitation sites, rock shelters, and caves within the proposed Disturbance Area of Cullen Valley Mine;
- A comprehensive re-assessment of all potential Archaeological & Cultural Heritage Sites, including edge-effects, in the Windy Gully Road area of Cullen Bullen; and
- A comprehensive re-assessment of all potential Aboriginal Heritage Sites within the proposed Disturbance Area's, including edge-effects, of Modification 4 – Invincible Mine (07_0127 MOD 4), and Modification 2 – Cullen Valley Mine Extension (DA 200-5-2003 MOD 2).

1(b) Non-Aboriginal Heritage

Tyldsley Trig (*Lat: -33.284361°, Long: 150.026639°*) is one of the oldest non-aboriginal heritage items in the Cullen Bullen area, and may well be one of the oldest remaining Trig Points in the Lithgow LGA. It has been a major landmark on every map ever printed of the Cullen Bullen area since mapping first commenced in NSW, and is likely to date back to the mid-1800's. Tyldsley Trig was not identified in the previous Coalpac Consolidation Project EA, nor does it appear to be identified in the current EA, despite the fact it was undermined by prior highwall mining at Cullen Valley, and is less than 1.2 km from the Proposal.

LEG has also found several old and potentially historic open mineshafts in the Cullen Valley Mine and Invincible Mine Disturbance areas, and a potentially historic old saddle in a cave in the Invincible area.



Photo 5, 6 & 7: Tyldsley Trig, old open Mine Shaft, and an old Saddle found in a cave overhang

These are just a few examples to highlight the issue. The EA states in Section 6.6.14, page 114 -

“No impacts to known items of non-Aboriginal heritage significance will occur as a result of the Modifications.”

How is it that highly paid consultants for mining companies cannot find potentially very historic items, some of which have appeared on every map ever printed since mapping first commenced in NSW?

Is it ethical to claim a heritage item is not “known” simply by failing to acknowledge its existence?

How many other non-Aboriginal Heritage items have been missed in the current EA?

How many non-Aboriginal Heritage items will be lost if these two Modification are approved?

LEG questions the veracity of the non-Aboriginal Heritage Assessment for this Proposal, and requests –

- A comprehensive independent re-assessment of non-Aboriginal Heritage Items, including edge-effects, across the entire proposed Disturbance Area of Modification 4 – Invincible Mine (07_0127 MOD 4), and Modification 2 – Cullen Valley Mine Extension (DA 200-5-2003 MOD 2).

2. INADEQUACIES IN THE FLORA ASSESSMENT

The work of Cumberland Ecology, authors of the Ecological Assessment² for this Proposal, have attracted so much criticism that a Federal Government Senate Inquiry has been set up to investigate.³

LEG, BMCS and the Colong Foundation are not alone in having serious reservations about the flora assessments and vegetation community mapping undertaken by Cumberland Ecology. ABC National: Background Briefing “*The Trouble with Offsets*” on March 16, 2014³ also raised serious concerns about Cumberland Ecology’s work. A reported 95% of the biodiversity offset mapping of the CEEC of Box Gum Woodland undertaken by Cumberland Ecology on the 1600Ha Mt Lindesay and Wirradale offsets for Whitehaven Coal were found to be wrong. Concerns were also raised about the quality of Cumberland Ecology’s offset mapping for Stage 2 of the Moolarben Coal Mine.

The NSW Planning Commission (PAC) Report⁴ on the Coalpac Consolidation Project on 14 December 2012 made seven (7) recommendations relating to the adequacy or otherwise of Cumberland Ecology’s work in relation to threatened species, baseline biodiversity, vegetation communities, calculation of edge effects, cumulative impacts of the Nuebeck Coal Project and Pine Dale Mine Stage 2 Extension, the Biodiversity Offset package, and an over-reliance on rehabilitation as a mitigation strategy -

Recommendation 49: *The Commission recommends that concerns about the adequacy of the flora assessment and identification of the vegetation associations present in the project area be resolved to the satisfaction of OEH prior to approval of any extension to open-cut mining in the project area and prior to any assessment of adequacy or otherwise of the biodiversity offset package.*

Recommendation 50: *The Commission recommends that, given the acknowledged high quality and species richness of the native vegetation present in the project area, the assessment focus should be on the overall quality of the habitat under threat and its biodiversity value rather than just on the threatened species component which is the focus of the EA.*

Recommendation 51: *The Commission recommends that calculation of edge effects be required to the satisfaction of OEH before the project is submitted for determination.*

Recommendation 52: *The Commission recommends that the cumulative impacts on the biodiversity values of Ben Bullen State Forest and the region of this project, together with the proposed Pine Dale Stage 2 Extension, be considered before any assessment of this project is finalised.*

Recommendation 53: *The Commission recommends that the following three principles be accepted as underpinning assessment of biodiversity impacts for this project:*

- * Rehabilitation cannot restore the existing vegetation associations or ecological balance of the area;*
- * Rehabilitation to mature woodland is unproven for open-cut mines in NSW; and*
- * The impacts on biodiversity from this project are incompatible with reservation proposals for Gardens of Stone Stage II.*

Recommendation 54: *The Commission recommends that, given the considerable Uncertainties concerning the likelihood of rehabilitation on this project area being capable of delivering a satisfactory biodiversity outcome, rehabilitation not be given credence as a mitigation strategy in the assessment.*

Recommendation 55: *The Commission recommends that, until the baseline biodiversity characteristics of the site have been resolved to the satisfaction of OEH, assessment of the adequacy or otherwise of the revised offset package should not proceed. The Commission also recommends that particular attention be given in the assessment to the essential nature of the trade-off being proposed, i.e. it is a proposal designed to exchange a number of fragmented areas that generally require extensive rehabilitation work and are currently not considered suitable for reservation, for a single area of high quality habitat that adjoins other areas of high quality habitat and is already proposed for reservation.*

LEG considers that none of the above PAC Recommendations have been adequately addressed in the current EA because –

- Almost all of the Flora Quadrat Locations shown in *Figure 2.1 Flora Survey Locations*² are outside the proposed Disturbance Boundary;
- Negligible additional Flora Survey work appears to have been done since the Coalpac Consolidation Project EA of 2012 apart from a ‘random meander’ on 10 - 11 December 2013, and most of the flora survey work was done in 2011²;
- The location and distribution of *Persoonia marginata* (Vulnerable) within the proposed Cullen Valley Disturbance Area has still not been adequately mapped nor have the edge effects been calculated;²
- No Targeted Surveys have yet been conducted for the most likely to occur Threatened Flora Species including *Thesium australe* (Vulnerable), *Derwentia blakelyi* (Vulnerable), *Eucalyptus aggregata*

(Vulnerable), *Prostanthera cryptandroides* ssp. *cryptandroides* (Vulnerable), or *Genoplesium superba* (Endangered);²

- Continued failure to acknowledge the presence, significance of, or conduct Targeted Surveys for, the seven (7) Rare Or Threatened Australian Plants (ROTAPs) known to occur in or near the proposal Area including *Acacia asparagoides* (2R), *Chiloglottis palachila* (ROTAP 3RC), *Eucalyptus apiculata* (ROTAP 3RC), *Leionema lamprophyllum* ssp. *orbiculare* (2R-P3), *Leucochrysum graminifolium* (2R), *Philothea obovalis* (3RCa), and *Pseudanthus divaricatissimus* (3RCa);²
- Downplaying the fact that a form of threatened 'Box-Gum Grassy Woodland' dominated by Blakely's Red Gum (*Eucalyptus blakelyi*) does occur within the study area but may be masked by aggregation at mapping scales that are probably too coarse to reveal its presence;
- Failure to acknowledge that a form of Tablelands Snow Gum - Black Sallee – Candlebark - Ribbon Gum Grassy Woodland EEC occurs in the proposed Disturbance Area of Cullen Valley Mine but is currently obscured by aggregation at map scales that were used, and in cumulative terms will also be impacted by the Nuebeck Coal Project and Pine Dale Stage 2 Extension;
- Failure to acknowledge that the Federally listed EEC of Temperate Highland Peat Swamps on Sandstone (TSC Act equivalent - Montane Peatlands & Swamps) will be impacted unless Coalpac permanently decommissions and surrenders all Discharge Licences for two Drainage Boreholes in Long Swamp Ben Bullen State Forest approved in 1983 and 1991 - Invincible Colliery Water Drainage Borehole LDP01: 33°18'33.07"S, 150° 5'37.77"E; and Invincible Colliery Water Drainage Borehole near the old Airvent at 33°19'32.13"S, 150° 5'39.98"E;
- Misrepresenting the Biodiversity Offset package as being 'Like for Like';
- Failure to adequately calculate the Edge Effects on Threatened species, EEC's, and ROTAP's;
- Failure to assess the Cumulative Impacts on Threatened Species, EEC's, ROTAP's, and the overall biodiversity values of Ben Bullen State Forest and the region of these Modifications, together with the proposed Nuebeck Coal Project and Pine Dale Stage 2 Extension;
- Over- reliance on rehabilitation as a mitigation strategy contrary to PAC Recommendation 53 & 54.

3. IMPACTS ON ENDANGERED ECOLOGICAL COMMUNITIES (EEC's)

At least two vegetation communities listed as EECs will be impacted by the 2 Modifications:

- Box Gum Woodland - listed as a Critically Endangered Ecological Community (CEEC) under Federal and State Legislation; and
- Frost Hollow Woodland - listed as an EEC in Part 3 of Schedule 1 of the TSC Act.

A third EEC of Temperate Highland Peat Swamps on Sandstone (TSC Act equivalent - Montane Peatlands and Swamps) will be impacted upon unless Coalpac P/L formally agree to permanently decommission, and surrender the Discharge Licences for, two Drainage Boreholes approved in 1983 and 1991 in Long Swamp, Ben Bullen State Forest. These are Invincible Colliery LDP01: -33.309182°, 150.093805°; and Invincible Colliery Drainage Borehole near the old Airvent: -33.325623°, 150.094437°.

3.1 Box Gum Woodland CEEC

Section 6.6.3 Impact Assessment: Impacts on Vegetation Communities, Page 67 of the EA¹ identifies that White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box Gum Woodland) listed as an EEC under the TSC Act and a CEEC under the EPBC Act does occur within the Modification Boundaries. However Cumberland Ecology claim that -

“This vegetation community [Box Gum Woodland] exists only within the proposed highwall mining areas and will not be impacted. Therefore, the Modifications will not result in any direct or indirect impacts on listed ecological communities.”

Yet **Figure 13** clearly shows three (3) areas of the Box Gum Woodland CEEC have been mapped within the orange or Open-cut Disturbance Boundary of the Invincible Mine Extension (07_0127 MOD 4).

Cumberland Ecology now claim that the areas originally mapped as Box Gum Woodland CEEC (MU20) are a variant of Tableland Gully Mountain Gum – Broad Leaved Peppermint Grassy Forest (MU 35). Dr Steve Douglas in a report⁵ commissioned by the Blue Mountains Conservation Society to investigate this very issue determined that –

- A form of the threatened 'Box-Gum Grassy Woodland', namely the open, grassy (not *Joycea*) woodland dominated by Blakely's Red Gum, does occur in the study area but is masked by aggregation at mapping scales that are apparently too coarse to reveal it;
- Whilst OEH view the broader unit in which the Blakely's Red Gum Woodland occurs as Tablelands Grassy Forest, this does not preclude the Red Gum-dominated subunit being treated as 'Box-Gum Grassy Woodland' at a suitable scale of mapping and analysis;

And even if this mapped CEEC is a variant of Tableland Gully Mountain Gum – Broad Leaved Peppermint Grassy Forest (MU 35), a previous submission by the OEH on the Coalpac Consolidation Project identified that MU35 is also of conservation significance because it is poorly reserved. Benson and Keith (1990) identified that the entire 10h Grassy Woodland Complex Unit was poorly reserved in the region.

The PAC Review Main Report⁴ stated on page 94 that:

*“OEH also raises the poor conservation status of some significant areas of vegetation communities within the project area including 21.1 ha of Ribbon Gum grassy forest on alluvial flats, 65.5 ha of Mountain Gum Apple Box Blakelys Red Gum grassy forest on small drainage lines and footslopes, and 192.5 ha of Broad-leaved Peppermint Brittle Gum Red Stringybark grassy forest on small rises. **OEH suggests that impacts on these vegetation types within the project area should be avoided.**”*

These are the very same poorly-reserved vegetation types that are dominate within the proposed open-cut Disturbance Areas of the Invincible Mine Extension and Cullen Valley Mine Extension.

Cumulative losses of these very same poorly-reserved vegetation types will occur if the adjacent Pine Dale Mine Extension Stage 2 and Nuebeck Coal Project are approved.

The PAC Review Main Report⁴ states on Page 93 and reinforces in Recommendation 49 that –

“Given the controversy over this issue, any further survey work to establish the

occurrence and distribution of vegetation communities on the site should be fully independent or directly oversighted by OEH at the Proponent's cost."

This recommendation for independent oversight of vegetation survey work has not been adopted by Coalpac in the preparation of the EA report for these two modifications. Instead, Coalpac's consultant Cumberland Ecology has made comments regarding the significance of the vegetation that are contrary to the conclusions of the Commission, the OEH, the Department of Planning & Infrastructure, and Dr. Steven Douglas in a report commissioned by Blue Mountains Conservation Society⁵. The findings made by Cumberland Ecology regarding the significance of the native vegetation to be removed by mining found on the proposal site are weak, understate the value of the vegetation on the site, are not substantiated by new evidence provided by professional flora consultant Dr Steven Douglas.

LEG reiterates the findings of PAC⁴ that ***further survey work to establish the occurrence and distribution of vegetation communities on the site should be fully independent or directly oversighted by OEH at the Proponent's cost.***

3.2 Tablelands Frost Hollow Grassy Woodlands EEC

Dr Steve Douglas⁵ also identified the presence of *Eucalyptus rubida*, *E. pauciflora* and *E. bridgesiana* in the proposed open-cut for the Cullen Valley Mine modification. These eucalypts suggest that the Tablelands Frost Hollow Grassy Woodlands EEC is present.

Cumberland Ecology failed to identify the likely presence of the Tablelands Frost Hollow Grassy Woodlands EEC in the EA¹ or in Appendix C² for the two Modification proposals.

In 2011 the NSW Scientific Committee made a Final Determination to list Tablelands Frost Hollow Grassy Woodlands as an ENDANGERED ECOLOGICAL COMMUNITY in Part 3 of Schedule 1 of the Act.

Tablelands Frost Hollow Grassy Woodlands consist of the vegetation communities *Tableland Gully Snow Gum – Ribbon Gum Grassy Forest (MU11)*, and *Tableland Hollows Black Gum – Black Sally Grassy Open Forest (MU15)*.

Tablelands Frost Hollow Grassy Woodlands are yet another component of the Tablelands Grassy Woodland Complex, which the PAC⁴ and the OEH considered to be poorly reserved, and recommended that impacts to these communities be avoided.

The adjacent Neubeck Coal Project site contains Tablelands Frost Hollow Grassy Woodlands⁷. The main components are *Eucalyptus pauciflora* (Snow Gum), *E. rubida* (Candlebark), *E. stellulata* (Black Sallee), *E. viminalis* (Ribbon Gum), and *E. bridgesiana* (Apple Box). The Vulnerable threatened species *Eucalyptus aggregata*, *Eucalyptus cannoni*, and *Thesium australe* also occur on this site.

This EEC is also likely to occur in the Invincible Mine area due to the presence (page S11 Appendix C)² of 20 individual *Eucalyptus aggregata* in a previous Invincible 2008 offset (Lot 12 DP877190), and potentially in the gully through which the proposed pipeline will run east of the Carleon Coachouse.

Open-cut mining poses the single greatest threat to this EEC. Other Threats to Tablelands Frost Hollow Grassy Woodlands include climate change, fragmentation, fertilizers, tree dieback, trampling and grazing by domestic livestock, weed invasion and altered fire regimes.

LEG reiterates the findings of PAC⁴ that ***further survey work to establish the occurrence and distribution of vegetation communities on the site should be fully independent or directly oversighted by OEH at the Proponent's cost,*** in this case targeting Tablelands Frost Hollow Grassy Woodlands EEC.

3.2 Montane Peatlands and Swamps EEC

The EEC of Montane Peatlands & Swamps (Federal equivalent is Temperate Highland Peat Swamps on Sandstone) occurs in Long Swamp, Ben Bullen State Forest. Invincible Colliery has two Drainage Boreholes in Long Swamp, Ben Bullen State Forest which were approved in 1983 and 1991. Coalpac currently has approval to discharge up 4ml/day from LDP001 into Long Swamp and the Coxs River.



Photo 8: LDP01: -33.309182°, 150.093805°



Photo 9: Borehole/Airvent: -33.325623°, 150.094437°.

Unless Coalpac are required to permanently decommission and surrender their Licence to discharge from both of these Boreholes, this EEC will continue to suffer significant damage.

When Invincible Open Cut Mine was first approved in 2006 (App. No. 05_0065) Coalpac Pty Ltd claimed that the Proposal was entirely within the Macquarie River Catchment, and that it would have no impact on the Coxs River catchment or Sydney Drinking Water Supply.

Six months after approval, on 23 March 2007, CoalPac Pty Ltd lodged a Licence Variation with the NSW EPA to recommence pumping up to 4 ML/day from LDP01 into the Cox's River. The EPA approved that licence variation, and pumping commenced in June 2007.

Salinity levels in the Cox's River downstream of LDP01 jumped virtually overnight from 30 to 1700 $\mu\text{S}/\text{cm}$. The swamp below the borehole was covered with a dense layer of toxic Iron deposits, virtually all groundcover vegetation died, and the pristine clear waters of the Coxs River became choked with green and rust-coloured Iron algae. Dissolved Oxygen levels in the water plummeted to 0.3 mg/L or less than 10% - lethal for aquatic life. Hydrogen Sulphide (Rotten-egg gas) odours filled the air.

Coalpac Pty Ltd claim that regional water quality in Invincible Colliery and Cullen Valley underground workings are consistent with ANZECC (2000) guideline values for upland rivers and streams. They also claim that no data is available on Iron and Manganese levels to suggest it exceeded background levels.

Yet Coalpac's own Annual Return 2007/2008 for Invincible Colliery Licence No. 1095 states that –

- Salinity at LDP01 ranged from 1627 to 1750 $\mu\text{S}/\text{cm}$ in 2007/8 - five times higher than ANZECC (2000) guideline for Fresh & Marine Water Quality for an Upland Stream of 30 – 350 $\mu\text{S}/\text{cm}$;
- Iron levels averaged 14 mg/L – 46 times higher than the <0.3mg/L ANZECC (2000) upper limit;
- Manganese averaged 0.684 mg/L, exceeding the ADWG limit in drinking water of 0.1 mg/L;
- Total Suspended Solids averaged 32 mg/L - just below the 33mg/L Licence limit.

Lithgow Environment Group has maintained since the 2006 that any discharges from Invincible Mine into Long Swamp Ben Bullen State Forest Proposal will have an adverse impact on the EEC of Montane Peatlands and Swamps, and yet once again Coalpac have ignored/covered up the presence of this EEC and the likely damage their two registered boreholes could do if pumping was recommenced.

We urge the DoPI to require both Invincible Colliery boreholes in Long Swamp to be permanently decommissioned, de-registered, and delicensed.

4. IMPACT ON THREATENED PLANT SPECIES

Once again Coalpac P/L have not been entirely honest, and have downplayed the significance of the threatened plant species known to occur in or near the Proposal Area.

4.1 Clandulla Geebung (*Persoonia marginata*) - Vulnerable

Coalpac's claim that all Clandulla Geebung (*Persoonia marginata*) have been avoided in the proposed Disturbance Area of Cullen Valley Mine is incorrect.

Figure 2.1, Appendix C - map of Clandulla Geebung in the Cullen Valley Mine area is incorrect.

Coalpac's claim that all *Persoonia marginata* habitat has been avoided is incorrect. Two records for 23 individual plants to the south-west of the Proposal demonstrate that the entire area is suitable habitat.

An estimated 310 individual Clandulla Geebung plants occur within the Disturbance Boundary of the Cullen Valley Mine. Many 100's more individual plants will suffer edge effects from this Proposal.



Figure 1: *Persoonia marginata* locations adjacent the Disturbance Area of Cullen Valley Mine

LEG volunteers have walked the entire northern part of the Disturbance Area and recorded the location of each individual plant or groups of plants using a GPS. The southern section has not been surveyed. In

some locations a single plant may occur, at other locations a cluster of 60 or more plants can occur. All locations have been recorded on the NPWS Wildlife Atlas⁸ since under LEG's Scientific Licence SL100714.

The location of *Persoonia marginata* plants in relation the proposed Disturbance Area of Cullen Valley Mine can easily be verified by logging the GPS coordinates below onto a GPS and walking the area.

Table 1: GPS Coordinates - *Persoonia marginata* recorded within proposed Disturbance Boundary of Cullen Valley Mine

Latitude	Longitude	No. of Individual Plants
-33.261500°	150.025750°	1
-33.260472°	150.023889°	3
-33.260611°	150.029139°	2
-33.259944°	150.029667°	10
-33.259472°	150.028861°	1
-33.259306°	150.029444°	14
-33.259250°	150.025278°	5
-33.259083°	150.024639°	1
-33.258917°	150.025694°	3
-33.258722°	150.028056°	1
-33.258444°	150.025472°	20
-33.258278°	150.025472°	60
-33.258183°	150.025375°	22
-33.257778°	150.025389°	12
-33.257333°	150.025028°	3
-33.257167°	150.028528°	2
-33.257556°	150.030861°	3
-33.257361°	150.030806°	2
-33.257250°	150.031028°	36
-33.257028°	150.031639°	1
-33.256833°	150.031056°	6
-33.255778°	150.028944°	100+
-33.256667°	150.025389°	1
	TOTAL No. of Plants	310

- Please note these GPS Coordinates are only for plants within the Disturbance Boundary. Many 100's more plants occur just outside the boundary and will suffer edge-effects. Coalpac only provided GPS Coordinates for the Highwall and not the open-cut boundary. However by checking the maps in the EA it is patently clear that many individual Clandulla Geebung plants occur within the proposed open-cut.

LEG reminds the DoPI that shoddy work by Flora Consultants has already resulted in the loss of 1000's of plants. Cumberland Ecology is continuing that trend. *Persoonia marginata* was not identified in the original Flora Assessments for Cullen Valley Mine in 1997 (Lembit, R., Flora Survey for Feldmast Coal Project) or 2003 (Gingra Ecological Surveys. Cullen Valley Lease Extension Project Flora Survey). And Cumberland Ecology failed to identify *P. marginata* in the EPBC Referral for the Coalpac Consolidation Project On 18 December 2010.

Because *P. marginata* occurs predominately on the westerly slopes and 23 plants occur 2.3km south of the main population, it is inevitable that many 1000's of plants would have been lost to previous open-cut mining operations before LEG reported the population to the EPA in April 2011.

That resulted in work stopping until Coalpac prepared a Species Management Plan (SMP). Cumberland Ecology prepared that SMP but claimed that *P. marginata* was restricted to the immediate western slope adjacent the Wallerawang – Gwabegar Railway Line, when in fact it occurred in a band up to 1.3km further east. Cumberland Ecology estimated that there were 17,600 individual plants, when in reality there were less than one tenth of that number.

The Planning Assessment Commission (PAC) report of December 2012 was highly critical of the analysis of edge effects for *Persoonia marginata* undertaken by Coalpac's consultants (PAC, page 94)⁴.

After almost 4 years of obfuscation on this issue it is well beyond time for Coalpac and Cumberland Ecology (CE) to finally do the right thing and map the true extent of *Persoonia marginata* in the Cullen Valley Mine area. As Dr Steve Douglas says in his report⁵:

This species is not cryptic like Thesium or many orchids or other tiny or highly seasonal plants. It is a small to medium sub-shrub to shrub that is readily observed and identified. Even allowing for all of the situations that could cause ecologists to miss significant plants, I'm confounded as to why CE has so severely under-recorded this species. But irrespective of this, CE's information and associated claims are now shown to be defective, and substantially so. This needs to be addressed, and greater regard should now be given to the conservation status of this species, and what measures might be undertaken if this substantial area of known habitat is destroyed by mining.

To the best of my knowledge, there is not currently a reliable means of translocating P. marginata or reintroducing it into a reconstructed habitat after mining. I believe this species is one of several threatened Persoonias where, beyond the issue of direct habitat loss, it is not clear what the causes of decline are and/or how these can be readily managed (problems associated with honey bees and the absence of native fauna critical to seed germination are theorised). I suspect that this species is genuinely under-conserved and that it warrants reservation of as much of its habitat as is feasible. Further surveys at the level of intensity undertaken by Chris Jonkers would greatly assist OEH and others to understand the species' distribution, abundance, and threat level. Chris's information reveals that the plant is more abundant than has been previously estimated, but whilst more occurrences have been found, population size remains small, and threat levels, including from mining, remain high and may be escalating.

4.2 Eucalyptus cannonii (Vulnerable)

At least 148 hectares of threatened *Eucalyptus cannonii* habitat will be destroyed by Coalpac's modification proposals, estimated by Coalpac to contain 2,300 individual trees. The EA identified a further 2,200 *E. cannonii* trees outside the proposed extensions to the open-cut pits for both mines, which will no doubt suffer edge-effect impacts of dust and loss of ground water resources due to both open-cut and highwall mining operations. The long-term survival of these trees must be in doubt.

Cumulative losses of *Eucalyptus cannonii* will occur if the adjacent Pine Dale Mine Extension Stage 2 and Nuebeck Coal Projects are also approved.

The claim that the species is not actively threatened is demonstrably inaccurate given the situation with mining in the Cullen Bullen area and beyond. The original EPBC Act Listing Advice for the species also lists threats such as too frequent fire, grazing, and logging (esp. for firewood), along with the non-specific threat of land clearing. The determination to delist the species does not provide evidence that these threats have diminished or ceased to operate. Furthermore, there is abundant evidence of landscape-scale decline of stringybarks, most notably *E. macrorhyncha s.l.*, apparently due to moisture stress and potential over-abundance of insect pest species associated with the most recent thirteen-year drought.

E. macrorhyncha has been widely reported to have experienced extensive deaths and die-back (loss of foliage, death of limbs etc.) across the tablelands and western slopes of south-eastern Australia. Evidence of this is still abundant. *E. cannonii* is closely related to *E. macrorhyncha* and may well have suffered the same stresses and decline.

On the basis of current and potentially continuing threats, including from mining and from drought that is officially accepted as having been magnified by climate change, there seems to be a case for nominating *E. cannonii* to be relisted as Vulnerable on the EPBC Act. Equally, there is sufficient cause to retain its status under the TSC Act. I doubt that OEH or the NSW Scientific Committee would seriously contemplate removing this species from the TSC Act based on the evidence available and on assessments of other Vulnerable species that have been had their status evaluated in detail.

The proposed removal of a substantial number of *E. cannonii* to accommodate the mine extension will clearly only weaken the species' conservation status, which I believe is legitimately Vulnerable. The magnitude of this threat needs to be assessed in the context of an accurate appraisal of the local population and its significance for the conservation of the species across its range. Vulnerable species are often prone to incremental erosion of their conservation status because they are not at imminent risk of extinction, and may be locally common. Assessment of the effects of the proposed mine extension on this species should have full regard to the risk of incremental endangerment through a series of decisions to remove habitat associated with forecast mining, forestry (especially plantation development), road works, etc., as well as considering the best available information about the effect that climate change may have.

4.3 Eucalyptus aggregata (Vulnerable)

Although Cumberland Ecology claims that Black Gum (*Eucalyptus aggregata*) does not occur within the disturbance boundary, they also said the same about Clandulla Geebung as well.

At least 20 individual *Eucalyptus aggregata* trees occur on a previous Invincible Mine 2008 offset (Lot 12 DP877190) adjacent the proposed Disturbance Area. More Black Gum occur on the adjacent Nuebeck Coal Project site and probably on the Pine Dale Mine Stage 2 Extension site as well.

As well as direct losses from open-cut mining, highwall mining also poses a threat. Dr Steven Douglas⁵ states that "*The indirect risk from mining is through alteration of surface and subsurface hydrology. At least some sites supporting this habitat are likely to be groundwater dependent.*"

Dr Douglas further states that the significance of the local population around Wallerawang is well documented. It is one of only three large populations, and perhaps the largest (the others are in the Braidwood and Black Springs areas). The species is at or near the northern limit of its distribution in this area, and is threatened by further clearing, fragmentation, weeds, direct and indirect effects of mining, grazing that prevents recruitment, altered hydrology, genetic 'swamping' from proximate species, and by climate change.

LEG believes that Coalpac should be required to undertake a targeted search for Black Gum in the Proposal area, as well as assess the likely Cumulative Losses at the adjacent Nuebeck Coal Project and Pine Dale Mine Extension Stage 2.

4.4 *Thesium australe* (Vulnerable TSC & EPBC Act)

No targeted Survey had been conducted *Thesium australe* in the Proposal Area, despite the fact that it has been recorded just 2 km south of the Invincible Mine Disturbance Boundary on the Nuebeck Coal Project site, and further south on the Pine Dale Mine site. Those populations represent the only records for *Thesium australe* in the entire Sydney Bio-region.

Dr. Steven Douglas⁵ states that: *It [Thesium australe] is believed to be at least hemi-parasitic on the roots of grasses, and is most strongly associated with Themeda. It is known to occur in highly disturbed sites that may be so seemingly degraded that most ecologists wouldn't look there or would devote very little survey effort to such areas.*

Cumberland Ecology (CE) earlier asserted that the species had not been recorded in Lithgow LGA based on BioNet Atlas records, and that it was unlikely to be present in the study area. This is another example of CE's either profound misunderstanding of how datasets like the Atlas and ROTAP codes operate, or of unprofessionally selective misuse of information. Proposing that a species is unlikely to be present simply because there are (were, in this case) no proximate Atlas records fails to consider that the Atlas is not a database of comprehensive, systematic survey results, and that many, indeed most areas, have not been surveyed for threatened biota, especially something as cryptic as Thesium australe. Oddly, in another context, CE uses something of a contrary argument by rightly pointing out some of the limitations of Atlas data when arguing against a view that Atlas data can be used to a) predict the presence of a community and/or b) determine the relative biodiversity of an area. CE clearly understands that the Atlas isn't comprehensive, and that the absence of a species in its records means virtually nothing because of the general paucity of survey data available. The perversity of CE's reasoning in this regard is revealed in the Nuebeck Coal Project EPBC referral which shows that the species is now confirmed from the local region in two substantive populations.

Thesium australe is strongly associated with Themeda grasslands and could occur in native grassland, derived grassland, and grassy woodland/forest. CE apparently hasn't performed targeted surveys for this species. This may be especially warranted given how cryptic the species can be (especially if surveyed outside of flowering time), and because at least one of the proximate records was found in 'highly disturbed areas', which may be so poor that CE and others wouldn't have looked there or given the area much attention. In the absence of thorough survey at a time when the proximate populations are flowering, I suggest treating potential habitat as actual habitat using the same sort of numbers and densities as occur at the proximate site unless there are significant differences in site conditions. This

would result in an over-estimate of actual habitat, not least because the species doesn't seem to occur in areas where it would often be predicted based on what is known of its habitat requirements.

My preliminary assessment is that this species warrants upgrading to Endangered, at least in one or more States, even if it remained Vulnerable nationally.

LEG believes a targeted survey for *Thesium australe* must be conducted, including a Cumulative Loss assessment of the Pine Dale and Nuebeck Coal Project populations.

4.5 *Prostanthera cryptandroides subsp. cryptandroides* (Vulnerable)

Coalpac have not undertaken a targeted search for *Prostanthera cryptandroides subsp. cryptandroides* in the Proposal Area, despite the fact that ample suitable habitat exists in the Proposal Area, and it has been recorded just 6km to the east above Baal Bone Colliery LW19.

In fact Cumberland Ecology doesn't list a single *Prostanthera* species in the Flora Species List, Appendix C - Ecological Assessment². This is despite the fact three (3) *Prostanthera* species are recorded on the NPWS Wildlife Atlas immediately adjacent Cullen Valley and Invincible Mines, and seven (7) species are recorded in Ben Bullen State Forest. They are –

- *Prostanthera howelliae* – recorded on pagodas 230m east of Invincible disturbance boundary;
- *Prostanthera saxicola var. montana* – recorded on Tyldsley Hill 900m south of Cullen Valley Mine disturbance boundary;
- *Prostanthera saxicola var. saxicola* – recorded 500m north of Cullen Valley disturbance boundary;
- *Prostanthera rotundifolia*;
- *Prostanthera granitica*;
- *Prostanthera lasianthos*; and
- *Prostanthera cryptandroides subsp. cryptandroides*

In fact Cumberland Ecology omitted the entire Lamiaceae Family from Shrubs in the Species List!!!

The Approved Conservation Advice for *Prostanthera cryptandroides subsp. cryptandroides* approved by the Minister on 30/7/2008 (s266B of the Environment Protection and Biodiversity Conservation Act 1999) states that –

- “The distribution of this species overlaps with the White Box -Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grasslands. EPBC Act listed threatened community.” This very same Critically Endangered Community occurs within the proposed Disturbance Area of Cullen Valley and Invincible Mines (see Figure 13¹).
- “*Prostanthera cryptandroides* occurs in dry sclerophyll forested slopes and gullies, in rocky areas, especially at the base of scree slopes and sandstone boulders, and in shallow sandy loam, as an understorey species to *Eucalyptus* spp. and *Acacia* spp. (Althofer, 1978; Fairley & Moore, 1989; Harden, 1992). Associated vegetation communities include Narrabeen Rocky Heath, Narrabeen *Acacia* Woodland, Narrabeen Exposed Woodland, Open Heath of Common Fringe -

myrtle (*Calytrix tetragona*), *Leptospermum parvifolium*, *Nepean Conebush* (*Isopogon=dawsonii*), and *Open Scrubland of Dwyer's Red Gum* (*Eucalyptus dwyeri*), *Harmogia densifolia*, *Dillwynia floribunda*, *Aotus ericoides* and *Hemigenia cuneifolia* (DECC NSW, 2005a)."

The above fits the description of much of the area of the proposed Disturbance Area.

- "The main identified threats to *P. cryptandroides* are habitat loss and fragmentation; changed hydrology from erosion; trampling and grazing by domesticated and feral animals; inappropriate fire regimes; habitat modification from weed invasion; reduced water quality from agricultural runoff; and nitrification of the soil due to animal excrement agricultural chemicals (NSW NPWS, 2000a)". The Proposed Action will exacerbate many of these threats.
- "The main potential threats to *P. cryptandroides* include waterborne and soil pathogens, based on the sensitivity of other members of the genus to these threats (NSW NPWS, 2000a), fragmentation, and removal of associated vegetation, which is likely to impact on the life-cycle of the associated pollination vectors (NSW NPWS, 2000b; DECC, 2005b)."

The Proposed Action will exacerbate many of these potential threats.

LEG must consider it unlikely that Cumberland Ecology could ever find *Prostanthera cryptandroides* ssp. *cryptandroides* even if it was abundant within and adjacent the proposed Disturbance Boundary, given they could not find 3 *Prostanthera* species immediately adjacent both mines, and despite the fact seven (7) *Prostanthera* species are recorded on the Wildlife Atlas as occurring in Ben Bullen State Forest.

The members of Lithgow Environment Group urge the Department to require an independent Flora Assessment, and a targeted search for *Prostanthera cryptandroides* ssp. *cryptandroides* (Vulnerable).

4.6 Genoplesium superbum (Endangered)

A search of the Wildlife Atlas reveals two records for the endangered Orchid *Genoplesium superbum* 3.9km and 8.6 km east of the proposed Invincible Disturbance Boundary.

Disturbingly those Wildlife Atlas records appear to be in moist gullies dominated by Ribbon Gum/Mountain Gum, similar to the gullies which are proposed to be cleared as part of this Proposal.

Ben Bullen State Forest and the Proposal Area in particular contains an extraordinarily biodiverse range of Orchids – 46 species in total. Australia's foremost expert on Australian Orchid species David L. Jones has identified⁹ that, overall, native Orchids make up 5 - 6% of the Australian flora. Of the 633 plant species recorded for Ben Bullen State Forest, 46 or 13.7% are Orchid species. The Proposal area is therefore more than twice as rich in Orchid species than the Australian average, and by comparison with other countries almost equals the entire orchid population of Great Britain (approx. 50 species).

LEG considers that the endangered orchid *Genoplesium superbum* is highly likely to occur within the proposed disturbance areas, and that a Targetted Survey must be conducted.

4.7 Derwentia blakelyi (Vulnerable TSC Act)

The Wildlife Atlas⁸ contains records for *Derwentia blakelyi* just 1 km east of the Invincible Mine Disturbance Boundary in similar vegetation communities to those occurring within the Project Area ie. *Tableland Gully Ribbon Gum – Blackwood – Apple Box Forest*.

OEH descriptions for this community identify *Derwentia blakelyi* as a Definite threatened species component .

Cumulative losses of *Derwentia blakelyi* if the Pine Dale Mine Extension Stage 2 is approved, as a significant population of over 200 individual plants is under threat.

LEG firmly believes that *Derwentia blakelyi* is likely to occur in the Proposal Area, and contends that a targeted survey must be undertaken for this threatened species so that it can be avoided if possible.

5. IMPACT ON ROTAP LISTED SPECIES

Coalpac and Cumberland Ecology have consistently omitted ROTAP listed plant species from the species list and Flora Assessment, claiming that because they are not threatened species there is no requirement to report them.

Dr. Steven Douglas⁵ states that *"Unless competently assessed and found otherwise, ROTAPs that are not currently listed as threatened under the Acts should be treated as environmentally important and, in accordance with the precautionary principle, as potentially threatened. Their Rare and/or Poorly Known status is indicative that they may be at risk: most have simply not been further assessed. They should not be disregarded in the impact assessment of open cut mining."*

The PAC Review Main Report⁴ and the OEH held the same view, hence Recommendations 49, 50 & 55.

Seven ROTAP Listed species occur within or adjacent the Proposal area -

- *Acacia asparagoides* – 2R
- *Banksia penicillata* - ROTAP 3RCa
- *Eucalyptus apiculata* - ROTAP 3RC
- *Leonema lamprophyllum* subsp. *orbiculare* - RECOMMEND 2R-P3
- *Leucochrysum graminifolium* - 2R
- *Philotheca obovalis* – 3RCa
- *Prostanthera hindii* – ROTAP 2RCa
- *Pseudanthus divaricatissimus* - ROTAP 3RCa

LEG regards this as a matter of State and National environmental significance. These plant species are the among the rarest plants on earth, they should have been identified, and the direct/indirect and cumulative impacts of the Nuebeck Coal Project and Pine Dale Mine Stage 2 Extension must be assessed. Cumberland Ecology is making a mockery of the Flora Assessment Process – which in itself is a matter of State and National environmental significance!!!

6. IMPACT ON OVERALL SPECIES RICHNESS

Once again almost 100 plant species known to occur in or near the Proposal area have been omitted from the Flora Species List, Appendix C - Ecological Assessment², including ROTAP listed species and many rare and unusual species.

Despite all that has been said by LEG, other environmental groups, the PAC (December 2012), and OEH - Cumberland Ecology appear to wear errors-of-omission as a badge of honour – arrogantly flaunting their coal-god given right to thumb their nose at all and sundry, and 'cherrypick' which plants (and communities) they choose to list, with the primary aim of omitting any and all things rare. The PAC

Recommendation 50 was abundantly clear, but has again been ignored: *“The Commission recommends that, given the acknowledged high quality and species richness of the native vegetation present in the project area, the assessment focus should be on the overall quality of the habitat under threat and its biodiversity value rather than just on the threatened species component which is the focus of the EA.”*

LEG could once again list all the species that were missed, as we did in 2010, 2011, 2012 and 2013. But what is the point? The DoPI and OEH simply ignore our concerns and it's business as usual for Flora Consultants.

However we will highlight the extraordinary richness of Orchid species in the Proposal Area in Particular. A unique combination of soils, landforms, aspect, rainfall and other extraneous factors had created an ideal environment for 46 terrestrial and epiphytic orchid species unparalleled in the Lithgow region.

Australia's foremost expert on Australian Orchid species David L. Jones has identified⁹ that, overall, native Orchids make up 5 - 6% of the Australian flora. Of the 633 plant species recorded for Ben Bullen State Forest, 46 or 13.7% are Orchid species. The Proposal area is therefore more than twice as rich in Orchid species than the Australian average, and by comparison with other countries almost equals the entire orchid population of Great Britain (approx. 50 species).



Pterostylis coccinea



Calochilus paludosus



Corybus hispidus

Above are photos of just 3 Orchid species which LEG has only recorded within in the Proposal area, and nowhere else in the entire Lithgow LGA. Individually they may not be listed as Threatened, but surely any Australian environment containing so many species in a small area must be regarded as Threatened? And surely worthy of reservation within a State Conservation Area?

7. IMPACT ON FAUNA

Coalpac admits that at least eight threatened fauna species in Ben Bullen State Forest would be further impacted if these Coalpac modification proposals are approved (EA, page 76). The Broad-headed Snake, Large-eared Pied Bat and Eastern Bent-wing Bat habitat would also be impacted based on OEH advice to the PAC dated Nov 6th, 2012. Coalpac has not provided any scientific evidence in this EA contrary to the OEH recommended 500 metre setback for these species or rebuttal of the PAC 2012 recommendation of 300 metre setback to provide 70-75 per cent of the foraging area for these species.

The EA for the Modifications relies on the claim that the proposal is small and does not impact on sensitive areas. In relation to the small size of the Ben Bullen Pagoda Land System, the modifications

are large and will have a large impact on the most fertile foraging area of landscape. This proposal is akin to bulldozing the kitchen and living room of a home but retaining the bedrooms – and assumes that dependent wildlife can travel to buy takeaway for the next 100+ years until the area recovers.

Given its size relative to Newnes State Forest and the Gardens of Stone National Park, Ben Bullen State Forest has the highest overall plant and animal diversity, the Ben Bullen Pagoda Land System is the key to that biodiversity, and Coalpac's modifications will remove irreplaceable elements of that diversity.

8. INADEQUATE BIODIVERSITY OFFSETS

The proposed Biodiversity Offset package is contrary to the PAC Recommendation 55 *in that is essentially "a proposal designed to exchange a number of fragmented areas that generally require extensive rehabilitation work and are currently not considered suitable for reservation, for a single area of high quality habitat that adjoins other areas of high quality habitat and is already proposed for reservation."*

The Gulf Mountain Offset is not on Permian Geology, has different vegetation types and fauna association, and does not contain any of the features unique to the irreplaceable Ben Bullen Pagoda Land System.

The Hillview/Billabong Offset represents 83 Ha of largely degraded grazing land; is riddled with feral Radiata Pine, St John's Wort, Thistles, Blackberry, Cape Broom, Cotoneaster and more; has a polluted waterway flowing through it from the Invincible Mine Main Dam (Salinity tested by LEG at 900+ EC); and as coal reserves beneath it and there are no guarantees that it won't be mined at some time in the future.

The money being spent on Offsets could be better spent buying intact bushland containing the equivalent threatened plants, communities, and fauna species, or preferably by mining in previously cleared areas and converting Ben Bullen SF to a State Conservation Area.

9. ADVERSE IMPACTS ON THE SIGNIFICANT BEN BULLEN PAGODA LANDSCAPE

The Lithgow Environment Group, Colong Foundation, and Blue Mountains Conservation Society described the western portion of the Ben Bullen State Forest in and adjacent to the 2013 'contracted' Coalpac Project as having a distinctive pagoda landform with a specific suite of ecosystems and vegetation types (see Attachment A for details regarding this landform).

The groups believe that Coalpac's consultants have failed to consider what would comprise a comprehensive, adequate and representative (CAR) sample of this pagoda landform complex.

This landform is affected by both modification proposals, particularly the Tablelands Grassy Woodland Complex Unit of this pagoda landform complex (see below).

The pagoda landform complex has a unique sequence of internationally significant platy pagoda landforms which include tableland vegetation types on the valley floor. Although the above conservation groups were unable to map the above landform, Coalpac's consultants did so in an attempt to discredit the groups' claim that the landform was unique to the western side of Ben Bullen State Forest.

The Coalpac consultant's land unit mapping confirms that the only place where the three landforms units (shown in pink, yellow and green in the figure below) occur side by side and together is in the western portion of the state forest. In other words, the only place where the Ben Bullen Pagoda Land System exists and thus can be protected is centred on the area where the Coalpac modification proposals are located.

If Ben Bullen Pagoda Land System is to be protected, then it needs to be protected where its three components occur together. If only two of the three units were protected then this unique pagoda landform complex is not protected.

Ben Bullen Pagoda Land System within the western side of the Ben Bullen State Forest is highly significant because other parts of this land system have been compromised and it cannot be replaced by other pagoda land systems.

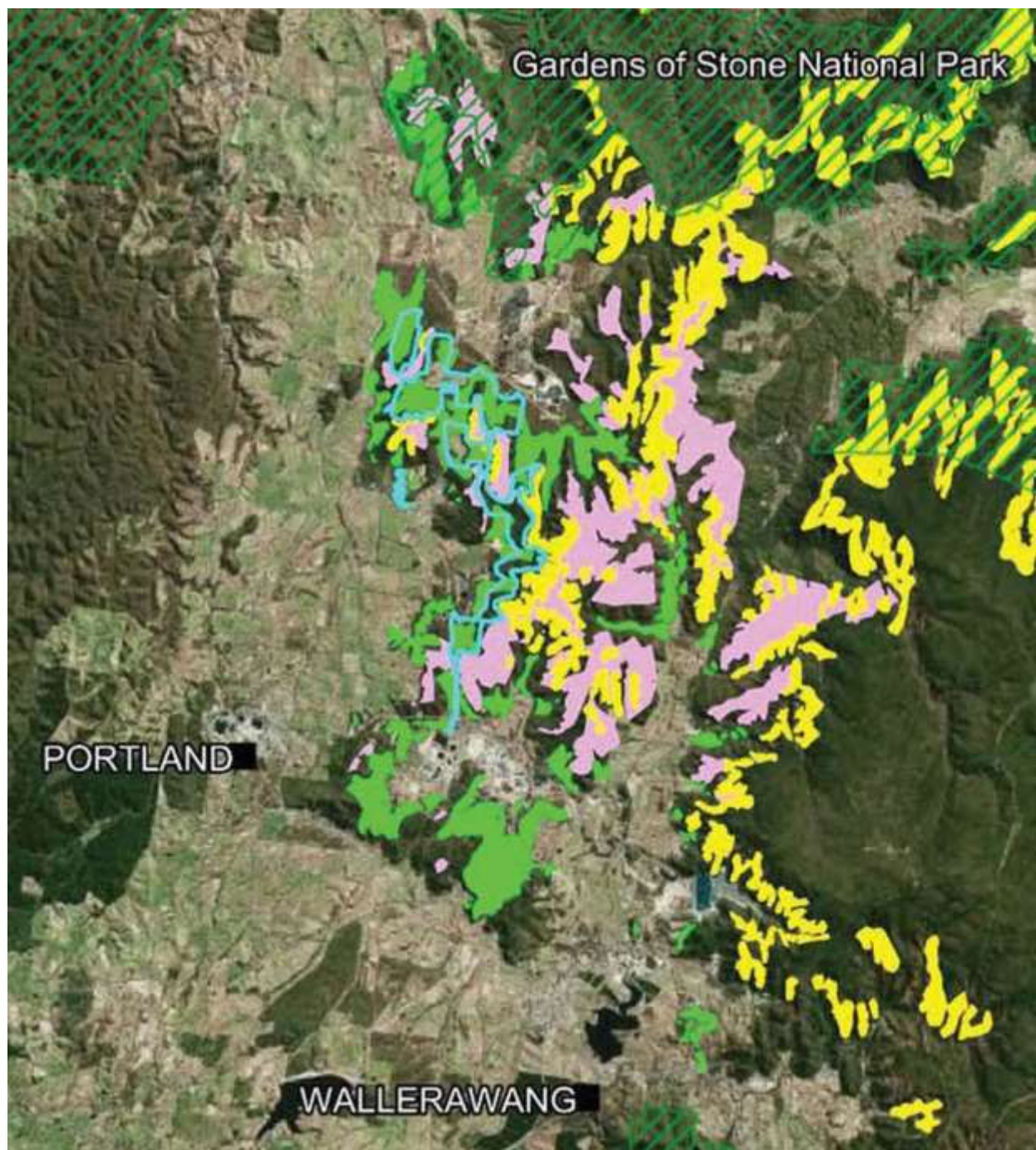
To the north, most of the Baal Bone coal lease area has been damaged by extensive cliff falls and desiccated due to intensive underground coal mining. Across the Dividing Range in the upper Cocks River valley to the east, the woodlands on Permian strata have been cleared along the Wolgan Road. To the south, Triassic Narrabeen sandstones are absent, and so there are no pagodas.

Further north in the Capertee Valley, Tablelands Grassy Woodland Complex is absent; and still further north, the climate becomes drier and the vegetation types change as the Blue Mountains Pagoda Shrublands reach their northern limit.

None of the pagoda landscape complex characterised as the unique cluster of three land units comprising the Ben Bullen Pagoda Land System and as mapped below is protected in national parks or state conservation areas. This pagoda landscape complex is then completely irreplaceable and the Tableland Grassy Woodland Complex Unit within it will be badly degraded and compromised by both proposed Coalpac modifications.

The Tableland Grassy Woodland Complex Unit is very limited in extent, particularly where it is associated with the other two landscape units.


The modifications proposed to Invincible Colliery and Cullen Bullen Mine cut deeply into the Tableland Grassy Woodland Complex Unit, making it difficult to reserve a representative sample of this pagoda landscape complex. The Invincible modification is of concern in this regard because it removes the Unit south and just below the Ben Bullen Range where it is particularly well developed. The Cullen Valley Modification will potentially remove an CEEC of Box Gum Woodland, a Frost Hollow Woodland EEC, and a unique pagoda system containing aboriginal rock art.



Cumberland Ecology Mapping of the Ben Bullen Pagoda Land System in the Region


Legend

 Contracted Project Disturbance Boundary

 National Parks and Reserves

Ben Bullen Pagoda Land System (as described in joint submission)

 Ben Bullen Range Pagoda Unit

 Tablelands Grassy Woodland Complex Unit

 Cullen Plateau Unit

10. INADEQUATE REHABILITATION

Despite hollow reassurances from Coalpac in the EA, the company's past record of rehabilitation at Cullen Valley Mine is very poor. Mining commenced in 1998, and 14 years later less than 10% of the 4 kilometre scar along the western side of Tyldsley Hill has any greenery on it whatsoever.

The open-cuts and highwalls were so steep in places that they exceed the angle-of-draw, a point at which soil cannot be prevented from slipping downslope. Meanwhile there was not enough spoil available to cover the highwalls and voids, so Coalpac P/L now want to clear another 300Ha to obtain enough fill to push up these escarpments and to the voids. No doubt when they've cleared this 300 Ha they'll want to clear more to rehabilitate that area – and the cycle will continue.

The Modifications can never be rehabilitated to anything remotely resembling the original hydrology, biodiversity and geodiversity of the existing Ben Bullen Pagoda Land System.

LEG supports the PAC (Dec 2012) Recommendations 53 & 54, which are quite clear -

Recommendation 53: *The Commission recommends that the following three principles be accepted as underpinning assessment of biodiversity impacts for this project:*

- * Rehabilitation cannot restore the existing vegetation associations or ecological balance of the area;*
- * Rehabilitation to mature woodland is unproven for open-cut mines in NSW; and*
- * The impacts on biodiversity from this project are incompatible with reservation proposals for Gardens of Stone Stage II.*

Recommendation 54: *The Commission recommends that, given the considerable Uncertainties concerning the likelihood of rehabilitation on this project area being capable of delivering a satisfactory biodiversity outcome, rehabilitation not be given credence as a mitigation strategy in the assessment.*

11. IMPACT ON WORLD HERITAGE VALUES

The Greater Blue Mountains World Heritage Area (GBMWhA) was inscribed on the World Heritage List in 2000 for its “outstanding natural values including the biodiversity of its plant and animal communities, and its vegetation dominated by Australia's unique eucalypts.”

The GBMWhA Advisory Committee has long recommended that it be renominated to the World Heritage List for the geodiversity, cultural heritage and scenic values for which it was originally nominated, but did not get listed. The Federal Government supports such a proposal and has included the GBMWhA and a number of adjacent reserves, including the Gardens of Stone Stage 2 proposal, on the 'Priority List' for National Heritage List re-assessment.

Mr Keith Muir of the Colong Foundation for Wilderness has advised that in 2006 the NSW Department of Environment and Conservation considered Ben Bullen State Forest for addition to the national park estate, and that the NSW Office of Environment has since identified this state forest as its first priority for reservation in the region.

Protecting the geodiversity, cultural heritage and scenic values of Ben Bullen SF is therefore an important initial step in the World Heritage re-nomination process. The creation of further huge scars from open-cut mining will detract from the scenic value of this gateway to the GBMWhA.

Open-cut mining in Ben Bullen SF, including the Coalpac Project, is therefore contrary to Commonwealth, State and GBMWhA Advisory Committee long-term plans for this unique area.

12. UNACCEPTABLE WATER POLLUTION ISSUES

Below are several extracts from a NSW Soil Services report – *Erosion & Sediment Control and Remediation Plan – Wallerawang to Kandos Baal Bone Junction, 191.795km to 195.705km. July 1998*¹⁰

The Report¹⁰ identifies that the State Rail Authority of NSW undertook a cutting widening program along the Wallerawang to Kandos line adjacent the Cullen Valley Mine open-cut. Construction activities subsequently impacted on the downstream property “Forest Lodge”, owned by Mr Reg Larkin. Vegetation in several drainage lines was killed or adversely affected due to –

- Sedimentation
- Acidic drainage and/or
- Saline drainage

The Report¹⁰ states the highly acidic saline nature of the run-off smothered and killed the vegetation, making the areas prone to further degradation. The report states that older cuttings constructed 30+ years ago also exposed “Green Rock” or pyritic lenses, and are still discharging water that is Acid (pH 4.0), Saline (5.5 – 9.0 dS/m), with a distinct Sulphur smell, and traces of a yellow precipitate.

The Department is well aware that preventing impacts from metal leaching and acid rock drainage produced by sulphide minerals has historically been the major rehabilitation challenge facing the mining industry.

Locally the coal mining industry failed to adequately address acid mine drainage at the Eastern and Western Main Collieries (now Lambert’s Gully Mine) and Wallerawang Colliery (now Pine Dale Mine). As a result the Nuebeck’s Creek arm of the Cocks River has been identified in the Sydney Catchment Audit 2010 as the most severely polluted and degraded waterway in the entire SCA area.

The findings on water quality in Appendix D & E Surface Water Assessment for this proposal are a cover-up, and the mitigation strategies proposed are the same as those which have been tried and proven to be a dismal failure at the old Eastern and Western Main Collieries and Wallerawang Colliery.

EROSION & SEDIMENT CONTROL AND REMEDIATION PLAN.

*Wallerawang to Kandos Rail Line
at Baal Bone Junction,
191.795 km to 195.705 km*

BACKGROUND

The State Rail Authority of NSW, and more recently the NSW Rail Services Authority, have undertaken a cutting widening program along the Wallerawang to Kandos line. These works have been completed with the aim of reducing the potential for rock fall or batter slumps blocking the line. Various works were also completed concurrently to improve drainage around the RSA infrastructure.

This area considered in this plan is between railway chainages 191.795 km to 195.705 km and includes the Baal Bone Junction. The line runs traverse to a series of small drainage lines via cut and fill, with maintenance and access tracks (to the junction) running parallel along both sides; these vehicular tracks follow the natural topography.

THE CURRENT SITUATION

Although completed approximately two years ago, the construction activities throughout the area have since impacted upon the downstream property known as "Forest Lodge", owned by Mr Reg Larkin. Vegetation in several of the drainage lines on "Forest Lodge" has either been killed or adversely affected due to the influences of:-

- sedimentation,
- acidic drainage and/or
- saline drainage.

Erosion of cut and fill slopes, cess drains, culvert outlets, access tracks and other bare or denuded areas have resulted in sediment deposition along the low points in the easement and in "Forest Lodge". This sediment has smothered and killed the vegetation, making these areas prone to further degradation. The highly acidic, saline nature of the run-off leaving these areas has also destroyed vegetative ground cover on-site and on "Forest Lodge".

EROSION & SEDIMENT CONTROL AND REMEDIATION PLAN

BAAL BONE JUNCTION (191.795 KM - 195.705 KM)

Soil Services, July 1998

The process is fundamentally:

1. Groundwater moves into the pyritic lens (Green rock area)
2. Oxidisation occurs on surface on contact with air (O_2) or oxygenated groundwater.
3. Acidic saline solution transported offsite in leachate and runoff.

Once the process is initiated it will continue to occur, even under water, for a considerable length of time (100 years). The Iron rich pyrite layer oxidises with oxygen ($H_2SO_4 + O_2 \rightarrow Fe_2O_3 + H_2S$) to produce a ferric compound plus hydrogen sulphide. Next stage is to react with water to produce sulphuric acid and ferrous sulphate. The resultant acidic solution also changes the pH considerably, with many heavy metals becoming more soluble and more available in-situ and in leachate.

A geotechnical report could have indicated a potential problem in the first instance. A test for pyrite at the sampling stage be included if RSA are planning any more widening projects in the area.

The salinity offsite will be of minor consequence once the acidic nature of the solution is overcome.

The sequences are usually sandstones, mudstones, claystone; capped by Hawkesbury sandstone and commonly have shales and coal bearing measures within them. They are old sedimentary systems with considerable precipitates locked into the systems (salinity loading in some systems yield half sea-water quality in groundwater).

Observations: The recently widened embankments have a leachate solution that is acid (pH 4.0) and saline (5.5- 9.0 dS/m). Colour of the material is green with a distinct sulphur smell, and traces of a yellowish precipitate.

Older cuttings that were exposed 30 + years ago are still discharging water, and the embankments are undercutting significantly. This is very evident in the old embankment adjacent to the Jews Creek crossing. Some vegetation is noted to have been affected offsite by the leachate solution. The "Green Rock" referred to in this report are pyritic lenses.

Discussion: Permian sediments in this area have a "lens of pyritic material" that behaves in a similar fashion to an acid sulphate soil. They are a real "Pandora's Box" when exposed to the air.

The process is fundamentally:

1. Groundwater moves into the pyritic lens (Green rock area)
2. Oxidisation occurs on surface on contact with air (O_2) or oxygenated

LEG urges the Department not to repeat the mistakes made by the State Rail Authority of NSW adjacent Cullen Valley Mine in the 1990's¹⁰, or the mistakes made at the Eastern & Western Main Mines and Wallerawang Colliery in the 1970 - 80's.

Coalpac do not have a good track record on managing water quality issues, rehabilitation, coal combustion, dust, noise or other issues – please do not allow them to create and Acid Mine Drainage problem that will persist for 100+ years.

10. INTENSIFICATION OF MINING/WEAKENING CONSENT CONDITIONS AFTER APPROVAL

LEG considers it grossly unethical that a mine which has twice been rejected can lodge a smaller version of the same proposal, when it is patently obvious they (as EnergyAustralia) have every intention of ramping the project back up to the scale originally intended.

The PAC (Dec 2012) and the DOPI both rejected the original Coalpac Consolidation Project because open-cut mining was considered to be inconsistent with the high biodiversity values and internationally significant pagoda landforms located on the western edge of the Great Dividing Range in Ben Bullen State Forest. Nothing has changed.

This Proposal would destroy 150 hectares of the Tablelands Grassy Woodland Complex that is integral to the survival of the entire Ben Bullen Pagoda Land System. Destroy one part and you destroy the entire Land System. The highwall mining of an additional 165 hectares will dry out and degrade the moist forests of this complex located below the escarpments. This desiccation will cause a loss of understorey species, such as orchids and ferns. Highwall mining will place cliffs, pagodas and Aboriginal heritage at risk of damage through subsidence and blasting during and following such coal mining.

LEG reminds the Department that the approval of the 10 Ha first stage of Invincible open-cut mine on 7 September 2006 was followed by an endless flow of Modifications and Extensions – **7 Approvals in 4 years from 2006 and 2010.**

Only 3 of those 7 Projects were actually ever approved by a Minister, the remainder were approved by planning staff on behalf of a Minister – 3 were approved by a Mr Chris Wilson and 1 by David Kitto.

- Invincible Open Cut Mine Extension (05_0065): 7 September 2006 – Frank Sartor
- Invincible Open Cut Mine - Modification 1 (Part3AMod): 4 June 2007 – Frank Sartor
- Invincible Colliery Coal Augering (05_0065 MOD 2): 6 December 2007 – Chris Wilson
- Invincible Coal Project (07_0127): 4 December 2008 – Kristina Keneally
- Open Cut Expansion Project (07_0127 MOD 1): 12 January 2009 – Chris Wilson
- Open Cut Expansion Project (07_0127 MOD 2): 12 August 2009 – Chris Wilson
- Open Cut Extension Project (07_0127 MOD 3): 8 October 2010 – David Kitto

However, not content to sit back and wait for the gradual ramping up of cumulative impacts on the residents of Cullen Bullen, Coalpac simply defied s125 of the EP&A Act between September 2006 and September 2007 illegally dug and transported 80% more coal than their approval allowed.

On 11 September 2008 Judge Biscoe found that **there had been damage to the integrity of the planning system**, that Coalpac had acted intentionally and committed this offence in order to obtain a financial advantage, and fined them \$200,000 plus \$55,000 prosecution costs – peanuts.

Despite this 'damage to the integrity' of the Planning System, less than 3 months later on 4 December 2008 (07_0127); then Planning Minister Kristina Keneally 'rewarded' Coalpac for their bad behaviour by approving a more than tripling of production from 350,000 MTPA to 1.2 MTPA.

Of those seven (7) Modifications and Extensions, the worst approval from an environmental and visual perspective was MOD 2 approved by Mr Chris Wilson on 6/12 2007. The two Prior approvals by Minister Sartor only involved clearing 10 Hectares of bushland, and the EA specifically stated that open-cut mining operations would not be visible from the Castlereagh Hwy.

Arguably the 2nd worst approval in terms of impacts on the Cullen Bullen community was MOD 3 07_0127 approved by David Kitto on 8 October 2010 – *Increased Road Haulage to Transport an Additional 300,000 tpa to Mt Piper Power Station, bringing the total amount proposed to be trucked from Invincible Colliery to 1.2 MPTA*. Mr Kitto should have known about the ongoing dust problem since 1998 of coal trucks from Cullen Valley, Invincible, and Ivanhoe North Mines (MP05_0103 approved 11/4/2007) tracking dirt and mud onto the Castlereagh Hwy, which dried, turned to dust, and was constantly stirred up and dragged by traffic along the highway thru Cullen Bullen, filling the town and the entire valley with dust.

The removal of the proposed Coal Conveyor from these Modifications will see a repeat of the above.

Similarly after Planning Minister Craig Knowles approved Cullen Valley Mine on 4 December 1997, they were fined \$30,000 plus the EPA's costs of \$18,000 in 2003 after pleading guilty to a licence breach allowing fine particle mining dust to be emitted from Cullen Valley Mine. As another reward for bad behaviour Minister Knowles approved Extension (DA-200-5-2003) in 2004, followed within months by an Extension of Coal Haulage (00-5-2003 MOD 1) approved by Diane Beamer on 19 August 2004.

Residents and environmental groups deserve to know what they are really lodging a submission on – is it 300 ha over 5 years, or is it the Coalpac Consolidation Project revisited in numerous small bites???

11. UNACCEPTABLE DUST and NOISE LEVELS and BLAST IMPACTS

The adverse health and amenity impacts of dust emissions from Cullen Valley and Invincible Mines on the residents of Cullen Bullen have been very poorly managed. Cullen Valley Mine was prosecuted \$30,000 plus \$15,000 in 2003 for causing dust emissions.

The removal of the Coal Conveyor from these Modifications will see a return of heavy coal trucks on the Cullen Valley Haul Road only 495 metres from Cullen Bullen Primary School, and a return of coal trucks from invincible Mine onto the Castlereagh Highway.

Since 1998 of coal trucks from Cullen Valley, Invincible (and Centennial Ivanhoe North Mine approved 11/4/2007) have tracked dirt and mud onto the Castlereagh Hwy, which when dry turned to dust, was constantly stirred up by traffic and dragged along the highway through Cullen Bullen, choking local residents, and filling the town and entire valley with dust.

Dust emissions from blasting have proven similarly impossible to control. The Invincible Mine proposal is only 1km, and the Cullen Valley proposal only 2.6km from Cullen Bullen. Self-regulation does not work. Self-regulation will not protect the health of Cullen Bullen residents.

The only safe way to manage dust, noise and blasting impacts is to insist on adequate separation distances as recommended by the WA EPA³⁵, SA EPA³⁶, and National Party of NSW³³, which is no open-cut mining within **a minimum of 3 kilometres, and preferably 5 kilometres of a residential township.**

12. POLITICAL DONATIONS

Lithgow Environment Group Inc. has not made any political donations that need to be disclosed.

CONCLUSION

The members of Lithgow Environment Group believe we have provided a compelling body of evidence to demonstrate why these Modifications must be rejected.

We trust that our submission meets with your favorable consideration.

Yours sincerely,

Chris Jonkers
Vice President
on behalf of Lithgow Environment Group Inc.

REFERENCES

1. Environmental Assessment Modifications to PA 07_127 and DA 200-5-2003 for Coalpac Pty Limited (Administrators Appointed) Hansen & Bailey. March 2014.
2. Cullen Valley Modification and Invincible Colliery Modification, Appendix C - Ecological Impact Assessment. Cumberland Ecology for Hansen & Bailey. February 2014.
3. ABC National: Background Briefing 'The Trouble with Offsets'. March 16, 2014
www.abc.net.au/radionational/programs/backgroundbriefing/.../5312944
4. NSW Planning Assessment Commission. Coalpac Consolidation Project Review: Main Report. 14 December 2012
5. Dr Steven Douglas, Report to Blue Mountains Conservation Society examining a subset of ecological concerns regarding the proposed extensions of Cullen Valley and Invincible Mines. April 2014
6. Benson and Keith (1990) Vegetation of the Wallerawang 1:100 000 Map Sheet. Cunninghamia 2(2) 305-335
7. Centennial Coal, Nuebeck Coal Project Briefing Paper. September 2012
8. NSW Wildlife Atlas, National Parks & Wildlife Service www.bionet.nsw.gov.au/
9. David L. Jones. Field Guide to the Orchids of the Australian Capital Territory. Canberra 2008
10. NSW Soil Services. Erosion & Sediment Control and Remediation Plan – Wallerawang to Kandos Baal Bone Junction, 191.795km to 195.705km. July 1998
11. Minister for Planning v Coalpac Pty Limited [2008] NSWLEC 271 (11 September 2008): Invincible Colliery fined \$200,000 plus \$55,000 in prosecution costs for producing 80% more coal than approved on 7 September 2006.
12. Lithgow Mercury, 22 July 2003 – Cullen Valley Mine fined \$30,000 plus ordered to pay the EPA's \$18,000 costs after pleading guilty to allowing fine particle mining dust to be emitted from the Cullen Valley Mine.
13. EPA POEO Licence Register <http://www.epa.nsw.gov.au/prpoeo/searchregister.aspx>. Non-compliances recorded at Invincible Colliery (Lic. No. 1095), Cullen Valley Mine (Lic. No.10341), and Canyon Colliery (Lic. No. 558),
14. ABC Lateline 17/05/2012: Toxic metal contamination found in Grose Valley.
<http://www.abc.net.au/lateline/content/2012/s3505426.htm>. Tests in parts of the World Heritage-listed Grose Valley have found zinc and nickel at 100 times safe levels downstream of an abandoned coal mine, the Canyon Colliery.
15. Sydney Morning Herald, 5 May 2008: Disused mine leak is killing life in river
<http://www.smh.com.au/news/national/disused-mine-leak-is-killing-life-in-river/2008/05/04/1209839456272.html>
16. ABC Catalyst, 15 August 2008. Grose River Zinc pollution.
<http://www.abc.net.au/catalyst/stories/2331597.html>
17. Unlike mining companies with large budgets to pay consultants, LEG and BMCS rely entirely on volunteers, whilst the Colong Foundation has only one principal employee. It is therefore necessary to share knowledge and respect each other's abilities. BMCS has expertise in rock mechanics, geologic structure and hydrogeology, the Colong Foundation in environmental sciences, legislation and procedure, and LEG in floristics, and water quality.
18. Hanson and Bailey, Coalpac Consolidation Project Preliminary Environmental Assessment, October 2010
19. Umwelt Environmental Consultants, Preliminary Assessment – Ventilation Shaft and Powerline Easement, South eastern Mining Area Baal Bone Colliery. February 2007
20. AECOM Australia Pty Ltd, August 2009. EA for Continued Operations at Baal Bone Colliery (09_0178). Species List as part of Flora Assessment: Gingra Ecological Surveys, Appendix L, pages 29-33.
21. Gingra Ecological Surveys, Flora & Fauna Assessment, Ivanhoe North Rehabilitation Project, January 2006
22. Approved Conservation Advice for *Persoonia marginata* (Clandulla Geebung)
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/10852-conservation-advice.pdf>

23. Conservation Risk Codes in Briggs, J.D. & Leigh, J.H. (1996). Rare or Threatened Australian Plants: 1995. CSIRO.
24. NSW Wildlife Atlas, National Parks & Wildlife Service <http://wildlifeatlas.nationalparks.nsw.gov.au/wildlifeatlas/>
24. *Cunninghamia* 10(3): 2008 *Stephen Bell*, Rare or threatened vascular plant species of Wollemi National Park
26. Gingra Ecological Surveys (2003). Cullen Valley Lease Extension Project Flora Survey. Report prepared for International Environmental Consultants.
27. Lembit, R. (1997), Flora Survey for Feldmast Coal Project.
28. Cumberland Ecology Pty Limited (2010). *Cullen Valley and Invincible Mines: Opportunities and Constraints Analysis*. Draft report for R.W Corkery & Co Pty Ltd , April 2010. Review of Environmental Factors for an Exploration Program (Boreholes CP113 to CP 129). Report on behalf of Coalpac Pty Ltd.
29. GCNRC (2004), Pine Dale Coal Mine Proposal. Environmental Impact Statement. Flora Assessment Part 4.
30. Flora Assessment, Pine Dale Coal Mine. Part 4. Geoff Cunningham Natural Resource Consultants. June 2010.
31. Benson and Keith (1990) Vegetation of the Wallerawang 1:100 000 Map Sheet. *Cunninghamia* 2(2) 305-335
32. DECCW (2009). Gardens of Stone National Park Plan of Management. NPWS. June 2009
33. Washington, H. 2001, *Gardens of Stone National Park, Vegetation Survey*, NSW NPWS. Unpublished report.
34. Washington and Wray, 2011. The Geoheritage and Geomorphology of Sandstone Pagodas of the North-western Blue Mountains Region'. *Proceedings of the Linnean Society of New South Wales* 132, 131-143: Attachment A .
35. DECCW, Montane Peatlands and Swamps: EEC Identification Guidelines.
<http://www.environment.nsw.gov.au/resources/threatenedspecies/montanepeatIDguidelinehighres.pdf>
36. Australian Drinking Water Guidelines 6, 2004.
http://www.nhmrc.gov.au/publications/synopses/_files/adwg_11_06.pdf
37. Birch, G., Siaka, M., and Owens, C. (2001). The source of anthropogenic heavy metals in fluvial sediments of a rural catchment: Cox's River, Australia. *Water, Air and Soil Pollution* **126**, pp.13-35.
38. Salinity impacts of low Murray River flows in the South Australian Riverland: Fact Sheet No. 05/07
www.pir.sa.gov.au/factsheets
39. Muir, K. (2005) Gardens of Stone Stage Two. Colong Foundation & Blue Mountains Conservation Society.
40. Petition 551 tabled 2nd May 2012: Mr Paul Toole - from certain citizens opposing the open-cut mining proposal in Ben Bullen
41. Castleden, WM, et. al. 2011 The mining and burning of coal: effects on health and the environment, *Medical Journal of Australia*.
42. Christine Ferguson and Mike Blake, Central Council Natural Resources & Energy Policy Committee, The Nationals NSW, Submission to Director, Strategic Regional Policy, NSW DP&I, 24 April 2012, Section 4.0.
43. The Land, 25 June 2010. 'One man approves his own project, another man's dream dies'.
<http://theland.farmonline.com.au/news/state/agribusiness-and-general/political/one-man-approves-his-own-project-another-mans-dream-dies/1868365.aspx>
44. WA Environment Protection Authority (June 2005). Guidance for the Assessment of Environmental factors - Separation distances between industrial and sensitive land uses. http://www.epa.wa.gov.au/docs/1840_GS3.pdf
45. South Australia Environment Protection Authority (2007). Guidelines for separation distances.
www.epa.sa.gov.au/xstd_files/Industry/Guideline/sepguidepcd.pdf